STRATEGIC PLANNING AND DEVELOPMENT COMMITTEE MEETING

ATTACHMENTS

ITEMS UNDER SEPARATE COVER

7.30 PM, TUESDAY 6 JUNE 2023

Waverley Council
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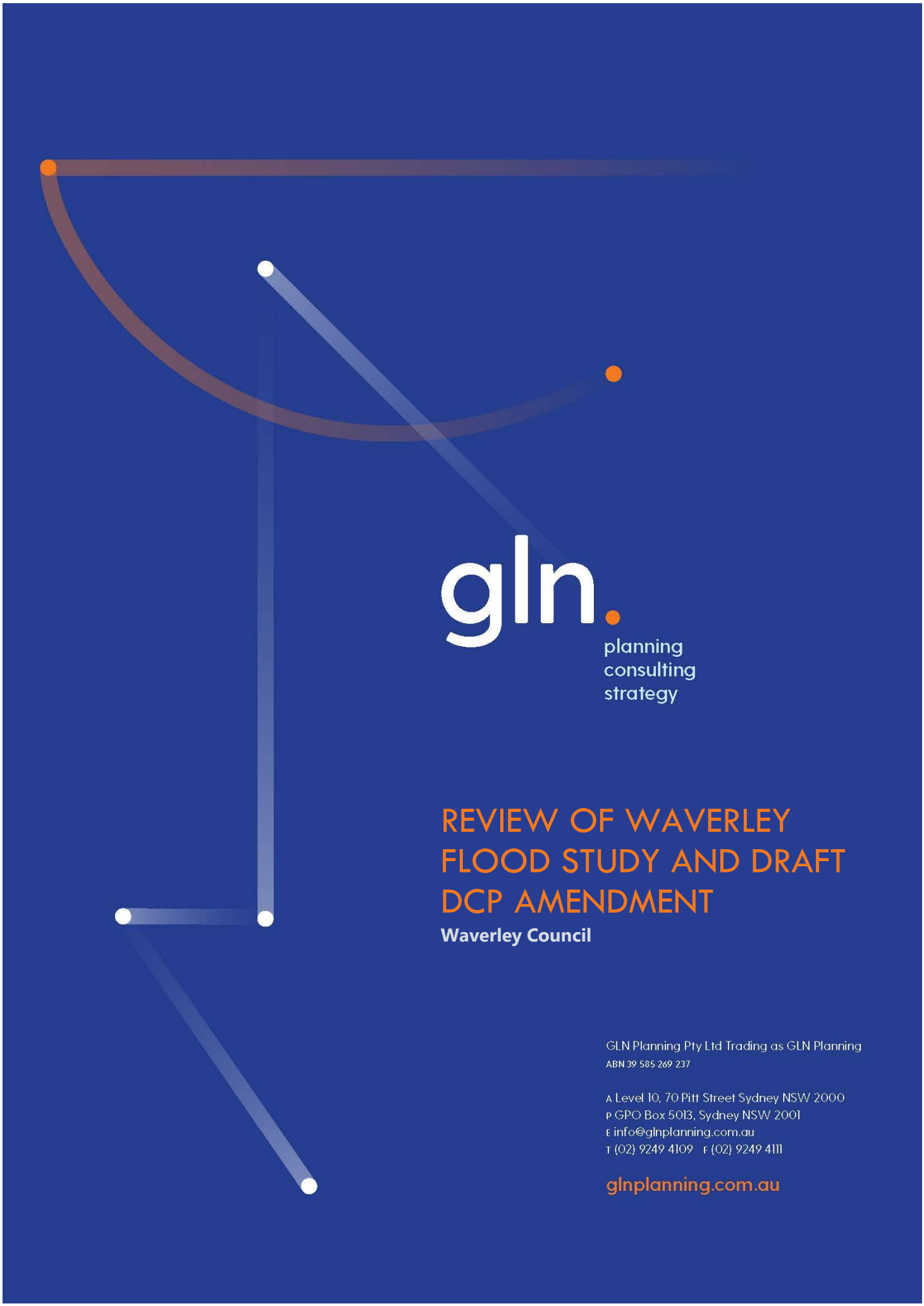
STRATEGIC PLANNING AND DEVELOPMENT COMMITTEE MEETING

Tuesday, 6 June 2023

ATTACHMENTS



REVIEW OF WAVERLEY FLOOD STUDY AND DRAFT DCP AMENDMENT

Waverley Council

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Table of Contents

Figures

Appendices

1 Introduction

1.1 Commission

GLN Planning was commissioned by Waverley Council to peer review the key documents relating to the Waverley LGA Flood Study prepared by BMT for Council dated January 2021 (**Flood Study**) and proposed amendment to the Waverley Development Control Plan 2022 (**Draft DCP**) based on Draft DCP provisions prepared by WMS dated September 2021.

1.2 Background

In April 2021, Council adopted the Waverley Flood Study after technical investigations and two rounds of community engagement. In July 2021, the NSW Government issued NSW Flood Prone Land Package (**the 2021 Package**). The 2021 Package included changes to the standard instrument local environmental plan, which consequently amended *Waverley Local Environmental Plan 2012* (**the LEP**), and provided guidance for other related matters including inclusions for development control plans.

The Flood Study represents the initial stage of the NSW Floodplain Risk Management (**FRM**) process as outlined in the NSW Floodplain Development Manual published in April 2005 by the NSW Government (**the Manual**). The Flood Study made recommendations in regard to the adoption of flood planning levels (**FPL**s) and Flood Planning Areas (**FPAs**) for planning purposes.

Subsequent stages in the NSW FRM process involve the preparation of a Floodplain Risk Management Study (**FRMS**) and a Floodplain Risk Management Plan (**FRMP**) that will investigate the consequences of the flood risks identified by the study, potential mitigation measures and recommendations to be implemented through the FRMP. While these mitigation measures can include planning controls, it is not unusual for planning controls to be reviewed based on the findings of a flood study as the preparation of a FRMS and FRMP typically take many years to complete and the Manual encourages Councils to always act on the best available information.

The Flood Study provided a 3 tier classification (**Types A, B** and **C**) for lots that should be subject to flood related development controls (**Flood Control Lots**) based on the level of confidence of the flood modelling due to the nature of the terrain. Types B and C Flood Control Lots were identified as requiring further investigation to determine the extent of the lot affected (Type B) and whether flooding would affect the identified lot or adjacent land (Type C).

As a logical adjunct to the preparation of the Flood Study, Council commissioned the preparation of draft amendments to the DCP (**Draft DCP**) to introduce appropriate flood related development controls. This provided the opportunity to address the additional lands subject to flood risks and the more detail information regarding flood extents and hazard identified by the Flood Study

Based on the Flood Study, Water Modelling Solution (**WMS**) prepared the Draft DCP provisions dated September 2021 and a Flood Risk Precinct (**FRP**) Map to be used for the purposes of applying the DCP controls. The FRP Map adapted information contained in the Flood Study to categorise lots as either part of a Low, Medium or High FRP, which cumulatively represent all proposed Flood Control Lots for the Waverley LGA.

The amendment to the DCP was exhibited in June-July 2022. During the exhibition process Council notified over 10,000 landowners and received feedback from a number of residents, many concerned with the risk classification (low, medium or high) given to their properties and the implications this may have on property values, insurance premiums and their ability to renovate or redevelop their property in the future.

Council subsequently engaged GLN Planning and KBR Consulting to undertake a peer review of the Flood Study and Draft DCP, which is the subject of this report.

1.3 Purpose of this report

The purpose of this report is to document the findings of a peer review of the key documents relating to the Flood Study and Draft DCP.

1.4 Study Team

In order to address the various components of the brief, the peer review was undertaken by the following study team:

- GLN Planning (**GLN**)
- KBR.

GLN is the lead consultant and addresses town planning related matters, specifically the approach taken to the preparation of the Draft DCP, the format and content of the Draft DCP and associated FRP mapping, and other related matters. Paul Grech (GLN Director), is the principal author of this report and has 40 years experience working as a town planner with involvement in flood risk management projects during the last 30 years for both local and state governments across Australia and private industry, most of which involved the preparation or review of FRM planning controls.

KBR addresses the assumptions and methodology adopted by the Flood Study and suitably of the information provided by the Flood Study to inform the FRP mapping relied upon by the Draft DCP and technical matters related to controls in the draft DCP. The Review by KBR was led by Joshua Eggleton (KBR National Industry Lead – Water Resources) who is an experienced water resource engineer that has completed a wide range of public and private sector projects primarily related to floodplain management across Australia.

1.5 Information Reviewed or Considered

The following is a list of the information sourced and considered.

- Flood prone land package changes as documented in the DPE Planning Systems Circular issued to Councils in final form on 14 July 2021 (**2021 Package**)
- *Considering flooding in land use planning – Guideline*, DPIE, 14 May 2021 (**2021 Guideline** provided with the 2021 Package)
- *Floodplain Development Manual*, Department of Infrastructure, Planning and Natural Resources, April 2005 (**the Manual**)

- *Draft Floodplain Management Manual,* Environment, Energy and Science Department of Planning and Environment (DPE), 2022, and associated complementary Guides (Draft Flood Risk Management Manual and associated draft Guidelines. (**Draft Manual**)
- *Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia* Australian Institute of Disaster Resilience 2017 (**Handbook 7**)
- *ISO 31000:2009 Risk management — Principles and guidelines*
- Draft Shelter in Place Guideline, Department of Planning & Environment, 2022 (exhibited 17 January until 28 February 2023. (**Draft SIP Guideline**)
- Waverley LGA Flood Study, Final Report, January 2021, prepared by BMT for Waverley Council (**Flood Study**)
- Draft DCP provisions prepared by Water Modelling Solution (**WMS**) for Council dated September 2021 (**Draft DCP**)
- Submissions received by Council in regard to the exhibition of the Draft DCP
- Review of Submissions to Draft DCP, 6.10.2022, prepared for Council by WMS (**Submissions Report**)
- Council Officer reports regarding the establishment of the Waverley Council Floodplain Management Committee, Flood Study and Draft DCP, to Council Meetings of 21.08.2018, 19.05.2020, and 13.04.2021.

2 General

2.1 Statewide Planning Guidance

Current Floodplain Development Manual

The Manual and NSW Flood Prone Land Policy have changed over time since first adopted in the early 1980s but have principally retained the following key principles:

- Local Government is responsible for FRM in NSW with financial and technical support being provided by the State Government. The actions, decisions and information provided by Council and exercised in this duty are indemnified through the provisions of Section 733 of the *Local Government Act, 1993*. Indemnity is provided where Council acts in good faith, which is deemed to be in accordance with the principles of the Manual unless proven otherwise.
- A merit approach is to be adopted for the purposes of formulating a FRMP that provides a basis for decision making in the floodplain. This is in recognition that flood prone land is a valuable resource which should not be unnecessarily sterilised by the rigid application of prescriptive criteria, and to avoid the approval of inappropriate proposals. The merit approach is defined in the Manual as follows:

  The merit approach weighs socio-economic, ecological and cultural impacts of land use options

for different flood prone land areas together with flood damage, hazard and behaviour implications, and environmental protection and wellbeing of the State's rivers and floodplains.[1]

The level of flood risk acceptable to the community is to be determined through a process typically overseen by a committee comprised of local elected representatives, community members and State and Local Government officials. This process is shown in **Figure 1**.

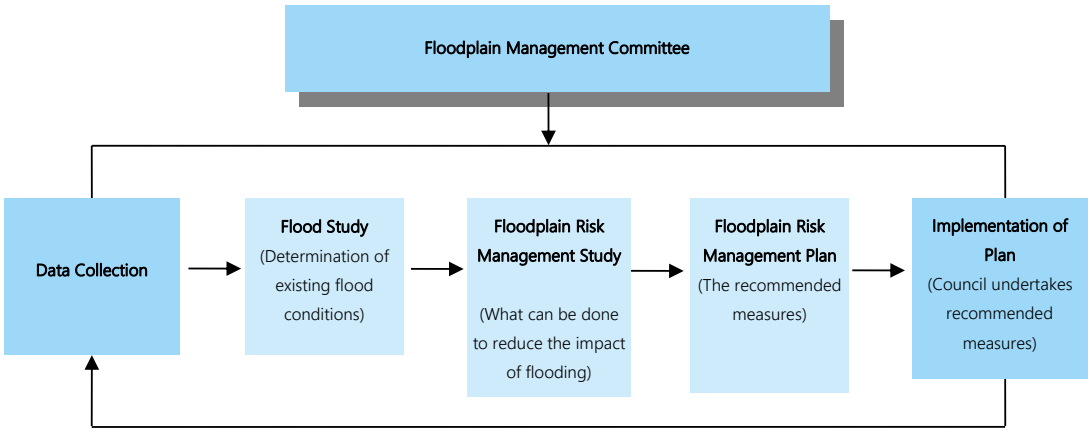


Figure 1 NSW FRM Process (adapted from the Manual 2005, pg.6)

The ultimate intent is to prepare FRMPs for individual floodplains that are adopted by Councils. FRMPs should have an integrated mix of management measures that address existing, future and continuing risk. These measures include planning and managing the approval of the location and form of new development.

The Manual and planning controls under the *Environmental Planning And Assessment Act 1979* (**EP&A Act**) should not be considered as providing alternate approaches. The Flood Prone Lands Policy and Manual are separate to the principal planning legislation in NSW, being that contained within the EP&A Act and associated Regulations. Ultimately, the planning recommendations of a FRMP may be reflected in planning instruments and policies brought into force in accordance with the EP&A Act, such as the DCP.

The way that FRM should ultimately be considered in plans made under the EP&A Act is primarily determined by a combination of matters including the Manual, guidelines and circulars issued by the NSW *Department of Planning and Environment* (**DPE**), national guidance documents such as Handbook 7 (AIDR, 2017) , the interplay of the LEP and DCP, Council planning strategies and higher order plans and polices prepared by the DPE, and the environmental, economic and social circumstances of individual Councils. Relevant legislation, planning instruments and policies are reviewed below to provide a basis for reviewing the Flood Study and Draft DCP.

[1] 2005 Manual, NSW Government, 2005, page 23.

Draft Flood Risk Management Manual and associated draft Guidelines

The Draft Manual was placed on public exhibition in the early part of 2022. The primary document consists of a more concise Manual complemented by a series of guideline documents.

The Draft Manual retains similar principles as the existing Manual. The most significant new guidance relevant to this report includes:

- The *Understanding and Managing Flood Risk Guide* (**Guide FB01**) This includes example considerations for DCP's (Appendix B). Three examples have been provided, each utilising a matrix approach based on dividing the floodplain into flood risk precincts, *Flood Planning Constraints Categories* or floodway and areas inside and outside of the FPA. Generic controls are provided under headings similar to those used in the Draft DCP. These example DCP's are intended to provide a guide only, requiring tailoring for individual council circumstances.

- The *Flood Impact At Risk Assessment Guide*, (**FIRA Guide**) which outlines matters to consider when preparing and reviewing flood impact assessments for development assessment purposes. Such a guide could replace, or inform a review of Council's current requirements for the preparation of site specific flood impact assessments.

The Draft Manual and above Guides have been taken into consideration when reviewing the Draft DCP.

Flood Planning Guideline

On January 31, 2007 the then NSW Planning Minister announced a guideline for development control on floodplains (**2007 Guideline**). An overview of the 2007 Guideline and associated changes to the EP&A Act and Regulation was issued by the Department of Planning in a Circular dated January 31, 2007 (Reference PS 07-003). The 2007 Guideline issued by the Minister at that time was in effect related to a package of directions and changes to the EP&A Act, Regulation and Manual.

This 2007 Guideline provided an amendment to the Manual. The Guideline confirmed that unless there were "exceptional circumstances", Councils were to adopt the 100 year flood as the flood planning level (**FPL**) for residential development, with the exception of some sensitive forms of residential development such as seniors living housing. That Guideline provided that controls on residential development above the 1 in 100 year flood could only be imposed subject to an "exceptional circumstances" justification being agreed to by the Department of Planning (now DPE) and the Department of Natural Resources (now also part of DPE) prior to the exhibition of a Draft LEP or Draft DCP.

The direction regarding the selection of an FPL in the 2007 Guideline did not apply to all land uses (only standard residential) and recognised the need to consider the full range of flood sizes, up to and including the PMF and the corresponding risks associated with each flood. Where there was a reason ('exceptional circumstances') a different FPL not based on the 100 year flood (plus freeboard) could also be applied with government approval. The direction did not apply to pre-existing planning controls.

More recently, the NSW Government introduced significant changes to the FRM statutory planning framework across NSW with the Implementation of the DPE Flood Prone Lands Package. These changes were initiated on 14 May 2021 and came into effect on 14 July 2021.

The Flood Prone Land Package changes were introduced in a DPE Planning Systems Circular issued to Councils in final form on 14 July 2021 and included the *Considering flooding in land use planning – Guideline* (the **2021 Guideline**).

The principal changes relate to the harmonisation of the FRM provisions of all LEPs but with important incidental implications for DCPs and flood planning maps. Notably, the prescription in the 2007 Guideline regarding the adoption of the 100 year flood as the FPL for residential development without exceptional circumstances approval was abandoned. The current Guideline now allows Council greater autonomy in determining FPLs and FPA mapping.

The 2021 Circular provided advice to Councils on the recent changes that included:

- an amendment to clause 7A of Schedule 4 to the *Environmental Planning and Assessment Regulation 2000*
- a revised local planning direction regarding flooding (for consideration in the review of Planning Proposals) issued under section 9.1 of the EP&A Act
- two LEP clauses which introduce flood related development controls (one compulsory – clause 5.21 and one optional – clause 5.22)
- all FPA maps are now deleted from LEPs
- introduction of the 2021 Guideline
- revoking of the 2007 Guideline.

Notable direction provided by the 2021 Guideline includes:

- The guideline applies to both mainstream and overland flow flooding (pg.3).
- The full range of flooding up to and including the PMF must be considered when undertaking strategic land use planning (pg.3).
- "Councils should define their FPAs and FPLs in their development control plans (DCPs) and outline if there are multiple FPAs/FPLs and where they apply. For example, a council may have a different FPAs for different catchments based on the flood risk identified through the FRM process. Council may also have different FPLs based on the land use type (for example, residential, industrial, commercial developments) and these should be documented in their DCP. Council may have a range of development controls to suit the flood constraints and different types of development" (pg.5).
- "The manual identifies the 1% AEP flood event, or an equivalent historic flood, as an appropriate starting point for determining the DFE for development controls, including for residential development. The manual allows the selection of a rarer DFE to address broad scale flood impacts in consideration of the social, economic, environmental and cultural consequences associated with floods of different probabilities" (pg.5). DFE is an abbreviation for "defined flood event" which can be added to freeboard to determine an FPL.
- "The typical freeboard for residential development due to flooding from waterways, such as rivers or creeks, is 0.5m. A lower freeboard or an alternative approach to freeboard may be

used where the consequences to people and property of low probability flood events are assessed as minor through the FRM process" (pg.5).

- "Where councils propose alternative FPL's, they are required to demonstrate and document the merits of this approach based on a risk management approach that is consistent with the FRM process and the principles of the manual" (pg.5).
- All areas where flood-related development controls apply should be mapped where flood study information is available, with publicly accessible maps (pg.7).
- It is suggested that Councils could attach their adopted flood policies, flood studies and FRMS&Ps to their DCPs to ensure they are considered in the assessment of a DA (pg.5). However, in our view this is unnecessary. Ideally the Flood Study or future FRMP should be publicly available but all relevant planning recommendations should be translated to a DCP.

Our review takes into consideration the changes introduced with the Flood Prone Lands Package, including the new 2021 Guideline.

2.2 Relevant State Environmental Planning Policies

No State Environmental Planning Policy (**SEPP**) has been prepared dealing specifically with the issue of flooding, but some regulate development in response to potential flood risks.

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the **Codes SEPP**) has some relevance to this report. The Codes SEPP effectively provides approval pathways as alternatives to a full DA for certain low impact development as "exempt" or "complying" development. Exempt development requires no approval provided it complies with certain criteria. Complying development must meet certain criteria but also requires an approval in the form of a complying development certificate (**CDC**) which must be issued by Council or a private certifier subject to specified conditions.

The Codes SEPP is divided into a number of "Codes" that deal with exempt development and different types of complying development. Those Codes of relevance are the Exempt Development Code (Part 2), the General Housing Code (Part 3), and the Commercial and Industrial (New Buildings and Additions) Code (Part 5A).

Relevant clauses of the Codes SEPP apply to "flood control lots" defined as:

> ***flood control lot*** *means a lot to which flood related development controls apply in respect of development for the purposes of industrial buildings, commercial premises, dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (other than development for the purposes of group homes or seniors housing).*
>
> ***Note****. This information is a prescribed matter for the purpose of a certificate under section 149 (2)* [now 10.7] *of the Act.*

The term "Flood control lots" exist only for the purposes of the Codes SEPP. Consequently the process of "lot tagging" to identify Flood Control Lots is a practice that had initially evolved in the preparation of flood studies to assist Councils for the purposes of issuing s10.7 planning certificates. Consequently Flood Control Lot Maps are not necessarily an appropriate format for FPA maps.

The term 'flood-related development controls' within the definition of flood control lot is not defined but would include any development controls relating to flooding that apply to land, that are a matter for consideration under section 4.15 of the Act[2]. These development controls may apply through an LEP or DCP.

2.3 Waverley LEP

The relevant planning instrument is *Waverley Local Environmental Plan 2012* (**the LEP**) The standard instrument mandatory FRM clause 5.21 applies. Subclause 5.21(5) provides:

flood planning area *has the same meaning as it has in the Floodplain Development Manual*

The Manual (pg.21) provides:

flood planning area *the area of land below the FPL and thus subject to flood related development controls. The concept of flood planning area generally supersedes the "flood liable land" concept in the 1986 Manual.*

flood planning levels (FPLs) *are the combinations of flood levels (derived from significant historical flood events or floods of specific AEPs) and freeboards selected for floodplain risk management purposes, as determined in management studies and incorporated in management plans. FPLs supersede the "standard flood event" in the 1986 manual.*

Council has not opted into the optional SFC clause 5.22 in the standard instrument. We understand that Council did discuss this with the DPE and was advised that this would not be appropriate until Council had completed its FRMS and FRMP:

[2] See 2021 Guideline. Page 2.

2.4 Council Flood Mapping

Council currently provides flood mapping as part of its online mapping information. This mapping identifies relatively few properties based on limited information available prior to the current Flood Study (**Figure 2)**. These limited properties are those that would be currently subject to flood related development controls.

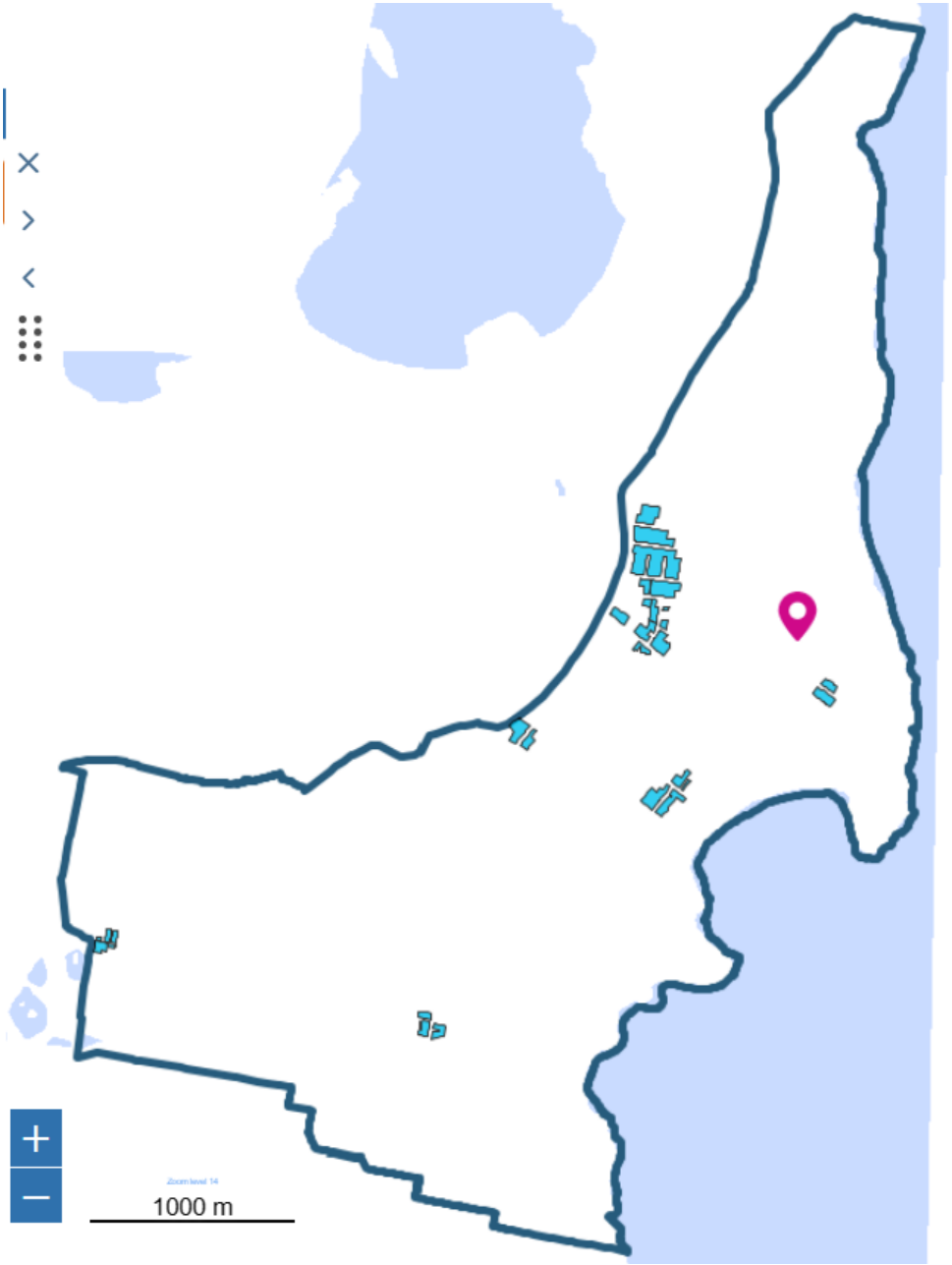


Figure 2 Online Flood Planning Area Mapping

2.5 Existing DCP Provisions

In summary the existing FRM provisions of the DCP (Section B5 clause 5.2) comprise the following:

- Refers to the LEP to define the FPA
- FPL for habitable floors – 1% + 300mm freeboard
- FPL for non-habitable floors – 150mm above adjacent ground.
- Auto flood gates for basements.
- Refers to *Water Management Technical Manual* – mainly stormwater management.

The existing DCP provisions are not consistent with current LEP provisions – in particular the DCP refers to the LEP for guidance as to the FPA while clause 5.21 and the 2021 Guideline recommends that the DCP performs this function.

Importantly, the existing DCP FRM provisions do not reflect a risk based approach which is best practice as promoted by Handbook 7, or the appropriate range of controls suggested within Guide FB01 provided with the draft Manual.

3 Review of Flood Study and Draft DCP

3.1 Flood Study

A detailed review of the Flood Study as required by the brief was undertaken by KBR. a full copy of their report is contained as **Appendix A**. In summary the KBR report concludes the following:

- The Flood Study was completed in accordance with the NSW State Government's Floodplain Development Manual (2005), and Australian Rainfall & Runoff (ARR) 2016 (the current ARR guideline at the time of completion of the Flood Study).
- The adopted modelling methodology is considered reasonable and appropriate for the catchment. However, there are limitations in the adopted approach that directly influence the level of confidence in certain (predominantly steeper upper catchment) sections of the catchment. BMT have clearly acknowledged these limitations and considered them in their approach to lot tagging.
- Further investigation of key model limitations and assumptions discussed in this review should be considered within the FRMS.
- The adopted approach to lot tagging should be clearly articulated and repeatable but should also consider the level of uncertainty/confidence in the underlying modelling. Any deviation from the selected criterion to add or remove tagged properties based on engineering judgement or visual inspection should be documented for future reference.
- The BMT approach to lot tagging considered the level of uncertainty in the underlying

modelling but is not simple to articulate or replicate.

- The WMS approach to lot tagging follows a set criterion (i.e. well-articulated) and is simple to replicate but does not take into consideration the level of uncertainty in the underlying modelling.

- The approach to defining the FPA is a matter that can be considered further as part of the FRMS. In the interim, the WMS FRP approach is considered a reasonable, albeit conservative, approach to determining the FPA and FRP maps for the application of DCP controls.

- The FRP map is currently presented using the lot-based approach as discussed in Section 3.2. It is recommended that the FRP map be modified to adopt a line-based approach (i.e. based on the actual extent of the three precincts) to convey the flood extent and level of risk to the community to an improved level of accuracy. The lot-based map can be retained for use internally by Council to understand what DCP controls apply to each lot (based on the adopted post-processing of the FRP polygons detailed in Section 3.3 [of the KBR Report]).

While not directly related to our brief we note that the Flood Study (pg.90) concludes that "most of the inundation modelled and presented in this study would be regarded as "stormwater" for the purposes of the assessment of insurance claims". In contrast to insurance for stormwater damage, household insurance for flood damage is relatively new. The process for introducing flood insurance included Australian regulations adopting the following standard definition of "flood" in June 2012:

> *The covering of normally dry land by water that has escaped or been released from the normal confines of:*
>
> *any lake, or any river, creek or other natural watercourse, whether or not altered or modified; or*
>
> *any reservoir, canal, or dam.*

Separate to coverage for flood damage, most household insurance policies include cover for storm or rainwater damage which while not subject to a standard definition, typically refers to water that has fallen naturally from the sky. Simplistically, storm damage is associated with water travelling to a watercourse or water body, while flood damage is associated with water travelling from a watercourse or water body. It should be noted that the Flood Study only defined a few watercourses within the study area (such as Tamarama Gully and Bronte Gully).

3.2 Principles to be considered in Review of Draft DCP

3.2.1 Introduction

As alluded to above, there are no guidelines that prescribe the format or content of flood related development controls in a DCP. However best practice would require DCP controls adopt a risk based approach. This needs to be accompanied by appropriate mapping. The general principles of

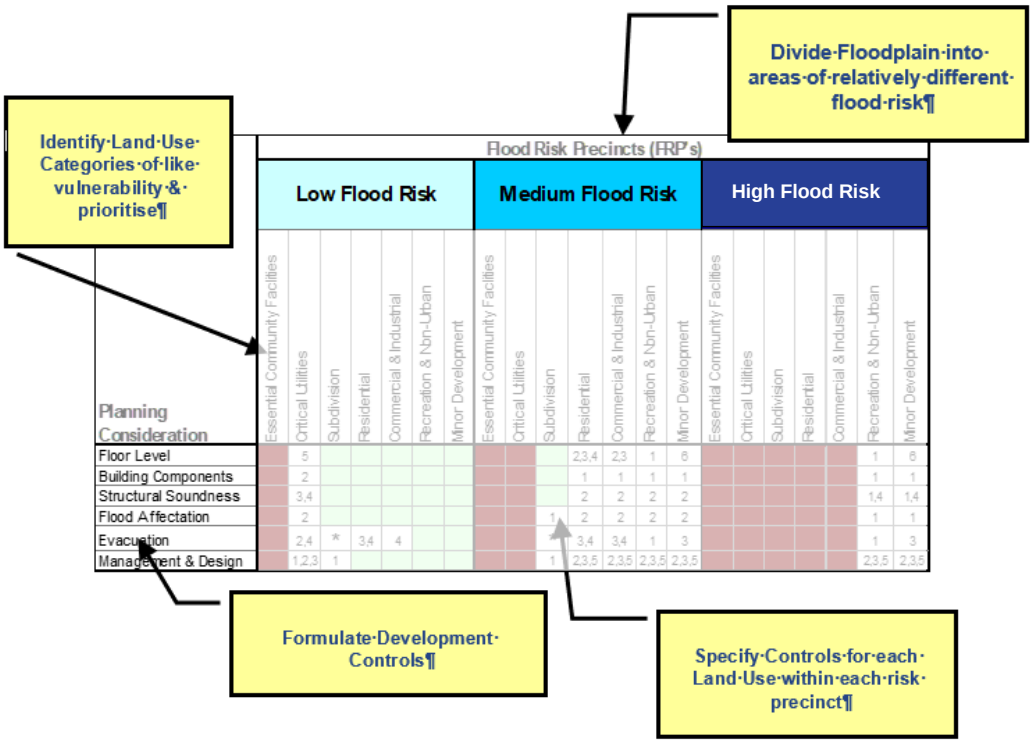
how this may be achieved is discussed below prior to undertaking a review of the draft DCP.

3.2.2 A Risk Based Approach for the Application of the DCP

Historically, the FRM statutory planning framework was based on determining a singular FPL to determine the extent of an FPA which in turn governs the appearance of statutory flood planning maps. However this does not allow for the application of a risk based approach which needs to consider the full range of potential floods and the variable sensitivity of different land uses to flooding.

The "Planning Matrix approach"[3] was formulated to address the inadequacy's of past approaches. This approach does not rely on a singular FPL and requires the mapping of typically 3 "precincts" with different levels of flood hazards. This is consistent with the recommendation of the Queensland Commission of Inquiry following devastating flooding in 2010-2011, that recommended that flood planning maps be prepared showing "…'zones of risk' (at least three) derived from information about the likelihood and behaviour of flooding." [4] Cumulatively these 3 precincts can constitute an FPA map.

The principles for applying the Planning Matrix approach are depicted on **Figure 3**, noting that the land use categories and metrics of the controls should be adapted to the meet the circumstances of



[3] Bewsher & Grech, May 1997, *A New Approach to the Development of Floodplain Controls for Floodplains*, paper presented to the 37th Annual Floodplain Management Conference, Maitland.

[4] Queensland Flood COI Final Report, March 2012, pg. 68.

different floodplains. This approach operates in conjunction with FRP maps. The Planning Matrix approach is consistent with a risk based approach.

Figure 3: Principles for Applying the Planning Matrix Approach

The Planning Matrix approach has been adopted by about a third of councils in the Sydney Metropolitan, Illawarra and Hunter regions of NSW[5] and is now endorsed as part of the example DCP's included in the DPE draft Guide FB01 (*Understanding and Managing Flood Risk Guide*) accompanying the draft Manual. Importantly, the matrix approach operates in conjunction with the mapping of FRPs (typically low, medium and high flood risk precincts - **FRP**s). Rather than identify a single FPA within which all development is equally subject to the same planning considerations, the FRPs are used in conjunction with the planning matrix to determine which controls apply, to which land uses, within each FRP.

3.2.3 How to Map the Floodplain for the Purposes of Applying the DCP

The function of flood planning maps prepared for statutory planning purposes is to trigger approval pathways and FRM considerations to be addressed in the assessment of a development application. This is different to more complex flood maps produced by Flood Studies that can be used for the purposes of strategic planning.

While there could be many permutations for preparing maps for statutory planning flood purposes, in recent years there have been mainly 3 approaches:

1. **A single line Map** – This approach shows a line based on a single FPL (typically the 1 in 100 year chance flood plus freeboard) to trigger the consideration of flood planning controls for areas only within that line.

2. **Flood Control Lot Map –** This maps the whole of lots that are identified as substantially affected by a single FPL (typically the 1 in 100 year chance flood plus freeboard) to trigger the consideration of flood planning controls for the whole of lots identified in this way.

3. **Flood Risk Precinct (FRP) Map –** This typically maps the whole of the floodplain (ie up to the PMF) into three areas (normally referred to as Low, Medium and High FRPs) based on various flood considerations to apply different planning controls to different land uses in different parts of the floodplain.

The merits of each approach are discussed below.

A Single Line Map

A Single Line Map is the simplest to understand and is historically the most common approach but has the following disadvantages:

[5] Based on research undertaken by GLN planning in 2021 which reviewed the FRM planning policy framework of 49 LGAs in the Sydney Metropolitan, Illawarra and Hunter regions of NSW prior to any changes initiated in July 2021 associated with the Flood Prone Lands Package,

- Can miscommunicate to the public that if located above the line then no flood risks exist, whereas in reality flood risks up to the PMF would exist.
- In some cases the flood risk can be over stated, (eg where the addition of freeboard to the 1 in 100 flood level exceeds the PMF, with no adjustments).
- It does not allow for the application of flood related planning controls based on a best practice risk based approach.

It is considered that this mapping format is not the optimal approach.

Flood Control Lot Map

As discussed above, there is no specific requirement to prepare a Flood Control Lot Map (ie that depicts flood control lots as defined by the Codes SEPP). However, in practice this is normally done for the purpose of having a GIS based source to automatically trigger which properties should be noted as a Flood Control Lot on a S10.7 Planning Certificate. Other flood maps cannot readily perform this function because it is common practice to exclude the "tagging" of Flood Control Lots if an immaterial proportion of the lot is affected by flooding (eg less than 10% being a criterion commonly used).

Flood Control Lot Maps had historically been used by some Councils within planning instruments. Prior to the changes brought by the Flood Prone Land Package, a few LEPs (e.g. Rockdale and Marrickville LEPs) and the DCPs of some other Councils adopted Flood Control Maps as Flood Planning Area maps. However, this is not favoured for the following reasons:

- Some lots remain only partially affected by actual flooding but are tainted as wholly flood affected (this being a particular issue with large lots).
- Such maps portray a distorted view of the flood risk across an area, which works against communicating clear and accurate information about flood risk to the community.
- It does not allow for the application of flood related planning controls based on a best practice risk based approach.

It is considered that this mapping format is also not the optimal approach. However, it is recommended that a Flood Control Map be prepared for the purposes of tagging properties for notification on S10.7 Planning Certificates, but that such a map be contained on Council's GIS system for internal use only.

3.2.4 Flood Risk Precinct (FRP) Maps

The flood risk precincts (**FRP**s) approach is preferred. For the reasons outlined above it provides a best practice risk based approach that is designed to work with the Planning Matrix Approach. The FRP approach divides the whole of the floodplain into precincts that do not miscommunicate known flood risk to the community and provides a platform from which planning controls can be established with minimal complexity.

The criteria used to demarcate between each FRP could vary. While not specifically referenced in the context of preparing a DCP, the draft Guide FB01 suggests the following criteria for FRP's:

- *high risk precinct – high hazard (from the 2005 Manual) or H5 and H6 as determined through FRM Guide FB03 – and in some cases floodways in the DFE event. This is the most constrained area of the floodplain*
- *medium risk – low hazard (from the 2005 Manual) or H1 to H4 as determined through FRM Guide FB03 in the DFE event and extending out to the FPA (based on the DFE plus freeboard)*
- *low risk – outside the FPA and potentially out to the extent of the PMF.*

The above suggestion in draft Guide FB01 is based on the premise that that there would be 2 maps – an FPA map and a separate FRP Map. Recognising the specific purpose of such maps is to trigger the need to consider FRM matters in the assessment of a development application, a simpler approach could suffice that does not rely on a separate FPA map. Given that the 2021 Guideline encourages the delineation of FPA areas in a DCP, having a single map that also allows for the application of DCP controls would be less confusing to the general public and administratively more efficient.

Having regard to the above background and principles, we review the questions asked of us in our brief below.

3.3 Flood Mapping to Support the Draft DCP

Comment on the appropriateness of the lot tagging method

In addition to KBR's technical review of the mapping derived from the Flood Study it is relevant to consider the appropriateness of utilising the flood map provided with the Draft DCP.

The Flood Study determined a Preliminary FPA based on a 1 in 100 year chance flood plus freeboard. The intent of the FPA map was to identify areas to be subjected to flood related development controls. However, the Draft DCP relies on FRP maps that are different to the FPA Map.

It has been common practice in NSW, since about the time of the 2007 Guideline, for Councils to adopt an FPA based on the 1 in 100 year chance flood plus 0.5m freeboard (with or without climate change factored in) for the purposes of applying LEP considerations and then to adopt DCP controls often based FRP maps. As discussed above, this conundrum was a consequence of the historical approach relying on a single FPL. This was also an expedient means of dealing with the 2007 Guideline which constrained the imposition of flood related planning controls on standard residential development. This changed with the introduction of the NSW Flood Prone Land Package and associated Guideline in 2021.

Given the Flood Study was prepared prior to the NSW Flood Prone Land Package changes and the Draft DCP was narrowly focused on that document, it is unclear as to what is now intended to be the FPA map for the purposes of applying clause 5.21 in the LEP. The options for defining the FPA for the purposes of clause 5.21 of the LEP could include:

1. Adopt a separate map that is ideally referenced in the DCP but explained as different to the FRP map used in the DCP.

2. State in the DCP that the Medium and High FRPs are the FPA for the purposes of the LEP.

3. Adopt the outer bounds of all the FRPs as the FPA.

Option 1 is likely to be confusing to the public, unnecessarily adds administrative complexity and could create conflict with the DCP. While this option might decrease the number of properties upon which development would be subject to consideration of clause 5.21 of the LEP if the FPA in the Flood Study was adopted, there would be inconsistency with the triggering of FRM considerations under the DCP using proposed FRP maps.

Option 2 is also likely to be confusing to the public, and would result in conflict between the DCP and LEP. The DCP provides basic emergency and environmental management considerations for a range of uses in the Low FRP for a range of uses[6]. Additionally the FRPs are based on flood extents exclusive of freeboard, meaning if Council was to rely on the more conventional FPA as provided in the Flood Study, its outer bounds would lie somewhere between the lines that the delineate the Medium and Low FRPs.

In our opinion, Option 3 is .preferable. To ensure consistency between application of the LEP clause 5.21 considerations and the DCP controls it would be desirable for the DCP to explicitly outline that satisfaction of the provisions of the DCP is a means of addressing clause 5.21. Additionally, while a scaled down version could be inserted in the DCP (as proposed by the Draft DCP) it would be the FRP map should be available electronically on Council's online maps (which is what was proposed).

The Draft DCP Flood Map uses a hybrid approach that combines an FRP Map approach with a Flood Control Lot map approach. To our knowledge such an approach has not been used in another jurisdiction in NSW or other parts of Australia. It's uniqueness does not necessarily mean it is not appropriate and we see there are both advantages and disadvantages with the approach, as outlined below.

Advantages	Disadvantages
Adopts a format that allows for the application of flood related planning controls using a risk based approach (ie the Planning Matrix Approach)	Does not reflect the actual pattern of flooding across the catchment, which could confuse the public particularly when comparing with flood extent maps in the Flood Study.
Allows for a degree of uncertainty in the flood mapping that could be warranted given the complex urban environment mapping constraints discussed by KBR. For example the Flood Study mapping might provide confidence that a lot is subject to some flood hazard albeit without a high level of confidence about the extent while the DCP map could trigger the application of planning controls for	Could overstate the level of flood risk on an individual lot (ie because only a part of the lot is actually flood affected).

[6] Note detailed review of the Draft DCP in Appendix B recommends that floor level and flood compatible building controls be also applied in the Low FRP. This is to ensure that development occurring in the Low FRP but on the edge of the edge of the Medium FRP on land only marginally above the 1% AEP flood level adopts the 1% AEP flood level plus appropriate freeboard. This will avoid inconsistencies in possible situations with development applications where neighbours are at almost the same ground level but one is required by Council to have elevated floor levels and the other is not.

Advantages	Disadvantages
a lot where further detail investigations could be undertaken.	

Based on the KBR review and the above, we consider that the proposed hybrid approach should be replaced with a conventional line based map derived from modelled flood extents. However, it would be appropriate to provide a statement on the map that recognises the known accuracy limitations as discussed by KBR.

Figure 4 provides an example area from the exhibited DCP map which uses a Flood Control Lot mapping approach. **Figure 5** shows how the same area could appear applying line-based FRP mapping approach. We note that when using Council's online mapping system the aerial photograph layer can be turned on/off, so differences associated with that aspect of the images in these figures should be understood in that context.

Figure 4: Hybrid Flood Control Lot & FRP Mapping Approach

(Extract from Exhibited Draft DCP Map)

Figure 5: FRP Mapping Approach

(Extract from map generated by Council)

Limitations on the accuracy of base flood mapping should not preclude the adoption of updated flood planning maps for development assessment purposes. This is not an uncommon situation and in our experience it can be adequately addressed by clearly outlining the limitations of the accuracy of the base mapping with the published maps. As discussed above, the principal purpose of a statutory planning map is to trigger the application of planning controls and FRM considerations. The DCP controls can appropriately provide flexibility to enable applicants to provide site specific flood assessments and could include performance based design solutions to respond to the particular circumstances of an individual property when preparing a development application.

The Manual encourages Councils to rely on the latest available information when preparing planning controls, and indemnity is provided in accordance with s733 of the *Local Government Act, 1993* when acting in accordance with the principles of the Manual. Updated flood planning maps would also address inconsistencies between existing flood planning maps and information provided in the flood study to minimise the opportunity for miscommunicating known flood risks to the community.

In addition to the technical mapping issues discussed by KBR, we consider that the area within the High FRP should be refined. The High FRP should identify that part of the floodplain within which the intensification of development is unlikely to be acceptable after practical ameliorative measures are considered, due to both flood hazard conditions and potential emergency management issues. The Flood Study (pg.84-85 and Figure 7-3) identified individual properties that are unsafe for sheltering in place (because they are potentially at risk of structural damage due to flooding) and roads that may not be trafficable by heavy vehicles (limiting rescuing capabilities) during the peak of a flood event. These individual properties should be included in a High FRP, if not already included, and further analysis undertaken to determine whether any properties isolated by flooded roads could become unsafe for sheltering in place, in which case they should also be included in the High FRP.

While consideration could be given to factoring in climate change to the determination of flood extents and hazards in the delineation of FRPs, we do not consider this is critical at this stage provided FPLs used in the planning controls ultimately factor in climate change as discussed further below.

3.4 Draft DCP Provisions

Comment on the methodology undertaken to prepare the amendments to the Development Control Plan, inclusive of reviewing a consultant report discussing this process.

In answering this question we have considered both the process for the preparation of the Draft DCP and the content of the Draft DCP.

3.4.1 Process

We have not identified any issues with the process for preparing the DCP. The DCP was based on detailed knowledge provided by the Flood Study. Based on the documents we reviewed and discussion with Council officers, the notification of the draft DCP met the requirements of the EP&A Act and Council's Public Participation Policy.

3.4.2 Content

We have considered the following aspects of the content of the Draft DCP:

- General Format
- Stated Objectives
- Definition of Land Use Categories
- Substance of controls
- Defined Terms

Appendix B provides a detailed review of the DCP having regard to the above aspects. The following provides a summary of this review.

General Format

The format of the draft DCP is consistent with that adopted by other DCP's that adopt a similar Planning Matrix approach. However we recommend the incorporation of performance criteria to complement the prescriptive controls.

Section 4.15(3A)(b) of the *Environmental Planning and Assessment Act 1979*, requires:

> *(3A) Development control plans If a development control plan contains provisions that relate to the development that is the subject of a development application, the consent authority—*
>
> *...*
>
> *(b) if those provisions set standards with respect to an aspect of the development and the development application does not comply with those standards—is to be flexible in applying those provisions and allow reasonable alternative solutions that achieve the objects of those standards for dealing with that aspect of the development, ...*

Given the complex nature of the highly urbanised area to which the controls apply, and the potential for refinement of the understanding of the flood hazards on individual sites subject to site specific assessments, performance criteria will enable council to flexibly apply the controls to ensure the intended outcome is achieved. This provides reasonable flexibility to ensure that any unavoidable inaccuracies with the flood modelling that have underpinned the definition of FRP's would not unreasonably impact the development potential of individual properties.

Stated Objectives

The stated objectives could be simplified and clarified to avoid any confusion in regard to the intent of the controls.

Additionally the objectives could confirm the intention that satisfaction of the DCP controls would address the considerations required by clause 5.21 of *Waverley Local Environmental Plan 2012*. This provides greater clarity for both applicants and Council assessment officers when addressing all FRM issues associated with a development application. Importantly this would also clarify that the intent of utilising the FRP mapping prepared for the DCP, to also define the LEP FPA, is not intended to expand the restrictions on development when being considered under clause 5.21 of the LEP.

Land Use Categories

In our view the number of land use categories proposed are excessive in the context of the Waverley LGA, and can be reduced to simplify the matrix, in the following way:

- The categories of "Essential Community Facilities" and "Sensitive Uses and Facilities" can be consolidated as the same controls would be relevant to both.
- A separate land use category for "Subdivision" is not necessary, and relevant considerations can be incorporated into controls for each land use category.
- The category for "Tourist Related Development" can be dispensed with as most uses in this category would be uncommon to the Waverly LGA and can be incorporated into other land use categories.

Range of Controls

The range of controls are generally consistent with best practice, including the suggested DCP controls in Guide FB01. However some minor refinements are recommended as to how subdivision matters are addressed, to simplify the matrix without diminishing the intent of the controls.

Substance of Controls

The substance of the controls generally reflect best practice, but detail refinements that reflect the highly urbanised and complex nature of the Waverley LGA have been recommended.

The various FPLs referred to in the DCP do not factor in climate change. On the basis that this is a consequence of the information available within the Flood Study we consider that this is acceptable at this stage. Sensitivity analysis undertaken by the Flood Study included consideration of a range of increased rainfall intensity scenarios having regard to government guidelines for consideration of climate change impacts. However final design flood levels were exclusive of the effects of these increased rainfall scenarios. Further consideration of the effects of climate change and any adjustments required to FPL's should be undertaken at the FRMS stage.

Defined Terms

Many of the relevant defined terms are not referred to in the flood planning controls and can be deleted. Recommendations have also been made to simplify terms so that they are more clearly understood by the general public while remaining technically appropriate. Where relevant, definitions contained within the now available Draft *Floodplain Risk Management Manual* have been recommended.

3.4.3 Consistency with the Manual and 2021 Guidelines

Is the DCP consistent with the Floodplain Development Manual 2005 and the Considering flooding in land use planning Guidelines?

As discussed above there is no mandatorily prescribed format for flood risk management DCP provisions. The Planning Matrix and FRP Map approach, that has been adopted by a substantial

number of Councils in NSW, is considered to be consistent with both the Manual and 2021 Guidelines.

3.4.4 Low Medium and High Risk Categorisation

Is the categorisation of low, medium and high flood risk the most appropriate given the results of the flood study and the context of Waverley? What other approaches could be adopted?

We have addressed this above.

3.4.5 Best Practice

Does the DCP follow best practice, particularly in relation to what Councils with similar flood risk are adopting?

While we have identified the potential for improvements, the general approach adopted by the draft DCP is consistent with best practice.

Best practice, in regards to the preparation of flood related planning controls, allows for a risk based approach to the assessment of the acceptability of development. The use of the Planning Matrix approach together with FRP maps, provides an appropriate means of achieving best practice.

3.4.6 Submissions Report

Comment on the post-exhibition report prepared, addressing the concerns raised by residents.

Both the Draft Flood Study and Draft DCP underwent extensive public consultation processes. We have been requested to comment specifically on the post-exhibition report (Submissions Report) for the Draft DCP. We note that we were also provided with access to all 99 submissions received by Council.

The Submissions Report (pg.1) outlines its purpose was to provide:

- an overview of the submissions received
- a summary of the key issues raised
- recommendations about possible responses and next steps.

The Submissions report also provides a comparison of the FRP precincts on the Draft DCP map and

the properties identified by the former LEP FPA Map.

The following 6 key issues, in order of recurrence, were identified as being raised in the submissions:

1. flood risk precinct classification
2. implications to property value
3. consultation process
4. implications to insurance premiums
5. implications to development
6. applicability of FRP to apartments.

This appears to provide a fair representation of the submissions received. The Submissions Report also identifies the location of submitters.

This Submissions Report outlines how responses are to be made in the short, medium and long term. The description of the approach for short and medium term responses basically deals with the administrative process to be followed as opposed to discussing the validity of the submissions.

The comments provided in regard to long term responses outlined how the issues raised in submissions would be appropriately addressed at the FRMS stage of the NSW Floodplain Risk Management process.

In our view, the Submissions Report does address its stated purposes. However, while we agree that the issues raised are matters that would appropriately be addressed when preparing a FRMS, no direct responses to the validity of the issues raised were provided. Further, it should be recognised that these submissions specifically related to the Draft DCP prepared in accordance with the provisions of the EP&A Act. While the Draft DCP is related, the Flood Study is being prepared in accordance with the NSW Floodplain Risk Management process which will at some later time involve the preparation of a FRMS.

Notwithstanding the above, Council has now commissioned this review which is substantially focused on addressing the primary issues raised in the submissions.

3.4.7 Potential Improvements

Based on findings from the peer review of the Flood study and DCP, what changes could be made to improve the DCP?

As outlined above we have reviewed the content of the DCP and associated definitions and provide detailed recommendations for improvements within **Appendix B**. These recommendation are for Council's consideration.

While the detailed review of the Draft DCP includes recommended specifications for site specific assessments, this could be reviewed further having regard to the FIRA Guide provided with the Draft

Manual, once finalised and adopted.

Ideally the flood related planning controls and mapping approach should also be consistent with that adopted by Randwick City Council for the same catchment area. The Flood Study was undertaken for both the Waverley LGA and a smaller part of the Randwick LGA covering Clovelly. Randwick Council's website indicates that they are yet to adopt a Final Flood Study. Accordingly we would recommend that this report be forwarded to Randwick City Council for consideration.

4 Conclusion

This report has been prepared to peer review of key documents relating to the Waverley LGA Flood Study prepared by BMT for Council dated January 2021 (**Flood Study**) and the proposed amendment to the Waverley Development Control Plan 2022 (**Draft DCP**) based on Draft DCP provisions prepared by WMS dated September 2021.

Technical aspects of the Flood Study were reviewed by KBR who concluded:

- The Flood Study was completed in accordance with the NSW State Government's Floodplain Development Manual (2005), and Australian Rainfall & Runoff (ARR) 2016 (the current ARR guideline at the time of completion of the Flood Study).
- The adopted modelling methodology is considered reasonable and appropriate for the catchment. However, there are limitations in the adopted approach that directly influence the level of confidence in certain (predominantly steeper upper catchment) sections of the catchment. BMT have clearly acknowledged these limitations and considered them in their approach to lot tagging.
- Further investigation of key model limitations and assumptions discussed in this review should be considered within the FRMS.
- The adopted approach to lot tagging should be clearly articulated and repeatable but should also consider the level of uncertainty/confidence in the underlying modelling. Any deviation from the selected criterion to add or remove tagged properties based on engineering judgement or visual inspection should be documented for future reference.
- The BMT approach to lot tagging considered the level of uncertainty in the underlying modelling but is not simple to articulate or replicate.
- The WMS approach to lot tagging follows a set criterion (i.e. well-articulated) and is simple to replicate but does not take into consideration the level of uncertainty in the underlying modelling.
- The approach to defining the FPA is a matter that can be considered further as part of the FRMS. In the interim, the WMS FRP approach is considered a reasonable, albeit conservative, approach to determining the FPA and FRP maps for the application of DCP controls.
- The FRP map is currently presented using the lot-based approach as discussed in Section 3.2. It is recommended that the FRP map be modified to adopt a line-based approach (i.e. based on the actual extent of the three precincts) to convey the flood extent and level of

risk to the community to an improved level of accuracy. The lot-based map can be retained for use internally by Council to understand what DCP controls apply to each lot (based on the adopted post-processing of the FRP polygons detailed in Section 3.3 [of the KBR Report]).

GLN reviewed the Draft DCP, having regard to the KBR conclusions and the intrinsic relationship that flood planning mapping has with the format and content of such a DCP. The conclusions reached with regard to the questions asked within our brief are summarised as follows:

- The Draft DCP Flood Map uses a hybrid approach that combines an FRP Map approach with a Flood Control Lot map approach. While we recognise there are some advantages with such an approach we recommend that it be replaced with a conventional line based map derived from modelled flood extents. However, it would be appropriate to provide a statement on the map that recognises the known accuracy limitations as discussed by KBR.

- The FRP map should be used to identify the flood planning area to which clause 5.21 of the LEP would apply. However, to ensure consistency between application of the LEP clause 5.21 considerations and the DCP controls it would be desirable for the DCP to explicitly outline that satisfaction of the provisions of the DCP is a means of addressing clause 5.21. This will provide clarity to the community as to the combined flood related considerations for development applications for both the LEP and DCP.

- We have not identified any issues with the process for preparing the DCP.

- We provide detail recommendations for improvements to the Draft DCP. In particular, we recommend inclusion of performance criteria which would provide flexibility to ensure that any unavoidable inaccuracies with the flood modelling that have underpinned the definition of FRP's would not unreasonably impact the development potential of individual properties.

- The Planning Matrix and FRP Map approach relied on by the Draft DCP is consistent with DCPs adopted by a substantial number of Councils in NSW and is considered to be consistent with both the Floodplain Development Manual and 2021 Guidelines. The matrix could be simplified by for example rationalising land use categories.

- The approach adopted by the draft DCP is consistent with best practice.

- The Submissions Report does address the stated purpose for which it was prepared. However, no direct responses to the validity of the issues raised were provided. While consideration of these issues at the Floodplain Risk Management Study stage as recommended in the Submissions Report is appropriate the submissions specifically related to the Draft DCP prepared in accordance with the provisions of the *Environmental Planning and Assessment Act, 1979* and not the NSW Floodplain Risk Management process. Notwithstanding, Council has now commissioned this review which is substantially focused on addressing the primary issues raised in the submissions.

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APPENDIX A: REVIEW OF FLOOD STUDY BY KBR

11882 Rpt
April 2023

Review of Waverley LGA Flood Study

Final Peer Review Report

Review of Waverley LGA Flood Study

Final Peer Review Report

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27 April 2023

SEW352-TD-WR-REP-0001 Rev0

Acknowledgments

KBR acknowledges the Traditional Custodians throughout Australia and their continuing connection to land, water, culture and community, and pays respect to their Elders past and present.

Limitations Statement

The sole purpose of this report and the associated services performed by Kellogg Brown & Root Pty Ltd (KBR) is to undertake a peer review of the Waverley Flood Study in accordance with the scope of services set out in the contract between KBR and GLN Planning ('the Client'). That scope of services was defined by the requests of the Client, by the time and budgetary constraints imposed by the Client, and by the availability of access to the site.

This report has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in connection with the provisions of the agreement between KBR and the Client. KBR accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report by any third party.

Revision History

Revision	Date	Comment	Signatures			
			Originated by	Checked by	Technical Approval	Project Approval
0	27/4/23	Issued for Use	Joshua Eggleton	Dan Morgan	John Brown	Joshua Eggleton
			Digitally signed by Joshua Eggleton Date: 2023.04.27 12:56:12 +10'00'	Dan Morgan 2023.04.27 13:05:26 +10'00'	Digitally signed by John Brown (Sydney) DN: cn=John Brown (Sydney), email=john.brown@kbr.com Date: 2023.04.27 20:51:19 +10'00'	Digitally signed by Joshua Eggleton Date: 2023.04.27 13:59:02 +10'00'

Contents

1 Introduction

1.1 COMMISSION

KBR was commissioned by GLN Planning on behalf of Waverley Council to prepare a peer review of the key documents relating to the Waverley LGA Flood Study prepared by BMT for Council dated January 2021 (the Flood Study) and proposed amendment to the Waverley Development Control Plan 2022 (the DCP).

1.2 BACKGROUND

In April 2021, Council adopted the Flood Study after technical investigations and two rounds of community engagement.

The Flood Study represents the initial stage of the NSW Floodplain Risk Management (FRM) process as outlined in the NSW Flood Plain Development Manual published in April 2005 by the NSW Government (FDM). The Flood Study made recommendations regarding the adoption of flood planning levels (FPLs) and a Flood Planning Area (FPA) for planning purposes.

Subsequent stages in the NSW FRM process involve the preparation of a Floodplain Risk Management Study (FRMS) and Floodplain Risk Management Plan (FRMP) that will investigate the consequences of the flood risks identified by the study, potential mitigation measures and recommendations to be implemented through the FRMP. While these mitigation measure can include planning controls, it is not unusual for planning controls to be reviewed based on the findings of a flood study as the preparation of a FRMS and FRMP typically take many years to complete and the FDM encourages Councils to always act on the best available information.

The Flood Study provided a three-tier classification (Types A, B and C) to identify lots that should be considered for flood related development controls (Flood Control Lots) based on the level of confidence of the flood modelling due to the nature of the terrain. Type B and C Flood Control Lots were identified as requiring further investigation to determine the extent of the lot affected (Type B) and whether flooding would affect the identified lot or adjacent land (Type C).

As a logical adjunct to the preparation of the Flood Study, Council commissioned the preparation of draft amendments to the DCP (Draft DCP) to introduce appropriate flood related development controls. This provided the opportunity to address the additional lands subject to flood risks and the more detailed information regarding flood extents and hazard provided by the Flood Study

Based on the Flood Study, Water Modelling Solution (WMS) prepared the Draft DCP provisions dated September 2021 and a Flood Risk Precinct (FRP) Map to be used for the purposes of applying the DCP controls. The FRP Map adapted information contained in the Flood Study to categorise lots as either part of a Low, Medium or High FRP, which cumulatively represent all proposed Flood Control Lots for the Waverley LGA.

The amendment to the DCP was exhibited in June-July 2022. During the exhibition process Council notified over 10,000 landowners and received feedback from a number of residents, many concerned with the risk classification (low, medium or high) given to their properties and the implications this may have on property values, insurance premiums and their ability to renovate or redevelop their property in the future."

Council subsequently engaged GLN Planning and KBR Consulting to undertake a peer review of the Flood Study and Draft DCP, which is the subject of this report.

1.3 STUDY TEAM

To address the various components of the brief, the peer review was undertaken by the following study team:

- GLN Planning (GLN)
- KBR.

GLN is the lead consultant and addresses town planning related matters, specifically the approach taken to the preparation of the Draft DCP, the format and content of the Draft DCP and associated FRP mapping, and other related matters.

KBR addresses the assumptions and methodology adopted by the Flood Study and suitability of the information provided by the Flood Study to inform the FRP mapping relied upon by the Draft DCP and technical matters related to controls in the draft DCP.

1.4 PURPOSE OF THIS REPORT

The purpose of this report is to document the findings of a peer review of the key documents relating to the Flood Study undertaken by KBR.

1.5 INFORMATION REVIEWED OR CONSIDERED

The following is a list of the information sourced and considered.

- Waverley LGA Flood Study Final Report (BMT, 2021)
- Waverley LGA Flood Study Flood Mapping Compendium Final Report (BMT, 2021)
- Waverley LGA Flood Study TUFLOW model and associated input and output files
- Waverley DCP Flood Chapter – Response to Public Exhibition Submissions (WMS, 2022)
- Draft DCP provisions prepared by Water Modelling Solution (WMS) for Council (WMS, 2021)

1.6 SCOPE OF REVIEW

KBR's scope for the peer review of the Flood Study was as follows:

- Acquire Flood Study documents and associated data from Council.
- Prepare for and attend project objectives workshop at the outset of the Peer Review.
- Comment on the appropriateness of the adopted Flood Study and flood modelling methodology.
- Comment on the correctness of the assumptions adopted in the Flood Study and associated modelling.
- Based on the methodology and assumptions, comment on whether the Flood Study conclusions are appropriate.
- Comment on whether the identified categorisation of flooding (type A to C) has been correctly identified.
- Comment on whether the overall conclusions are correct, including the identification of 12 hotspot areas.

No allowance was made for a detailed review of hydrologic or hydraulic models developed as part of the Flood Study.

This peer review also does not comment on the community consultation elements of the Flood Study.

2 Flood Study Methodology

2.1 SUMMARY

The Flood Study was completed in accordance with the NSW State Government's Floodplain Development Manual (2005), and Australian Rainfall & Runoff (ARR) 2016 (the current ARR guideline at the time of completion of the Flood Study).

The key objectives of the Flood Study were as follows:

- Update the existing flood information for the Waverley LGA catchments based on the Drainage System Modelling completed in 2007.
- Develop and calibrate appropriate hydrologic and hydraulic models
- Determine flood conditions for a range of design flood events
- Identify properties at risk of flooding during various design flood events.

To achieve the above objectives, BMT developed the following models:

- An XP-RAFTS hydrologic model to develop flood hydrographs to apply as inflow boundaries to the hydraulic model
- A TUFLOW hydraulic model to determine flood levels, velocities, depths and flood hazard across the study area.

Site inspections were completed by BMT to gain an appreciation of local hydraulic features and their potential influence on flood behaviour and to ground truth the hydraulic model outputs.

2.2 LIMITATIONS OF HYDRAULIC MODELLING IN URBAN CATCHMENTS

As a precursor to the peer review, it is important to note that modelling of overland flooding in urban environments is a complex undertaking. As detailed in Section 4.1 of the Flood Study Report, the ability to represent the intricate local hydraulic controls in urban environments is limited by the resolution and accuracy of the available data (e.g. topographic data) and the adopted hydraulic model and modelling methodology. The available data and adopted approach to hydraulic modelling has a level of inherent uncertainty with regard to certain floodplain mechanism as detailed in Table 2-1 below (a more detailed review of modelling methodology is detailed in Table 2-2). There are also typically instances throughout the upper catchment reaches that may be perceived by the community as being "flooding", which are in fact local drainage issues and not considered as overland flooding.

Table 2-1 Limitations with Overland Flow Modelling in Urban Environments

Source of Uncertainty	Adopted Approach	Comment
Stormwater pit capture for on-grade locations	The pipe network is represented as 1D elements dynamically linked to the 2D domain at specified pit locations. Pit inlet capacities have been modelled using lintel opening lengths and grate sizes based on the collected data. Pit inlet dimensions have been assumed where data were not available, based on site inspections and nearby pits.	For high magnitude flood events (>5% AEP) the pipe drainage system capacity is anticipated to be exceeded with the major proportion of flow conveyed overland. Therefore, any limitations in the model representation of the drainage system are not expected to influence results for these events.
Available flow capacity of kerb and gutter profiles	Kerb and gutter profiles were defined using LiDAR data and a 2m 2D cell size	The adopted approach is considered reasonable for an LGA/catchment wide flood

Source of Uncertainty	Adopted Approach	Comment
	which results in the LiDAR data being sampled every 1m. No reinforcement of kerb or gutter profiles was undertaken.	study. However, no reinforcement of kerb and gutter profiles may result in artificial breakout of flows from the road profile resulting in overland flow paths through urban properties. BMT has acknowledged this by identifying areas where this may be occurring and classifying as Type C lots as discussed later in this document. The (localised or global) representation of kerb and gutter profiles or an alternative approach to represent appropriate conveyance of flows through road corridors may warrant further investigation as part of the Floodplain Risk Management Study (FRMS) if suitable survey data is available.
Crest level controls of driveway entrances	Similar to kerb and gutter profiles, driveway crests were defined using LiDAR data and a 2m 2D cell size which results in the LiDAR data being sampled every 1m.	The adopted approach is considered reasonable for an LGA/catchment wide flood study. However, the adopted approach may result in the crest level of the driveway which acts as the control level in maintaining flow within the road profile not being represented in the TUFLOW model. This may then result in water artificially spilling from the road profile forming an overland flow path through adjacent properties. It should also be noted that given the steep grades and resolution of the LiDAR data, the crest level may also not be captured in the data used to set the TUFLOW model topography in the first place.
Complexity of urban lot vegetation	Captured within the applied surface roughness for urban lots.	Urban lot vegetation (including garden beds and landscaping features) may act to redirect flows within urban environments. This level of complexity cannot readily be captured within an urban overland flow model.
Flow under, over, around and through various fence types	Brick and/or concrete walls acting as barriers to the progression of catchment runoff were represented on a localised (i.e. not catchment wide) basis where identified/appropriate in the hydraulic model. Other obstructions less sturdy in nature (such as wooden or Colorbond fences) have not been incorporated, as they typically fail when floodwaters build on the upstream side. These elements are effectively captured within the applied surface roughness for urban lots.	The adopted approach is considered reasonable for an LGA/catchment wide flood study. Further investigation of flow obstructions may be warranted as part of the FRMS to further validate key flowpaths to provide increased confidence in Type C properties discussed later in this document.
Flood storage within underground basements and domestic/commercial stormwater tanks	Not represented in the hydraulic model.	Difficult to incorporate accurately into a TUFLOW model without detailed information of flow ingress location/arrangement, storage and drainage of flows. Therefore, assuming this information was not readily available for use in the Flood Study, the adopted approach is considered reasonable.

Source of Uncertainty	Adopted Approach	Comment
Flow under, around and between buildings and/or through gates	Buildings along key footpaths were represented via a high Manning's 'n' surface roughness to reflect the impediment of flow but also account for the potential flood storage.	The adopted approach does not provide for full obstruction of flow. However, representation of buildings as full obstructions to flow also presents complex challenges in urban environments with regard to flow between buildings being inhibited depending on the adopted grid cell size (e.g. the adopted cell size is 2m and gaps less then 2m between buildings would occur in the catchment). The adopted approach is reasonable but may warrant further investigation as part of the FRMS to further validate key flowpaths to provide increased confidence in Type C properties
Collection and re-distribution of debris by catchment runoff and the potential impact on the inlet capacity of the stormwater drainage network and/or hydraulic structures such as culverts	A pit blockage of 50% for sag pits and 20% for on-grade pits has been adopted in design event modelling in line with AR&R 2016 guidelines. Hydraulic structure blockages determined using Chapter 6: Blockage of Hydraulic Structures, Book 8 in Australian Rainfall and Runoff - A Guide to Flood Estimation (2016).	Appropriate.

2.3 REVIEW OF MODELLING METHODOLOGY

The review of the adopted modelling methodology for the Flood Study is detailed in Table 2.1 below.

Some items have been flagged for further consideration, investigation or review as part of the subsequent Waverley LGA FRMS. The FRMS provides an opportunity to review and revise (if required/deemed appropriate) the modelling should there be any change in the recommended guidelines (e.g. Australian Rainfall & Runoff), change in software (e.g. updated release of TUFLOW) or additional information (e.g. survey data) that was not available at the time of completion of the Flood Study. The model developed as part of the Flood Study should be subject to a detailed review of model health and configuration at the outset of the FRMS.

Table 2-2 Review of Adopted Modelling Methodology

Modelling Theme / Parameter name	Adopted Approach	Comment
Hydrologic Model		
Adopted Engine	XP-RAFTS	XP-RAFTS is considered suitable for use for the Flood Study. However, it should be noted that XP-RAFTS has been discontinued as a supported program at the end of 2021, with the software supplier recommending conversion of XP-RAFTS model to XP-SWMM as an alternative hydrologic model.
Catchment Delineation	A database of over 3,000 individual sub-catchments (one for each pit) was previously developed as part of the Drainage System Modelling completed in 2007. BMT consolidated the 3,000 sub-catchments into 805 sub-catchments covering the study area.	This is an unusually high number of sub-catchments for a catchment of this size. However, at this scale, the majority of the hydraulic routing of surface flows would be undertaken within the hydraulic model. The high number of catchments would also prevent the over allocation of inflows to pits located in

Modelling Theme / Parameter name	Adopted Approach	Comment
		the upper catchment which may occur using larger sub catchments. As such, the adopted approach is considered reasonable.
Hydraulic Model		
Adopted Engine	TUFLOW HPC	TUFLOW HPC is considered suitable for use for the Flood Study.
Model Configuration	Combined 2D (floodplain) / 1D (stormwater drainage) model with a 2m 2D cell size.	Appropriate.
Topography	Model topography based on 1m resolution DEM derived from 2013 NSW Land and Property Information LiDAR survey with additional reinforcement of gullies and embankments as required.	Appropriate and suitable for 2m 2D cell size. No reinforcement of kerb and gutter profiles may result in artificial breakout of flows from the roadway resulting in overland flow paths through urban properties. May warrant localised reinforcement as part of the FRMS if suitable survey data is available.
Hydraulic Roughness	Hydraulic roughness assigned using a combination of aerial photography and cadastral data with Manning's 'n' values presented in report for different surface types.	Applied Manning's 'n' values of 0.040 for low density residential lots (without building digitised) and 0.060 for Medium and High Density Residential Lots (without building digitised) are considered reasonable but at the lower end of the expected values for these surface types especially when the adopted value is accounting for buildings, fences and urban lot vegetation. Recommend further consideration as part of FRMS.
Buildings	Localised representation of buildings via increased Manning's n roughness value of 1.0 within simulated/predicted flowpaths.	Approach considered reasonable. The representation of buildings may warrant further investigation as part of the FRMS to investigate sensitivity of model to alternate approaches to representing buildings (i.e. representing as complete or partial flow obstructions).
Stormwater Drainage Network	5,200 pipes for a combined run length of over 101km was included in model as 1D elements embedded within 2D domain based on data on pit/pipe locations, pit inlet type/dimensions and pipe sizes provide by Council.	Appropriate. Minimum pipe size included in model not defined in report. For high magnitude flood events (>5% AEP) the pipe drainage system capacity is anticipated to be exceeded with the major proportion of flow conveyed overland.
Boundary Conditions	Inflows applied directly to 1D pipe network or directly to 2D domain in the absence of pipe network. The downstream model limit corresponds to the water level in either Sydney Harbour or the South Tasman Sea.	This approach assumes that there is sufficient pit capture to pass the flow into the pipe network until pipe capacity is reached at which point flows surcharge into the 2D domain (i.e. surface flow). Considered appropriate.
Major Flow Path Representation	BMT noted that each modelled flow path has been verified based on LiDAR elevation data, site visit notes, aerial photography and Google Street View imagery to incorporate local hydraulic controls into the TUFLOW model, where appropriate. This involved the	Approach considered reasonable with localised reinforcement/representation of fences and walls. May warrant further investigation as part of the FRMS to further validate key flowpaths and representation of appropriate road conveyance to provide increased confidence in

Modelling Theme / Parameter name	Adopted Approach	Comment
	inclusion of brick and/or concrete walls as barriers to the progression of catchment runoff. Other obstructions less sturdy in nature (such as wooden or Colorbond fences) have not been incorporated, as they typically fail when floodwaters build on the upstream side.	Type C properties discussed later in this document.
Model Calibration and Validation		
Selected Events	Calibration events: December 2015. Validation events: August 2015, February 2017.	Available calibration data limited to anecdotal flood information such as observations, photographs and peak flood level estimates based on observed flood marks (i.e. no gauges available). A reasonable calibration was achieved noting the uncertainty associated with anecdotal flood information.
XP-RAFTS Flow Validation	A Direct Rainfall approach was adopted with the TUFLOW model to validate the flows generated by the XP-RAFTS hydrologic model.	A reasonable correlation was achieved between the 1% AEP 45-min and 90-min duration events been the XP-RAFTS and Direct Rainfall Approach for a single overland flow path. A cross check against other overland flow paths or comparison of extents and levels may also further validate the adopted approach. However, the limitations highlighted in urban overland flow modelling can be potentially exacerbated by the direct rainfall approach. As such, further analysis may not yield reliable results.
Design Event Modelling		
Design Rainfall	IFD 2016	Appropriate.
Aerial Reduction Factor	ARF of 1.0 adopted.	Given the makeup of the study catchment an ARF of 1.0 is considered appropriate.
Design Rainfall Losses	Pervious Initial Loss: 20mm Pervious Continuing Loss: 2mm/hr Impervious Initial Loss: 2mm Impervious Continuing Loss: 0mm/h	Based on adopted calibration/validation values. Comparably higher then ARR 2019 DataHub but generally aligns with values for neighbouring catchments and are therefore considered reasonable.
Temporal patterns	Ensemble approach as per ARR 2016.	Appropriate.
Critical Duration	The 20-minute and 45-minute durations were critical for catchment areas affected by overland flooding, and the 90-minute duration was critical for areas affected by storage flooding. For the PMF, the critical durations were found to be the 15-minute, 30-minute and 90-minute durations.	Appropriate approach (noting is it based on mean flood level within TUFLOW and not flows in XP-RAFTS). Critical durations considered typical for catchment of this nature.
Design Downstream Boundary	Constant water level boundary assigned based on Flood Risk Management Guide (OEH, 2015).	Appropriate.
Structure Blockage	A pit blockage of 50% for sag pits and 20% for on-grade pits has been adopted in design event modelling in	Appropriate.

Modelling Theme / Parameter name	Adopted Approach	Comment
	line with AR&R 2016 guidelines. Hydraulic structure blockages determined using Chapter 6: Blockage of Hydraulic Structures, Book 8 in Australian Rainfall and Runoff - A Guide to Flood Estimation (2016).	

2.4 POST-PROCESSING OF FLOOD MODEL OUTPUTS

BMT applied the following filters to the TUFLOW model design flood extents:

(1) Areas where depth does not exceed 0.15m were removed from the design flood extents;

(2) Areas where the velocity-depth product (i.e. V x D) exceeds 0.10m2/s were re-instated;

(3) Flood islands with an area of less than 200m2 were removed.

BMT outlined that the results were filtered to remove sheet flow from the final design extents such that only regions of significant flood depth or of significant velocity-depth product were included.

BMT simulated the following design events: 0.2%, 1%, 2%, 5%, 10%, 20% and 50% AEP, 1EY (63.2% AEP) (note – ARR2019 recommends that events more frequent than 50% AEP should be expressed as X Exceedances per Year (EY). For example, 1 EY is equivalent to a design event with a 12-month recurrence interval when there is no seasonality in flood occurrence – this can also be termed the 63.21% AEP) and PMF events. For each event, a map of peak flood level, depth and velocity was prepared covering the modelled area. In addition, mapping was prepared detailing the flood function and provisional flood hazard categorisation.

3 Flood Lot Tagging Approach

As outlined by BMT, Flood Control Lots are intended to relate to properties that are known to have a flooding constraint and should be referred to Council's flood-related development controls because of their potential to be flood affected.

As previously stated, the Flood Study provided a three-tier classification (Types A, B and C) to identify lots that should be considered for flood related development controls (Flood Control Lots) based on the level of confidence of the flood modelling.

Subsequent to the Flood Study, Water Modelling Solution (WMS) prepared a Flood Risk Precinct (FRP) Map to be used for the purposes of applying the DCP controls. The FRP Map adapted information contained in the Flood Study to categorise lots as either part of a Low, Medium or High FRP, which cumulatively represent all proposed Flood Control Lots for the Waverley LGA. The FRP approach has no direct correlation to BMT's three-tier classification (Types A, B and C).

3.1 FLOOD PLANNING LEVELS AND FLOOD PLANNING AREA

As detailed in Section 7.7.1 the Flood Study, Flood Planning Levels (FPLs) are used for planning purposes and can also be used to determine the extent of the Flood Planning Area (FPA), which is effectively the area of land subject to flood-related development controls. It is typical for FPLs to be derived from designated design flood events plus a freeboard allowance, to account for underlying uncertainties, such as the variation between flood modelling results and actual flood events, the effect of localised factors on flood levels and potential wave action. The 1% AEP event is usually adopted as the designated flood, however the FPL and FPA can include allowances for future climate change conditions (i.e. rainfall intensity increases). The incorporation of climate change considerations into the FPLs and adopted freeboard should be considered as part of the FRMS.

BMT adopted the 1% AEP event as the basis of the FPA, with a 0.3m freeboard applied (0.5m for area affected by oceanic flooding). The freeboard was applied to the simulated 1% AEP extent and extrapolated outwards until in intersected with the LiDAR DEM. The resulting extents formed the preliminary FPA as presented in Figure 3-1. This approach is considered appropriate for defining the preliminary FPA. However, the preliminary FPA should be reviewed and refined as part of the FRMS.

3.2 THREE-TIER CLASSIFICATION

As outlined by BMT, the FPA can be used to determine which properties to define as potential flood control lots. However, as outlined previously, there are significant uncertainties regarding flood modelling of shallow overland flowpaths in complex urban environments. As such, BMT undertook a ground-truthing exercise to verify the simulated results against actual site conditions to ensure that the model results are interpreted and correctly applied for flood planning purposes.

BMT adopted the following three-tier classification to the identified flood control lots across the study area based on the level of confidence of the flood modelling:

- "Type A" – lots for which standard flood-related development controls and a single Flood Panning Level (FPL) can be applied. Lots with this classification are typically located within areas along a major overland flood flow path. The surface grades are relatively gentle, and the modelling of flood extents and flood levels is relatively certain (i.e. comparably high level of confidence in model results).

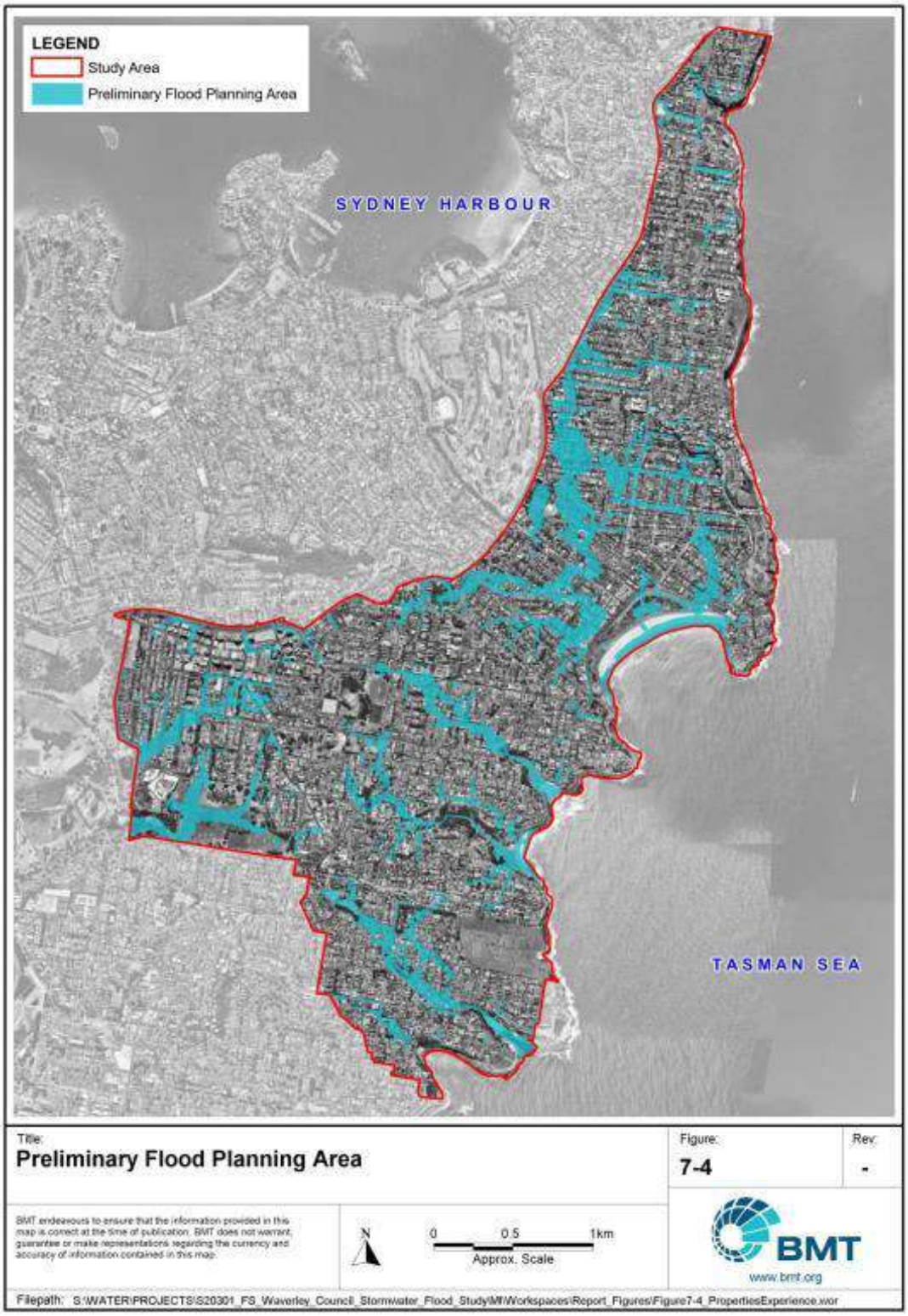


Figure 3-1 Preliminary FPA (BMT, 2021)

- "Type B" – lots through which an overland flood flow path is conveyed and confirmed through ground truthing. Type B lots are typically in areas of relatively steep topography and the location, depth and velocity of overland flows cannot determined with certainty by the flood modelling as the model resolution and available data is not at a fine enough scale to resolve the local hydraulics. As such, standard flood-related development controls cannot be readily applied because there is uncertainty in the modelled peak flood level and also because a single representative FPL for the lot is not appropriate (e.g. steep sloping lots will have a high gradient in the FPL across the lot).
- "Type C" – lots captured by the preliminary FPA but are lots for which the flood modelling should not be relied upon for determining the presence or absence of overland flow paths. These are typically located within steep upper catchment areas that have relatively small contributing catchments or lots adjacent to a roadway that was effectively containing the overland flow with an encroachment onto the lot once a suitable freeboard is added to define the FPA.

As discussed in Section 2.2, there is a level of inherent uncertainty associated with overland flood modelling in urban environments. BMT have attempted to address this uncertainty within the adopted three-tier classification by identifying Type C lots within the FPA and acknowledging the low level of confidence in the model outputs for these locations. Further explanation of this is detailed in Section 7.7.2 of the Flood Study report.

The spatial coverage of the three-tier classification is presented in Figure 3-2.

The three-tier classification is presented as a combination of a line-based approach (i.e. extent line/polygon based on the simulated flood extent) and lot-based approach (i.e. extent based on definition of cadastral lots).

The advantage of the line-based approach is that it conveys the actual simulated flood risk to the community as the extent is based on the simulated flood model outputs. This allows the community to understand the proportion of a lot that is at risk of flooding and the level of risk. The disadvantage is that a lot may fall within multiple 'risk classifications' with different associated DCP controls which may lead to confusion within the community of what DCP controls apply to each lot.

Conversely, the advantage of the lot-based approach that it identifies each lot in accordance with its dominant 'risk classifications' which can remove the confusion as to what DCP controls apply. However, the disadvantage is that it may overestimate the actual simulated extent of flood risk and does not convey the simulated flood risk to the community in terms of the proportion of a lot that is at risk of flooding (e.g. 15% of the total area of the lot may be at risk of flooding but the lot-based approach would cover the lot in full).

3.3 FLOOD RISK PRECINCTS

As defined in Appendix B of the *Waverley DCP Flood Chapter – Response to Public Exhibition Submissions* (WMS, 2022), WMS utilised the model outputs from the Waverley LGA Flood Study (BMT, 2021) to prepare FRP polygons.

The raw outputs from the Flood Study were first post-processed as defined in Figure 3-3. Whilst there is potential for some variations in adopted threshold values (e.g. 0.15m depth filter) for post-processing between Councils, the adopted values are considered reasonable and appropriate.

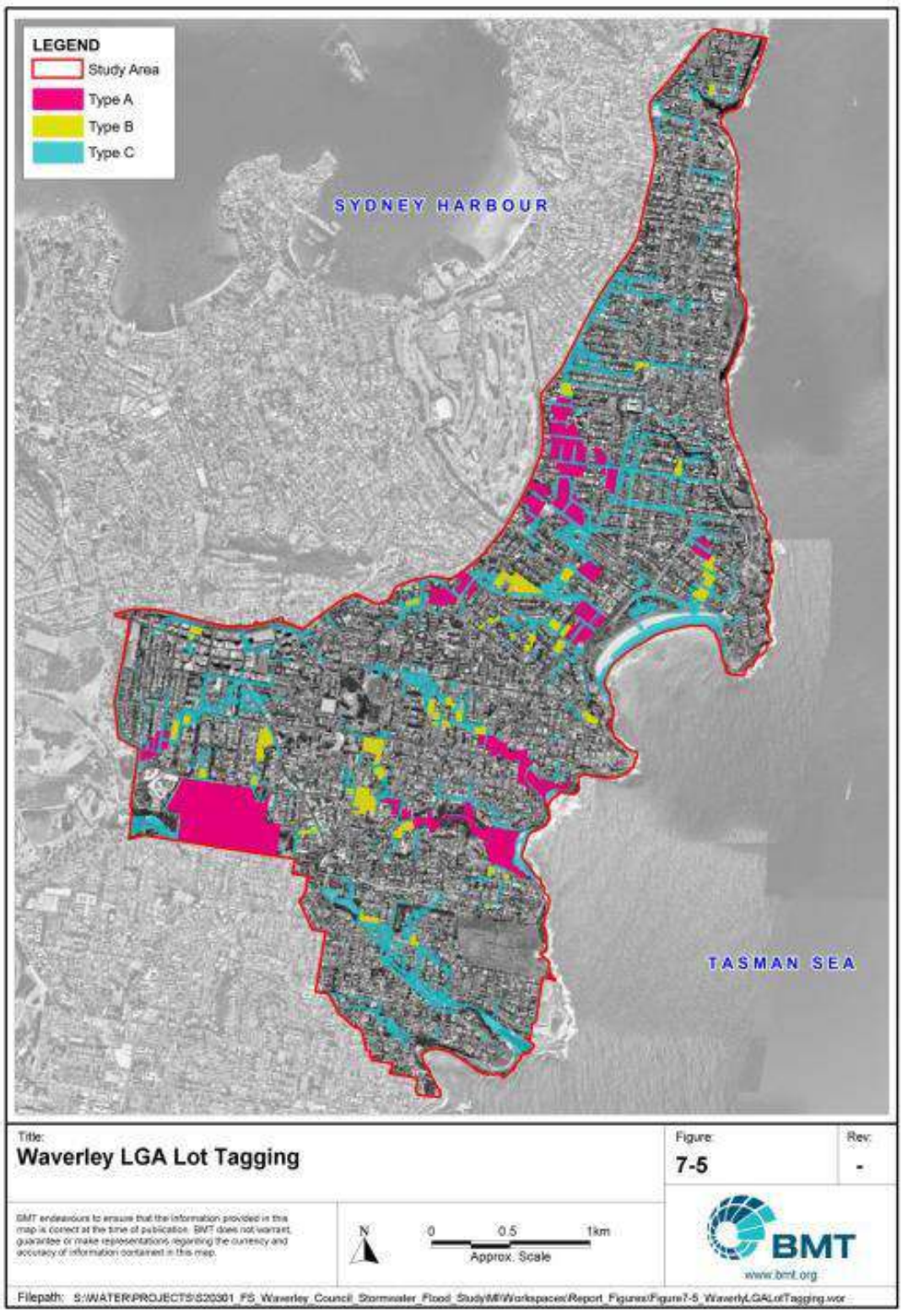


Figure 3-2 Waverley LGA Lot Tagging (BMT, 2021)

Filtering/Clipping	Per Waverley LGA Flood Study (Section 7.1.1): - Areas where depth does not exceed 0.15m were removed from design flood events - Areas where the velocity depth product (i.e. V x D) exceeds 0.1m²/s were reinstated - Flood islands with an area of less than 200 m² were removed
Peak Flood Depths	• Extracted Maximum depths of raw results for each AEP/PMF using TUFLOW utility • Clipped max grid based on clip boundary • Post-processed with raster statistics tool in QGIS
Peak Flood Levels	• Extracted Maximum WSL's of raw results for each AEP/PMF using TUFLOW utility • Clipped max grid based on clip boundary • Post-processed with raster statistics tool in QGIS
Hazard: H1- H6	• Extracted Maximum depths of raw results for each AEP/PMF using TUFLOW utility • Clipped max grid based on clip boundary • Post-processed with raster statistics tool in QGIS

Figure 3-3 Post-Processing Approach (WMS, 2022)

Following the post-processing, FRP polygons were defined based on a combination of the post-processed/filtered 1% AEP and PMF results based on the criteria detailed in Figure 3-4.

High Flood Risk	Areas with a hazard classification of H4-H6 in the 1% AEP event
Medium Flood Risk	Areas with a hazard classification of H1-H3 in the 1% AEP event
Low Flood Risk	The area between the 1% AEP extent and the PMF extent

Figure 3-4 FRP Criteria (WMS, 2022)

In addition to the post-processing detailed above, the following criteria was applied to tag lots as high, medium or low FRP's:

- only lots with more than 15% of their area situated within the flood risk precinct polygon were tagged (i.e. included in the flood risk precinct mapping).
- Lots are assigned the FRP that covers the greatest area with the lot, unless:
  - a High FRP covers more than 0.5% of the lot area, then it is assigned a minimum rating of Medium FRP.
  - a higher FRP covers more than 15% of the lot area, then the higher FRP is assigned.

The resulting FRP map is presented in Figure 3-5. The FRP map is presented using the lot-based approach as previously discussed.

As previously stated, the FRP approach has no direct correlation to BMT's three-tier classification (Types A, B and C). However, it is reasonable to expect that all Type A, Type B and Type C lots flagged by BMT would have been captured within the FRP map. Furthermore, as presented in Section 3.4, the FRP approach would flag a greater number of lots than the three-tier classification approach as no manual review and removal of tagged lots has been undertaken.

3.4 COMPARISON OF LOT TAGGING APPROACHES

A comparison of the number of lots tagged under the LEP (2012), three-tier classification approach (BMT) and flood risk precinct approach (WMS) is detailed in Table 3-1.

Table 3-1 Comparison of Total Lots Tagged

Definition	Lots Tagged
LEP (2012)	
Total	942
Three-Tier Classification (BMT, 2021)	
Type C	2100
Type B	400
Type A	650
Total	3150
Flood Risk Precincts (WMS, 2021)	
Low	2830
Medium	1392
High	146
Total	4368

Both the BMT and WMS approach result in a significant increase in the number of tagged lots when compared to LEP (20212). However, comparing the sum of Type A and Type B lots from the BMT approach (1050) (i.e. the lots with a level of confidence suitable to be tagged for application of flood controls in the opinion of BMT) provides for a reasonable comparison to LEP (2012). The WMS approach results in the highest number of tagged lots.

The adopted approach to lot tagging should be clearly articulated and repeatable but should also consider the level of uncertainty/confidence in the underlying modelling. The BMT approach to lot tagging considered the level of uncertainty in the underlying modelling but is not simple to articulate or replicate. The WMS approach to lot tagging follows a set criterion (i.e. well-articulated) and is simple to replicate but does not take into consideration the level of uncertainty in the underlying modelling.

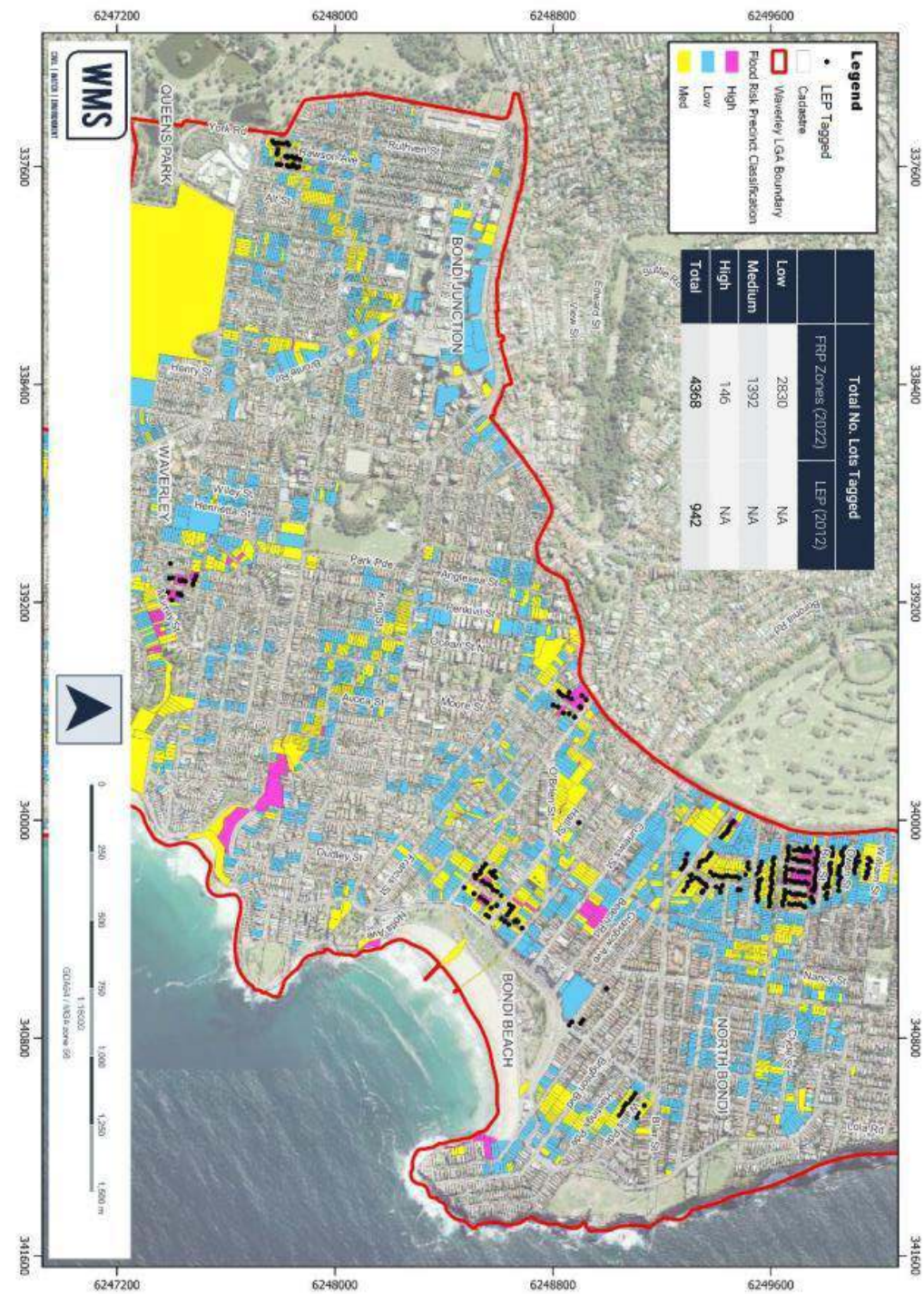


Figure 3-5 Flood Risk Precinct Map (WMS, 2022)

4 Conclusions and Recommendations

The conclusions and recommendations of the peer review completed by KBR are as follows:

- The Flood Study was completed in accordance with the NSW State Government's Floodplain Development Manual (2005), and Australian Rainfall & Runoff (ARR) 2016 (the current ARR guideline at the time of completion of the Flood Study).
- The adopted modelling methodology is considered reasonable and appropriate for the catchment. However, there are limitations in the adopted approach that directly influence the level of confidence in certain (predominantly steeper upper catchment) sections of the catchment. BMT have clearly acknowledged these limitations and considered them in their approach to lot tagging.
- Further investigation of key model limitations and assumptions discussed in this review should be considered within the FRMS.
- The adopted approach to lot tagging should be clearly articulated and repeatable but should also consider the level of uncertainty/confidence in the underlying modelling. Any deviation from the selected criterion to add or remove tagged properties based on engineering judgement or visual inspection should be documented for future reference.
- The BMT approach to lot tagging considered the level of uncertainty in the underlying modelling but is not simple to articulate or replicate.
- The WMS approach to lot tagging follows a set criterion (i.e. well-articulated) and is simple to replicate but does not take into consideration the level of uncertainty in the underlying modelling.
- The approach to defining the FPA is a matter that can be considered further as part of the FRMS. In the interim, the WMS FRP approach is considered a reasonable, albeit conservative, approach to determining the FPA and FRP maps for the application of DCP controls.
- The FRP map is currently presented using the lot-based approach as discussed in Section 3.2. It is recommended that the FRP map be modified to adopt a line-based approach (i.e. based on the actual extent of the three precincts) to convey the flood extent and level of risk to the community to an improved level of accuracy. The lot-based map can be retained for use internally by Council to understand what DCP controls apply to each lot (based on the adopted post-processing of the FRP polygons detailed in Section 3.3).

APPENDIX B: DETAIL REVIEW OF DRAFT DCP

11882 Rpt
April 2023

PART B GENERAL PROVISIONS

Contents

6.2 FLOOD PLANNING

Sections 6.2.1-6.2.8 apply to land identified in the 'Flood Planning Areas' layer on Council's mapping website. These Flood Planning Areas cumulatively represent the Flood Planning Area referred to in clause 5.21 of Waverley LEP 2021.

Section 6.2.9 provides controls for all other development.

Waverley Online Mapping Tool	
Discover Waverley Mapping Tool	
Map Configuration	Planning
Layer	Flood Planning Areas

There are three different ~~flood risk~~ levels of potential flood risk associated with the Flood Planning Areas, high, medium and low, see below. ~~The Flood Planning Areas are available on Council's mapping website.~~

Flood Risk Precinct	Description	Technical Definition
High	Land within the 1% AEP flood extent with a high hydraulic hazard classification. There is a high potential for damage to property, risk to life or evacuation difficulty. *Most development should be restricted in this precinct. In this precinct there would be a significant risk of flood damages without compliance with flood related building and planning controls.*	Land classified as "H4-H6" in the 1% AEP event (Waverley LGA Flood Study, 2021)
Medium	Land below the 1% AEP flood that is not subject to high hydraulic hazard and where they are no significant evacuation difficulties. Note: in this precinct there would still be significant risk of flood damage, but these damages can be minimised by the application of appropriate development controls	Land classified as "H1-H3" in the 1% AEP event (Waverley LGA Flood Study, 2021)
Low	All other land within the floodplain (ie. within the extent of the probably maximum flood (PMF), that is not classified as a High or Medium Flood Risk Precinct. *Note: The Low Flood Risk Precinct is where the risk of damages is low for most land uses. The Low Flood Risk Category is that area above the 1% AEP flood, and most land uses would be permitted in this category. Development controls may apply to special land uses with critical functions or vulnerable occupants.*	Flood affected land between the PMF and 1% AEP extent.

Note: Where sufficient information is not available, but the potential for flood risk issues are evident based on available information, aApplicants may be required to undertake a ~~flood study~~site specific flood assessment. These situations include where:

a) Council has knowledge that the property has been previously affected by or impacted upon flooding or an overland flow path;

~~(b) The property is on the low side of the road and/or the~~ boundary levels are below

Commented [PG1]: To provide for confirmation of the LEP FPA in the DCP as promoted by the 2021 Guideline, noting that the Guideline also recognises that a Council may have multiple FPAs.

Commented [PG2]: The definition of the FRPs are primarily based on hazard which contribute to the determination of risk as technically defined.

Commented [PG3]: Repitition

Commented [PG4]: Consider extending description and definition to include areas with significant emergency management issues such as "properties identified as unsafe for Onsite Refuge" or isolated due to flooded roads in the Flood Study. This could require further analysis at the FRMS stage.

b) the level of Council's kerb;
c) The property is lower than surrounding properties;
d) The property is in a natural low point, gully or depression; or
e) The property is adjacent to or contains a flow path, open channel, watercourse or drainage line.

The assessment would ~~to~~ determine the ~~flood extent and~~ Flood Risk Categories in order to apply appropriate controls in addition to any further assessments required by this Development Control Plan.

Commented [PG5]: To distinguish between site specific assessments and catchment based Flood Studies, clarify when that might be needed and to note additional assessments may be required.

~~Council may require flood related development controls in situations where:~~

~~(a) Council has knowledge that the property has been previously affected by or impacted upon flooding or an overland flow path;~~
~~(b) The property is on the low side of the road and/or the boundary levels are below the level of Council's kerb;~~

~~(c) The property is lower than surrounding properties;~~
~~(d) The property is in a natural low point, gully or depression; or~~
~~(e) The property is adjacent to or contains a flow path, open channel, watercourse or drainage line.~~

Objectives

(a) Minimise risk to life and damage to property by controlling development on flood prone land

~~Reduce risk to human life and minimise damage to property caused by flooding.~~ (b) ~~Ensure that development is sited to minimise potential risk from flooding.~~

~~(c) Ensure that, in the event of a flood, adequate access to affected properties is available for emergency service personnel and that safe egress is available for residents and employees.~~

~~(d) Ensure that proposed development does not increase the flood inundation of other properties.~~

~~(e)~~ Ensure the impacts of the full range of potential floods up to and including the PMF are considered when assessing development having regard to the sensitivity of different land uses to flooding~~Ensure that sensitive land uses are designed and sited to minimise risk from flooding and have safe and reliable access~~.

(~~f~~c) Ensure that development does not have an unacceptable impact on flood behaviour, people's safety, surrounding properties and structures, and the natural environment;

(d) To provide detailed controls that if satisfied would address the considerations required by clause 5.21 of *Waverley Local Environmental Plan 2012*~~Ensure that potential environmental contamination resulting from inundation of sensitive developments is minimised by appropriate design and siting.~~

~~(g) Facilitate, where appropriate, conversion of floodways to natural waterway corridors.~~

~~(h) Minimise potential impact of development on the ecology and the aesthetic and recreational value of waterways.~~

~~(i) Ensure that land identified by Council as having a potential flood risk is subject to a full flood risk assessment before approval of new development.~~

~~(j) Provide detailed controls for the assessment of applications lodged in accordance with the Environmental Planning and Assessment Act 1979 on land affected by potential floods.~~

Controls

How to determine what planning controls apply

Refer to land use risk categories in Annexure B6-1, and the planning controls matrix in Annexure B6-2 to determine which controls are applied.

Application of Controls

Compliance with the prescriptive controls must be demonstrated.

Commented [PG6]: To better reflect what is achievable through the DCP and delete superfluous objectives

Commented [PG7]: To provide a broader recognition of the intended risk based approach for all uses,

Commented [PG8]: To provide an overall recognition of the intent of various existing objectives

Commented [PG9]: To provide a clear statement that satisfaction of the DCP controls would be considered satisfaction of the LEP required considerations and that the adoption of the LEP FPA based on the FRP maps that extend to the PMF is not intended to impose any greater restrictions.

Commented [PG10]: Subject to future review of FPLs consider including an objective such as "Ensure that the effects of climate change are considered when assessing development on flood prone land."

Commented [PG11]: To remove outcomes unlikely to be achievable by individual DAs and outcomes addressed by the above objectives.

Commented [PG12]: Superfluous or potentially inconsistent with complying development permitted by Codes SEPP

Where the prescriptive controls are not satisfied, applicants must demonstrate that the performance criteria are clearly satisfied to the satisfaction of Council.

Commented [PG13]: Incorporate performance criteria so that the DCP can be flexibly applied, with clarity of intended outcomes, when required by s4.15(3A) of the EP&A Act. This also provides flexibility to vary controls that flow from Flood Study parameters that are refined based on site specific assessments.

6.2.1 Floor Level

Performance Criteria

1. The cost of damages that may be incurred over the expected life of a development should be no greater than that which could be reasonably expected to be met by the occupants and/or the developer without Government assistance.

2. Despite the need to elevate floors, the development must remain acceptable with regard to its appearance and accessibility from the public domain and the amenity of the occupants.

Prescriptive Controls

1. ~~All~~ All floor levels are to be equal to or greater than the 5% AEP flood level.
2. Habitable floor levels are to be equal to or greater than the 1% AEP flood level plus ~~300mm~~ freeboard.
3. All floor levels are to be equal to or greater than the PMF level unless justified by a site-specific assessment.
4. All non-habitable floor levels shall be no lower than the 1% AEP flood level. Where ~~is this~~this is impractical, non-habitable spaces should be flood-proofed to the 1% AEP level.

5. Floor levels shall be equal to or greater than the level of the 1% AEP flood level plus freeboard. Where this is not practical due to compatibility with the height of adjacent buildings, or compatibility with the floor level of existing buildings, or the need for access for persons with disabilities, a lower floor level may be considered. In these circumstances, the floor level shall be as high as practical and when undertaking alterations or additions, no lower than the existing floor level. ~~Floor levels are to be as close to the flood planning level as practical (or higher), and no lower than the existing floor level when undertaking alterations and additions~~.

Commented [PG14]: To provide greater clarity as to what circumstances may not be practical

6.2.2 Building Components

Performance Criteria

1. All structures to have flood compatible building materials below the prescribed floor flood planning level.

Prescriptive Controls

1. All new structures are to have flood compatible building components below or at the 1% AEP flood level plus ~~300mm~~ freeboard. R~~,~~ refer to Annexure B6-3 for ~~the~~ a list of recommended flood compatible building components.
2. All new structures to have flood compatible building components below or at the PMF level.

Commented [PG15]: Should not be considered an exhaustive list

6.2.3 Structural Soundness

Performance Criteria

1. All development would be structurally sound when impacted by a 1% AEP flood plus freeboard.
2. Where development relies on sheltering in place to be acceptable it would be structurally sound when impacted by a PMF.

Prescriptive Controls

1. An engineer's report (refer to Annexure B6-4 for details) shall be provided for developments ~~in a Medium or High risk area~~ to certify that any new structure can withstand the forces of floodwater, debris & buoyancy up to & including a 1% AEP flood level plus ~~300mm~~ freeboard. Note: certification to be up to and including PMF if required to satisfy evacuation criteria (see below).
2. An engineer's report (refer to Annexure B6-4 for details) shall be provided for developments ~~in a Medium or High risk area~~ to certify that any new structure can withstand the forces of floodwater, debris & buoyancy up to & including the PMF level.

Commented [PG16]: The Matrix identifies within which FRP the control applies

6.2.4 Flood Affectation

Performance Criteria

1. Development does not detrimentally increase the potential flood affectation on other development or properties either individually or in combination with the cumulative impact of development that is likely to occur in the same floodplain.

2. Development should not change the height or behaviour of flood waters elsewhere in the floodplain in a manner which is likely to materially and adversely impact other property. The assessment of these effects must include the potential for similar impacts that would arise as a consequence of other development in the floodplain that has the potential to occur in the future under current zoning and planning controls.

Prescriptive Controls

1. An engineer's report (refer to Annexure B6-4 for details) shall be provided ~~for developments in a Medium or High risk area~~ to certify that the development (including indoor and outdoor features, such as above ground swimming pools and associated pump housing) will not increase flood effects elsewhere, having regard to:
   - loss of flood storage;
   - changes in flood levels, flows and velocities caused by alterations to the flood conveyance.

6.2.5 Car Parking and Driveway Access

Performance Criteria

1. Measures will be in place to warn people not to drive out of car parking areas where this would be dangerous and provide guidance and facilities to be able to safely exit the carpark.
2. All reasonable and practical measures are implemented to reduce the likelihood of motor vehicles being damaged by a flood.
3. All reasonable and practical measures will be in place to manage the potential vehicles floating and causing damage or becoming debris during a flood.

Prescriptive Controls

1. The minimum surface level of open car parking spaces or carports shall be no lower than the 5% AEP flood level ~~+ 300mm~~plus freeboard.
2. ~~Enclosed car parking spaces (g~~Garages ~~)~~ for three (3) or fewer vehicles shall have a minimum finished floor level no lower than the 5% AEP flood level plus ~~300mm~~ freeboard.
3. ~~Enclosed~~ Basement car parking ~~spaces (garages) for more than three (3) vehicles~~ shall ~~have a minimum finished floor level no lower than~~ be protected from inundation ~~the~~ by a 1% AEP flood ~~level~~ plus ~~300mm~~ freeboard.

Commented [PG17]: To clearly distinguish between domestic garages normally above ground and basement parking

Commented [PG18]: In recognition of basement parking having additional risks.

4. The crest of the driveway providing access between the road and ~~Basement~~ basement c~~C~~ar- ~~Parking~~ parking ~~or Below Ground Car Parking~~ shall be a minimum of 1% AEP flood plus ~~300 mm~~freeboard or the PMF, whichever is higher.

5. Restraints or vehicle barriers shall be provided to prevent floating vehicles leaving a site during a 1% AEP flood. (Note: A flood depth of more than 200mm will cause serious water damage to a typical vehicle and a depth of 300mm is sufficient to cause a typical vehicle to float.)

6.2.6 ~~Evacuation~~Emergency Management

Performance Criteria

1. The development should be designed and be able to be managed to ensure that during a flood emergency all occupants are capable of seeking safe refuge.

Commented [PG19]: To clarify intent

Commented [PG20]: To reflect the broader intent of the controls

Prescriptive Controls

1. The evacuation requirements of the development during flooding shall be considered ~~and identified~~ in the Statement of Environmental Effects.
2. Reliable access for pedestrians or vehicles shall be provided from a minimum level equal to the lowest habitable floor level to an area of refuge above the PMF level. Where safe and practical this should involve evacuation to an area outside of the PMF extent. ~~The evacuation requirements of the development are to be considered up to the PMF level and identified in the Statement of Environmental Effects.~~
3. The development shall be consistent with any relevant flood strategy, Floodplain Risk Management Plan adopted by Council or similar.
4. ~~The Applicant shall demonstrate that evacuation of potential development as a consequence of a subdivision proposal can be undertaken in accordance with the Flood Planning controls.~~
5. ~~T~~The Applicant shall provide a flood emergency response plan that demonstrates how risk to life will be managed during a flood event. For example, a safe ~~the~~ evacuation route needs to be clearly identified, or a shelter in-place strategy with reliable access shall be provided to an area of refuge above the PMF level.

Commented [PG21]: superfluous

Commented [PG22]: To be definitive as to what outcome is sought

Commented [PG23]: Replace with note under Matrix as to considerations for subdivision

Commented [PG24]: To use terms consistent with those used in practice

6.2.7 Management and Design

Performance Criteria

1. The development should be designed and managed to ensure that during a flood it does not cause unacceptable levels of pollution and valuable goods are capable of being protected.

Prescriptive Controls

1. ~~The Applicant is to demonstrate that potential development as a consequence of a subdivision proposal can be undertaken in accordance with the DCP.~~
2. ~~The~~ The Applicant is to demonstrate that an area is available to store goods above the 1% AEP flood level plus ~~300 mm~~ freeboard.
3. ~~2~~. No storage of materials below the 1% AEP plus ~~300 mm~~freeboard which may cause pollution or be potentially hazardous during any flood.
4. ~~3~~. In-ground swimming pools are to have surrounding coping/tiling that is no more than 100 mm above surrounding ground level. All pumping/electricals are to be above the 1% AEP flood level plus ~~300 mm~~ freeboard.

Commented [PG25]: Replace with note under Matrix as to considerations for subdivision

6.2.8 Fencing

1. Fencing is to be constructed in a manner that does not obstruct the flow of floodwaters so as to have an adverse impact on flooding.
2. Fencing shall be constructed to withstand the forces of floodwaters.

Commented [PG26]: Can be more efficiently addressed as a note to the Planning Matrix

6.2.9 All Other Areas

(a) For sites not in a 'flood planning area' habitable floor levels must comply with the drainage requirements of the BCA.

(b) A reduction in the required floor level will only be considered if the development includes the installation of an automatic flood gate system.

Commented [PG27]: Unclear as to basis of this requirement in the context of drainage requirements of the BCA. Considering deleting this requirement and allowing for consideration of such alternate measures on the basis of development specific performance solutions.

Annexures

Annexure B6-1
Land Use Risk Categories

Land use is categorised into eight Land Use Risk Categories according to the sensitivity of each type of land use to flooding. The definitions of each land use are based on the Waverley LEP 2012 and are categorised as follows.

Category	Examples (not exhaustive, refer to Waverley LEP 2012 for full list)
~~Essential Community Facilities~~	Emergency services; public administration building that may provide an important contribution to the notification or evacuation of the community during flood events (e.g. SES headquarters and Police Stations); hospitals and residential care facility.
~~Sensitive Uses and Facilities~~Sensitive and Hazardous Development	Offensive storage establishments; seniors housing; child care centres; preschools; schools and other educational institutions; correctional centres; liquid fuel depots; public utility undertakings (including electricity generating works; sewerage treatment plant; sewerage systems; telecommunication facilities; utility installations and water treatment facilities) which are essential to evacuation during periods of flood or if affected would unreasonably affect the ability of the community to return to normal activities after flood events; and waste disposal facilities.
~~Subdivision~~	~~Subdivision of land which involves the creation of new allotments with potential for further development.~~
Residential	Boarding houses; camping or caravan park site; health consulting rooms; home businesses; home industries; home occupation; hotel or motel accommodation; residential accommodation (excluding seniors housing and residential care facilities); serviced apartments; and other development within residential lots including but not limited to construction of garages, swimming pools, and the construction of an outbuilding with a floor area that exceeds 30 m^2, fencing and/or retaining walls.
Commercial or Industrial	Business premises; office premises; retail premises or buildings or land used for industrial activity.
~~Tourist Related Development~~	~~Camp sites or caravan parks –short–term sites (1) only~~ ~~As defined by the Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) Regulation 2005~~
Recreation or Non-urban Uses	Agriculture; aquaculture; animal boarding or training establishments; extractive industry; recreation facility (indoor), recreation facility (outdoor); recreation facility (major); recreation areas and minor ancillary structures (e.g. toilet blocks or kiosks); and water recreation structure.
Concessional Development	Residential development that involves: a) An internal or external alteration to an existing dwelling, which does not change the floor area and/or footprint of the existing dwelling; b) An addition to existing premises of not more than 10% of the floor area of the existing building footprint; c) A change of use which does not increase flood risk having regard to property damage and personal safety;

Commented [PG28]: Table should be expanded to include all defined development within the Standard Instrument LEP to avoid uncertainty. The parent definitions of multiple subsidiary definitions can be used to minimise the number of listed definitions.

Commented [PG29]: These 2 categories can be collapsed into 1 as the they are similar and the same controls are applied to both.

Commented [PG30]: Subdivision is expected to typically form part of development proposals involving the built form outcomes. This category could be dispensed with and an overall note included to the effect that when assessing subdivision the planning controls for the intended end use will be taken into consideration to ensure that any potential development on a new lot would be capable of meeting the controls.

Commented [PG31]: Tourist developments referred to here are uncommon in the Waverley LGA and can be redistributed into other categories.

Category	Examples (not exhaustive, refer to Waverley LEP 2012 for full list).
	d) Subdivision which does not propose the creation of new allotments with potential for further development; e) The construction of an outbuilding with a floor area of no greater than 30 m^2.

Annexures

Annexure B6-2
Planning Controls Matrix for Flood Planning

The Planning Controls Matrix identifies the prescriptive flood related development controls that apply to the Flood
Planning Areas and land use category. Refer to all ~~The detailed~~ controls ~~are provided~~ in B6.

Flood Risk	Low Flood Risk								Medium Flood Risk								High Flood Risk							
LAND USE	Essential Community Facilities	Sensitive Uses and Facilities	Subdivision	Residential	Commercial or Industrial	Tourist Related Development	Recreation or Non-urban Uses	Concessional Development	Essential Community Facilities	Sensitive Uses and Facilities	Subdivision	Residential	Commercial or Industrial	Tourist Related Development	Recreation or Non-urban Uses	Concessional Development	Essential Community Facilities	Sensitive Uses and Facilities	Subdivision	Residential	Commercial or Industrial	Tourist Related Development	Recreation or Non-urban Uses	Concessional Development
Floor Level	3	3		[2]	2	2						2, 4	2, 4	2, 4	1	5				2, 4	2, 4		1	5
Building Components	2	2		1	1	1						1	1	1	1	1				1	1		1	1
Structural Soundness	2	2				2						1	1	2	1	1				1	1		1	1
Flood Affectation											1	1	1	1	1	1			1	1	1		1	1
Car Parking & Driveway Access	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4	2, 3, 4				1, 2, 3, 4, 5	1, 2, 3, 4, 5	1, 2, 3, 4, 5	4, 5	4, 5				1, 2, 3, 4, 5	1, 2, 3, 4, 5		4, 5	4, 5
~~Evacuation~~Emergency Management	2, 3	2, 3	1	1	1	1	1	1			4	1	1, 3	1, 3	1, 3	1			4	1	1, 3, 5		1, 3	1
Management & Design			1								1	2, 3, 4	2, 3	2, 3, 4	2, 3, 4	2, 3, 4			1	2, 3, 4	2, 3		2, 3, 4	2, 3, 4
Fencing	1	1	1	1	1	1	1	1			1, 2	1, 2	1, 2	1, 2	1, 2	1, 2			1, 2	1, 2	1, 2		1, 2	1, 2

Key

No Controls	
Subject to significant flood constraints (refer to General Note 1)	
DCP Control Reference no.	1

General Notes:

1. ***Significantly Constrained Land**: Where development types are likely to be incompatible with the hazards existing within the nominated part of the floodplain without substantial mitigation measures. Consequently the development may be found unacceptable unless the design of the development together with the mitigation measures can address any potential unacceptable amenity or environmental impacts. Alternatively, this may require a reduction in the otherwise anticipated development intensity for the land.*
2. ***Filling:** Filling of a site, or site modification works in general, that is partially affected by flooding (if acceptable to Council) may change the flood risk precinct, and the associated development controls that apply to development on the site.*
3. ***Multiple FRPs**: Development controls relate to the FRP identified for the site. Where a site has two or more FRPs the relevant sets of controls apply to each risk precinct but for practical purposes the stricter controls would normally apply across the whole development.*
4. ***Fencing:** Refer to section XX of the DCP for planning considerations involving only the erection of a fence. Any fencing that forms part of a proposed development is subject to the relevant flood effect and structural soundness considerations of the relevant category.*
5. ***Freeboard:** Where required the following freeboard heights apply:*
   a. *Areas subject to oceanic flooding conditions: 500mm*
   b. *Other areas: 300mm.*

Commented [PG32]: Collapse number of land use categories as discussed above

Commented [PG33]: Floor level and flood compatible building controls should be also applied in the Low FRP. This is to ensure that development occurring in the Low FRP but on the edge of the edge of the Medium FRP on land only marginally above the 1% AEP flood level adopts the 1% AEP flood level plus appropriate freeboard. This will avoid inconsistencies in possible situations with development applications where neighbours are at almost the same ground level but one is required by Council to have elevated floor levels and the other is not.

Commented [PG34]: To recognise the legal situation that the DCP controls cannot override the LEP in regard to permissibility and to better reflect the intent of the provision.

6. ***Mixed Use Development:*** *For mixed-used developments, the planning controls apply to each use to the extent relevant. For example Floor level and Building Component controls will typically apply to only the ground floor, while the balance of the controls could apply to the overall development.*

7. ***Subdivision****: When assessing subdivision the planning controls for the intended end use will be taken into consideration to ensure that any potential development on a new lot would be capable of meeting the controls.*

~~*Note: New residential, commercial or industrial development are not permitted in the High Flood Risk areas. Redevelopment that does not intensify the occupancy will be assessed on a merit basis presented by the applicant.~~

~~*For mixed-used developments, the planning controls matrix applies to the relevant ground floor use.~~

~~**Key**~~

~~Not Relevant~~	
~~Unsuitable Land Use~~	
~~DCP Control Reference no.~~	~~1~~ ~~7~~

Annexures

Annexure B6-3
Flood Compatible Material

Building Component	
Flooring and sub-floor	• Concrete slab-on-ground monolith
	• suspended reinforced concrete slab
Floor covering	• clay tiles
	• concrete, precast or in situ
	• concrete tiles
	• epoxy, formed-in-place
	• mastic flooring, formed-in-place
	• rubber sheets or tiles with chemicals-set-adhesive
	• silicone floors formed-in-place
	• vinyl sheets or tiles with chemical-set adhesive
	• ceramic tiles, fixed with mortar or chemical-set
	• asphalt tiles, fixed with water resistant adhesive
Wall structure	• Solid brickwork, block work, reinforced, concrete or
Roofing structure (for situations where the relevant flood level is	• reinforced concrete construction • galvanised metal construction
Doors	• solid panel with water proof adhesives
	• flush door with marine ply filed with cell foam
	• painted metal construction
	• aluminium or galvanised steel frame
Wall and ceiling linings	• fibro-cement board
	• brick face or glazed
	• clay tile glazed in waterproof mortar
	• concrete
	• concrete block
	• steel with waterproof applications
	• stone, natural solid or veneer, waterproof grout
	• glass blocks
	• glass
	• plastic sheeting or wall with waterproof adhesive
Insulation windows	• Foam (closed cell types)
	• Aluminium frame with stainless steel rollers or similar corrosion and water ~~resistent~~resistant
Nails, bolts, hinges and fittings	• Brass, nylon or stainless steel; • Removable pin hinges • Hot dipped galvanised steel wire nails or similar.

Commented [PG35]: A note could be included to the effect that this list is not exhaustive and other materials and methods can be proposed for Council's consideration. References to other Guidelines and emerging research could be provided.

Electrical and mechanical equipment *For dwellings constructed on land to which this DCP applies, the electrical and mechanical materials, equipment and installation must conform to the following requirements:*	
Main power supply	Subject to the approval of the relevant authority the incoming main commercial power service equipment, including all metering equipment, must be located above the relevant flood level. Means must be available to easily disconnect the dwelling from the main power supply.
Wiring	All wiring, power outlets, switches, must be to the maximum extent possible, located above the maximum flood level. All electrical wiring installed below this level must be suitable for continuous underwater immersion and must contain no fibrous components. Earth leakage circuit-breaker (core balance relays) or a Residual Current Device must be installed. Only submersible type splices must be used below maximum flood level. All conduits located below the relevant designated flood level must be so installed that they will be self-draining if subjected to flooding.
Equipment	All equipment installed below or partially below the relevant flood level must be capable of disconnection by a single plug and socket assembly.
Reconnection	Should any electrical device and/or part of the wiring be flooded it must be thoroughly cleaned or replaced and checked by an approved electrical contractor before reconnection.
Heating and air conditioning systems *Where viable, heating and air conditioning systems should be installed in areas and spaces of the house above maximum flood level. When this is not feasible, every precaution must be taken to minimise the damage caused by submersion according to the following guidelines:*	
Fuel	Heating systems using gas or oil as fuel must have a manually operated valve located in the fuel supply line to enable fuel cut-off.
Installation	Heating equipment and fuel storage tanks must be mounted on and securely anchored to a foundation pad of sufficient mass to overcome buoyancy and prevent movement that could damage the fuel supply line. All storage tanks must be vented to an elevation of 600 millimetres above the relevant flood level.
Ducting	All ductwork located below the relevant flood level must be provided with openings for drainage and cleaning. Self-draining may be achieved by constructing the ductwork on a suitable grade. Where ductwork must pass through a water-tight wall or floor below the relevant flood level, a closure assemble operated from above relevant flood level must protect the ductwork.

Annexures

Annexure B6-4
Flood Risk Management Report Requirements

A Flood Assessment (FA) must be prepared by a professional engineer who specialises in hydraulic engineering. The FA must be prepared in accordance with the relevant sections of this Chapter. The 20% AEP, 1% AEP and PMF flood events must be modelled to assess the impact on existing flood conditions of a proposed development to property, infrastructure and the environment. The FA will be required for any type of development where the development occurs in the floodplain (i.e. situated within the Flood Planning Area) or where the Site in question is tagged as a Flood Control Lot.

Unless it can be demonstrated that hydraulic modelling is not required, the FA must be prepared using Council's TUFLOW model (note: a fee is payable for the TUFLOW model). Once engaged, the consultant must enter into a license agreement for the use of Council's flood model for the specific purpose of preparing the FA for the proposed development only. *[A link to the form to acquire the model and detailing the fee would be helpful here]*

The FA must address the following:

- Description of the Site (including existing stormwater drainage and local catchment characteristics) and details of the proposed development
- Flood affectation to the Site during the 5% AEP, 1% AEP and PMF events under existing (i.e. pre-development) conditions
- Overview of the Flood Risk Precinct and associated development controls applicable to the Site
- Flood affectation to the Site during the 5% AEP, 1% AEP and PMF events under post-development conditions
- Overview of the change in flood conditions associated with the proposed development
- Discussion of adherence to applicable planning controls
- Proposed mitigation measures to address any impacts or minimise risk to personal safety of occupants and the risk of property damage
- A flood evacuation strategy (Flood Emergency Response Plan) (if required) *[Further guidance on requirements may be required here]*
- On site response plan to minimise flood damage, and provide adequate storage areas for hazardous materials and valuable goods above the flood level (if required)
- The architectural/engineering plans on which the assessment is based
- Supporting calculations and mapping
- The professional qualifications and experience of the author(s).

~~A Flood Risk Management Report must be prepared by a suitably qualified and practising engineer with experience in floodplain risk management. The report must be prepared in accordance with the relevant sections of Annexure B6-4.~~

~~Council will request a report to determine the effects of a proposed development on flooding and the effect of flooding on a proposed development. A report will be required for any type of development where the development occurs in the floodplain or in areas where overland flow is suspected.~~

~~Unless it can be demonstrated that flood modelling is not required, any modelling must be undertaken using Council's TUFLOW model (subject to local refinements including revisions to the DEM using detailed survey). A fee is payable to use the TUFLOW model. Once engaged, the consultant must enter into a license agreement for the use of Council's flood model for the specific purpose of preparing the flood study for the proposed development only.~~
~~The Flood Risk Management Report must at a minimum address:~~

1. ~~Extent of the 5% AEP flood, 1% AEP flood and PMF event in the vicinity of the development in the pre-development and post-development stage (where modelling has been undertaken).~~

2. ~~Peak Flood Velocity, Hydraulic Categorisation and Flood Hazard mapping during the 5% AEP, 1% AEP flood and PMF event in the vicinity of the development in the pre-development and post-development stage (where modelling has been undertaken).~~

Commented [PG36]: These requirements were reviewed in consultation with KBR to seek to provide better clarity and consistency with other policies and guidelines and current terminology.

Commented [PG37]: To align with the requirements of the Codes SEPP.

3. Any difference in mapping to compare changes in flood behaviour from the pre-development and post-development stage (where modelling has been undertaken).

4. Recommendations on all precautions to minimise risk to personal safety of occupants and the risk of property damage for the total development to address the flood impacts on the site during a 1% AEP flood and PMF event. These precautions must include but not be limited to the following:
    a. Types of materials to be used to ensure the structural integrity of the development for immersion and impact of velocity and debris for the 1% AEP flood event and PMF;
    b. Waterproofing methods, including electrical equipment, wiring, fuel lines or any other service pipes or connections;
    c. A flood evacuation strategy (Flood Emergency Response Plan); and
    d. On site response plan to minimise flood damage, and provide adequate storage areas for hazardous materials and valuable goods above the flood level.

5. Details of any flood mitigation works (including any supporting modelling and calculations) that are proposed to protect the development.

6. The architectural/engineering plans on which the assessment is based.

7. The date of site inspection undertaken.

8. The professional qualifications and experience of the author(s).

DEFINITIONS

NOTE: ONLY KEY DEFINITIONS RELEVANT TO FLOOD RISK MANAGEMENT HAVE BEEN CONSIDERED

Note: Terms used in this Plan are defined in Waverley LEP 2012 and the Act and override any identical definition in this dictionary. The definitions below refer to terms that are not defined by either the LEP or the Act.

A

Annual Exceedance Probability (AEP) - The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage ~~The probability that a given rainfall total accumulated over a given duration will be exceeded in any one year. Example, if a peak flood discharge of 500 m3 /s has an AEP of 1%, it means that there is a 1% chance (that is one in 100 chance) of a 500 m3 /s or larger event occurring in any one year.~~

Commented [PG1]: Superfluous (not used)

Commented [PG2]: Simplify to be more understandable to the general public (definition taken from the Draft Manual)

~~**Australian Height Datum (AHD)** - A common national plan of level corresponding approximately to mean sea level.~~

~~**Average Recurrence Interval (ARI)** - The average time interval (expressed in years or fraction of years) between recurrences of a rainfall event of a given intensity and duration. For example, floods with a discharge as great as, or greater than, the 20 year ARI flood event will occur on average once every 20 years. ARI is another way of expressing the likelihood of occurrence of a flood event.~~

B

Basement Car Parking ~~**or Below Ground Car Parking**~~ - The car parking area generally below ground level where inundation of the surrounding areas may raise water levels above the entry level to the basement, resulting in inundation. Basement car parks are areas where the means of drainage of accumulated water in the car park has an outflow discharge capacity significantly less than the potential inflow capacity.

Commented [PG3]: To align precisely with the term used in the controls

C

Commented [PG4]: Superfluous as specified in Land Use Category table

~~**Critical Facilities** - Includes hospitals and ancillary services, communication centres, police, fire SES, major transport facilities, sewerage and electricity plants; any installations containing critical infrastructure control equipment and any operational centres for use in a flood.~~

D

E

Effective Warning Time - The time available after receiving advice of an impending flood and before the floodwaters prevent appropriate flood response actions being undertaken. The effective warning time is typically used to raise furniture, evacuate people, and transport their possessions.

Commented [PG5]: Term not used in Emergency Management controls but can be if Council considers sufficient information is or could be available.

Evacuation - The transfer of people and or stock from areas where flooding is likely, either close to, or during a flood event. It is affected not only by warning time available, but also the suitability of the road network, available infrastructure, and the number of people that have to evacuate during floods.

F

DEFINITIONS

Flood - A natural phenomenon that occurs when water covers land that is normally dry. It may result from coastal inundation (excluding tsunamis) or catchment flooding, or a combination of both. ~~A relatively high stream flow which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with major drainage as defined by the Floodplain Development Manual before entering a watercourse, and/or coastal inundation resulting from super elevated sea levels and/or waves overtopping coastline defences excluding tsunami.~~

Commented [PG6]: Replaced with simplified definition in Draft Manual

Flood compatible building components - A combination of measures incorporated in the design and/or construction and alteration of individual buildings or structures subject to flooding, and the use of flood compatible materials for the reduction or elimination of flood damage.

ABBREVIATIONS

Flood compatible materials - Those materials used in building which are resistant to damage when inundated.

Flood evacuation strategy - The proposed strategy for the evacuation of areas within effective warning time during periods of flood as specified within any policy of Council, the Floodplain Risk Management Plan (FRMP), the relevant State Government disaster plan, or by advice received from the State Emergency Services (SES) ~~or as determined in the assessment of individual proposals.~~

~~**Flood hazard** - The potential risk to life and limb and potential damage to property resulting from flooding. The degree of flood hazard varies with circumstances across the full range of floods.~~

~~**Flood planning area** - The area where flood related development controls apply. It includes land below the flood planning level (FPL) and may extend to include other areas of land where the high consequences in low probability events require additional flood related controls to reduce damages or to not alter the floodway in rarer flood events.~~

~~**Flood planning level (FPL)** - In the Waverley LGA, the FPL is the level of a 1% AEP flood event plus 300 mm freeboard, unless otherwise stated in an adopted Floodplain Risk Management Study and/or Floodplain Risk Management Plan.~~

~~**Flood prone land** - Land susceptible to flooding by the probable maximum flood (PMF) event. Flood Prone Land is synonymous with flood liable land.~~

Flood proofing - A combination of measures incorporated in the design, construction and alteration of individual buildings or structures subject to flooding, to reduce or eliminate flood damages. Examples include use of tiled surfaces and installing power points above flood planning levels etc.

Flood refuge area - An onsite refuge above the PMF that provides reasonable shelter for the likely occupants of the development commensurate with the period of time that refuge is likely to be required in floods up to the PMF.
Note: In general, it is not acceptable to rely on a refuge provided by or on other development sites. In all cases where an onsite refuge is provided, it is to be both intrinsically accessible to all people on the site, sheltered and an integrated part of the development (i.e. a second storey with internal stair access). The route to the refuge is to be fail safe, plainly evident and self-directing.

Flood Fringe Areas - The remaining areas of flood prone land after floodway and flood storage areas have been identified.

Floodway Areas - Areas of the floodplain where a significant discharge of water occurs during floods. They are often aligned with naturally defined channels. Floodways are areas that, even if only partially blocked would cause a significant redistribution of flow or a significant increase in flood levels.

Flood Storage Areas - Floodplain area that is important for the temporary storage of floodwaters during a flood.

Floodplain - (Synonymous with flood liable and flood prone land) is the area of land that is subject to inundation by the PMF.

Floodplain Development Manual (FDM) - Floodplain Development Manual (2005) or the latest version.

Commented [PG7]: To distinguish strategies for an area form those that may be required for an individual site via a FERP as specified by the controls.

Commented [PG8]: Superfluous

Commented [PG9]: Superfluous, Defined in LEP which refers back to the Manual and clarified in the Controls as required by the 2021 Guideline.

Commented [PG10]: Superflous

ABBREVIATIONS

~~**Floodplain Risk Management Plan (FRMP)** - A plan prepared for one or more floodplains in accordance with the requirements of the FDM.~~

~~**Floodplain Risk Management Study (FRMS)** – A study prepared for one or more floodplains in accordance with the requirements of the FDM.~~

Freeboard - A factor of safety typically used in relation to the setting of minimum floor levels or levee crest levels~~A margin of safety applied to calculations that estimate the water surface during a storm event. The freeboard accounts for the inaccuracies in calculation methods. The height between water level and the underside of a structure or top of an embankment/channel wall is referred to as freeboard~~.

Commented [PG11]: Simplified definition from draft Manual

G

H

Habitable - In a residential situation: a living or working area, such as a lounge room, dining room, rumpus room, kitchen, bedroom or workroom; In an industrial or commercial situation: an area used for offices or to store valuable possessions susceptible to flood damage in the event of a flood.

I

L

M

N

Non – Habitable Room - Spaces not occupied frequently or for extended periods.

O

Outbuilding - An unattached building or structure that includes a bird aviary, cubby house and other play equipment, cabana, garden shed and greenhouse and the like.

Commented [PG12]: These would be permitted as Concessional Development under the controls. Review to ensure they are all appropriate and would not be likely to provide a significant blockage.

Overland flow - Runoff from rainfall that flows over the land before entering a watercourse, creek, river, lake or dam. Overland flow can flow down roads, driveways and through homes and buildings. It is typically shallow and fast flowing.

Overland Flow Path - The path that stormwater may take if the piped or channelled stormwater system becomes blocked or its capacity exceeded. Overland flow paths provide a fail safe system to ensure that stormwater is not likely to cause flood damage.

P

Probable Maximum Flood (PMF) - The largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation.

ABBREVIATIONS

Probable Maximum Precipitation (PMP) - The greatest depth of precipitation for a given duration meteorologically possible over a given size storm area at a particular location at a particular time of the year, with no allowance made for long-term climatic trends (World Meteorological Organisation, 1986). It is the primary input to the estimation of the probable maximum flood.

R

Reliable Access - During a flood means the ability for people to safely evacuate an area subject to imminent flooding within effective warning time, having regard to the depth and velocity of flood waters, the suitability of the evacuation route, and without a need to travel through areas where water depths increase.

Risk - The chance of something happening that will have an impact. It is measured in terms of consequences and probability (likelihood).

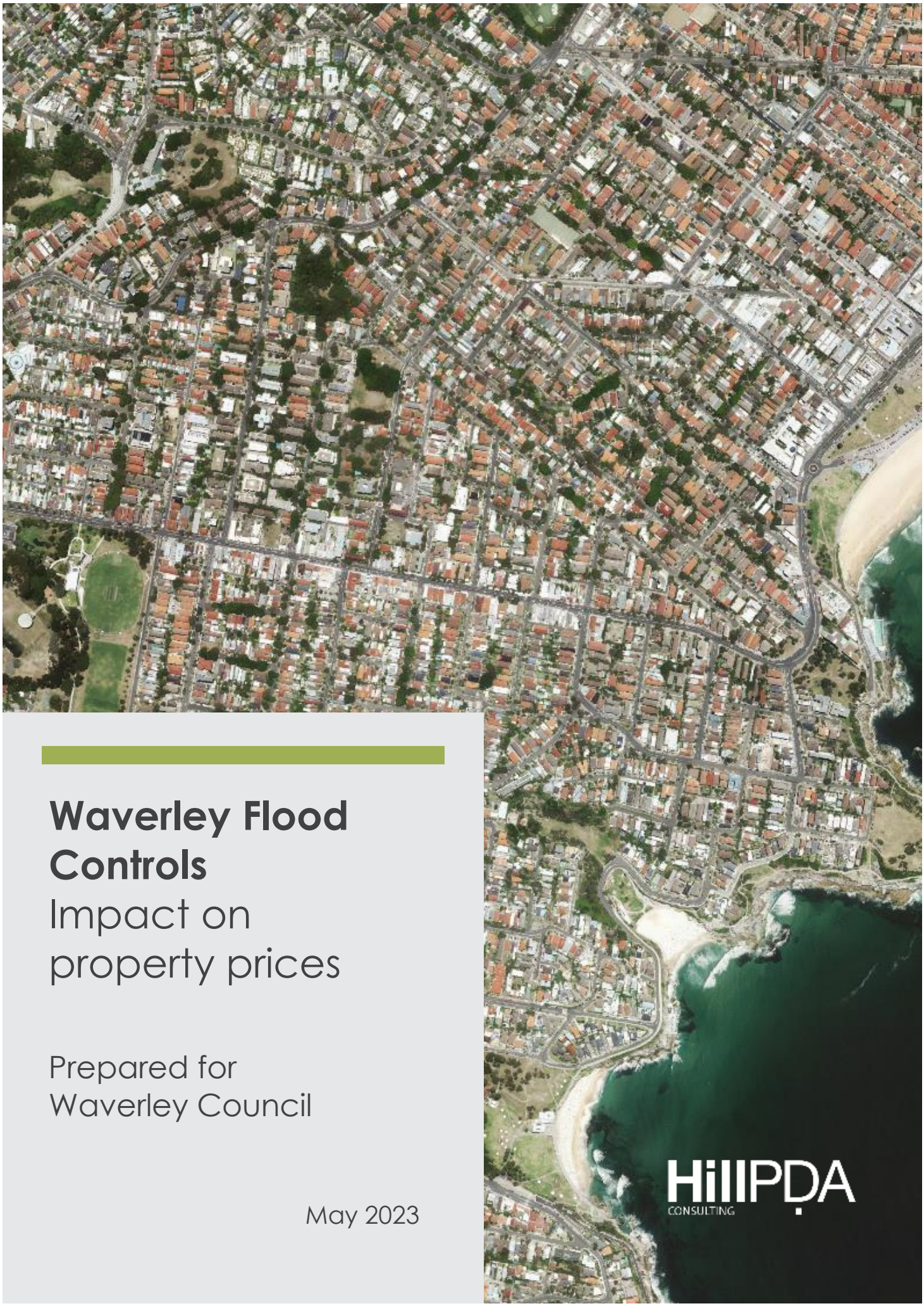
S

T

U

V

W



Waverley Flood Controls

Impact on property prices

Prepared for
Waverley Council

May 2023

HillPDA CONSULTING

CONTENTS

Tables

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This document is for discussion purposes only unless signed and dated by an Executive of HillPDA.

Reviewer

Signature		Dated	08/05/23

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EXECUTIVE SUMMARY

Waverley Council has engaged HillPDA to consider the impact that proposed flood controls would have on property prices within the LGA. The proposed flood controls seek to identity properties as high, medium, and low risk for flooding. The flooding refers to the accumulation of overland flows, so relates to excess stormwater.

The identification of land as being potentially flood (stormwater) affected is on its own unlikely to have a material impact on property prices in Waverley over time.

While there has been limited academic literature looking at flooding through the accumulation of overland flow, there has been literature that looks at riverine and coastal flooding. In general, flooding will have an impact on prices once inundation has been occurred, resulting in lower prices for flood affected properties. Over time the price gap between flood affected and non-flood affected properties tends to reduce, as the flood affected prices normalise. Therefore, ***it is unlikely that the identification of flood risk on its own would result in a sustained price impact on property prices in Waverley.***

Through an analysis of the actual prices of identified flood affected and non-flood affected prices of properties transacted in Waverley LGA, there was not an economically or statistically significant relationship between the price of the property and if it was identified as flood affected. This was tested through:

- Reviewing transactions of properties in Waverley LGA once the DCP amendments were placed on exhibition and therefore the flood affectation was included in the section 10.7 certificate, which was a part of the contract of sale. Regression analysis and statistical testing found that those that were flood affected did not have a statistically significant lower price than those that were not flood affected. It also found that when looking at medium and high-risk properties alone that were transacted there was not a meaningful relationship between price and flood risk identification observed.
- The Waverley LEP has identified properties that are at risk of flooding, and these properties have been identified since at least 2012. Considering the transactions on those properties compared to those not flood affected between 2001 and 2022, no statistically significant relationship between flood risk identification and price was observed when controlling for time and property type.

In our view, the key determinant of property price in the Waverley LGA is the attraction of the coastal lifestyle proximity to the Sydney CBD, and access to high quality retail, and schools in both Waverley and the surrounding area. This culminates in a highly attractive location, where people want to move, which is the key determinant of house prices, and results in premium property prices.

If sustained and observable inundation were to occur, because of regular storm activity, it is likely that there would be a negative impact on prices. This impact would occur regardless of any prior identification of flood risk because the actual experience of flooding would have an observed impact on the quality of the property. However, the early identification of the risk and prudent works to minimise any flood risks would have a marginal impact on price, up to the cost of the works, and prevent any greater downward pressure on price from regular inundation.

Up to now, ***we have not seen evidence of price impacts because of the identification of flood affectation in the Waverley LGA.***

1.0 INTRODUCTION

HillPDA has been engaged by Waverley Council to review the impact of proposed flood planning controls on property values in Waverley LGA.

1.1 Background

The Waverley Flood Study commenced in 2017 and was an initial step toward a toward a Floodplain Risk Management Study and Plan in accordance with NSW Floodplain Development Manual (2005) it defined flood prone land across the LGA. The study was finalised in January 2021 and endorsed by council in April 2021.

As a response to the study the Council proceeded to make LEP and DCP amendments based on the recommendations of the study. These recommendations sought to map the extent of potential flood risk in the LGA and sought to introduce new controls.

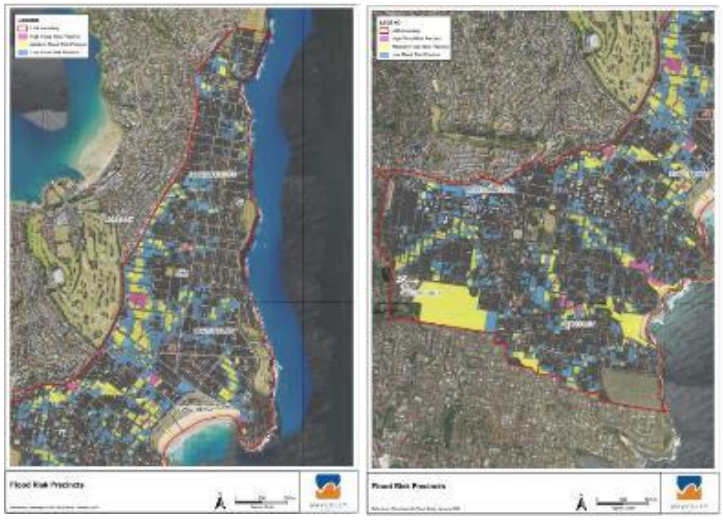
1.2 Definition of Flooding

The Waverley Flood Study refers to the accumulation of overland flows as flooding and to the hydraulic modelling used to represent this process as flood modelling, which would be defined as "stormwater" for the assessment of insurance claims.

1.3 Proposed DCP Controls

As part of the proposed DCP amendments, Council mapped properties as "high", "medium", and "low" risk.

Figure 1 Flood Maps



The proposed DCP incorporated controls around required floor levels, structural soundness, driveway access, and design access to help mitigate the impact of flooding on the property.

1.4 Purpose of the study

There was significant community concern about the impact of identification as medium or high flood risk on property prices within the LGA. The purpose of this study is to quantify the impact that the proposed measures would have on property prices in the LGA.

2.0 LITERATURE REVIEW

This section reviews the relevant literature that has been released in relation to the impact of flooding on property prices.

The impact of flooding characterised by overland flow, typical of the Waverley Flood Study, on prices has not been studied as extensively as riverine flooding. Overland flow can have a risk to property and life; however, the frequency and impact of riverine flooding (most recently experienced in the Hawkesbury-Nepean and the Northern Rivers) can represent a significant risk to property or life. Much of the literature has focussed on riverine flooding, we consider that these learnings on property prices are relevant to Waverley, because they represent a much more extreme version of flooding than would be experienced in Waverley.

Overall, the impact of the flooding on prices can be summarised as there is no significant difference in property values in flood zones during periods of no flooding. When flooding occurs, there has usually been a reduction in value of the property, which then quickly recovers over time.

- Fletcher et al. (2022), *The Behaviour of property prices when affected by infrequent floods* studied price shifts in Brisbane following the 2011 Floods. It found that prices in flood zone were equivalent to the zero-risk zone when major events are in the past, immediately after minor or major flood events prices would decline, but then recover within a few years. Therefore, it is possible that the market depreciates the risk of flooding over time or forgets the risk. The authors hypothesise that frequent flooding could result in a lasting change in the valuation of risk.
- Beltran et al. (2019), *The Impact of flooding on property prices: A repeat-sales approach* studied the impact of flooding on property prices in England between 1995 and 2014. Using repeat sales, it found that there was an immediate decline of 21.1% where coastal flooding occurred and the property was inundated however, after 4 years the discount experienced as a result of flooding is removed by the market and there is not statistically significant difference in price between properties affected by flooding and those that were not. For coastal properties in the top quartile, which reflects properties in Waverley, the prices recovered after 2 years, and the discount was only 10.5%.
- Bin O, et al. (2008), *Flood hazards, Insurance rates and amenities* studied the impact of identification of flood risk in Carteret County North Carolina, which is a lower cost housing area in the United States. This found a 7.3% reduction in house sales price due to being identified as flood risk, noting that this referred to riverine flooding. We also note that this incorporated housing within a 1:100 riverine flood zone, which would not be permitted in NSW, and not relevant for Waverley LGA.

Overall, the literature has identified that prices tend to recover after inundation in Brisbane and the UK. This indicates that there is unlikely to be discounting because of the identification of flood risk.

2.1 2022 Valuer-General Review

In November 2022, the NSW Valuer General issued its *Review of the impact of flooding on the 1 July 2022 land values*. This review sought to determine the impact on valuations on 1 July 2022 following the severe flooding at the start of the 2022. The study for Northern NSW was based on market transactions and had the following findings:

- Areas with limited flood impact have remained stable with some increases
- Moderately impacted areas have decreased in land value by up to 10%
- Up to 35% reduction in the most significantly impacted areas, predominately Lismore

The Hawkesbury LGA mostly saw an increase in land values; however, for the most significantly impacted area along the Hawkesbury river between Richmond and Wilberforce land values have decreased by 20% from 2021.

Overall, we consider that the flooding in Waverley would be limited in nature compared to the moderately or significantly impacted flooding in the areas. Therefore, we consider that the identification of flooding would likely have a minimal negative impact on prices in the LGA.

3.0 APPROACH TO PROPERTY PRICES

The fair market value is the price that property changes hands between a willing buyer and willing seller. A buyer is seeking several factors including:

- Location
- Size
- Amenities
- Building quality
- Capacity to pay

The cumulative nature of all these factors will determine the buyers that are interested in the property, and their capacity to pay. Home purchasers will tend to make trade-offs and purchase up to their capacity to pay, which is usually set externally by availability of financing.

A seller is often seeking to maximise the sale price, and therefore will accept an offer either through an auction or private treaty that they believe is the highest offer for the price.

Some these factors influence the value of the underlying land and then others are related to the capital improvements. The reason that property prices in Waverley tend to be more expensive than in other areas is because the underlying value of the land is high reflecting its proximity to the CBD and beaches.

Often external factors can influence prices in the short-term, sometimes up to ten percent of the estimated value of the properties, an example would be the exhaust from a tunnel or sewer ventilation shafts. The impact on price has been greatest when it is first installed then overtime prices tend to normalise, and recover to the point that it becomes indistinguishable, unless it has a sustained and noticeable impact.

3.1 Flood affectation can impact property prices

Flood affectation would impact property prices in three ways:

- **Risk discount to cost of flooding**, whereby a prospective purchaser considers the risk of inundation and flood impacts and therefore offers a lower price considering that risk, or perceived loss of amenity. This is where, for example, significantly increased insurance costs may impact the development.
- **Augmentation discount**, whereby additional works or augmentation of the asset needs to occur to meet new flood controls. It is likely that this discounting would most likely be considered where the site is being considered for re-development or substantial renovations. This discounting would result in a purchaser considering the additional cost of works as part of the overall investment in the property, and therefore reduce their willingness to pay. Our review of the controls is that they are generally minor and manageable, often requiring increased floor levels. They also do not require proactive work completed on properties that are already completed. Therefore, these costs will most likely be considered on the general market for properties that are substantially run down or underutilised, where work would be required anyway. Therefore, we consider that it could have a marginal impact on property prices.
- **Discount due to limited re-development opportunity**, whereby the flood controls limit redevelopment opportunities. If the flood controls were to reduce the re-development permissibility for the site, then the reduced opportunity would be reflected in a lower acquisition price to reflect the new maximum allowable use for a development. Council has advised HillPDA that the flood controls proposed largely

do not limit redevelopment opportunity, except for seniors living and some sensitive uses. Overall, we consider that the risk discounting would occur for development opportunities in the LGA.

The risk discounting to flooding has tended to focus on areas with catastrophic riverine flooding, or lower incomes with more sensitivity to ongoing price changes such as insurance premiums. The Waverley housing market is more likely to be driven by the highly desirable location and amenity of the local area characterised with proximity to beaches, entertainment, open space, and lifestyle features.

4.0 WAVERLEY LGA PROPERTY MARKET

This section assesses the housing stock of the property market in the Waverley LGA and seeks to identify key trends in prices in the LGA.

4.1 Number of Dwellings

There are 32,775 private dwellings in Waverley of which 27,455 are occupied (ABS, 2021). The table below outlines the number and percentage of the type of occupied private dwellings in the Waverley LGA at the 2021 Census. Across the LGA 12,321 properties were identified as flood affected.

Table 1 Dwelling Structure of Waverley LGA (ABS)

Dwelling Structure	Waverley (no.)	Waverley (%)	Greater Sydney (%)
Separate House	4,405	16.0	55.8
Semi-detached, row or terrace, townhouse etc	4,969	18.1	12.8
Flat or apartment	17,590	64.1	30.7
Other	443	1.6	0.4

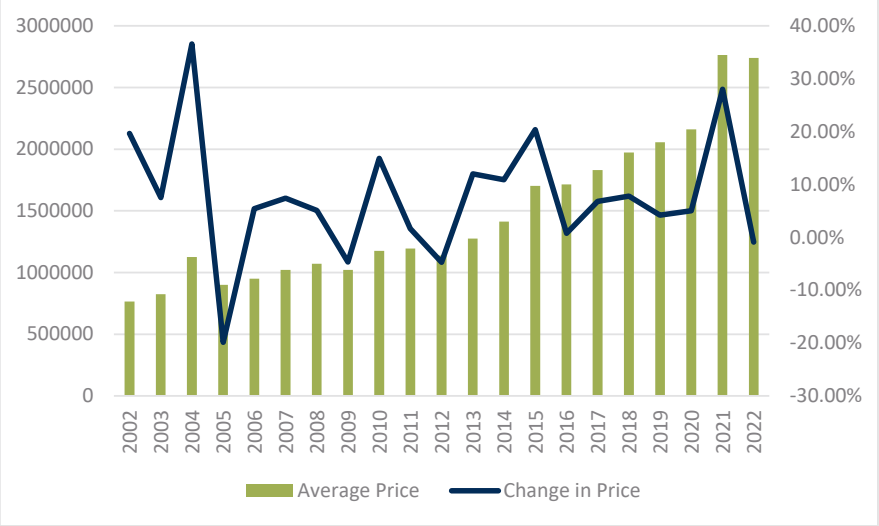
Nearly two-thirds of dwellings are flats or apartments, which means that the price for the dwelling is determined by a greater proportion of the built-form cost, with the underlying land value being less reflective in the cost of the apartment. This is because the cost of the underlying land is shared across each of the apartment dwellings.

The impact of flood affectation is less likely to influence the price of an apartment than the price of a separate home, because individual properties may not be affected as much, the cost to develop flood defences is shared by the strata, and apartments tend to be well-located near amenity, which is a key price determinant.

4.2 Price and Market Trends

The housing market in Waverley has seen significant price increases between July 2021 and 2022 for both residential and commercial land values, the trend has been attributed to the ongoing demand in the Eastern Suburbs due to its desirable location, close to beaches, commercial centres, the CBD, and transport. Between 2019 and 2022 there was a 56.22% increase in the land value of the residential zone category (Valuer General, 2022).

Figure 2 Average Residential Property prices in Waverley LGA



Source: HillPDA 2023, Valuer General Property Sales

Figure 2 shows that there has been substantial price growth in Waverley over the last 20 years as the areas has become more attractive. The ABS residential price index increased 156% in Greater Sydney between September 2003 to December 2021, over the same period prices in Waverley grew by 236%.

Between January 2018 and March 2023 house prices in Greater Sydney grew on average 7% between the two periods, whereas house prices in Waverley grew 15%.

The Waverley market is a premium housing market. It has had faster price growth than the Greater Sydney average, indicating it is a highly attractive market for many people. Based on these accelerated prices we consider that a multitude of factors are driving people to the LGA.

5.0 ANALYSIS

This section analyses the price impacts for the properties that were identified in the DCP amendments. It also analyses the impact of flood identification under the LEP, which have been identified for a longer period of time. Finally, it undertakes some case studies of particular transactions.

5.1 DCP Control Analysis

HillPDA identified transactions where the contract was exchanged from 30 June 2022 and settled by 23 February 2023. This covers from the time the DCP amendment was placed on exhibition from 23 June to 21 July 2022, when the draft affectation was placed on the section 10.7 certificate included on the contract.

Utilising Valuer General data, HillPDA has identified the transactions that occurred in the period and the properties that were flood affected during the period. During that period there were 608 transactions of which 239 were flood affected properties reflecting approximately 40% of the transactions in the Waverley LGA at the time.

Table 2 Flood Affectation of Properties transacted from 30 June 2022 and 23 February 2023 (HillPDA, Valuer General)

Flood Affectation	Number of Sales
High	9
Medium	78
Low	152
None	369
Total	644

5.1.1 Descriptive statistics and distribution analysis

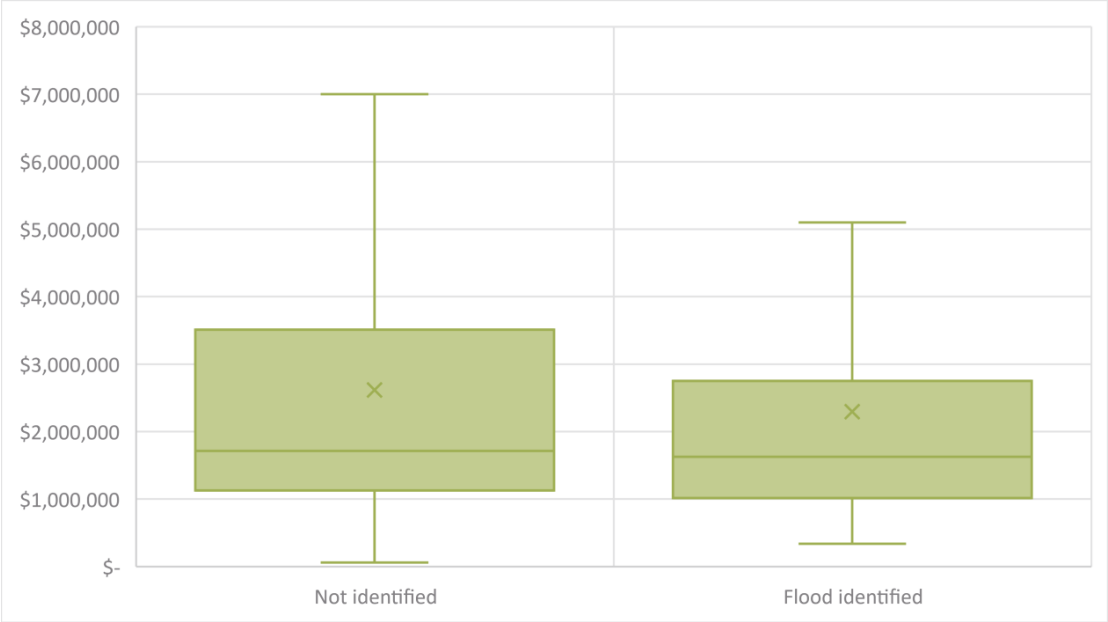
The descriptive statistics for the transactions are outlined in Table 3. The average and the median for a non-flood affected property is in general higher than a flood affected property. Statistical testing will check if the difference in affectation is responsible for the difference, or if the conclusion has statistical significance. As each sample has a high standard deviation and variance, there are a number of different factors that are impacting on prices achieved by individual properties such as location, property size, and type.

Table 3 Descriptive Statistics (HillPDA)

	Total Transactions	Non-Flood Affected	Flood Affected
Mean	2,491,462	2,618,300	2,295,632
Standard Error	91,998	126,761	127,627
Median	1,682,500	1,712,500	1,627,500
Mode	1,200,000	1,200,000	6,000,000
Standard Deviation	2,268,465	2,434,994	1,973,072
Sample Variance	5,145,935,497,604	5,929,194,367,770	3,893,014,090,476
Kurtosis	10	10	9
Skewness	3	3	2
Range	18,215,000	18,215,000	14,860,000
Minimum	60,000	60,000	340,000
Maximum	18,275,000	18,275,000	15,200,000
Sum	1,514,808,940	966,152,871	548,656,069
Count	608	369	239

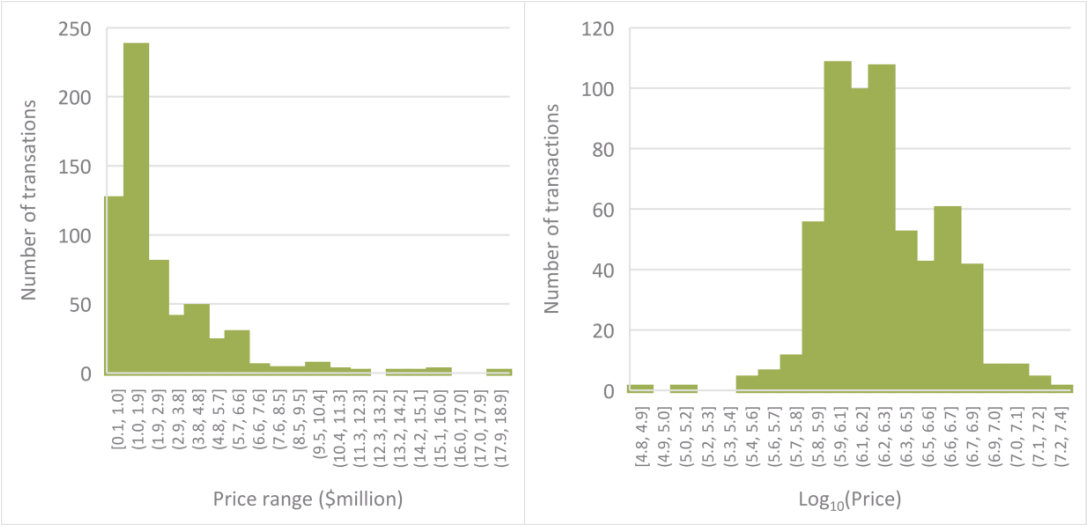
Figure 3 shows the interquartile range and prices excluding outliers both non flood affected, and flood identified properties in the LGA transacted over the period. The data is skewed with many of the observations within the $1m to $1.94m range (Figure 4), reflecting that 440 of the sales were strata sales. Since many statistical tests assume a normal distribution, the data set for prices was logarithmically transformed to allow for statistical testing. This resulted in a broadly normally distributed data set to allow for analysis, as shown in Figure 3.

Figure 3 Box and whisker chart for Waverley LGA properties



Source: HillPDA 2023, Valuer General

Figure 4 Histogram of sales prices in Waverley LGA ($m) and logarithmically transformed sales prices



HillPDA 2023

5.1.2 Model One – Flood Affectation

HillPDA prepared a linear regression model to test the impact that a dummy variable of flood affectation had on the properties at the time, with the following equation:

$$\hat{Y}_i = \alpha + \beta X_1$$

Where:

$\hat{Y}_i$ referred to logarithmic transformation of the property price

X_i referred to a dummy variable of identified flood affectation, where X was equal to 1 then the property was flood affected.

Statistical testing is a data analysis testing tool to see if there are meaningful results from a variable. The t-test determines if a single variable is statistically significant, by quantifying the relationship between the individual explanatory variable (identified flood affectation) and the dependent variable (property price). It seeks to confirm if there is a strong relationship between the variables. The F-test seeks to test if the model is jointly significant, this looks at explanatory variables within the model. This is more important in multi-variable models (such as those used in the LEP flood affectation analysis).

There was not a statistically significant relationship between flood affectation and the change in price in the model. The t-test and f-test both resulted in values that fell outside of the rejection range, which means any variation could be due to chance or other factors. The observed F-value was 1.98, whereas the critical f-Value needed was 3.01, that is the observed F-value needed to be greater than the critical F-value. The observed t-value was also lower than the critical t-value. Similarly, the explanatory power of the model was approximately 0.03% through the observed R^2 value.

Therefore, identification as being potentially flood affected in the DCP has not been a useful variable in predicting price on transactions where contracts were exchanged from 30 June 2022 and settled by 23 February 2023.

5.1.3 Model Two – High and Medium Flood Affectation

HillPDA modelled the impact of a property being identified as possessing high or medium flood risk. The model had an R^2 of 0.0051 which means it accounted for 0.51% of the variation in prices between high and medium flood affected properties compared to low or non-flood affected properties. This would imply that other factors external to the model (such as location, property size, or building quality) had a much more substantial impact on prices than the identification of flood affectation. Similarly, the observed t-value was below the critical t-value to be statistically significant. This means the reduction in property prices observed in the model would likely be due to other factors external to the model.

5.2 LEP Flood Affectation Analysis

Prior to the release of the DCP amendments, 942 properties were identified as flood affected in the LEP. HillPDA has analysed the transactions on these properties between 2012 and 2022. There have been 393 transactions related to these properties between 2012 and 2022 and 20,016 transactions in total in the LGA.

5.2.1 Descriptive statistics and distribution analysis

	Total Transactions	Non-Flood Affected	Flood Affected
Mean	2,035,472	2,031,699	2,223,857
Standard Error	26,971	27,393	127,430
Median	1,325,000	1,320,000	1,605,000
Mode	1,100,000	1,100,000	1,120,000
Standard Deviation	3,815,867	3,837,220	2,526,207
Sample Variance	14,560,839,719,993	14,724,255,677,680	6,381,723,445,682
Kurtosis	5,662	5,648	123
Skewness	57	58	9
Range	395,234,640	395,234,640	39,569,544
Minimum	100	100	16,750
Maximum	395,234,740	395,234,740	39,586,294
Sum	40,742,003,633	39,868,027,831	873,975,802
Count	20,016	19,623	393

HillPDA 2023, Valuer-General

The distribution of transactions is similarly skewed rightward as shown in Figure 5. Therefore, a logarithmic transformation was applied to make the data suitable for analysis as the data become normal enough for the statistical tests.

Figure 5 Histogram of sales prices in Waverley LGA and logarithmically transformed sales prices in the LGA.

HillPDA, 2023

5.2.2 Model One – Two Variable

HillPDA has analysed the difference in the prices for these properties through a multiple linear regression model, which controlled for the change in time over the period by including a variable for time in addition to the dummy variable for flood affectation. It was expressed

$$\hat{Y}_i = \alpha + \beta X_1 + \beta X_2$$

Where:

$\hat{Y}_i$ referred to the property price

X_1 referred to a dummy variable of flood affectation, where *X* was equal to 1 then the property was flood affected.

X_2 referred to the transaction date.

HillPDA tested both logarithmically transformed prices for this model. The inclusion of the transaction date for this variable reflected the over 20-year time horizon because there has been significant price growth as discussed in section 4.2 so time would explain for a large amount of variation in prices in the data set. Statistical significance refers to the robustness of the conclusions, economic significance refers to the likely impact or materiality of the variation. For example, a statistically significant variation in prices of 0.05% would be unlikely to be economically significant.

When prices were logarithmically transformed a statistically and economically significant relationship was identified. A property that was identified as flood affected in the LEP sold for 6% more on the average, than property that was not flood affected. Overall, the model had a low explanatory power, only 8.6% of the variation in prices can be explained by the model. Therefore, this suggests other factors may be more important in determining property prices than flood affectation. Furthermore, since the model's conclusion does not make intuitive or logical sense, we consider the identification of flood affectation must be correlated with another factor that could be confusing the results. Therefore, HillPDA has assessed other models.

5.2.3 Model Two – Three Variable

An additional three variable model was used looking at residential property. This model sought to add an additional control for property type, and expressed as:

$$\hat{Y}_i = \alpha + \beta X_1 + \beta X_2 + \beta X_3$$

Where:

$\hat{Y}_i$ referred to the property price

X_1 referred to a dummy variable of flood affectation, where *X* was equal to 1 then the property was flood affected.

X_2 referred to the transaction date.

X_3 referred to the type of property, that is whether it was a house or a unit, where when where *X* was equal to 1 then the property was a house.

This model explained 28% of the variation in prices in the LGA over the period. The variables for transaction date and property type were economically and statistically significant. The variable for flood affectation was economically significant with the identification of flood affectation accounting for 3.4% higher prices on the average than no, but these were not statistically significant. An additional model that accounted for different suburbs was developed and found that there was a statistically insignificant and economically insignificant relationship between property prices and flood affectation when accounting for variations due to suburbs.

5.3 Case Study Properties – High Flood Risks

North Bondi has a high-risk flood area. It also has properties that were identified as flood affected under the LEP, in addition to some properties that were identified as flood affected in the DCP.

Figure 6 maps the study area and properties that were transacted in North Bondi, north of Murriverie. There were 17 properties transacted, their flood affectation (at the time of transaction) is shown in blue for flood affected properties in the map. The transaction details and summary of key property features are identified in Table 4.

Figure 6 Map of North Bondi study area (north of Murriverie Road)

HillPDA 2023

Table 4 Transaction summary

Address	Contract Date	Sale Price ('000)	Area	$/m²	LEP Flood Identified	Bed	Bath	Parking
10 MURRIVERIE RD NORTH BONDI	11/01/2022	$5,450	303.5	$17,957	1	5	3	2
130 MURRIVERIE RD NORTH BONDI	24/01/2022	$7,050	404.7	$17,420	0	5	5	2
9 MACLEAY ST NORTH BONDI	16/02/2022	$6,125	632.3	$9,687	0	4	4	2
90 CLYDE ST NORTH BONDI	14/03/2022	$6,500	594.4	$10,935	0			
34 CLYDE ST NORTH BONDI	4/05/2022	$4,020	215	$18,698	0	4	2	1
18 MURRIVERIE RD NORTH BONDI	5/05/2022	$7,625	327.67	$23,270	1	5	3	3
28 OWEN ST NORTH BONDI	19/05/2022	$3,750	215	$17,442	0	3	3	2
11 CLYDE ST NORTH BONDI	19/05/2022	$7,100	771.4	$9,204	0			Block of flats
24 MURRIVERIE RD NORTH BONDI	1/06/2022	$6,100	360.4	$16,926	1	5	3	2
38 STEWART ST NORTH BONDI	2/06/2022	$3,700	221.25	$16,723	0	3	3	1
2 HARDY ST NORTH BONDI	6/06/2022	$4,800	457.25	$10,498	0	5	3	2
32 ROE ST NORTH BONDI	28/06/2022	$4,300	215	$20,000	1	4	3	1
25 A STEWART ST NORTH BONDI	30/06/2022	$4,375	302	$14,487	0	4	3	1
23 STEWART ST NORTH BONDI	2/08/2022	$3,420	221.3	$15,454	0	4	2	0
16 OWEN ST NORTH BONDI	9/08/2022	$4,600	218	$21,101	1	4	3	1
63 MURRIVERIE RD NORTH BONDI	23/08/2022	$6,100	366.7	$16,635	0	5	3	3
23 OWEN ST NORTH BONDI	26/08/2022	$6,375	423.7	$15,046	1	4	4	2

Source: HillPDA

The average price per square metre in the study area for a flood affected property was higher than the average price per square metre for a non-flood affected property in the study area. For example, the per square metre rate of 10 Murriverie Road was higher than that of 130 Murriverie Road, which likely indicates improved condition. While the flood affectation may have had some downward pressure on the prices, it is not highly noticeable.

32 Roe Street is a semi-detached flood affected property, it had four bedrooms, three bathrooms, and a single car parking space, which was renovated with an additional storey sometime between 2011 and 2013. 25A Stewart Street was built in 2012 it is a semi-detached property also with four bedrooms, three bathrooms, and a single car parking space. 25A Stewart Street sold for $75,000 more than 32 Roe Street in June 2022, despite having approximately 80 additional square metres in land area, and a swimming pool. They also appear to have similar internal areas. It is unlikely that there has been a negative impact of flood affectation on the 32 Roe Street.

At least two properties were sold as development sites, 16 Owen Street was sold as a potential dual occupancy development site, and 11 Clyde St was sold as a block of flats. Both sites have development potential, interestingly the dual occupancy flood affected site sold for a higher per square metre rate.

5.4 Case Study Properties – Medium Flood Risk

HillPDA has reviewed flood impact for medium risk properties in Rose Bay focussed on William Street, The Avenue and Chaleyer Street. During the study period there were 18 transactions of which 17 had sufficient information to be able to assess the property. These were mostly apartment developments, we would consider that these theoretically would have a lower responsiveness to potential flood risk, because they may be further raised form the ground. These properties are summarised below

Table 5 Transactions in Rose Bay

Address	Sale Month	Sale Price	Internal Size	Beds	Baths	Parking	Flood Risk
16/33-35 William St, Rose Bay	December 2022	1,195,000	77	2	1	1	Low
2/33-35 William St, Rose Bay	December 2022	630,000	41	1	1	1	Low
17/33-35 William St, Rose Bay	December 2022	705,000	41	1	1	1	Low
1/21 William St Rose Bay	October 2022	1,671,000	86	2	1	1	Medium
1/15 William Street Rose Bay	October 2022	2,100,000	111	3	2.5	1	Medium
11/3 William Street Rose Bay	October 2022	1,700,000	107	2	2	2	Medium
5/37 William Street Rose Bay	September 2022	1,100,000	61	2	1	1	Low
5/47 Chaleyer Street Rose Bay	November 2022	1,081,000	90	2	1	1	Nil
4/65 Chaleyer Street Rose Bay	October 2022	580,000	80	2	2	0	Nil
4/48 Chaleyer Street Rose Bay	September 2022	1,220,000	100	2	1	1	Nil
2/84 Chaleyer Street Rose Bay	September 2022	1,700,000	187.2	3	1	1	Nil
7/18 Chaleyer Street Rose Bay	September 2022	1,310,000	141.7	2	1	1	Low

6/18 The Avenue Rose Bay	November 2022	765,000	47	1	1	1	Med
6/37 The Avenue Rose Bay	August 2022	1,275,000	64	2	1	1	Nil
9/37 The Avenue Rose Bay	August 2022	1,370,000	78	3	1	2	Nil
3/4 The Avenue Rose Bay	August 2022	2,025,000	117	2	2	2	Low
1/2 The Avenue Rose Bay	August 2022	2,100,000	300	3	2	3	Low

In general properties that had medium flood risk were substantially larger in William Street, so not directly comparable to those with low flood risk. These were garden apartments with large court yards, which resulted in higher prices being achieved; however, it is possible that garden apartments, being on the ground flood would be more exposed to the risk of inundation if flooding were to occur. Unit 6/18 The Avenue is somewhat equivalent to the low flood risk properties at 33-35 William Street, and the price differential with the property on the Avenue selling for more in a similar time is unlikely to indicate that there has been discounting because of flooding for apartments in the Rose Bay Area.

Indicative regression analysis of the transactions above controlling the flood risk for the calculated internal size, the bedrooms, bathrooms, and parking, indicates that flood affectation was positively correlated with higher prices; however, this was not statistically significant, which means the result could be due to chance.

6.0 FINDINGS

Flood affectation can have an impact on property prices, where the risk of flooding provides substantial limitations on the ability to develop land, or in the period immediately after inundation. In relation to the transactions observed in the Waverley LGA, where flood affectation has been listed on the contract of sale:

- There has not been a statistically significant relationship between the identification of flood affectation in the DCP and the property prices in the LGA identified in the transaction that were observed between 30 June and 23 February 2023.
- There has not been a statistically significant relationship between the prices observed in properties identified as flood related in the Local Environment Plan between 2012 and 2022, when controlling for property type and time.

The academic literature has not supported a relationship between flood identification and price discounts, except in the immediate aftermath of the flood. It is unlikely that potential of overland flow flooding that has been experienced in Waverley will result in the substantial and noticeable discounting in price on potentially impacted properties. Where a property is abnormally affected discounting might occur, we consider that this discount would likely occur without the additional identification of flood risk in the DCP, because:

- The property may have already been identified in the LEP
- The impact of the flooding on the property might be able to be seen in the property, and present itself during a prudent buyer's due diligence process

Where a property is identified as flood affected and its development potential is limited, then there may be a price impact. However, that needs to be weighed against the sensitivities of uses and safety considerations.

The proposed controls in the DCP, mostly focussed on responding and mitigating against risk, may have a marginal impact on price where a property is transacted for the purpose of a substantial renovation, because there might be slightly higher costs to complete the renovation.

Overall, we cannot identify an economically or statistically significant relationship between the identification of a property being potentially flood affected and property prices across Waverley LGA.

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Insurance implications review - Draft Development Control Plan Amendment – Flood

May 2023

Disclaimer: The following discussion paper on flood insurance is intended to provide general information and should not be considered as specific advice tailored to individual circumstances. It is important to note that the content presented here is not intended to replace professional guidance or consultation with a specialist in the field.

While every effort has been made to ensure the accuracy and currency of the information contained in this paper, the nature of flood insurance policies and regulations necessitates ongoing updates and revisions. The information provided is of a general nature and should not be relied upon as a substitute for seeking professional advice, Therefore, it is strongly advised that readers seek their own independent advice from their insurer or a qualified specialist or professional regarding their specific circumstances. Only a specialist familiar with your unique circumstances can offer appropriate advice and guidance tailored to your specific needs.

Table of Contents

1. Background

In response to concerns raised by residents during the public exhibition of a draft amendment relating to flood planning controls in the Waverley Development Control Plan (WDCP), research has been undertaken to investigate the potential insurance implications of having a lot identified as part in a Flood Risk Precinct (FRP) and as part of the Flood Planning Area (FPA).

2. Considerations for insurers

2.1 Definition of Flooding

Flood insurance has only been widely available on the Australian insurance market since 2009. Prior to this information regarding flooding was considered unreliable and therefore insurers did not provide flood insurance. Since 2014 all insurers have adopted a common definition of 'flood' for the purposes of insurance as follows:

> *"The covering of normally dry land by water that has escaped or been released from the normal confines of any lake, or any river, creek or other natural watercourse, whether or not altered or modified; or any reservoir, canal, or dam."*

This is demonstrated in **Figure 1**, which is an extract from an NRMA fact sheet on flood insurance.

Figure 1 NRMA Fact Sheet[1].

[1] https://www.floods.asn.au/client_images/1787686.pdf

The Waverley LGA Flood Study[2] indicated that most of the inundation which could occur throughout the Waverley LGA could be considered as stormwater for insurance assessment purposes:

> *"There are only a few defined watercourses within the study area (such as Tamarama Gully and Bronte Gully) and thus, most of the inundation modelled and presented in this study would be regarded as "stormwater" for the purposes of the assessment of insurance claims".*

A Fact sheet prepared by the Floodplain Management Australia (FMA)[3], the peak flood planning body in Australia, in conjunction with the Insurance Council of Australia (ICA) also provides the following discussion on Riverine Flooding vs Overland Flow in relation to the previously outlined definition of 'Flood' for insurance purposes:

> *"This definition does not include the impacts of overland flow, which is typically covered as a standard inclusion in home insurance policies. Councils are not obliged to use the mandated insurance definition of flood. Where a council has created local flood data that includes flooding from sources other than those considered by insurers as flood risk, difficulties can arise for a small number of insurers. There are two ways in which these insurers can address this issue:*
>
> - *Where a Council chooses to differentiate between overland flow and riverine flooding, the insurer would review how this assessment relates to the definition of flooding and preferably use only the riverine flooding output as determined by Council's processes;*
> - *Where a Council chooses not to differentiate between overland flow and riverine flooding as per the definition, the insurer will need to make this differentiation. This would take into account hydrology consultations, topographic and hydrological features of the catchment and the definition of flooding above. Only the riverine flooding component would then be used in flood premium calculations."*

In considering the above two options presented in the fact sheet, it is noted that Council chose to differentiate between overland flow and riverine flooding in the Waverley LGA Flood Study which formed the basis of the draft amendment to the DCP. As such, it should be simple for insurers to review the description provided as an excerpt from the Waverley LGA Flood Study to determine how water inundation should be considered for the purposes of insurance. This definition has not been specifically referenced within the draft DCP amendment; however, the Waverley LGA Flood Study is referenced as the source of data for the purposes of the defined Flood Risk Precincts (High, Medium and Low).

2.2 Considerations for insurers when assessing flood risk

Insurers consider a variety of factors when undertaking an assessment of risk for an individual property. This includes information as listed in **Figure 2**, including:

- History of flooding in an area, including instances of flooding and associated claims.
- The severity of any flood event and the likelihood this will occur (based on flood studies and models undertaken by either local or state governments or separate studies commissioned by insurers themselves).

[2] https://haveyoursay.waverley.nsw.gov.au/waverley-flood-study
[3] https://www.floods.asn.au/client_images/1787682.pdf

- The materials a house is made from.
- The size of the house and the floor level.

An example of the types of things that the NRMA consider in calculating flood insurance premiums as displayed in **Figure 2** and a further discussion is provided in this report.

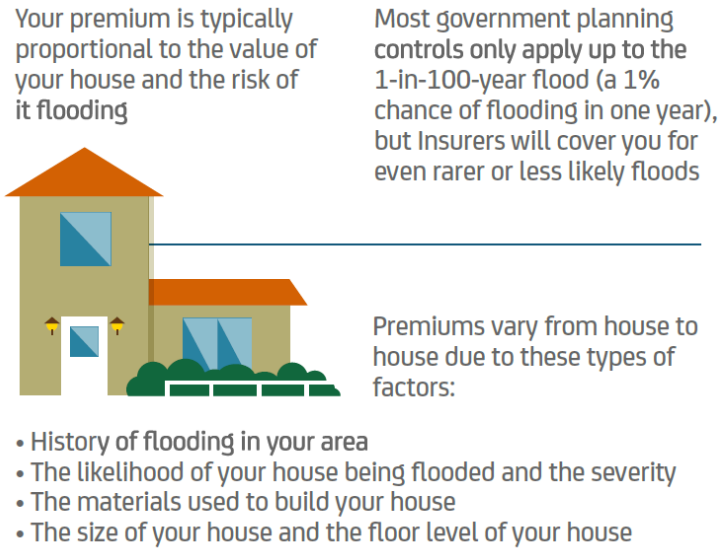

Figure 2 NRMA Factsheet

2.2.1 Data

According to information prepared by the FMA in conjunction with the ICA[4], insurers prefer to utilise the highest quality flood modelling available. This can include local or state government flood studies and modelling incorporated into the industry's National Flood Information Database (NFID). The NFID is an Australia-wide database that provides insurers with information about the relevant flood depths for different sized flood events. Insurers having the best available information improves their ability to assess flood risk at an individual address level and they will be less likely to overprice or under-price flood insurance premiums. It is noted that the information from the Waverley LGA Flood Study has been publicly available since its adoption in 2021 and that information would also be available for insurers, should they wish to consider this in their assessment of risk for insurance purposes. Whilst Council does not have access to the NFID, it is likely that the Flood Study is contained within the NFID. The Flood Study report and relevant flood depth data (including mapped peak flood depths) is also publicly available on the SES NSW Flood Data Portal[5] and has been since 2021.

A recent article in the Australian Financial Review[6] (AFR) also explained insurers often supplement with

[4] https://www.floods.asn.au/client_images/1787680.pdf
[5] https://flooddata.ses.nsw.gov.au/flood-projects/waverley-lga-flood-study
[6] https://www.afr.com/companies/financial-services/home-owners-in-flood-prone-areas-get-wildly-different-insurance-quotes-20220520-p5an2g

government data from external data sources and the use of different sources can vary widely dependent on the insurer. Major insurance provider Allianz was quoted as stating that the different types of data sources used by insurers ends up being reflected in the differences of the prices provided, explaining that "differences in pricing could be linked to insurers having different flood rating capabilities, commercial strategies and data sources".

2.2.2 Re-insurance

Information made available by both the ICA and commentary in the AFR noted that the cost of re-insurance (insurance for insurers) has increased substantially as a result of the major weather events, such as the major flooding across the East Coast of Australia, which have occurred over the past 2 years. These increased costs are passed on to the consumer with those addresses considered to have a higher flood risk receiving more of these costs, than those with little flood risk.

2.2.3 Section 10.7 Certificates

A Fact Sheet prepared by the FMA and the ICA explained that insurers also do not typically use information from Section 10.7 certificates to calculate risk or set premiums, rather they consider the combination of factors discussed in this report[7].

2.2.4 Historical claims and events

A factor considered by insurers in the cost of insurance is the history of flooding in an area and claims which have been made relating to flooding. Recent high-level insurance claims data made available from the ICA[8] in 2023 showed that claims were made for flooding, in the postcodes of 2022, 2024 and 2026 (which cover all postcodes in the Waverley LGA) for the following recent weather events as described by the ICA:

- Description of event: 2022 - Record breaking flooding across NSW and SEQ. Consistent rain for weeks, with water levels rapidly rising. Reported 23 deaths. Lismore notably affected, waters reaching 14.4m.
- Description of event: 2021 - Following intense rainfall on 18th-22nd March, flooding and storm damage affected Sydney, The Hunter Valley and the Mid North Coastal areas. Major impact in Taree where the Manning River reached a peak of 5.6m and areas around Port Macquarie. The Western Sydney suburbs around Penrith and along the Nepean River were submerged after the river burst its banks. 150mm of rain to the Warragamba Dam catchment caused it to spill adding to the already swollen Nepean River. Downstream suburbs of Richmond, Windsor, Pitt Town and into Wisemans Ferry were also affected by flooding.

No further suburb by suburb breakdown was available.

Beyond the high-level data outlined above, detailed street by street or address level information on historical claims is not something Council has access to and would only be specifically available to insurers.

[7] https://www.floods.asn.au/client_images/1787684.docx
[8] https://insurancecouncil.com.au/wp-content/uploads/2023/04/ICA-Historical-Catastrophe-April-2023.xlsx

One example of a major flood which would have resulted in substantial insurance claims was the large-scale flooding event which occurred in 1984. This flooding event was mentioned by a number of Waverley residents during the public exhibition process. In order to determine the intensity of this flood, research was undertaken to determine what the flood was equivalent to in the metrics used in 2023. The 2010 Rose Bay Catchment Flood Study[9] undertaken by Woollahra Council determined the November 1984 flood to be approximately a 100 year ARI (1% AEP or 1 in 100 year) rainfall event. Historical newspaper excerpts are provided in the below figures 3 and 4.

[9] https://www.woollahra.nsw.gov.au/__data/assets/pdf_file/0003/119154/Rose_Bay_Flood_Study.pdf

PENSIONER Mrs Mary Nash (left) took a sleeping pill before the deluge ... and woke to find herself floating on her bed in a metre of water.

She was one of many elderly North Bondi residents rescued yesterday after being cut off in their homes for 48 hours by the floods.

Mrs Nash, still visibly shaking, said her life had been saved by her friend, Prudence Rolfe, who battled through chest-high flood waters to rescue her.

The drama took place in Elliott Street, where every home was flooded.

Residents told of many other close escapes when doors could not be opened and adults with babies plunged through windows to scramble to car roofs or swim to safety.

They blame a week-old Waverley Council garbage strike for the intensity of the flooding — uncollected bins and bags were sucked into main stormwater channels, banking water up to well over one metre.

— Zoe Reynolds

Figure 3 Exert from the Sun Herald on Flooding in North Bondi 1984[10]

Woman collapses in shock

THE heartache of last night's deluge was no more graphically expressed than when this elderly woman collapsed as she watched floodwaters sweep through her home.

She was one of more than 100 residents who fled their homes after heavy rain transformed Roe St, North Bondi, into a raging torrent.

About 20 homes were swamped. Residents had to wade through floodwaters which peaked at almost 2m.

Theresa Scott was treated for shock at Prince of Wales Hospital.

● City under water; police have busiest day; weather outlook; more dramatic pictures Pages 2, 3

● Flood photo special

Figure 4 Exert from the Daily Mirror on Flooding in North Bondi 1984[10]

[10] https://flooddata.ses.nsw.gov.au/dataset/sydney-metropolitan-area-storms-floods-november-1984-newspaper-articles-report

3. Empirical evidence of insurance premiums in Waverley

Research was undertaken to ascertain whether or not there was a correlation between flood affectation and an increased premium in insurance prices. In undertaking this process, a number of variables were considered:

- Properties with no flood affectation.
- Properties tagged in the *Waverley Local Environmental Plan* Flood Maps (old LEP Flood Maps) which are no longer relevant due to State Government changes in 2021 but still present.
- Properties categorised as A, B or C in the Waverley Flood Study.
- Properties tagged as being in a Low, Medium or High Flood Risk Precinct in the proposed new Flood Planning Area as part of the Draft DCP Amendment.
- A range of geographical locations.

Insurance premium quotes were obtained during February 2023. A total of 24 different addresses were selected across the LGA, with particular attention given to areas and streets where Council received submissions and concerns from residents, such as Queens Park and North Bondi. Quotes were obtained from reputable insurers including St George Bank (Quote 1), GIO Insurance (Quote 2) and AHM (Quote 3). Insurers were also chosen with different underwriters. The controlled variables were the value of the replacement build, recent claim history, date of birth and types of materials and structure present on the site. While these variables remained constant, the property address (and its associated flood affectation) was isolated to understand how insurance premiums relate to specific flood risks. St George was the only insurer that provided a separate line fee for flood insurance, while GIO and AHM both included this as part of the overall premium price, AHM also included a separate $500 flood excess, beyond any standard excess, in the instance a claim was to be made for flood damage.

The tables overleaf provide details of the quotes received. Individual street number addresses have been redacted for privacy purposes.

3.1 Old LEP Maps

Consideration was given to properties affected on the old LEP Flood Planning Maps. The key findings of this exercise found that the most expensive quotes correlate with areas in North Bondi identified on the previous LEP Maps, but there did not appear to be a clear correlation with an address having an old LEP flood affectation and a higher premium being charged. Addresses with affectations on the old LEP maps were also among some of the cheapest quotes received, this included an address in both Bondi Beach and two addresses in

Bronte. It should be noted that the area around Elliot and Roe Street generally returned the highest premiums, indicating that other factors, such as historic events or claims in this area are likely driving higher premiums. This is discussed further in section 3.4 Outliers of this report.

Quotes obtained filtered by LEP Map affectation are listed in the below figures from most to least expensive. Where a 'flood' component of an insurance premium quote was provided (Quote 1), the cost of the flood component was filtered. The different colours align with the colours used in the old LEP flood maps (light blue – Flood Planning Area and no colour – not in the Flood Planning Area).

Property Address	LEP FLOOD	SUBURB	Quote 1	FLOOD
Elliott Street	YES	NORTH BONDI	$ 7,377.04	$ 5,196.83
Ellliott Street	YES	NORTH BONDI	$ 7,655.44	$ 5,196.83
Roe Street	YES	NORTH BONDI	$ 7,600.63	$ 3,729.21
Denison Street	NO	QUEENS PARK	$ 2,473.97	$ 488.59
Alt Street	NO	QUEENS PARK	$ 2,473.97	$ 417.70
Alt Street	NO	QUEENS PARK	$ 2,473.97	$ 417.70
Wallis Parade	YES	NORTH BONDI	$ 2,737.38	$ 278.77
Murriverie Road	NO	NORTH BONDI	$ 3,006.19	$ 218.83
Simpson Street	YES	BONDI BEACH	$ 2,363.33	$ 86.37
Old South Head Road	NO	NORTH BONDI	$ 2,502.52	$ 43.91
Dickson Street	YES	BRONTE	$ 2,452.78	$ 2.76
Dickson Street	YES	BRONTE	$ 2,452.78	$ 2.76
Liverpool Street	NO	ROSE BAY	$ 2,476.87	$ 2.76
Liverpool Street	NO	ROSE BAY	$ 2,476.87	$ 2.76
Liverpool Street	NO	ROSE BAY	$ 2,476.87	$ 2.76
Reina Street	NO	NORTH BONDI	$ 2,458.61	$ 2.76
Alt Street	NO	QUEENS PARK	$ 2,473.97	$ 2.76
Alt Street	NO	QUEENS PARK	$ 2,473.97	$ 2.76
Murray Street	NO	BRONTE	$ 2,452.78	$ 2.76
Wallis Parade	NO	NORTH BONDI	$ 2,458.61	$ 2.76
Murray Street	NO	BRONTE	$ 2,452.78	$ 2.76
Simpson Street	NO	BONDI BEACH	$ 2,363.33	$ 2.76
Bronte Road	NO	BRONTE	$ 2,452.78	$ 2.76
Liverpool Street	NO	ROSE BAY	$ 2,476.87	$ 2.76

Figure 5 Old LEP Map Comparison, Insurer 1

Property Address	LEP FLOOD	SUBURB	Quote 2	FLOOD
Roe Street	YES	NORTH BONDI	$ 6,657.09	Included
Elliott Street	YES	NORTH BONDI	$ 5,207.74	Included
Ellliott Street	YES	NORTH BONDI	$ 4,996.06	Included
Alt Street	NO	QUEENS PARK	$ 4,668.33	Included
Old South Head Road	NO	NORTH BONDI	$ 4,534.77	Included
Murriverie Road	NO	NORTH BONDI	$ 3,846.20	Included
Alt Street	NO	QUEENS PARK	$ 2,883.36	Included
Denison Street	NO	QUEENS PARK	$ 2,682.75	Included
Simpson Street	YES	BONDI BEACH	$ 2,532.40	Included
Murray Street	NO	BRONTE	$ 2,530.24	Included
Wallis Parade	YES	NORTH BONDI	$ 2,445.92	Included
Simpson Street	NO	BONDI BEACH	$ 2,369.89	Included
Alt Street	NO	QUEENS PARK	$ 2,317.57	Included
Liverpool Street	NO	ROSE BAY	$ 2,303.83	Included
Dickson Street	YES	BRONTE	$ 2,299.16	Included
Liverpool Street	NO	ROSE BAY	$ 2,280.14	Included
Murray Street	NO	BRONTE	$ 2,189.27	Included
Reina Street	NO	NORTH BONDI	$ 2,132.26	Included
Liverpool Street	NO	ROSE BAY	$ 2,100.57	included
Bronte Road	NO	BRONTE	$ 2,072.19	Included
Wallis Parade	NO	NORTH BONDI	$ 2,058.90	Included
Liverpool Street	NO	ROSE BAY	$ 2,052.73	Included
Dickson Street	YES	BRONTE	$ 2,051.26	Included
Alt Street	NO	QUEENS PARK	$ 2,038.10	Included

Figure 6 Old LEP Map Comparison, Insurer 2

Property Address	LEP FLOOD	SUBURB	Quote 3	FLOOD
Roe Street	YES	NORTH BONDI	$ 2,461	Included
Liverpool Street	NO	ROSE BAY	$ 2,439	Included
Liverpool Street	NO	ROSE BAY	$ 2,424	Included
Old South Head Road	NO	NORTH BONDI	$ 2,410	Included
Liverpool Street	NO	ROSE BAY	$ 2,398	Included
Murriverie Road	NO	NORTH BONDI	$ 2,379	Included
Elliott Street	YES	NORTH BONDI	$ 2,359	Included
Reina Street	NO	NORTH BONDI	$ 2,358	Included
Ellliott Street	YES	NORTH BONDI	$ 2,345	Included
Denison Street	NO	QUEENS PARK	$ 2,322	Included
Alt Street	NO	QUEENS PARK	$ 2,317	Included
Alt Street	NO	QUEENS PARK	$ 2,316	Included
Alt Street	NO	QUEENS PARK	$ 2,316	Included
Alt Street	NO	QUEENS PARK	$ 2,316	Included
Wallis Parade	YES	NORTH BONDI	$ 2,309	Included
Simpson Street	YES	BONDI BEACH	$ 2,299	Included
Murray Street	NO	BRONTE	$ 2,263	Included
Wallis Parade	NO	NORTH BONDI	$ 2,263	Included
Murray Street	NO	BRONTE	$ 2,263	Included
Simpson Street	NO	BONDI BEACH	$ 2,260	Included
Bronte Road	NO	BRONTE	$ 2,258	Included
Dickson Street	YES	BRONTE	$ 2,256	Included
Liverpool Street	NO	ROSE BAY	$ 2,237	Included
Dickson Street	YES	BRONTE	$ 2,223	Included

Figure 7 Old LEP Map Comparison, Insurer 3

3.2. Flood Study Categorisation

Consideration was given to the lot tagging categories from the Waverley Flood Study (types A, B and C). There appeared to be no clear correlation between Flood Study categorisation and a higher premium, with properties particularly in the A and B categories having varied

quoted prices. Some properties with A categories also returned quotes cheaper than those with No category at all. It should be noted that the area around Elliot and Roe Street generally returned the highest premiums, indicating that other factors, such as historic events or claims in this area are likely driving higher premiums. This is discussed further in section 3.4 Outliers of this report.

Quotes obtained filtered by Flood Study categorisation are listed in the below figures from most to least expensive. Where a 'flood' component of an insurance premium quote was provided (Quote 1) the cost of this component was filtered. The different colours align with the colours used in the lot tagging maps in the Flood Study (pink – A, yellow – B and light blue – C).

Property Address	SUBURB	FLOOD STUDY CAT	Quote 1	FLOOD
Elliott Street	NORTH BONDI	A	$ 7,377.04	$ 5,196.83
Ellliott Street	NORTH BONDI	A	$ 7,655.44	$ 5,196.83
Roe Street	NORTH BONDI	A	$ 7,600.63	$ 3,729.21
Denison Street	QUEENS PARK	A	$ 2,473.97	$ 488.59
Alt Street	QUEENS PARK	B	$ 2,473.97	$ 417.70
Alt Street	QUEENS PARK	B	$ 2,473.97	$ 417.70
Wallis Parade	NORTH BONDI	A	$ 2,737.38	$ 278.77
Murriverie Road	NORTH BONDI	A	$ 3,006.19	$ 218.83
Simpson Street	BONDI BEACH	A	$ 2,363.33	$ 86.37
Old South Head Road	NORTH BONDI	C	$ 2,502.52	$ 43.91
Murray Street	BRONTE	A	$ 2,452.78	$ 2.76
Wallis Parade	NORTH BONDI	A	$ 2,458.61	$ 2.76
Simpson Street	BONDI BEACH	A	$ 2,363.33	$ 2.76
Dickson Street	BRONTE	A	$ 2,452.78	$ 2.76
Liverpool Street	ROSE BAY	B	$ 2,476.87	$ 2.76
Liverpool Street	ROSE BAY	B	$ 2,476.87	$ 2.76
Liverpool Street	ROSE BAY	B	$ 2,476.87	$ 2.76
Murray Street	BRONTE	B	$ 2,452.78	$ 2.76
Alt Street	QUEENS PARK	C	$ 2,473.97	$ 2.76
Bronte Road	BRONTE	C	$ 2,452.78	$ 2.76
Reina Street	NORTH BONDI	NIL	$ 2,458.61	$ 2.76
Alt Street	QUEENS PARK	NIL	$ 2,473.97	$ 2.76
Liverpool Street	ROSE BAY	NIL	$ 2,476.87	$ 2.76
Dickson Street	BRONTE	NIL	$ 2,452.78	$ 2.76

Figure 8 Flood Study Categorisation Comparison, Insurer 1

Property Address	SUBURB	FLOOD STUDY CAT	Quote 2	FLOOD
Roe Street	NORTH BONDI	A	$ 6,657.09	Included
Elliott Street	NORTH BONDI	A	$ 5,207.74	Included
Ellliott Street	NORTH BONDI	A	$ 4,996.06	Included
Alt Street	QUEENS PARK	B	$ 4,668.33	Included
Old South Head Road	NORTH BONDI	C	$ 4,534.77	Included
Murriverie Road	NORTH BONDI	A	$ 3,846.20	Included
Alt Street	QUEENS PARK	B	$ 2,883.36	Included
Denison Street	QUEENS PARK	A	$ 2,682.75	Included
Simpson Street	BONDI BEACH	A	$ 2,532.40	Included
Murray Street	BRONTE	A	$ 2,530.24	Included
Wallis Parade	NORTH BONDI	A	$ 2,445.92	Included
Simpson Street	BONDI BEACH	A	$ 2,369.89	Included
Alt Street	QUEENS PARK	NIL	$ 2,317.57	Included
Liverpool Street	ROSE BAY	B	$ 2,303.83	Included
Dickson Street	BRONTE	NIL	$ 2,299.16	Included
Liverpool Street	ROSE BAY	B	$ 2,280.14	Included
Murray Street	BRONTE	B	$ 2,189.27	Included
Reina Street	NORTH BONDI	NIL	$ 2,132.26	Included
Liverpool Street	ROSE BAY	B	$ 2,100.57	included
Bronte Road	BRONTE	C	$ 2,072.19	Included
Wallis Parade	NORTH BONDI	A	$ 2,058.90	Included
Liverpool Street	ROSE BAY	NIL	$ 2,052.73	Included
Dickson Street	BRONTE	A	$ 2,051.26	Included
Alt Street	QUEENS PARK	C	$ 2,038.10	Included

Figure 9 Flood Study Comparison, Insurer 2

Property Address	SUBURB	FLOOD STUDY CAT	Quote 3	FLOOD
Roe Street	NORTH BONDI	A	$ 2,461	Included
Liverpool Street	ROSE BAY	B	$ 2,439	Included
Liverpool Street	ROSE BAY	B	$ 2,424	Included
Old South Head Road	NORTH BONDI	C	$ 2,410	Included
Liverpool Street	ROSE BAY	B	$ 2,398	Included
Murriverie Road	NORTH BONDI	A	$ 2,379	Included
Elliott Street	NORTH BONDI	A	$ 2,359	Included
Reina Street	NORTH BONDI	NIL	$ 2,358	Included
Ellliott Street	NORTH BONDI	A	$ 2,345	Included
Denison Street	QUEENS PARK	A	$ 2,322	Included
Alt Street	QUEENS PARK	B	$ 2,317	Included
Alt Street	QUEENS PARK	B	$ 2,316	Included
Alt Street	QUEENS PARK	C	$ 2,316	Included
Alt Street	QUEENS PARK	NIL	$ 2,316	Included
Wallis Parade	NORTH BONDI	A	$ 2,309	Included
Simpson Street	BONDI BEACH	A	$ 2,299	Included
Murray Street	BRONTE	A	$ 2,263	Included
Wallis Parade	NORTH BONDI	A	$ 2,263	Included
Murray Street	BRONTE	B	$ 2,263	Included
Simpson Street	BONDI BEACH	A	$ 2,260	Included
Bronte Road	BRONTE	C	$ 2,258	Included
Dickson Street	BRONTE	A	$ 2,256	Included
Liverpool Street	ROSE BAY	NIL	$ 2,237	Included
Dickson Street	BRONTE	NIL	$ 2,223	Included

Figure 10 Flood Study Comparison, Insurer 3

3.3 Draft DCP Flood Risk Categorisation

Consideration was given to the draft Flood Risk Precinct category for properties in the draft amendment to the WDCP. There appeared to be no clear correlation between Flood Risk Categorisation in the draft DCP and high insurance quotes. In some instances, addresses with 'Low' or no risk classification ('Nil') had more expensive quotes than addresses tagged with 'High' or 'Medium' classifications. It should be

noted that the area around Elliot and Roe Street generally returned the highest premiums, indicating that other factors, such as historic events or claims in this area are likely driving higher premiums. This is discussed further in section 3.4 Outliers of this report.

Quotes obtained filtered by Flood Risk Precinct categorisation are listed in the below figures from most to least expensive. Where a 'flood' component of an insurance premium quote was provided (Quote 1) the cost of the flood component was filtered. The different colours align with the colours used in the draft Flood Risk Precincts (Pink – High, Yellow – Medium and Blue – Low).

Property Address	SUBURB	DCP RISK CAT	Quote 1	FLOOD
Ellliott Street	NORTH BONDI	HIGH	$ 7,655.44	$ 5,196.83
Elliott Street	NORTH BONDI	MEDIUM	$ 7,377.04	$ 5,196.83
Roe Street	NORTH BONDI	MEDIUM	$ 7,600.63	$ 3,729.21
Denison Street	QUEENS PARK	HIGH	$ 2,473.97	$ 488.59
Alt Street	QUEENS PARK	MEDIUM	$ 2,473.97	$ 417.70
Alt Street	QUEENS PARK	MEDIUM	$ 2,473.97	$ 417.70
Wallis Parade	NORTH BONDI	MEDIUM	$ 2,737.38	$ 278.77
Murriverie Road	NORTH BONDI	MEDIUM	$ 3,006.19	$ 218.83
Simpson Street	BONDI BEACH	HIGH	$ 2,363.33	$ 86.37
Old South Head Road	NORTH BONDI	MEDIUM	$ 2,502.52	$ 43.91
Liverpool Street	ROSE BAY	HIGH	$ 2,476.87	$ 2.76
Liverpool Street	ROSE BAY	HIGH	$ 2,476.87	$ 2.76
Liverpool Street	ROSE BAY	MEDIUM	$ 2,476.87	$ 2.76
Liverpool Street	ROSE BAY	NIL	$ 2,476.87	$ 2.76
Alt Street	QUEENS PARK	LOW	$ 2,473.97	$ 2.76
Alt Street	QUEENS PARK	NIL	$ 2,473.97	$ 2.76
Reina Street	NORTH BONDI	NIL	$ 2,458.61	$ 2.76
Wallis Parade	NORTH BONDI	MEDIUM	$ 2,458.61	$ 2.76
Murray Street	BRONTE	HIGH	$ 2,452.78	$ 2.76
Murray Street	BRONTE	MEDIUM	$ 2,452.78	$ 2.76
Bronte Road	BRONTE	LOW	$ 2,452.78	$ 2.76
Dickson Street	BRONTE	HIGH	$ 2,452.78	$ 2.76
Dickson Street	BRONTE	LOW	$ 2,452.78	$ 2.76
Simpson Street	BONDI BEACH	MEDIUM	$ 2,363.33	$ 2.76

Figure 11 Flood DCP Comparison, Insurer 1

Property Address	SUBURB	DCP RISK CAT	Quote 2	FLOOD
Roe Street	NORTH BONDI	MEDIUM	$ 6,657.09	Included
Elliott Street	NORTH BONDI	MEDIUM	$ 5,207.74	Included
Ellliott Street	NORTH BONDI	HIGH	$ 4,996.06	Included
Alt Street	QUEENS PARK	MEDIUM	$ 4,668.33	Included
Old South Head Road	NORTH BONDI	MEDIUM	$ 4,534.77	Included
Murriverie Road	NORTH BONDI	MEDIUM	$ 3,846.20	Included
Alt Street	QUEENS PARK	MEDIUM	$ 2,883.36	Included
Denison Street	QUEENS PARK	HIGH	$ 2,682.75	Included
Simpson Street	BONDI BEACH	HIGH	$ 2,532.40	Included
Murray Street	BRONTE	HIGH	$ 2,530.24	Included
Wallis Parade	NORTH BONDI	MEDIUM	$ 2,445.92	Included
Simpson Street	BONDI BEACH	MEDIUM	$ 2,369.89	Included
Alt Street	QUEENS PARK	LOW	$ 2,317.57	Included
Liverpool Street	ROSE BAY	HIGH	$ 2,303.83	Included
Dickson Street	BRONTE	LOW	$ 2,299.16	Included
Liverpool Street	ROSE BAY	MEDIUM	$ 2,280.14	Included
Murray Street	BRONTE	MEDIUM	$ 2,189.27	Included
Reina Street	NORTH BONDI	NIL	$ 2,132.26	Included
Liverpool Street	ROSE BAY	HIGH	$ 2,100.57	included
Bronte Road	BRONTE	LOW	$ 2,072.19	Included
Wallis Parade	NORTH BONDI	MEDIUM	$ 2,058.90	Included
Liverpool Street	ROSE BAY	NIL	$ 2,052.73	Included
Dickson Street	BRONTE	HIGH	$ 2,051.26	Included
Alt Street	QUEENS PARK	NIL	$ 2,038.10	Included

Figure 12 Flood DCP Comparison, Insurer 2

Property Address	SUBURB	DCP RISK CAT	Quote 3	FLOOD
Roe Street	NORTH BONDI	MEDIUM	$2,461	Included
Liverpool Street	ROSE BAY	HIGH	$2,439	Included
Liverpool Street	ROSE BAY	HIGH	$2,424	Included
Old South Head Road	NORTH BONDI	MEDIUM	$2,410	Included
Liverpool Street	ROSE BAY	MEDIUM	$2,398	Included
Murriverie Road	NORTH BONDI	MEDIUM	$2,379	Included
Elliott Street	NORTH BONDI	MEDIUM	$2,359	Included
Reina Street	NORTH BONDI	NIL	$2,358	Included
Ellliott Street	NORTH BONDI	HIGH	$2,345	Included
Denison Street	QUEENS PARK	HIGH	$2,322	Included
Alt Street	QUEENS PARK	MEDIUM	$2,317	Included
Alt Street	QUEENS PARK	MEDIUM	$2,316	Included
Alt Street	QUEENS PARK	LOW	$2,316	Included
Alt Street	QUEENS PARK	NIL	$2,316	Included
Wallis Parade	NORTH BONDI	MEDIUM	$2,309	Included
Simpson Street	BONDI BEACH	HIGH	$2,299	Included
Murray Street	BRONTE	HIGH	$2,263	Included
Murray Street	BRONTE	MEDIUM	$2,263	Included
Wallis Parade	NORTH BONDI	MEDIUM	$2,263	Included
Simpson Street	BONDI BEACH	MEDIUM	$2,260	Included
Bronte Road	BRONTE	LOW	$2,258	Included
Dickson Street	BRONTE	HIGH	$2,256	Included
Liverpool Street	ROSE BAY	NIL	$2,237	Included
Dickson Street	BRONTE	LOW	$2,223	Included

Figure 13 Flood DCP Comparison, Insurer 3

3.4 Outliers

It is noted within the exercise undertaken that there were a number of outliers which were subject to far higher flood components or overall premiums than other parts of the LGA with the same flood affectations (whether Old LEP, Flood Study or draft DCP). In particular, this was the case in parts of the suburb of North Bondi around Roe Street and Elliott Street.

Whilst Council does not have access to the risk assessment insurers undertake to determine the potential causes for this, or all information (such as historical claims) it is concluded that the following factors may have influenced the higher premiums in this area:

1. Historical flooding events that have occurred in this area (such as the 1984 flood discussed in this report).
2. Historical claims for flooding (which Council does not have access to).
3. Potential reassessment of risk following the significant rainfall events and natural disasters which occurred in 2021 and 2022.
4. Variances in how individual insurers assess of risk for these addresses (noting that one insurer did not quote noticeably higher premiums for these areas).
5. The former presence of bodies of water within these areas has influenced some insurers interpretation of the definition of 'flood'.

With regards to point number five, prior to colonisation and in the early periods post-colonisation, the Waverley LGA was home to many wetland and lagoon areas, including at Bondi Beach and North Bondi. It may be possible that insurers consider any water inundation that occurs in these areas to be considered as one of the water bodies referenced within the definition of 'Flood' for insurance purposes having been considered as 'modified'.

3.5 Other Observations

Both St George and GIO displayed noticeable fluctuations in prices for quotations across all properties, with AHM displaying consistently low prices across all quotes. It is worth noting that AHM also had a separate 'Flood Excess' that would be effective in the instance of a claim, not part of the annual premium.

4. Conclusions

In concluding the assessment of the quotes received as part of this research exercise, as well as the other information reviewed, the following observations were made:

- Insurance premiums vary widely depending on the insurer.
- Flood affectation on the old LEP flood maps did not directly translate into a higher premium.

- Flood affectation A, B or C in the Flood Study did not directly translate into a higher premium.
- Flood affectation as High, Medium or Low risk in the draft DCP amendment did not directly translate into a higher premium.
- There are some parts of the LGA which are subject to higher premiums, particularly with one insurer who provided a 'flood' component of the price provided. There is no definitive conclusion why this was the case; although historical claims and past flooding events in this area, as well as individual insurers approach, may be driving higher premiums in this area.

It is also worth noting that the AFR article discussed earlier within this document undertook a quoting (referenced as 'mystery shopper') exercise similar to that undertaken for the purposes of this research. The findings of this exercise also showed that prices varied substantially for the same property with the same inputs, depending on the insurer. These findings correlate with the findings in this research paper. For residents who believe the flood premium has been incorrectly charged. The ICA recommends to investigate the following actions:

"If you have evidence that an insurer has incorrectly assessed risk of flooding (e.g. a Council flood study, floor level survey, site-specific flood report or similar), please contact the insurer directly to discuss. Many major insurers have dedicated flood premium review processes in place and welcome information that helps improve the accuracy of their flood risk assessments. The Insurance Council of Australia (ICA) can also assist in reviewing information if an insurer cannot. Providing the insurer or ICA documentation will assist in this discussion.

It is also important to shop around if you are not satisfied by the premium or cover offered by your insurer.

3 February 2023

Mills Oakley
ABN: 51 493 069 734

Your ref:TBA
Our ref: MEDS/MEDS/3637538

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Ms Diana Lawrie
Waverley Council
Cnr Paul St and Bondi Road
BONDI JUNCTION NSW 2022

Email: diana.lawrie@waverley.nsw.gov.au

Dear Diana

STATEWIDE
PUBLIC LIABILITY ADVICE
INSURED: WAVERLEY COUNCIL

ADVICE RE FLOOD DCP

We note you have asked for advice on Council's potential liability in the following scenarios:

1. *If Council should remove all flood planning area maps from the LEP and DCP noting that cl. 5.21 of 5.22 will remain in the LEP.*
2. *If Council should retain on the existing Flood Planning Map in the LEP, and not implement the new flood planning area to reflect the adopted Flood Study 2021 and not implement the draft DCP controls.*
3. *If Council implement the new flood planning area to reflect the adopted Flood Study 2021 and implement the draft DCP controls.*

As a general comment liability associated with any approval is generally the result of information provided (and relied upon) which is incorrect. It is generally not as the result of any issue with the process that Councils have (or which is prescribed) for approval processes, particularly when a Council can in that process ask for the provision of reports etc. which can be relied upon in that process. That is, in our view, there is generally no need for a Council to go behind that report.

The claims we have seen that arise from the situation raised by you in your questions above are either claims for financial loss or property damage claims. They are also more often than not professional indemnity claims that are generally more expensive to defend and larger in terms of damages.

We have read the information contained in your emails of 13 October 2022 (x2). We will not repeat the information provided in those emails here, unless it is needed for our answers to the above three questions.

We note re 1 that 5.21 and 5.22 of the LEP provide for flood issues, though 5.22 is noted as not being adopted in the LEP we have read. 5.21 does not refer to maps in any event, though proscribes what needs to be considered re flooding when proposed development is in a flood prone area. We would suggest, in case it does not occur at the moment, that the considerations provided for in 5.21 are each specifically dealt with in each application that might occur in an area with flooding potential. If those issues are not specifically considered, there may be a future issue if there is damage to what is permitted to be built on the land. We assume also that flooding in your LGA is due to infrastructure issues rather than from creeks or rivers.

Therefore, as to Question 1, we would say there is little risk of liability to Council if the maps were removed by the Council, but Council still considered the issues raised, as it would have to, in clause 5.21.

We have some issue with Question 2. First, it would not seem to us to be necessarily workable. If the officers who have to undertake the work required says the process would still be workable then that answers our first concern. We would also be concerned that the knowledge Council had was used in the approval process, though that would be open to challenge if not favourable to an applicant in any event. The fact of knowledge available and not used in the answering of a question in a certificate, led to the certificate relied upon in *Mid Density Developments v. Rockdale Council* containing information which the Full Federal Court (though not the Court at first instance) found was incorrect and that the certificate had been negligently issued, as a result. Otherwise, if the Flood Planning Map remains correct, then it can be kept but if the new map contains other area which have the potential to be flood effected, then not indicating that to a person who relies upon Council having informed them of that or if the restriction on development was incorrect, then there is then a clear potential for liability. We would not recommend 2 to the Council.

As to 3, whilst it might not be popular, if the new maps and plans show where it is expected there will be flooding or where there has historically been flooding (due to either climate change or aging infrastructure being unable to cope with increased stormwater due to climate change) then that implementation must be correct as the latest and the adoption of those and use of them should ensure limited liability, if any, in that situation. This option would be the optimal in our view for Council though perhaps not for residents who now due to an increase in stormwater due to climate change find their property subject to flooding, when it might not have originally.

It would be remiss of me not to refer to statutory protections that Council has available to is relating to flood liable land.

Section 733 of the *Local Government Act 1993* provides

A council does not incur any liability in respect of—

a) any advice furnished in good faith by the council relating to the likelihood of any land being flooded or the nature or extent of any such flooding, or
b) anything done or omitted to be done in good faith by the council in so far as it relates to the likelihood of land being flooded or the nature or extent of any such flooding.

What is good faith as not been determined with any certainty. What we do know from *Alamdo v. Bankstown City Council* is the High Court of Australia said of good faith:

The emphasis upon the significance to the Council of the pending litigation advanced its case for good faith, not the case of Alamdo to the contrary. It must be remembered that, as Mr Morrison explained in his oral evidence in chief, the established procedures of the Council with respect to proposals for infrastructure expenditure involved consideration of the relative priority of all projects.

Where, depending upon the outcome of litigation which the Council was defending, the Council might have no responsibility in law to make an expenditure, prudence would support deferral. Section 733(1) protects such an approach as an exercise in good faith of the Council's powers.

The High Court members in *Alamdo* discuss Section 733 extensively (given what it contained and its appropriateness to injunctive relief were the issues before the High Court).

We are comfortable in saying that if maps etc. provided for flooding in an area and those were disregarded by Council that would on balance not be accepted as being in good faith to trigger the protection provided in Section 733.

We so advise.

If you have any questions or require further information, please do not hesitate to contact Michael Down on +61 2 8289 5852 or mdown@millsoakley.com.au.

Yours faithfully

MICHAEL DOWN
PARTNER
MILLS OAKLEY

PLANNING PROPOSAL

34-36 Flood Street, Bondi - Heritage Listing

Amendment to Schedule 5 and the Heritage Map of the Waverley Local Environmental Plan 2012

Planning Proposal Information

Council versions:

No.	Date	Version
1	18 May 2023	For the Waverley Local Planning Panel
2	24 May 2023	For the 6 June 2023 Council SPDC Meeting

Contents

EXECUTIVE SUMMARY

Waverley Council is required to maintain a list of Heritage Items and Heritage Conservation Areas that are significant to the local area under the Waverley Local Environmental Plan (WLEP) 2012.

A detailed Heritage Assessment of 34-36 Flood Street was prepared in May 2023 by Hector Abrahams Architects, finding that the Synagogue building towards the Flood Street frontage has heritage significance rendering it worthy of local heritage listing in the WLEP (Heritage Items in Schedule 5 and on the Heritage Map) and state heritage listing in the NSW State Heritage Register.

Specifically, the building fronting Flood Street at 34-36 Flood Street, Bondi meets 6 out of the 7 categories of heritage significance from the Burra Charter for listing on the State Register.

Table 1 – Summary of Proposed Changes to the WLEP2012

WLEP2012 Provision	Existing	Proposed
Heritage Map	34-36 Flood Street, Bondi is not shown as a Heritage Item on the Heritage Map	34-36 Flood Street, Bondi is to be shown as a local Heritage Item on the Heritage Map
Schedule 5 Part 1 Heritage Items	34-36 Flood Street, Bondi is not listed in Schedule 5 Part 1 as a Heritage Item	34-36 Flood Street, Bondi is to be listed in Schedule 5 Part 1 as a local Heritage Item, with Lot 1 DP 1094020 referenced and a written description of 'Harry Seidler designed Synagogue and College building, interiors and exteriors'.

This Planning Proposal seeks to implement this listing, with the following changes:

The building at the rear of the site, currently used ancillary to the Synagogue, and historically a rabbi's home, was not thoroughly investigated as part of the Heritage Assessment, so its heritage significance is unknown at this stage. Future investigations will be undertaken to assess its significance, and if found to be of significance a separate future Planning Proposal will be prepared seeking to alter the listing and inventory sheet for the site.

INTRODUCTION

Affected Land and Existing Development

The site subject of the Proposal is located at 34-36 Flood Street, Bondi (Lot 1 DP 1094020) and has an area of approximately 1,319.03m^2. The site has a primary frontage to Flood Street, and a secondary frontage to Anglesea Street.

34-36 Flood Street contains a building currently used as a Synagogue closer to the Flood Street frontage, and a detached structure ancillary to the Synagogue closer to the Anglesea Street frontage. The building closer to the Flood Street frontage has been identified to have heritage significance.

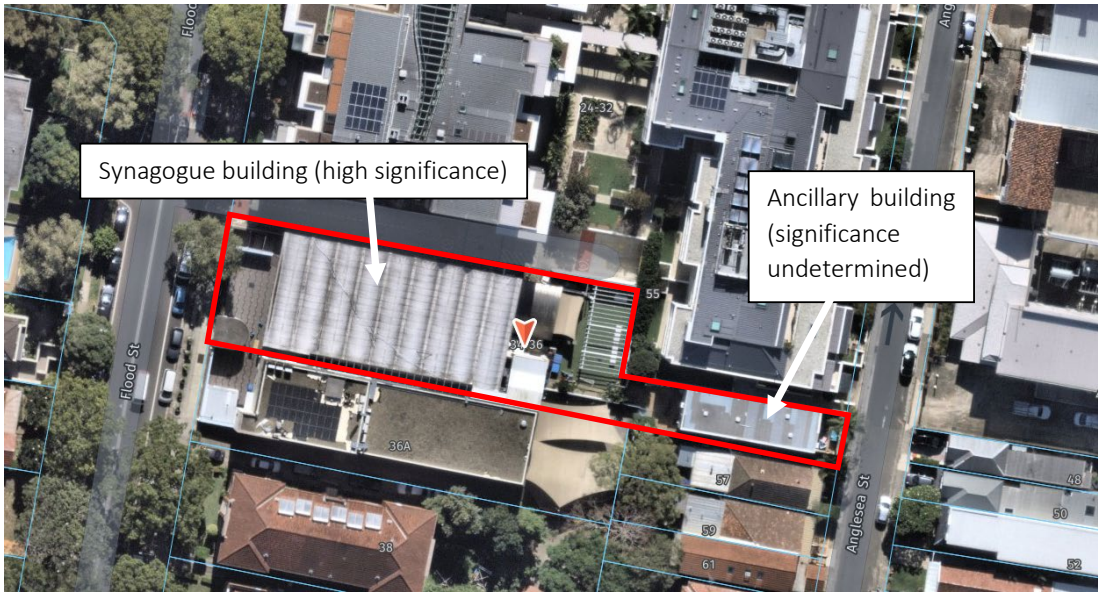


Figure 1 –*Site of the Planning Proposal, 34-36 Flood Street, Bondi (NearMap, 2023)*

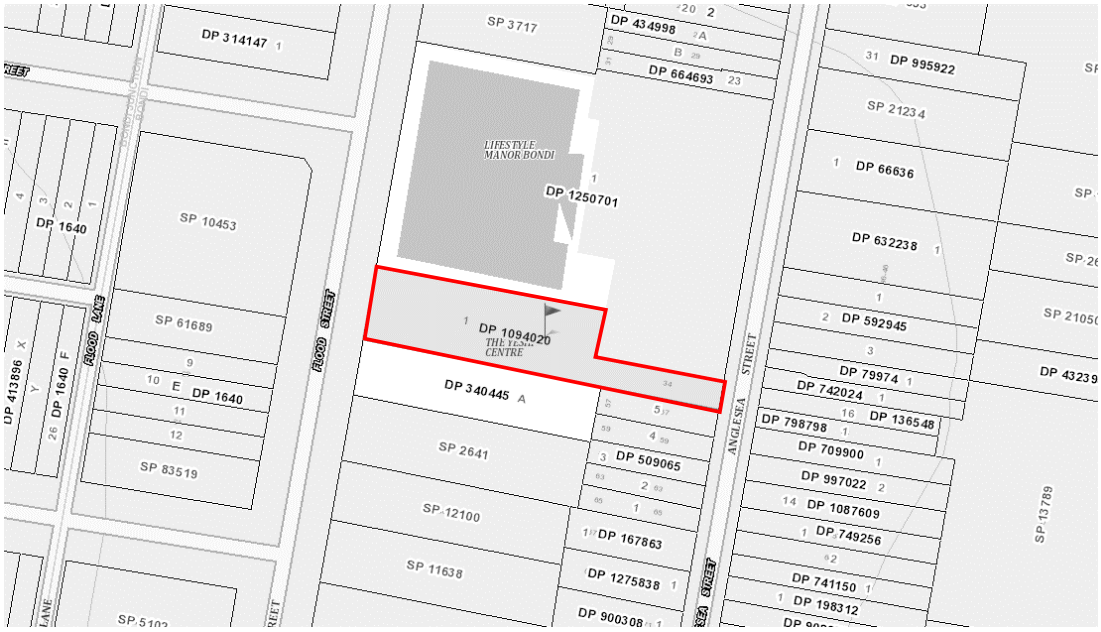


Figure 2 –*Site of the Planning Proposal, 34-36 Flood Street, Bondi (SixMaps, 2023)*

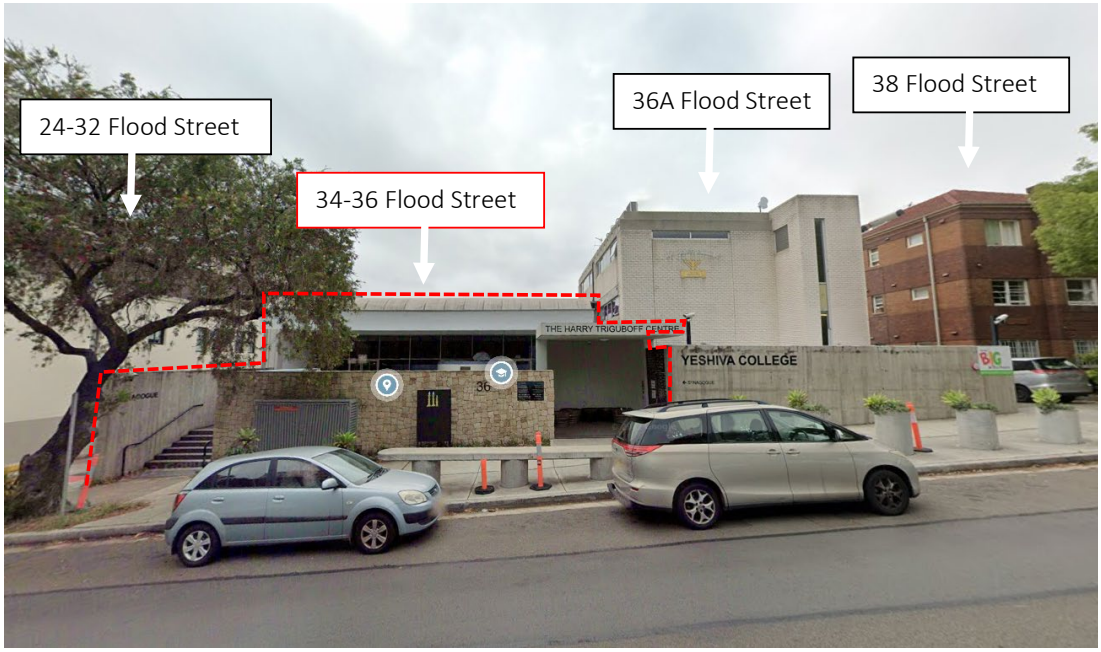


Figure 3 *– Site of the Planning Proposal, 34-36 Flood Street, Bondi (Google Maps, 2020)*

Figure 4 *– Historic photo of Synongogue interior at 34-36 Flood Street, Bondi (Photo by Max Dupain)*

Site Context

The site adjoins a building that was most recently used as an educational establishment, currently known as the Yeshiva College at 36A Flood Street to the south. A dwelling house at 57 Anglesea Street also abuts the site to its south. A multi-storey seniors housing development that shares vehicle access with 34-36 Flood Street to the north at 24-32 Flood Street.

Current Planning Controls

The site is currently not subject to any Heritage Item and Heritage Conservation Area listing but is adjacent to the Woodstock Heritage Conservation Area.

Background to this Planning Proposal

A proponent-led Planning Proposal seeking to change the land zone of 34-36 Flood Street, Bondi (PP-2022-676) was lodged with Waverley Council in 2022. During the assessment of PP-2022-676, the building at 34-36 Flood Street was identified by both Council and the community to have potential heritage significance.

A detailed Heritage Assessment of 34-36 Flood Street was prepared in May 2023 by Hector Abrahams Architects, finding that the Synagogue building towards the Flood Street frontage has heritage significance rendering it worthy of local heritage listing in the WLEP (Heritage Items in Schedule 5 and on the Heritage Map) and state heritage listing in the NSW State Heritage Register.

The Waverley Local Planning Panel (WLPP) considered the Planning Proposal on 24 May 2023 and supported the recommendation to list the subject building subject to minor changes which have since been addressed.

The building at the rear of the site, currently used as a structure ancillary to the Synagogue, and historically a rabbi's home, was not thoroughly investigated as part of the Heritage Assessment, so its heritage significance is unknown at this stage. Future investigations will be undertaken to assess its significance, and if found to be of significance a separate future Planning Proposal will be prepared seeking to alter the listing and inventory sheet for the site.

The Heritage Assessment found the building along the Flood Street frontage of 34-36 Flood Street to meet the NSW heritage assessment criteria in the following ways:

Criterion (a) An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area)

The building at 34-36 Flood St is historically significant as it evidences part of a distinct period for synagogue construction within NSW (c1957-60). The synagogue is associated with the post-war period of synagogue building and demonstrates a distinct phase of enlargement migration of the Jewish faith and culture within NSW. The establishment of the Talmudic College is part of the development of a distinctive locality of Jewish immigrants within the Waverley Local Government Area and facilitated the training of rabbis in Sydney reflecting the growth of the Jewish faith diaspora following World War II. Also, the construction of the synagogue is part of a historical pattern demonstrating the arrival of Jewish architects to NSW.

Criterion (b) An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area)

The original building at 34-36 Flood Street and its later development is evidence of the ongoing use of the place as a religious and civic site. The synagogue and 1979 school building addition reflects the broadening of institutions available to the Jewish faith community in NSW and the Waverley LGA; responding to migration patterns after World War II. The place maintains ongoing institutional associations with similar Jewish faith institutions in Brooklyn (New York) and Israel. As an institution the synagogue has an ongoing association with the broader Jewish community, by the training of Rabbis who engage with communities that are not congregants of the Orthodox 'Habad' philosophy.

The place is primarily associated with eminent modern architect Harry Seidler as the original design is his only religious building, although he did design Jewish sites, and demonstrates an important stage in Seidler's output and career as an early work of Civic architecture. The distinct roof form of the synagogue with its repeating thin shell concrete vaults is stylistically associated with principles of Bauhaus design and Modernism with which Seidler is particularly associated. It is an outstanding example of the Modernist building forms produced and constructed by Seidler in collaboration with structural engineer Peter Owen Miller, of Miller, Milston and Ferris. This association began with c1950 Meller House (LEP item no. 1995), 37 The Bulwark, Castlecrag, and continued with the Igloo House c1951 (Williamson House, SHR item no. 01652) at Mosman. The Synagogue and Talmudical College is associated with this collaboration and is an important work which demonstrates their innovative achievement.

Notably, Allen Milston, also of Miller, Milston and Ferris, donated his time to the construction of the adjacent school building (the Malka Brender Building) and other synagogue projects in NSW. The Malka Brender building was constructed to the ~~to~~ design of Mirvac founder Henry Pollack. Pollack was born in Poland to Russian parents and fled in 1939 to Lithuania. At the time of construction, 10% of enrolments at the Talmudical College were Russian Jewish migrants. The buildings educational and civic functions is evidence of the development of a diverse Jewish faith community in the Waverley LGA, and NSW more broadly, and its continued use as a school and place of worship continues to demonstrate this historical association.

The Synagogue and Talmudical College is associated with Abraham Rabinovitch. Rabinovitch, a businessman and philanthropist, was instrumental in the Jewish day school movement, which initiated the construction of similar Jewish institutions such as the North Bondi Hebrew School and Kindergarten (c1942-43) and Moriah College (c1952) in Sydney. Rabinovitch was the founder and chair of Sydney Talmudical College (now called Yeshiva College Bondi) who purchased the site on Flood Street in 1955 and commissioned Seidler to design the original college buildings. The ongoing use of the place for educational and worship purposes continue this significant associations.

The connection to the place with former Prime Minister Malcolm Fraser and prominent politician and judge Dr H.V. Evatt~~'s~~ is acknowledged as significant to the importance of the building but incidental as an association. In 1961, Dr Evatt attended opened the Sydney Talmudical College with buildings designed by Seidler.

Fraser opened the primary school building (Malka Brender Building) at Yeshiva College Bondi in 1980 while elected Prime Minister. Dr Evatt, paternal uncle of architect Penelope Seidler nee Evatt (married to Harry Seidler), acted as Foreign Minister in the Chifley and Curtin governments circa 1940s and contributed to the establishment of the United Nations and drafting of the Universal Declaration of Human Rights. In 1947, Dr Evatt chaired a special committee on Palestine which engendered the partition of Palestine. In 1949 as President of the UN General Assembly Dr Evatt oversaw the historic vote which admitted Israel as the 59th member of the United Nations. While these notable figures demonstrate the importance of the place as a Jewish institution their associations are merely incidental as they were not directly involved with the construction or design of the place.

Criterion (c) An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or in local area)

The place is an important work of eminent architect Harry Seidler who the historian Jennifer Taylor regards as "one of the major talents of Australian Architectural History". It is significant to Seidler's

architectural output, firstly as probably his first civic building, incorporating a civic external plaza space. Seidler went on to create plaza spaces of great importance in cities of the eastern coast.

Also, the building is significant for its technical and creative achievement using thin shell concrete. It is among the largest and most ambitious thin shell structure built in NSW in the immediate post-war period.

The distinctive roof form is significant as an architectural sculptural form, along with the curved stair, both of which are identified as indicative of the mastery of Harry Seidler by the eminent historian of Australian Modernism Philip Goad.

The shells are a technical innovation, in collaboration with structural engineer Peter Owen Miller (Miller, Milston, and Ferris). Particularly, the geometric configuration of the roof form is important in demonstrating Seidler's Bauhaus-inspired Modernist design. It is possible that the vaulted roof system was the largest in NSW from the same period. Seidler's design for the Igloo House (Williamson House) earlier in 1951, which is considered an influential example in Australia of innovative domestic design and construction, featured a smaller two-vault garage roof. Despite later alteration to finishes, and noting a fine complementary addition, the place retains the original form and characteristics of its pure spatial and structural concept.

The place also demonstrates in an early work, the Bauhaus principles for which Seidler is particularly identified, being the pupil, assistant and collaborator of Marcel Breuer. In this case the principles are clear to see in the abstract planning, and devising of pure space sculpted by structural form.

Criterion (d) An item has strong or special association with a particular community or cultural group in NSW (or local area) for social, cultural or spiritual reasons

The Synagogue and Talmudical College has been the focus of Jewish communal worship and education in Bondi since its construction in 1959. The place has strong and special associations with the Jewish faith community in Bondi for its ongoing use as a civic and religious building. The worship, educational and civic functions of the building demonstrate the continued use of the place for community in association with the Jewish community in Bondi. The place has social significance for its ongoing associations and continued use for Jewish educational purposes with the migrant Jewish in Bondi and Waverley.

Criterion (e) An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area)

It is possible that the vaulted roof system was the largest in NSW from the same period and has the potential to yield information regarding its construction and the performance of thin shell concrete over time.

Criterion (f) An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area)

The building is uncommon for the period due to its large thin shell concrete vaulted roof form. The place has rarity value as the only religious building by Seidler and as a surviving intact example of a post-war Modernist synagogue, which were once common across NSW particularly Eastern Sydney but are now smaller in number.

Criterion (g) An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or environments (or a class of the local area's cultural or natural places or environments)

The place demonstrates the principal characteristics of its class as a post-war Modernist synagogue designed by a migrant architect. It is part of a small but important group of distinctive Modernist-style synagogues designed by migrant architects who established practice in NSW. The place is a relatively intact and surviving example of a post-war Modernist synagogue which is rare for its class.

Statement of Significance

The Heritage Assessment has provided the following Statement of Significance for 34-36 Flood Street, Bondi:

The building fronting Flood Street at 34-36 Flood Street, Bondi is significant as:

- *A seminal work in the development of the civic and sculptural concrete architecture of the pre-eminent Australian Modern architect Harry Seidler, displaying the application of Bauhaus principles for which he is known.*
- *The largest and best example of thin concrete shell technology of the 1950s in NSW.*
- *One of the most architecturally distinguished religious chambers of the immediate post-war period in New South Wales and one of the finest synagogues of the period.*
- *A historically important place in the development of Jewish religion in New South Wales in the post-war migration period and the first Talmudical school with integral synagogue.*
- *Highly representative of the history of post-war migration in New South Wales, behind the establishment of a new religious building and educational institution by a migrant community.*
- *A place held in high esteem by the Jewish community of Waverley and broader afield.*

PART 1 – OBJECTIVES AND INTENDED OUTCOMES

This Planning Proposal intends to provide statutory protection to a site of heritage significance (34-36 Flood Street) by amending Schedule 5 of the WLEP 2012 and associated Heritage Map to show the site as a local Heritage Item.

PART 2 – EXPLANATION OF PROVISIONS

This Planning Proposal seeks to amend the Waverley Local Environmental Plan 2012 as follows:

- Add 34-36 Flood Street, Bondi as a Heritage Item on the Heritage Map
- Add 34-36 Flood Street, Bondi as a Heritage Item in Schedule 5 Part 1

A detailed Heritage Assessment of 34-36 Flood Street was prepared in May 2023 by Hector Abrahams Architects, finding that the Synagogue building towards the Flood Street frontage has heritage significance rendering it worthy of local heritage listing in the WLEP (Heritage Items in Schedule 5 and on the Heritage Map) and state heritage listing in the NSW State Heritage Register.

The building at the rear of the site, currently used ancillary to the Synagogue, and historically a rabbi's home, was not thoroughly investigated as part of the Heritage Assessment, so its heritage significance is unknown at this stage. Future investigations will be undertaken to assess its significance, and if found to be of significance a separate future Planning Proposal will be prepared seeking to alter the listing and inventory sheet for the site.

PART 3 – JUSTIFICATION OF STRATEGIC AND SITE-SPECIFIC MERIT

3.1 Strategic Merit

The proposal is considered to have strategic merit because it gives effect to the findings of a Heritage Assessment prepared by Hector Abrahams Architects, dated May 2023 which was commissioned in response to a Council resolution.

Section A – Need for the planning proposal (Strategic Merit)

This section establishes the need for a Planning Proposal in achieving the key outcomes and objectives. The set questions address the strategic origins of the proposal and whether amending the WLEP is the best mechanism to achieve the aims of the proposal.

1. Is the planning proposal a result of any strategic study or report?

Yes, the Planning Proposal is a result a Heritage Assessment prepared by Hector Abrahams Architects, dated May 2023.

2. Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

This Planning Proposal is the only means of achieving the objectives and intended outcomes – a local heritage listing in the WLEP 2012.

Section B – Relationship to strategic planning framework

3. Will the planning proposal give effect to the objectives and actions of the applicable regional or district plan or strategy (including any exhibited draft plans or strategies)?

The Planning Proposal aligns with the objectives and actions of the Region Plan *A Metropolis of Three Cities* and the *Eastern City District Plan*.

A Metropolis of Three Cities

The Planning Proposal has strategic merit and is consistent with the Greater Sydney Region Plan in that it will help to implement the following Objective:

- Environmental heritage is identified, conserved and enhanced (Objective 13)

Eastern City District Plan

The Planning Proposal has Strategic Merit and is consistent with the *Eastern Sydney District Plan* in that it will help to implement the following Planning Priority:

- Creating and renewing great places and local centres, and respecting the District's heritage (Planning Priority E6)

Guide to preparing Planning Proposals

The Planning Proposal meets the Strategic Merit Test, the assessment is presented in Table 2.

Table 1 –*Assessment of Proposal against Strategic Merit Test*

Strategic Merit Test
a) Does the proposal have strategic merit? Is it:

Consistent with the relevant regional plan outside of the Greater Sydney Region, the relevant district plan within the Greater Sydney Region, or corridor/precinct plans applying to the site, including any draft regional, district or corridor/precinct plans released for public comment; or	Yes, it is consistent with Objective 13 of the Region Plan A Metropolis of Three Cities. It also aligns with Planning Priority E6 of the Eastern City District Plan.
Consistent with a relevant local council strategy that has been endorsed by the Department; or	It is not inconsistent with any local Council strategy that has been endorsed by DPE.
Responding to a change in circumstances, such as the investment in new infrastructure or changing demographic trends that have not been recognised by existing planning controls.	It responds to the findings of a recent Heritage Assessment, commissioned in response to attention brought to the site due to a recent Planning Proposal seeking to change its zone.

4. Is the planning proposal consistent with a council LSPS that has been endorsed by the Planning Secretary or GSC, or another endorsed local strategy or strategic plan?

Waverley Local Environmental Plan 2012

The Waverley LEP has fifteen main aims that all Planning Proposals and development should be consistent with where applicable. This Planning Proposal is consistent with aim (g) of the Waverley LEP:

"To identify, conserve and enhance the cultural, environmental, natural, aesthetic, social and built heritage, and existing scenic and cultural landscapes of Waverley, including the curtilage of Centennial Park, for current and future generations."

Waverley Local Strategic Planning Statement (March 2020)

Table 3 assessed the Planning Proposal against the relevant Planning Priority and actions.

***Table 3 –** Assessment of the Proposal against the Local Strategic Planning Statement*

Direction: A city of great places	
Planning Priority 7: Recognise and celebrate Waverley's unique place in the Australian contemporary cultural landscape	
1. Implement the recommendations of the Waverley Heritage Review into Council's LEP and DCP, including stronger enforcements for curtilage and protecting the context of existing items	This Proposal is the mechanism for implementing the recommendations of a Heritage Assessment by Hector Abrahams Architects into Council's LEP, an assessment that is ancillary to the wider Heritage Review. It is to be noted that the Waverley Heritage Review is a "live" and iterative document.
8. Develop strategies and programs that celebrate and share the local heritage and cultural stories of the Waverley area	The statutory listing of the 34-36 Flood Street as a heritage item will celebrate and share the sites local heritage and cultural story.

Waverley Community Strategic Plan 2018-2029

This Planning Proposal aligns with the community vision which is:

"*A welcoming and cohesive community that celebrates and enhances our spectacular coastline, vibrant places, and rich cultural heritage".*

The Planning Proposal also aligns with the strategies presented in Table 5 below:

Table 4 – *Assessment of Proposal against Waverley Community Strategic Plan*

Goal 1.2: Preserve and interpret the unique cultural heritage of Waverley	
Strategies	Consistency
1.2.1 Maintain the unique cultural value and heritage significance of key landmarks	This Proposal will provide the mechanism that will ensure that local heritage is conserved and celebrated. By listing 34-36 Flood Street as a heritage item in the WLEP, the heritage significance of key landmarks in Waverley LGA will be protected.
Goal 5.2: Value and embrace Waverley's heritage items and places	
Strategies	Consistency
5.2.1 Protect, respect and conserve items and places of heritage significance within Waverley	This Proposal will provide the mechanism that will ensure that local heritage is conserved and celebrated. By listing 34-36 Flood Street as a heritage item in the WLEP, the heritage significance of key landmarks in Waverley LGA will be protected.

5. Is the planning proposal consistent with any other applicable State and regional studies or strategies?

There are no other relevant State or regional studies or strategies.

6. Is the planning proposal consistent with applicable SEPPs?

This Planning Proposal is consistent with applicable State Environmental Planning Policies. Table 5 assessed the Planning Proposal against the State Environmental Planning Policies (SEPPs).

Table 5 – *Assessment of Proposal against the SEPPs*

Title	Applicable	Consistent
Housing SEPP	N/A	Not inconsistent
Transport and Infrastructure SEPP	N/A	Not inconsistent
Primary Production SEPP	N/A	Not inconsistent
Biodiversity and Conservation SEPP	N/A	Not inconsistent
Resilience and Hazards SEPP	N/A	Not inconsistent
Industry and Employment SEPP	N/A	Not inconsistent
Resources and Energy SEPP	N/A	Not inconsistent
Planning Systems SEPP	N/A	Not inconsistent
Precincts SEPPs: Eastern Harbour City SEPP, Western Parkland City SEPP, Central River City SEPP and Regional SEPP	N/A	Not inconsistent
Codes SEPP	N/A	Not inconsistent

7. Is the planning proposal consistent with applicable Ministerial Directions (section 9.1 Directions)?

Ministerial Direction 3.2 Heritage Conservation

The Ministerial Direction 3.2 applies to this Planning Proposal. The Planning Proposal must contain provisions that facilitate the conservation of:

(a) items, places, buildings, works, relics, moveable objects or precincts of environmental heritage significance to an area, in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item, area, object or place, identified in a study of the environmental heritage of the area,

(b) Aboriginal objects or Aboriginal places that are protected under the National Parks and Wildlife Act 1974, and

(c) Aboriginal areas, Aboriginal objects, Aboriginal places or landscapes identified by an Aboriginal heritage survey prepared by or on behalf of an Aboriginal Land Council, Aboriginal body or public authority and provided to the relevant planning authority, which identifies the area, object, place or landscape as being of heritage significance to Aboriginal culture and people.

Minister's Planning Principles – Preserving, conserving and managing NSW's natural environment and heritage

The Planning Proposal must seek to value, protect, conserve and manage the innate value and external benefits of NSW's natural environment and heritage. The Minister's Planning Principle 3.13 applies to this Planning Proposal and states the following:

Heritage protection, conservation and management strategies should be included in strategic and land use planning to avoid or minimise any negative heritage impacts from development, as well as provide innovative opportunities to enhance and celebrate NSW's rich heritage.

Consistency

This Planning Proposal proposes to conserve an additional heritage item by amending Schedule 5 and the Heritage Map of the WLEP 2012 to list 34-36 Flood Street. The proposed amendment does not include additional Aboriginal areas, objects, places or landscapes. An assessment of Aboriginal heritage was not done as part of the Heritage Assessment by Hector Abrahams Architects. Council will be carrying out a separate study in the future to understand Aboriginal heritage.

3.2 Site Specific Merit

This Planning Proposal is considered to have site-specific merit as it gives regard to and is expected to have a positive impact on the natural and built environment, and on the existing uses, approved uses and likely future uses of the land affected.

Guide to preparing Planning Proposals

The Planning Proposal meets the Site-specific Merit Test, the assessment is presented in Table 6.

***Table 6 –** Assessment of Proposal against Site Specific Merit Test*

Site-specific Merit Test	
b) Does the proposal have site-specific merit, having regard to the following:	
The natural environment (including known significant environmental values, resources or hazards); and	This Proposal will not have any impacts on the natural environment.
The existing uses, approved uses, and likely future uses of land in the vicinity of the proposal; and	This Proposal will not inhibit development within Waverley. The Proposal will ensure the effective conservation of important

	heritage values of the LGA, and will allow reasonable development that supports and retains the heritage.
The services and infrastructure that are or will be available to meet the demands arising from the proposal; and	Not applicable as this Proposal will not result in the increase of infrastructure demand.
Any proposed financial arrangements for infrastructure provision.	Not applicable as this Proposal will not result in the increase of infrastructure demand.

Section C – Environmental, social and economic impact

8. Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected because of the proposal?

This Planning Proposal does not propose any physical development and therefore the proposal would not have any adverse impacts on threatened species, populations or ecological communities.

9. Are there any other likely environmental effects of the planning proposal and how are they proposed to be managed?

There are unlikely to be any other environmental effects as a result of the Planning Proposal.

10. Has the planning proposal adequately addressed any social and economic effects?

No adverse economic or social impact is anticipated. Local communities value local heritage as it contributes to an area's identity, sense of place and amenity. Local heritage usually relates more closely to people's personal heritage too when compared with national icons.

While heritage listing can sometimes raise concerns around adverse economic or financial impacts to residents, the empirical evidence demonstrates that the protection of local heritage results in net positive economic impacts for local communities and councils. Heritage can encourage visitation and tourism by shaping a place that makes for a desirable temporary visit, or permanent home or workplace.

Section D – Infrastructure (Local, State and Commonwealth)

11. Is there adequate public infrastructure for the planning proposal?

This consideration is not applicable to the Planning Proposal.

Section E – State and Commonwealth Interests

12. What are the views of state and federal public authorities and government agencies consulted in order to inform the Gateway determination?

Not applicable at this stage.

PART 4 – MAPPING

The Planning Proposal intends to alter the WLEP Heritage Map to show 34-36 Flood Street, Bondi as a Heritage Item.

Figure 5 – Excerpt from existing Heritage Map (WLEP 2012, Heritage Map - Sheet HER_004A)

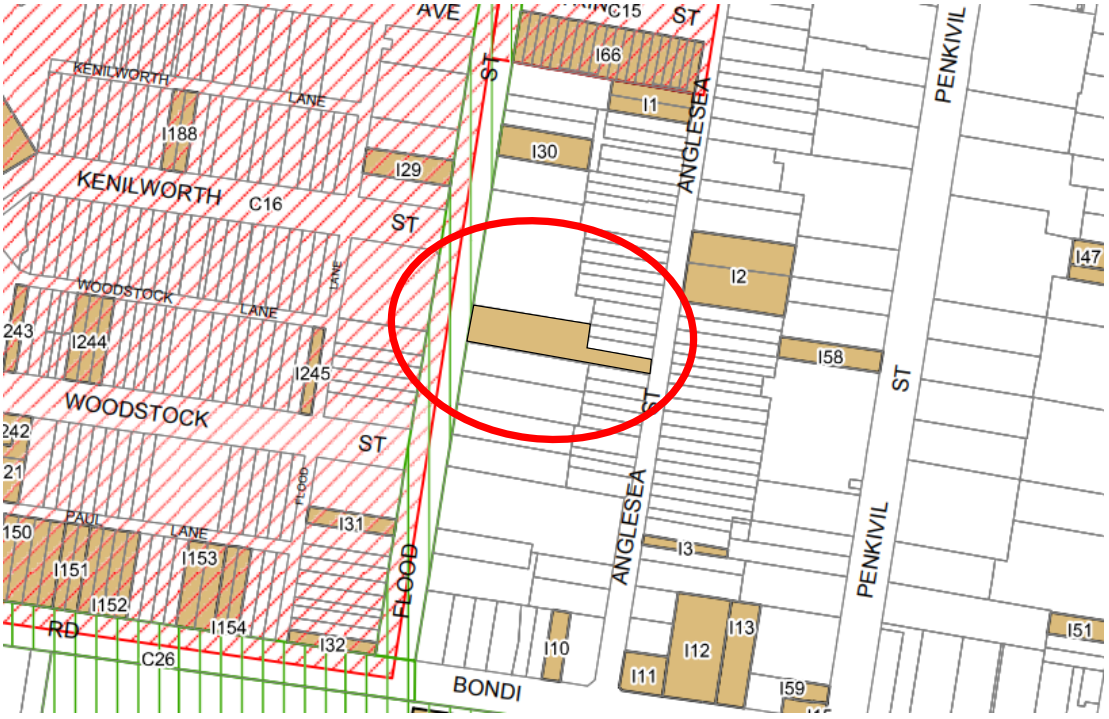


Figure 6 – Proposed change, showing 34-36 Flood Street as a Heritage Item

PART 5 – COMMUNITY CONSULTATION

Public exhibition is likely to include a display on the Council's Have Your Say website and written notification to landowners. The Gateway Determination will specify the level of public consultation that must be undertaken in relation to the Planning Proposal.

Pursuant to Division 3.4 of the Act, a Planning Proposal must be placed on public exhibition for a minimum of 28 days, or as specified in the Gateway Determination for the proposal. The Planning Proposal Authority must consider any submissions made concerning the proposed instrument and the report of any public hearing (if required).

PART 6 – PROJECT TIMELINE

The following indicative project timeline will assist with tracking the progress of the Planning Proposal through its various stages of consultation and approval. It is estimated that this amendment to the WLEP will be completed by October 2023.

The detail around the project timeline is expected to be prepared following the referral to DPE for a Gateway Determination.

Table 7 – *Indicative Project Timeline*

Tasks	Timeframe and/or date
Consideration by Council	June 2023
Gateway Determination	July 2023
Pre-exhibition	July 2023
Public Exhibition	August 2023
Consideration of submissions	August 2023
Post-exhibition Review	September 2023
Submission to the Department for finalisation (where applicable)	September 2023
Gazettal of LEP amendment	October 2023

APPENDIX A – DRAFT INVENTORY SHEET

Item Details	
Name of Item	Synagogue and former Sydney Talmudical College premises building including interiors
Other Names/Former Names	Yeshiva College The Harry Triguboff Centre
Item Type	Built
Item Group	Synagogue and school
Item category	Education facility and religious building
Street Number	34
Street Name	Flood Street

Suburb/Town	Bondi
Local Government Area	Waverley
Property description	Lot 1 DP 1094020
Location	-33.891637 (Latitude) and 151.259096 (Longitude)
Current Use	Religious education
Former Use	Religious worship and education
Statement of Significance	The synagogue and former Sydney Talmudical College premises building located at 34 Flood St Bondi satisfies significance thresholds for historic, associational, aesthetic, scientific, rarity and representative values at the State level. Additionally, it satisfies threshold for social significance at the local level. The synagogue and former Sydney Talmudical College premises building located at 34 Flood St, Bondi is significant as: • A seminal work in the development of the civic and sculptural concrete architecture of the pre-eminent Australian modern architect Harry Seidler, displaying the application of Bauhaus principles for which he is most known. • The largest and best example of thin concrete shell technology of the 1950s in NSW. • One of the most architecturally distinguished religious chambers of the immediate post war period in New South Wales and one of the finest synagogues of the period. • An historically important place in the development of; Jewish religion in New South Wales, the post war migration period, as the first Talmudical school with integral synagogue. • Highly representative of the history of post war migration in New South Wales, being the establishment of a new religious building and educational institution by a migrant community. • A place held in high esteem by the Jewish community of Waverley and broader afield.
Level of Significance	State AND Local
Designer	Harry Seidler, architect, and Peter Miller, of P.O.Miller, Milston and Ferris, structural engineers
Builder/maker	Not known
Physical Description	The place is a rectangular modernist building located on a narrow allotment. It has a repetitive curved roof form. For detailed description see heritage assessment
Physical Condition and	There is no known archaeological significance.

<table>
<tr><td>Archaeological Potential</td><td></td></tr>
<tr><td>Construction Years</td><td>1959-1961</td></tr>
<tr><td>Modifications</td><td>See heritage assessment</td></tr>
<tr><td>History</td><td>See heritage assessment</td></tr>
<tr><td>Themes</td><td>Guidelines from the NSW Heritage Office emphasise the role of history in the heritage assessment process. A list of state historical themes has been developed by the NSW Heritage Council, in New South Wales Historical Themes Table showing correlation of national, state and local themes, with annotations Dated 4 October 2001.

The table below identifies fabric, spaces and visual relationships that demonstrate the relevant historic themes in evidence at the synagogue and former Sydney Talmudical College premises building located at 34 Flood St, Bondi.

<table>
<tr><th>Australian Theme</th><th>NSW Theme</th><th>Notes</th></tr>
<tr><td>Peopling Australia</td><td>Ethnic influences</td><td>The building at 34 Flood St, Bondi and its later development is evidence of the influences of Jewish culture within NSW.</td></tr>
<tr><td>Peopling Australia</td><td>Migration</td><td>The building at 34 Flood St, Bondi and its later development is evidence of the pattern of synagogue construction by migrant architects in the 1950-1960s.</td></tr>
<tr><td>Building settlements, towns and cities</td><td>Town, suburbs and villages</td><td>The land that the building at 34 Flood St occupies is evidence of subdivision patterns in Bondi and the Waverley LGA more broadly.</td></tr>
<tr><td>Educating</td><td>Education</td><td>The building at 34 Flood St is evidence of the development of Jewish education across NSW.</td></tr>
</table>
</td></tr>
<tr><td>Application of Criteria</td><td>The assessment criteria have prepared and applied in the form prescribed by the NSW Heritage Manual assessing heritage significance guideline (2022) and Australia ICOMOS, The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance (2013)</td></tr>
</table>

Criterion (a) An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area)

The building at 34 Flood St is historically significant as one of seven surviving works from a distinct period for synagogue construction within NSW (c1957-60). The synagogue is associated with the post war period enlargement of migration of Jewish faith and culture within NSW. The establishment of the Talmudic College is part of the development of a distinctive locale of Jewish immigrants within the Waverley Local Government Area. It also facilitated the training of rabbis in Sydney reflecting the growth of the Jewish faith diaspora following World War II. Finally, the construction of the synagogue is part of a historical pattern demonstrating the arrival of Jewish architects to NSW, all of whom were modernists; Hugh Buhrich, Hans Peter Oser and Harry Seidler.

Inclusion Guidelines	Check
Shows evidence of a significant human activity	Yes
Is associated with a significant activity or historical phase	Yes
Maintains or shows the continuity of a historical process or activity	Yes
Exclusion Guidelines	
Has incidental or unsubstantiated connections with historically important activities or processes	No, the connections with Jewish migration to NSW and synagogue building are substantial.
Provides evidence of activities or processes that are of dubious historical importance	No, migration and the development of the Jewish faith and community within Australia following World War 11 is not dubious historical importance.
Has been so altered that it can no longer provide evidence of a particular association	No, still a synagogue and school and has been retained as a work of a migrant architect.

Level of Significance: State

Criterion (b) An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area)

The synagogue and former Sydney Talmudical College premises building and its later development is evidence of the ongoing use of

	the place as a religious and civic site. The building and its later development addition reflects the broadening of institutions available to the Jewish faith community in NSW and the Waverley LGA; responding to migration patterns after World War II. The place maintains ongoing institutional associations with similar Jewish faith institutions in Brooklyn; New York, and Israel. As an institution the synagogue has an ongoing association with the broader Jewish community, by the training of Rabbis who engage with communities which are not congregants of the Orthodox 'Habad' philosophy. The place is primarily associated with eminent modern architect Harry Seidler as the original design is his only religious building, although he did design Jewish sites, and demonstrates an important stage in Seidler's output and career as an early work of Civic architecture. The distinct roof form of the synagogue with its repeating thin shell concrete vaults is stylistically associated with principles of Bauhaus design and Modernism with which Seidler is particularly associated. It is an outstanding example of the modernist building forms produced and constructed by Seidler in collaboration with structural engineer Peter Owen Miller, of Miller, Milston and Ferris. This association began with c1950 Meller House (LEP item no. 1995), 37 The Bulwark, Castlecrag, and continued with the Igloo House c1951 (Williamson House, SHR item no. 01652) at Mossman. The synagogue and former Sydney Talmudical College premises building is associated with this collaboration and is an important work which demonstrates their innovative achievement. The synagogue and former Sydney Talmudical College premises building is associated with Abraham Rabinovitch. Rabinovitch, a businessman and philanthropist, who was instrumental in the Jewish day school movement, which initiated the construction of similar Jewish institutions such as the North Bondi Hebrew School and Kindergarten (c1942-43) and Moriah College (c1952) in Sydney. Rabinovitch was the founder and chair of Sydney Talmudical College (now called Yeshiva College Bondi) who purchased the site on Flood Street in 1955 and commissioned Seidler to design the original college buildings. The ongoing use of the place for educational and worship purposes continue this significant associations. The connection to the place with former Prime Minister Malcolm Fraser and prominent politician and judge Dr H.V. Evatt's is acknowledged as significant to the importance of the building but incidental as an association. In 1961, Dr Evatt attended opened the Syndey Talmudical College with buildings designed by Seidler.[1] Fraser opened the primary school building (Malka Brender Building)

[1] Dr. EVATT OPENS COLLEGE FOR JEWISH STUDY (1961, September 1). *The Australian Jewish Herald (Melbourne, Vic. : 1935 - 1968)*, p. 7. Retrieved May 10, 2023, from http://nla.gov.au/nla.news-article265731010

at Yeshiva College Bondi in 1980 while elected Prime Minister. [2] Dr Evatt, paternal uncle of architect Penelope Seidler nee Evatt (married to Harry Seidler), acted as Foreign Minister in the Chifley and Curtin governments circa 1940s and contributed to the establishment of the United Nations and drafting of the Universal Declaration of Human Rights. In 1947, Dr Evatt chaired a special committee on Palestine which engendered the partition of Palestine. [3] In 1949 as President of the UN General Assembly Dr Evatt oversaw the historic vote which admitted Israel as the 59th member of the United Nations. While these notable figures demonstrate the importance of the place as a Jewish institution their associations are merely incidental as they were not directly involved with the construction or design of the place.

Inclusion Guidelines	Check
Shows evidence of a significant human occupation	Yes, as a synagogue building and school and is evidence of an ongoing use.
Is associated with a significant event, person, or group of persons	Yes, with Seidler and his office; structural engineer Peter Owen Miller of Miller, Milston, and Ferris; Abraham Rabinovitch; Henry Pollack (Pollack and Associates later Mirvac); the Jewish migrant community within NSW including Russian Jewish migrants.
Exclusion Guidelines	
Has incidental or unsubstantiated connections with historically important people or events	No, the connections direct and well documented.
Provides evidence of people or events that are of dubious historical importance	No, the persons and events are significant to the cultural history of both NSW and the Waverley locality.
Has been so altered that it can no longer provide evidence of a particular association	No, additions to the building are evidence of continued use as a synagogue which continue these associations.

Level of Significance: State

[2] P.M. OPENS NEW BUILDING AT YESHIVA (1980, May 8). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 1. Retrieved May 10, 2023, from http://nla.gov.au/nla.news-article263286530
[3] "Evatt Herbert", *Australian Dictionary of Biography,* accessed May 8, 2023, https://adb.anu.edu.au/biography/evatt-herbert-vere-bert-10131

Criterion (c) An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or in local area)

The building located at 34 Flood St, Bondi is an important work of the eminent Australian architect Harry Seidler who the historian Jennifer Taylor regards as "one of the major talents of Australian architectural History".[4] It is significant to Seidler's architectural output, firstly as probably his first civic building, incorporating a civic external plaza space. Seidler went on to create plaza spaces of great importance in cities of the eastern coast, preeminent among them is the Australia Square development (c.1962-1967).

Also, the synagogue is important in Seidler's work for its technical and creative emphasis using thin shell concrete vaulting. It is among the largest and most ambitious thin shell structure built in NSW in the immediate post war period in collaboration with structural engineer Peter Owen Miller (Miller, Milston, and Ferris).

The distinctive roof form is significant as architectural sculptural form, along with the curved stair, both of which are identified as indicative of the mastery of Harry Seidler by the eminent historian of Australian Modernism Philip Goad. Particularly, the geometric configuration of the roof form is important in demonstrating Seidler's application of Bauhaus principles and Oscar Neimeyer's influence. Notwithstanding, later alteration to finishes, and noting a fine complimentary addition, the place retains the original form and characteristics of its pure spatial and structural conception.

The place also demonstrates in an early non-domestic work, the Bauhaus architectural principles for which Seidler is particularly identified, being the pupil, assistant and collaborator of Marcel Breuer. In this case the principals are clear to see in the abstract planning, and devising of pure space sculpted by structural form.

Finally, it is also a leading surviving example of a post war modernist synagogue within NSW. It is one of the finest religious architectural works of its period.

Inclusion Guidelines	Check
Shows or is associated with, creative or technical innovation or achievement	Yes
Is the inspiration for a creative or technical innovation or achievement	Yes
Is aesthetically distinctive	Yes
Has landmark qualities	No, while the original forecourt design may have possibly had

[4] Jennifer Taylor, "Harry Seidler", 623-624.

		landmark value this has been compromised by later changes to the finishes and arrangement.
	Exemplifies a particular taste, style or technology	Yes, the place is a good example of Seidler's post war Modernist design with large vaulted thin shell concrete roof form and abstract modernism planning.
	Exclusion Guidelines	
	Is not a major work by an important designer or artist	No, the place is a good example of eminent architect Harry Seidler and demonstrates a key technical development as structure with refined thin shell concrete vaulted roof.
	Has lost its design or technical integrity	No, although the finishes have changed, and the liturgical layout, the Bauhaus design principles are not missing.
	Its positive visual or sensory appeal or landmark and scenic qualities have been more than temporarily degraded	No, the landmark and scenic qualities have been degraded by later changes to the forecourt finishes but these are not permanent.
	Has only a loose association with a creative or technical achievement	No, the association with structural engineer Peter Owen Miller and the technical achievement of the large thin shell concrete vaulted roof system are direct and well documented.

Level of Significance: State

Criterion (d) An item has strong or special association with a particular community or cultural group in NSW (or local area) for social, cultural or spiritual reasons

The building located at 34 Flood St, Bondi has been the focus of Jewish communal worship and education in Bondi since its construction in 1959. The place has strong and special associations with the Jewish faith community in Bondi for its ongoing use as a civic and religious building. The worship, educational and civic functions of the building demonstrate the continued use of the place for community in association with the Jewish community in Bondi. The place has social significance for its ongoing associations and

continued use for Jewish educational purposes with the migrant Jewish in Bondi and Waverley.

Inclusion Guidelines	Check
Is important for its associations with an identifiable group	Yes, the place is important to the local Bondi Jewish community.
Is important to a community's sense of place	Yes, the place has a strongly held association with the Jewish faith community in Bondi who largely migrated to Australia following WWII. The place is special for its purpose and function as a educational and religious institution.
Exclusion Guidelines	
Is only important to the community for amenity reasons.	No, the place demonstrates a strong association with the Jewish faith community of the Waverley LGA.
Is retained only in preference to a proposed alternative	No, the place is not preferred to be retained due to a proposed alternative.

Level of Significance: Local

Criterion (e) An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area)

It is possible that the vaulted roof system of the 1959 designed synagogue and former Sydney Talmudical College premises building was the largest in NSW from the same period. It has the potential to yield information regarding its construction and the performance of thin shell concrete over time. The roof form of the synagogue and former Sydney Talmudical College premises building located at 34 Flood St, Bondi meets the threshold for state significance.

Inclusion Guidelines	Check
Has the potential to yield new or further substantial scientific and/or archaeological information	Yes, there is potential that the shell form concrete roof could yield regarding its construction and performance.
Is an important benchmark or reference site or type	Yes, the thin shell concrete vaulted roof form is an important benchmark for technical and creative achievements.

Provides evidence of past human cultures that is unavailable elsewhere	No, evidence of Jewish faith cultures are available elsewhere in NSW.
Exclusion Guidelines	
The knowledge gained would be irrelevant to research on science, human history or culture	No. The place has potential to inform about the human history and culture of the Jewish community in NSW.
Has little archaeological or research potential	Yes. The site has been disturbed and there is little archaeological potential.
Only contains information that is readily available from other resources or archaeological sites	No. The thin shell concrete roof was likely the largest at the time of its construction.

Level of Significance: State

Criterion (f) An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area)

The synagogue and former Sydney Talmudical College premises building at 34 Flood St, Bondi is uncommon for the period due to its large thin shell concrete vaulted roof form. The place has rarity value as the only religious building by Seidler and as a surviving intact example of a post war modernist synagogue, which were once common across NSW particularly Eastern Sydney however are now smaller in number.

Inclusion Guidelines	Check
Provides evidence of a defunct custom, way of life or process	No.
Demonstrates a process, custom or other human activity that is in danger of being lost	No.
Shows unusually accurate evidence of a significant human activity	No.
Is the only example of its type	No. It is not the only modern synagogue in NSW.
Demonstrates designs or techniques of exceptional interest	Yes, it is one of only three Jewish related works by Seidler and the only building, the other two being garden and memorial structures. It is one of Seidler's earliest civic works and the abstract modernist plan form

	and thin shell concrete roof form is of exceptional interest.
Shows rare evidence of a significant human activity important to a community	Yes. it is rare surviving post-war synagogue, many synagogues built after WWII particularly in the late 1950s to mid-1960s have been demolished.
Exclusion Guidelines	
Is not rare	No, is a rare surviving post-war modernist synagogue.
Is numerous but under threat	Yes, it is rare surviving post-war synagogue, many synagogues built after WWII particularly in the late 1950s to mid-1960s have been demolished.

Level of significance: State

Criterion (g) An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or environments (or a class of the local area's cultural or natural places or environments)

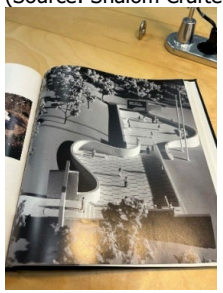
The synagogue and former Sydney Talmudical College premises building located at 34 Flood St demonstrates the principal characteristics of its class as a post war modernist synagogue designed by a migrant architect. It is part of a small but important group of distinctive modernist style synagogues designed by migrant architects who established practice in NSW. The place is a relatively intact and surviving example of a post war modernist synagogue which is rare for its class.

Inclusion Guidelines	Check
Is a fine example of its type	Yes, fine example of a Post War Modernist synagogue.
Has the principal characteristics of an important class or group of items	Yes, demonstrates the principal characteristics of an abstract modernism plan form and as a post war synagogue with its arrangement (forecourts etc) and the ongoing use of the building for educational and worship purposes.
Has attributes typical of a particular way of life, philosophy, custom, significant process, design, technique or activity	Yes, the place demonstrates attributes typical to an Orthodox synagogue including the menorah, bimah, ark, seating arrangement and partition of male and female congregants. The abstract

		modernist planning demonstrates a church plan typical of Bauhaus influence. The construction technique is an outstanding example of post war modernist design.
	Is a significant variation to a class of items	No. The place is a notable example in a group of post war synagogues designed by migrant architects.
	Is part of a group which collectively illustrates a representative type	Yes, part of a group of synagogues which collectively illustrates the characteristics of post war modernist design. The structure is representative of a synagogue designed a migrant architect within the post war period.
	Is outstanding because of its setting, condition or size	No, the setting, condition or size of the place is not considered outstanding. However, the barrel-vaulted roof form is likely to be the largest in size in NSW at the time of construction.
	Is outstanding because of its integrity or the esteem in which it is held	No, the place is outstanding for its integrity, which has been changed by later alterations and additions.
	Exclusion Guidelines	
	Is a poor example of its type	No, the place is not a poor example of its type as a synagogue.
	Does not include or has lost the range of characteristics of a type	No, while some later changes to the forecourt have lost the ability to demonstrate a religious and civic building the form and post war Modernist characteristics have largely been retained.
	Does not represent well the characteristics that make up a significant variation of a type	Yes, it does have the characteristics that make it a variation of post war synagogues in Sydney, including, distinctive modernist elements such as the systems-based plan form and vaulted thin shell concrete roof.
	Level of Significance: State	

Integrity	Largely intact
Current Listings	Australian Institute of Architects (NSW Chapter), Register of Significant Buildings in NSW, Item No 4702711
Comparative analysis	Due to the nature of the architecture and history of the synagogue and former Sydney Talmudical College premises building located at 34 Flood St, Bondi a number of comparisons can be drawn. Each of the schedules and lists stated below have been considered and discussed to some extent in the application of criteria. See below of all comparative schedules and lists.

1.1. Relevant works by Harry Seidler

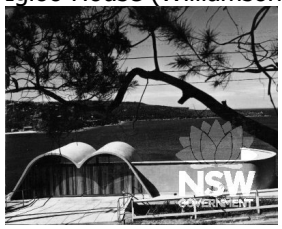
Jewish Architecture by Seidler			
Name of work	Location	Year	Significance/Description
Australia-Israel Friendship Forest Memorial  Figure 1 Australia-Israel Friendship Forest (Source: Shalom Crafter) [5]  Figure 2 (Source: Harry Seidler: Four Decades of Architecture) [6]	Israel	1990	An assembly place, and tribute to the at the time 40-year friendship between Australia and Israel. It is notable for commemorating the ongoing relationship between Australia and Israel. Description: Two stone paved plazas set in the foothills of the surrounding valley landscape addressing the southern panorama. The assembly point is accessed via an opening with concrete lintel and stonewalls, leading to steps down to a monument on the eastern wall. The western portion wall bears gold coloured metal lettering of the names of sponsors and patrons. The plazas are bounded by opposing retaining walls; one straight and the other curved.
Jewish Holocaust Memorial (Formerly Martyrs Memorial) in Rookwood Cemetery and Necropolis	East Street, Lidcombe, NSW 2141. (SHR #00718)	1969-1972	A monument commemorating the victims of the Nazi Holocaust of World War II. It was the first memorial monument of its kind erected by the NSW Jewry.

[5] "Vision for the Wilderness Leadership Academy in Shorashim," *Shalom Crafter*, accessed May 17, 2023, https://shalomcrafter.weebly.com/wilderness-leadership-academy_old/category/all.

[6] Kenneth Frampton and Phillip Drew, "Harry Seidler: Four Decades of Architecture," (London: Thames & Hudson Ltd 1992), 184.

 Figure 3 Jewish Holocaust Memorial (Martyrs Memorial) Source: Heather Stevens 2019, Monument Australia.  Figure 4 Jewish Holocaust Memorial (Martyrs Memorial) (Source: Gary Heap 2021, Monument Australia).			For the monument Seidler worked with engineers Miller, Milston and Ferris.[7]

[7] Martyrs memorial to be built at Rookwood, Sydney (1969, August 21). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 1. Retrieved May 17, 2023, from http://nla.gov.au/nla.news-article263156299

Relevant domestic architecture by Seidler			
Meller House  Figure 5 Meller House (Source: State Heritage Inventory)	37 The Bulwark, Castlecrag NSW 2068 LEP #1995	1950	"37 The Bulwark is an excellent example of the early work of Australia's most eminent modern architect, Harry Seidler, AC. The house, with its level of integrity and with its position on the highest point of Castlecrag, overlooking Sailor's Bay is of a high level of aesthetic significance. It is a rare example of the architect's work in the area." [8]. For this house Seidler worked with the engineers Miller, Milston and Ferris
Igloo House (Williamson House)  Figure 6 The Igloo House (Source: State Heritage Inventory)	65 Parriwi Road, Mosman NSW 2088 SHR #01652	1951	"Igloo House, dating from 1951, is of State aesthetic significance as an important early example of modern house design in Australia, which is innovative in its use of structural technology. It is significant for its association with its designer, leading Australian architect Harry Seidler, who had been a teenage refugee from Nazi oppression in the 1930s and who had trained as an architect in Canada before coming to Australia in 1948 to design a house for his immigrant parents. Igloo House is thus also a demonstration of the contribution of immigrant culture to Australia." [9]

[8] "House (including original interiors) - Meller House," State Heritage Inventory, accessed May 8, 2023, https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=2660244

[9] "Igloo House, The," State Heritage Inventory, accessed 8 May, 2023, https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5045139.

1.2. A survey of Synagogues and Jewish Schools outside NSW

Adelaide			
Item	Location	Architect and construction	Significance/Description
Beit Shalom Synagogue  Figure 7 Beit Shalom, Hackney Road (Adelaide Jewish Museum). [10]	Hackney Road Adelaide	Architect unknown c. 1970 - 1979	Significant as a Liberal synagogue in Adelaide with the congregation forming in 1963. The synagogue was converted from a house. The synagogue has stained glass windows but is otherwise unremarkable.
Adelaide Hebrew Congregation in Glenside  Figure 8 Adelaide Hebrew Congregation (Source: Adelaide Jewish Museum).[11]	13 Flemington St, Glenside SA 5065	1850; 1989-1990	Significant was the first synagogue in Adelaide. It was renovated in 1989-1990 and is the 'longest continuously used synagogue in the southern hemisphere'. [12]

[10] "Beit Shalom Synagogue", Adelaide Jewish Museum, accessed May 17 2023, https://adelaidejmuseum.org/features/beit-shalom-synagogue/.
[11] "Adelaide Hebrew Congregation," Adelaide Jewish Museum, accessed May 17, 2023, https://adelaidejmuseum.org/features/adelaide-hebrew-congregation/.
[12] "History," Adelaide Hebrew Congregation, accessed May 17, 2023, https://adelaidehebrew.com/about#block-ddb233bc420c0495b91c

Victoria			
Brighton Hebrew Congregation Synagogue  Figure 9 Brighton Hebrew Congregation Synagogue (Source heritage ALLIANCE).	132 Marriage Road BRIGHTON EAST	Built 1950-53; 1965-66 Herbert Tisher (1950); Abraham Weinstock (1965-66).	The synagogue at 132 Marriage Road in Brighton East is a local item of historic, architectural, and aesthetic significance. Constructed in 1950-53, it was one of the first new synagogue built in Melbourne following WWII. The principal building was designed by Herbert Tischer, in 1950 (c1950-53). Abraham Weinstock added the substantial extension (c 1965-66). It has rarity value as the only example of a bold 1960s synagogue with its locality. It has aesthetic significance for its contemporary use of the bold hexagonal form as an expression of the star of David.[13]
Kew Jewish Centre (Bet Nachman Synagogue)  Figure 10 Kew Jewish Centre (Source: Melbourne Photos Australia) [14] 	53 Walpole Street, Kew, Boroondara City Local Item (Place ID 199790)	Louis Kahan c. 1963- 1965	Known for the site of the Kew Hebrew Congregation is has local historic significance for its ability to demonstrate the development of Jewish worship and culture in the City of Boroondara from 1949. As a collection of buildings including the Bet Nacham Synagogue (c1963-65) Norman Smorgon House which building envelope encompasses the remnant core of a brick residence (c1886) only with other associated buildings represent the development of a cohesive social, religious and cultural centre of the Jewish community (also of social significance) of Kew during the postwar period. It has rarity value as postwar example of a synagogue in the city of Boroondara and within Victoria. It is representative of a postwar Internationalist synagogue designed by émigré architects (Anthony A Hayden) and

[13] David Wixted and Simon Reeves, *City of Bayside Inter-War & Post-War Heritage Study, Voume 2 of 2* (North Melbourne: heritage ALLIANCE, 2010), 68, https://www.bayside.vic.gov.au/sites/default/files/2021-09/Volume%202_0.pdf.

[14] "Kew Synagogue," Melbourne Photos Australia, accessed May 17 2023, http://melbournedaily.blogspot.com/2014/03/kew-synagogue.html.

Figure 11 Figure 10 Kew Jewish Centre (Source: Boroondara Planning Scheme). [15]			has local aesthetic significance of its distinctive use of pre-cast concrete, form composition, flat roof and expansive use of glazing.
St Kilda Hebrew Congregation Synagogue  Figure 12 St Kilda Hebrew Congregation Synagogue (Source: Victorian Heritage Database).	10-12 Charnwood Grove, St Kilda, Port Phillip City. VHR H1968 Place ID 3467	Joseph Plottel c. 1926	"The St Kilda Hebrew Congregation synagogue is of state significance for architectural, aesthetic and historic reasons. It is architecturally and aesthetically significant as a highly distinctive stylistic representation of the Byzantine style. The scale and quality of the building and finishes are demonstrative of the development of the local Jewish community during the inter war period. The synagogue has historic significance primarily for its association with Rabbi Jacob Danglow who served the congregation 1905-1957. Is socially significant to the Jewish community of St Kilda from the inception of the congregation in 1871." [16]
Former Mickveh Yisrael Synagogue and School  Figure 13 Former Mickveh Yisrael Synagogue and School (Source: Victorian Heritage Database)	275-285 Exhibition Street Melbourne VHR H0766	Knight and Keer	"The City Free Kindergarten is a simple brick structure with pedimented gables, brick pilasters and arched windows with brick dressings. It was constructed in 1859-60 as a Jewish School for the Michveh Yisrael Synagogue. The architects were Knight and Keer who also designed Parliament House, Melbourne. The building was used for worship until 1877 and since then has served several uses. It became a kindergarten in 1920. This was one of the earliest synagogues in Melbourne and a surviving example of early building in the C.B.D. It is an interesting example of the conservative classical style and of the small scale work of Knight and Kerr. The projecting pediments with trapezoidal brackets are a distinctive and important motif and can be compared, with the same

[15] "Kew Hebrew Congregation, 53 Walpole Street, Kew Statement of Significance," Boroondara Planning Scheme, accessed May 17, 2023, https://www.boroondara.vic.gov.au/media/59831/download?inline.

[16] "St Kilda Hebrew Congregation Synagogue", Victorian Heritage Database, accessed April 19, 2023, https://vhd.heritagecouncil.vic.gov.au/places/3467

			usage at 'D Estaville' in Kew, also by Knight and Kerr and erected in 1857. The building is essential to the character and historic quality of the neighbouring area. Windows on the Exhibition and Little Lonsdale Street facades have been deepened; windows down the other side remain intact. From an 1870 photo it seems that part of the pedimented end to Exhibition Street facade has been removed. The brickwork has been painted." [17]
Synagogue – Melbourne Hebrew Congregation  Figure 14 Synagogue, Melbourne Hebrew Congregation (Source: Victorian Heritage Database).	Melbourne city 2-8 Toorak Road (Corner St Kilda Road), South Yarra	Nahum Barnet 1928- 1930	"Victoria's most prominent synagogue, in a style of twentieth century Baroque classicism with a Corinthian portico and striking copper dome suggestive of the composition of Palladio's Villa Capra. It was built in 1928-30 to the design of Nahum Barnet and is in very intact condition, with a richly designed interior in traditional form, including a women's gallery." [18]
Former Residence 	Melbourne City 32 Lord Street Brunswick	James Dolphin c 1911-1912	"A most unusual brick building, erected as a home for James Dolphin in 1911-12 but used as a synagogue and Sabbath School by the Brunswick Talmun Torah from 1942 until its closure in 1987, during which time it was the only synagogue north of the City of Melbourne. The building is notable for its extraordinary portico (of timber?) with oversized entablature supported on paired Ionic columns, its keyhole-shaped front door and windows giving a somewhat Moresque character; and elaborate

[17] "FORMER MICKVEH YISRAEL SYNAGOGUE AND SCHOOL," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/747
[18] "Synagogue - Melbourne Hebrew Congregation," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/65737

Figure 15 32 Lord St Brunswick (Source Victorian Heritage Database).			joinery in the hall and principal rooms. The use of very large terracotta ventilating panels is also of interest." [19]
East Melbourne Synagogue (Mickva Yisrael)  Figure 16 East Melbourne Synagogue (Source: Victorian Heritage Database).	Melbourne City 494-500 Albert Street East Melbourne	Crough and Wilson c. 1877 - 1883	"Victoria's largest nineteenth century synagogue, containing a Bema, Tabernacle and other features in a highly intact state and of architectural interest especially for the interior of 1877, designed by Crough & Wilson. The space is surrounded on three sides by a Gallery carried on iron columns, each surmounted by an unusual arrangement of an impost block flanked by consoles (in the manner of the Badia at Fiesole, Italy); the face of the gallery is treated as a classical entablature with dentillation and the balustrade is of swag-bellied cast iron. The main ceiling is panelled, with a dentillated and modillionated cornice and with a row of large and unusual ventilators marking the location of former suspended gas lights. The facade, completed in 1883 to the design of T J Crouch, is an imposing but not especially remarkable renaissance design with a pedimented centre panel projecting slightly and with dome-like hexagonal mansard roofs to either side." [20]
Former Mickveh Yisrael Synagogue and School 	Melbourne City 275-285 Exhibition Street, Melbourne	Knight and Kerr 1859	"The Former Mickveh Yisrael Synagogue and Hebrew School was constructed in 1859 to a design by the architects Knight and Kerr. It was used as such until 1877 when a new Synagogue was built in Albert Street, East Melbourne. It then became State School No 2030 until 1892, and subsequently had a number of educational, social welfare and child care uses. The building is a simple single storey brick structure on a basalt plinth, with

[19] "Former Residence," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/66212.
[20] "EAST MELBOURNE SYNAGOGUE," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/353.

Figure 17 Former Mickveh Yisrael Synagogue and School (Source: Victorian Heritage Database).			pedimented gables, brick pilasters and arched windows with brick dressings." [21]
Synagogue  Figure 18 2-4 Barkly St Ballarat East (Source: Victorian Heritage Database).	Ballarat City 2-4 Barkly Street, Ballarat East	T. B. Cameron 1861	"The Jewish Synagogue in Barkly Street, Ballarat was built in 1861 and designed by the local architect, T. B. Cameron for the Ballarat Hebrew congregation. The first Jewish service was held in the Clarendon Hotel, Lydiard Street, in 1853 as the Jewish community began to establish itself in Ballarat, two years after gold was discovered in the area. The growth of this community in the township of Ballarat resulted in the need for a permanent synagogue. Constructed in Barkly Street and consecrated in 1855, the first synagogue in Ballarat was a large, timber building, designed to accommodate a congregation of about two hundred. Two years later, about three hundred Jews were recorded as residing in Ballarat and the surrounding areas, with similar numbers in Bendigo and fewer in such towns as Geelong, Avoca and Castlemaine. In 1859 the Ballarat East Town Council requisitioned the land in Barkly Street and granted the congregation a replacement site at the corner of Barkly and Princess Streets. Private homes were used for religious services until the new synagogue, designed to accommodate about three hundred and fifty people, was built, and consecrated in 1861. The Synagogue is a single storey rectangular building designed in a simple Renaissance Revival style with pedimented portico fronting a parapeted main hall. Paired Tuscan squared columns and pilasters support the portico, the tympanum of which contains the name of the congregation, Remnant of Israel(?) in Hebrew characters.

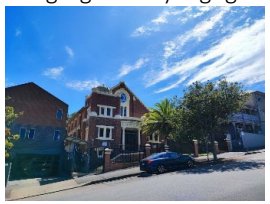
[21] "FORMER MICKVEH YISRAEL SYNAGOGUE AND SCHOOL," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/747.

			Tuscan pilasters support the deep cornice of the main parapet and divide the side facades into bays. Simple, tall round-headed window openings flank the front portico and are positioned along the sides of the main hall. Remodelling was undertaken in 1878, including the extension of the women's gallery along the sides of the hall, and the addition of a second staircase to the gallery and ante-rooms towards the front of the building. Externally the latter are in a style consistent with that of the building. The Synagogue was originally constructed in face brickwork, with contrast provided by rendered pilasters, columns, pediment, window reveals and cornice. The entire building has since been rendered. The building was renovated in the 1960s and 1970s and is still in use as a synagogue."[22]
Former Synagogue  Figure 19 Former Synagogue (Source: Victorian Heritage Database).	Geelong City 74 McKillip Street, Corner Yarra Stret, Geelong	Jones and Halpin 1861	"The former Synagogue at Geelong was built in 1861 by builders Jones and Halpin to a design by Geelong architect John Young. The stucco rendered brick structure in classical revival style replaced an earlier structure constructed in 1854. The building is now used as an office." [23]

[22] Synagogue," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/58.
[23] Former Synagogue," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/68316.

1.3. Synagogues and other notable Jewish architecture in New South Wales, in chronological order

Minor synagogues or those of no known designer are not included.

Name of Synagogue	Location	Architect	Significance or Description
Great Synagogue  Figure 20 Great Synagogue (Source: State Heritage Inventory).	Castlereagh St SHR #01710	Thomas Rowe (1872); 1957 basement deepened and reconstructed as War Memorial Hall. 'Some intrusion, although the previous basement area appears to have been of little significance.'[24]	Significant as likely the earliest surviving synagogue in New south Wales still in use. Built in the Victorian style it is elaborately decorated both internally and externally. It has excellent decorative mouldings, carved sandstone, metalwork, tiling and stained glass.
Newcastle Hebrew Congregation Synagogue  Figure 21 February 2023 (Source: Raynardthan Pontoh; Google Images).	122 Tyrrell St, The Hill NSW 2300	Messrs Pepper & Seater[25] 1927	Constructed in the At Deo style with dome, the stretcher bond brick contrasts against the white moulding. There is a circular stained-glass window decorated with the Star of David to the principal façade. The first floor entry has a porch which is flanked by two columns with lintel bearing Hebrew text.

[24] "Great Synagogue," State Heritage Inventory, accessed May 8, 2023, https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5051584
[25] https://www.newcastlehebrewcongregation.org/history.html

Emanuel Synagogue (formerly Temple Emanuel Synagogue)  Figure 22 Lippmann Partnership restoration (Source: Brett Boardman & Willem Rethmeier 2018, Lippman.com.au)  Figure 23 Emanuel Synagogue (Source: Dictionary of Sydney)	7 Ocean St, Woollahra LEP #519	1941 Principal synagogue by Lipson c1966 Second synagogue added by Bolot; Neuewg Synagogue (former chapel) 2018 Restoration of interior by Lippmann Partnership	Emmanuel Synagogue is of local historic significance as the first of only two Liberal Synagogues established in Sydney and shows the expansion of Liberal Judaism in Australia in the mid-20th century. Both synagogues on the site are associated with émigré architects Lipson and Bolot as examples of their respective works. The composition and materials of the forecourt are of local aesthetic significance. Emanuel Synagogue contributes to a group of Inter-War buildings on Ocean and Wallis Street. Emanual Synagogue is of local social significance for its ongoing ability to meet the needs of its congregation. The Emmanuel Synagogue has rarity value as the only surviving early example of a Liberal Judaism synagogue in Australia and as intact surviving example of Lipson's work.
Chevra Kadisha  Figure 24 Source: Sydney Chevra Kadisha. [26]	172 Oxford St, Woollahra	Lipson & Kaad (Samuel Lipson) 1949-52	Notable as place of Jewish burial and funeral services. It was renovated c. 1949 – 1952 to the design of Samuel Lipson of Lipson and Kaad.

[26] "Gallery," *Sydney Chevra Kadisha*, accessed May 17, 2023, https://sydney-chevra-kadisha.business.site/.

Nefresh Shul (formerly Roscoe St Synagogue)  Figure 25 Source: Nefesh Library and Community Centre. [27]	54 Roscoe Street, Bondi	Unknown Possibly 1955-57	The original single storey synagogue was demolished to erect a three storied synagogue and community hub in 2021.
North Shore Synagogue, at Lindfield (formerly the Garden Synagogue) [28]  Figure 26 North Shore Synagogue (Source: Wikipedia, 2015).	Treatts Road, Lindfield	Hans Peter Oser	A modernist synagogue with skillion roof form, constructed with concrete besser blocks and cladding to principal northern façade. Northern façade is ornamented with menorah and Star of David.

[27] "New Builoding Images – June 2021," *Nefresh Library & Community Centre*, accessed May 8, 2023, https://www.nefesh.org.au/templates/photogallery_cdo/aid/5154717/jewish/New-Building-Images-June-2021.htm.

[28] Undated extensions alterations and additions to synagogue building Killara, HP Oser. "TENDERS CALLED" Construction (Sydney, NSW : 1938 - 1954) 21 November 1951: 11. Web. 8 May 2023http://nla.gov.au/nla.news-article222887670; Undated extension alteration and additions to building in Lindfield for North Synagogue – plans etc HP Oser. "TENDERS CALLED" Construction (Sydney, NSW : 1938 - 1954) 30 April 1952: 13. Web. 8 May 2023 http://nla.gov.au/nla.news-article223548112; Undated extensions additions and alterations to building Lindfield for North Shore synagogue, HP Oser. "TENDERS CALLED" Construction (Sydney, NSW : 1938 - 1954) 7 May 1952: 10. Web. 8 May 2023 <http://nla.gov.au/nla.news-article223548193>.

 Figure 27 Max Dupain (Source: "Unloved Modern" Rebecca Hawcroft, Migrant Architects).  Figure 28 Max Dupain (Source: "Unloved Modern" Rebecca Hawcroft, Migrant Architects).			
South Head Synagogue at dover Heights (Closed in 2017 now Kehillat Kadimah) [29]	626-666 Old South Head Road, Rose Bay	Neville Gruzman 1957-58 Gruzman building now demolished (demolition date unknown)	Gruzman's original design has since been demolished (date unknown), photographic evidence from that time shows curved stairs with balustrade and columns to. what appears, the roof form eaves. It was described as ultra-modern.

[29] SOUTH HEAD & DISTRICT SYNAGOGUE (1950, November 16). *The Hebrew Standard of Australasia (Sydney, NSW : 1895 - 1953)*, p. 4. Retrieved May 5, 2023, from http://nla.gov.au/nla.news-article131103411; "Sydney Synagogue prevented from sacking Rabbi to close on Friday," Sydney Morning Herald, 2017, accessed May 5, 2023, https://www.smh.com.au/national/nsw/sydney-synagogue-prevented-from-sacking-rabbi-to-close-on-friday-20170629-gx1c8d.html; New Rose Bay Synagogue (1958, November 21). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 1. Retrieved May 5, 2023, from http://nla.gov.au/nla.news-article263068389

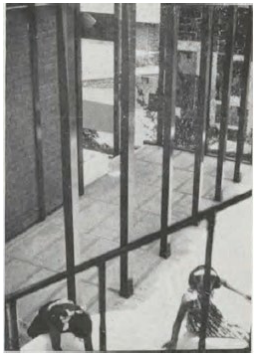
 Figure 29 Source: Architecture and Arts 1962 [30]  Figure 30 Max Dupain (Source: Series 31 - Religious - Synagogues, University of Melbourne) [31].			
Strathfield Synagogue (formerly Holocaust and War Memorial Synagogue)	19 Florence St, Strathfield LEP #I232	Hans Peter Oser 1959	The Strathfield Synagogue congregation was established on the site in 1949 and has local historic significance as it demonstrated the development of the Jewish population into Sydney suburban areas in the post war period. It is notable for associations with the Conference on Jewish Material Claims Against Germany and education in the growing

 Figure 31 Source: Strathfield Schule, weebly.com.  Figure 32 Source: Strathfield Schule, weebly.com [32]			Jewish Community in Strathfield in the mid-20th century. It has local aesthetic significance as a good example of well-known modernist émigré architect HP Oser. It is sustainably intact despite additions retaining synagogue elements including pendant lamps and plywood doors decorative with copper pulls and Menorah symbol. It has rarity value for its architectural style (in Strathfield) as the only surviving purpose-built synagogue from the post war period in the western suburbs of Sydney. It is representative of its class as an International Style synagogue designed by emigrant architect in the post war period.
Cremorne Synagogue  Figure 33 Source: onthehouse.com	12A Yeo St Neutral Bay	Hugh Buhrich 1958	A rectangular structure erected to the tabernacle plan form, Cremorne synagogue has a curved wall to centre of principal façade flanked by cladded terminating ends. It is decorated with the Star of David.

[30] Jennifer Hill and Elizabeth Gibson, *1480 – Strathfield Synagogue heritage Assessment* (Sydney: Architectural Projects, 2014), 184, http://jewsofnsw.info/heritagelists/StrathfieldHeritageAssesment.pdf.

[31] "Series 31 – Religious – Synagogues," *University of Melbourne*, accessed May 8 2023, https://www.csec.esrc.unimelb.edu.au/image_viewer.htm?CSEC00900,4.

[32] "The Synagogue – Past and Present," *Strathfield Schule*, accessed May 5, 2023, https://strathfieldschule.weebly.com/the-synagogue---past-and-present.html.

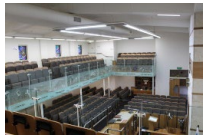
New Central Synagogue (formerly Central Synagogue and War Memorial) [33]  Figure 34 Source: The Australian Jewish Times 1969.	Bon Accord Av, Bondi Junction	Lipson & Kaad Samuel Lipson and Peter Kaad 1959	The original design was a synagogue constructed from brick with two curved concrete lintels over the principal entrance accessed via stair from street level. The synagogue has undergone numerous changes.

[33] Donors visit new synagogue (1969, August 7). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 7. Retrieved May 5, 2023, from http://nla.gov.au/nla.news-article263155980; NEW SYNAGOGUE IS "LARGEST IN AUSTRALIA" (1960, September 2). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 11. Retrieved April 14, 2023, from http://nla.gov.au/nla.news-article263139279; 1951 'Synagogue Meetings', *The Australian Jewish Herald (Melbourne, Vic. : 1935 - 1968)*, 21 September, p. 2. , viewed 14 Apr 2023, http://nla.gov.au/nla.news-article261423057; New Site for Central Synagogue (1952, February 15). *The Hebrew Standard of Australasia (Sydney, NSW : 1895 - 1953)*, p. 2. Retrieved April 14, 2023, from http://nla.gov.au/nla.news-article130949924;

[33] CENTRAL SYNAGOGUE SUPPLEMENT Why They Built The "New Central" (1960, September 2). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 7. Retrieved April 14, 2023, from http://nla.gov.au/nla.news-article263139306; CENTRAL SYNAGOGUE IN NEW HOME (1960, September 30). *The Australian Jewish News (Melbourne, Vic. : 1935 - 1999)*, p. 3. Retrieved April 14, 2023, from http://nla.gov.au/nla.news-article262395125; "Architecture, our collection," *Jewish Heritage New South Wales*, accessed April 14, 2023, http://www.jewsofnsw.info/architecture/

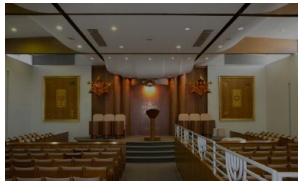
 Figure 35 Source: Central Synagogue (Sydney), Wikipedia.			
North Shore Temple Emanuel  Figure 36 Source: North shore Temple Emanuel [34]  Figure 37 Source: Google street view, accessed May 8 2023.	Chatswood Av, Chatswood	Unknown 1960	Original synagogue was constructed in 1960 and its designer is unknown. The existing North Shore Temple Emanuel Synagogue has likely been largely altered.

[34] "Who are We?," North Shore Temple Emanuel, accessed May 8 2023, https://www.nste.org.au/about-us

Bankstown Hebrew synagogue (formerly Jewish Martyrs War Memorial Synagogue) [35]  Figure 38 Source: Canterbury Bankstown Local Studies Collection.	Meredith St, Bankstown	Harry Harold Smith 1957 destroyed by fire 1991.	The second synagogue in Bankstown. Designed by Harold Harry Smith and completed in 1957. It was destroyed by fire in 1991. It is distinctive for its hexagonal form representative of the Star of David. It's entry way covered with concrete awning. Quite possibly the boldest post-war synagogue design in NSW had it survived. Its form exemplifies the expression of post war modernist émigré architects.
Coogee Synagogue  Figure 39 https://images.shulcloud.com/852/81116_large.jpg	121 Brook St, Coogee	Unknown 1960 rebuilt 2006	The architect of the original design in unknown, the synagogue was rebuilt in 2006.

[35] MODERN HOUSE OF WORSHIP Bankstown Synagogue (1960, March 25). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 8. Retrieved April 14, 2023, from http://nla.gov.au/nla.news-article263134673; "Architect of new ideas and much of Sydney," *Sydney Morning Herald*, 2009, accessed April 14, 2023, https://www.smh.com.au/national/architect-of-new-ideas-and-much-of-sydney-20080716-gdsmad.html.

Sephardi Synagogue  Figure 40 Source:  Figure 41 Source: The Sephardi Synagogue, sephardi.org.au	40 Fletcher St, Woollahra	Hugh Buhrich 1961, additions in 1962	Significant as the oldest Sephardi synagogue in Australia. The original design appears to be largely altered.
Wolper Jewish Hospital  Figure 42 Source: Wolpher Hospital, Facebook.	Woollahra	Harold Harry Smith 1961	Smith's 1961 design was part of a major expansion fo the existing hospital and there have been alterations and additions since this time.

Offices at the National Council of Jewish Women  Figure 43 Hall Source: National Council of Jewish Women NSW.	Woollahra	Harold Harry Smith 1963	Unable to locate image of Smith's 1963 design.
Cyril Rosenbaum Synagogue, Montefiore Home (on premises of aged care residence)	Hunters Hill	Aaron Bolot 1964	Significant as the synagogue located at Montefiore Home which has provided aged care services to Jewish communities since 1889. Unable to locate image of Bolot's 1964 design.
Kingsford Maroubra Synagogue  Figure 44 Source: Maroubra Synagogue. [36]	635 Anzac Parade, Maroubra NSW 2035	Hugh Buhrich 1965	The original design has likely been altered. The existing synagogue has covered courtyard with roof supported by columns.

[36] "About," *Maroubra Synagogue*, accessed April 17, 2023, https://www.maroubrasynagogue.org.au/slide/about/.

 Figure 45 Source: Maroubra Synagogue.			

1.4. Architecturally distinguished Places of Worship of the 1950s and 1960s in New South Wales

St Bernard's Catholic Church at Botany

Designed by Kevin Curtin in 1954

Caringbah Uniting Church

Loder and Dunphy c. 1959

St Andrews Presbyterian Church, Gosford NSW

Loder and Dunphy c.1960 demolished 2022

Polish War Memorial Chapel, Blacktown NSW

Michael Dysart 1967

Holy Trinity Memorial Church Canberra Act

Frederick Romberg of Grounds, Romberg and Boyd (1961)

Our Lady of Fatima Kingsgrove

Wentworth Memorial Church, Vaucluse

Don Gazzard and Partners

St Anthony's RC Church Marsfield,

Enrico Taglietti 1968

Six Churches by B Smith of McConnell Smith and Johnson

Chapel of St Pauls College, University of Sydney

Jim Kell, of Foyle Mansfield Jervis and McLurcan 1964

1.5. Concrete Shell Structures of the 1950s

Igloo House

Sydney Opera House Utzon and Anderson (unbuilt shell structure)

Kevin Borland House, Victoria

St Mary's Star of the Sea Darwin
1955-1962

Holy Family War memorial Church Queensland
1960-63

St Kevin's Dee Why
1959-61

1.6. Religious places built by migrant groups in NSW after World War II (a selection)

St Mina and St Minas Coptic Church Sydenham

The Gallipoli Mosque Granville

Polish War Memorial Chapel Blacktown

Sources	See footnotes and heritage assessment for all sources including: Brady, Colin. *Talmudical College Heritage Study*. (Sydney: Waverley Council, 2023). Frampton, Kenneth and Phillip Drew. *Harry Seidler: Four Decades of Architecture*. (London: Thames & Hudson Ltd 1992). Nearmap. *34 Flood St, Bondi NSW 2026*. March 16, 2023. Nearmap.com. https://apps.nearmap.com/maps/#/@-33.8917100,151.2595700,18.00z,0d/V/20230316?locationMarker. SIX Maps. *Sydney 1943 Imagery: 34 Flood St, Bondi.* 1943. SIX Maps. https://maps.six.nsw.gov.au/. *Environmental Planning and Assessment Act 1979 No 203 (NSW) Sch. 5 Pt. 2.* Waverley Council Local Environmental Plan 2012. https://legislation.nsw.gov.au/view/html/inforce/current/epi-2015-0020#sch.5-pt.2. McGinness, Mark. "He needed both wisdom and wits." *Sydney Morning Herald*, February 4, 2005. https://www.smh.com.au/national/he-needed-both-wisdom-and-wits-20050204-gdkmin.html

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Yeshiva College within the Harry O Triguboff Centre
formerly the Sydney Talmudical School
34 Flood Street, Bondi

Heritage Assessment
Version V1.4
1st June 2023

for
Waverley Council
by
Hector Abrahams Architects

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Version 1.0	HAA	Preliminary Draft	12th May
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CONTENTS

1. Introduction

This Heritage Assessment to assess the significance of the 1959 Harry Seidler designed Sydney Talmudical College and synagogue was commissioned by Waverley Council after its own assessment led to the letting of an Interim Heritage Order for the place under the NSW Heritage Act 1977.

This assessment includes a description of the site, history, physical analysis, comparative analysis, significance assessment, listing recommendations and management recommendations.

This report was prepared by Hector Abrahams, Georgia Holloway, Sioned Lavery, and Tristan Ryan. The place was inspected by Hector Abrahams, Sioned Lavery and Tristan Ryan who inspected the place on 24 March 2023. The report has been prepared in the form prescribed by the NSW Heritage Manual *assessing heritage significance guideline* (2022) and Australia ICOMOS, *The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance* (2013)

2. Description of the place in title and Heritage Planning Status

The place is located at 34 Flood Street, Bondi NSW 2026 with the following real property description; Lot 1 Deposited Plan 1094020 (containing two buildings; synagogue and former Sydney Talmudical College premises building and the separate Rabbi's residence).

As to boundaries, synagogue and former Sydney Talmudical College premises building fronts Flood St to the west, the Rabbi's residence also located at 34 Flood St fronts Anglesea St. The place is marked in red on the figures one and two below.

The place is not currently listed as a heritage item on the NSW Heritage Register. However, the western perimeter is opposite to the eastern boundary of the Woodstock Heritage Conservation Area and abuts the Waverley Park Landscape Conservation Area on Flood St; listed as items C16 and C67, respectively, on Schedule 5 of the Waverley Council Local Environmental Plan (LEP). [1]

[1] *Environmental Planning and Assessment Act 1979 No 203 (NSW) sch. 5 pt. 2*, Waverley Council Local Environmental Plan 2012, accessed April 28, 2023, https://legislation.nsw.gov.au/view/html/inforce/current/epi-2012-0540#sch.5-pt.2.

Figure 1 Aerial Photograph showing 34 Flood Street Bondi marked in red.
(Source: Nearmap with HAA overlay)[2]


Figure 2 1943 aerial with 34 Flood St, Bondi site marked in red (Source SixMaps with HAA overlay).[3]

[2] Nearmap, *34 Flood St, Bondi NSW 2026,* March 16, 2023, Nearmap, accessed April 27, 2-2023, https://apps.nearmap.com/maps/#/@-33.8917100,151.2595700,18.00z,0d/V/20230316?locationMarker.
[3] SIX Maps, Sydney 1943 Imagery: 34 Flood St, Bondi, 1943, SIX Maps, Accessed April 27, 2023, https://maps.six.nsw.gov.au/.

3. History

The following historical aspects of the site is reproduced from Waverley Council: *Talmudical College Heritage Study* (2023) [4]

Pre- European Occupation

Early European accounts dating from 1788 indicate at least 1500 people lived in the area between Botany Bay and Broken Bay. The region was made up of 29 clans, forming the Eora nation, with the Waverley area being the traditional land of the Bidjigal, Birrabirragal and Gadigal people. There was some interaction between tribal groups with the women moving to the country of their husband, while maintaining ties with the country of their birth.

For the first 40 years after the establishment of the penal colony at Sydney Cove, the Waverley area, as with most of the Eastern Suburbs, was an isolated and largely uninhabited locale. The land was initially retained by the Crown and then released in a piecemeal manner from the late 1820s after an abortive attempt in 1828 to reserve the area as church glebe. By 1870 most of the crown land within the present day municipality of Waverley had been released through land sales undertaken predominantly in the decades of the 1830s, 1850s and 1860s. After 1831 the land releases in Waverley were by public auction, generally of moderately sized parcels of land between five and ten acres.

19th Century development at Flood Street, Bondi

The site has evolved from the early settlement pattern of purchase grants in Waverley of the period 1838-50, serving to fund assisted migration. The subject sites form part of 11 ½ acres purchased by Michael Woolley for 161 pounds, the grant being issued on 2 February 1839.

These crown land purchases had frontage to the small number of public roads that followed the ridgelines such as present-day Bondi Road, Bronte Road and Birrell Street. Bondi Road is one of the oldest public rights of way in the Waverley LGA. Known for some years as Waverley Street, the road was put through prior to 1840 and over the following decades the neighbouring land was cut up into crown grants of between five and fourteen acres.

With the gradual release of the crown land the residential population of the Waverley area grew but remained relatively small. With few exceptions, the early occupation was confined to the elevated, airy plateau lands that offered views of the coast, the harbour and Botany Bay. The first generation of residences included a small number of substantial villas set within large blocks of land inclusive of Barnett Levey's Waverley House that stood to the west of Flood Street, opposite today's Talmudical College. The villa lands now form the eastern boundary of Waverley Council's

[4] Colin Brady, *Talmudical College Heritage Study*, (Sydney: Waverley Council, 2023), 5-10.

Woodstock Heritage Conservation Area (HCA). This encompasses lands originally within and adjacent to William Foreman's grant acquired by the Jewish free settler Levey in 1826. Levey, who built the colony's first theatre. quickly set about building a substantial villa named 'Waverley". In 1859, the house gave the Waverley LGA its name, becoming Sydney's second municipality.

The early land grants of the 1820s and 1830s established the current street pattern of the area. Two early residences identified as Wairoa and Anglesea erected on estate lands on which the Talmudical College now stands typified the isolated villas occupying the Waverley landscape prior to establishment of Waverley municipality in 1859.

Lands immediately east of the Levey Estate were sold in 1838 to John B Jones and Edward Flood. Their land, along with grants east to Bondi Beach, were of regular size, establishing the current grid pattern. Flood was one of NSW's most successful pastoralists. In 1868 the entrepreneur established the Waverley Crescent Extension Estate bringing into being Geirstein [now Bon Accord Avenue], Kenilworth and Woodstock Streets. Flood continued Levey's reference to Sir Walter Scott's Waverley novels, the streets being named after the Scott's novels Kenilworth (published in 1821), Woodstock (published in 1826) and Anne of Geirstein (published in1829).

Over the 1880s the majority of the large estates were subdivided to meet the demand for land for suburban development, and by the mid-1880s the municipality was reported as developing faster than any other area near Sydney. This frenzy of land speculation was driven by a number of factors inclusive of a maturing economy with banks and other financial institutions willing to lend money to both developers to buy and subdivide the estates and also to the prospective homeowner.

A sale of lots on the Waverley Extension Estate held on 6 February 1886 established much of the current streetscape of late Victorian Italianate and Federation style residences of the area surrounding today's College site. The broad parallel street formations provided one of the first locations for superior suburban housing in the area. It is still dominated by isolated grand villas and small vernacular cottages.

Detail of S Pollitzer's 'Plan of the Borough of Waverley' published in 1887 showing the area of the then recently Anglesea Estate. Source: Mitchell Library

Subdivision of purchased grants and the grounds of established villas accelerated during the land boom of the 1880s, Woolley's Anglesea lands were subdivided and marketed as the Anglesea Estate prior to 1887, with the northern areas of the original grant about Anglesea House separately marketed as the Williams Estate.

Subdivision saw development of residential sites as freestanding and semi-detached residences of the later 19th and early 20th Centuries. Sites later occupied by the current buildings were identified as Lots 49 and 50, purchased by Aitkins, in the Anglesea Estate.

Expansion of Sydney's steam and electric tram system provided an impetus for late Federation housing within the established Victorian streetscapes. Another factor was the improvement of basic government services. The supply of reticulated water from the City Council's Botany Swamps became available from 1883 with the completion of the Waverley Reservoir. The steam tram service from the city via Bondi to Waverley (Charing Cross) was approved for construction by the government in 1880 and was subsequently completed in 1884. The demand for ready access to the beaches resulted in the extensions of the tramlines from the city to the eastern beaches. In 1894 the steam tram service from the city to Waverley was extended to Bondi Beach with the junction being established at Bondi Junction. During 1902 the tramway was converted to the more convenient and speedier electric service.

20th Century Development

1948
As Australia's external affairs minister, Dr H.V. Evatt [uncle of Penelope (Evatt) Seidler] sat on the U.N. Security Council. At the second session of the General Assembly, he chaired a special committee on Palestine and attained a cherished ambition with his election as president of the third session (September 1948 to May 1949). Australia's mediatory role during these years helped to bring about the partition in Palestine, which was approved by the required two-thirds majority. Australia was the first country to vote 'Yes' to partition. The Australian Government under Prime Minister Ben Chifley recognition to the new State of Israel on 29 January 1949. After being elected President of the General Assembly, Dr Evatt presided over the vote at which Israel was admitted as a member of the United Nations in May 1949.

1950
Rose Seidler House is completed on a former pottery clay mining site on Clissold Road, Wahroonga. "It was a sensation, the most talked about house in Sydney," architect Penelope Seidler, Harry's widow and director of Seidler & Associates, [said]. It made such a splash that Mrs Seidler recalled hearing about it as a 12-year-old from her father Clive Evatt, the then-housing minister. It was nothing like the surrounding brick homes and bungalows, including the nearby heritage-listed Georgian home "Parklands" where Penelope grew up.

Harry Seidler, the 'great disruptor' of modern Australian architecture, The Sydney Morning Herald, Julie Power, 11 January, 2021

1950
The Minister for Housing, Clive Evatt [father of Penelope Evatt Seidler], has over-ridden Willoughby Council's decision disallowing a Canadian architect, Mr Harry Seidler, from erecting a modernistic house at The Bulwark, Castlecrag. This follows a story published in "The Sunday Herald" on March 26. The architect approached the Minister, who decided to sponsor the dwelling as a "demonstration" home.

In a letter of approval, Mr Evatt said that Mr Seidler was taking one step towards releasing architecture in NSW from shackles that bind it. The house will have three levels, connected by inside ramps. There will be a full-height glass wall in every room.

Modernistic House Ban Overruled, The Sunday Herald, 23 April 1950 (page 6)

1955
The board of management of the Sydney Talmudical College announces the embarkation of Rabbi G. Here and family at Naples by the SS "Otranto", due in Sydney on August 3, 1955.The Rabbi has been invited to establish a Talmudical College (Yeshiva) and to accept the position as Rosh Yeshiva, first principal of the Institution.
The chairman, Abraham Rabinovitch, said the board aimed to establish and foster higher Jewish education but not overlook secular education for children. The building recently acquired by the board at Flood Street.

"The Sydney Talmudical College", The Australian Jewish Times, 15 July 1955, Page 6

August 1955
The Maccabean Hall was packed last Wednesday week, when the executive of the Sydney Talmudical College gave a reception in honour of Rabbi G. Here (Rosh Yeshiva), Dean of the College. Over 400 persons attended the reception, including Rabbi Porush, Rabbi Abramson, Rabbi Frampton, Mr. S. D. Einfeld, Mr. D. J. Benjamin. Mr. Rabinovitch was chair. All spoke on the necessity of a Yeshiva in Sydney. Rabbi Here said that, even in the short time he had been in Sydney, he felt confident that the Yeshiva would be a success …At present there are seven pupils enrolled in the temporary building in Flood Street, Bondi.

"Support For Yeshiva", The Australian Jewish Times, 26 August 1955, Page 7

1956
About 50 people were invited to a meeting on 29 January 1956, at Flood Street, at which it was unanimously resolved to form a congregation to be known as "Knesset Israel". It was resolved that Rabbi G. Here, Dean of the Sydney Talmudical College, be invited to be the Rabbi of the Congregation. The Rabbi consented to accept the position in addition to the position that he now
holds at the College.

"New Congregation in Bondi", The Australian Jewish Times, 10 February 1956, Page 8

1957
Seidler enters an Architectural Competition to resign Waverley Council's new Chambers building on Bondi Road, near Flood Street. The competition was won by the Sydney architects Ancher, Mortlock and Murray, who received £500 prize money. The second prize was awarded to the firm of P. B. Hall, G. P. Webber, A. L. Craig,

and K. Woolley. Seidler took third prize. Fourth prize went to the firm of Peter Priestley, Lyle Dunlop and K. G. McLaren. The second, third and fourth prizes were £200 each. Three other designs were given special mention. There were 87 entries in all.

1958
The Knesset Yisroel congregation is planning a new Talmudical College with facilities to train ministers of religion. The new college, expected to cost £50,000, will be built on 'the site of the present Sydney Talmudical College, in Flood Street, Bondi.
A Knesset Yisroel supporter last week said the old college would be pulled down; the new institution would be a two-storey building. He said that "more than 25 per cent" of the total cost of the new building already had been pledged by individual congregants. Tenders were being called now that plans by architect Mr. H. Seidler, had been approved by the college authorities. The new building which will house, six classrooms for pupils, aged 6-13, is to be completed in time for the High Holydays. At present, there are 60 students working under Rabbi, G. Here.

"New Talmud College next year", The Australian Jewish Times, 12 December 1958, Page 3

1961
The completed Talmudical College opened by special guest Dr H.V. Evatt [uncle of Penelope (Evatt) Seidler] in 1961. Dr H.V. Evatt served as a judge of the High Court from 1930 to 1940, Attorney-General and Minister for External Affairs from 1941 to 1949, and leader of the Australian Labor Party and Leader of the Opposition from 1951 to 1960.

As external affairs minister, Evatt sat on the U.N. Security Council. At the second session of the General Assembly, he chaired a special committee on Palestine and attained a cherished ambition with his election as president of the third session (September 1948 to May 1949). Australia's mediatory role during these years helped to bring about the partition in Palestine, which led to the creation of the Jewish state of Israel.

In 1960, Evatt later received a UN medal for his presidency of the third General Assembly, which he later gave to Moriah College (now in Queens Park, Waverley), the school that provided secular education to the children attending religious classes at the Talmudical College in Flood Street.

September 1961
Police made additional security patrols of the Bondi area following last Thursday's shattering of the glass entrance doors to the new £60,000 Sydney Talmudical College in Flood Street. Three large rocks were hurled through the plate glass doors of the Yeshiva building causing damage estimated at more than £150. It was the second time this month that glass in the new building has been broken. On September 2, Yeshiva officials reported that a stone had damaged one window. Police said they did not consider the incidents to be anti-Jewish actions. They suggest it was the work of

a group of hooligans. Special patrols have been alerted to watch the Yeshiva building during darkness. Police say that damage to other religious buildings in the area has also been reported. Yeshiva president (Mr. A. Rabinovitch) said he had written to the NSW Police Commissioner (Mr. C. J. Delaney), the NSW Minister for Housing (Mr. A. Landa) and the Board of Deputies' Public Relations Chairman (Mr G. Falk) urging strongest possible action to apprehend the culprits.

"Police probing into damage", The Australian Jewish News, 22 September 1961, Page 1

May 1965
Newspapers reported that Moriah College and the Sydney Talmudical College at Flood Street, Bondi, will benefit from the almost £300,000 estate of the late Mr and Mrs Abraham Rabinovitch. The estate will be invested by the Trustees, the Permanent Trustee Company of NSW Limited with the income to go to the two institutions. The proportion of the income would be decided by the trustee. Ultimately, the capital is for the University of Jerusalem in Israel. Mr. Rabinovitch, founder of both Moriah and Sydney Talmudical College died July 1964 and his wife early 1965.

"Schools get rich estate", The Australian Jewish Times, 21 May 1965, Page 3

November 1965
A sixth-generation sabba, Rabbi Ezra Barzel, is the new head of Sydney Talmudical College and minister of the Flood Street, Bondi, congregation. Rabbi Barzel, 51, was officially welcomed by the congregation last Saturday night. He arrived from Israel with his wife five weeks ago and already conducted Yom Kippur services at the synagogue. Their two married daughters and two sons were left behind in Israel. The former head of the college, Rabbi Here, is now heading a Yeshiva in Tel Aviv.

"Sabba head for Yeshiva", The Australian Jewish Times, 12 November 1965

1979
The Yeshiva, in Flood Street, Bondi, was last week described as "the centre of Yiddishkeit in Sydney". Rabbi Yehoshva Karlinsky, head of the Institute for Higher Learning in Jerusalem, said this at a Melave Malkah to commemorate the 15th anniversary of the death of Yeshiva founder Abraham Rabinovitch. "We are sitting here tonight in the centre of Yiddishkeit in Sydney," the rabbi said. "Orthodox people are always small, but this does not matter. "What is important is that the education you give is pure", he said.

"Melave Malkah in memory of Yeshiva founder", The Australian Jewish Times, 16 August 1979, Page 4

1992
A 50-member Australian mission unveiled the Australia Israel Friendship Forest dedicatory centre and monument near Moshav Shorashim in Galil. The dedication was part of festivities marking the Jewish National Fund's 90th anniversary. Sydney architect Harry Seidler designed the dedicatory centre and monument, which features two white interlocking plazas. They blend into the mountain landscape of the Forest established three years ago to mark the twin occasions of Australia's Bicentenary and
Israel's 40th anniversary -1948 and 1988. A separate plaque marks the specific contribution to the creation of the State of Israel by Australia's one-time Foreign Minister Dr Herbert Evatt who was president of the United Nations Assembly when the critical vote recognising the state of Israel was taken.

"Australians celebrate JNF's 90th", The Australian Jewish News, 19 June 1992, P7

1994
Seminal Australian architectural history and heritage book A Pictorial Guide to Identifying Australian Architecture: Styles and Terms from 1788 to the Present (Richard Apperly, Robert Irving and Peter Reynolds) states that: 'From the early 1950s onwards, the steady stream of uniformly high-quality work from [Harry] Seidler's office set a standard against which the work of other Modernists has tended to be judged'.

2003

Two Sydney properties owned by the Yeshiva group will be sold to repay debts to Australian mining identity Joe Gutnick.

"Inquiries pour in for Flood Street", The Australian Financial Review, 24 July 2003

2011
Harry's Park honouring the memory of renowned Australian architect Harry Seidler opened on 10 November 2011. The park is adjacent to the Seidler Office. Penelope [Evatt] Seidler, the wife of the late Harry Seidler, was invited to officially open the park. Overlooking Luna Park and with a 180-degree view of west Sydney Harbour, the park commemorates Seidler's life and significant contribution made to architecture internationally and at home. John Curro, project architect and partner from Harry Seidler & Associates, designed the park using a palette of elements and materials common to Harry's work. "We have used contrasts which Harry favoured, including straight and curved elements, smooth white and textured grey finishes, strong geometric forms and soft irregular planting. Harry also liked to craft shifting voids in solid forms as seen in the curved wall with its viewing slot framing Luna Park and Lavender Bay."
The park's location also has a special personal family connection for Penelope Seidler as her father, the late Clive R. Evatt QC, grew up in Kirribilli, and with his brothers attended the local church (St John's Anglican Kirribilli) where they sang in the choir. Their house was demolished for the construction of the Harbour Bridge. The park is a gift from Penelope Seidler to the people of Sydney.

"Harry Seidler Park opens in Milson's Point", Architecture and Design, 11 November, 2011, https://www.architectureanddesign.com.au/news/industry-news/harry-seidler-park-opens-in-milsons-point-sydney

The following historical aspects have been prepared by HAA.

The Alder Building.

Historical aerial images show that the Alder Building (adjacent to the south of the Sydney Talmudical College and synagogue) was likely constructed c. 1987 – 1989.

The Malka Brender Building.

The Malka Brender Building (north of 34 Flood St, Bondi) was constructed as a primary school associated with the Sydney Talmudical College, necessitated by growing enrolments, many of whom were Russian migrants. [5] Construction was commenced and completed in 1979. The principal architect was Bruce Vote of Henry Pollack and Associates and the engineer Allen Milston of Miller, Milston and Ferris. [6] W.M Shipton and Co. won the building contract with a tender price of $250,000. [7]

[5] NON-RELIGIOUS ATTRACTED TO THE YESHIVA (1979, March 15). The Australian Jewish Times (Sydney, NSW : 1953 - 1990), p. 6. Retrieved April 27, 2023, from http://nla.gov.au/nla.news-article263240539; Turning cherished hope into reality (1980, May 1). The Australian Jewish Times (Sydney, NSW : 1953 - 1990), p. 15. Retrieved April 27, 2023, from http://nla.gov.au/nla.news-article263286082
[6] Turning cherished hope into reality (1980, May 1). The Australian Jewish Times (Sydney, NSW : 1953 - 1990); 1980 'Schools to support Russian children', *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, 5 June, p. 5. , viewed 18 May 2023, http://nla.gov.au/nla.news-article263287671
[7] Turning cherished hope into reality (1980, May 1). The Australian Jewish Times (Sydney, NSW : 1953 - 1990), p. 15.

The Malka Brender Building opened on Sunday 4 May 1980 and the opening event was attended by numerous politicians including the then Prime Minister Malcolm Fraser. [8] It was named after the Mrs Malka Brender the mother of benefactor Jospeh Brender whose donation was instrumental in funding the completion construction. [9] Funding for the building was raised from a Commonwealth government grant via the Schools Commission and private donations. [10] The building displays a plaque dedicated to Mr S D Einfeld, to the memory of Yeshiva founders; Mr and Mrs A Rabinovitch.[11] In 1989 a third floor was added to the Malka Brender building the designer of which is unknown. [12] The addition is described alongside other proposed changes considered a major development in February 1989.

> *"Six houses facing Anglesea Street which currently operate as offices and classrooms. They will be demolished and replaced with a multipurpose centre. When development is complete, a building facing Bondi Road will comprise classrooms, a theatre, canteen, balconies and a synagogue. This will be connected to the Malka Brender building with a building containing administration facilities and a library. Underground parking will be developed and a courtyard built on top. The recreational area will be renovated and enlarged and situation adjacent the multi-purpose centre."* [13]

Henry Pollack, the Jewish refugee who later founded Mirvac, donated his firm's architectural advice to the Malka Brender Building. [14] This is perhaps notable as, according to his obituary, the Pollack family lived in tsarist Russian until 1919 and later fled from communist rule to Lods, Poland. Pollack left his parents in Lods when

[8] YESHIVA SPECIAL FEATURE TO MARK THE OFFICIAL OPENING OF THE MALKA BRENDER BUILDING GREAT OCCASION, SOURCE OF PRIDE (1980, May 1). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 13. Retrieved April 27, 2023, from http://nla.gov.au/nla.news-article263286093; P.M. OPENS NEW BUILDING AT YESHIVA (1980, May 8). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 1. Retrieved April 27, 2023, from http://nla.gov.au/nla.news-article263286530; "MAYOR WANTS TO DO MORE FOR RUSSIANS" *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)* 24 April 1980, accessed April 27, 2023 2023 <http://nla.gov.au/nla.news-article263285768>.
[9] SCHOOL IS AN ENDURING TRIBUTE TO SPONSORS (1980, May 1). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 14. Retrieved April 27, 2023, from http://nla.gov.au/nla.news-article263286078; P.M. WILL OPEN YESHIVA CENTRE (1980, April 17). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 33. Retrieved April 27, 2023, from http://nla.gov.au/nla.news-article263285363
[10] FLOWERS MAJOR DONORS PAY FOR NEW YESHIVA BUILDING (1979, November 15). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 5. Retrieved April 27, 2023, from http://nla.gov.au/nla.news-article263248169; SCHOOL IS AN ENDURING TRIBUTE TO SPONSORS (1980, May 1). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 14. Retrieved April 27, 2023, from http://nla.gov.au/nla.news-article263286078;
[11] Turning cherished hope into reality (1980, May 1). The Australian Jewish Times (Sydney, NSW : 1953 - 1990), p. 15. Retrieved April 27, 2023, from http://nla.gov.au/nla.news-article263286082
[12] Major Yeshiva development (1989, February 17). The Australian Jewish Times (Sydney, NSW : 1953 - 1990), p. 5. Retrieved April 27, 2023, from http://nla.gov.au/nla.news-article263274327
[13] Major Yeshiva development (1989, February 17). The Australian Jewish Times (Sydney, NSW : 1953 - 1990).
[14] Turning cherished hope into reality (1980, May 1). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 15.

he moved to Vilnius, Lithuania in 1939. [15] At the outbreak of World War Two, Pollack returned to Lods to locate his parents, however they had already travelled to Warsaw. In 1941 Pollack obtained a passport from Dutch consul travelling to Japan to escape Germany's advance, and was relocated to Shanghai, Hong Kong, and later Indonesia before reaching Australia (via boat) on Saturday 13 December 1941. [16]

Pollack graduated from the University of NSW in 1964 and entered into private practice in 1966. He designed an apartment block in Lakemba, flats in Drummoyne and terraces in Paddington before beginning property development company Mirvac in 1972. [17]

Judaism in NSW

Jewish people have been present in Australia since the arrival of the First Fleet which included Jewish convicts. Whilst this constituted a presence it wasn't until much later that Jewish communal structures were erected.

In 1832 the Jewish community in Sydney was formally established ensuing from the arrival of free Jewish settlers in greater numbers throughout the 1820s. [18] As most Jewish migrants of this period were of British origin it was an English pattern of Jewish religious practice that first came to Australia.

In 1844 the first purpose-built synagogue was constructed on York Street in Sydney. [19] The gold rush during the 1850s attracted larger numbers of Jewish settlers to Australia and the Sydney Jewish congregation separated engendering a second synagogue in a former Baptist Church on Macquarie Street. [20] In the mid nineteenth century 40 per cent of the then existing Jewish migrants in Australia lived throughout rural NSW. [21] Many either moved to Syndey or assimilated due to the difficulty observing Jewish customs. By the 1870s the two congregations were unified with the construction of the Great Synagogue beginning 1875. [22]

The persecution of Jewish people led to the arrival of Jewish refugees before and following World War II. However, the Jewish population of Sydney almost doubled from postwar migration throughout the 1950s when at this time almost 60 percent of

[15] Mark McGinness, "He needed both wisdom and wits", *Sydney Morning Herald*, February 4, 2005, accessed April 27, 2023, https://www.smh.com.au/national/he-needed-both-wisdom-and-wits-20050204-gdkmin.html
[16] Mark McGinness, "He needed both wisdom and wits".
[17] Mark McGinness, "He needed both wisdom and wits".
[18] Suzanne D Rutland, "Jews," Dictionary of Sydney, 2008, accessed May 17, 2023, https://dictionaryofsydney.org/entry/jews;
[19] Laila Ellmoos, "Great Synagogue," Dictionary of Sydney, 2008, accessed May 17, 2023, https://dictionaryofsydney.org/entry/great_synagogue#ref-uuid=b1c1c47f-20cf-1d32-5355-5b8cf83949c0
[20] Suzanne D Rutland, "Jews,"; "Great Synagogue," State Heritage Inventory, accessed May 17, 2023, https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5051584
[21] Suzanne D Rutland, "Jews".
[22] "Great Synagogue," State Heritage Inventory.

Sydney's Jewry were foreign born. [23] During the postwar period Sydney's Jewish community was invigorated by new ideas about Judaism influenced new refugee migrants. While some Orthodox synagogues were strengthened other forms of Judaism such as Reform (Progressive) Judaism were introduced, resulting in the erection of Temple Emmanuel c1938. This led to a period of construction of some 21 synagogues and educational institutions across Sydney in the 1950s. More recently the construction of new synagogues has been focused primarily in the eastern suburbs of Sydney.

[23] Suzanne D Rutland, "Jews,"; "History of NSW Jewry," New South Wales Jewish Board of Deputies, accessed May 17, 2023, https://www.nswjbd.org/history-of-nsw-jewry/

Harry Seidler (1923 – 2006)

The following is a precis of Jennifer Taylor's Harry Seidler entry within the Encyclopedia of Australian Architecture. [24]

Harry Seidler was born in Vienna, Austria in 1923 to Jewish parents. In 1938 following the Nazi occupation of Austria Seidler fled to England where he continued his education at Cambridge Polytechnic. In May 1940 Seidler was deported to Canada as an interned enemy alien. Throughout 1941-44 Seidler attended 1944 the University of Manitoba in Winnipeg while on study release parole. He obtained a Bachelor of Architecture in 1944. While attending graduate school at the University of Harvard, Cambridge (1945-46) Seidler was educated by Marcel Breuer and Walter Gropius who instructed the principles of Bauhaus design. This education was highly influential and Seidler continued to uphold Bauhaus principles throughout his career and design output. Other notable associations during Seidler's education and training include Josef Albers who he studied under at Black Mountain College and Oscar Niemeyer. In 1948 Seidler spent four months in Niemeyer's office in Rio De Janeiro, Brazil. The influence of Niemeyer is evident in the sculptural form expression of concrete in Seidler's output. In 1948 Seidler joined his family in Australia and established his practice in 1963 with immediate success. Seidler's offices went on to become one of the most important architectural practices in Australia known in particular for large works as well as houses. His life and work are discussed in published histories of Australian architecture as well as monographs about him. For instance, in Jennifer Taylors view Seidler is

> *"One of the major talents in Australian architectural history. He was a leading figure throughout his career, and the first architect in Australia to fully comprehend the lessons handed down from the Bauhaus, from which he remained a steadfast exponent."* [25]

In the opinion of Professor Barry Bergdoll Seidler is regarded as having designed "some of the most spatially compelling designs of twentieth century architecture". [26]

[24] Jennifer Taylor, "Harry Seidler", in *The Encyclopedia of Australian Architecture,* eds. Hannah Lewi and Phillip Goad, (Cambridge University Press: Port Melbourne, Victoria 2012), 622-624.
[25] Jennifer Taylor, "Harry Seidler", 623-624.
[26] B Bergdoll, "Australian idiom," in Modern Australia, eds. Hannah Lewi and Phillip Goad (Thames & Hudson: Port Melbourne, Victoria 2019), 13.

4. Physical Analysis

The place is a modernist building with a simple rectangular form with windows that repeat across the same panes of northern façade, it is located on a narrow allotment. It has distinctive repetitive curved roof form. For detailed assessment see schedule below.

The following schedule of elements describes each component of the 1959 designed synagogue and former Sydney Talmudical College premises building, noting fabric which is original as adjudged by examination of original plans and photographs, and informed by general knowledge of history of building in New South Wales.

Element	Description	Period	Notes
Synagogue building			
Interior	Seven interior semicircular vaults finished with set plaster and painted.	Vaults and render are original. It is unclear if the existing painting is original.	Earlier photographs of the synagogue show light fittings that are suspended from the apex of the interior vaults. There is no visible evidence of these original features.
Ceiling	The finish of interior of vaulted ceiling is set plaster and painted. Appears to have some finish/trim with downlights on centre of the ribs of the vaults.	It is unclear if the existing painting to ceiling finish is original. The finish to ribs of vaults is recent.	Earlier photographic evidence shows the interior finish to vaulted ceiling as rendered concrete or similar.
Bulkhead	Sheet material cantilevered from all interior walls containing air-conditioning and other services, with downlights on the soffit	Recent	This element is not shown in earlier photographic evidence of synagogue interior.
Synagogue Interior Walls			
East	Finished with plasterboard, or similar, painted and set square to the bulkhead.	Recent	Earlier photograph evidence of eastern wall shows the interior finished with plasterboard or face brick rendered Earlier photograph evidence of eastern wall shows large panel (wood in appearance) to centre with double with double doors either side there are large square glass panels above the lintel of each double door.
West	Plasterboard or similar.	Recent	
North	Plasterboard, or similar panels, with expressed joint at the centre of the ribs of the vaults.	Recent	1962 photograph taken by Harry Seidler shows the interior finish to northern wall as face brick with concrete columns expressed.

South	Plasterboard or similar panels with expressed joint at the centre of the ribs of the vaults	Recent	1962 photograph taken by Harry Seidler shows the interior finish of the former division partition wall as ribs or curtains with the joins expressed like posts.
Synagogue Floor			
Skirting	15 x 100 stone tile matching that on the floor.	Recent	Earlier photographic evidence shows no visible skirting boards to interior finish of walls.
Finish to floor	Floor 500 x 500 mm stone with fine joints	Recent	Earlier photographic evidence shows parquetry floor finish; the original fabric of flooring finish is unclear.
Liturgical Furniture and Fittings			
Bema placed centrally	Raised plinth in oak with large laser cut metal grey, balustrade and oak corner posts appears to be sitting on wheels.	Recent	Earlier photographic evidence shows bema at west end, on a raised plinth with stairs accessing ends to north and south. A large balustrade forms the edging of Bema with light fixtures to each corner; finish appears to be metal and painted blue.
Reading desk and Torah	Sheet veneered in oak with aluminium trim and fitted seats matching the pews, with one step adjoining base accessing lectern at the northern/southern end	Recent	1962 photograph taken by Harry Seidler shows reading desk as wood? with metal painted in blue balustrade on eastern end. No visible step accessing lectern is shown.

Ark	Ark cabinet adjoins interior of northern wall finished with stone and wood panels. Hebrew text is engraved on lintel of Ark cabinet. Ark is concealed behind fabric decorated with Hebrew text and flags.	Recent	Earlier photographic evidence shows the Ark cabinet adjoining the interior of the east/west wall. A 1962 photograph taken by Harry Seidler show the Ark cabinet abutting a large wood(?) panel and reveal framed in wood(?). There is a decorative element above the lintel of ark cabinet; possibly a light fixture. Ark is concealed behind dark panels/curtains with possible material/fabric finish decorated with Star of David.
Menorah	Menorah is placed to east/west end of Ark cabinet on northern wall. The menorah branches are straight and of angled less than 90 degrees from body of menorah base; the design appears to be metal in finish	Recent	Earlier photographic evidence shows the Menorah placed in front of Ark cabinet affixed to metal balustrade of reading desk. The menorah branches are curved toward ceiling its design appears to be metal in finish painted white.
Pews	Oak (?) veneer linear units of seven and 14 seats respectively, with fitted receptacles, folding lids sit on solid bleachers of stone	Recent	A 1962 photograph taken by Harry Seidler shows second hand pews as long benches constructed from timber with open backs
Doors, West wall	Two sets of painted pre-painted aluminium doors with frosted laminated glass set in rubber with a transom and fixed glass fan light	Recent	
Doors south	Two sets of solid fire doors painted the door in the West, has two steps in the floor, stone material	Recent	

Windows East	Two fixed pre-painted aluminium windows with frosted and clear glass set with rubber gaskets	Recent	
Windows North	Glazed infill to the hemi, circular vault, factory, painted aluminium with frosted glass fix on the side and top panel and a awning hung centre panel	Recent	
Exterior			
South	Adjacent to the eastern wall is a panel of approximately three lineal metres face brick painted with semicircular, right joints and unexpressed concrete plinth with DPC	Original?	
	The majority of the exterior is now inside in addition, and is a beam on the floor supporting a plasterboard block of boxes with doors in it	Recent	
West	Concrete volt number eight finished in sprayed textured render	Original?	
	South wall render and painted masonry wall	Original?	At the centre of the wall is the foundation stone bears, the following text in English "this foundation stone was laid by Mr A Rabinovitch JP, founder and president of the Sydney Talmudical College in the presence of The Rosh Yeshiva Rabbi G Herc 27th of August 1961", and in Hebrew as well.
	North wall rendered masonry painted	Original?	

	The pier at the west end of the wall is faced out in a sheet material	Recent	
	Skirting	One 50 x 15 stone to match the floor	Recent
	Floor 500 x 500. Approximately stone tiles with narrow joints.	Recent	
East	Aluminium frame, glass partition in the configuration of the original	Recent	
Courtyard	Stair unit	2.2 approximately curved wall with mosaic tiles and brass plaque.	The wall form is original. The tiling is recent. The brass plaque is the incised image of the menorah, the Torah and in English Rabinovich Yeshiva college, Sydney
	Wall north and south	Or form concrete to face	Original?
	West rendered concrete with applied stone facing to the exterior	Recent	
	Entry porch, concrete, curved walls, concrete, cantilevered roof rendered and painted with factory painted steel, grill, large gates	Recent	
	Floor patterned ceramic or porcelain tiles with a square stainless steel drainage grill in the middle	Recent	
Lower ground floor	Ceilings plasterboard set square	Recent	
	Walls plaster board	Recent	
	Doors pre painted metal frame and glazed sidelight. Solid fire door	Recent	

	Window painted aluminium framing	The heavy beam across the middle may indicate an earlier configuration. It's a little bit unexpected.	
	Floor strip carpet and tiles	Recent	
	Stair to lobby concrete form original	Stone tiled steps and stainless-steel handrail recent	

5. Comparative analysis

Preparatory to a discussion of cultural significance in the following section, lists have been prepared of relevant places for comparative purposes. Unless otherwise noted notes on significance and descriptions are by HAA, drawn from secondary sources in the main.

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5.1. Relevant works by Harry Seidler

Jewish Architecture by Seidler			
Name of work	Location	Year	Significance/Description
Australia-Israel Friendship Forest Memorial  Figure 3 Australia-Israel Friendship Forest (Source: Shalom Crafter) [27]  Figure 4 (Source: Harry Seidler: Four Decades of Architecture) [28]	Israel	1990	An assembly place, and tribute to the at the time 40-year friendship between Australia and Israel. It is notable for commemorating the ongoing relationship between Australia and Israel. Description: Two stone paved plazas set in the foothills of the surrounding valley landscape addressing the southern panorama. The assembly point is accessed via an opening with concrete lintel and stonewalls, leading to steps down to a monument on the eastern wall. The western portion wall bears gold coloured metal lettering of the names of sponsors and patrons. The plazas are bounded by opposing retaining walls; one straight and the other curved.

[27] "Vision for the Wilderness Leadership Academy in Shorashim," *Shalom Crafter*, accessed May 17, 2023, https://shalomcrafter.weebly.com/wilderness-leadership-academy_old/category/all.
[28] Kenneth Frampton and Phillip Drew, "Harry Seidler: Four Decades of Architecture," (London: Thames & Hudson Ltd 1992), 184.

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Nominated Architect:
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Jewish Holocaust Memorial (Formerly Martyrs Memorial) in Rookwood Cemetery and Necropolis  Figure 5 Jewish Holocaust Memorial (Martyrs Memorial) Source: Heather Stevens 2019, Monument Australia.  Figure 6 Jewish Holocaust Memorial (Martyrs Memorial) (Source: Gary Heap 2021, Monument Australia).	East Street, Lidcombe, NSW 2141. (SHR #00718)	1969-1972	A monument commemorating the victims of the Nazi Holocaust of World War II. It was the first memorial monument of its kind erected by the NSW Jewry. For the monument Seidler worked with engineers Miller, Milston and Ferris.[29]
Relevant domestic architecture by Seidler			

[29] Martyrs memorial to be built at Rookwood, Sydney (1969, August 21). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 1. Retrieved May 17, 2023, from http://nla.gov.au/nla.news-article263156299

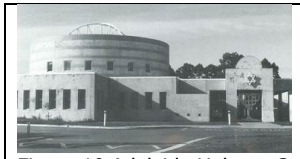
Meller House  Figure 7 Meller House (Source: State Heritage Inventory)	37 The Bulwark, Castlecrag NSW 2068 LEP #1995	1950	"37 The Bulwark is an excellent example of the early work of Australia's most eminent modern architect, Harry Seidler, AC. The house, with its level of integrity and with its position on the highest point of Castlecrag, overlooking Sailor's Bay is of a high level of aesthetic significance. It is a rare example of the architect's work in the area." [30]. For this house Seidler worked with the engineers Miller, Milston and Ferris
Igloo House (Williamson House)  Figure 8 The Igloo House (Source: State Heritage Inventory)	65 Parriwi Road, Mosman NSW 2088 SHR #01652	1951	"Igloo House, dating from 1951, is of State aesthetic significance as an important early example of modern house design in Australia, which is innovative in its use of structural technology. It is significant for its association with its designer, leading Australian architect Harry Seidler, who had been a teenage refugee from Nazi oppression in the 1930s and who had trained as an architect in Canada before coming to Australia in 1948 to design a house for his immigrant parents. Igloo House is thus also a demonstration of the contribution of immigrant culture to Australia." [31]

[30] "House (including original interiors) - Meller House," State Heritage Inventory, accessed May 8, 2023, https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=2660244
[31] "Igloo House, The," State Heritage Inventory, accessed 8 May, 2023, https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5045139.

5.2. A survey of Synagogues and Jewish Schools outside NSW

Adelaide			
Synagogue	Location	Architect and construction	Significance/Description
Beit Shalom Synagogue  Figure 9 Beit Shalom, Hackney Road (Adelaide Jewish Museum). [32]	Hackney Road Adelaide	Architect unknown c. 1970 - 1979	Significant as a Liberal synagogue in Adelaide with the congregation forming in 1963. The synagogue was converted from a house. The synagogue has stained glass windows but is otherwise unremarkable.
Adelaide Hebrew Congregation in Glenside	13 Flemington St, Glenside SA 5065	1850; 1989-1990	Significant was the first synagogue in Adelaide. It was renovated in 1989-1990 and is the 'longest continuously used synagogue in the southern hemisphere'. [34]

[32] "Beit Shalom Synagogue", Adelaide Jewish Museum, accessed May 17 2023, https://adelaidejmuseum.org/features/beit-shalom-synagogue/.
[34] "History," Adelaide Hebrew Congregation, accessed May 17, 2023, https://adelaidehebrew.com/about#block-ddb233bc420c0495b91c

 Figure 10 Adelaide Hebrew Congregation (Source: Adelaide Jewish Museum).[33]			
Victoria			
Brighton Hebrew Congregation Synagogue  Figure 11 Brighton Hebrew Congregation Synagogue (Source heritage ALLIANCE).	132 Marriage Road BRIGHTON EAST	Built 1950-53; 1965-66 Herbert Tisher (1950); Abraham Weinstock (1965-66).	The synagogue at 132 Marriage Road in Brighton East is a local item of historic, architectural, and aesthetic significance. Constructed in 1950-53, it was one of the first new synagogue built in Melbourne following WWII. The principal building was designed by Herbert Tischer, in 1950 (c1950-53). Abraham Weinstock added the substantial extension (c 1965-66). It has rarity value as the only example of a bold 1960s synagogue with its locality. It has aesthetic significance for its contemporary use of the bold hexagonal form as an expression of the star of David.[35]
Kew Jewish Centre (Bet Nachman Synagogue)	53 Walpole Street, Kew, Boroondara City	Louis Kahan c. 1963- 1965	Known for the site of the Kew Hebrew Congregation is has local historic significance for its ability to demonstrate the development of Jewish worship and culture in the City of Boroondara from 1949. As a collection of buildings including the Bet Nacham

[33] "Adelaide Hebrew Congregation," Adelaide Jewish Museum, accessed May 17, 2023, https://adelaidejmuseum.org/features/adelaide-hebrew-congregation/.
[35] David Wixted and Simon Reeves, *City of Bayside Inter-War & Post-War Heritage Study, Voume 2 of 2* (North Melbourne: heritage ALLIANCE, 2010), 68, https://www.bayside.vic.gov.au/sites/default/files/2021-09/Volume%202_0.pdf.

 Figure 12 Kew Jewish Centre (Source: Melbourne Photos Australia) [36]  Figure 13 Figure 10 Kew Jewish Centre (Source: Boroondara Planning Scheme). [37]	Local Item (Place ID 199790)		Synagogue (c1963-65) Norman Smorgon House which building envelope encompasses the remnant core of a brick residence (c1886) only with other associated buildings represent the development of a cohesive social, religious and cultural centre of the Jewish community (also of social significance) of Kew during the postwar period. It has rarity value as postwar example of a synagogue in the city of Boroondara and within Victoria. It is representative of a postwar Internationalist synagogue designed by émigré architects (Anthony A Hayden) and has local aesthetic significance of its distinctive use of pre-cast concrete, form composition, flat roof and expansive use of glazing.
St Kilda Hebrew Congregation Synagogue  Figure 14 St Kilda Hebrew Congregation Synagogue (Source: Victorian Heritage Database).	10-12 Charnwood Grove, St Kilda, Port Phillip City. VHR H1968 Place ID 3467	Joseph Plottel c. 1926	"The St Kilda Hebrew Congregation synagogue is of state significance for architectural, aesthetic and historic reasons. It is architecturally and aesthetically significant as a highly distinctive stylistic representation of the Byzantine style. The scale and quality of the building and finishes are demonstrative of the development of the local Jewish community during the inter war period. The synagogue has historic significance primarily for its association with Rabbi Jacob Danglow who served the congregation 1905-1957. Is socially significant

[36] "Kew Synagogue," Melbourne Photos Australia, accessed May 17 2023, http://melbournedaily.blogspot.com/2014/03/kew-synagogue.html.
[37] "Kew Hebrew Congregation, 53 Walpole Street, Kew Statement of Significance," Boroondara Planning Scheme, accessed May 17, 2023, https://www.boroondara.vic.gov.au/media/59831/download?inline.

			to the Jewish community of St Kilda from the inception of the congregation in 1871." [38]
Former Mickveh Yisrael Synagogue and School  Figure 15 Former Mickveh Yisrael Synagogue and School (Source: Victorian Heritage Database)	275-285 Exhibition Street Melbourne VHR H0766	Knight and Keer	"The City Free Kindergarten is a simple brick structure with pedimented gables, brick pilasters and arched windows with brick dressings. It was constructed in 1859-60 as a Jewish School for the Michveh Yisrael Synagogue. The architects were Knight and Keer who also designed Parliament House, Melbourne. The building was used for worship until 1877 and since then has served several uses. It became a kindergarten in 1920. This was one of the earliest synagogues in Melbourne and a surviving example of early building in the C.B.D. It is an interesting example of the conservative classical style and of the small scale work of Knight and Kerr. The projecting pediments with trapezoidal brackets are a distinctive and important motif and can be compared, with the same usage at 'D Estaville' in Kew, also by Knight and Kerr and erected in 1857. The building is essential to the character and historic quality of the neighbouring area. Windows on the Exhibition and Little Lonsdale Street facades have been deepened; windows down the other side remain intact. From an 1870 photo it seems that part of the pedimented

[38] "St Kilda Hebrew Congregation Synagogue", Victorian Heritage Database, accessed April 19, 2023, https://vhd.heritagecouncil.vic.gov.au/places/3467

			end to Exhibition Street facade has been removed. The brickwork has been painted." [39]
Synagogue – Melbourne Hebrew Congregation  Figure 16 Synagogue, Melbourne Hebrew Congregation (Source: Victorian Heritage Database).	Melbourne city 2-8 Toorak Road (Corner St Kilda Road), South Yarra	Nahum Barnet 1928- 1930	"Victoria's most prominent synagogue, in a style of twentieth century Baroque classicism with a Corinthian portico and striking copper dome suggestive of the composition of Palladio's Villa Capra. It was built in 1928-30 to the design of Nahum Barnet and is in very intact condition, with a richly designed interior in traditional form, including a women's gallery." [40]
Former Residence  Figure 17 32 Lord St Brunswick (Source Victorian Heritage Database).	Melbourne City 32 Lord Street Brunswick	James Dolphin c 1911-1912	"A most unusual brick building, erected as a home for James Dolphin in 1911-12 but used as a synagogue and Sabbath School by the Brunswick Talmun Torah from 1942 until its closure in 1987, during which time it was the only synagogue north of the City of Melbourne. The building is notable for its extraordinary portico (of timber?) with oversized entablature supported on paired Ionic columns, its keyhole-shaped front door and windows giving a somewhat Moresque character; and elaborate joinery in the hall and

[39] "FORMER MICKVEH YISRAEL SYNAGOGUE AND SCHOOL," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/747
[40] "Synagogue - Melbourne Hebrew Congregation," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/65737

			principal rooms. The use of very large terracotta ventilating panels is also of interest." [41]
East Melbourne Synagogue (Mickva Yisrael)  Figure 18 East Melbourne Synagogue (Source: Victorian Heritage Database).	Melbourne City 494-500 Albert Street East Melbourne	Crough and Wilson c. 1877 - 1883	"Victoria's largest nineteenth century synagogue, containing a Bema, Tabernacle and other features in a highly intact state and of architectural interest especially for the interior of 1877, designed by Crough & Wilson. The space is surrounded on three sides by a Gallery carried on iron columns, each surmounted by an unusual arrangement of an impost block flanked by consoles (in the manner of the Badia at Fiesole, Italy); the face of the gallery is treated as a classical entablature with dentillation and the balustrade is of swag-bellied cast iron. The main ceiling is panelled, with a dentillated and modillionated cornice and with a row of large and unusual ventilators marking the location of former suspended gas lights. The facade, completed in 1883 to the design of T J Crouch, is an imposing but not especially remarkable renaissance design with a pedimented centre panel projecting slightly and with dome-like hexagonal mansard roofs to either side." [42]
Former Mickveh Yisrael Synagogue and School	Melbourne City 275-285 Exhibition Street, Melbourne	Knight and Kerr 1859	"The Former Mickveh Yisrael Synagogue and Hebrew School was constructed in 1859 to a design by the architects Knight and Kerr. It was used as such until 1877 when a new Synagogue was built in Albert Street, East Melbourne. It then became State School No 2030 until 1892, and subsequently had a

[41] "Former Residence," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/66212.
[42] "EAST MELBOURNE SYNAGOGUE," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/353.

 Figure 19 Former Mickveh Yisrael Synagogue and School (Source: Victorian Heritage Database).			number of educational, social welfare and child care uses. The building is a simple single storey brick structure on a basalt plinth, with pedimented gables, brick pilasters and arched windows with brick dressings." [43]
Synagogue  Figure 20 2-4 Barkly St Ballarat East (Source: Victorian Heritage Database).	Ballarat City 2-4 Barkly Street, Ballarat East	T. B. Cameron 1861	"The Jewish Synagogue in Barkly Street, Ballarat was built in 1861 and designed by the local architect, T. B. Cameron for the Ballarat Hebrew congregation. The first Jewish service was held in the Clarendon Hotel, Lydiard Street, in 1853 as the Jewish community began to establish itself in Ballarat, two years after gold was discovered in the area. The growth of this community in the township of Ballarat resulted in the need for a permanent synagogue. Constructed in Barkly Street and consecrated in 1855, the first synagogue in Ballarat was a large, timber building, designed to accommodate a congregation of about two hundred. Two years later, about three hundred Jews were recorded as residing in Ballarat and the surrounding areas, with similar numbers in Bendigo and fewer in such towns as Geelong, Avoca and Castlemaine. In 1859 the Ballarat East Town Council requisitioned the land in Barkly Street and granted the congregation a

[43] "FORMER MICKVEH YISRAEL SYNAGOGUE AND SCHOOL," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/747.

			replacement site at the corner of Barkly and Princess Streets. Private homes were used for religious services until the new synagogue, designed to accommodate about three hundred and fifty people, was built, and consecrated in 1861. The Synagogue is a single storey rectangular building designed in a simple Renaissance Revival style with pedimented portico fronting a parapeted main hall. Paired Tuscan squared columns and pilasters support the portico, the tympanum of which contains the name of the congregation, Remnant of Israel(?) in Hebrew characters. Tuscan pilasters support the deep cornice of the main parapet and divide the side facades into bays. Simple, tall round-headed window openings flank the front portico and are positioned along the sides of the main hall. Remodelling was undertaken in 1878, including the extension of the women's gallery along the sides of the hall, and the addition of a second staircase to the gallery and ante-rooms towards the front of the building. Externally the latter are in a style consistent with that of the building. The Synagogue was originally constructed in face brickwork, with contrast provided by rendered pilasters, columns, pediment, window reveals and cornice. The entire building has since been rendered. The building was renovated in the 1960s and 1970s and is still in use as a synagogue."[44]

[44] Synagogue," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/58.

Former Synagogue  Figure 21 Former Synagogue (Source: Victorian Heritage Database).	Geelong City 74 McKillip Street, Corner Yarra Stret, Geelong	Jones and Halpin 1861	"The former Synagogue at Geelong was built in 1861 by builders Jones and Halpin to a design by Geelong architect John Young. The stucco rendered brick structure in classical revival style replaced an earlier structure constructed in 1854. The building is now used as an office." [45]

[45] Former Synagogue," Victorian Heritage Database, accessed May 17, 2023, https://vhd.heritagecouncil.vic.gov.au/places/68316.

5.3. Synagogues and other notable Jewish architecture in New South Wales, in chronological order

Minor synagogues or those of no known designer are not included.

Name of Synagogue	Location	Architect	Significance or Description
Great Synagogue  Figure 22 Great Synagogue (Source: State Heritage Inventory).	Castlereagh St SHR #01710	Thomas Rowe (1872); 1957 basement deepened and reconstructed as War Memorial Hall. 'Some intrusion, although the previous basement area appears to have been of little significance.'[46]	Significant as likely the earliest surviving synagogue in New south Wales still in use. Built in the Victorian style it is elaborately decorated both internally and externally. It has excellent decorative mouldings, carved sandstone, metalwork, tiling and stained glass.
Newcastle Hebrew Congregation Synagogue	122 Tyrrell St, The Hill NSW 2300	Messrs Pepper & Seater[47] 1927	Constructed in the At Deo style with dome, the stretcher bond brick contrasts against the white moulding. There is a circular stained-glass window decorated with the Star of David to the principal façade. The first floor entry has a porch which is flanked by two columns with lintel bearing Hebrew text.

46 "Great Synagogue," State Heritage Inventory, accessed May 8, 2023, https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5051584
47 https://www.newcastlehebrewcongregation.org/history.html

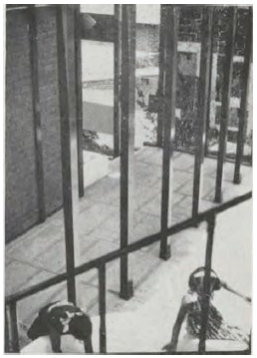
 Figure 23 February 2023 (Source: Raynardthan Pontoh; Google Images).			
Emanuel Synagogue (formerly Temple Emanuel Synagogue)  Figure 24 Lippmann Partnership restoration (Source: Brett Boardman & Willem Rethmeier 2018, Lippman.com.au)  Figure 25 Emanuel Synagogue (Source: Dictionary of Sydney)	7 Ocean St, Woollahra LEP #519	1941 Principal synagogue by Lipson c1966 Second synagogue added by Bolot; Neuewg Synagogue (former chapel) 2018 Restoration of interior by Lippmann Partnership	Emmanuel Synagogue is of local historic significance as the first of only two Liberal Synagogues established in Sydney and shows the expansion of Liberal Judaism in Australia in the mid-20th century. Both synagogues on the site are associated with émigré architects Lipson and Bolot as examples of their respective works. The composition and materials of the forecourt are of local aesthetic significance. Emanuel Synagogue contributes to a group of Inter-War buildings on Ocean and Wallis Street. Emanual Synagogue is of local social significance for its ongoing ability to meet the needs of its congregation. The Emmanuel Synagogue has rarity value as the only surviving early example of a Liberal Judaism synagogue in Australia and as intact surviving example of Lipson's work.

Chevra Kadisha  Figure 26 Source: Sydney Chevra Kadisha. [48]	172 Oxford St, Woollahra	Lipson & Kaad (Samuel Lipson) 1949-52	Notable as place of Jewish burial and funeral services. It was renovated c. 1949 – 1952 to the design of Samuel Lipson of Lipson and Kaad.
Nefresh Shul (formerly Roscoe St Synagogue)  Figure 27 Source: Nefesh Library and Community Centre. [49]	54 Roscoe Street, Bondi	Unknown Possibly 1955-57	The original single storey synagogue was demolished to erect a three storied synagogue and community hub in 2021.
North Shore Synagogue, at Lindfield (formerly the Garden Synagogue) [50]	Treatts Road, Lindfield	Hans Peter Oser	A modernist synagogue with skillion roof form, constructed with concrete besser blocks and cladding to principal northern façade. Northern façade is ornamented with menorah and Star of David.

[48] "Gallery," *Sydney Chevra Kadisha*, accessed May 17, 2023, https://sydney-chevra-kadisha.business.site/.
[49] "New Builoding Images – June 2021," *Nefresh Library & Community Centre*, accessed May 8, 2023, https://www.nefesh.org.au/templates/photogallery_cdo/aid/5154717/jewish/New-Building-Images-June-2021.htm.
[50] Undated extensions alterations and additions to synagogue building Killara, HP Oser. "TENDERS CALLED" Construction (Sydney, NSW : 1938 - 1954) 21 November 1951: 11. Web. 8 May 2023http://nla.gov.au/nla.news-article222887670; Undated extension alteration and additions to building in Lindfield for North Synagogue – plans etc HP Oser. "TENDERS CALLED" Construction (Sydney, NSW : 1938 - 1954) 30 April 1952: 13. Web. 8 May 2023 http://nla.gov.au/nla.news-article223548112; Undated extensions additions and alterations to building Lindfield for North Shore synagogue, HP Oser. "TENDERS CALLED" Construction (Sydney, NSW : 1938 - 1954) 7 May 1952: 10. Web. 8 May 2023 <http://nla.gov.au/nla.news-article223548193>.

 Figure 28 North Shore Synagogue (Source: Wikipedia, 2015).  Figure 29 Max Dupain (Source: "Unloved Modern" Rebecca Hawcroft, Migrant Architects).  Figure 30 Max Dupain (Source: "Unloved Modern" Rebecca Hawcroft, Migrant Architects).			
South Head Synagogue at dover Heights (Closed in 2017 now Kehillat Kadimah) [51]	626-666 Old South Head Road, Rose Bay	Neville Gruzman 1957-58 Gruzman building now demolished	Gruzman's original design has since been demolished (date unknown), photographic evidence from that time shows curved stairs with balustrade and columns to. what appears, the roof form eaves. It was described as ultra-modern.

[51] SOUTH HEAD & DISTRICT SYNAGOGUE (1950, November 16). *The Hebrew Standard of Australasia (Sydney, NSW : 1895 - 1953)*, p. 4. Retrieved May 5, 2023, from http://nla.gov.au/nla.news-article131103411; "Sydney Synagogue prevented from sacking Rabbi to close on Friday," Sydney Morning Herald, 2017, accessed May 5, 2023, https://www.smh.com.au/national/nsw/sydney-synagogue-prevented-from-sacking-rabbi-to-close-on-friday-20170629-gx1c8d.html; New Rose Bay Synagogue (1958, November 21). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 1. Retrieved May 5, 2023, from http://nla.gov.au/nla.news-article263068389

 Figure 31 Source: Architecture and Arts 1962 [52]  Figure 32 Max Dupain (Source: Series 31 - Religious - Synagogues, University of Melbourne) [53].		(demolition date unknown)	
Strathfield Synagogue (formerly Holocaust and	19 Florence St, Strathfield	Hans Peter Oser 1959	The Strathfield Synagogue congregation was established on the site in 1949 and has local historic significance as it

[52] Jennifer Hill and Elizabeth Gibson, *1480 – Strathfield Synagogue heritage Assessment* (Sydney: Architectural Projects, 2014), 184, http://jewsofnsw.info/heritagelists/StrathfieldHeritageAssesment.pdf.

War Memorial Synagogue)  Figure 33 Source: Strathfield Schule, weebly.com.  Figure 34 Source: Strathfield Schule, weebly.com [54]	LEP #I232		demonstrated the development of the Jewish population into Sydney suburban areas in the post war period. It is notable for associations with the Conference on Jewish Material Claims Against Germany and education in the growing Jewish Community in Strathfield in the mid-20th century. It has local aesthetic significance as a good example of well-known modernist émigré architect HP Oser. It is sustainably intact despite additions retaining synagogue elements including pendant lamps and plywood doors decorative with copper pulls and Menorah symbol. It has rarity value for its architectural style (in Strathfield) as the only surviving purpose-built synagogue from the post war period in the western suburbs of Sydney. It is representative of its class as an International Style synagogue designed by emigrant architect in the post war period.
Cremorne Synagogue	12A Yeo St Neutral Bay	Hugh Buhrich 1958	A rectangular structure erected to the tabernacle plan form, Cremorne synagogue has a curved wall to centre of principal façade flanked by cladded terminating ends. It is decorated with the Star of David.

[53] "Series 31 – Religious – Synagogues," *University of Melbourne*, accessed May 8 2023, https://www.csec.esrc.unimelb.edu.au/image_viewer.htm?CSEC00900,4.
[54] "The Synagogue – Past and Present," *Strathfield Schule*, accessed May 5, 2023, https://strathfieldschule.weebly.com/the-synagogue---past-and-present.html.

 Figure 35 Source: onthehouse.com			
New Central Synagogue (formerly Central Synagogue and War Memorial) [55]	Bon Accord Av, Bondi Junction	Lipson & Kaad Samuel Lipson and Peter Kaad 1959	The original design was a synagogue constructed from brick with two curved concrete lintels over the principal entrance accessed via stair from street level. The synagogue has undergone numerous changes.

[55] Donors visit new synagogue (1969, August 7). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 7. Retrieved May 5, 2023, from http://nla.gov.au/nla.news-article263155980; NEW SYNAGOGUE IS "LARGEST IN AUSTRALIA" (1960, September 2). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 11. Retrieved April 14, 2023, from http://nla.gov.au/nla.news-article263139279; 1951 'Synagogue Meetings', *The Australian Jewish Herald (Melbourne, Vic. : 1935 - 1968)*, 21 September, p. 2. , viewed 14 Apr 2023, http://nla.gov.au/nla.news-article261423057; New Site for Central Synagogue (1952, February 15). *The Hebrew Standard of Australasia (Sydney, NSW : 1895 - 1953)*, p. 2. Retrieved April 14, 2023, from http://nla.gov.au/nla.news-article130949924;

 Figure 36 Source: The Australian Jewish Times 1969.  Figure 37 Source: Central Synagogue (Sydney), Wikipedia.			
North Shore Temple Emanuel 	Chatswood Av, Chatswood	Unknown 1960	Original synagogue was constructed in 1960 and its designer is unknown. The existing North Shore Temple Emanuel Synagogue has likely been largely altered.

[55] CENTRAL SYNAGOGUE SUPPLEMENT Why They Built The "New Central" (1960, September 2). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 7. Retrieved April 14, 2023, from http://nla.gov.au/nla.news-article263139306; CENTRAL SYNAGOGUE IN NEW HOME (1960, September 30). *The Australian Jewish News (Melbourne, Vic. : 1935 - 1999)*, p. 3. Retrieved April 14, 2023, from http://nla.gov.au/nla.news-article262395125; "Architecture, our collection," *Jewish Heritage New South Wales*, accessed April 14, 2023, http://www.jewsofnsw.info/architecture/

Figure 38 Source: North shore Temple Emanuel [56]  Figure 39 Source: Google street view, accessed May 8 2023.			
Bankstown Hebrew synagogue (formerly Jewish Martyrs War Memorial Synagogue) [57]  Figure 40 Source: Canterbury Bankstown Local Studies Collection.	Meredith St, Bankstown	Harry Harold Smith 1957 destroyed by fire 1991.	The second synagogue in Bankstown. Designed by Harold Harry Smith and completed in 1957. It was destroyed by fire in 1991. It is distinctive for its hexagonal form representative of the Star of David. It's entry way covered with concrete awning. Quite possibly the boldest post-war synagogue design in NSW had it survived. Its form exemplifies the expression of post war modernist émigré architects.
Coogee Synagogue	121 Brook St, Coogee	Unknown 1960 rebuilt 2006	The architect of the original design in unknown, the synagogue was rebuilt in 2006.

[56] "Who are We?," North Shore Temple Emanuel, accessed May 8 2023, https://www.nste.org.au/about-us
[57] MODERN HOUSE OF WORSHIP Bankstown Synagogue (1960, March 25). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 8. Retrieved April 14, 2023, from http://nla.gov.au/nla.news-article263136673; "Architect of new ideas and much of Sydney," *Sydney Morning Herald*, 2009, accessed April 14, 2023, https://www.smh.com.au/national/architect-of-new-ideas-and-much-of-sydney-20080716-gdsmad.html.

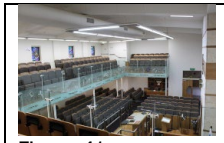
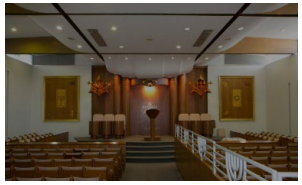
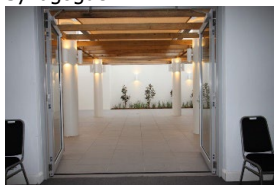
 Figure 41 https://images.shulcloud.com/852/81116_large.jpg			
Sephardi Synagogue  Figure 42 Source:  Figure 43 Source: The Sephardi Synagogue, sephardi.org.au	40 Fletcher St, Woollahra	Hugh Buhrich 1961, additions in 1962	Significant as the oldest Sephardi synagogue in Australia. The original design appears to be largely altered.
Wolper Jewish Hospital	Woollahra	Harold Harry Smith 1961	Smith's 1961 design was part of a major expansion fo the existing hospital and there have been alterations and additions since this time.

 Figure 44 Source: Wolpher Hospital, Facebook.			
Offices at the National Council of Jewish Women  Figure 45 Hall Source: National Council of Jewish Women NSW.	Woollahra	Harold Harry Smith 1963	Unable to locate image of Smith's 1963 design.
Cyril Rosenbaum Synagogue, Montefiore Home (on premises of aged care residence)	Hunters Hill	Aaron Bolot 1964	Significant as the synagogue located at Montefiore Home which has provided aged care services to Jewish communities since 1889. Unable to locate image of Bolot's 1964 design.

Kingsford Maroubra Synagogue  Figure 46 Source: Maroubra Synagogue. [58]  Figure 47 Source: Maroubra Synagogue.	635 Anzac Parade, Maroubra NSW 2035	Hugh Buhrich 1965	The original design has likely been altered. The existing synagogue has covered courtyard with roof supported by columns.

[58] "About," *Maroubra Synagogue*, accessed April 17, 2023, https://www.maroubrasynagogue.org.au/slide/about/.

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5.4. Architecturally distinguished Places of Worship of the 1950s and 1960s in New South Wales

St Bernard's Catholic Church at Botany
Designed by Kevin Curtin in 1954

Caringbah Uniting Church
Loder and Dunphy c. 1959

St Andrews Presbyterian Church, Gosford NSW
Loder and Dunphy c.1960 demolished 2022

Polish War Memorial Chapel, Blacktown NSW
Michael Dysart 1967

Holy Trinity Memorial Church Canberra Act
Frederick Romberg of Grounds, Romberg and Boyd (1961)

Our Lady of Fatima Kingsgrove

Wentworth Memorial Church, Vaucluse
Don Gazzard and Partners

St Anthony's RC Church Marsfield,
Enrico Taglietti 1968

Six Churches by B Smith of McConnell Smith and Johnson

Chapel of St Pauls College, University of Sydney
Jim Kell, of Foyle Mansfield Jervis and McLurcan 1964

5.5. Concrete Shell Structures of the 1950s

Igloo House

Sydney Opera House Utzon and Anderson (unbuilt shell structure)

Kevin Borland House, Victoria

St Mary's Star of the Sea Darwin
1955-1962

Holy Family War memorial Church Queensland
1960-63

Level 2, 1 Barrack Street
Sydney NSW 2000

Hector Abrahams Architects Pty. Ltd.
ABN: 95 160 116 030
Nominated Architect:
Hector Abrahams, Reg No. 5245

St Kevin's Dee Why
1959-61

5.6. Religious places built by migrant groups in NSW after World War II (a selection)

St Mina and St Minas Coptic Church Sydenham

The Gallipoli Mosque Granville

Polish War Memorial Chapel Blacktown

6. Assessment of Significance

6.1. Ability to demonstrate

Guidelines from the NSW Heritage Office emphasise the role of history in the heritage assessment process. A list of state historical themes has been developed by the NSW Heritage Council, in *New South Wales Historical Themes Table showing correlation of national, state and local themes, with annotations Dated 4 October 2001*.

The table below identifies fabric, spaces and visual relationships that demonstrate the relevant historic themes in evidence at the synagogue and former Sydney Talmudical College premises building located at 34 Flood St, Bondi.

Australian Theme	NSW Theme	Notes
Peopling Australia	Ethnic influences	The building at 34 Flood St, Bondi and its later development is evidence of the influences of Jewish culture within NSW.
Peopling Australia	Migration	The building at 34 Flood St, Bondi and its later development is evidence of the pattern of synagogue construction by migrant architects in the 1950-1960s.
Building settlements, towns and cities	Town, suburbs and villages	The land that the building at 34 Flood St occupies is evidence of subdivision patterns in Bondi and the Waverley LGA more broadly.
Educating	Education	The building at 34 Flood St is evidence of the development of Jewish education across NSW.

6.2. Assessment against NSW heritage assessment criteria

Criterion (a) An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area)

The building at 34 Flood St is historically significant as one of seven surviving works from a distinct period for synagogue construction within NSW (c1957-60). The synagogue is associated with the post war period enlargement of migration of Jewish faith and culture within NSW. The establishment of the Talmudic College is part of the development of a distinctive locale of Jewish immigrants within the Waverley Local Government Area. It also facilitated the training of rabbis in Sydney reflecting the growth of the Jewish faith diaspora following World War II. Finally, the construction of the synagogue is part of a historical pattern demonstrating the arrival of Jewish architects to NSW, all of whom were modernists; Hugh Buhrich, Hans Peter Oser and Harry Seidler.

Inclusion Guidelines	Check
Shows evidence of a significant human activity	Yes
Is associated with a significant activity or historical phase	Yes
Maintains or shows the continuity of a historical process or activity	Yes
Exclusion Guidelines	
Has incidental or unsubstantiated connections with historically important activities or processes	No, the connections with Jewish migration to NSW and synagogue building are substantial.
Provides evidence of activities or processes that are of dubious historical importance	No, migration and the development of the Jewish faith and community within Australia following World War 11 is not dubious historical importance.
Has been so altered that it can no longer provide evidence of a particular association	No, still a synagogue and school and has been retained as a work of a migrant architect.

Level of Significance: State

Criterion (b) An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area)

The synagogue and former Sydney Talmudical College premises building, located at 34 Flood St, Bondi, and its later development is evidence of the ongoing use of the place as a religious and civic site. The building and its later development addition reflects the broadening of institutions available to the Jewish faith community in NSW and the Waverley LGA; responding to migration patterns after World War II. The place maintains ongoing institutional associations with similar Jewish faith institutions in Brooklyn; New York, and Israel. As an institution the synagogue has an ongoing association with the broader Jewish community, by the training of Rabbis who engage with communities which are not congregants of the Orthodox 'Habad' philosophy.

The place is primarily associated with eminent modern architect Harry Seidler as the original design is his only religious building, although he did design Jewish sites, and demonstrates an important stage in Seidler's output and career as an early work of Civic architecture. The distinct roof form of the synagogue with its repeating thin shell concrete vaults is stylistically associated with principles of Bauhaus design and Modernism with which Seidler is particularly associated. It is an outstanding example of the modernist building forms produced and constructed by Seidler in collaboration with structural engineer Peter Owen Miller, of Miller, Milston and Ferris. This association began with c1950 Meller House (LEP item no. 1995), 37 The Bulwark, Castlecrag, and continued with the Igloo House c1951 (Williamson House, SHR item no. 01652) at Mossman. The synagogue and former Sydney Talmudical College premises building is associated with this collaboration and is an important work which demonstrates their innovative achievement.

The synagogue and former Sydney Talmudical College premises building is associated with Abraham Rabinovitch. Rabinovitch, a businessman and philanthropist, who was instrumental in the Jewish day school movement, which initiated the construction of similar Jewish institutions such as the North Bondi Hebrew School and Kindergarten (c1942-43) and Moriah College (c1952) in Sydney. Rabinovitch was the founder and chair of Sydney Talmudical College (now called Yeshiva College Bondi) who purchased the site on Flood Street in 1955 and commissioned Seidler to design the original college buildings. The ongoing use of the place for educational and worship purposes continue this significant associations.

The connection to the place with former Prime Minister Malcolm Fraser and prominent politician and judge Dr H.V. Evatt's is acknowledged as significant to the importance of the building but incidental as an association. In 1961, Dr Evatt attended opened the Syndey Talmudical College with buildings designed by Seidler.[59] Fraser opened the primary school building (Malka Brender Building) at Yeshiva

[59] Dr. EVATT OPENS COLLEGE FOR JEWISH STUDY (1961, September 1). *The Australian Jewish Herald (Melbourne, Vic. : 1935 - 1968)*, p. 7. Retrieved May 10, 2023, from http://nla.gov.au/nla.news-article265731010

College Bondi in 1980 while elected Prime Minister. [60] Dr Evatt, paternal uncle of architect Penelope Seidler nee Evatt (married to Harry Seidler), acted as Foreign Minister in the Chifley and Curtin governments circa 1940s and contributed to the establishment of the United Nations and drafting of the Universal Declaration of Human Rights. In 1947, Dr Evatt chaired a special committee on Palestine which engendered the partition of Palestine. [61] In 1949 as President of the UN General Assembly Dr Evatt oversaw the historic vote which admitted Israel as the 59th member of the United Nations. While these notable figures demonstrate the importance of the place as a Jewish institution their associations are merely incidental as they were not directly involved with the construction or design of the place.

Inclusion Guidelines	Check
Shows evidence of a significant human occupation	Yes, as a synagogue building and school and is evidence of an ongoing use.
Is associated with a significant event, person, or group of persons	Yes, with Seidler and his office; structural engineer Peter Owen Miller of Miller, Milston, and Ferris; Abraham Rabinovitch; Henry Pollack (Pollack and Associates later Mirvac); the Jewish migrant community within NSW including Russian Jewish migrants.
Exclusion Guidelines	
Has incidental or unsubstantiated connections with historically important people or events	No, the connections direct and well documented.
Provides evidence of people or events that are of dubious historical importance	No, the persons and events are significant to the cultural history of both NSW and the Waverley locality.
Has been so altered that it can no longer provide evidence of a particular association	No, additions to the building are evidence of continued use as a synagogue which continue these associations.

Level of Significance: State

[60] P.M. OPENS NEW BUILDING AT YESHIVA (1980, May 8). *The Australian Jewish Times (Sydney, NSW : 1953 - 1990)*, p. 1. Retrieved May 10, 2023, from http://nla.gov.au/nla.news-article263286530
[61] "Evatt Herbert", *Australian Dictionary of Biography,* accessed May 8, 2023, https://adb.anu.edu.au/biography/evatt-herbert-vere-bert-10131

Criterion (c) An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or in local area)

The building located at 34 Flood St, Bondi is an important work of the eminent Australian architect Harry Seidler who the historian Jennifer Taylor regards as "one of the major talents of Australian architectural History".[62] It is significant to Seidler's architectural output, firstly as probably his first civic building, incorporating a civic external plaza space. Seidler went on to create plaza spaces of great importance in cities of the eastern coast, preeminent among them is the Australia Square development (c.1962-1967).

Also, the synagogue is important in Seidler's work for its technical and creative emphasis using thin shell concrete vaulting. It is among the largest and most ambitious thin shell structure built in NSW in the immediate post war period in collaboration with structural engineer Peter Owen Miller (Miller, Milston, and Ferris).

The distinctive roof form is significant as architectural sculptural form, along with the curved stair, both of which are identified as indicative of the mastery of Harry Seidler by the eminent historian of Australian Modernism Philip Goad. Particularly, the geometric configuration of the roof form is important in demonstrating Seidler's application of Bauhaus principles and Oscar Neimeyer's influence. Notwithstanding, later alteration to finishes, and noting a fine complimentary addition, the place retains the original form and characteristics of its pure spatial and structural conception.

The place also demonstrates in an early non-domestic work, the Bauhaus architectural principles for which Seidler is particularly identified, being the pupil, assistant and collaborator of Marcel Breuer. In this case the principals are clear to see in the abstract planning, and devising of pure space sculpted by structural form.

Finally, it is also a leading surviving example of a post war modernist synagogue within NSW. It is one of the finest religious architectural works of its period.

Inclusion Guidelines	Check
Shows or is associated with, creative or technical innovation or achievement	Yes
Is the inspiration for a creative or technical innovation or achievement	Yes
Is aesthetically distinctive	Yes
Has landmark qualities	No, while the original forecourt design may have possibly had landmark value this has been compromised by later changes to the finishes and arrangement.

[62] Jennifer Taylor, "Harry Seidler", 623-624.

Exemplifies a particular taste, style or technology	Yes, the place is a good example of Seidler's post war Modernist design with large vaulted thin shell concrete roof form and abstract modernism planning.
Exclusion Guidelines	
Is not a major work by an important designer or artist	No, the place is a good example of eminent architect Harry Seidler and demonstrates a key technical development as structure with refined thin shell concrete vaulted roof.
Has lost its design or technical integrity	No, although the finishes have changed, and the liturgical layout, the Bauhaus design principles are not missing.
Its positive visual or sensory appeal or landmark and scenic qualities have been more than temporarily degraded	No, the landmark and scenic qualities have been degraded by later changes to the forecourt finishes but these are not permanent.
Has only a loose association with a creative or technical achievement	No, the association with structural engineer Peter Owen Miller and the technical achievement of the large thin shell concrete vaulted roof system are direct and well documented.

Level of Significance: State

Criterion (d) An item has strong or special association with a particular community or cultural group in NSW (or local area) for social, cultural or spiritual reasons

The building located at 34 Flood St, Bondi has been the focus of Jewish communal worship and education in Bondi since its construction in 1959. The place has strong and special associations with the Jewish faith community in Bondi for its ongoing use as a civic and religious building. The worship, educational and civic functions of the building demonstrate the continued use of the place for community in association with the Jewish community in Bondi. The place has social significance for its ongoing associations and continued use for Jewish educational purposes with the migrant Jewish in Bondi and Waverley.

Inclusion Guidelines	Check
Is important for its associations with an identifiable group	Yes, the place is important to the local Bondi Jewish community.
Is important to a community's sense of place	Yes, the place has a strongly held association with the Jewish faith community in Bondi who largely migrated to Australia following WWII. The place is special for its purpose and function as a educational and religious institution.
Exclusion Guidelines	
Is only important to the community for amenity reasons.	No, the place demonstrates a strong association with the Jewish faith community of the Waverley LGA.
Is retained only in preference to a proposed alternative	No, the place is not preferred to be retained due to a proposed alternative.

Level of Significance: Local

Criterion (e) An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area)

It is possible that the vaulted roof system of the 1959 designed synagogue and former Sydney Talmudical College premises building was the largest in NSW from the same period. It has the potential to yield information regarding its construction and the performance of thin shell concrete over time. The roof form of the synagogue and former Sydney Talmudical College premises building located at 34 Flood St, Bondi meets the threshold for state significance.

Inclusion Guidelines	Check
Has the potential to yield new or further substantial scientific and/or archaeological information	Yes, there is potential that the shell form concrete roof could yield regarding its construction and performance.
Is an important benchmark or reference site or type	Yes, the thin shell concrete vaulted roof form is an important benchmark for technical and creative achievements.
Provides evidence of past human cultures that is unavailable elsewhere	No, evidence of Jewish faith cultures are available elsewhere in NSW.
Exclusion Guidelines	
The knowledge gained would be irrelevant to research on science, human history or culture	No. The place has potential to inform about the human history and culture of the Jewish community in NSW.
Has little archaeological or research potential	Yes. The site has been disturbed and there is little archaeological potential.
Only contains information that is readily available from other resources or archaeological sites	No. The thin shell concrete roof was likely the largest at the time of its construction.

Level of Significance: State

Criterion (f) An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area)

The synagogue and former Sydney Talmudical College premises building at 34 Flood St, Bondi is uncommon for the period due to its large thin shell concrete vaulted roof form. The place has rarity value as the only religious building by Seidler and as a surviving intact example of a post war modernist synagogue, which were once common across NSW particularly Eastern Sydney however are now smaller in number.

Inclusion Guidelines	Check
Provides evidence of a defunct custom, way of life or process	No.
Demonstrates a process, custom or other human activity that is in danger of being lost	No.
Shows unusually accurate evidence of a significant human activity	No.
Is the only example of its type	No. It is not the only modern synagogue in NSW.
Demonstrates designs or techniques of exceptional interest	Yes, it is one of only three Jewish related works by Seidler and the only building, the other two being garden and memorial structures. It is one of Seidler's earliest civic works and the abstract modernist plan form and thin shell concrete roof form is of exceptional interest.
Shows rare evidence of a significant human activity important to a community	Yes. it is rare surviving post-war synagogue, many synagogues built after WWII particularly in the late 1950s to mid-1960s have been demolished.
Exclusion Guidelines	
Is not rare	No, is a rare surviving post-war modernist synagogue.
Is numerous but under threat	Yes, it is rare surviving post-war synagogue, many synagogues built after WWII particularly in the late 1950s to mid-1960s have been demolished.

Level of significance: State

Criterion (g) An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or environments (or a class of the local area's cultural or natural places or environments)

The synagogue and former Sydney Talmudical College premises building located at 34 Flood St demonstrates the principal characteristics of its class as a post war modernist synagogue designed by a migrant architect. It is part of a small but important group of distinctive modernist style synagogues designed by migrant architects who established practice in NSW. The place is a relatively intact and surviving example of a post war modernist synagogue which is rare for its class.

Inclusion Guidelines	Check
Is a fine example of its type	Yes, fine example of a Post War Modernist synagogue.
Has the principal characteristics of an important class or group of items	Yes, demonstrates the principal characteristics of an abstract modernism plan form and as a post war synagogue with its arrangement (forecourts etc) and the ongoing use of the building for educational and worship purposes.
Has attributes typical of a particular way of life, philosophy, custom, significant process, design, technique or activity	Yes, the place demonstrates attributes typical to an Orthodox synagogue including the menorah, bimah, ark, seating arrangement and partition of male and female congregants. The abstract modernist planning demonstrates a church plan typical of Bauhaus influence. The construction technique is an outstanding example of post war modernist design.
Is a significant variation to a class of items	No. The place is a notable example in a group of post war synagogues designed by migrant architects.
Is part of a group which collectively illustrates a representative type	Yes, part of a group of synagogues which collectively illustrates the characteristics of post war modernist design. The structure is representative of a synagogue designed a migrant architect within the post war period.
Is outstanding because of its setting, condition or size	No, the setting, condition or size of the place is not considered outstanding. However, the barrel-vaulted roof form is likely to be the largest in size in NSW at the time of construction.

Is outstanding because of its integrity or the esteem in which it is held	No, the place is outstanding for its integrity, which has been changed by later alterations and additions.
Exclusion Guidelines	
Is a poor example of its type	No, the place is not a poor example of its type as a synagogue.
Does not include or has lost the range of characteristics of a type	No, while some later changes to the forecourt have lost the ability to demonstrate a religious and civic building the form and post war Modernist characteristics have largely been retained.
Does not represent well the characteristics that make up a significant variation of a type	Yes, it does have the characteristics that make it a variation of post war synagogues in Sydney, including, distinctive modernist elements such as the systems-based plan form and vaulted thin shell concrete roof.

Level of Significance: State

7. Statement of Significance

The synagogue and former Sydney Talmudical College premises building located at 34 Flood St, Bondi is significant as:

- A seminal work in the development of the civic and sculptural concrete architecture of the pre-eminent Australian modern architect Harry Seidler, displaying the application of Bauhaus principles for which he is most known.
- The largest and best example of thin concrete shell technology of the 1950s in NSW.
- One of the most architecturally distinguished religious chambers of the immediate post war period in New South Wales and one of the finest synagogues of the period.
- An historically important place in the development of; Jewish religion in New South Wales, the post war migration period, as the first Talmudical school with integral synagogue.
- Highly representative of the history of post war migration in New South Wales, being the establishment of a new religious building and educational institution by a migrant community.
- A place held in high esteem by the Jewish community of Waverley and broader afield.

8. Listing Recommendations

The Seidler-designed synagogue and former Sydney Talmudical College premises building is nominated for inclusion as a heritage item under NSW Heritage Act and Part 1 (Heritage items) of Schedule 5 attached to Waverley Local Environmental Plan 2012.
The mapping for Lot and DP for 34 Flood Street, Bondi, is to be amended to recognizing the heritage listing of the site.
The Seidler-designed building should be retained and conserved.
A Heritage Assessment and Heritage Impact Statement should be prepared for the building prior to any major works being undertaken.

9. Management Recommendations

The below recommendations are drawn solely from a consideration of the significance of the place. They do not consider, as similar recommendations in a Conservation Management Plan would, the owner's requirements or other factors such as financial implications.

9.1. Obligations arising from significance

The high cultural significance of the place identified in the statement of significance obliges its conservation and good management (Burra Charter Article 2).

The significance is embodied in the place. Place means site, area, land, landscape, building of other work, group of buildings or other works, and may include components, contents, spaces and views. Place also includes fabric, setting, use, associations, meanings, records, related places, and related objects. (Burra Charter Article 1).

9.2. Conservation of fabric

All original external and internal elements contributing to the significance of the place as a Jewish civic and educational building with abstract modern planning principles and strong civic presence, should be retained and conserved.

The spatial planning arrangement of the synagogue and former Sydney Talmudical College premises building is a fine example of Bauhaus systems-based construction modular planning, this should be retained. Additionally, the thin shell vaulted concrete roof form and ceiling is a significant element and part of a seminal work by Seidler and should be conserved and retained, meaning: not enclosed by infill and later alterations to finishes should be detectable and sympathetic.

All original joinery and other interior elements should be conserved. Where the opportunity arises the non-significant later addition plasterboard and should be removed to reveal the original face brick.

The existing relationship between the interior and exterior spaces should be retained and conserved. Where the opportunity arises the non-significant later addition 2014 blast wall should be removed to recover to reinstate Seidler's original principal street elevation and civic address.

Adjacent buildings, the existing spatial relationship between the synagogue and former Sydney Talmudical College premises building and the adjacent Alder building contributes to the social significance of the place. This interface should be retained and conserved?

Where original interior or exterior fabric is to be demolished, they should be replaced

with similar or sympathetic material. Demolition to the original vaulted roof form and internal ceiling of the synagogue and former Sydney Talmudical College premises building should be avoided.

9.3. Tolerance for change

Given the place has undergone later alterations and additions there is some scope for change.

However, the surviving original elements are highly significant and intact, i.e., plan and vault roof form, and therefore have a low tolerance for change.

High significance, low tolerance for change thin shell concrete vaulted roof form and ceiling.

High significance moderate tolerance for change, forecourt – 2014 blast wall addition is intrusive and there is an opportunity for change. Consideration should be given to remove this intrusive element and fully restore the historical civic forecourt.

Non original fabric should as the synagogue worship elements have neutral heritage significance and therefore high tolerance for change (assuming the proposed changes are sympathetic and suited for Jewish customs and uses).

9.4. Future use

In the opinion of the authors ongoing use of the place as a synagogue is not essential for conserving significance. However, future use of the place should remain consistent with the needs for Jewish customs and practices.

Naming conventions

The naming of the buildings at the place on 34 Flood St should retain or reinstate the original names given. Original names are of historical and social significance as it is evidence of the history of the place including, historical associations among the migrant Jewish of Waverley and Bondi and the funding of construction of the building. This practice is demonstrated by the naming of the former Malka Brender educational building located to the north of the subject place.

10.Appendices

11.Bibliography

Nearmap. *34 Flood St, Bondi NSW 2026*. March 16, 2023. Nearmap.com. https://apps.nearmap.com/maps/#/@-33.8917100,151.2595700,18.00z,0d/V/20230316?locationMarker.

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ADVICE OF THE WAVERLEY LOCAL PLANNING PANEL
Planning Proposal PP-1/2023
34-36 Flood Street, Bondi – Heritage Listing Planning Proposal
Wednesday 24 May 2023

SCHEDULE 2, PART 5, ITEM 26 OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 (NSW)

Panel members:
Stuart McDonald (Chair)
Philippa Frecklington
Sandra Robinson

Declarations of Interest
Jan Murrell has declared a reasonably perceived conflict of interest for this item.

Site visit and briefing
The Panel were provided opportunity to undertake independent external site visits prior to the meeting. The Panel was also briefed by Emma Rogerson (Strategic Planner) during the meeting.

Following the briefing the Panel discussed the PP and provided advice on the PP on 24 May 2023 under Schedule 2, Part 5, Item 26 of the Environmental Planning and Assessment Act 1979.

Reasons
The Panel has considered the information that was circulated to it by Council email on 18 May 2023, which included:

- Council officer's WLPP Report
- Planning Proposal

Resolution
For the reasons outlined in the Council officer's report, the Panel supports the recommendation for the Planning Proposal seeking the local heritage listing of 34-36 Flood Street to proceed to Gateway Determination and public exhibition, subject to the following changes:

1. Change the WLEP 2012 draft Schedule 5 listing from '20th Century Modernist synagogue by architect Harry Seidler featuring repetitive thin-shell concrete roof vaults, experienced internally and externally.' to:

Sydney Talmudical College and Synagogue building and interiors	34-36 Flood Street, Bondi	Lot 1 DP 1094020	Local*

**Note: Heritage Assessment by Hector Abrahams Architects concludes that the building is also worthy of listing on the NSW State Heritage Register.*

2. The Planning Proposal be amended to be wholly consistent with the final Heritage Assessment by Hector Abrahams Architects, most importantly the item and site description.

Carried unanimously