

27 August 2021

Paul Hussein
Business Manager
Yerin Aboriginal Health Services

c/o
Amanda Hill
Senior Town Planner
ADW Johnson Pty Limited
5 Pioneer Avenue
Tuggerah NSW 2259

Dear Amanda,

Re: 35 McPherson Road, Mardi Flood Risk Management Report

This letter sets out the Flood Risk Management considerations for the proposed development at the above address. Its scope is to describe flooding on the site, discuss early evacuation as the preferred flood emergency response, provide guidance on the flood-related development considerations, and compare the proposed development to council's flood-related development controls.

Proposed Development

The proposed development involves the adaptive reuse of a vacant former nursing home to an Aboriginal community services facility. The site is located at 35 McPherson Road, Mardi NSW 2259 (Lot 1 Sec 1 DP3368), on the banks of the Wyong River. It is zoned E3 Environmental Management under the Wyong Local Environmental Plan 2013 (WLEP 2013) and is identified as flood prone land in Council's mapping.

While the site plans and operational procedures are still being finalised, the proposed development aims to provide a culturally enriching and engaging space for Yerin Aboriginal Health Services to provide an integrated community service to the local Aboriginal community, promoting ownership of assets and self-empowerment of local Aboriginal services.

The proposed community facility would accommodate and streamline a range of community services including:

- A community hub service providing support through trauma informed programs;
- Appointment space for a number of outreach services;
- Ample parking for clients, visitors and staff;
- A community connection point for families and individuals;
- Connections to other NGOs including Lifeline, Wesley Mission, NDIS Providers, visiting health providers, education, training and other community and government-based services;
- Collaboration with other Aboriginal organisations;
- Community activities and forums.

The intention is to reuse the existing buildings on site and not construct new buildings. The development consists of a ground floor with a southern and northern wing (Figure 1 and Figure 2). The ground floor of the northern part of the building is 3.5 m AHD, which rises to 4.4 m AHD at the southern part of the building.



Issue
No. 01
Date 22.07.2021
Draft 04/04



at
35 McPherson Road,
Marril, NSW 2269
for
Yerin AMS

NOTE: Existing Building



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Sherson Architecture
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Drawing Title
Existing Site Plan

Date 07.2021
Scale As indicated @ A1
Drawing Reference
20200026 - A100

Figure 1. Site and building overview

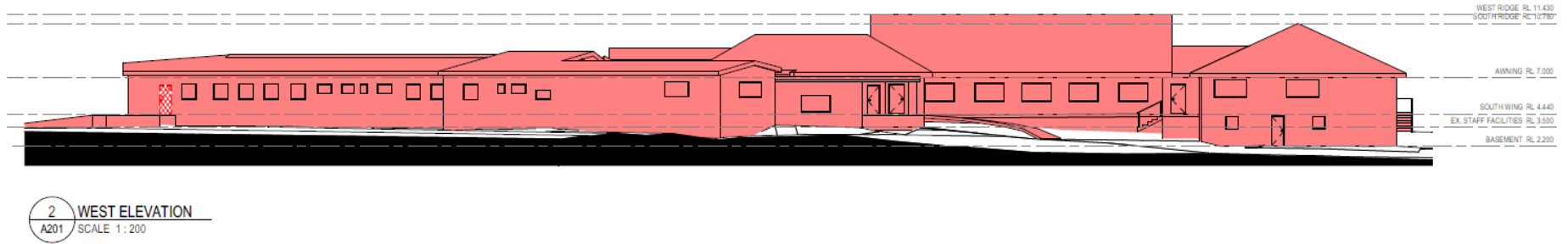


Figure 2. Cross section of west building elevations

There is a basement storage area under the southern part of the ground floor, which has a level of 2.2 m AHD. There is a shed adjacent to the basement at a similar level (2.2 m AHD). See detailed plans in Appendix B.

Ground levels of the site range from 1.2 m AHD at the site boundary adjacent to McPherson Road (southwest corner of the site), to 2 m AHD at the north and eastern parts of the site, where the building is located.

Council has undertaken an initial review of the proposed application and has issued a Record of Pre-Development Advice (dated 2 December 2020). This includes the need to address the requirements of the Development Control Plan 2013 (DCP 2013) – Chapter 3.3 – Floodplain Management and Clause 7.2 of Wyong Local Environmental Plan 2013 (WLEP 2013). It is noted that Clause 7.2 of the WLEP has since been repealed and replaced with Clause 5.21 Flood Planning. Due to the flood risk onsite and its identification as a flood island, Council advised that, “early evacuation through application of the emergency response plan is the best option for managing the existing flood risk across this property.”

Nature of Flooding on Site

According to Council’s Record of Pre-Development Advice:

The Land is severely constrained due to flooding of the land. The existing use of the site is the Wyong aged care facility/seniors housing and is identified in the Local SES Flood Plan for the area. The Wyong River Catchment Floodplain Risk Management Study & Plan (January 2020)... identifies the subject site as a ‘low flood island’ and the impacts of flooding. Access is cut in a 20% AEP (i.e. 1 in 5 chance per year) event.

The flooding of the south-western part of the site in the 20% AEP event can be seen in Figure 3, which is from the Wyong River Catchment Floodplain Risk Management Study & Draft Plan (FRMSP). The flood levels on site provided in the Flood Information from Council dated 23 November 2020 (Appendix A) are:

- 20% AEP: 2.21 m AHD
- 5% AEP: 3.82 m AHD
- 1% AEP: 4.57 m AHD
- Probable Maximum Flood (PMF): 7.79 m AHD

Based on analysis of the Wyong River FRMSP flood mapping files provided by Council, the above levels appear to be from the part of the site closest to McPherson Road, where flood levels are the highest, not the levels where the building is located. Table 1 summarises floor levels (as per Appendix B) in parts of the building and the corresponding flood levels in those locations based on the Wyong River FRMSP flood mapping provided by Council.

Table 1. Flood and floor levels

Location	Floor Level (m AHD)	20% AEP Flood Level (m AHD)	5% AEP Flood Level (m AHD)	1% AEP Flood Level (m AHD)	PMF Level (m AHD)
Basement storage and shed	2.2 m AHD	2.07	3.53	4.43	7.63
Ground floor northern building wing	3.5 m AHD	N/A	3.69	4.40	7.64
Ground floor southern building wing	4.4 m AHD	N/A	3.49	4.37	7.59

The FRMSP states that the duration of lost access (i.e. duration of road cut) for the Mardi rural residential area, including 35 McPherson Road, are:

- 20% AEP: 1 to 7 hours
- 1% AEP: 21 to 23.5 hours
- PMF: 35.5 to 37 hours

The FRMSP also indicates that the subject site would experience high hydraulic hazard. In the 1% AEP flood the site would have a hydraulic hazard of up to H5 (which is unsafe for people and vehicles, and buildings would require special engineering design and construction to withstand) and in the PMF there would be hydraulic hazard H6 (which is unsafe for people and vehicles, and all buildings types are considered vulnerable to failure).

Based on the site survey and plans, the level of the proposed parking lot is as low as 1.3 m AHD and the driveway is as low as 1.5 m AHD close to McPherson Road. The north-eastern part of the site is higher, at a level of between approximately 2 and 4 m AHD. Therefore, access is cut before the part of the site where the building is located floods.

The driveway and lower portion of the site closer to McPherson Road are below the 20% AEP flood level. In the 20% AEP flood, the driveway would be flooded by up to 0.7 m, while the northern part of the site (including the building) would remain above floodwaters.

The 5% AEP would be 1.3 m deep in the basement and 0.19 m deep in the ground floor of the northern building wing.

In the 1% AEP flood, the majority of the site except for the ground floor of the building's southern wing is inundated; the driveway is inundated by approximately 3 m depth and the northern part of the site would be inundated by between approximately 0.6 to 2.6 m. The basement flooding would be more than 2.3 m deep and the northern wing ground floor flooding would be 0.9 m deep. Although the modelling shows a 1% AEP flood level just below the floor level of the ground floor of the southern wing, this does not take into account any inaccuracies in the modelling or the fact that there may be surface irregularities in the flood flow which is unlikely to be a smooth surface as modelled. Council's development control plan requires a 0.5 m freeboard between the 1% AEP flood and new building floor levels to account for these uncertainties. Therefore, in a flood equivalent to the 1% AEP flood, some floodwater might enter the ground floor of the southern wing.

It is noted that as the site is already low-lying, future sea-level rise associated with climate change will cause more frequent inundation at the site. The Wyong River Catchment FRMSP models climate change impacts of both increased rainfall and increases in the levels of Tuggerah Lake due to sea-level rise. At the highest of the modelled climate change scenarios, 1% AEP flood levels would increase by more than 1 m. This would result in potentially constant inundation of lower lying parts of the site, and much more frequent inundation of the building. Site access may be always cut at these climate change scenario flood levels, and, if not, the site would be isolated much more frequently, with higher hazard floodwaters and for longer durations than currently.

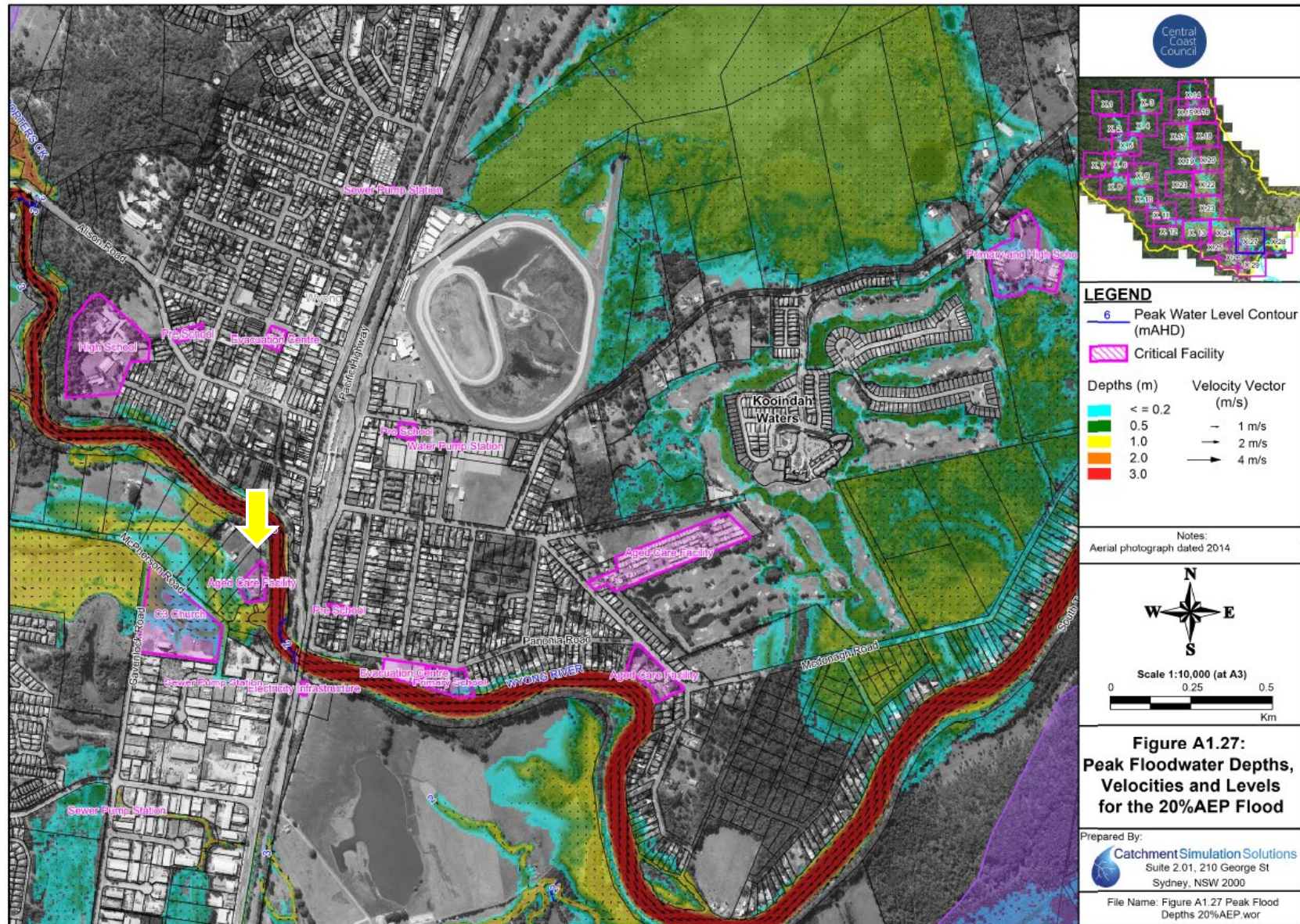


Figure 3. Flood depths, velocities and levels in the 20% AEP flood from the Wyong River Catchment FRMSP (yellow arrow points to the site).

Flood Warning and Evacuation Capability Assessment

Due to the high flood levels, high flood hazard, and potential long duration of site isolation, the site must be evacuated early in response to dangerous flooding. Figure 4 shows the evacuation route for the site south to the Pacific Motorway traveling south, as identified by the Wyong River Catchment FRMSP, along with the locations of early road cut points. The site will need to be fully evacuated before the evacuation route is flooded, and so requires appropriate triggers that allow for timely evacuation.

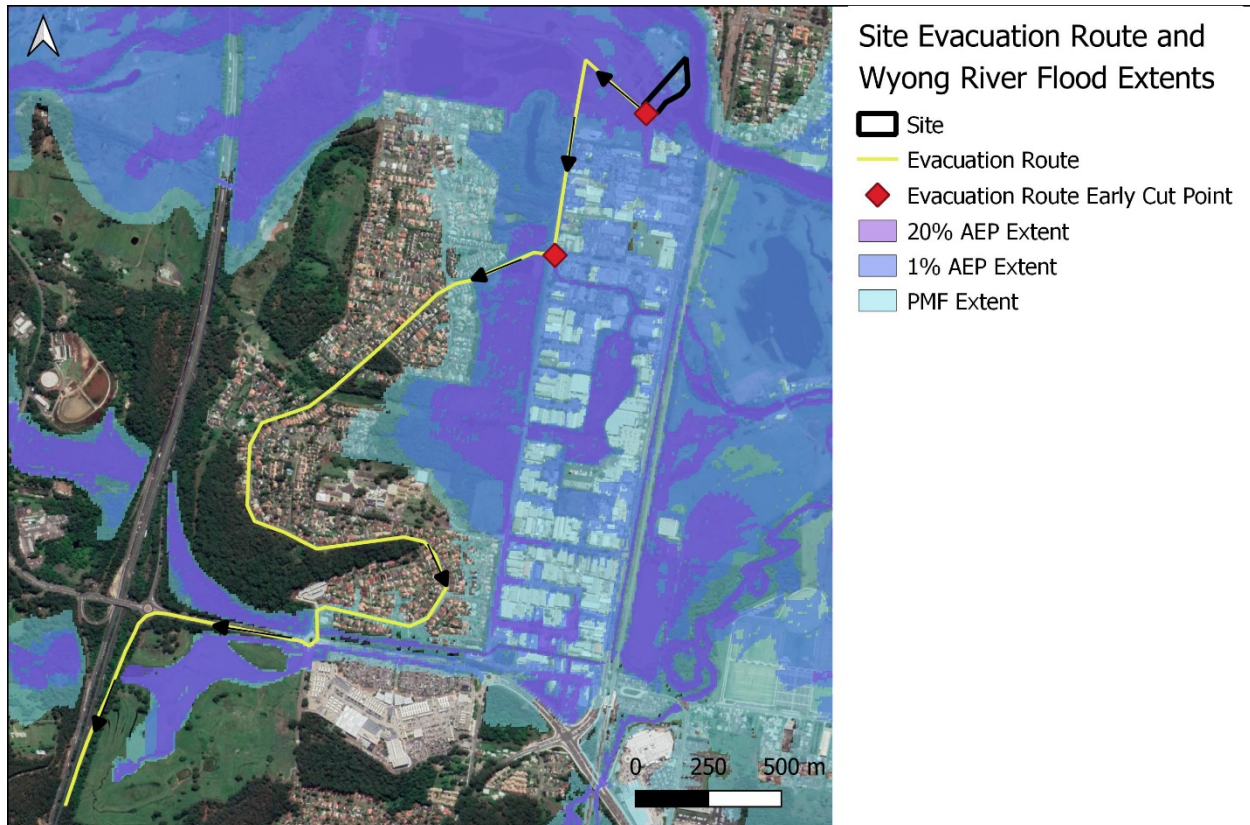


Figure 4. Site evacuation route and flood extents.

Based on the site survey and publicly available topographic data, the lowest point on the evacuation route is the low point in the site's driveway, which is at 1.5 m AHD. This is lower than the public roads on the evacuation route, which are 1.7 m AHD and above. However, the parking lot would flood before this, since it is at a level of 1.3 m AHD. Therefore, the requirement is for evacuation to be completed before the parking lot begins to flood, with appropriate evacuation triggers set to allow for this.

The Bureau of Meteorology (BoM) Service Level Specification for Flood Forecasting and Warning Services for New South Wales and the Australian Capital Territory indicates that the Bureau aims to provide 6 hours' warning prior to 2.7 m at the Wyong Bridge gauge (downstream of the bridge), which is located approximately 250 m downstream from the site. However, this level is too high to provide any warning time before access to the site is cut by floodwaters, and, additionally, flood levels at the site would be higher than levels experienced at this gauge location. This means that the site is isolated significantly before there will be an official BoM flood warning issued, and the BoM warnings are too late to be used as evacuation triggers for the site.

Due to the lack of timely formal flood warnings for this area, the Wyong River Catchment FRMSP states that evacuation may need to commence based on another trigger such as issuance of a Flood Watch or Severe Weather Warning. While these general warnings could also be used as triggers to evacuate the site, or advise people not to attend the site, it is possible that no flooding occurs following these warnings. Such triggers may be socially unsustainable if users frequently evacuate but flooding fails to eventuate. Such general warnings may be more useful as alerts to closely monitor the river behaviour in preparation for a possible evacuation.

Despite not having an official warning from the BoM, evacuation can be informed by published real-time river levels from the BoM, which can be used to set triggers for site evacuation based on the river levels to ensure that there is enough time to evacuate the site before the driveway access is cut. This would use the BoM published river heights for the Wyong River Upstream of the Wyong Bridge, which is approximately 200 m downstream of the site. Published levels are found here:

<http://www.bom.gov.au/fwo/IDN60233/IDN60233.061386.plt.shtml>

The process of setting evacuation triggers involves:

- Calculating the time required to evacuate. This depends on how quickly site occupants can respond to a flood evacuation trigger and the number of vehicles on site requiring evacuation. The number of vehicles that will need to evacuate from the site depends on the exact site plans and proposed uses, which are still being developed. Based on the Timeline Evacuation Model developed by the NSW State Emergency Service, evacuation route capacity is based on 600 vehicles per lane per hour. If there were 100 cars parked on site it would take about 10 minutes for them all to leave at this rate. Given that the site will not be occupied by residents and most people on site will be make short duration visits, it would be reasonable to assume that the site can be evacuated within 1 hour (noting that the process to ensure this is laid out in the Flood Emergency Response Plan for this site). This includes the time needed to make an evacuation decision, tell everyone on site to leave and all vehicles to have left the site.
- Calculating the time available to evacuate. This is done using the hydrograph of the fastest rising PMF (which shows the probable maximum rate of rise of flood waters) taken at the Wyong River adjacent to the site. The site's parking lot has flood levels approximately 10 cm higher than the level at the location of the hydrograph. Therefore, when the flood level of the hydrograph is 1.2 m AHD (i.e., 10 cm below 1.3 m AHD) the site's parking lot starts to flood. A water level of 1.2 m AHD corresponds to approximately hour 3.3 on the 2 hour design PMF (Figure 5).
- Calculating the appropriate trigger level. This is the level after which the time available to evacuate is equal to the time needed to evacuate. As the preliminary evacuation capability assessment assumes that the site can be evacuated within 1 hour, the evacuation needs to be called 1 hour prior to hour 3.3 of the PMF, which is hour 2.3 of the PMF. As per Figure 5 this corresponds to a water level of 0.6 m AHD at the site's boundary along the Wyong River.
- Therefore, when there is a water level of **0.6 m AHD** at the site's boundary along the Wyong River, the site would **have 1 hour to evacuate** prior to its access being cut in a flood rising as fast as the 2 hour design PMF. In slower rising floods there would be more time to evacuate but this should be considered to be a safety margin rather than a reason to delay evacuation.

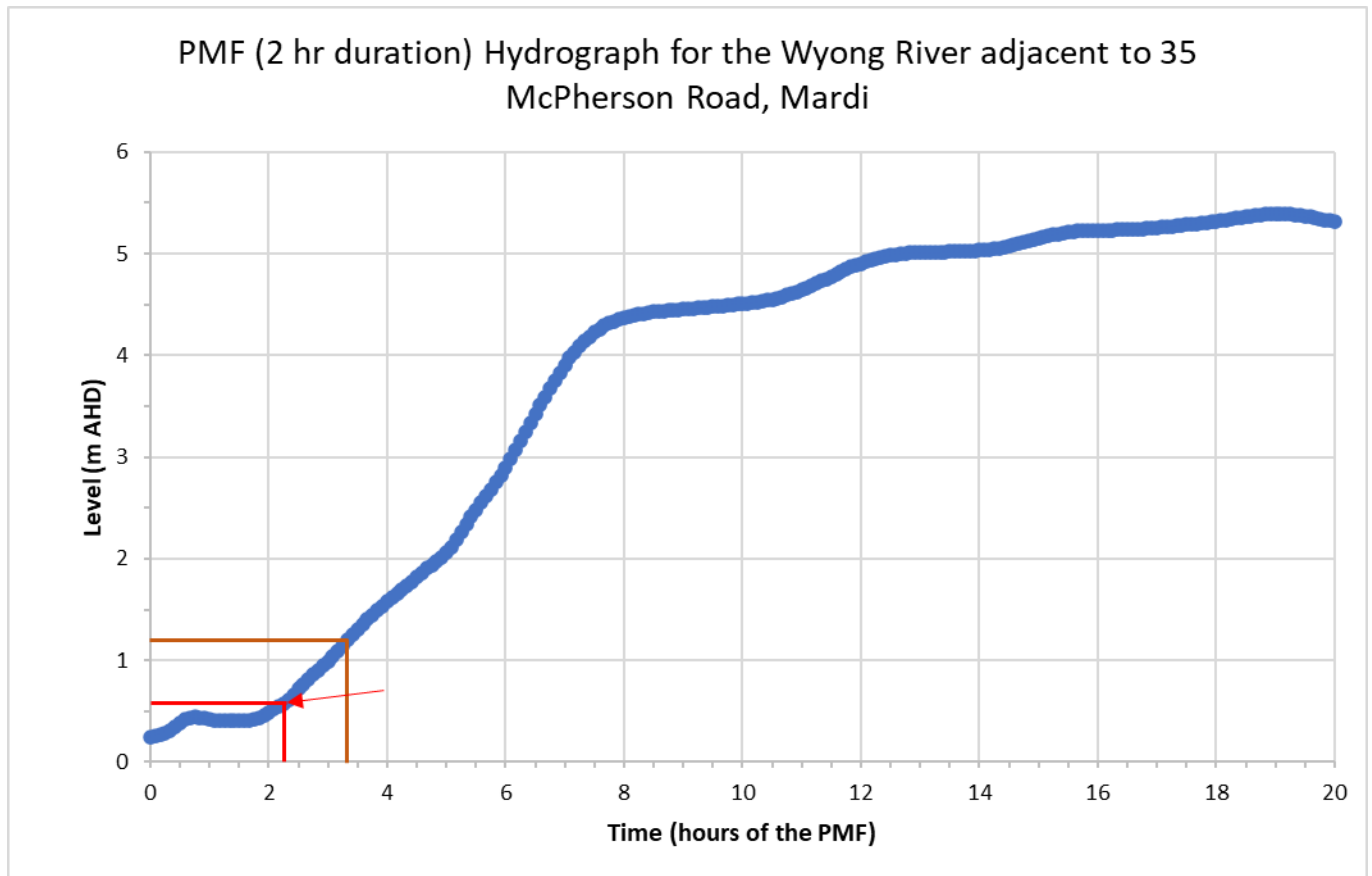


Figure 5. PMF hydrograph at the Wyong River adjacent to the site

At this scale of flooding, the location of the above hydrograph would have roughly the same water level as the Wyong River Upstream of the Wyong Bridge, which is the location of the published BoM river levels. Therefore, evacuation would be triggered when the BoM river level gauge reaches 0.6 m AHD. It is noted that this is only less than half a metre above current normal water levels and thus potentially could occur frequently (i.e. several times a year in a wet year).

The frequency that this trigger would be reached was analysed using “event” data provided by the BoM for the Wyong River Upstream of the Wyong Bridge flood gauge. According to the BoM, event data is tagged and archived whenever a Flood Watch is issued, or there is flooding in the catchment. Based on this data, the trigger level of 0.6 m AHD would be reached at least every time a Flood Watch is issued or there is flooding in the catchment, which has happened 16 times since 2003. Additional recent time series data from the BoM also shows that this level has been reached five other times in 2018, 2019 and 2020, when no Flood Watch was issued. This means that a 0.6 m AHD trigger level could, on average, be reached more than one time per year. Note that in 2020 (a wet year), the site reached this level three times. Large events have seen the site being inaccessible for about one week.

While frequent evacuation may occur with this trigger level, given the rate at which the river can rise and the potential adverse consequences of evacuation failure even in relatively frequent floods, the inconvenience of frequent evacuations is recognised as a part of the cost of adaptively reusing the premises.

While monitoring water levels based on the BoM gauge will be important in monitoring potential flood conditions, it must also be recognised that it might not always be possible to access the BoM gauge levels online. This may be due to a failure of the gauge or its telemetry or due to local failures in the electricity or telecommunications networks which prevent internet access. It would therefore be prudent to have a flood gauge next to the river which could be read visually from within the premises and also have an alarm system for the site. This would work by having an alarm system that alerts the site when flood levels reach of 0.6 m AHD at the site's boundary along the Wyong River. This alarm would provide for enough time to evacuate the site (i.e. an estimated 1 hour) prior to the driveway access being cut at 1.3 m AHD.

Protection of Property from Flooding

The following measures are to be implemented to help in protection of property in the event of flooding:

- No dangerous materials, chemicals, or fuel will be stored in the basement storage area or shed due to their low floor levels.
- No valuable property will be stored in the basement or shed, and any goods stored within them will be elevated off the ground on shelving.
- Within the building, all valuable goods will be stored elevated on shelving or in cabinets above the floor level.
- The main electrical distributor hub for the building as well as distributor box 1 are located at an approximate level of 5.4 m AHD, which is above the 1% AEP floor level plus free board (0.5 m).
- Where possible, internal walls, fixtures, fittings, furniture and flooring will be made of flood compatible materials.

Development Controls

The site is subject to flood-related development controls from the Wyong Local Environmental Plan 2013 (WLEP 2013) and the Wyong Development Control Plan 2013 (WDCP 2013).

The WLEP 2013 is the primary legal planning document for guiding land use and planning decisions made by Council and states:

5.21 Flood planning

(1) The objectives of this clause are as follows—

- (a) to minimise the flood risk to life and property associated with the use of land,*
- (b) to allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change,*
- (c) to avoid adverse or cumulative impacts on flood behaviour and the environment,*
- (d) to enable the safe occupation and efficient evacuation of people in the event of a flood.*

(2) Development consent must not be granted to development on land the consent authority considers to be within the flood planning area unless the consent authority is satisfied the development—

- (a) is compatible with the flood function and behaviour on the land, and*
- (b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and*
- (c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and*
- (d) incorporates appropriate measures to manage risk to life in the event of a flood, and*

- (e) will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.
- (3) In deciding whether to grant development consent on land to which this clause applies, the consent authority must consider the following matters—
- (a) the impact of the development on projected changes to flood behaviour as a result of climate change,
 - (b) the intended design and scale of buildings resulting from the development,
 - (c) whether the development incorporates measures to minimise the risk to life and ensure the safe evacuation of people in the event of a flood,
 - (d) the potential to modify, relocate or remove buildings resulting from development if the surrounding area is impacted by flooding or coastal erosion.
- (4) A word or expression used in this clause has the same meaning as it has in the *Considering Flooding in Land Use Planning Guideline* unless it is otherwise defined in this clause.
- (5) In this clause—
- Considering Flooding in Land Use Planning Guideline* means the *Considering Flooding in Land Use Planning Guideline* published on the Department's website on 14 July 2021.
 - flood planning area* has the same meaning as it has in the *Floodplain Development Manual*.
 - Floodplain Development Manual* means the *Floodplain Development Manual* (ISBN 0 7347 5476 0) published by the NSW Government in April 2005.

The WLEP 2013 also defines the flood planning level as the level of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metre freeboard.

Detailed flood-related planning and design guidelines to support the above LEP planning controls are included in the Chapter 3.3 Floodplain Management of the WDCP 2013. In addition to the discussion below based on the DCP requirements, the following points pertaining to the WLEP are noted:

- The Flood Emergency Response Plan details the procedures in place to allow for the safe evacuation of people and manage risk to life on the property;
- The evacuation from this development will need to occur before other surrounding areas need to evacuate, because it floods earlier than surrounding areas, and thus will not take up capacity of existing evacuation routes for areas that need to evacuate at later times;
- The proposed development is on a site currently containing a vacant aged care facility which had operated on the site for over 20 years. Therefore, as long as the building footprint and the site levels are not modified, the proposed development will not adversely impact the environment or affect flood levels on neighbouring properties.

The first step to identifying the applicable DCP controls is to identify the precinct of the site. According to Council online mapping, the site is mostly Precinct 4: High Hazard (Figure 6).

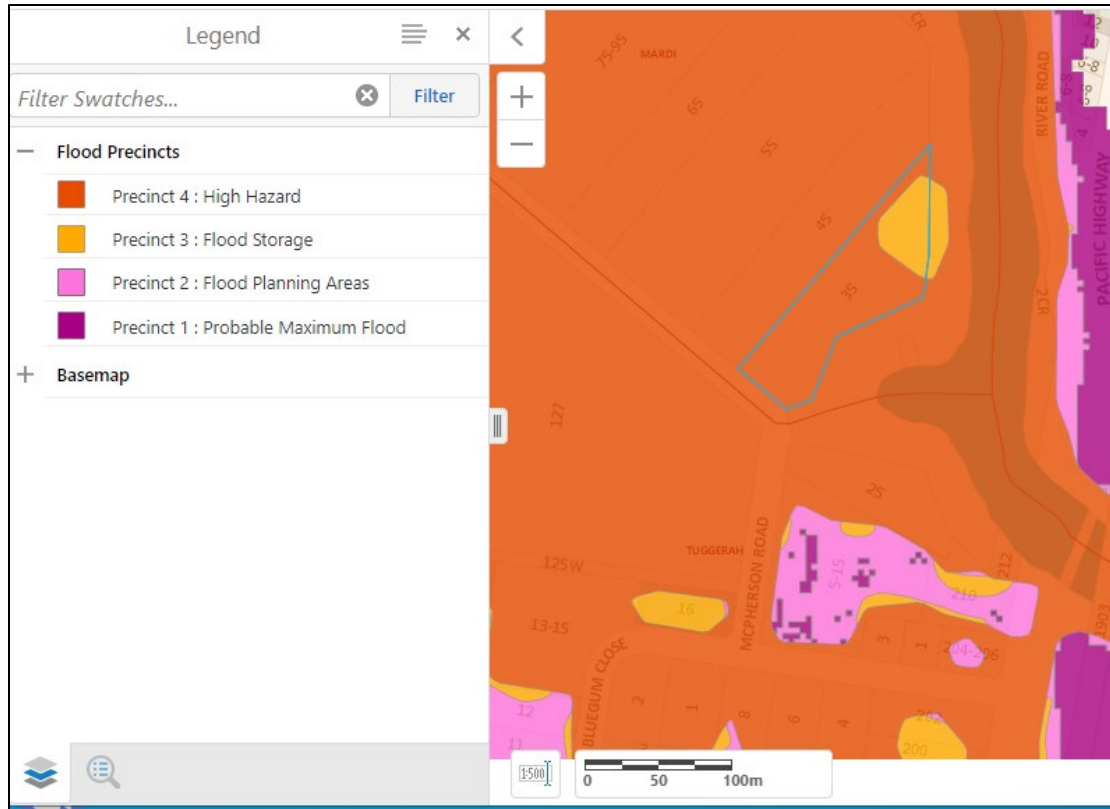


Figure 6. The site's hazard precinct (Central Coast Council Online Mapping, June 2021)

Regarding a Precinct 4 High Hazard site, the DCP states:

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

Section 3.2 is a Performance Based Assessment, and states that:

Council will consider development proposals that do not meet the prescriptive requirements of this DCP only if a report prepared by a suitably qualified engineering professional accompanies the application and addresses the following (see first column of Table 2).

Table 2 summarises how the development may be able to address each component of the assessment.

Table 2. WDCP 2013 Chapter 3.3 Floodplain Management Section 3.2 Performance Based Assessments

Clauses	Comments Pertaining to the Site
<i>a) is compatible with the established flood hazard of the land. In areas where flood hazard has not been established through previous studies or reports, the flood hazard must be</i>	The site will have to show that its use as a non-residential community centre is compatible with the high flood hazard of the land. This can be supported by it not being a residence, and only being used during normal business hours (i.e. occupied less than 25% of the time). The Flood Emergency Response Plan sets out the procedures in place that provide

<i>established in accordance with the Floodplain Development Manual.</i>	for early evacuation before there is flooding to the parking lot and access to the site is cut in any event and demonstrates how risk to life will be managed.
<i>b) will not significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties;</i>	The proposed development is on a site currently containing a vacant aged care facility which had operated on the site for more than 20 years. Therefore, as long as the building footprint and site levels are not modified, the proposed development will not have an impact on flood behaviour.
<i>c) incorporates appropriate measures to manage risk to life and property from flood;</i>	The site will require robust flood management procedures in place that ensure early evacuation of the site in case of flooding. This is fully detailed in the Flood Emergency Response Plan.
<i>d) will not significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses;</i>	The proposed development is on a site currently containing a vacant aged care facility which had operated on the site for over 20 years. Therefore, as long as the building footprint and site levels are not modified, the proposed development will not adversely impact the environment or cause any of the stated impacts.
<i>e) is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.</i>	<p>Appendix C states that this must take into account:</p> <ul style="list-style-type: none"> <i>the additional economic and social costs that may arise from damage to property from flooding should not be greater than that which can reasonably be managed by the property owner and general community;</i> <i>ii land values and social equity – effect both negative and positive – e.g. development increasing land values, restrictions decreasing land values, etc;</i> <i>iii future development (specifically, the ability of the community and individuals to recover from flood events);</i> <i>iv economic factors both in regard to doing and not doing the development;</i> <i>v social issues;</i> <i>vi servicing the development safely in flood e.g. potable water, sewer, etc.</i> <p>The proposed development aims to provide a culturally enriching and engaging space for Yerin Aboriginal Health Services to provide an integrated community service to the local Aboriginal community, promoting ownership of assets and self-empowerment of local Aboriginal services. It</p>

	<p>therefore will provide a real and substantial social benefit to the community.</p> <p>It can be argued that the social benefit outweighs the cost that may arise from flood damage. The Flood Emergency Response Plan details the development's plans in place for recovery in case of flood, and the robust flood management procedures in place that ensure early evacuation of the site in case of flooding. It describes how life will be protected in the event of a flood, and measures to reduce risk to property such as ensuring valuable assets within the building will be kept above of the reach of frequent flooding.</p>
<p><i>f) is consistent with the principles of Ecologically Sustainable Development.</i></p>	<p>The proposed development is on a site currently containing a vacant aged care facility which had operated on the site for over 20 years. Therefore, as long as the building footprint and site levels are not modified, the proposed development will not adversely impact the environment. The adaptive reuse of an existing building is consistent with the principles of ecologically sustainable development.</p>
<p><i>g) adequately considers the impact of climate change.</i></p> <p><i>i It is to be noted that with regard to climate change, appropriate benchmarks based on the best available current information have been used in producing the flood risk management studies and plans that inform this document.</i></p> <p><i>ii Some prescriptive requirements such as flood planning level requirements may be relaxed if Council can be satisfied that the projected life of the proposed development is for a relatively short-term and therefore does not warrant the imposition of controls that consider impacts beyond the cessation of the proposed development. This will only be considered for uses where the residual risk to the occupation of the development is considered to be low.</i></p>	<p>The site is already low-lying and future sea-level rise associated with climate change will cause more frequent inundation at the site. The Wyong River Catchment FRMSP models climate change impacts of both increased rainfall and increases in the levels of Tuggerah Lake. At the highest of the modelled climate change scenarios, 1% AEP flood levels would increase by more than 1 m. This would result in constant inundation of lower lying parts of the site. Site access may be always cut at these climate change scenario flood levels, and, if not, the site would be isolated much more frequently, with higher hazard floodwaters and for longer durations than currently.</p> <p>However, it can be argued that since the proposed development is not a residential development, and is the adaptive re-use of an existing building, the long-term future risk is acceptable. The proposed development can operate in the meantime with flood evacuation procedures in place and provide beneficial services to the community until a time at which the continued use of the site as per the current plans is no longer sustainable.</p> <p>There is a considerable uncertainty around the timing and magnitude of future flood levels associated with climate change, and it is likely that the proposed development can</p>

<p><i>This may include certain temporary or demountable structures but would not include residential developments.</i></p>	<p>operate for several decades until there comes a time at which it must explore solutions to adapt to climate change, such as raising the development's parking lot and driveway, in order to extend the lifetime of the development.</p> <p>In the future, low points in the parking lot and driveway of the development could be raised to 1.7 m AHD, which is the level of the McPhersons Road in front of the development. However, it is noted that care would need to be taken in designing these level changes to ensure they did not block an existing flow path.</p>
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Notes from the WDCP:

Note 1: The information listed above can be used to justify minor variations to the prescriptive provisions. Appendix C provides further detail with regard to applying the Performance Criteria mentioned above and will need to be addresses in full for large scale proposals and/or significant variations.

Note 2: The prescriptive controls have been developed to ensure that proposals that meet the requirements of the relevant Prescriptive Control Schedule will meet the objectives of this Plan. A performance based assessment is likely to involve the submission of independent studies and reports. It is recommended that you should discuss the level of detail required and the likelihood of achieving a successful outcome using a performance based assessment with Council staff using the pre-application process prior to making any decision to purchase and/or develop flood prone land.

Other issues addressed in Appendix C include Warning and Evacuation considerations:

i available effective warning time and reliable access for the evacuation of an area potentially affected by floods;

ii evacuation should be consistent with any relevant or flood evacuation strategy where in existence;

iii depth and velocity of flood waters for relative flood event;

iv Council's duty of care – proposals to addressed or limit;

v what level of flooding should apply to the development e.g. 1 in 20 year, etc;

vi effective flood access and evacuation issues;

vii flood readiness – method

The above clauses are addressed earlier in this document, and are detailed in the Flood Emergency Response Plan.

Conclusions

- A robust Flood Emergency Response Plan is required for the site that outlines how the site will manage flood risk to life, and any measures the reduce risk to property. It is to include details on the evacuation triggers and plan for a timely, early evacuation.
- The Flood Emergency Response Plan will include details for how site management will have to monitor weather, rain and river level information online when any rain is expected for the site.

- It is recommended that a site flood gauge and alarm system be installed on site. This alarm will need to be triggered at 0.6 m AHD, when there is enough time (i.e. 1 hour) to fully evacuate the site before the parking lot is flooded and driveway access is cut.
- It can be argued that since the proposed development is not a residential development, and is the adaptive re-use of an existing building, the long-term future risk associated with climate change is acceptable. The proposed development can operate in the meantime with flood evacuation procedures in place and provide beneficial services to the community until there comes a time at which it must explore solutions to adapt to climate change, such as raising the development's parking lot and driveway, in order to extend the lifetime of the development.

Yours faithfully

For Molino Stewart Pty Ltd



Steven Molino, BSc BE MIEAust CPeng NPER 3 (civil, environmental) 1053737
Principal

<https://molinostewart.sharepoint.com/sites/Jobs1200-1300/Shared Documents/1288 35 McPherson Rd Mardi- Flood Risk/Reports/Final/1288 Flood Risk Management Report Final.docx>

Appendix A: Council Flood Information

Flood Information



23 November 2020

Dear applicant,

I refer to your recent application for flood information. The information provided below is based on the available Council data at the time of application.

Property Details

Lot	1	DP	3368
Address	35 McPherson Rd Mardi NSW 2259		

Calculated Flood Levels

Flood event	Flood Level
PMF	7.79m AHD
1% AEP flood (1 in 100 Year Event)	4.57m AHD
5% AEP flood (1 in 20 Year Event)	3.82m AHD
20% AEP flood (1 in 5 year Event)	2.21m AHD

Refer to glossary for definitions

The above flood levels represent the maximum flood level within the lot boundary. The flood data maps are attached in the appendix.

Source of Flooding information: Wyong River Floodplain Risk Management Study and Plan 2020

State Environmental Planning Policy- SEPP (Exempt and Complying Development Codes) 2008

In accordance with State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, if whole or part of the property is located within at least one of the exclusionary categories in Clause 3.5, development may not be permitted.

The table below contains hazard and hydraulic categorisation of the property in accordance with the NSW Floodplain Development Manual April 2005; Exclusionary categories listed in SEPP 2008, Clause 3.5

Hazard, Hydraulic, and SEPP 2008 exclusionary Categorisation

1% AEP flood hazard	<input checked="" type="checkbox"/> H1 <input checked="" type="checkbox"/> H2
---------------------	--



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Flood Information: 35 McPherson Rd Mardi

Page | 1

Flood Information



	<input checked="" type="checkbox"/> H3 (Complying Development may not be permitted) <input checked="" type="checkbox"/> H4 (Complying Development may not be permitted) <input checked="" type="checkbox"/> H5 (Complying Development may not be permitted) <input type="checkbox"/> H6 (Complying Development may not be permitted) <input type="checkbox"/> N/A
Hydraulic categorisation	<input checked="" type="checkbox"/> All or part of the property is located in a floodway (Complying Development may not be permitted) <input checked="" type="checkbox"/> All or part of the property is located in a flood storage area (Complying Development may not be permitted) <input type="checkbox"/> All or part of property is located in a flood fringe <input type="checkbox"/> N/A

Disclaimer

Flood levels and minimum floor levels are provided in relation to Council's current records at the time of application. Council reserves the right to review and amend these levels from time to time. These amendments may impact the accuracy of information provided.

Glossary

AHD	Australian Height Datum is a common national surface level datum approximately corresponding to mean sea level.
PMF	The Probable Maximum Flood is the largest flood that could conceivably occur.
1% AEP flood	The 1% Annual Exceedance Probability flood has a 1% (1:100) probability of occurring in any given year. This flood is also known as 1 in 100, 100yr ARI or Q100.
2% AEP flood	The 2% Annual Exceedance Probability flood has a 2% (1:50) probability of occurring in any given year. This flood is also known as 1 in 50, 50yr ARI or Q50.
5% AEP flood	The 5% Annual Exceedance Probability flood has a 5% (1:20) probability of occurring in any given year. This flood is also known as 1 in 20, 20yr ARI or Q20.
H1 Hazard Categorisation*	Generally safe for people, vehicles and buildings
H2 Hazard Categorisation*	Unsafe for small vehicles



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Flood Information



H3 Hazard Categorisation*	Unsafe for vehicles, children and the elderly
H4 Hazard Categorisation*	Unsafe for people and vehicles
H5 Hazard Categorisation*	Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure
H6 Hazard Categorisation*	Unsafe for vehicles and people. All building types considered vulnerable to failure
Floodways*	Those areas where a significant volume of water flows during floods and are often aligned with obvious natural channels. They are areas that, even if only partially blocked, would cause a significant increase in flood levels and/or a significant redistribution of flood flow, which may in turn adversely affect other areas. They are often, but not necessarily, areas with deeper flow or areas where higher velocities occur.
Flood storage*	Those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of flood. If the capacity of a flood storage area is substantially reduced by, for example, the construction of levees or by landfill, flood levels in nearby areas may rise and the peak discharge downstream may be increased. Substantial reduction of the capacity of a flood storage area can also cause a significant redistribution of flood flows.
Flood fringe*	The remaining area of land affected by flooding, after floodway and flood storage areas have been defined.

Source – NSW Floodplain Development Manual April 2005

Hydraulic Hazard AIDR ref <https://knowledge.aidr.org.au/media/3518/adr-guideline-7-3.pdf>

NSW FDM ref <https://www.environment.nsw.gov.au/topics/water/floodplains/floodplain-manual>



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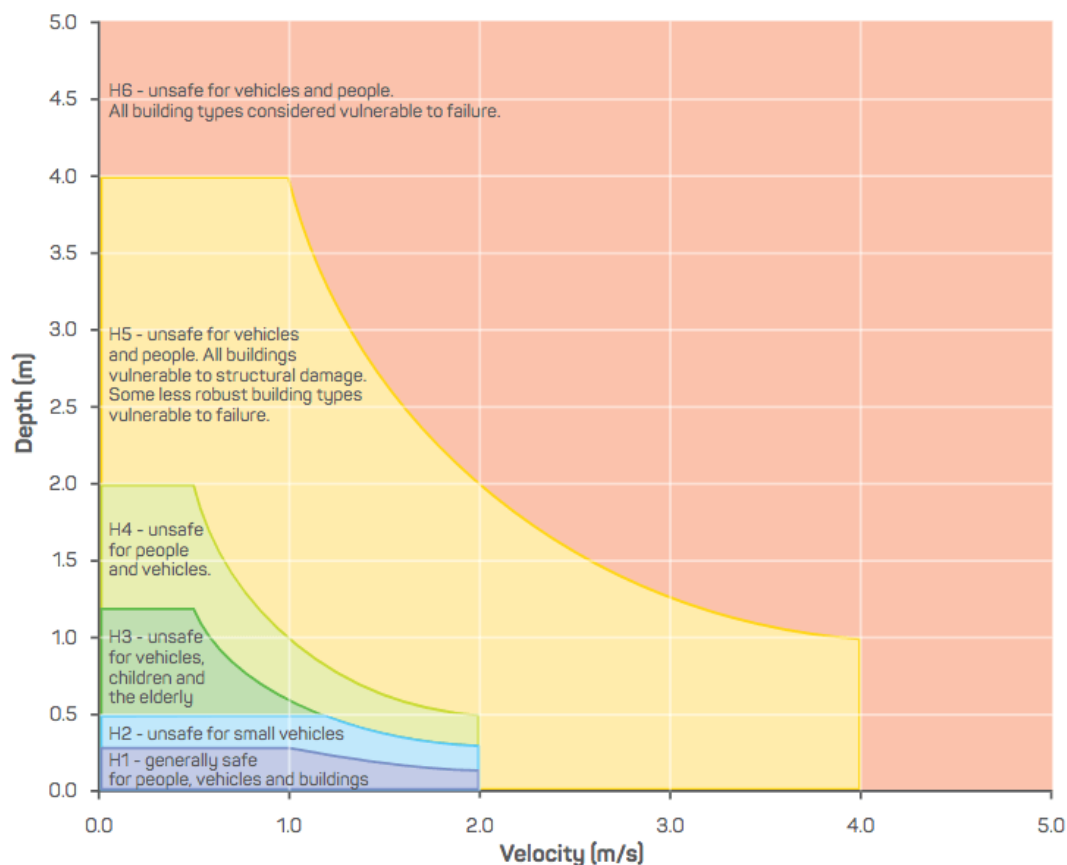
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Flood Information: 35 McPherson Rd Mardi

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Flood Information



Source – Australian Institute for Disaster Resilience 2017. Hydraulic Hazard: refer also to Australian Rainfall and Runoff Section 7.2.7 General Flood Hazard Curves (Figure 6.7.9) <http://book.arr.org.au.s3-website-ap-southeast-2.amazonaws.com/>

The information provided in this letter is provided only to you and is not intended to be provided to a third party.

Should you have any enquiries concerning this letter, please do not hesitate to contact Andrew Dewar on 1300 463 954 during the hours of 8.30am to 5.00pm Monday to Friday.

Yours faithfully,

Andrew Dewar
Floodplain Development Engineer

Phone: 1300 463 954



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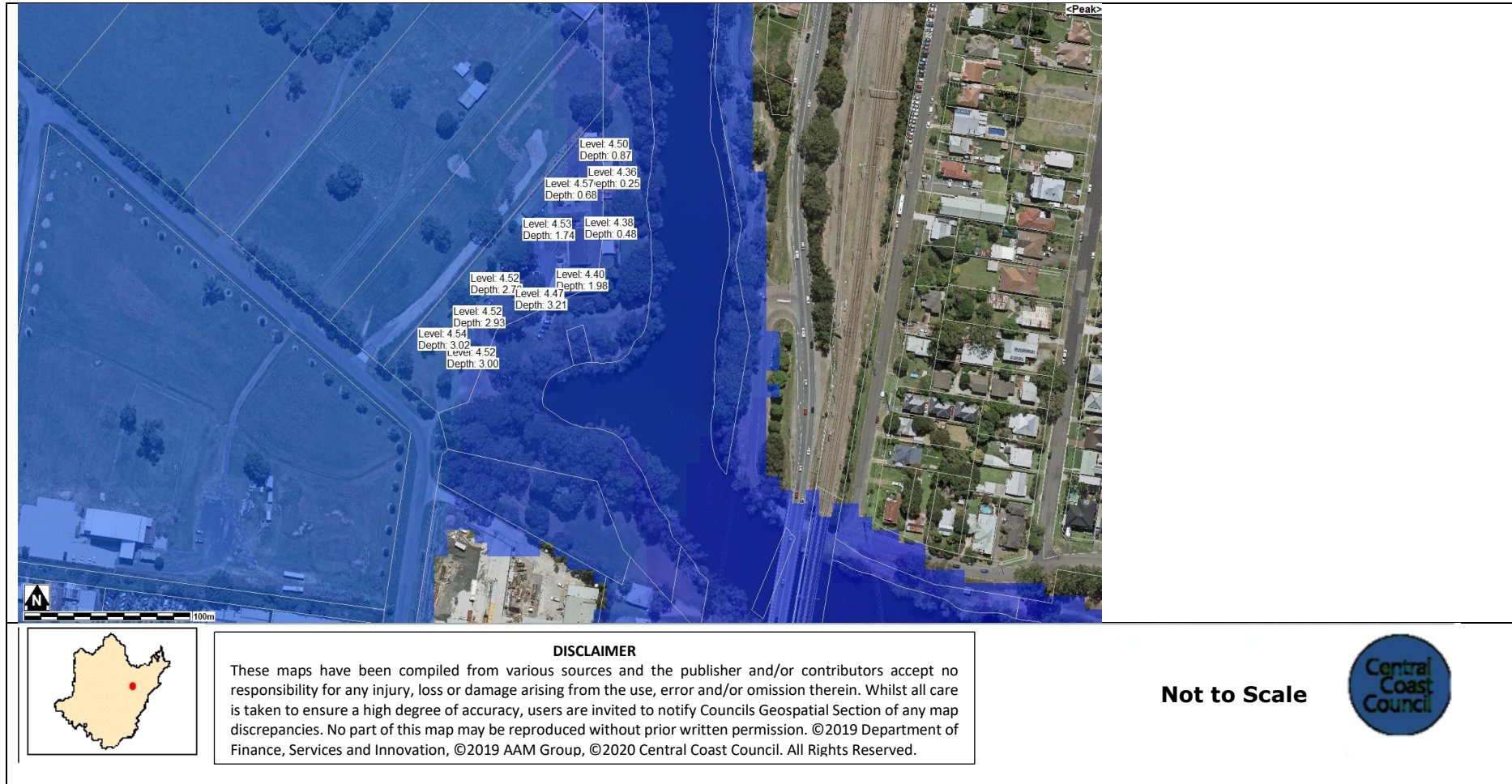
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Appendix

1% AEP Flood Extent



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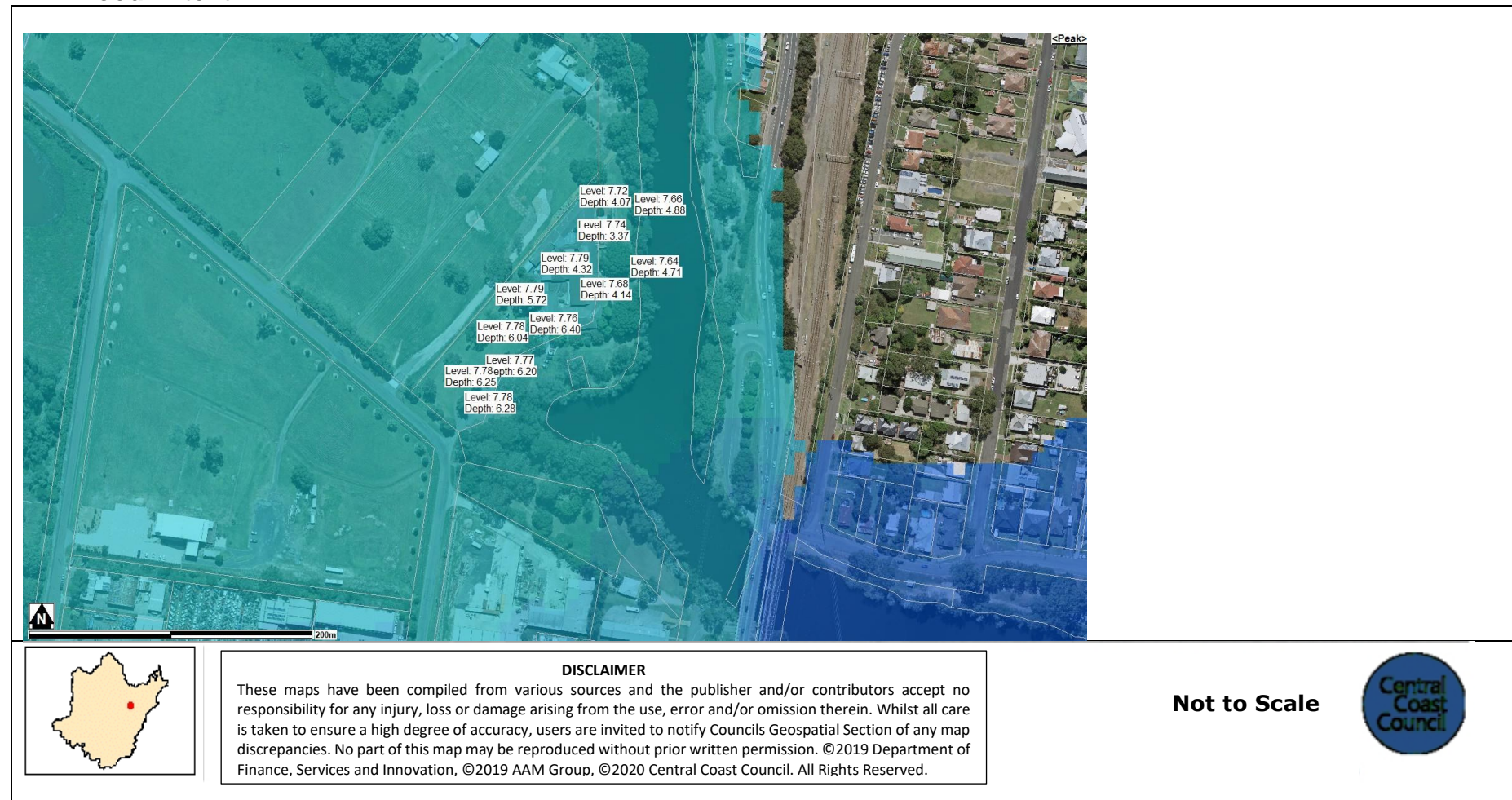
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Flood Information: 35 McPherson Rd Mardi

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Flood Information

PMF Flood Extent



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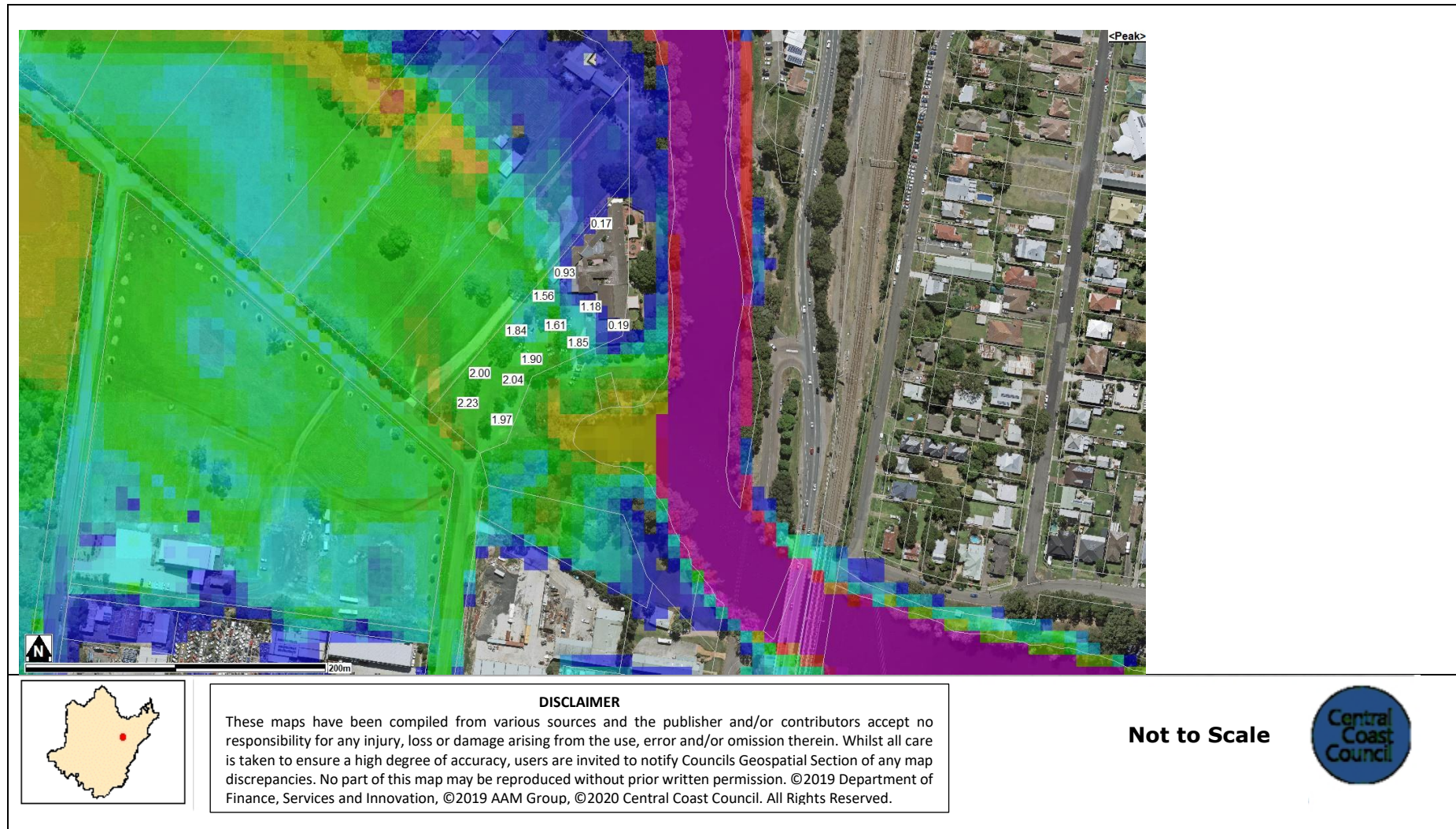
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Flood Information: 35 McPherson Rd Mardi

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Flood Information

5% AEP Flood Extent



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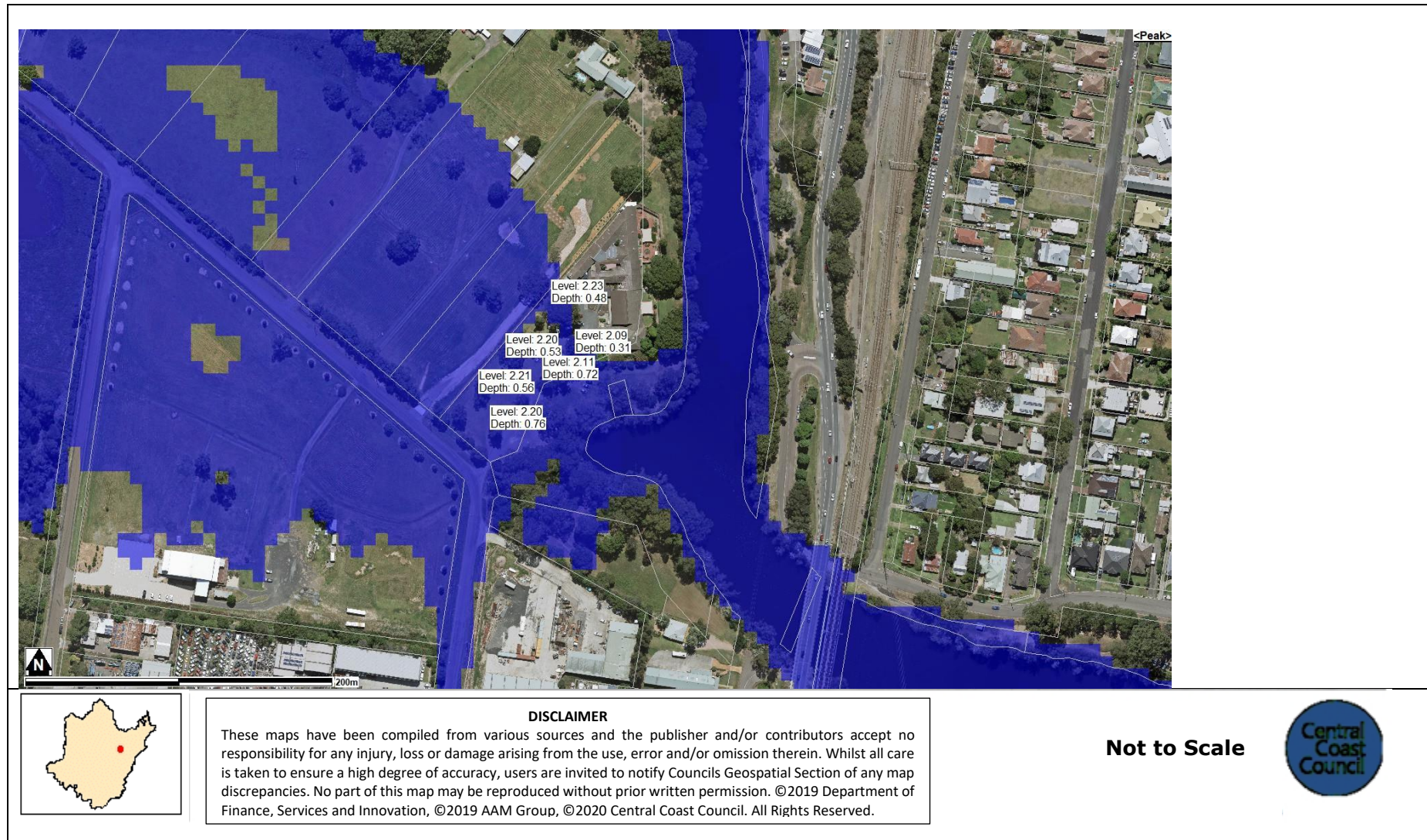
P 1300 463 954 | **E** ask@centralcoast.nsw.gov.au | **W** centralcoast.nsw.gov.au | ABN 73 149 644 003

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Flood Information

20% AEP Flood Extent



Wyong Office: 2 Hely St / PO Box 20 Wyong NSW 2259
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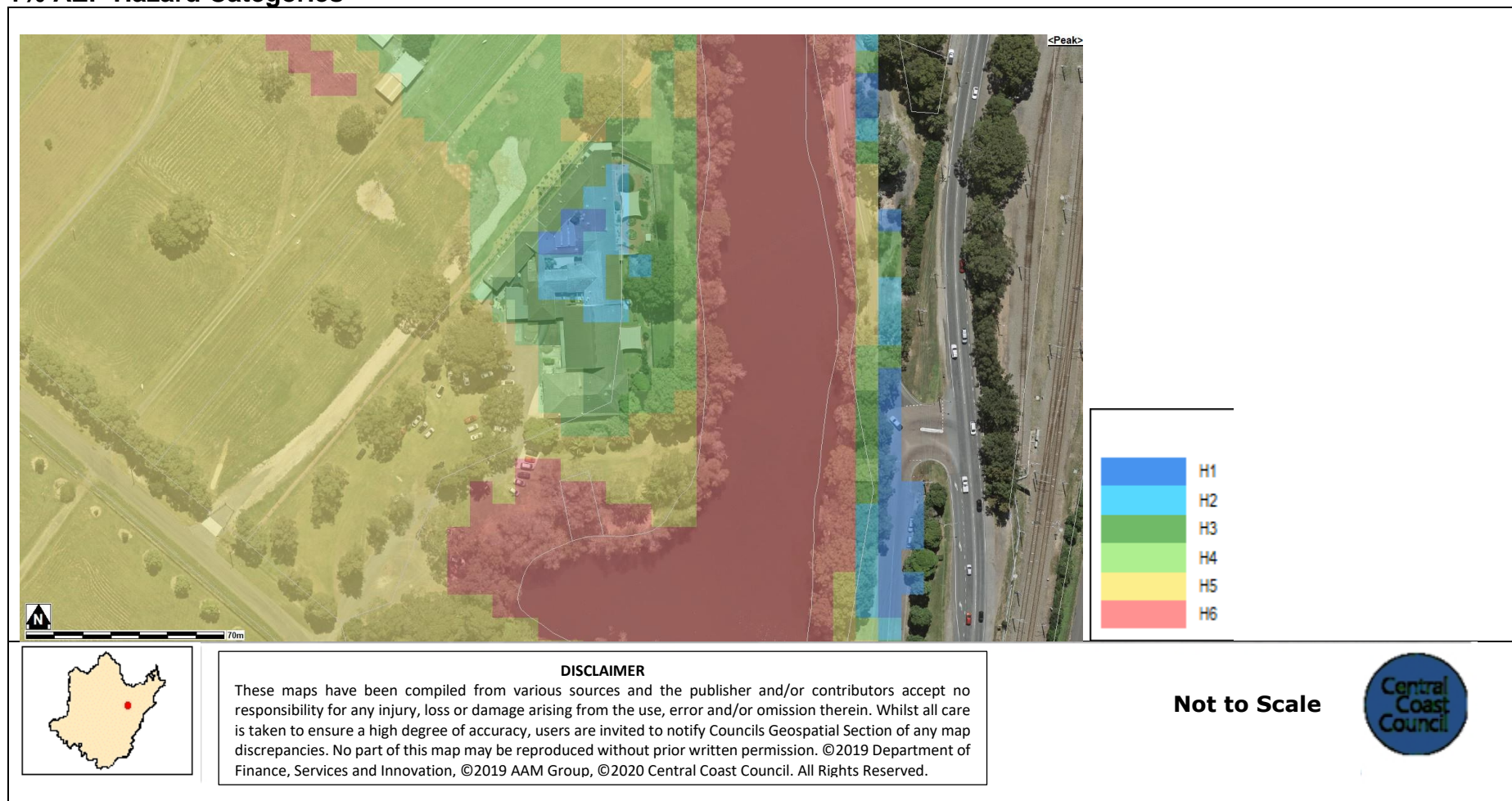
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Flood Information

1% AEP Hazard Categories



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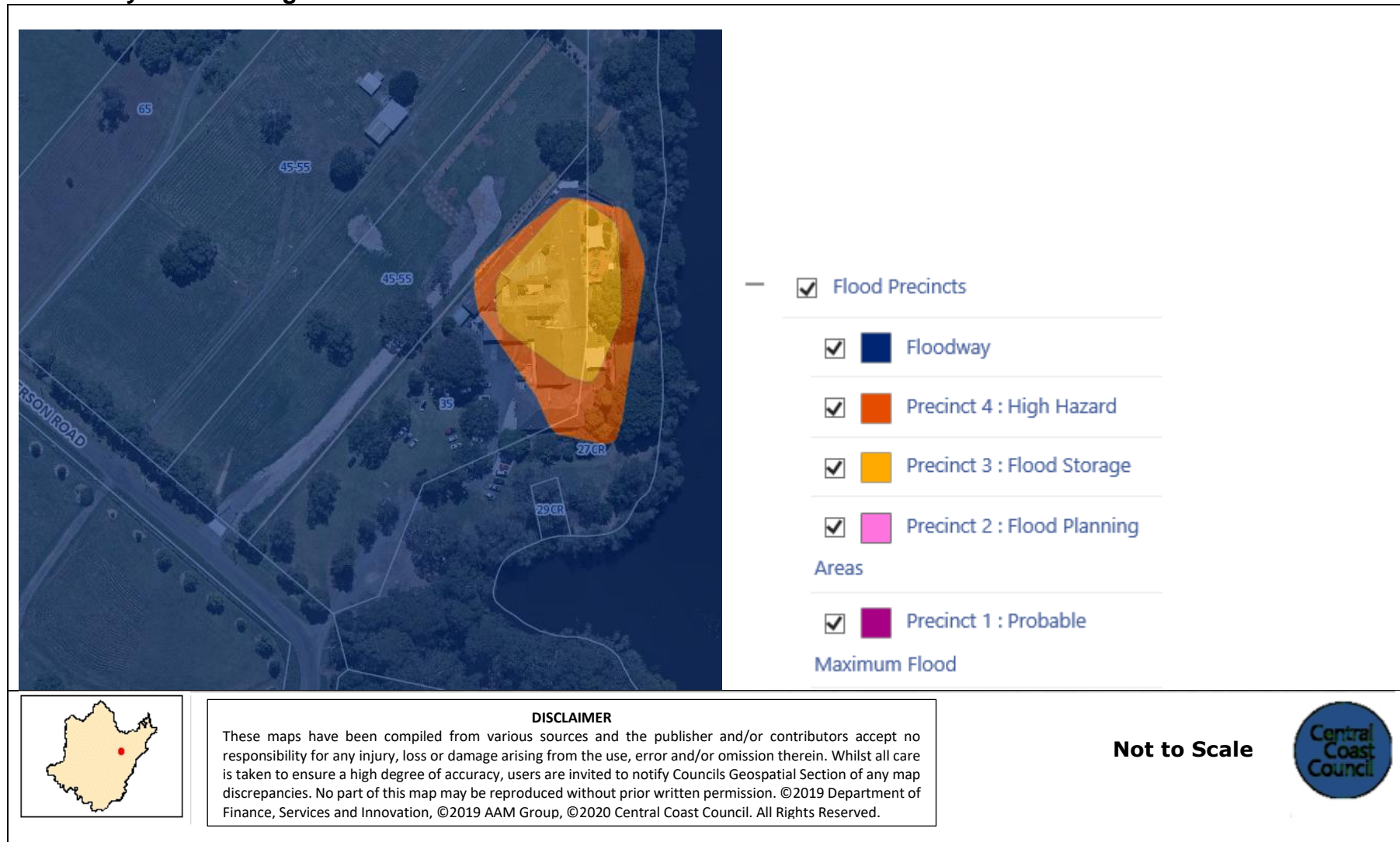
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Flood Information

1% AEP Hydraulic Categories



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Flood Information: 35 McPherson Rd Mardi

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Appendix B: Site Plans

Yerin Aboriginal Medical Service

35 McPherson Street, Mardi, NSW 2259

DEVELOPMENT APPLICATION DRAFT

Drawing List

Sheet No.	Sheet Name	Sheet Issue Date	Revision
A000	Title Sheet	07/08/21	A
A001	Site Analysis	07/08/21	A
A100	Existing Site Plan	07/08/21	A
A101	Existing Ground Floor Plan - South	07/08/21	A
A201	Proposed Ground Floor Plan - South	07/08/21	D
A204	Elevations	07/08/21	A
A202	Proposed Ground Floor Plan - North	07/16/21	B
A200	Proposed Site Plan	07/16/21	B
A203	Basement Floor Plan	07/21/21	A
A103	Existing Basement Floor Plan	07/21/21	A
A102	Existing Ground Floor Plan - North	07/21/21	A



Issue
No.
A 22.07.2021 Draft DA Set

Project & Client



YERIN
Eleanor Duncan
Aboriginal Health Centre

at
35 McPherson Road,
Mardi, NSW 2259
for
Yerin AMS

Architect

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Drawing Title
Title Sheet

Date 07 2021
Scale @ A1

Drawing Reference
20200026 - A000



Address	35 McPherson Road Mardi, NSW 2259
Lot/Section/Plan no.	1/1/DP3368
Local Aboriginal Land Council	Darkinjung
Council	Central Coast Council
Minimum Lot Size	40ha
Land Zoning	E3 Environmental Planning
Acid Sulfate Soils	Class 3 & 4
Flood Planning	Site located in a flood zone

For more information refer to Wyong Local Environmental Plan Map - Flood Planning Map-Sheet FLD_007B

Site Analysis
SCALE 1 : 500



EXISTING SITE PLAN
SCALE 1:500

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No. 22.07.2021 Draft DA Set



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Yerin AMS

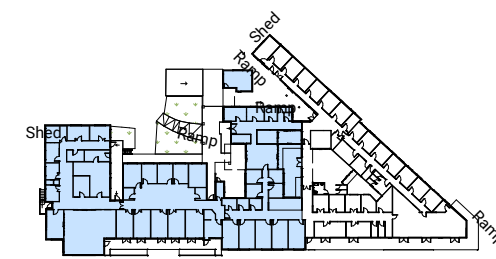
NOTE: Existing Building

LEGEND	
	Demolished walls
	Existing walls
	New walls

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Drawing Title
Existing Site Plan

Date 07 2021
Scale As indicated @ A1
Drawing Reference
20200026 - A100



GROUND FLOOR PLAN KEY - SOUTH

EXISTING GROUND FLOOR PLAN
A204 SCALE 1 : 100

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A



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Mardi, NSW 2259
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Yerin AMS

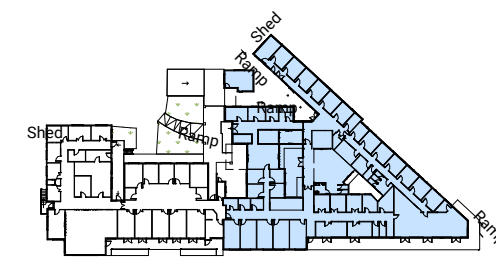
NOTE: Existing Building

LEGEND	
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	Existing walls
	New walls

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Drawing Title
Existing Ground Floor Plan - South

Date 07 2021
Scale As indicated @ A1
Drawing Reference
20200026 - A101



GROUND FLOOR PLAN KEY - NORTH



EXISTING GROUND FLOOR PLAN - NORTH
SCALE 1 : 100

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Aboriginal Health Centre

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for
Yerin AMS

NOTE: Existing Building

LEGEND

- Demolished walls
- Existing walls
- New walls

Architect

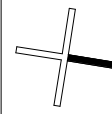
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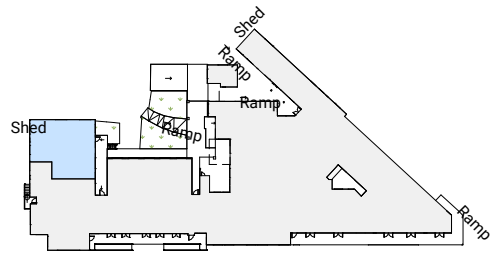
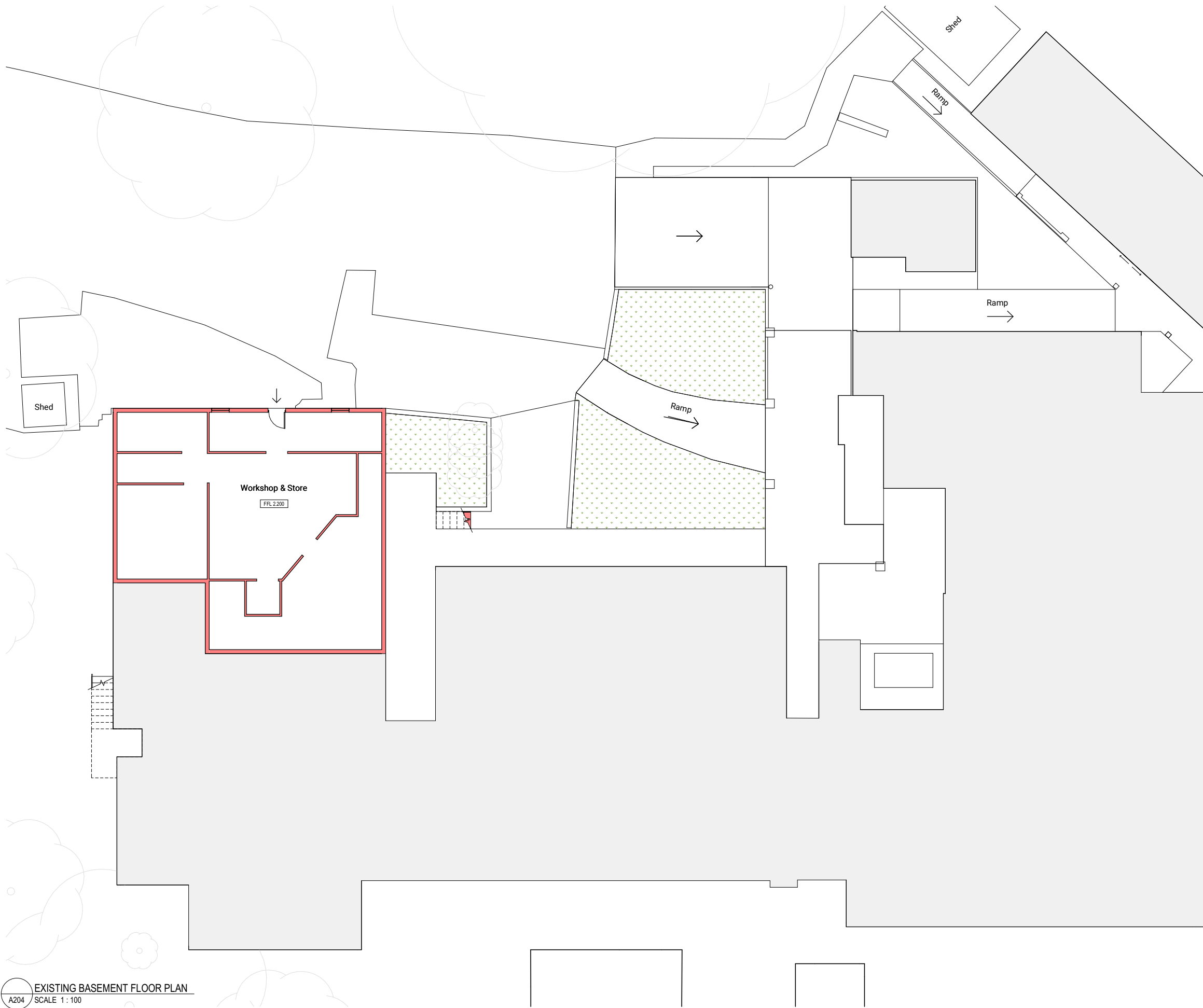
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Drawing Title
Existing Ground Floor Plan - North

Date 07 2021
Scale As indicated @ A1



Drawing Reference
20200026 - A102



BASEMENT FLOOR PLAN KEY

EXISTING BASEMENT FLOOR PLAN
A204 SCALE 1 : 100

Issue
No. 22.07.2021 Draft DA Set

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


YERIN
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Aboriginal Health Centre

at
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NOTE: Existing Building

LEGEND

-  Demolished walls
-  Existing walls
-  New walls

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Drawing Title
Existing Basement Floor Plan

Date 07 2021
Scale As indicated @ A1



Drawing Reference
20200026 - A103



NOTE: Carparking area to be at existing levels and using a permeable product as its surface such as Ecoraster.

PROPOSED SITE PLAN
SCALE 1 : 500

Issue		
No.	Date	Description
A	15.07.2021	Draft DA Set
B	22.07.2021	Draft DA Set






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NOTE: Existing Building

LEGEND

-  Demolished walls
-  Existing walls
-  New walls


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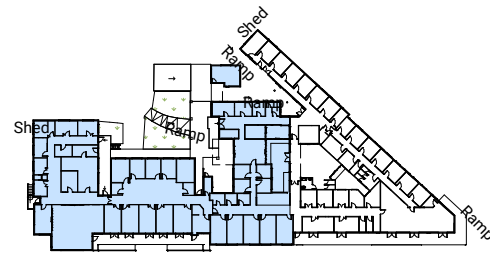
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Drawing Title
Proposed Site Plan



Date 07 2021
Scale As indicated @ A1

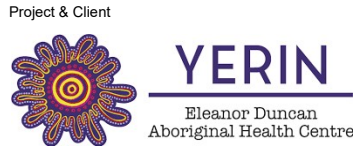
Drawing Reference
20200026 - A200



GROUND FLOOR PLAN PLAN KEY - SOUTH

PROPOSED GROUND FLOOR PLAN - SOUTH
SCALE 1 : 100

Issue		
No.	Date	Issue
A	14.07.2021	Issue to Town Planner
B	15.07.2021	Issue to Town Planner
C	15.07.2021	Draft DA Set
D	22.07.2021	Draft DA Set



at
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for
Yerin AMS

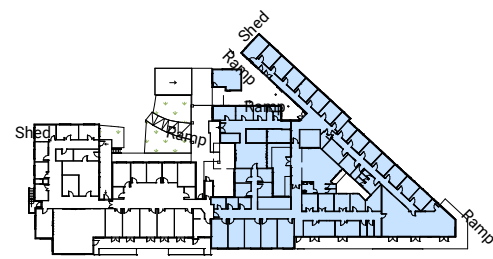
NOTE: Existing Building

LEGEND	
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	Existing walls
	New walls

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Drawing Title
Proposed Ground Floor Plan - South

Date 07 2021
Scale As indicated @ A1
Drawing Reference
20200026 - A201




GROUND FLOOR PLAN KEY - NORTH



PROPOSED GROUND FLOOR PLAN - NORTH
SCALE 1 : 100

Issue		
No.		
A	15.07.2021	Draft DA Set
B	22.07.2021	Draft DA Set

Project & Client



YERIN
Eleanor Duncan
Aboriginal Health Centre

at
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Mardi, NSW 2259
for
Yerin AMS

NOTE: Existing Building

LEGEND

- Demolished walls
- Existing walls
- New walls

Architect

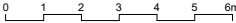
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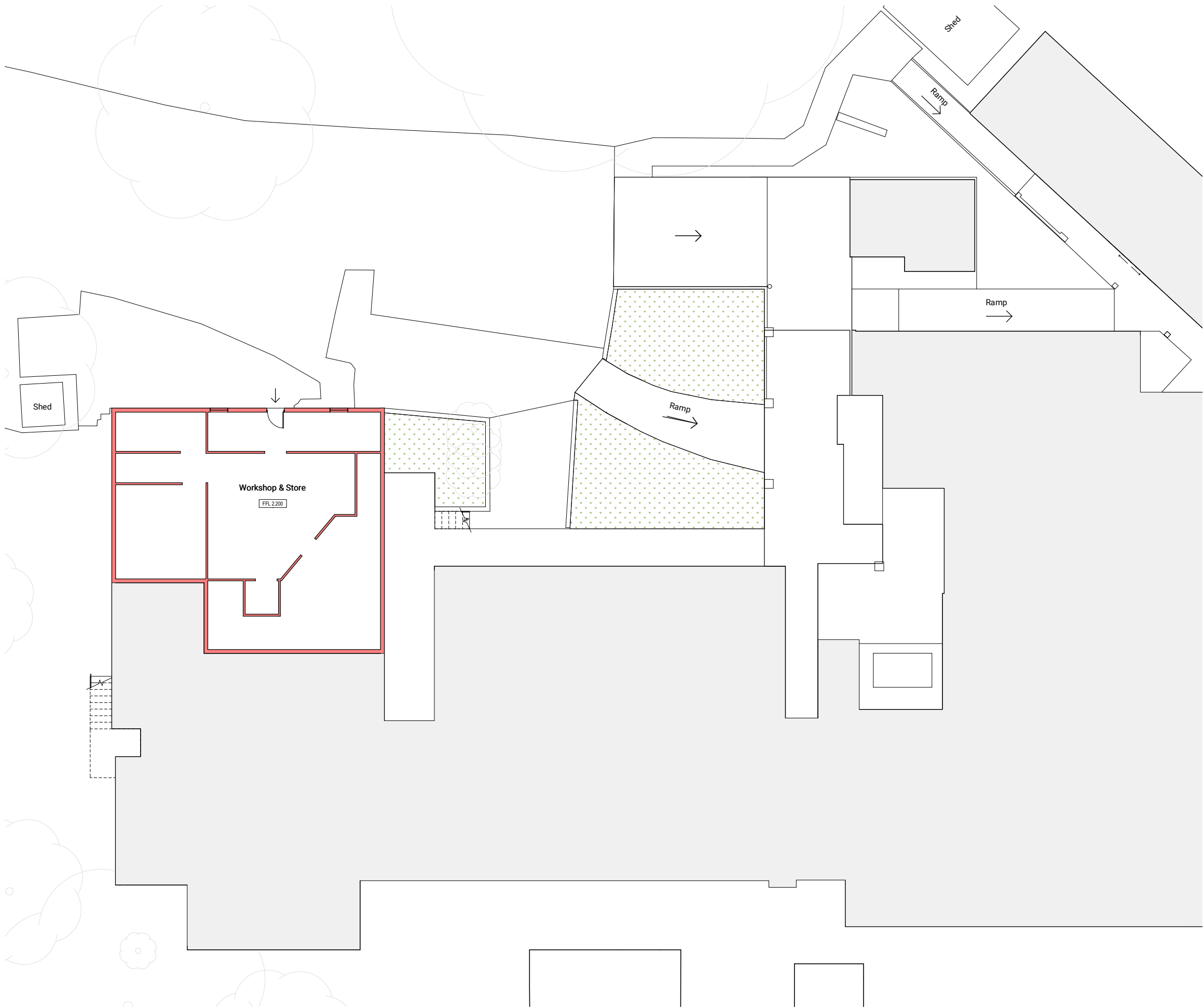
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Drawing Title
Proposed Ground Floor Plan - North

Date 07.2021
Scale As indicated @ A1



Drawing Reference
20200026 - A202



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No.
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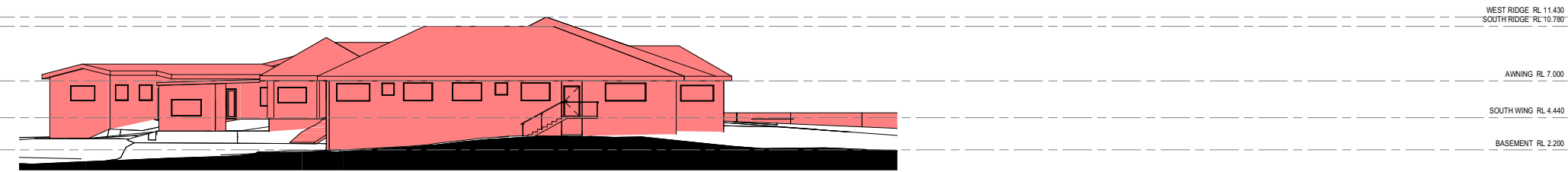
NOTE: Existing Building

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	Existing walls
	New walls

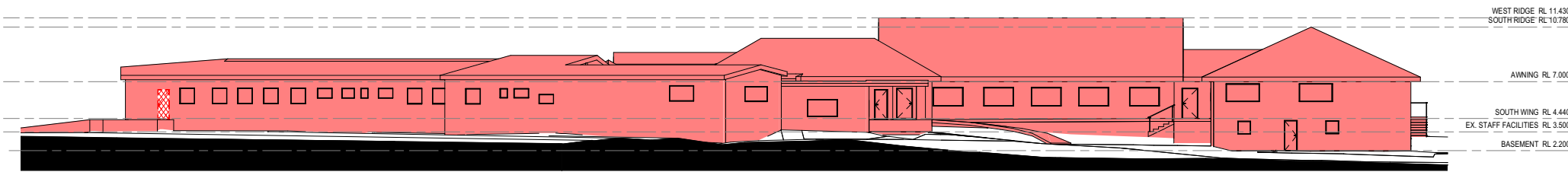
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Drawing Title
Basement Floor Plan

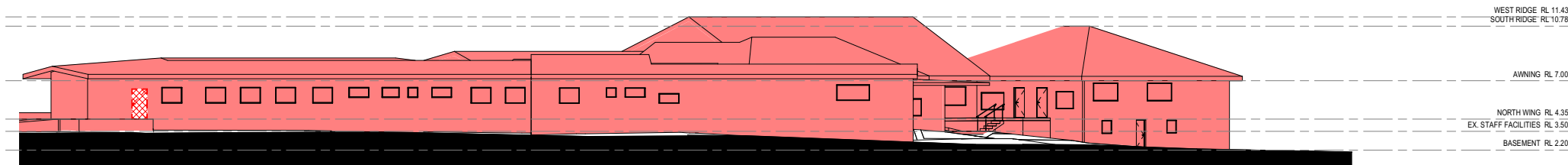
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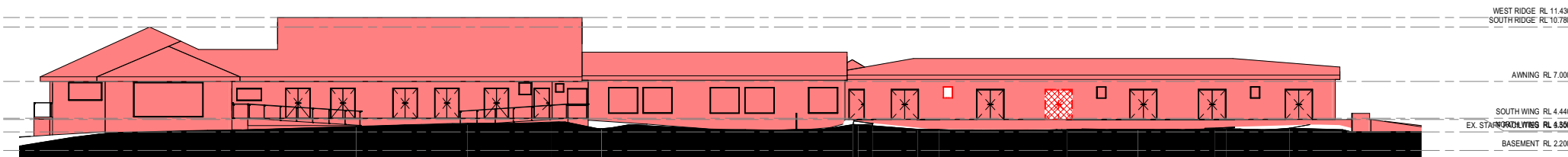
1 SOUTH ELEVATION
A201 SCALE 1 : 200



2 WEST ELEVATION
A201 SCALE 1 : 200



3 NORTH-WEST ELEVATION
A202 SCALE 1 : 200



4 NORTH ELEVATION
A201 SCALE 1 : 200

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Elevations

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Figure 1: View north to flooding around site entrance



Figure 2: View north-east to client entrance ramp

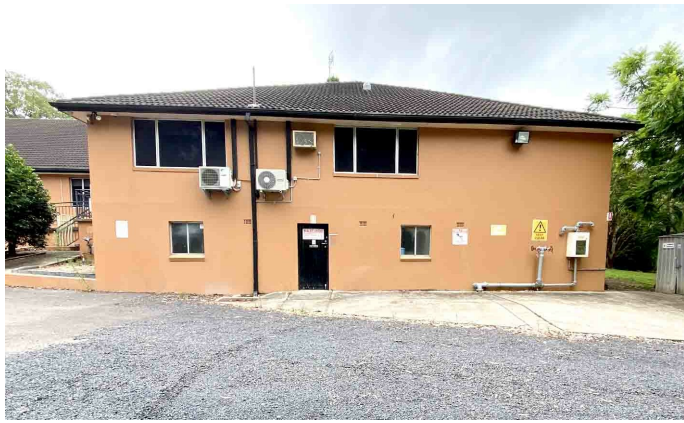


Figure 3: View east to basement level workshop and ground floor staff area



Figure 4: View east to patient rooms



Figure 5: View north to Staff Amenities Building and the building's North Wing

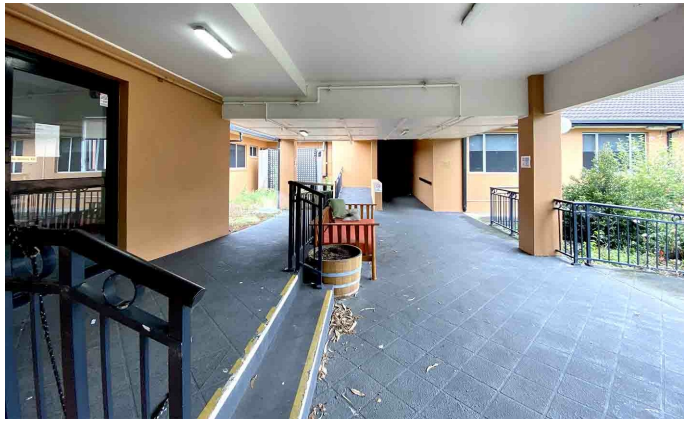


Figure 6: View east to client entrance on left and egress point directly ahead



Figure 7: View west along courtyard and dining area

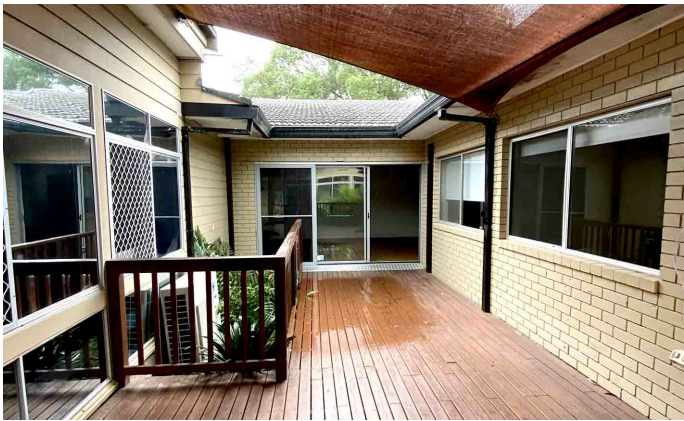


Figure 8: View east to Courtyard



Figure 9: Typical patient room



Figure 10: View west to courtyard



Figure 8: View south-west to second courtyard



Figure 12: View south to courtyard and rear of building