

Stormwater and Flooding Assessment SSDA SEARS Conditions Report

Nepean Hospital Development – Stage 2 Tower & Future Developments
Civil

Project Reference: 12260-01

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SSDA SEARS Conditions Report

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1 Executive Summary

Health Infrastructure NSW (HI) is the applicant for the proposed Stage 2 Redevelopment of Nepean Hospital in Penrith Local Government Area (LGA).

The proposal is a State Significant Development (SSD) for the purposes of the Environmental Planning and Assessment Act 1979 (EP&A Act) and clause 14(a) of Schedule 1 of the State Environmental Planning Policy (State and Regional Development) 2011 (SEPP SRD) as it involves development for the purposes of a hospital with a capital investment value in excess of \$30 million.

The Stage 2 Redevelopment seeks to deliver significantly enhanced acute services, as well as a new campus main entry and drop-off area. It complements the recent Stage 1 Redevelopment (SSD 8766) approved in February 2019 and due for completion by early 2022.

The proposed Stage 2 Tower will be located west of, and connected to, the Stage 1 Tower. Portions of the North Block (north section) will be demolished with the remaining sections of the North Block (to the south of the Stage 2 Tower) to remain operational.

Departments to be provided in the Stage 2 Tower include:

- Front of House, including retail;
- Education and Training Centre;
- Transit Lounge;
- Medical Imaging;
- Interventional Radiology;
- Intensive Care Unit and Close Observation Unit;
- In-Centre Dialysis and Renal Inpatient Unit;
- Paediatric In-patient Unit;
- Plant areas;
- Clinical Support areas; and
- Kitchen.

The Stage 2 Redevelopment project scope includes:

- The Stage 2 Tower, being predominantly a 7-storey building, with roof plant;
- Demolition of parts of the existing North Block and other satellite buildings directly within the Stage 2 Tower footprint (excluding other buildings already approved under the Stage 1 SSD consent);
- Demolition of the Total Asset Management (TAM) facility;
- Reconfiguration of the loading dock area and back of house functions;
- Landscaping and other associated at-grade works within the Stage 2 Tower's immediate vicinity; and
- Barber Avenue upgrade and access road to the Stage 2 Tower's forecourt, port cochere, and front of house area.

The Stage 2 Redevelopment's SEARs were issued by the Department of Planning, Industry and Environment on 22 April 2021.

2 Planning Secretary's Environmental Assessment Requirements

Section 4.12(8) of the Environmental Planning and Assessment Act 1979
Schedule 2 of the Environmental Planning assessment Regulation 2000

This report addresses the following SEARS conditions:

Application Number		SSD-16928008
Project Name		Nepean Hospital Redevelopment Project – Stage 2
Location		Derby Street, Kingswood
Applicant		Health Administration Corporation
Item No.	General Requirements Key Issue or Agency Advice	Reference / Location within this report.
15.	<p>Stormwater Drainage.</p> <ul style="list-style-type: none"> Provide: <ul style="list-style-type: none"> A preliminary stormwater management plan for development that: Is prepared by a suitably qualified person in consultation with Council and any other relevant drainage authority. Details the proposed drainage design for the site including on-site detention facilities, water quality measures and the nominated discharge point. Demonstrates compliance with Council or other drainage authority requirements. <ul style="list-style-type: none"> Stormwater plans detailing the proposed methods of drainage without impacting on the downstream properties. Where drainage infrastructure works are required that would be handed over to Council, provide full hydraulic details and detailed plans and specifications of proposed works that have been prepared in consultation with Council and comply with Councils relevant standard. 	For Stormwater drainage design and management, stormwater catchments, On-Site Detention and Water Quality management – refer to Section 4 of this report.
16.	<p>Flooding</p> <ul style="list-style-type: none"> Identify any flood risk on-site in consultation with Council and having regard to the most recent flood studies for the development area and the potential effects of climate change, sea level rise and an increase in rainfall intensity. Asses the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions to mitigate flood risk where required. If relevant, identify any changes to emergency management, evacuation and contingency measures during a flood event. 	<p>Flood risk, potential effects of climate change, sea level rise and increase in rainfall intensity have all been considered.</p> <p>Refer to Section 5 of this report.</p>
17.	<p>Soil and Water</p> <ul style="list-style-type: none"> Provide: <ul style="list-style-type: none"> An assessment of potential impacts on surface and groundwater (quality and quantity), soil, related infrastructure and watercourse(s) where relevant Details of measures to minimise and manage the generation of off-site transmission of sediment, dust and fine particles An assessment of salinity and acid sulphate soil impact, including a Salinity Management Plan and/or Acid Sulphate Soils Management Plan where relevant. <p>Relevant Policies and Guidelines:</p>	Refer to Section 4.2.6 and 4.2.7 of this report for Soil and Water assessment and measures (both during and post-construction).

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	<ul style="list-style-type: none"> • Managing Urban Stormwater – Soils and Construction Volume 1 (Landcom 2004) • Acid Sulfate Soil Manual • Acid Sulfate Soils Assessment Guidelines (DoP, 2008) • Managing Urban Stormwater – Soils and Construction Volume 1 (Landcom 2004) and Volume 2 (A. Installation of Services B. Waste Landfills C. Unsealed Roads D. Main Roads E Mines and Quarries) (DECC2008) 	
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3 Existing Site Conditions

3.1 Location

The proposed site is located within the Penrith City Council Local Government Area (LGA). The proposed development is located on the existing Nepean Hospital Campus, Kingswood NSW. The campus is bordered by Parker Street to the west, Barber Avenue and the Great Western Highway to the north, Somerset Street to the east and Derby Street to the south.

The Stage 2 Tower site is adjacent to the currently under construction Stage 1 Tower (see Figure 3.1-A). The Stage 2 Tower will be located to the west of the currently under construction Stage 1 Tower. Its footprint will require demolition works to the existing North Block.



Figure 3.1-A - Nepean Hospital Campus (Approximate Extent of Stage 1 & 2 Towers Shown – Source: Nearmaps)

3.2 Existing Stormwater System and Water Courses

The Nepean Hospital Campus broadly operates as four separate catchment quadrants.

The North-West quadrant includes portions of North Block, West Block, Multi-Storey Carpark and adjacent service roads. This catchment discharges to Parker Street and Barber Avenue. Overland flow is directed to Parker Street.

The South-West quadrant comprises of the West Block car park, helipad, portions of West Block and portions of South Block and discharges into the Council system in Parker Street.

The North-East quadrant is the largest and includes Cancer Care, Tresillian, Hope Cottage, portions of North Block, Doctor's Accommodation, Gateway, Drug and Alcohol, Stage 1 Tower (currently under construction) and East Block. The storm water is discharged at the site boundary into a dual pipe system opposite Rogers Street.

The South-East catchment (which includes Mental Health, Maintenance, Oral Health and multi-deck car park buildings) discharges directly into Derby St and Somerset St via individual systems, each of which typically includes on site detention.



Figure 3.2-A – Nepean Hospital Campus Catchment

4 Proposed Development

4.1 General Description

The proposed development comprises of a new 8 storey acute services building adjacent to the currently under construction Stage 1 Tower ('Main Tower'). Refer Figure 4.1-A for the site plan showing the new building.

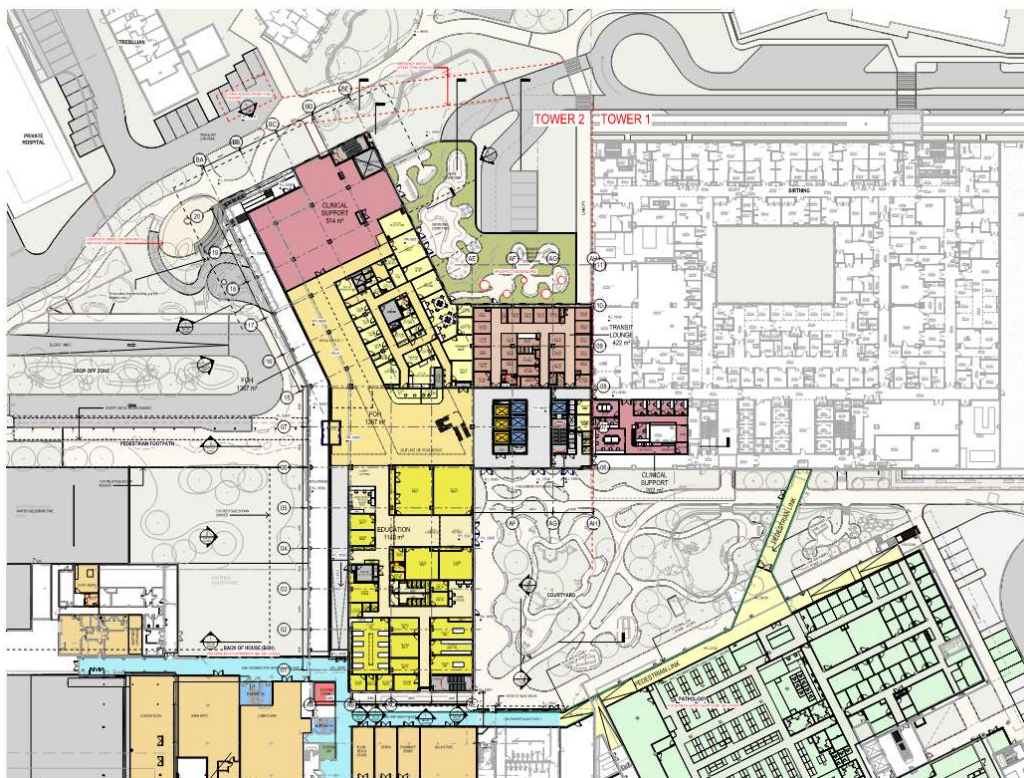


Figure 4.1-A - Level 01 General Arrangement Plan (Source: BVN)

The refurbishment and demolition of adjacent buildings including North Block, and Pathology is required for integration of the new Tower 2 building with existing buildings. Hope Cottage, Doctor's Accommodation, Population Health, Asset Management and part of North Block will be demolished to make way for the Stage 2 Tower.

4.1.1 Design Standards

The civil design will be in accordance with the latest revision of all relevant Australian Design Standards, Codes and other statutory requirements. As a minimum requirement, the design shall be based on but not limited to:

Table 4.1-A - Civil Design Guidelines and Standards

Design Element	Guideline or Standard
Site Grading	<ul style="list-style-type: none"> AS1428.1:2009 Design for Access and Mobility Part 1: General Requirements for Access – New Building Works Penrith City Council's Development Control Plan AS2890.2 – Parking Facilities Part 2: Off-street commercial Vehicle facilities AS2890.6 – Parking Facilities: Off-street Parking for People with Disabilities

Stormwater Management

- AS3500 Plumbing and Drainage Part 3 – Stormwater Drainage
- Australian Rainfall and Runoff
- Penrith City Council's Development Control Plan
- College, Orth, and Werrington catchment overland flow flood study

Erosion and Sediment Control

- Soils and Construction Volume 1 and 2 (4th edition), Landcom, 2004

4.2 Stormwater Drainage Design

Along with the construction of the new Stage 2 Tower, the redevelopment requires extension of and adjustment to Barber Avenue to the new Stage 2 Tower main entrance, new access to a drop off area and associated car parking. Figure 4.2-A shows civil works overlay and architectural layout.

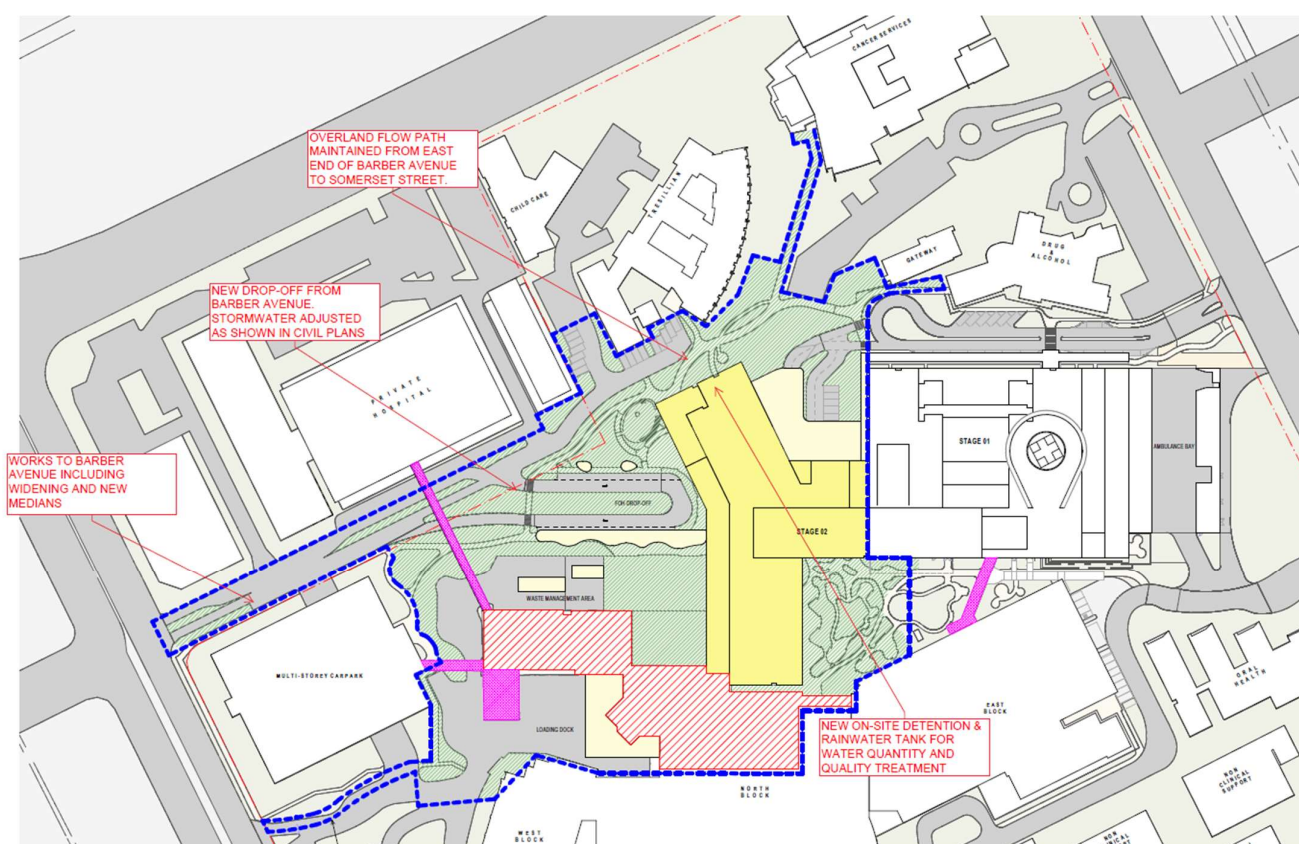


Figure 4.2-A: Civil Works Overlay

4.2.1 Stormwater Works

Stormwater works proposed consist of:

- Barber Avenue pits and pipes, including adjustment of the connecting stormwater system within the Hospital Campus which conveys stormwater to the east, where it joins the Council stormwater network at Somerset Street (refer Green outline in Figure 4.2-B).
- Adjusted stormwater system to the northern area of Stage 2 works, which connects to the Council pit and pipe system in Barber Avenue (refer Orange outline in Figure 4.2-B).

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- Stormwater system for Stage 2 building – which consists of the building footprint being directed to a combined On-site Detention and Rainwater tank and then connected to the main through-site stormwater system (refer Figure 4.2-H)

The proposed stormwater adjustments are shown in Figure 4.2-B.

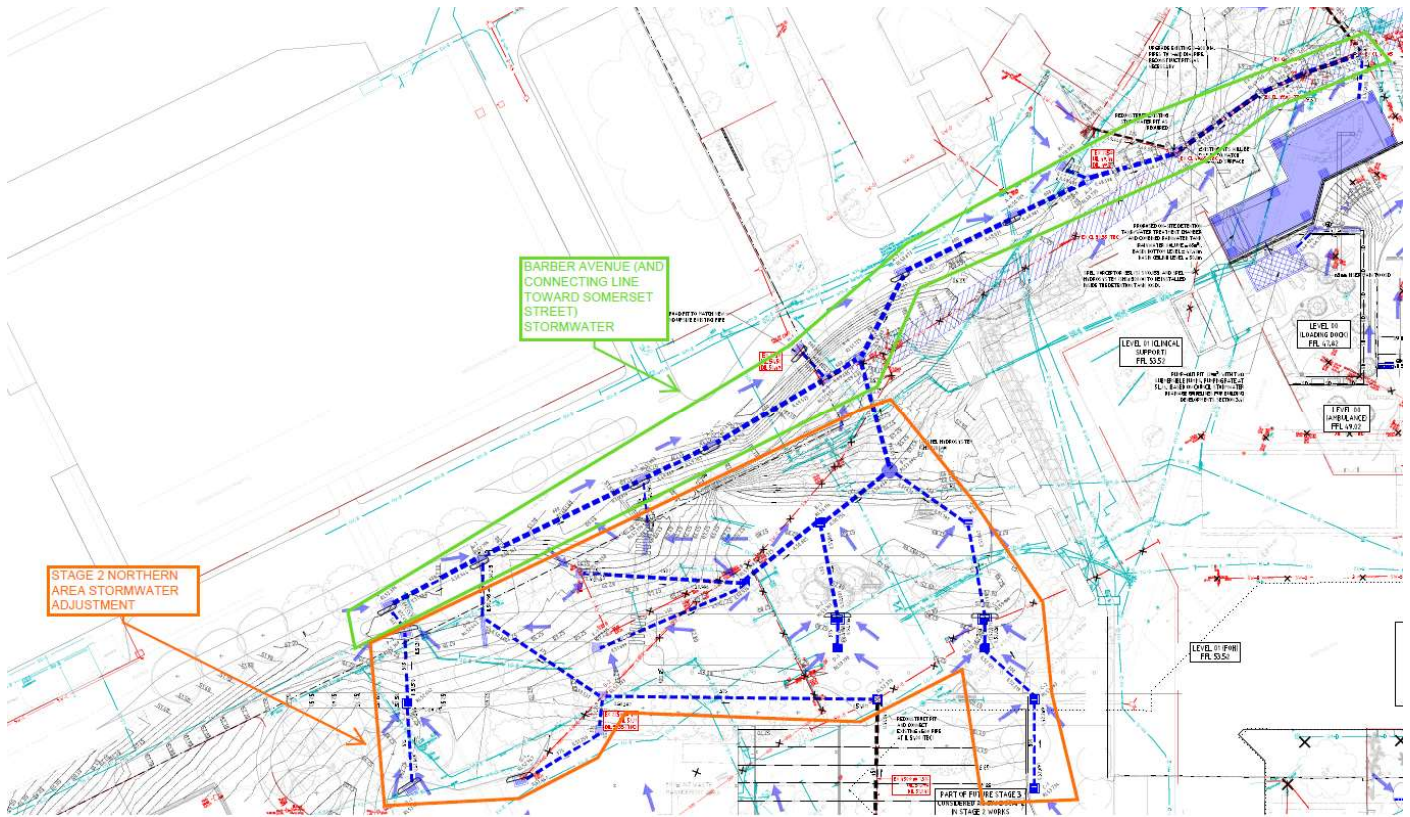


Figure 4.2-B: Stormwater Adjustments for Stage 2

Assessment of existing and proposed pervious/impervious areas within Stage 2 works has been undertaken. Figures 4.2-C and 4.2-D show existing and proposed layouts. Table 4.2-A details the change in impervious area.

Proposed Easement Over Existing Stormwater Line

An easement for water supply approximately 4.5m wide exists from the eastern end of Barber Avenue traversing the site East towards Somerset Street. The outlet pipe from the stormwater pit located at the eastern end of Barber Avenue approximately follows the water easement, eventually connecting to the stormwater network in Somerset Street.

The open swale channel that was located to the north of the proposed Stage 2 tower building has been filled and replaced with twin 300mm pipes. These twin pipes have been connected to a 600mm diameter pipe which runs along the northern side of Stage 1 tower, toward the east.

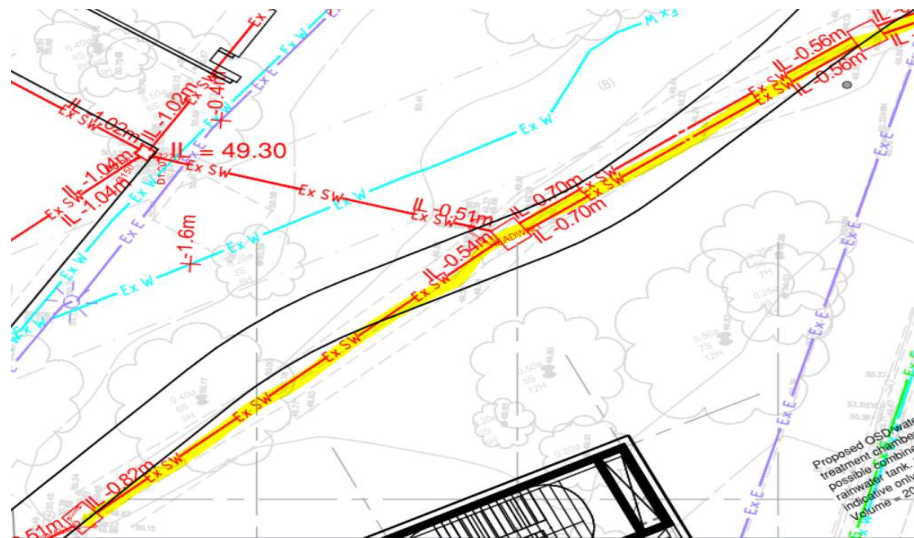


Figure
4.2-C:
Existing

Stormwater Pipes Replacing Swale

There is no existing easement over the stormwater line. Stage 1 works will see an easement established over this stormwater line. Stage 2 works include upgrading this stormwater line to 600mm diameter, to better cater for flows from Stage 2 area and minimise overland flow issues.

The maximum pipe size of this stormwater trunk drainage line is 600mm diameter (based on investigation during Stage 1). Based on a 600mm diameter pipe, the easement width will be 2.5m in accordance with Penrith City Council "Stormwater Drainage Guidelines for Building Developments" Table 2 Width of Drainage Easement. This easement width provides approximately 2.5 m clearance from the existing stormwater line to the proposed Stage 2 building tower outline.

Penrith City Council's stormwater drainage specification for building developments recommends that the stormwater drainage is to be designed in accordance with the following design criteria:

- Minor System Drainage (Underground Piped Network) 1 in 20 year ARI.
- Major System Drainage (Overland Flow Path) 1 in 100 year ARI.

Penrith City Council policy is that post-development stormwater flows must not exceed pre-development peak flows. This is the strategy that has been adopted for Stage 2. The existing impervious area has been compared with the proposed impervious area within the Stage 2 extent of works footprint. Refer Table 4.2-A for area comparison – the proposed impervious area exceeds existing impervious area, indicating that peak flows from the proposed development will exceed pre-development flows without mitigation.

An underground on-site detention tank has been proposed to mitigate the increased peak flows from the proposed development. Refer Figure 4.2-D for proposed impervious area catchment analysis and Figure 4.2-E for existing impervious area catchment analysis within Stage 2 works.

Area of Stage 2 works	1.245 Ha.
Proposed Pervious area	0.77 Ha
Proposed Percentage of impervious area	38%
Existing Pervious area	1.02 Ha (considering demountable buildings as pervious)
Percentage of existing impervious area	15%

Table 4.2-A: Site Impervious/Pervious Area Comparison



Figure 4.2-D: Proposed impervious area analysis within Stage 2

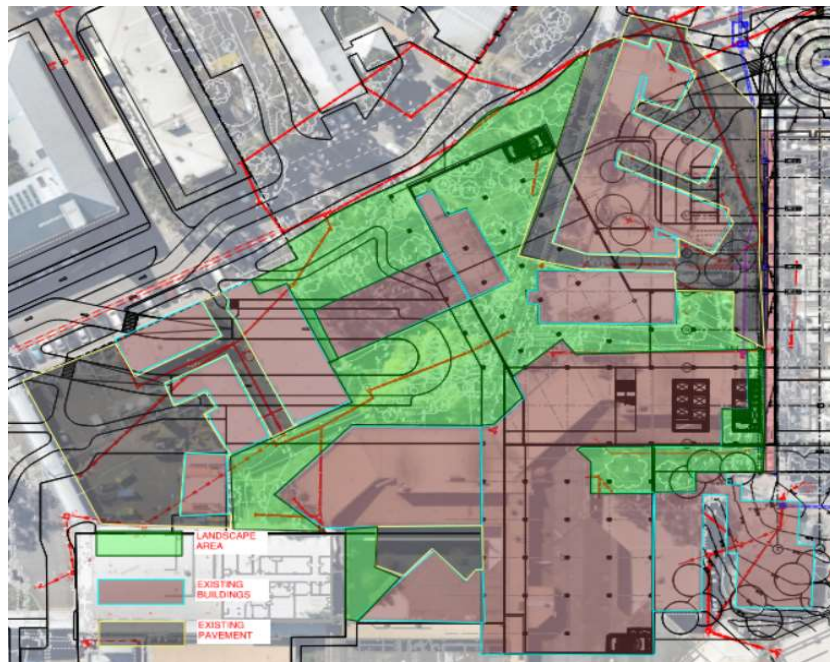


Figure 4.2-E: Existing impervious area analysis within Stage 2

4.2.2 Diversion of Drainage Lines

The existing stormwater line traversing within the Stage 2 building footprint will be diverted to the west of Stage 2 building and will be connected to the existing stormwater line. The drainage system has been designed to accommodate the drainage requirements of the proposed Stage 2 works, and the diversions required for the construction stage. During the construction stage, the western diversion line will be constructed and connected to proposed stormwater line as shown in Figure 4.2-F below.

An assessment of the existing stormwater pits in the back-of-house loading dock area has been undertaken. Some of these pits require relocation.

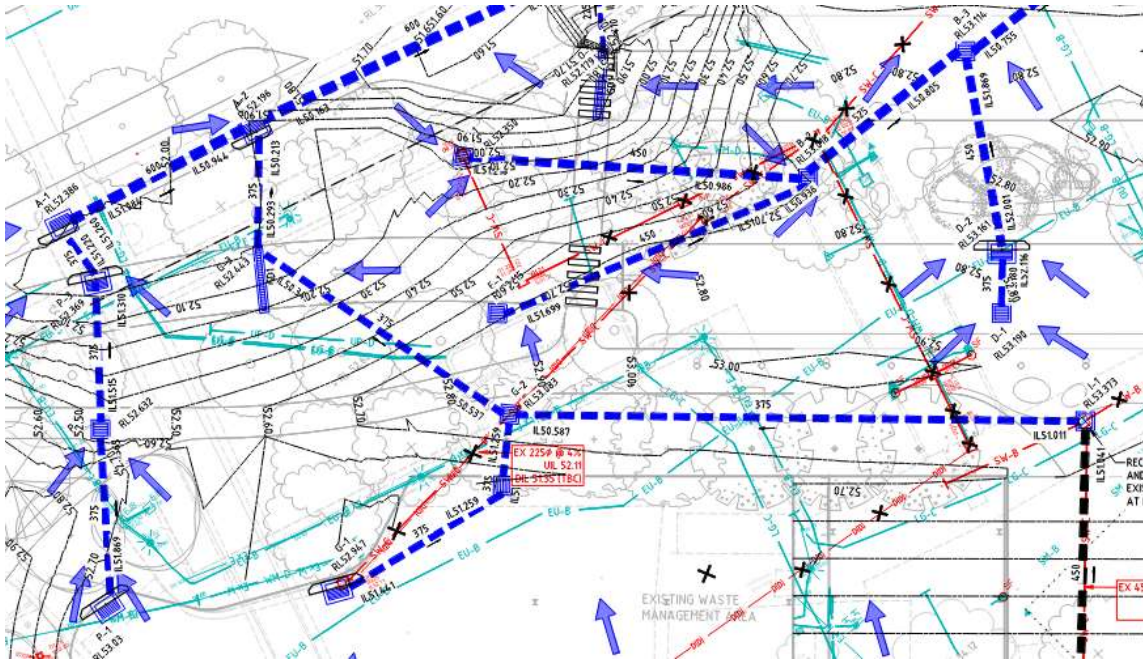


Figure 4.2-F: Diversion of existing stormwater lines from North Block

The proposed stormwater drainage and the diversion stormwater lines will be connected to the stormwater trunk drainage line which is located to the east of Barber Avenue. This line needs to be upgraded to safely convey stormwater flows from the proposed stormwater system. The proposed 600mm diameter stormwater line will adequately convey the diverted stormwater and the existing flows from the Barber Avenue pit and pipe system. This main stormwater line also carries flows east of Barber Avenue. An easement benefiting Council over this stormwater line is to be provided as part of Stage 1 works. Upgrade of this stormwater line and diversion of the upstream catchments will ensure the construction site and adjacent hospital operations do not experience any interruptions due to stormwater issues. Adjustment of the easement will be undertaken if required due to Stage 2 works (due to upgrade of the stormwater line, or to allow pit and pipe relocation based on the final landscape, architectural and services design).

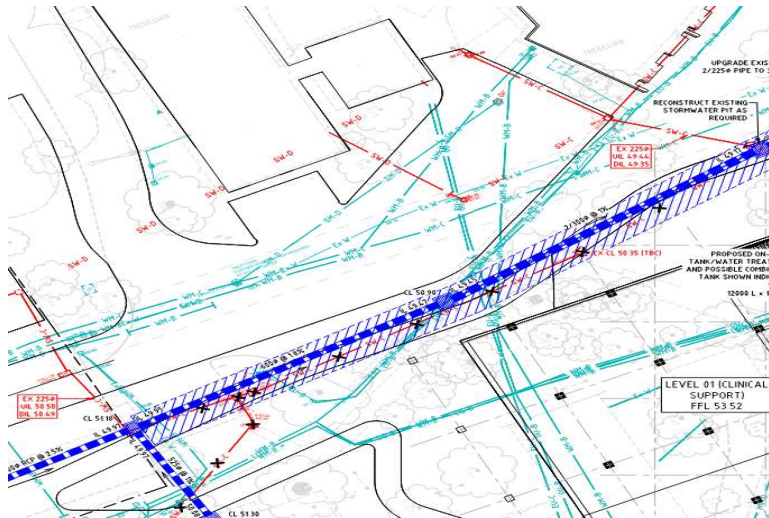


Figure 4.2-G: Proposed 600mm stormwater pipe replacing existing 375mm pipe from the East end of Barber Avenue

Diversion of drainage lines may be undertaken as early works to enable the decommissioning of existing stormwater lines within the construction site. They will be integrated into the final stormwater drainage network at the completion of the works. The diversion stormwater strategy for the site is shown in Figure 4.2-F.

4.2.3 Stage 2 Courtyard

The Stage 2 courtyard works consist of landscaped areas, which drain to a stormwater pit and pipe network that will connect to the system constructed during Stage 1 works. A pedestrian path is proposed between North Block and Stage 1 and the overland flow path can be seen in Figure 4.2-H.

No stormwater pipeline diversions are required in the landscaped courtyard located between Stage 1 tower and north block. Existing stormwater lines in this area have been considered in the Stage 1 design. The design has been checked to make sure the underground pipe network has sufficient capacity to convey stormwater runoff from 20-year ARI event without causing any flooding in the area.

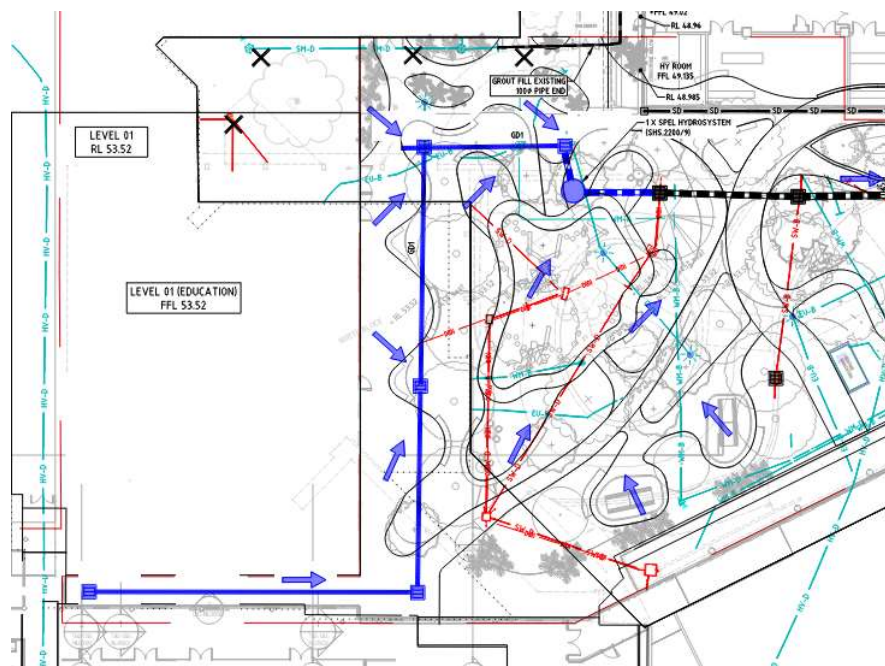


Figure 4.2-H: Connection of Eastern Courtyard to existing (Stage 1) stormwater

4.2.4 Kitchen Loading Dock

Discharge from the kitchen loading dock area is proposed to be captured via a network of stormwater pits and grated drains and conveyed through stormwater pipes to the northern stormwater easement, connecting to the existing stormwater trunk drainage line (Refer to Figure 4.2-I).

[illegible]

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4.2.5 On Site Detention

A combined rainwater and OSD tank has been proposed to reduce peak stormwater discharge from Stage 2 tower and decreases the runoff from the developed site to less than the pre-development peak flow. The Drains schematic layout is shown below in Figure 4.2-J, with Table 4.2-B detailing the peak flows for the modelled scenarios (pre and post development, with and without On-Site Detention).

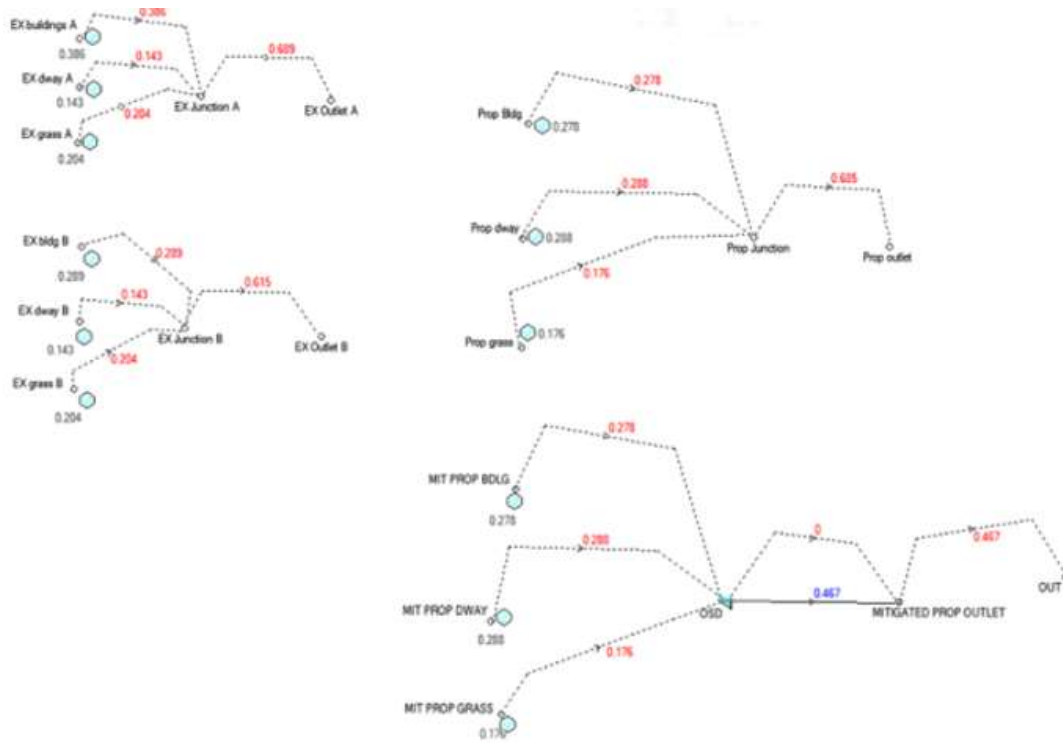


Figure 4.2-J "Drains" Schematic Layout

	Pre-Development	Post-Development (No OSD)	Post-Development (With 180m3 OSD)
Q100 flow (m3/s)	0.615	0.685	0.467

Table 4.2-B: Peak Discharge Results from the site (with and without OSD)

The combined rainwater tank and on-site detention volumes have been modelled in DRAINS with pre- and post-development scenarios incorporated.

A total volume of 180m³ is required for On-Site Detention, along with 20m³ of rainwater tank capacity to cater for irrigation demand of the site.

The provision of the nominated On-Site Detention volume limits peak post-development flows (which are increased from pre-development rates due to the increase in impervious area) to less than pre-development peak flows. This satisfies the requirements of Penrith City Council.

SSDA SEARS Conditions Report**4.2.6 Stormwater Quality**

The water quality treatment measure for the proposed Stage 2 Main Tower is designed to satisfy the requirements set by *Penrith City Council's Water Sensitive Urban Design (WSUD) Policy, December 2013*. The water quality targets set by *Penrith City Council's WSUD policy* are provided below:

- Reduction of Mean annual Load of Gross Pollutants – 90% (greater than 5mm)
- Reduction of Mean annual Load of Total Suspended Solids – 85%
- Reduction of Mean annual Load of Total Phosphorous – 60%
- Reduction of Mean annual Load of Total Nitrogen – 45%

The proposed strategy provides water quality measures specifically for the new tower and associated infrastructure. The proposed water quality strategy for the site is described in detail below. Water Sensitive Urban Design measures have been incorporated in the proposed development in accordance with best practice (including providing, where possible, opportunity for infiltration of stormwater runoff).

Water Quality Strategy

The water quality treatment measures for the site are provided to reduce pollutant loads in accordance with Penrith City Council requirements. The water quality targets set by *Penrith City Council* will be adhered to.

The water quality strategy for the site incorporates a rainwater tank, OceanGuard pit baskets and stormfilter cartridges. The Stage 2 tower roof will be directed to a 20kL rainwater tank (for irrigation reuse only), with the overflow to a detention tank with a stormfilter cartridge chamber for treatment. Locations of downpipes and connection to the proposed rainwater tank and any roof area that will bypass the rainwater tank will be coordinated with the hydraulic engineer.

There is an existing hardstand area where an overland flow path has been designed to bypass the stormfilter chamber. This area is to be treated by OceanGuard pit inserts, which are to be installed in the existing stormwater pits. The remainder of the hardstand area, including the front of house drop off area is captured and filtered by an OceanGuard in each stormwater inlet pit before passing through a Stormfilter chamber to meet Council's water quality targets.

The treatment train operates as a complete system removing the target pollutants to the required level. The results of modelling have confirmed the effectiveness of the proposed treatment train which satisfies the requirements of Penrith City Council's Water Sensitive Urban Design (WSUD) Policy, December 2013.

The proposed stormwater layout which incorporates the water quality treatment train can be seen in in Figure 4.2-K.

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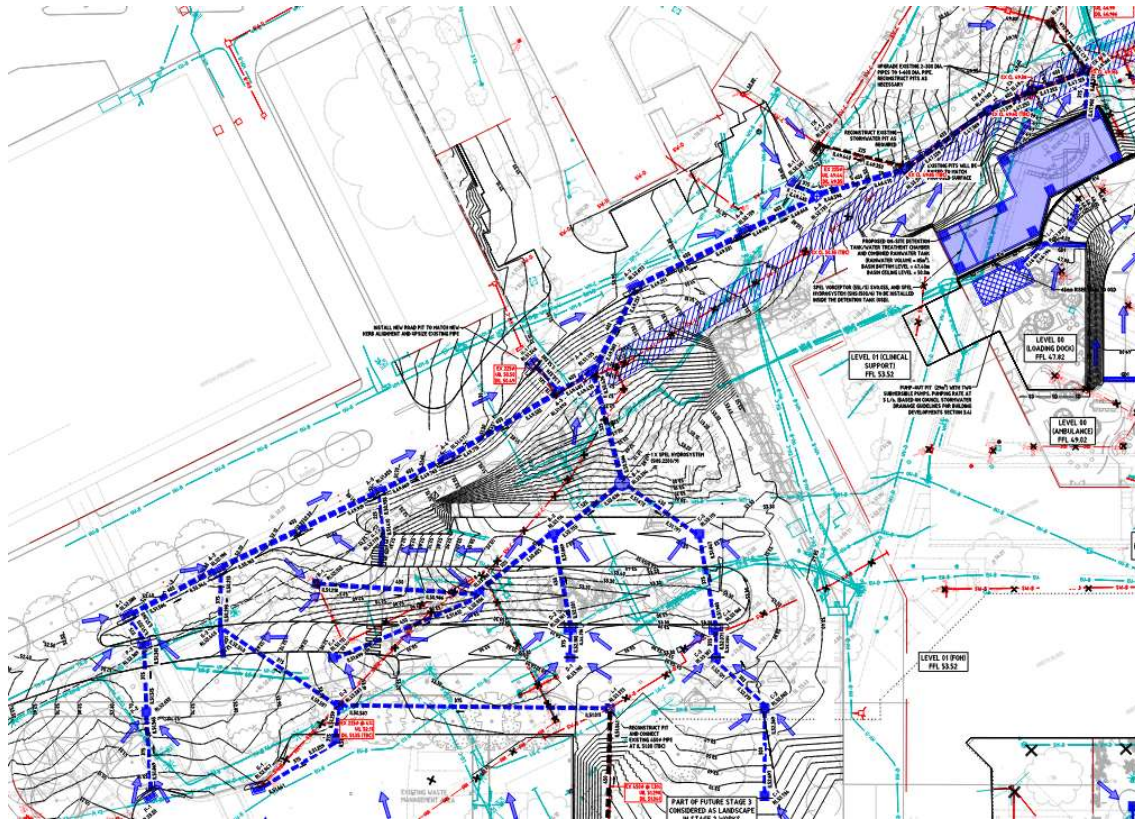


Figure 4.2-K: Proposed stormwater layout.

Water Quality Model

The *MUSIC* model was established using Penrith City Council's *MUSIC link* as per Section 4 in *WSUD Technical Guidelines, June 2015*. A screen shot of the Music model representing the site is provided below in Figure 4.2-L.

The Pollutant generation parameters for the site are as per Penrith city Council's WSUD Technical Guidelines.

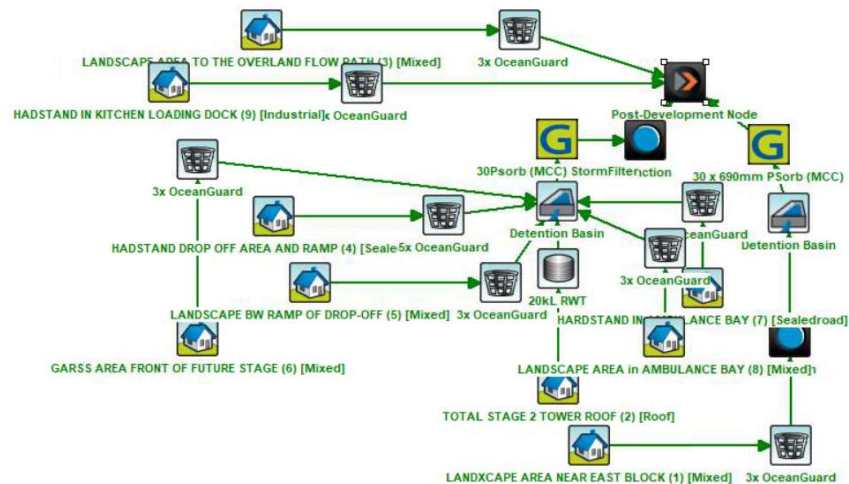
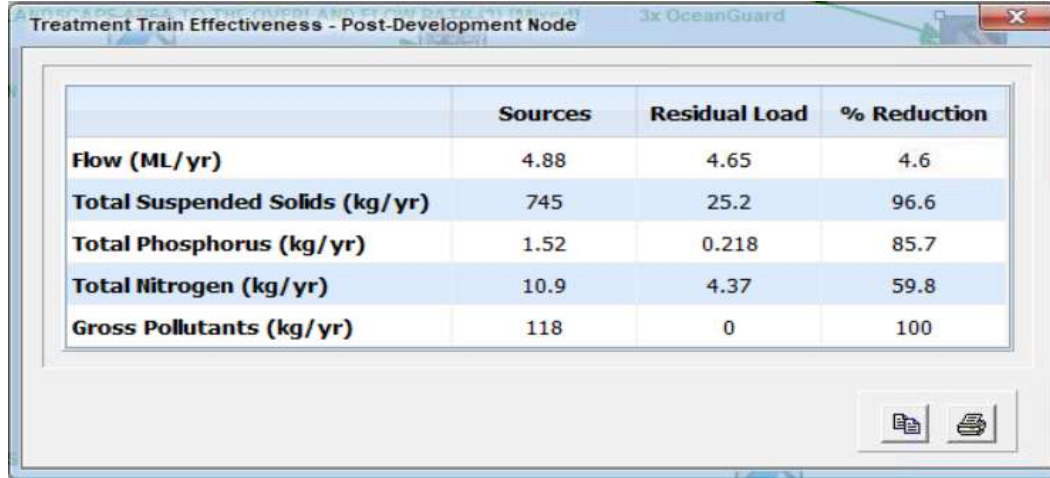


Figure 4.2-L: A Schematic diagram of the Music Model showing proposed scenario

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Water Quality Results

The results of MUSIC modelling show that the pollutant removal rate achieves pollutant reduction targets provided in Section 4.2.6. The results from the MUSIC model are shown below in Figure 4.2-M: Music model results



	Sources	Residual Load	% Reduction
Flow (ML/yr)	4.88	4.65	4.6
Total Suspended Solids (kg/yr)	745	25.2	96.6
Total Phosphorus (kg/yr)	1.52	0.218	85.7
Total Nitrogen (kg/yr)	10.9	4.37	59.8
Gross Pollutants (kg/yr)	118	0	100

Figure 4.2-M: Music model results

4.2.7 Soil and Water Management

A Soil and water management plan will be implemented during construction. The design of these measures is in accordance with the Landcom “Blue Book”. Refer Civil Drawings in the Appendix.

In general, where there is less than 150m³ per year of soil loss, the building of a sediment retention basin can be considered unnecessary (Section 6.3.2 “The Blue Book”). Nonetheless, the excavation of the Stage 2 Tower may act as a sediment basin to provide an opportunity to further improve water quality. Additionally, the following measures are provided to minimise the risk of sediments being washed into neighbourhood property and erosion of the site.

- A sediment fence/catch drain (or diversion bund) around the site
- Sandbag/Geotextile pit filters to be placed at stormwater inlet pits
- Temporary access to site with shaker pad
- An indicative stockpile area with sediment fence around it during construction. The stockpile must be located out of water flow paths (and be protected by earth banks/drains as required).

5 Flooding

Parts of Nepean Hospital Campus are flood affected. Penrith City Council has previously commissioned Flood Modelling for the area. The Campus lies within the subject area of the College, Orth and Werrington Creek Flood Study.

The College, Orth and Werrington Creek Overland Flow Flood Study was completed by Catchment Management Solutions in June 2017. This study has recently been updated, with the release of the College, Orth and Werrington Creek Floodplain Risk Management Study (Catchment Simulation Solutions Public Exhibition Draft 7-5-2021).

The upstream catchment generally drains from the north west to the south east. The rail line, immediately north of Great Western Highway, acts as a weir, with flood flows through the rail corridor (via a pipe) and then through the north-eastern side of the Hospital site via a 900mm diameter pipe. This connects to a stormwater pit located at the low point in Somerset Street, which is to the north east of the proposed Stage 2 site.

Figure 5A shows the ground surface utilised in the recent flood model update – which was completed while Nepean Hospital Stage 1 construction was underway. There appears to be a depression where the Stage 1 building is being constructed, which corresponds to the previous on-grade carpark, where excavation was required for the Stage 1 building.



Figure 5-A – Surface Model Used in Flood Modelling (Catchment Simulation Solutions Floodplain Risk Management Study Draft 7-5-2021)

The low point on the eastern boundary in Somerset Street, opposite Rogers Street, is affected by flooding as shown in Figure 5-B (1% AEP Level Flood Map Excerpt).

There appears to be a localised depression in the surface model and flood maps in the location of the Stage 1 building which is subject to ponding. The flood levels given in this location area due to modelling of the excavation and are not considered to be representative of actual flooding behaviour for the Campus (at completion of Stage 1 works). The flooding in the region of Stage 1 and Stage 2

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buildings is discontinuous to Somerset Street, indicating that the Stage 2 site is not affected by mainstream flooding. This is confirmed by flood mapping shown in Figure 5-C, which shows flooding through Drug and Alcohol Building and a flood depth over 2m in the Stage 1 building location. This is an anomaly in the model as 2m of flooding in this location is not possible with ponding, which can't happen given the site levels.

The 1% Flood Level at Somerset Street is approximately RL47. The PMF Flood Level at Somerset Street is approximately RL48. There are overland flow paths provided in Stage 1 and Stage 2, which ensures that Stage 2 will not be affected by flooding. The discontinuous flood affectation shown in Figures 5-B and 5-E in the region of the eastern end of Stage 2 validates this.

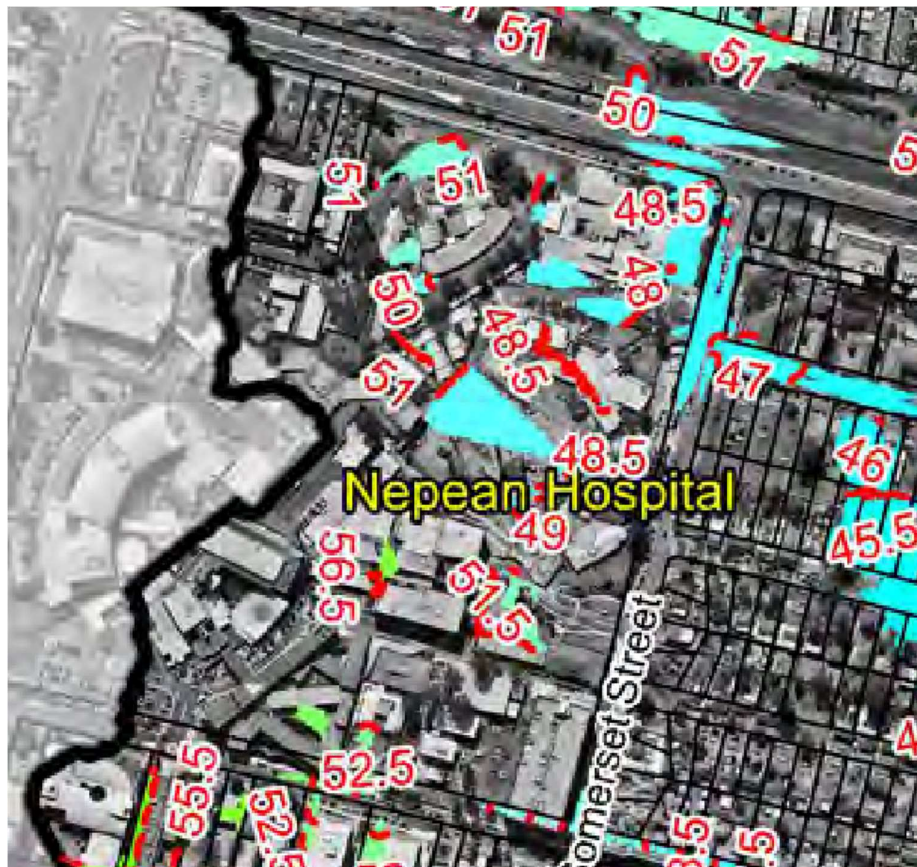
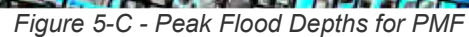


Figure 5-B - Peak Flood Levels for 100 Year ARI Storm

[illegible]

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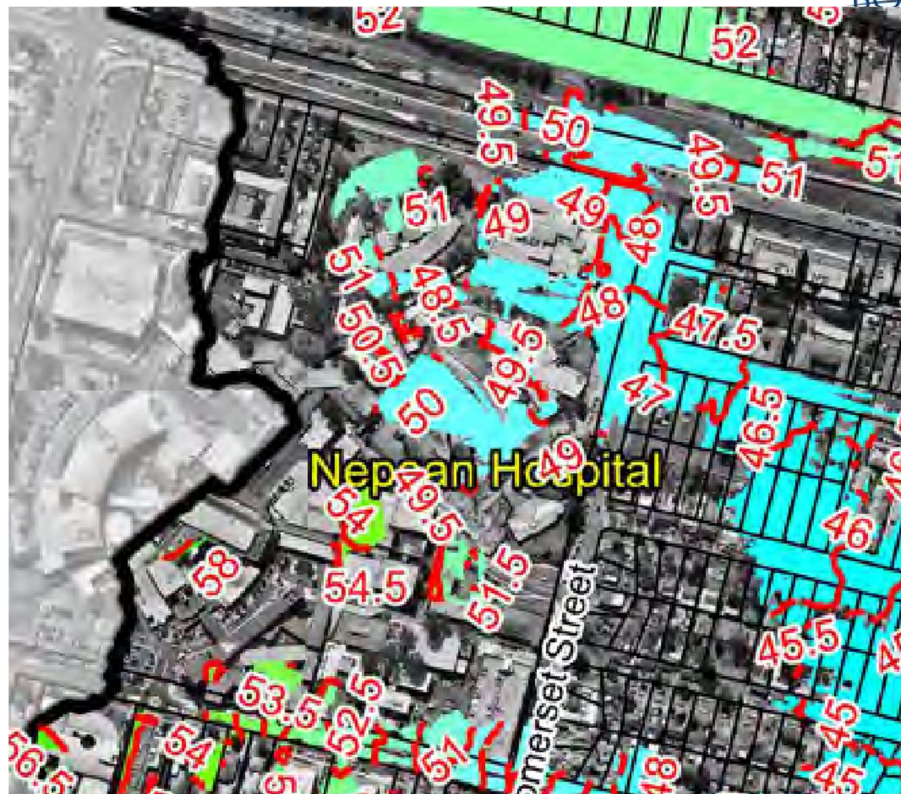


Figure 5-E - Peak Flood Levels for PMF

5.1.1 Climate Change



Figure 5-F – Climate Change Impact (less than 50mm on Hospital Campus): Flood Report Excerpt

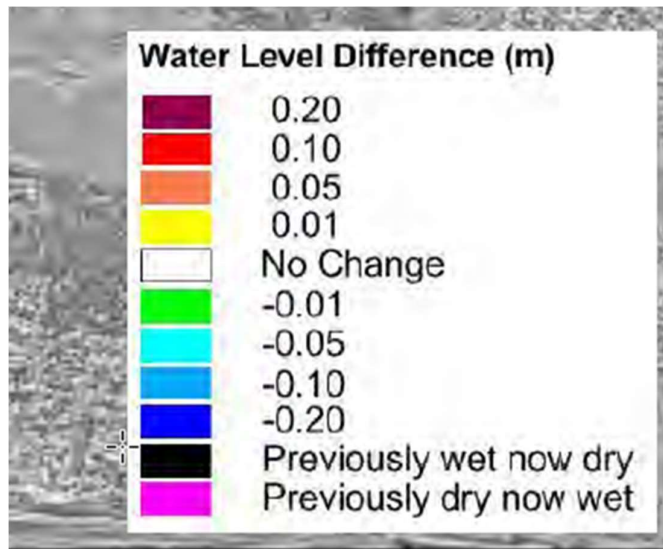


Figure 5-G – Climate Change Impact Legend: Flood Report Excerpt

The updated Council Flood Report shows impacts due to Climate Change scenarios. This is a sensitivity check to identify flooded areas most affected by Climate Change. For the worst-case scenario modelled (23% Increase in Intensity in 1% Rainfall), flood levels increase within the Hospital Campus (remote from Stage 2 building as shown in Figure 5-F) by approximately 50mm to the north-east of Stage 1.

This will not impact flood affectation of Stage 2, due to the minor increase in flood level and discontinuous nature of mainstream flooding from Somerset Street into the Health Campus toward Stage 2.

5.1.2 Impacts of the Development

There are no flood impacts due to the development. Potential impacts (including increased flows resulting from the development) have been addressed through provision of On-Site Detention in accordance with Penrith City Council requirements, limiting post-development peak flows to less than pre-development peak flow rates.

Overland flow paths have been provided in the Stage 2 design (refer Civil Drawings), which ensures that flood risk on-site is managed and is lower than the existing flood risk. The provision of an upgraded stormwater trunk drainage system (replacement of existing pipe with 600mm diameter stormwater pipe) through the site, as noted in previous sections and shown in Civil drawings, is another measure provided by the proposed development to lower flood risk on-site and up-stream.

5.1.3 Changes to Emergency Management/Evacuation or Contingency Measures

There are no changes to emergency management, evacuation or contingency measures required due to the Stage 2 development. Safe egress from the Hospital Campus is still available to the west via Barber Avenue then south via Parker Street (Stage 2 will provide access to Barber Avenue and Parker Street via reconfigured road layouts). The updated College, Orth and Werrington Flood Risk Management Study and Plan identifies Nepean Hospital impact as “Flooded Exit Route Rising Road”. Refer Flood Report excerpt in Figure 5-H below.

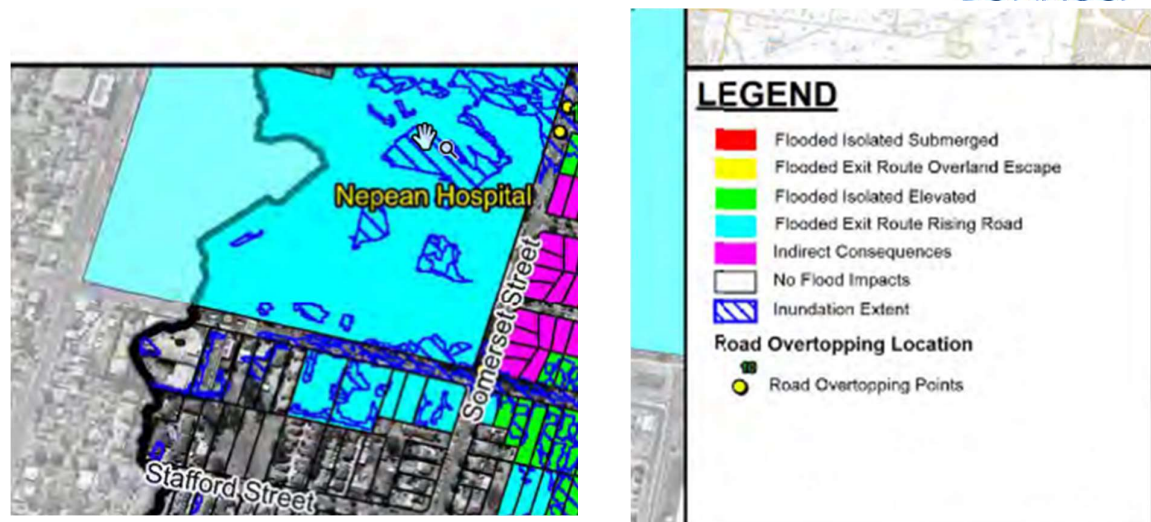


Figure 5-H – Emergency Response Classification (PMF)

Overland flow paths have been provided in the Stage 2 design (refer Civil Drawings), which ensures that flood risk on-site is managed appropriately and is lower than the existing flood risk. The provision of an upgraded stormwater trunk drainage system (replacement of existing pipe with 600mm diameter stormwater pipe) through the site, as noted in previous sections and shown in Civil drawings, is another measure provided by the proposed development to lower flood risk on-site and up-stream.

Appendix A – Civil Engineering Drawings