

NSW Health Infrastructure
**Children’s Hospital Westmead
Multi-storey Car Park**
State Significant Development
Application (SSDA) Civil Report

CHW-ARP-CV-RP-MP-91-XX011

Rev 01 | 12 February 2021




This report takes into account the particular instructions and requirements of our client.
It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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MSCP Civil Drawings

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1 Executive Summary

This State Significant Development Application (SSDA) civil report outlines the proposed civil works for the new Multistorey Car Park (MSCP) that is part of the Children’s Hospital Westmead Stage 2 (CHW2) redevelopment project. The table below outlines the specific State Significant Development Application (SSDA) items addressed in this report:

Table 1 - SSDA Civil Items (SSD-10434896 dated 20 November 2020)

| SSDA Ref. Item | Description |
|----------------|--|
| 7 | <ul style="list-style-type: none">Include an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design. |
| 16 | <p>Stormwater Drainage</p> <ul style="list-style-type: none">Provide:<ul style="list-style-type: none">a preliminary stormwater management plan for the development that:<ul style="list-style-type: none">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.stormwater plans detailing the proposed methods of drainage without impacting on the downstream propertiesWhere 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 Council’s relevant standards. |
| 18 | <p>Soil and Water</p> <ul style="list-style-type: none">Provide details of measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles. |

This report contains a review of the existing civil infrastructure in and around the proposed development, describes expected impacts on this infrastructure as a result of the development, and describes strategies to address and mitigate these impacts.

This report focuses on key civil aspects of design for the MSCP: roads and public domain, stormwater infrastructure, earthworks and free standing retaining walls.

2 Acronym Definitions

| | |
|-------|--|
| ACM | Asbestos Contaminated Material |
| AEP | Annual Exceedance Probability |
| ARI | Annual Recurrence Interval (no longer used; replaced by AEP) |
| AR&R | Australian Rainfall & Runoff |
| CASB | Central Acute Services Building |
| CHW | Children’s Hospital at Westmead |
| CoPC | City of Parramatta City Council |
| CMRI | Children’s Medical Research Institute |
| DCP | Development Control Plan |
| DCW | Domestic Cold Water |
| ESCP | Erosion and Sediment Control Plan |
| FA/AF | Fibrous Asbestos and Asbestos Fines |
| GFA | Gross Floor Area |
| HAC | Health Administration Corporation |
| HI | NSW Health Infrastructure |
| LHD | Local Health District |
| MSCP | Multi-Storey Car Park |
| PMF | Probable Maximum Flood |
| PSB | Paediatric Services Building |
| RMH | Ronald McDonald House |
| RPZD | Reduced Pressure Zone Device |
| SCHN | Sydney Children’s Hospitals Network |
| SSDA | State Significant Development Application |
| WSUD | Water Sensitive Urban Design |

3 Introduction

3.1 Purpose of Report

The purpose of this report is to address the SEARs and summarise the civil works design of the Children's Hospital at Westmead (CHW) Multistorey Car Park (MSCP) in support of the SSDA.

The MSCP project consists of a new multi-deck car park located on the site of the old Ronald McDonald House to the north of the campus. The proposed site is bounded by Labyrinth Way to the north and east and Redbank Road to the west. South of the site is the existing Children's Hospital at Westmead (CHW) building.

A locality plan showing the location of the proposed MSCP development is indicated in Figure 1.



Figure 1: MSCP Locality Plan (Sixmaps, 2020)

The proposed development under this SSDA is a Multi Storey Car Park (MSCP) accommodating both staff and visitor car parking to be located on Labyrinth Way, on the site of The Lodge.

The scope of proposed works includes:

- Demolition of The Lodge;
- Construction of a new MSCP with approximately 8 car parking storeys, which is equivalent to the height of 5 storeys of the hospital:

- Facilitating car parking spaces for staff and visitors;
- Vehicular access from Labyrinth Way and / or Redbank Road;
- A split-level approach to the MSCP to respond to the natural ground level;
- Ancillary retail facilities;
- Road works:
 - Realignment of Redbank Road with vehicular access connection to MSCP;
- Tree removal; and
- Associated landscape works

The MSCP is being designed to be constructed in a single stage yet car parking will be staged operationally to come on-line with parking demand across the Precinct:

- The first stage of car parking operation would provide replacement car parking for the demolished P17 car park. There would be no net increase of parking on site under this stage; and
- The second stage of car parking operation to serve the growth in hospital activity associated with the future PSB (subject to a separate SSDA) would only come on-line operationally with the PSB SSDA consent becoming operational, specifically at occupation. This would provide growth of around 280 additional spaces in line with hospital activity projections until 2031.

This report addresses the key civil and stormwater design elements relating to the site and the approval requirements. The civil engineering works is listed below and drawings are provided in Appendix A.

- Bulk Earthworks;
- Erosion and Sediment Control;
- Freestanding Retaining Walls;
- Pavement;
- Stormwater; and
- Road and surface grading.

The architectural plan of the ground level is shown in Figure 2 and the building east elevation is shown in Figure 3.

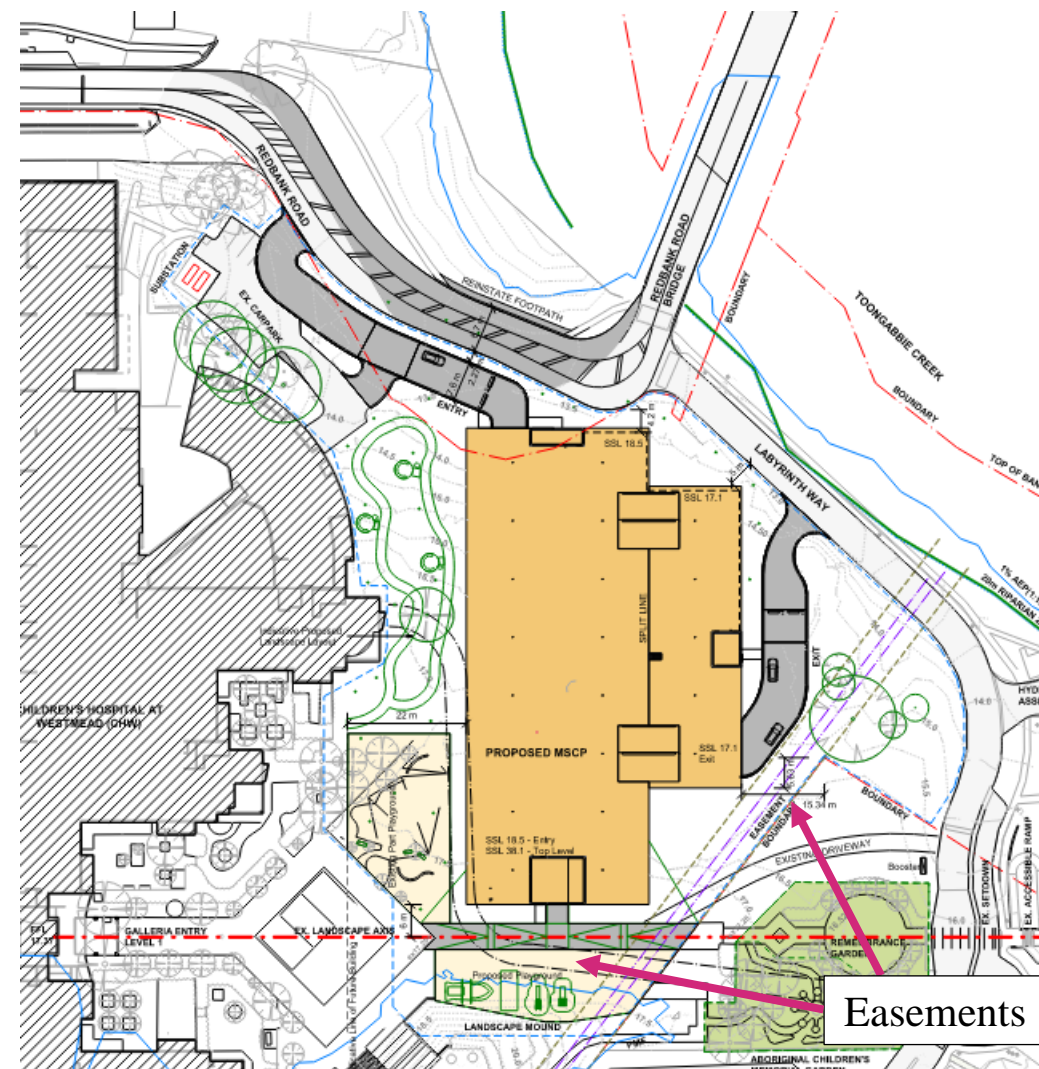


Figure 2: MSCP Architectural Site Plan (Source: BLP dated 14/12/20)

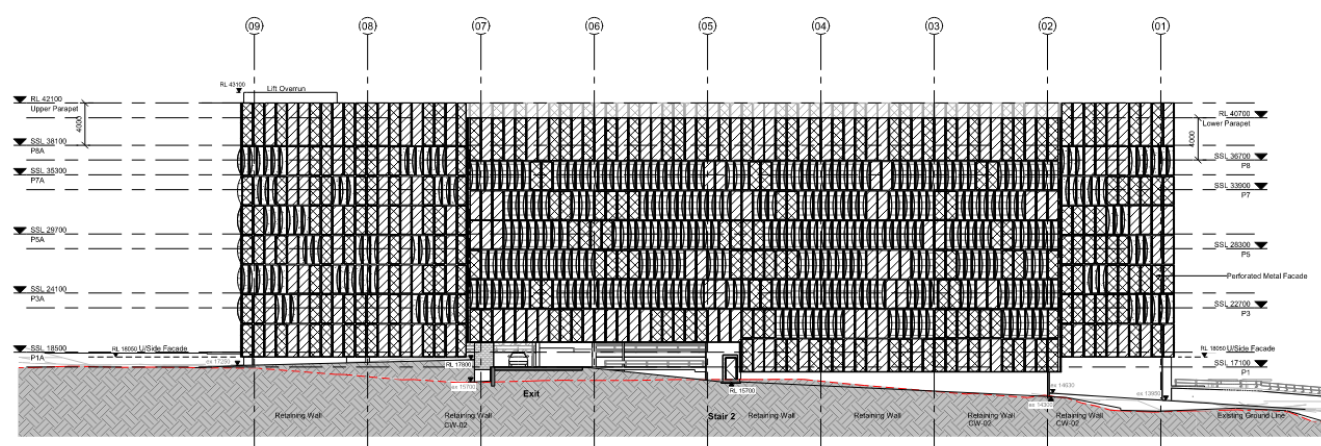


Figure 3: East elevation section of MSCP (Source: BLP dated 14/12/20)

3.2 Documentation Review

A summary of existing information and reference documents available that has been reviewed in preparation of this report is provided below:

- New Children's Hospital Stormwater and Sewer Trunk Mains Plan Sheet 1 and Sheet 2, Rev K, Maunsell 1991
- Plan of Detail and Levels and Underground Service Detection over Part of Westmead Hospital (Ref No. 32572 088DT) Rev D, LTS Lockley 2020
- Westmead Redevelopment – CASB Flood Impact Assessment, Arup, 2017
- Draft MSCP Geotechnical Report by JKGeotechnics (ref: 33303Brpt2 draft)
- The Lodge, Labyrinth Way Westmead NSW Contamination Detailed Site Investigation by JBS&G (ref: 56200/133895 rev 2)
- Billard Leese Partners architectural drawings
- McGregor Coxall landscape architectural SSDA package (ref: 0785SYD rev B)

4 Existing Site Conditions

The following section describes the existing infrastructure on the site of the proposed MSCP development and areas in the immediate vicinity.

4.1 Roads & Public Domain

Redbank Road is located northwest of the MSCP site and it has an undulating plan alignment. Redbank Road crosses through the Westmead Health Precinct and as it approaches the proposed MSCP site, the road bends and crosses over Toongabbie Creek to Northmead via Redbank Bridge. The posted speed limit of Redbank Road is 20km/hr on the south side of Redbank Road Bridge.

Labyrinth Way intersects Redbank Road before Redbank Road crosses over Toongabbie Creek. Labyrinth way continues in a south-easterly direction between the proposed MSCP location and the new Ronald McDonald House (RMH). The posted speed limit of Labyrinth Way is 20km/hr.

Pedestrian footpaths are accessible to the north side of Redbank Road and the eastern side of Labyrinth Way. Refer to Figure 1.

To the south of the old Ronald McDonald House is a significant public domain area with public amenities including a pedestrian link between CHW and the new Ronald McDonald House, children's playgrounds and seating.



Figure 4: Existing Public Domain (Arup, 2020)

4.2 Flooding

The location of the MSCP relative to Toongabbie Creek and Parramatta River means that it is affected by fluvial (river) flooding. The City of Parramatta Council's flood hazard mapping indicates that the MSCP building location is in a low risk area and portions of the Redbank Road realignment are within high/medium risk areas as shown in Figure 5.

The coloured shading indicate the following flood risk:

- Yellow = low flood risk area; affected from the 1% AEP up to the PMF
- Orange = medium flood risk area; medium and low hazard up to the 1% AEP event
- Red = high flood risk area; high hazard up to the 1% AEP
- Everywhere else = not expected to experience river flooding

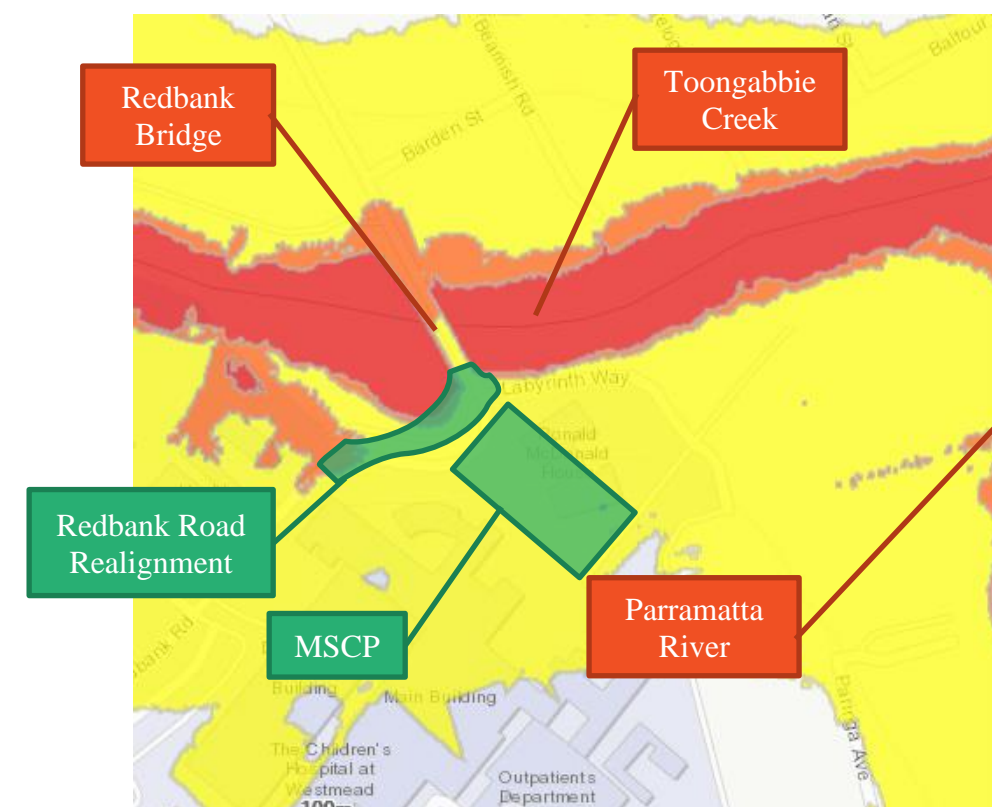


Figure 5: City of Parramatta Council Flood Risk Mapping (information from <https://www.cityofparramatta.nsw.gov.au/recreation-environment/floodsmart-parramatta/know-your-flood-risk> dated 25 May 2020)

Refer to the MSCP flood impact assessment report (ref: CHW-ARP-CV-RP-MP-91-XX013) for more details on the existing flooding conditions.

4.3 Stormwater

Within the MSCP development site there is existing stormwater infrastructure in the form of an extensive pit and pipe network which serves the Children's Hospital, the old Ronald McDonald House and the public domain areas in between the two buildings. Surface water (runoff) is collected by inlet pits which convey flows into in-ground drainage pipes. Similarly, gutters and downpipes convey roof water runoff into the in-ground drainage networks.

There are two large stormwater trunk lines within the MSCP development site as shown in Figure 6. It is currently understood that the **pink** stormwater trunk line with its associated easement is owned by Health Administration Corporation (HAC) while the **orange** stormwater trunk line is owned by City of Parramatta Council (CoPC).

The first stormwater trunk line (**pink**) crosses underneath the CHW. Upon clearing the eastern side of the CHW, the pipe bends in a southeast direction ($\varnothing 1200$) before bending again to continuing in a north-eastern direction towards the Ronald McDonald House ($\varnothing 1500$) and reducing in size before discharging to Parramatta River. The reduction in pipe size causes the line to surcharge via specially designed surcharge pits. Water which surcharges from this line is detained in an above ground basin. It is estimated that this basin provides approximately 3,500 m³ of storage capacity. Due to the size of this detention basin, it is assumed that the basin has been sized for multiple areas within the Westmead Hospital campus.

The second stormwater trunk line (**orange**) runs along the eastern side of the existing RMH building. The pipe is $\varnothing 825$ in size. After the pipe crosses Labyrinth Way, the pipe discharges into Toongabbie Creek.

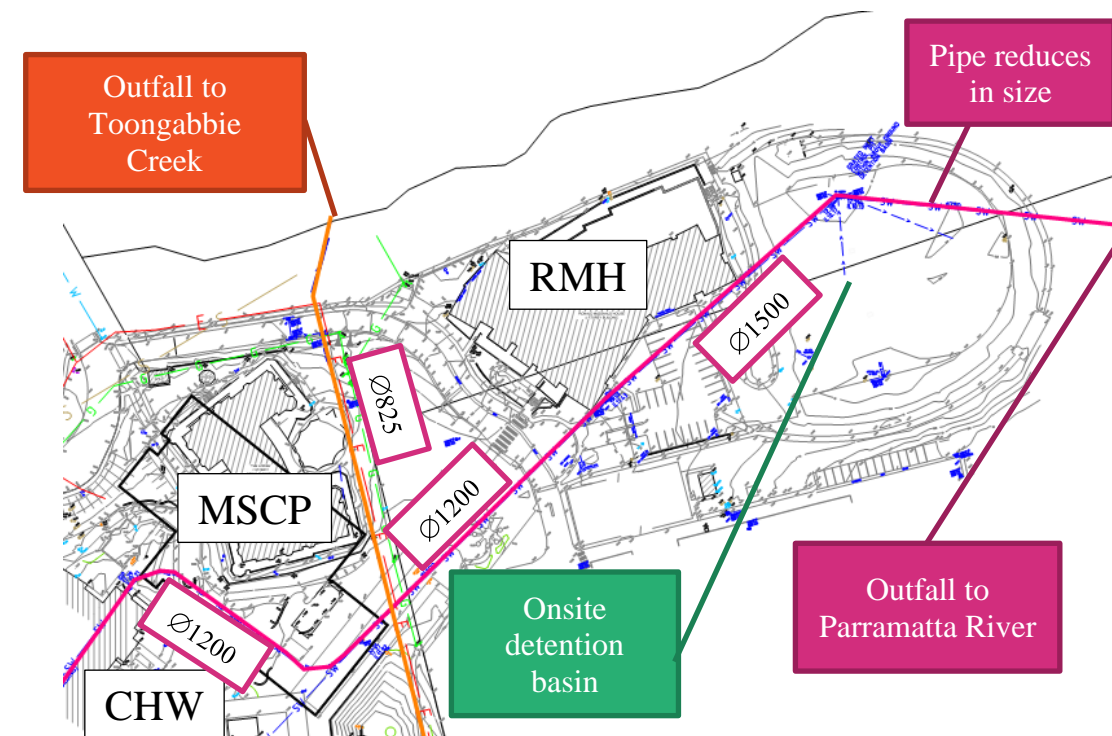


Figure 6: Existing Stormwater Infrastructure

4.4 Ground Conditions

The broader Westmead Hospital Precinct has been subject to a range of previous investigations which have identified asbestos impacted soils are present and as such this is a known risk for the MSCP development.

A detailed site investigation of the MSCP site was conducted by JBS&G in November of 2020. The investigation included 32 boreholes as indicated in Figure 7. Of the 32 boreholes conducted on site, 17 were found to contain asbestos material, which are indicated by the highlighted boreholes in Figure 7.

7 of the boreholes taken at the north-east corner of the site adjacent to Labyrinth Way were found to contain both asbestos contaminated material (ACM) and Fibrous Asbestos and Asbestos Fines (FA/AF) in concentrations higher than the site assessment criteria of 0.04% w/w and 0.001% w/w respectively. 3 other boreholes were found to contain FA/AF in concentrations higher than the site assessment criteria with 2 located in the centre of the site surrounding the old Ronald McDonald House and south of the site adjacent to the CHW building.

7 of the boreholes, 4 north of Redbank Road and 3 in the existing on grade car park south of Redbank road, are found to have bonded ACM and FA/AF.

JBS&G have advised that any disturbance of fill within the MSCP site will require a remediation strategy. The excavation, handling, and disposal of ACM will require management for workplace health and safety (WHS).



Figure 7: MSCP Site Borehole Investigation Locations (JBS&G, 2020)

4.5 Utilities

The site survey undertaken by LTS Lockley (2020) indicates the presence of existing utilities within the MSCP site. The MSCP site works will impact various existing utilities including stormwater, sewer, potable water, electrical gas and telecommunications. These utilities are a combination of privately owned and utility authority owned assets. Refer to the existing services plan sheet CHW-ARP-CV-DG-MP-00-XX801 of the civil works drawings illustrating the MSCP site works with respect to existing services.

Impacts on existing utilities are not covered in this report as it is outside the scope of the civil works. Refer design documentation for the relevant service design engineers for further information on utilities impacts and proposed mitigation measures.

Existing easements within the site are as follows and indicated in Figure 2:

- A combined utilities easement running along the east side of the MSCP building containing:
 - Electrical high voltage assets (Endeavour Energy)
 - High pressure gas mains (Jemena)
 - Trunk stormwater line (CoPC)
- A stormwater easement owned by HAC running along the west and south sides of the MSCP.

5 Proposed Development

The following section outlines the proposed civil works required as part of the development of the MSCP.

5.1 Earthworks

The earthworks for the site are driven by the finished floor level of the car park and the access road designs which tie the car park into the existing road network (Redbank Road and Labyrinth Way). In addition, the lowest floor level of the MSCP is proposed to be a fully suspended slab which is elevated from the existing ground level acting as a storage space for bulk earthworks from both the PSB and MSCP site works.

Additional earthworks will be required to install new services and to form the proposed landscape levels. The driveway entrance and exit ramps will grade from the existing levels of the connecting roads to the proposed levels of the car park. Where possible, the earthworks will batter down from the MSCP floor levels to the existing surface and a combination of building and free standing retaining walls are proposed where battering is not possible.

Refer to JBS&G's documentation for the required arrangements for contaminated material for the site. JBS&G's report advised that remediation will be required given the level of contamination in the soil within the MSCP site. Excavation works will also require specific management plans to address WHS risks associated with bonded ACM.

Marker layers, capping layers and management of contaminated material across the site (with respect to structures, slabs, pavements, utilities and landscaping elements) have not been assessed in detail at this stage. This will be confirmed subject to further consultations with the contamination consultant during detailed design and will affect the bulk earthworks estimate currently indicated in the civil design drawings.

5.1.1 Retaining Walls

Building retaining walls will be required around the north, east and south edges of the building facing Redbank Road and Labyrinth Way. The heights of the building retaining walls vary with maximum wall heights of up to 5.5m at the north edge of the building fronting Redbank Road. Building retaining walls will be documented in the Buildings Structural Design.

Free standing retaining walls will be required along the entryway ramp, exitway ramp and the fire brigade hardstand. The free standing retaining wall heights vary with maximum wall heights of 2.5 m. Free standing retaining walls are documented in this Civil Works design.

5.2 Roads & Public Domain

New access roads will need to be constructed to enable access to and from the car park to the road network. The proposed MSCP footprint occupies part of the existing Redbank Road alignment in order to avoid the easements within the site. As such, as part of the development proposal, a realignment of

Redbank Road is proposed which will tie-in to Labyrinth Way, Redbank Road Bridge, and Redbank Road west of the site.

The Redbank Road realignment is within high/medium flood risk zone as indicated in Figure 5. The road design matches into existing levels in order to mitigate impacts to adjacent properties, existing flood conditions and existing utilities. This road realignment will have a rigid traffic barrier at the curve just south of Redbank Bridge to prevent vehicle impact to the building.

The entryway and exitway ramps will have retaining walls with concrete upstands. In addition, there will be 500 mm wide and 150mm high concrete shoulders on the ramps to help guide and prevent vehicles from impacting the ramp walls.

The driveways will be designed in accordance with the requirements of AS2890.2 – Off-street Commercial vehicle facilities (2018). The design vehicle will be a Medium Rigid Vehicle (MRV). The grade of the driveway must not exceed 15.4% as indicated in Figure 8, and the rate of change in grade must be exceed 6.25% over 7 metres as indicated in Figure 9. The current schematic design of the ramps are in accordance with these limits.

| Design vehicle | Roadway/ramp grade ^a (max) |
|--|---------------------------------------|
| SRV | 1:6.5 (15.4 %) |
| MRV, HRV | 1:6.5 (15.4 %) |
| AV | 1:6.5 (15.4 %) |
| BD | 1:8.3 (12 %) |
| A-double | 1:10 (10 %) |
| A-triple | 1:20 (5 %) |
| ^a The grade on a curve is measured along the inside of the curve. If reverse manoeuvres are permitted on a ramp, the maximum grade shall be 1:8 (12.5 %). | |

Figure 8: AS2890.2 Table 3.2 - Maximum roadway and ramp grades (2018)

| Design vehicle | Rate of change of grade (max) |
|----------------|----------------------------------|
| SRV | 1:12 (8.3 %) in 4.0 m of travel |
| MRV, HRV | 1:16 (6.25 %) in 7.0 m of travel |
| AV | 1:16 (6.25 %) in 10 m of travel |
| BD | 1:16 (6.25 %) in 10 m of travel |
| A-double | 1:16 (6.25 %) in 10 m of travel |
| A-triple | 1:16 (6.25 %) in 10 m of travel |

Figure 9: AS2890.2 Table 3.3 - Maximum rates of change of grades for roadways and ramps (2018)

The levels of the driveways will also need to conform to the requirements of Council's DCP subject to flood modelling and assessment which is currently being undertaken. The applicable requirements from Table 2.4.2.1.3 to driveways are as follows:

- Garages capable of accommodating more than 3 motor vehicles on land zones for urban purposes, or enclosed car parking, must be protected from inundation by floods equal to or greater than the 1% AEP flood. Ramp levels to be no lower than 0.5m above the 1% AEP flood level.
- The level of the driveway providing access between the road and parking spaces shall be no lower than 0.2m below the 1% AEP flood level.
- Enclosed car parking and car parking areas accommodating more than 3 vehicles, with a floor level below the 1% AEP flood level, shall have adequate warning systems, signage, exists and evacuation routes.

The public domain design will be developed further in future design stages and will seek to incorporate:

- Levels and grades to promote and provide equitable access
- Levels and grades to protect the development from flooding in accordance with the relevant Council DCP conditions.
- Integration of water sensitive urban design (WSUD) elements with the proposed landscape.
- A fire brigade hardstand area which is currently to be confirmed.

5.3 Flooding

The development of the MSCP will result in changes to the behaviour of overland and river flow as the ground levels are changed within the development area.

Refer to the MSCP flood impact assessment report (ref: CHW-ARP-CV-RP-MP-91-XX013) for more details on the proposed flooding conditions.

Grading of the external surrounding public domain area is undertaken to mitigate significant flooding impact to adjacent developments. In addition, building thresholds will be designed to be above the 1% AEP flood event plus 500mm freeboard and grade away from building entryways to prevent overland flow entering into the building. The intent will be to ensure any building entryways into floor spaces are protected from flood waters. Some entryways into the building are below this level, however they internally ramp/rise to the floor level within the building.

5.4 Stormwater

Construction of the MSCP will necessitate the removal of a number of pits and pipes which discharge to the two stormwater trunk lines which in turn discharge to Parramatta River and Toongabbie Creek.

The stormwater strategy is a direct connection from the development site into the local existing (HI owned) stormwater network (i.e. no inclusion of on-site detention). This system has been designed maintain the existing natural catchment areas for discharges. Refer to Appendix A for the stormwater management plan. This stormwater strategy has been discussed with CoPC and there were no objections to this approach. Refer to Appendix B for the stormwater strategy presentation and meeting minutes with CoPC.

The proposed stormwater system for the site has effectively been designed to manage three (3) main catchment areas, namely:

- West areas of the Redbank Road realignment, car park entryway ramp and existing car park which connects to the existing Ø750 trunk main (owned by HAC) along Redbank Road and discharges directly into Toongabbie Creek upstream of the Redbank Road Bridge;
- The MSCP building extents, a portion of the exitway ramp, the south pedestrian ramps and external landscape areas (west, south and portions of the east areas) which connects to the existing Ø1200 trunk stormwater main (owned by HAC) running along the west and southern edges of the proposed building. This trunk main leads to the existing detention basin (near RMH) before discharging to Parramatta River downstream of where Toongabbie Creek and Darling Mills Creek converge; and
- The east areas of the Redbank Road realignment, Labyrinth Way, the lower portion of the exitway ramp and east landscape areas drain to the Ø825 trunk main (owned by CoPC) at Labyrinth Way and discharges into Toongabbie Creek downstream of Redbank Road Bridge. The surface run-off drains to existing inlet pits, mimics the existing surface runoff conditions, and does not require a new connection to the Council drainage network.

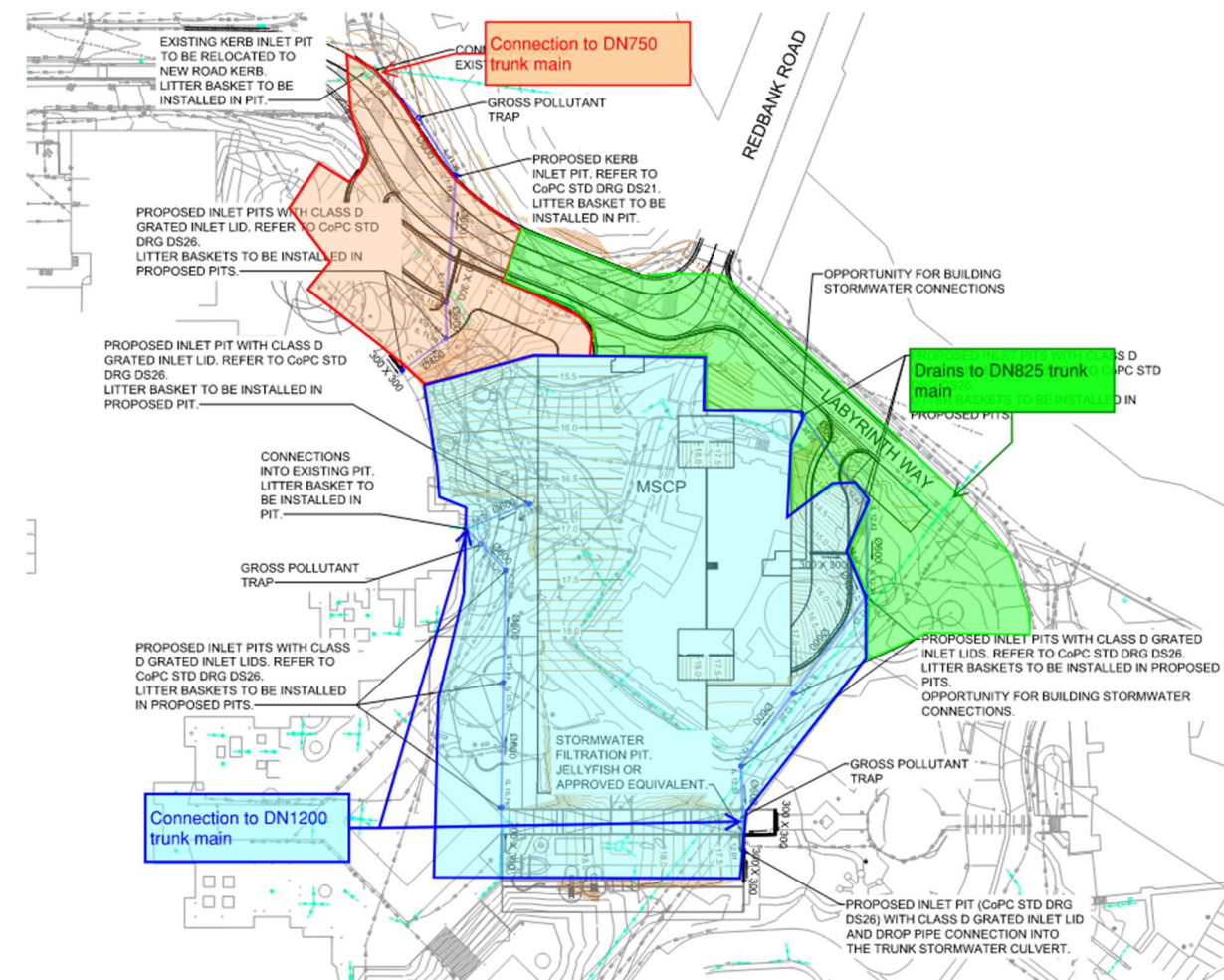


Figure 10: MSCP Stormwater strategy

The majority of the existing site is estimated to be draining to the Ø1200 trunk main and the intent generally matches the existing conditions by maintaining the same connection. In addition, we avoided connecting into the existing Ø825 stormwater trunk main running along the east side of the proposed building as it is understood this trunk main accommodates the flows from the PLR works along Hawkesbury Road and does not have capacity for additional flows.

Based on hydraulic and flooding analysis, the proposed stormwater strategy is assessed to be suitable for the site because it:

- Does not have significant impacts to the existing stormwater network or flooding conditions; and
- Intends to discharge site flows into Toongabbie Creek prior to the creek peak flow event (6 to 7 hours).

Refer to Figure 11 for the river flow hydrograph and

Figure 12 illustrating the site flow discharge difference between pre and post development at the RMH outlet to Toongabbie Creek.

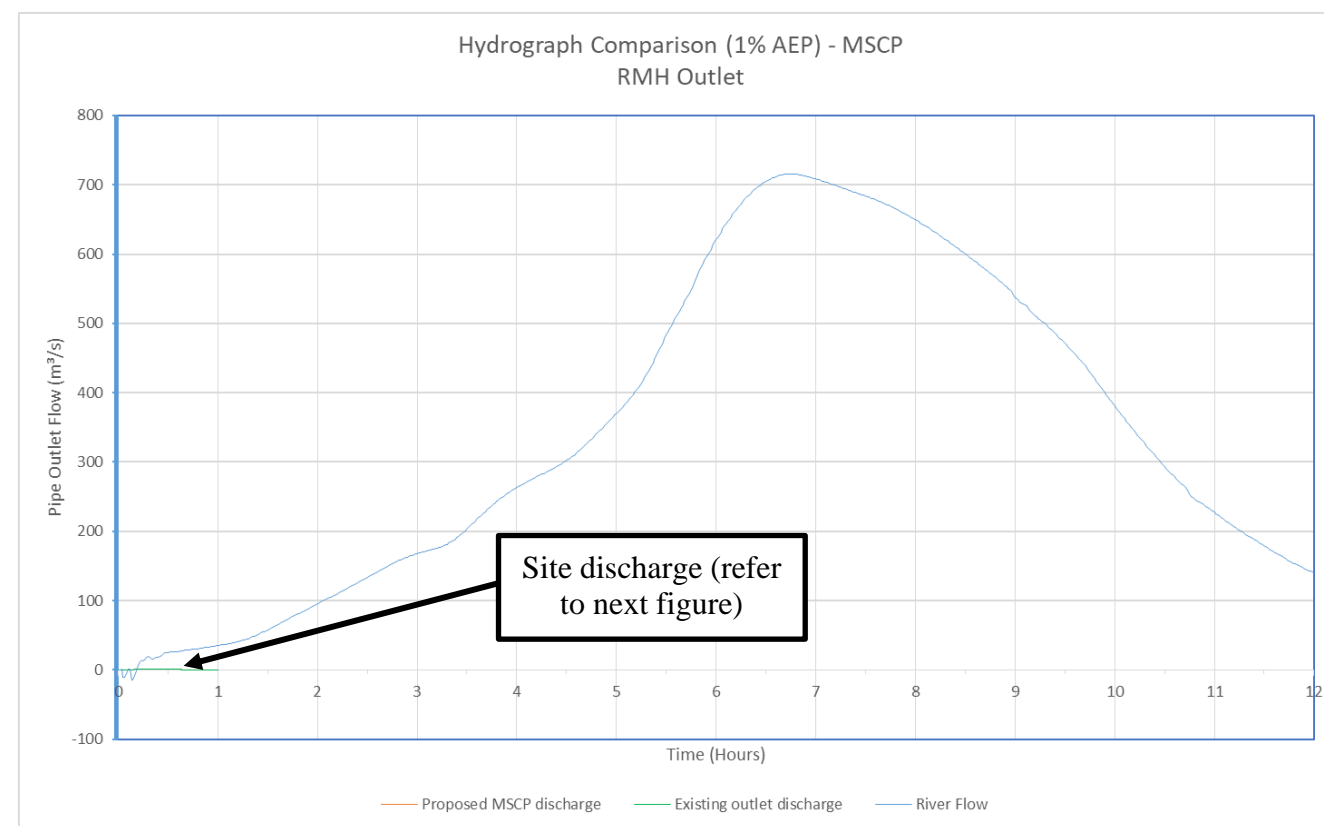


Figure 11: River flow hydrograph

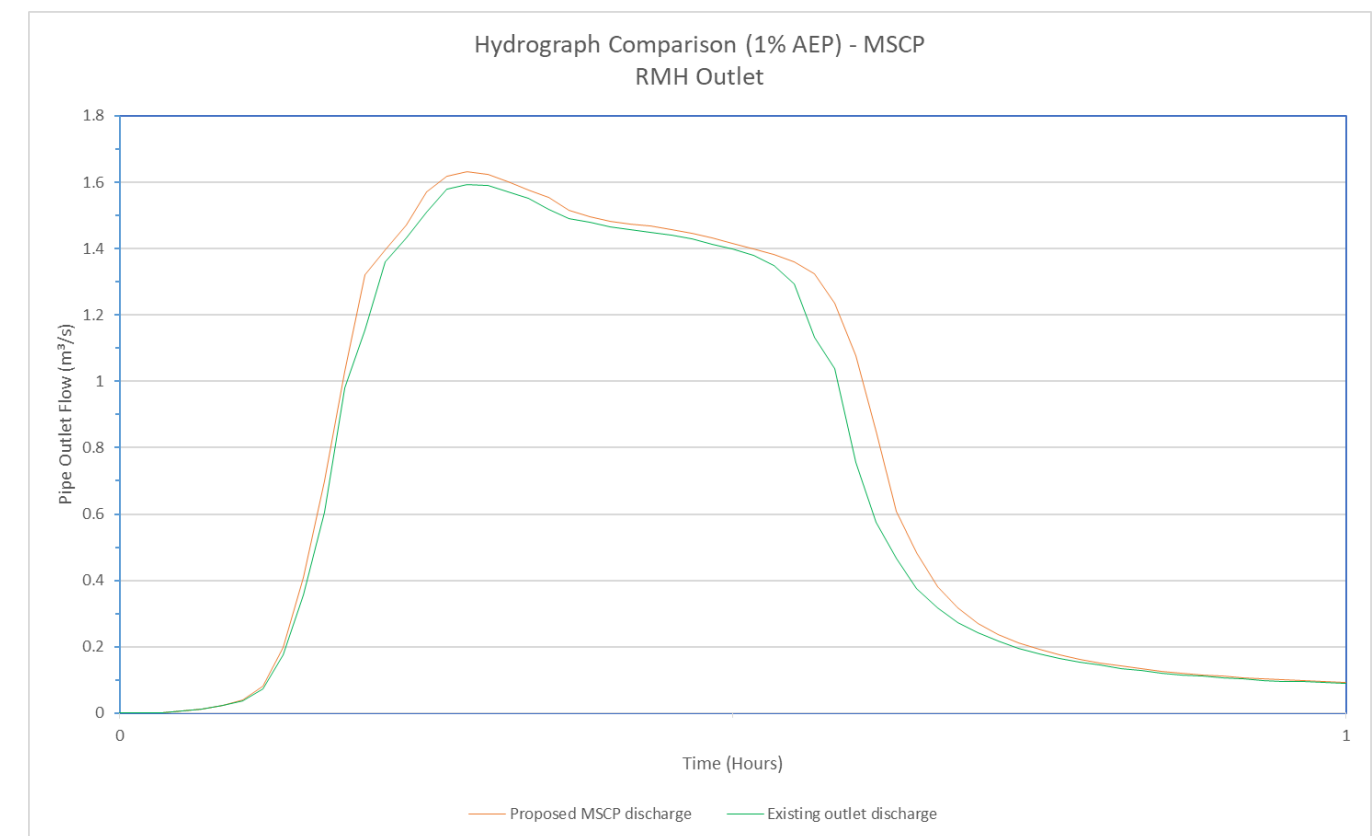


Figure 12: Site discharge flow hydrograph

5.5 Other Proposed Services

Impacts on existing utilities are not covered in the scope of the Civil Works Schematic Design. Refer the schematic design documentation of the relevant MSCP service provides where the impacts and mitigation measures on existing utilities are documented.

Due to the realignment of Redbank Road, an existing Jemena Gas Main will need to be relocated to follow the new road alignment. Discussions with Jemena are currently underway to determine the location of the realigned gas main.

Refer to the “MSCP Infrastructure Management Plan – Hydraulic & Fire Services” for more information on the proposed utilities servicing strategy for cold water, sewer and natural gas.

Refer to the relevant utilities engineer for electrical and telecommunications servicing strategy for MSCP.

5.6 Erosion and Sediment Control

Erosion and sediment control measures are a specific consideration of the broader construction management plan. These measures are designed to minimise the risk of scour, erosion, sedimentation and impacts to water quality. These risks are typically increased during construction activities including:

- Earthworks, including stripping of topsoil, excavation and filling.
- Demolition.

The potential impacts from inappropriate management of the construction site on water quality could include:

- Increased sediment loads from exposed soil during rainfall events and dust blown off site causing high sediment loads to be washed or deposited into nearby creeks;
- Increased sedimentation of downstream watercourses smothering aquatic life and affecting the ecosystems of downstream sensitive waterways, wetlands and floodplains;
- Increased levels of nutrients, metals and other pollutants, transported via sediment to downstream water courses;
- Chemical, heavy metal, oil and grease, and petroleum hydrocarbon spills from construction machinery directly polluting downstream waterways;
- Siltation of pit and pipe networks reducing the conveyance capacity of the network; and
- Water borne transport of ACM.

An erosion and sediment control plan (ESCP) for the site has been provided in accordance with Landcom's "Soil and Construction Manual" (commonly known as the Blue Book), Volume 1, March 2004. In accordance with Table 2.1 of the Blue Book. This has been prepared for the site due to the area of disturbance being greater than 2,500 m².

Measures that have been adopted to minimise water quality impacts are indicated on the ESCP and includes:

- Implementation of appropriate controls in place before the removal of topsoil and commencement of earthworks.
- Designated site access locations to enable management of sediment removed from site.
- Onsite water management using sediment traps, silt fencing and diversion banks.
- Stockpile management.
- Sedimentation basins.

It is the principal contractor's responsibility to develop and adapt this ESCP to suit the site conditions, construction staging and any requirements of CoPC and other relevant authorities. The ESCP has been prepared to be used as a guide only. Changes may materialise for several reasons including ongoing design development, construction methodology and the sequencing of works.

5.7 Protection of Waterways

The area of proposed works is within close proximity to Toongabbie Creek. Redbank Road realignment, northern extents of the MSCP building, the entryway and exitway ramps are within 40 metres of the creek. However, there are no significant modifications to Labyrinth way which currently forms a physical boundary to the creek.

The following measures have been considered as part of the design and shall be undertaken when working near the creek to mitigate any impacts to riparian areas:

- The design of the Redbank Road realignment generally matches the same levels of the existing road alignment. This minimizes impacts to the existing overland flow regime which travels along Redbank Road and the general site area;
- The landscape embankment north of the road sloping toward the creek will not exceed 1V:3H gradient and will be reinstated with grass for slope stability and erosion control;
- ESCP measures shall be undertaken to ensure adequate management of water quality during construction. Refer to section 5.6 and the ESCP plan in Appendix A;
- Water sensitive urban design measures have been considered as part of the stormwater strategy within the site to address pollutant removal prior to being discharged to Toongabbie Creek/Parramatta River. Refer to section 6.4 and the stormwater plan in Appendix A; and
- Construction works are to be undertaken within project site boundaries and shall avoid disturbing the existing riparian areas outside of our site extents.

6 Integrated Water Management Plan

This section outlines the proposed potable water supply/consumption, fire water supply, rainwater harvesting and water sensitive urban design (WSUD) for the proposed development.

6.1 Potable Water Supply

The cold water supply to the MSCP development will be provided from a new connection to the 100mm authority water main adjacent to the Redbank Road bridge (subject to authority confirmation), with a new water meter located at the site boundary. An RPZD (reduced pressure zone device) will be installed immediately downstream of the existing water meter to provide site containment protection. It will provide cold water supply to the fire hose reel system, hose taps and irrigation system.

No sanitary fixtures and tapware are anticipated, however, if provided, they will be water efficient to minimise potable water usage.

6.2 Fire Water Supply

A fire hydrant system will be provided throughout the building in accordance with the requirements of the NCC, AS2419, Fire Engineering requirements and FRNSW requirements.

A new fire protection water supply will be obtained via new connection to the 100mm authority water main adjacent to the Redbank Road bridge, subject to authority confirmation. The incoming fire water supply will be un-metered and pass through a double detector check valve with metered bypass to the requirements of Sydney Water.

A hydrant FRNSW booster assembly will be located at street level parallel to Redbank Road.

6.3 Rainwater Harvesting

Opportunities to collect rainwater water from the top floor the MSCP for landscape irrigation to minimise potable water usage were discussed. However, the current architectural design scheme for the MSCP does not include a roof, as such the quality of rainwater from the level P8 of the carpark was deemed not suitable for re-use and this option has been discarded.

6.4 Water Sensitive Urban Design (WSUD)

CoPC's DCP (2011) Section 3.3.6 outlines the requirements for WSUD including water quality targets. Table 2 summarises the pollutant reduction targets specified in the DCP. It is noted that the targets are reductions in pollutant loads relative to the same development without any water quality treatment.

Table 2: Water Quality Target Reduction Loads

| Pollutant | Performance Target reduction loads |
|--|--|
| Gross Pollutants | 90% reduction in the post development mean annual load of total gross pollutant load (greater than 5 mm) |
| Total Suspended Solids (TSS) | 85% reduction in the post development mean annual load of TSS |
| Total Phosphorous (TP) | 60% reduction in the post development mean annual load of TP |
| Total Nitrogen (TN) | 45% reduction in the post development mean annual load of TN |
| Hydrocarbons, motor oils, oil and grease | No visible oils for flows up to 50% of the one-year ARI peak flow |

A preliminary WSUD strategy has been considered based on current best practice, taking guidance from the CoPC DCP for Water Sensitive Urban Design Guidelines (2011). The proposed WSUD measures serves only the MSCP site and does not consider treating stormwater flows from upstream catchments.

An assessment of the proposed WSUD strategy based on the amended design is presented in Figure 13 to demonstrate the feasibility of meeting the CoPC pollutant reduction targets. The improvement in water quality can be estimated with the industry-standard water quality modelling software, MUSIC. This measures the effectiveness in terms of the percentage of pollutants removed.

Treatment is assessed against the 3-month ARI (or 4EY, exceedances per year) equivalent stormwater flows for the site area catchment only and does not account for the flow coming from upstream catchments.

With this strategy it is practical to achieve the Council pollution reduction targets as shown in Table 3.

Table 3: Results from the preliminary MUSIC model assessment

| Pollutant | City of Parramatta Council pollutant reduction targets (% reduction) | MSCP Preliminary Water Quality Assessment Results (% reduction) |
|------------------------|--|---|
| Total Suspended Solids | 85% | 89.8% |
| Total Phosphorous | 60% | 71.7% |
| Total Nitrogen | 45% | 53.2% |
| Goss Pollutants | 90% | 99.8% |

It is generally preferred that the WSUD features are located outside of the flood extents for frequent flood events as inundations of these items may result in compromised pollutant removal, damage and associated maintenance efforts for the WSUD elements. However, due to portions of the site being flood prone, this may not be feasible. These strategies will be further detailed to consider operation and maintenance when exposed to flood waters.

The MUSIC software does not permit numerical modelling of hydrocarbon and oil capture. However, the GPT units can be specified to achieve effective capture and containment of the anticipated hydrocarbons and oils running off from the paved vehicular access areas.

During detailed design, this WSUD strategy will be developed further and the MUSIC modelling presented in this report will be updated to check the compliance of the preferred approach with the CoPC water quality pollutant reduction targets.

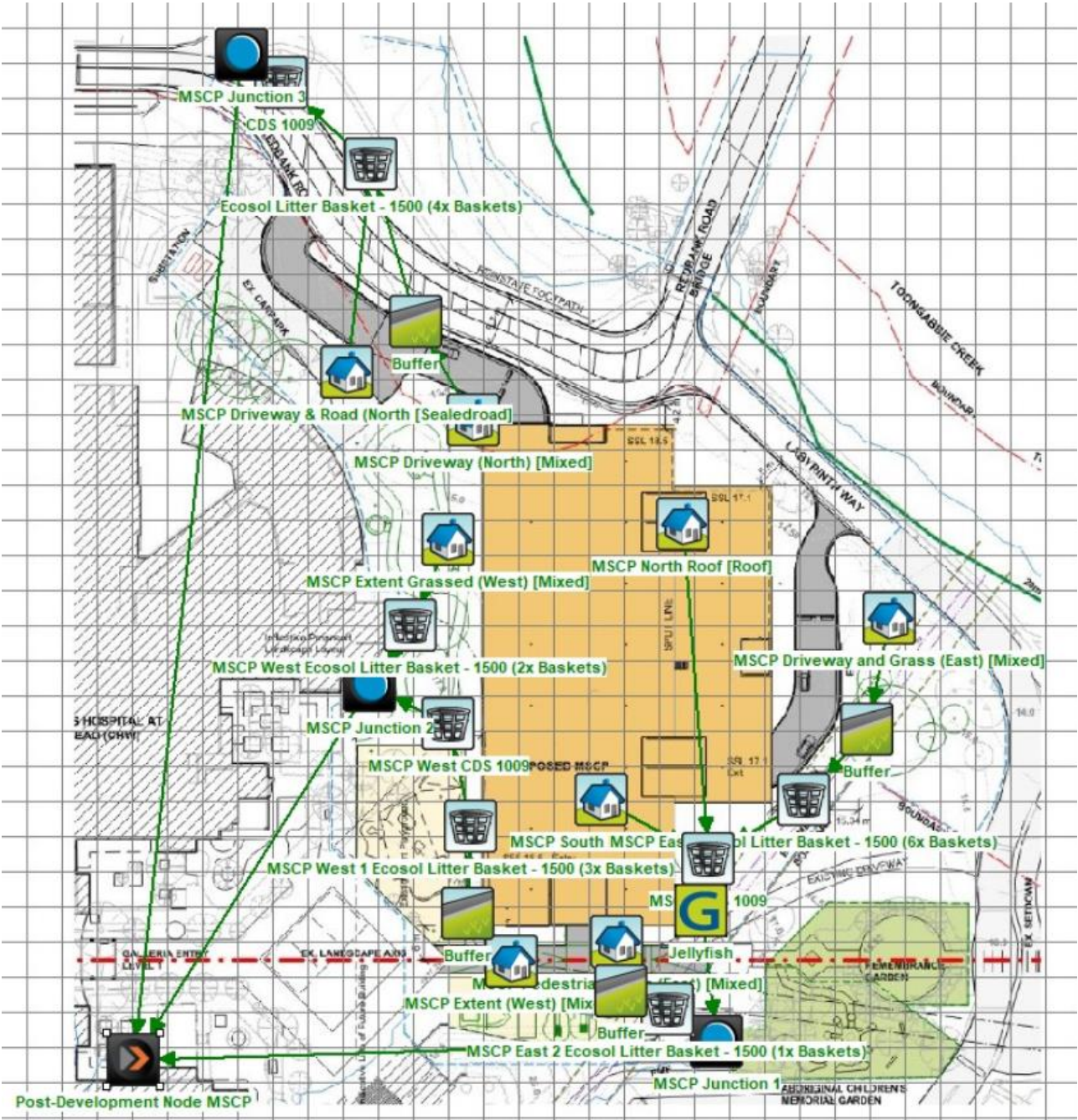


Figure 13: Preliminary WSUD assessment, extracted from MUSIC model

For the purposes of this assessment, consideration has been given to implementing the following treatment items:

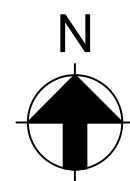
- GPTs (Rocla CDS 1009 unit);
- Media filled filtration cartridges (Ocean Protect Jellyfish Filter);
- Pit filtration baskets (Ecosol Litter baskets); and
- Landscape buffer strips.

Appendix A

MSCP Civil Drawings

CHILDREN'S HOSPITAL WESTMEAD - STAGE 2

MULTI-STOREY CAR PARK (MSCP) - CIVIL WORKS - SCHEMATIC DESIGN



LOCALITY PLAN
NOT TO SCALE

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| DRAWING No. | TITLE |
|---------------------------|---|
| CHW-ARP-CV-DG-MP-00-XX101 | COVER SHEET, LOCALITY PLAN AND DRAWING REGISTER |
| CHW-ARP-CV-DG-MP-00-XX106 | GENERAL NOTES |
| CHW-ARP-CV-DG-MP-00-XX110 | GENERAL LEGEND |
| CHW-ARP-CV-DG-MP-00-XX121 | EROSION AND SEDIMENT CONTROL - MSCP - PLAN |
| CHW-ARP-CV-DG-MP-00-XX191 | EROSION AND SEDIMENT CONTROL - MSCP - DETAILS |
| CHW-ARP-CV-DG-MP-00-XX200 | BULK EARTHWORKS - MSCP - OVERALL PLAN |
| CHW-ARP-CV-DG-MP-00-XX201 | BULK EARTHWORKS - MSCP - PLAN - SHEET 1 OF 2 |
| CHW-ARP-CV-DG-MP-00-XX202 | BULK EARTHWORKS - MSCP - PLAN - SHEET 2 OF 2 |
| CHW-ARP-CV-DG-MP-00-XX500 | CIVIL WORKS - MSCP - OVERALL PLAN |
| CHW-ARP-CV-DG-MP-00-XX501 | CIVIL WORKS - MSCP - PLAN - SHEET 1 OF 2 |
| CHW-ARP-CV-DG-MP-00-XX502 | CIVIL WORKS - MSCP - PLAN - SHEET 2 OF 2 |
| CHW-ARP-CV-DG-MP-00-XX591 | CIVIL WORKS - MSCP - DETAILS |
| CHW-ARP-CV-DG-MP-00-XX630 | DRAINAGE - MSCP - OVERALL PLAN |
| CHW-ARP-CV-DG-MP-00-XX691 | DRAINAGE - MSCP - DETAILS |
| CHW-ARP-CV-DG-MP-00-XX700 | PAVEMENT - MSCP - OVERALL PLAN |
| CHW-ARP-CV-DG-MP-00-XX701 | PAVEMENT - MSCP - PLAN - SHEET 1 OF 2 |
| CHW-ARP-CV-DG-MP-00-XX702 | PAVEMENT - MSCP - PLAN - SHEET 2 OF 2 |
| CHW-ARP-CV-DG-MP-00-XX791 | PAVEMENT - MSCP - PROFILES AND DETAILS |
| CHW-ARP-CV-DG-MP-00-XX801 | EXISTING SERVICES - MSCP - PLAN |

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Scales
NOT TO SCALE

Design Model Version

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| 3 | 11.02.21 | DJ | TT | BH |
| SCHEMATIC DESIGN UPDATE | | | | |
| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |
| Issue | Date | By | Chkd | Appd |



NSW
GOVERNMENT



Health
Infrastructure

Client

Engineering Certification (CEng)
Name: _____
Signature: _____ Date: _____

Job Title
CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN

Scale at A1
NOT TO SCALE

Discipline
Civil

ARUP

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Sydney, NSW, 2000
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www.arup.com

CONSULT AUSTRALIA

Member Firm
Anup Pty Ltd
ABN 16 000 986 165

Drawing Title
COVER SHEET, LOCALITY PLAN
AND DRAWING REGISTER

Drawing Status
SCHEMATIC DESIGN

Job No
271985-00

Drawing No
CHW-ARP-CV-DG-MP-00-XX101

Issue
3

GENERAL

- 1
- 2
1. ALL WORKS SHALL BE IN ACCORDANCE WITH CITY OF PARRAMATTA "DEVELOP CONTROL PLAN 2011", CITY OF PARRAMATTA COUNCIL "DEVELOPMENT ENGINEERING DESIGN GUIDELINES" AND HEALTH INFRASTRUCTURE "ENGINEERING SERVICE GUIDELINES".
2. SHOULD ANY AMBIGUITY, ERROR, OMISSION, DISCREPANCY, INCONSISTENCY OR OTHER FAULT EXIST OR SEEM TO EXIST IN THE DOCUMENTS, IMMEDIATELY NOTIFY THE ENGINEER OR SUPERINTENDENT.

SURVEY

- 1
- 2
- 3
1. ALL SURVEY FOR THIS DESIGN IS SUPPLIED BY:
LTS LOCKLEY (REFERENCE 32572088DT REV D)
SUITE 1, LEVEL 1, 810 PACIFIC HIGHWAY, GORDON, NSW, 2072
PHONE 1300 587 000
FAX 02 9499 7760
2. ALL BEARINGS AND DISTANCES BY SURVEY.

EROSION AND SEDIMENT

- 1
- 2
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1. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE IN ACCORDANCE WITH LANDCOM "SOILS AND CONSTRUCTION MANUAL VOLUME 1, MARCH 2004".
2. WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:
A) INSTALL EROSION AND SEDIMENT CONTROLS.
B) STRIP AND STOCKPILE TOPSOIL AND CARRY OUT ALL BULK EARTHWORKS.
C) TOPSOIL AND REHABILITATE BULK EARTHWORK AREAS IMMEDIATELY UPON COMPLETION.
D) UNDERTAKE REMAINING SITE WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS.
E) REMOVE SOIL AND WATER MANAGEMENT WORKS NOT REQUIRED FOR OTHER STAGES OF CONSTRUCTION ONCE UPSTREAM SURFACES ARE STABILISED TO THE SATISFACTION OF CITY OF PARRAMATTA COUNCIL.
3. CONTROLS AFFECTED BY WORKS ARE TO BE RE-ESTABLISHED PRIOR TO THE COMPLETION OF EACH DAYS WORK.
4. DUST CONTROL MEASURES SHALL BE IMPLEMENTED CONTINUOUSLY DURING CONSTRUCTION WORKS THROUGH REGULAR WATERING TO THE SATISFACTION OF THE PRINCIPAL'S AUTHORISED PERSON (PAP).
5. THE CONTRACTOR IS TO STABILISE TOPSOIL STOCKPILE AND BARE AREAS AS SOON AS THEY REACH FINAL LEVELS. STABILISATION TO BE BY HYDROSEEDING OR OTHER METHOD APPROVED BY CITY OF PARRAMATTA. ALL SEEDED AREAS TO BE WATERED TWICE WEEKLY UNTIL GRASS IS ESTABLISHED OR COVERED WITH BITUMEN STRAW MULCH.
6. THE CONTRACTOR SHALL TEMPORARILY REHABILITATE ANY DISTURBED AREAS WITHIN 14 DAYS. WHERE FINAL SHAPING HAS OCCURRED THE CONTRACTOR SHALL PROVIDE FINAL REHABILITATION WITHIN 7 DAYS.
7. NO MORE THAN 150 m OF TRENCH IS TO BE OPEN AT ANY ONE TIME.
8. AREAS OVER STORMWATER AND SEWER LINES NOT IN ROADS TO BE MULCHED AND SEEDED AS SOON AS POSSIBLE BUT NO LATER THAN WITHIN 14 DAYS AFTER BACKFILL.
9. AREAS OVER ELECTRICITY POWER, TELEPHONE AND GAS SUPPLY TRENCHES NOT IN ROADS ARE TO BE SEEDED AND MULCHED AS SOON AS POSSIBLE BUT NO LATER THAN WITHIN 14 DAYS AFTER BACKFILL.
10. ALL TEMPORARY EARTH BERMS, DIVERSION AND SEDIMENT BASIN EMBANKMENTS ARE TO BE TRACK ROLLED, SEEDED OR MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
11. ESTABLISHMENT OF FIRE BREAKS SHALL BE CARRIED OUT IN CONSULTATION WITH A FIRE CONTROL OFFICER.

SEDIMENT CONTROL MEASURES

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1. DURING EARTHWORKS, CAR PARK WORKS AND ROADWORKS, TEMPORARY DIVERSION BANKS SHOULD BE CONSTRUCTED TO LIMIT SLOPE LENGTH, WHERE POSSIBLE, IN ACCORDANCE WITH THE FOLLOWING:
2. ALL EXISTING STORMWATER PITS TO BE COVERED OR PROTECTED BY SEDIMENT CONTROL MEASURES AS ILLUSTRATED IN THE ENGINEERING DRAWINGS. NEWLY CONSTRUCTED DRAINAGE INLET PITS SHALL ALSO BE PROTECTED IMMEDIATELY AFTER INSTALLATION.
3. SEDIMENT TRAPS ARE TO BE MAINTAINED SUCH THAT:
A) SEDIMENT IS REMOVED SUCH THAT NO LESS THAN 70% OF THE DESIGN CAPACITY REMAINS AT ANY ONE TIME.
B) MATERIALS ARE REPLACED OR REPAIRED AS REQUIRED TO ENSURE SERVICEABILITY OF BOTH THE ELEMENT AND THE TRAP.
4. PERMANENT DRAINAGE STRUCTURES INCLUDING PIPES AND PITS ARE TO BE HANDED OVER IN A CLEAN CONDITION AT THE COMPLETION OF THE CONTRACT MAINTENANCE PERIOD.
5. FOLLOWING COMPLETION AND RESTORATION OF SITE, REMOVE ALL MATERIALS AND FILL DIVERSION DRAINS, WATERWAYS AND SEDIMENT TRAPS. COMPACT IN ACCORDANCE WITH SPECIFICATION TO MATCH LEVELS OF THE PREVIOUSLY COMPLETED WORKS. PROVIDE 150 mm TOPSOIL AND HYDROSEED.
6. AN ACCESS POINT TO ALLOW MACHINE ENTRY / EXIT ARE TO INCLUDE A ROUNDED EARTH MOUND 0.3 m HIGH WITH 10H:1V BATTERS.
7. THE CONTRACTOR SHALL PROVIDE A 0.4 m WIDE TURF STRIP BEHIND ALL KERB AND GUTTER AT COMPLETION OF FOOTPATH FORMATION AND 1.0 m WIDE AROUND ALL SURFACE INLET PITS.
8. THE CONTRACTOR SHALL MAINTAIN A LOG BOOK DETAILING
- RECORDS OF ALL RAINFALL
- CONDITION OF SOIL AND WATER MANAGEMENT STRUCTURES
- ANY ADDITIONAL REMEDIAL WORKS REQUIRED
THE LOG BOOK SHALL BE MAINTAINED ON A DAILY BASIS AND BE MADE AVAILABLE TO ANY AUTHORISED PERSON UPON REQUEST. THE ORIGINAL LOG BOOK SHALL BE ISSUED TO THE PROJECT MANAGER AT THE COMPLETION OF THE WORKS.
9. THE CONTRACTOR SHALL AT ALL TIMES RESTRICT CONSTRUCTION EQUIPMENT MOVEMENT TO THE ESSENTIAL CONSTRUCTION AREAS. THE CONTRACTOR SHALL NOT EXTEND LAND DISTURBANCE BEYOND 2 m FROM THE EDGE OF ANY ESSENTIAL CONSTRUCTION ACTIVITY.
10. THE CONTRACTOR SHALL PROVIDE CATCH DRAINS AT THE BOTTOM OF ALL BATTERS AND DIVERT THE CATCH DRAINS AND ANY TAIL OUT DRAINS TO DRAIN TO THE NEAREST STORMWATER PIT.

CLEARING AND GRUBBING

- 1
- 2
- 3
- 4
1. THE WORK SITE IS TO BE CLEARED OF ALL ORGANIC MATTER, RUBBISH OR OTHERWISE UNSUITABLE MATERIALS.
2. ALL TREES, OTHER THAN THOSE IDENTIFIED AND APPROVED FOR REMOVAL BY THE PROJECT ARBORIST, SHALL BE RETAINED.
3. GRUBBING OUT OF STUMPS AND ROOTS IS REQUIRED TO A MIN DEPTH OF 500 mm BELOW EXISTING GROUND LEVEL. FOLLOWING GRUBBING, ANY VOIDS OR DEPRESSIONS ARE TO BE FILLED WITH SELECTED MATERIAL AND COMPACTED IN 150 mm LAYERS TO THE DENSITY OF THE SURROUNDING UNDISTURBED MATERIAL.
4. ALL MATERIAL DERIVED FROM CLEARING AND GRUBBING IS TO BE DISPOSED OF BY THE CONTRACTOR AT AN APPROVED DISPOSAL SITE.

| RECOMMENDED MAXIMUM SPACING BETWEEN CROSS BANKS ON ALL ROADS | |
|--|---------------------|
| SLOPE | MAXIMUM SPACING (m) |
| 0 TO 1% | 150 |
| 1 TO 3% | 100 |
| 3 TO 5% | 70 |
| 5 TO 10% | 50 |
| 10 TO 17% | 16 |

DEMOLITION

- 1
- 2
1. ALL STRUCTURAL DEMOLITION WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH REQUIREMENTS OF AS 2601 AND STRUCTURAL ENGINEERING SPECIFICATIONS.
2. HAZARDOUS MATERIALS (INCLUDING ASBESTOS) ARE TO BE HANDLED, STORED, TREATED TRANSPORTED AND DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS OF THE WORK HEALTH & SAFETY ACT 2011 AND ANY RELEVANT REQUIREMENTS OF THE WORK COVER AUTHORITY OF NSW.
1. ALL MATERIAL UNSUITABLE FOR USE ON SITE SHALL BE DISPOSED OF OFF SITE TO AN APPROVED DISPOSAL SITE.
2. EARTHWORKS TO BE CARRIED OUT TO THE SATISFACTION OF THE PAP. ALL TESTING OF EARTHWORKS SHALL BE UNDERTAKEN AS NOMINATED IN THE SPECIFICATION.
3. AT THE TOP OF ALL EXCAVATED BATTERS OVER 1.0m HIGH PROVIDE A BARRIER FENCE.
4. ALL EXCAVATION WORKS WITHIN TREE PROTECTION ZONES ARE TO BE HAND DUG ONLY. PROJECT ARBORIST TO CONFIRM AND APPROVE METHODOLOGY PRIOR TO CONSTRUCTION COMMENCEMENT.
5. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS INCLUDING SHORING AND BATTERS. ALL TEMPORARY WORKS ARE TO BE DESIGNED IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND CODES OF PRACTICE BY A SUITABLY QUALIFIED ENGINEER.

EARTHWORKS

- 1
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- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
1. ALL MATERIAL UNSUITABLE FOR USE ON SITE SHALL BE DISPOSED OF OFF SITE TO AN APPROVED DISPOSAL SITE.
2. EARTHWORKS TO BE CARRIED OUT TO THE SATISFACTION OF THE PAP. ALL TESTING OF EARTHWORKS SHALL BE UNDERTAKEN AS NOMINATED IN THE SPECIFICATION.
3. AT THE TOP OF ALL EXCAVATED BATTERS OVER 1.0m HIGH PROVIDE A BARRIER FENCE.
4. ALL EXCAVATION WORKS WITHIN TREE PROTECTION ZONES ARE TO BE HAND DUG ONLY. PROJECT ARBORIST TO CONFIRM AND APPROVE METHODOLOGY PRIOR TO CONSTRUCTION COMMENCEMENT.
5. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS INCLUDING SHORING AND BATTERS. ALL TEMPORARY WORKS ARE TO BE DESIGNED IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND CODES OF PRACTICE BY A SUITABLY QUALIFIED ENGINEER.
6. THE CONTRACTOR IS RESPONSIBLE FOR MANAGING SITE RISKS ASSOCIATED WITH FALLS FROM HEIGHT INCLUDING INSTALLING SAFETY BARRIERS AROUND EXCAVATIONS WHERE APPROPRIATE.
7. EXCAVATED MATERIAL MAY BE USED AS STRUCTURAL FILL PROVIDED IT COMPLIES WITH THE SPECIFICATION FOR FILL MATERIAL AND THE PLACEMENT MOISTURE CONTENT COMPLIES WITH GEOTECHNICAL CONSULTANTS REQUIREMENTS, AND ALLOWS FILLING TO BE PLACED AND PROOFROLLED IN ACCORDANCE WITH RMS R44 SPECIFICATION.
8. FILLING IS TO BE UNDERTAKEN IN MAX 200mm LOOSE LAYERS AND 150mm LOOSE LAYERS AT DEPTHS <500mm BELOW PROPOSED BULK EARTHWORKS LEVELS.
9. SELECTED MATERIAL FOR USE AS GENERAL FILL SHALL BE UNIFORM IN CLASSIFICATION, WELL GRADED, COARSE, GRANULAR AND FREE DRAINING. MAX PARTICLE SIZE 75mm. COMPACTED IN 150mm MAX LAYERS TO OBTAIN 100% SMDD AS DETERMINED BY TEST AS 1289.5.1.1.
10. EXCAVATED SURFACES ARE TO BE CHECKED WITH A 10 TONNE ROLLER (MIN) FOR SOFT OR COMPRESSIBLE ZONES AREAS WITH MORE THAN 3mm MOVEMENT UNDER ROLLER. SUCH ZONES ARE TO BE OVER EXCAVATED TO A MIN DEPTH OF 300mm AND REPLACED WITH COMPACTED SELECTED MATERIAL IN ACCORDANCE WITH NOTE 8.

EXISTING SERVICES

- 1
- 2
- 3
- 4
- 5
1. THE CONTRACTOR SHALL UNDERTAKE POTHOLING AND/OR INVESTIGATION WORKS TO LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCING WORKS.
2. EXISTING SERVICES INFORMATION SHOWN ON THESE PLANS ARE LOCATED FROM INFORMATION SUPPLIED BY THE SURVEYOR AND ARE NOT GUARANTEED COMPLETE OR CORRECT. ALL SERVICE LOCATIONS ARE TO BE VERIFIED BY THE CONTRACTOR PRIOR TO ANY EXCAVATION OR CONSTRUCTION WORKS. ARUP ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.
3. ALL REMOVED, DIVERTED AND PROTECTED UTILITIES WORKS RELATED TO EXISTING SERVICES NEED TO BE VERIFIED AND APPROVED BY HEALTH INFRASTRUCTURE AND RELEVANT SERVICE AUTHORITIES.
4. ALL ACCESSIBLE EXISTING SERVICE PITS AND VALVES TO BE RETAINED MUST HAVE THEIR COVERS RAISED OR LOWERED TO THE PROPOSED SURFACE LEVELS TO MAINTAIN ACCESS. SERVICE PITS AND COVERS MAY NEED REPLACEMENT FOR CHANGED LOADING CONDITIONS.
5. IMPACTS ON EXISTING UTILITIES, INCLUDING REQUIRED DIVERSIONS, PROTECTION AND MODIFICATION WORKS ARE NOT SHOWN IN THIS SET OF CIVIL ENGINEERING DRAWINGS. REFER TO DOCUMENTATION OF

THE RELEVANT ENGINEERING AND TECHNICAL SERVICE CONSULTANTS. UTILITIES WORKS ARE TO BE COORDINATED WITH CIVIL ENGINEERING WORKS.

ASBESTOS

- 1
- 2
- 3
1. CONTAMINATED MATERIALS ARE KNOWN TO EXIST ON SITE, REFER TO CONTAMINATION REPORT.
2. A REMEDIATION ACTION PLAN IS TO BE PREPARED FOR THIS SITE. THE CONTRACTOR IS TO ATTEND TO ALL ISSUES IN THE REMEDIATION ACTION PLAN BEFORE COMMENCING ANY DEMOLITION OR CONSTRUCTION WORKS.
3. ALL AIR MONITORING EQUIPMENT TO BE IN PLACE PRIOR TO COMMENCING ANY DEMOLITION OR CONSTRUCTION WORKS,

ROADWORKS GENERAL

- 1
- 2
- 3
- 4
- 5
1. THE CONTRACTOR SHALL OBTAIN ALL LEVELS FROM ESTABLISHED BENCH MARKS ONLY AS SUPPLIED BY THE APPOINTED SURVEYORS.
2. NO WORK TO BE CARRIED OUT ON ADJOINING PROPERTIES WITHOUT THE WRITTEN PERMISSION FROM THE OWNER.
3. VEHICULAR ACCESS AND ALL SERVICES ARE TO BE MAINTAINED AT ALL TIMES TO AREAS AFFECTED BY CONSTRUCTION.
4. ALL RUBBISH, BUILDINGS, SHEDS, FENCES, AND POWER POLES ARE TO BE REMOVED IN ACCORDANCE WITH CoPC AND RMS SPECIFICATIONS.
5. CONTRACTOR TO INSTALL ROOT CONTROL BARRIERS ALONG LENGTH OF KERBS AND RETAINING WALLS ADJACENT TO LANDSCAPED AREAS.

GEOTECHNICAL INSPECTION & TESTING

- 1
- 2
- 3
1. IT IS INCUMBENT ON THE CONTRACTOR TO ENSURE ALL EARTHWORKS ARE UNDERTAKEN UNDER LEVEL 2 GEOTECHNICAL INSPECTION AND TESTING SUPERVISION AS DEFINED IN AS 3798-2007. ALL COSTS SHALL BE BOURNE BY THE CONTRACTOR.
2. THE LEVEL 2 GEOTECHNICAL AND TESTING AUTHORITY (GITA) SHALL PROVIDE A REPORT DETAILING ALL THE INSPECTIONS, SAMPLING AND TESTING IT HAS CARRIED OUT TOGETHER WITH PLAN LOCATIONS AND A SUMMARY OF RESULTS.
3. THE GITA IS ALSO REQUIRED TO EXPRESS AN OPINION ON THE COMPLIANCE OF THE SITE WORKS WITH THE SPECIFICATION AND DRAWINGS BY WAY OF EVIDENCE TO THE ENGINEER FOR CERTIFICATION PURPOSES.

DRAINAGE

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- 3
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- 8
1. PRIOR TO THE WORKS COMMENCING AND FOLLOWING COMPLETION OF WORKS, A CCTV INSPECTION AND REPORT IS TO BE UNDERTAKEN FOR ALL STORMWATER PIPES AND CULVERTS TO BE RETAINED AND AFFECTED BY THE PROPOSED WORKS.
2. ALL EXISTING REDUNDANT PITS AND PIPES WHICH ARE NO LONGER REQUIRED ARE TO BE GROUT FILLED UNLESS NOTED OTHERWISE.
3. ALL DRAINAGE TRENCHES WHERE PITS AND PIPES ARE REMOVED ARE TO BE BACKFILLED AND COMPACTED WITH CLEAN MATERIAL WHICH COMPLIES WITH THE CoPC SPECIFICATIONS AND IN ACCORDANCE TO THE GEOTECHNICAL ENGINEERS RECOMMENDATIONS.
4. ALL PITS OVER 1.2 m IN DEPTH TO BE PROVIDED WITH STEP IRONS IN ACCORDANCE WITH AS 4198.
5. PIT AND PIPE CONCRETE TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 32 MPa AT 28 DAYS U.N.O.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF ALL TEMPORARY DRAINAGE NECESSARY TO DRAIN THE SITE DURING CONSTRUCTION INCLUDING TEMPORARY DIVERSIONS OF TRUNK MAINS TO ENABLE PERMANENT WORKS.
7. CONNECT DOWNPIPES TO THE STORMWATER SYSTEM AS EARLY AS POSSIBLE.
8. CONTRACTOR TO PROVIDE ROOT CONTROL BARRIERS FOR DRAINAGE PIPES WITHIN LANDSCAPED AREAS.

NOT FOR CONSTRUCTION

Scales

NOT TO SCALE


Design Model Version

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| | | | | |
| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |
| Issue | Date | By | Chkd | Appd |

Client



Engineering Certification (CEng)
Name: _____
Signature: _____ Date: _____

Job Title

CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN

Scale at A1


NOT TO SCALE

Discipline

Civil

ARUP

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Member Firm
Anup Pty Ltd
ABN 16 000 966 165

Drawing Title

GENERAL NOTES

Drawing Status

SCHEMATIC DESIGN

Job No

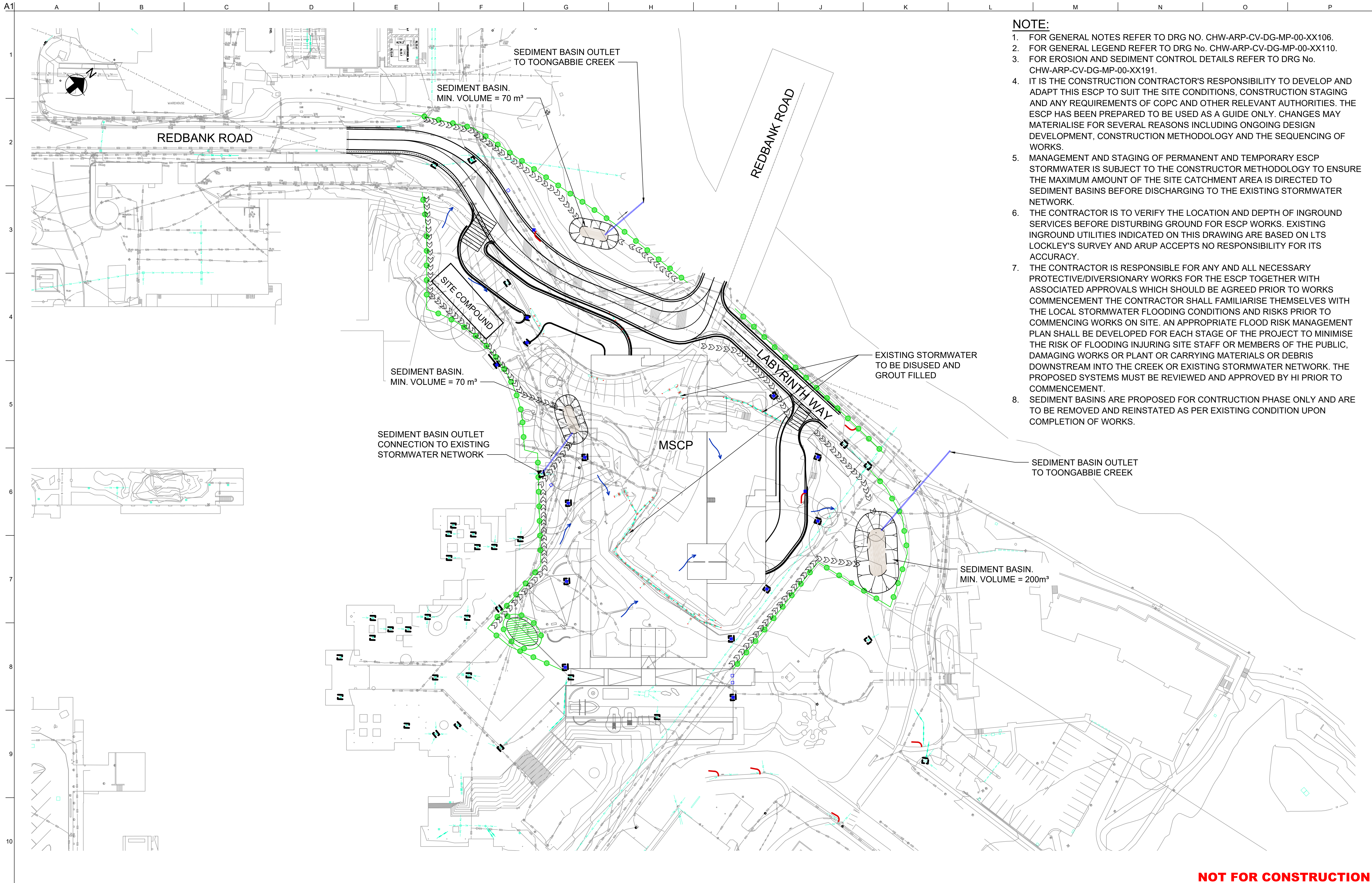
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Drawing No

CHW-ARP-CV-DG-MP-00-XX106

Issue

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- NOTE:**
1. FOR GENERAL NOTES REFER TO DRG NO. CHW-ARP-CV-DG-MP-00-XX106.
 2. FOR GENERAL LEGEND REFER TO DRG No. CHW-ARP-CV-DG-MP-00-XX110.
 3. FOR EROSION AND SEDIMENT CONTROL DETAILS REFER TO DRG No. CHW-ARP-CV-DG-MP-00-XX191.
 4. IT IS THE CONSTRUCTION CONTRACTOR'S RESPONSIBILITY TO DEVELOP AND ADAPT THIS ESCP TO SUIT THE SITE CONDITIONS, CONSTRUCTION STAGING AND ANY REQUIREMENTS OF COPC AND OTHER RELEVANT AUTHORITIES. THE ESCP HAS BEEN PREPARED TO BE USED AS A GUIDE ONLY. CHANGES MAY MATERIALISE FOR SEVERAL REASONS INCLUDING ONGOING DESIGN DEVELOPMENT, CONSTRUCTION METHODOLOGY AND THE SEQUENCING OF WORKS.
 5. MANAGEMENT AND STAGING OF PERMANENT AND TEMPORARY ESCP STORMWATER IS SUBJECT TO THE CONSTRUCTOR METHODOLOGY TO ENSURE THE MAXIMUM AMOUNT OF THE SITE CATCHMENT AREA IS DIRECTED TO SEDIMENT BASINS BEFORE DISCHARGING TO THE EXISTING STORMWATER NETWORK.
 6. THE CONTRACTOR IS TO VERIFY THE LOCATION AND DEPTH OF INGROUND SERVICES BEFORE DISTURBING GROUND FOR ESCP WORKS. EXISTING INGROUND UTILITIES INDICATED ON THIS DRAWING ARE BASED ON LTS LOCKLEY'S SURVEY AND ARUP ACCEPTS NO RESPONSIBILITY FOR ITS ACCURACY.
 7. THE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL NECESSARY PROTECTIVE/DIVERSIONARY WORKS FOR THE ESCP TOGETHER WITH ASSOCIATED APPROVALS WHICH SHOULD BE AGREED PRIOR TO WORKS COMMENCEMENT THE CONTRACTOR SHALL FAMILIARISE THEMSELVES WITH THE LOCAL STORMWATER FLOODING CONDITIONS AND RISKS PRIOR TO COMMENCING WORKS ON SITE. AN APPROPRIATE FLOOD RISK MANAGEMENT PLAN SHALL BE DEVELOPED FOR EACH STAGE OF THE PROJECT TO MINIMISE THE RISK OF FLOODING INJURING SITE STAFF OR MEMBERS OF THE PUBLIC, DAMAGING WORKS OR PLANT OR CARRYING MATERIALS OR DEBRIS DOWNSTREAM INTO THE CREEK OR EXISTING STORMWATER NETWORK. THE PROPOSED SYSTEMS MUST BE REVIEWED AND APPROVED BY HI PRIOR TO COMMENCEMENT.
 8. SEDIMENT BASINS ARE PROPOSED FOR CONTRUCTION PHASE ONLY AND ARE TO BE REMOVED AND REINSTATED AS PER EXISTING CONDITION UPON COMPLETION OF WORKS.

NOT FOR CONSTRUCTION

Scales

0 10 20m

A1 / A3
1:500 / 1:1000

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| 3 | 11.02.21 | DJ | TT | BH |
| SCHEMATIC DESIGN UPDATE | | | | |
| 2 | 21.01.21 | CL | TT | LC |
| SCHEMATIC DESIGN UPDATE | | | | |
| 1 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |

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| Issue | Date | By | Chkd | Appd |
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Client

Engineering Certification (CEng)

Name: _____ Date: _____

Signature: _____

Job Title

CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN

Scale at A1

1:500m

Discipline

Civil

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

Member Firm
Arup Pty Ltd
ABN 16 000 966 165

Drawing Title

EROSION AND SEDIMENT
CONTROL - MSCP
PLAN

Drawing Status

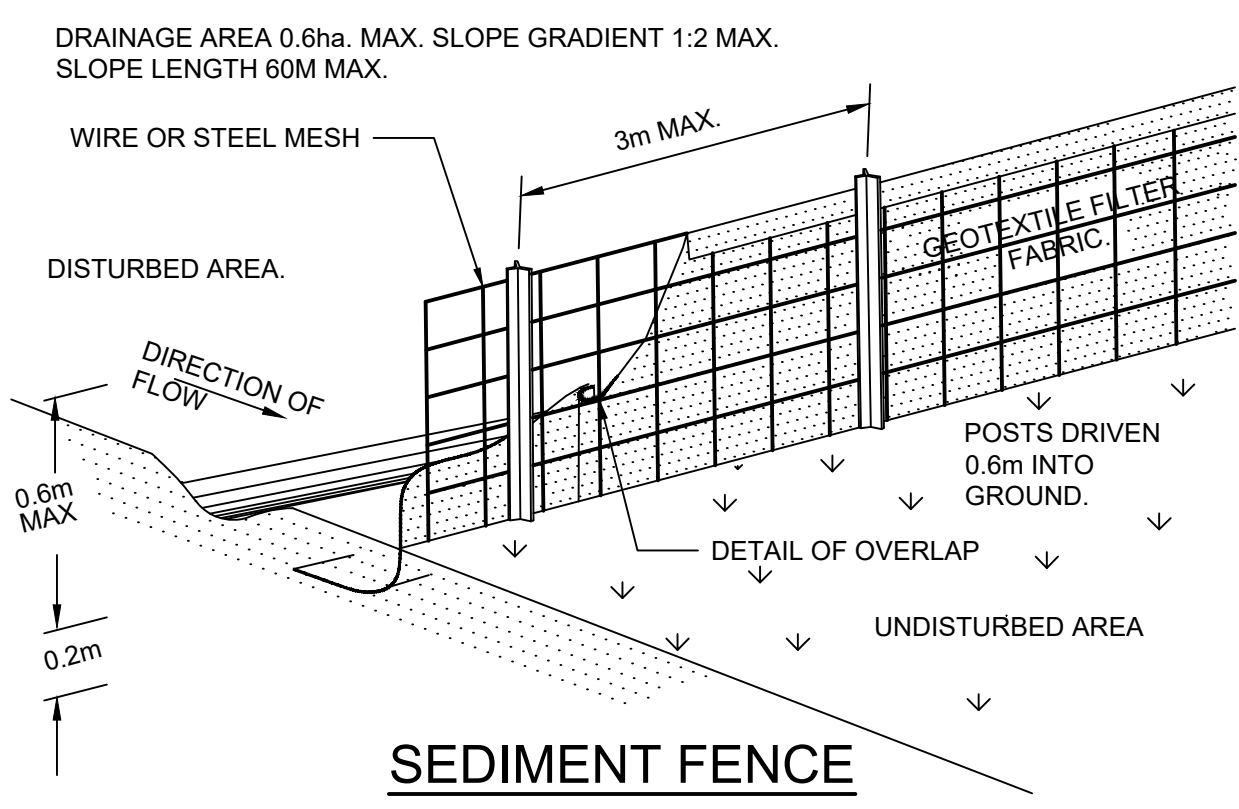
SCHEMATIC DESIGN

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|-----------|---------------------------|-------|
| Job No | Drawing No | Issue |
| 271985-00 | CHW-ARP-CV-DG-MP-00-XX121 | 4 |

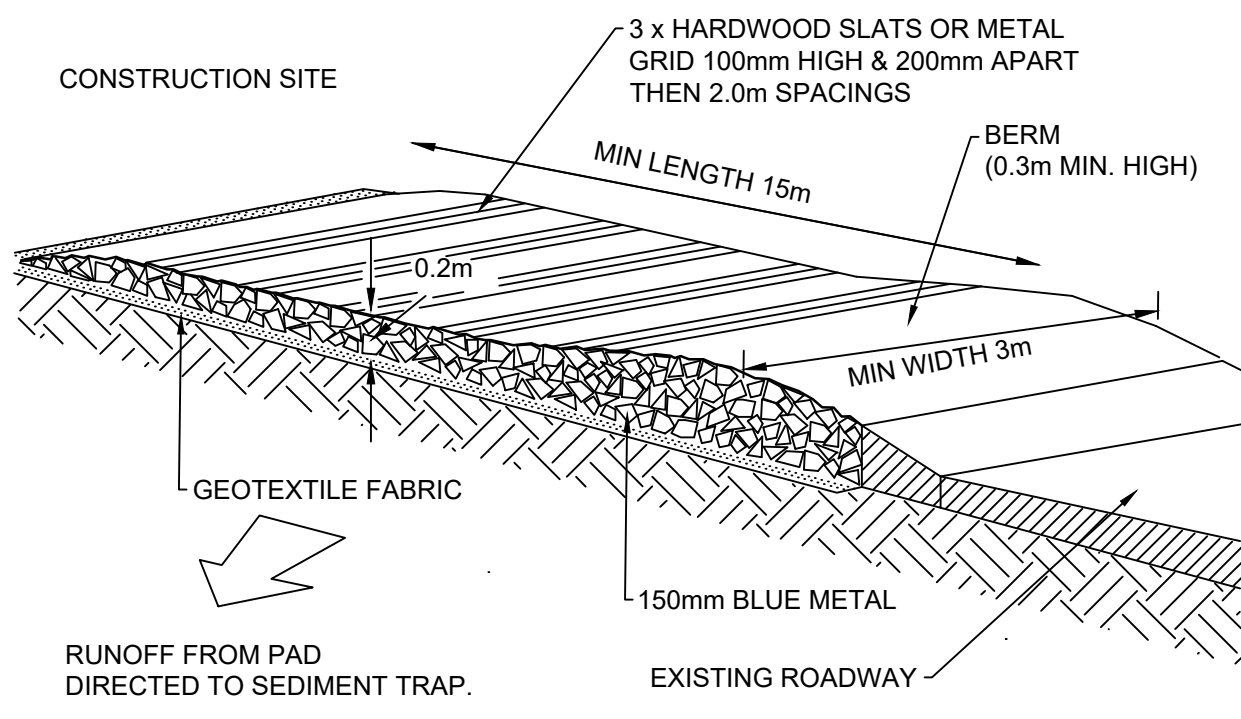
Design Model Version

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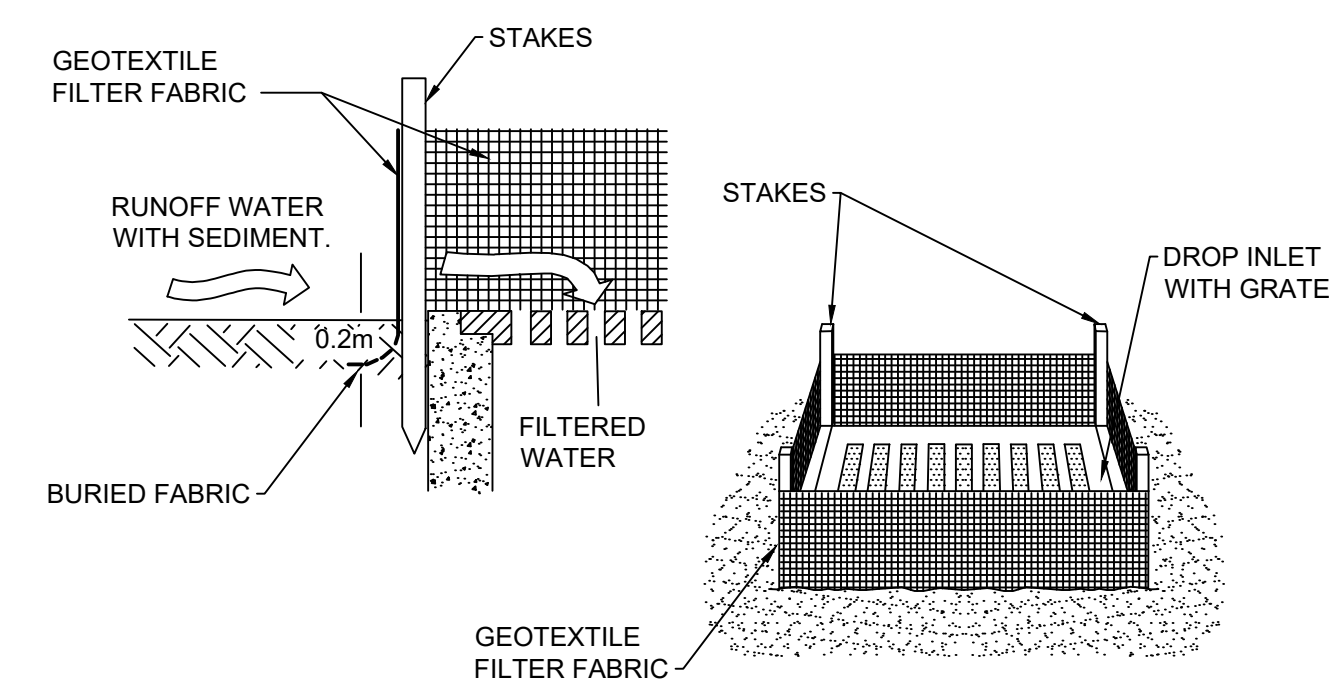
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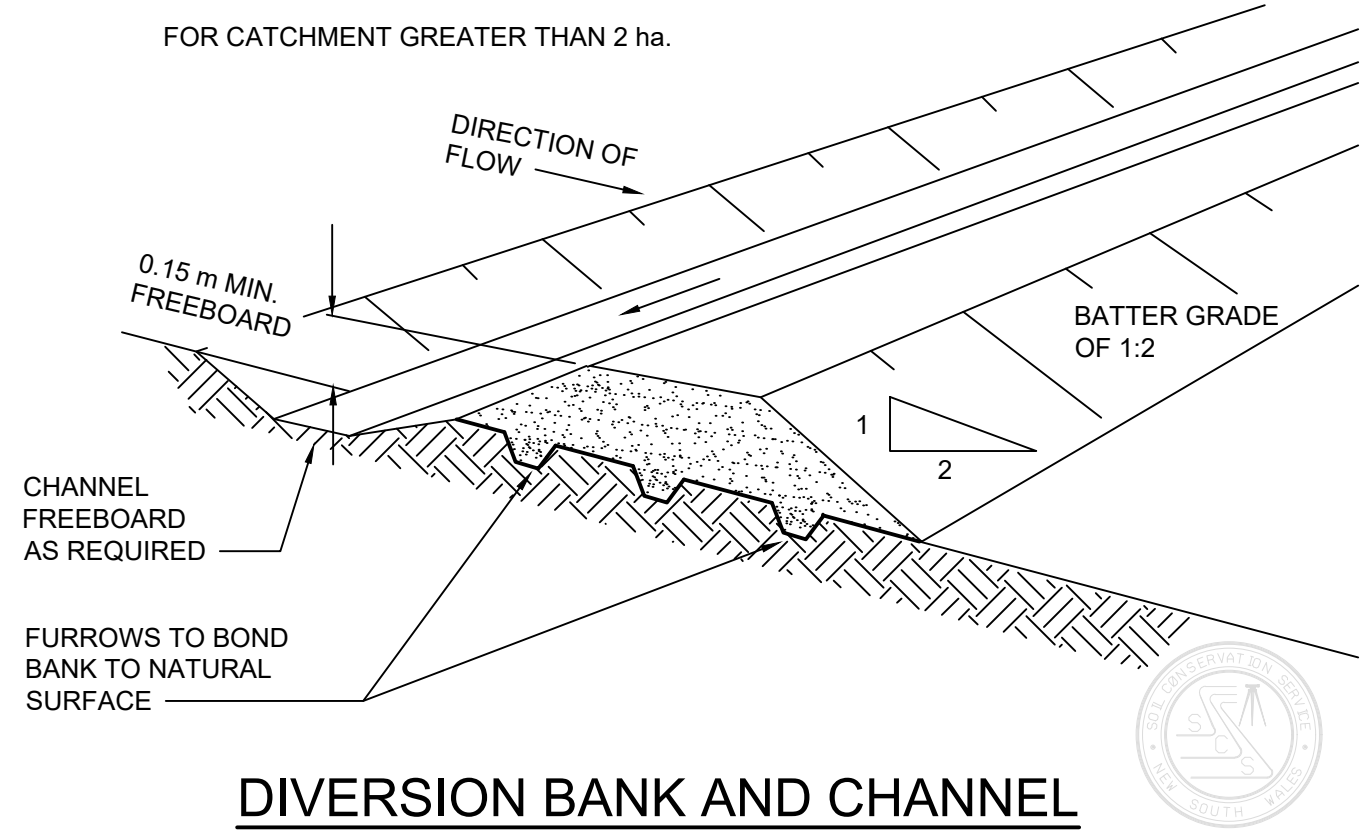
SEDIMENT FENCE



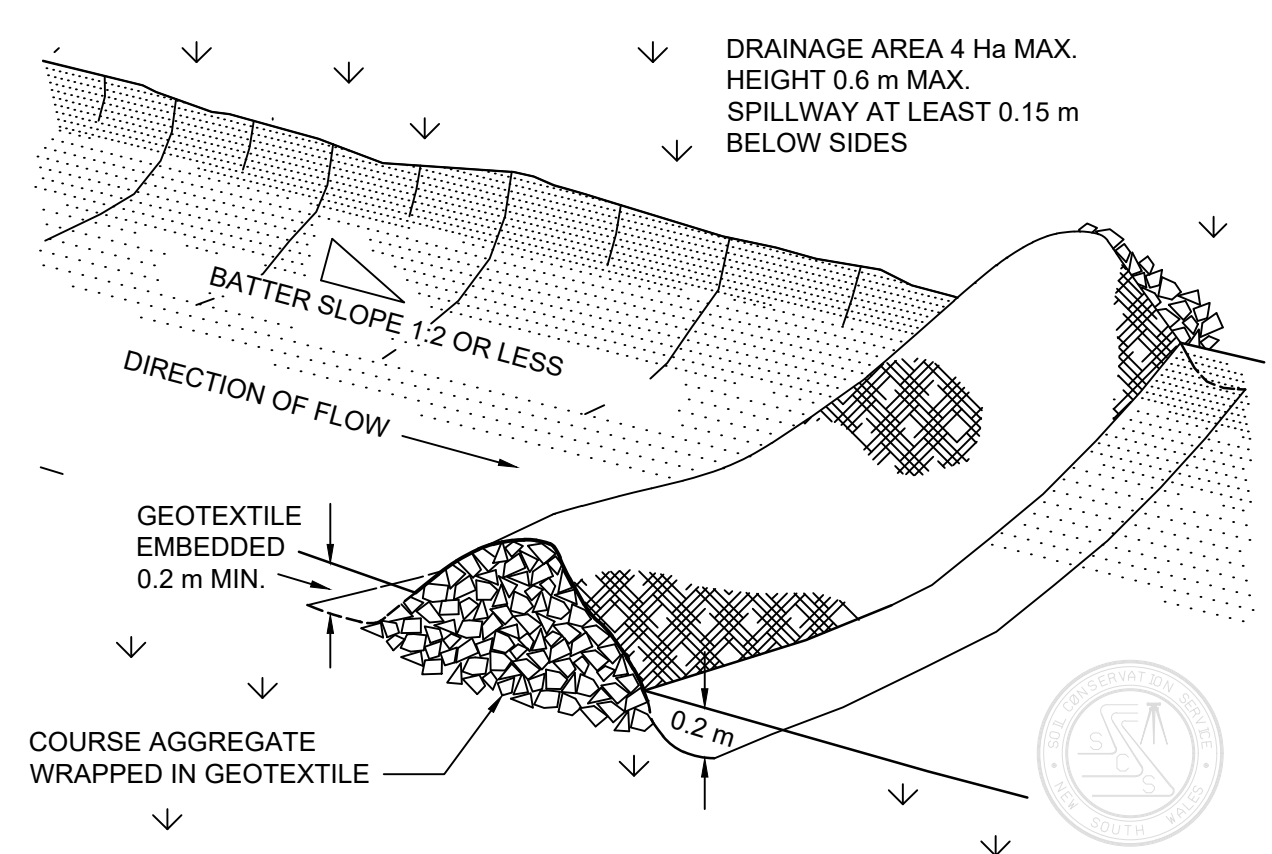
TEMPORARY CONSTRUCTION EXIT



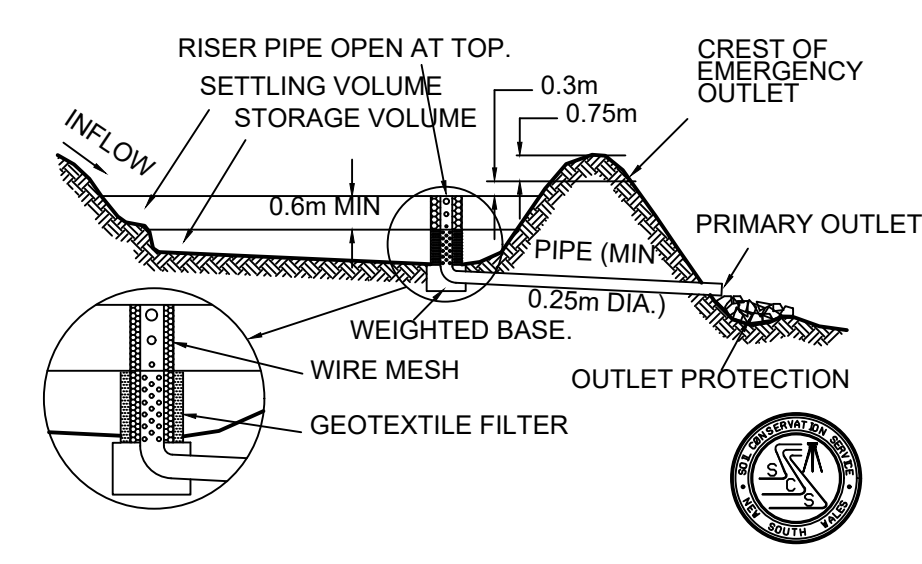
GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP



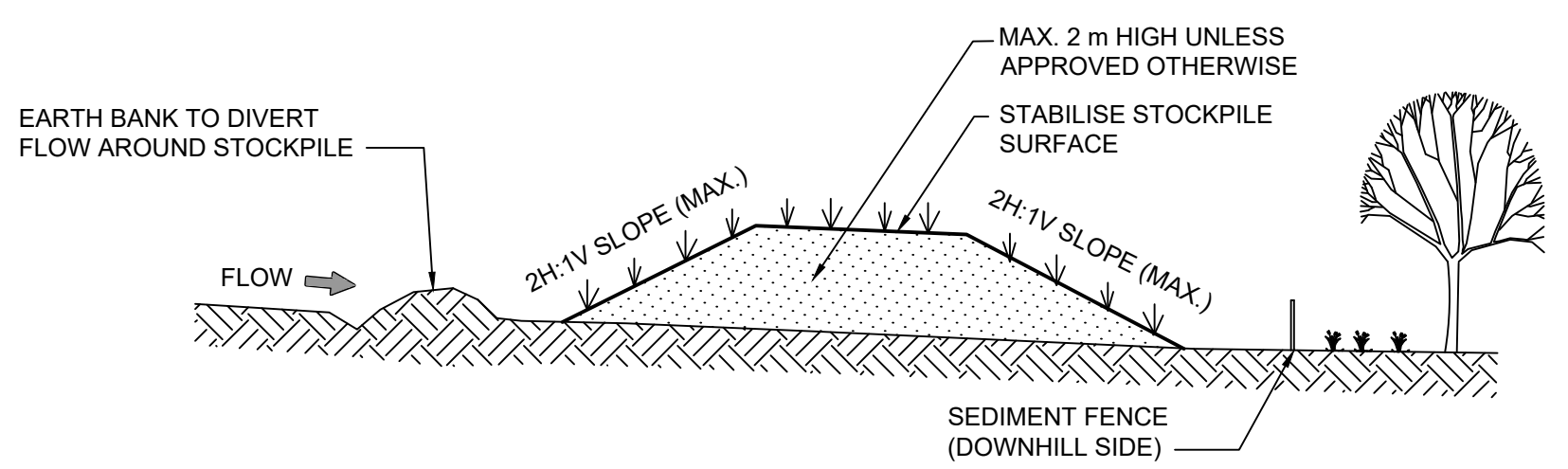
DIVERSION BANK AND CHANNEL



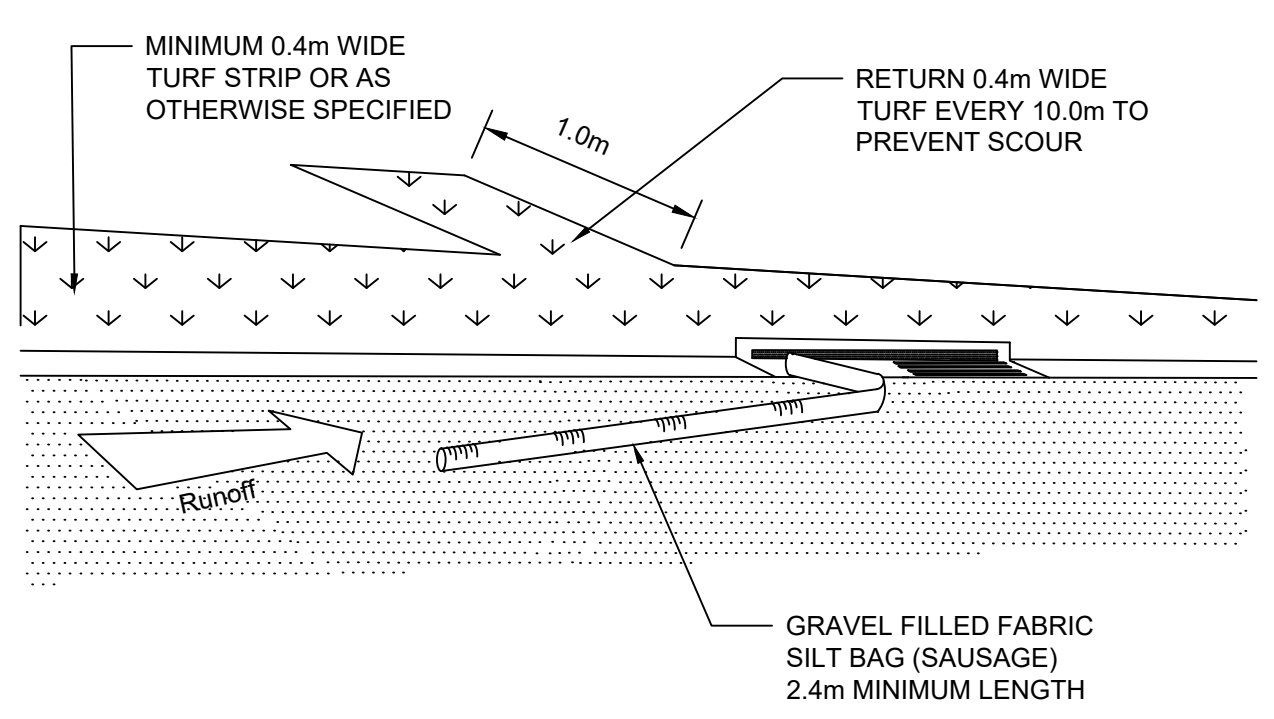
ROCK CHECK DAM



CROSS SECTION OF TYPICAL SEDIMENT BASIN

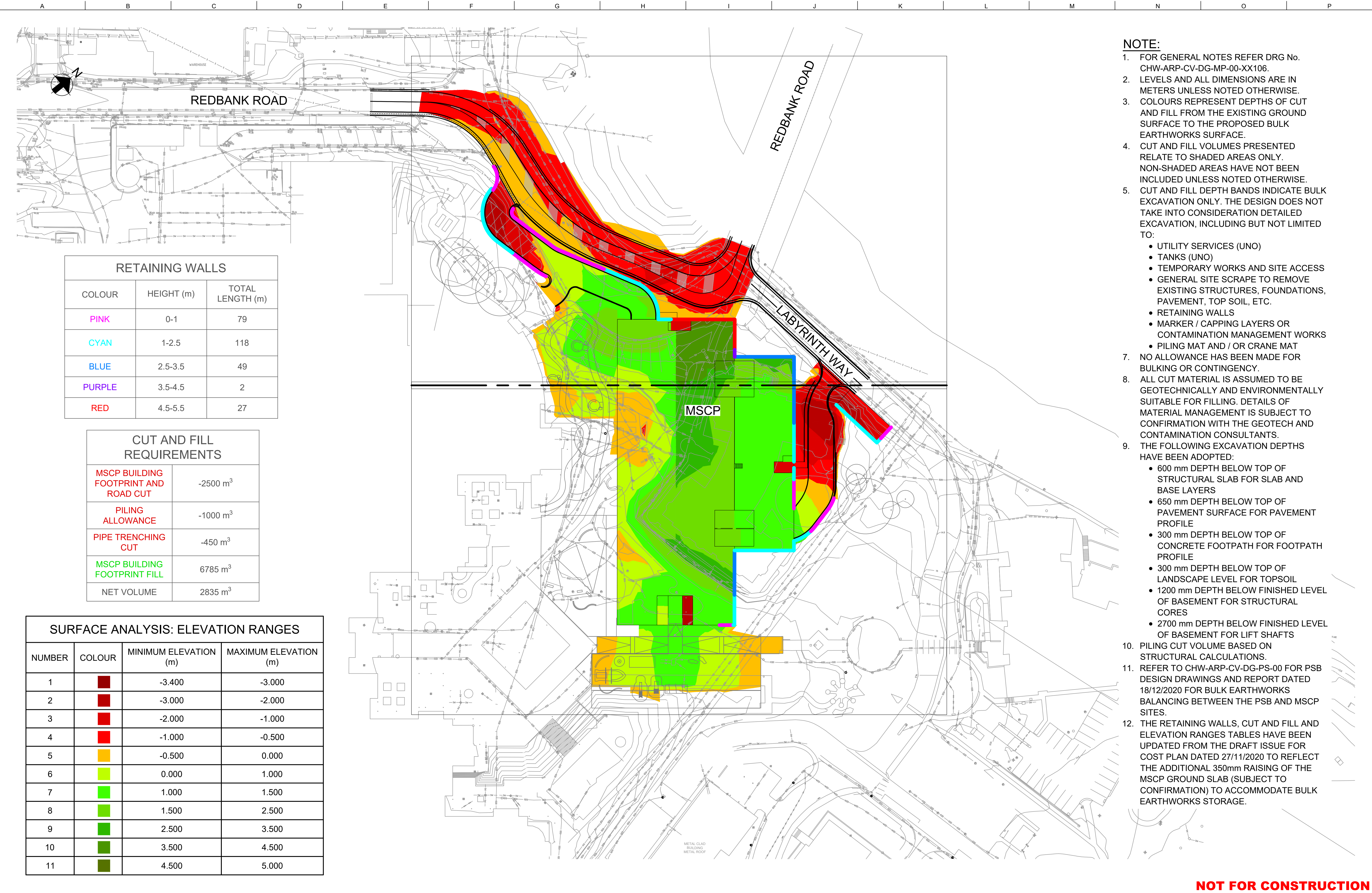


STOCKPILE



FABRIC STOCKING KERB INLET SEDIMENT TRAP

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- NOTE:**
- FOR GENERAL NOTES REFER DRG No. CHW-ARP-CV-DG-MP-00-XX106.
 - LEVELS AND ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
 - COLOURS REPRESENT DEPTHS OF CUT AND FILL FROM THE EXISTING GROUND SURFACE TO THE PROPOSED BULK EARTHWORKS SURFACE.
 - CUT AND FILL VOLUMES PRESENTED RELATE TO SHADED AREAS ONLY. NON-SHADED AREAS HAVE NOT BEEN INCLUDED UNLESS NOTED OTHERWISE.
 - CUT AND FILL DEPTH BANDS INDICATE BULK EXCAVATION ONLY. THE DESIGN DOES NOT TAKE INTO CONSIDERATION DETAILED EXCAVATION, INCLUDING BUT NOT LIMITED TO:
 - UTILITY SERVICES (UNO)
 - TANKS (UNO)
 - TEMPORARY WORKS AND SITE ACCESS
 - GENERAL SITE SCRAPE TO REMOVE EXISTING STRUCTURES, FOUNDATIONS, PAVEMENT, TOP SOIL, ETC.
 - RETAINING WALLS
 - MARKER / CAPPING LAYERS OR CONTAMINATION MANAGEMENT WORKS
 - PILING MAT AND / OR CRANE MAT
 - NO ALLOWANCE HAS BEEN MADE FOR BULKING OR CONTINGENCY.
 - ALL CUT MATERIAL IS ASSUMED TO BE GEOTECHNICALLY AND ENVIRONMENTALLY SUITABLE FOR FILLING. DETAILS OF MATERIAL MANAGEMENT IS SUBJECT TO CONFIRMATION WITH THE GEOTECH AND CONTAMINATION CONSULTANTS.
 - THE FOLLOWING EXCAVATION DEPTHS HAVE BEEN ADOPTED:
 - 600 mm DEPTH BELOW TOP OF STRUCTURAL SLAB FOR SLAB AND BASE LAYERS
 - 650 mm DEPTH BELOW TOP OF PAVEMENT SURFACE FOR PAVEMENT PROFILE
 - 300 mm DEPTH BELOW TOP OF CONCRETE FOOTPATH FOR FOOTPATH PROFILE
 - 300 mm DEPTH BELOW TOP OF LANDSCAPE LEVEL FOR TOPSOIL
 - 1200 mm DEPTH BELOW FINISHED LEVEL OF BASEMENT FOR STRUCTURAL CORES
 - 2700 mm DEPTH BELOW FINISHED LEVEL OF BASEMENT FOR LIFT SHAFTS
 - PILING CUT VOLUME BASED ON STRUCTURAL CALCULATIONS.
 - REFER TO CHW-ARP-CV-DG-PS-00 FOR PSB DESIGN DRAWINGS AND REPORT DATED 18/12/2020 FOR BULK EARTHWORKS BALANCING BETWEEN THE PSB AND MSCP SITES.
 - THE RETAINING WALLS, CUT AND FILL AND ELEVATION RANGES TABLES HAVE BEEN UPDATED FROM THE DRAFT ISSUE FOR COST PLAN DATED 27/11/2020 TO REFLECT THE ADDITIONAL 350mm RAISING OF THE MSCP GROUND SLAB (SUBJECT TO CONFIRMATION) TO ACCOMMODATE BULK EARTHWORKS STORAGE.

| RETAINING WALLS | | |
|-----------------|------------|------------------|
| COLOUR | HEIGHT (m) | TOTAL LENGTH (m) |
| PINK | 0-1 | 79 |
| CYAN | 1-2.5 | 118 |
| BLUE | 2.5-3.5 | 49 |
| PURPLE | 3.5-4.5 | 2 |
| RED | 4.5-5.5 | 27 |

| CUT AND FILL REQUIREMENTS | |
|--------------------------------------|----------------------|
| MSCP BUILDING FOOTPRINT AND ROAD CUT | -2500 m ³ |
| PILING ALLOWANCE | -1000 m ³ |
| PIPE TRENCHING CUT | -450 m ³ |
| MSCP BUILDING FOOTPRINT FILL | 6785 m ³ |
| NET VOLUME | 2835 m ³ |

| SURFACE ANALYSIS: ELEVATION RANGES | | | |
|------------------------------------|--------|-----------------------|-----------------------|
| NUMBER | COLOUR | MINIMUM ELEVATION (m) | MAXIMUM ELEVATION (m) |
| 1 | | -3.400 | -3.000 |
| 2 | | -3.000 | -2.000 |
| 3 | | -2.000 | -1.000 |
| 4 | | -1.000 | -0.500 |
| 5 | | -0.500 | 0.000 |
| 6 | | 0.000 | 1.000 |
| 7 | | 1.000 | 1.500 |
| 8 | | 1.500 | 2.500 |
| 9 | | 2.500 | 3.500 |
| 10 | | 3.500 | 4.500 |
| 11 | | 4.500 | 5.000 |

NOT FOR CONSTRUCTION

Scales
0 10 20m
A1 / A3
1:500 / 1:1000

Design Model Version
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| Issue | Date | By | Chkd | Appd |

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| 3 | 24.03.21 | TT | TT | BH |
| SCHEMATIC DESIGN UPDATE | | | | |
| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |
| Issue | Date | By | Chkd | Appd |

Client

Engineering Certification (CEng)
Name: _____
Signature: _____ Date: _____

Job Title
CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN
Scale at A1
1:500m
Discipline
Civil

ARUP

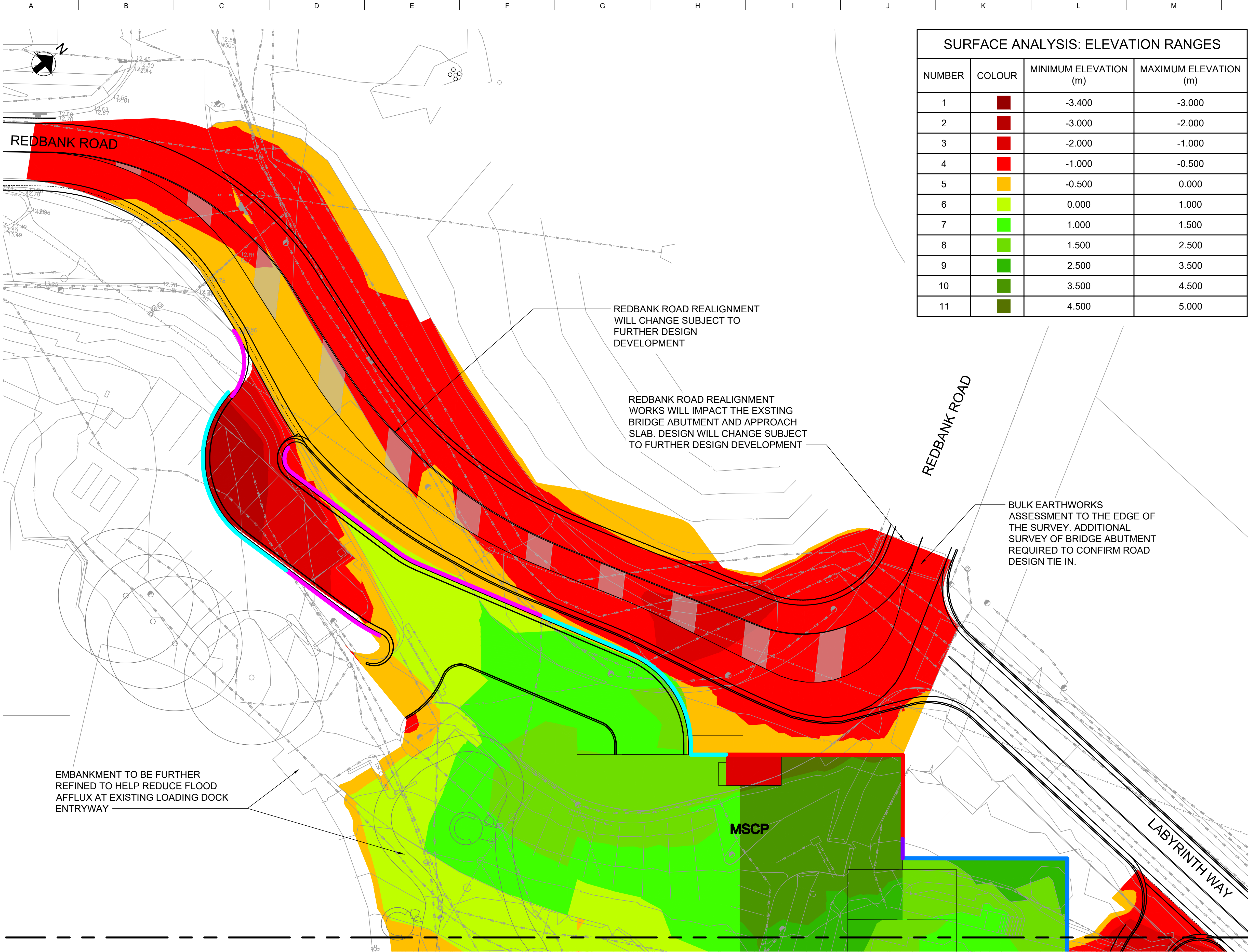
Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

Consult Australia
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
BULK EARTHWORKS
MSCP
OVERALL PLAN
Drawing Status
SCHEMATIC DESIGN
Job No
271985-00
Drawing No
CHW-ARP-CV-DG-MP-00-XX200
Issue
3

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

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| SURFACE ANALYSIS: ELEVATION RANGES | | | |
|------------------------------------|--------|-----------------------|-----------------------|
| NUMBER | COLOUR | MINIMUM ELEVATION (m) | MAXIMUM ELEVATION (m) |
| 1 | | -3.400 | -3.000 |
| 2 | | -3.000 | -2.000 |
| 3 | | -2.000 | -1.000 |
| 4 | | -1.000 | -0.500 |
| 5 | | -0.500 | 0.000 |
| 6 | | 0.000 | 1.000 |
| 7 | | 1.000 | 1.500 |
| 8 | | 1.500 | 2.500 |
| 9 | | 2.500 | 3.500 |
| 10 | | 3.500 | 4.500 |
| 11 | | 4.500 | 5.000 |

- NOTE:**
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 - LEVELS AND ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
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 - TEMPORARY WORKS AND SITE ACCESS
 - GENERAL SITE SCRAPE TO REMOVE EXISTING STRUCTURES, FOUNDATIONS, PAVEMENT, TOP SOIL, ETC.
 - RETAINING WALLS
 - MARKER / CAPPING LAYERS OR CONTAMINATION MANAGEMENT WORKS
 - PILING MAT AND / OR CRANE MAT
 - NO ALLOWANCE HAS BEEN MADE FOR BULKING OR CONTINGENCY.
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 - 300 mm DEPTH BELOW TOP OF LANDSCAPE LEVEL FOR TOPSOIL
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 - THE RETAINING WALLS, CUT AND FILL AND ELEVATION RANGES TABLES HAVE BEEN UPDATED FROM THE DRAFT ISSUE FOR COST PLAN DATED 27/11/2020 TO REFLECT THE ADDITIONAL 350mm RAISING OF THE MSCP GROUND SLAB (SUBJECT TO CONFIRMATION) TO ACCOMMODATE BULK EARTHWORKS STORAGE.

ADJOINS DRG No. CHW-ARP-CV-DG-MP-00-XX202

Scales
0 5 10m
A1 / A3
1:200 / 1:400

Design Model Version
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| 4 | 24/03/21 | TT | TT | BH |
| SCHEMATIC DESIGN UPDATE | | | | |
| Issue | Date | By | Chkd | Appd |

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| 3 | 11.02.21 | DJ | TT | BH |
| SCHEMATIC DESIGN UPDATE | | | | |
| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |
| Issue | Date | By | Chkd | Appd |

Client

Engineering Certification (CEng)
Name: _____
Signature: _____ Date: _____

Job Title
CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN
Scale at A1
1:200m
Discipline
Civil

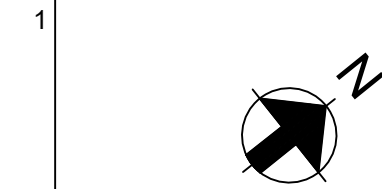
ARUP

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

Member Firm
Arup Pty Ltd
ABN 18 000 966 165

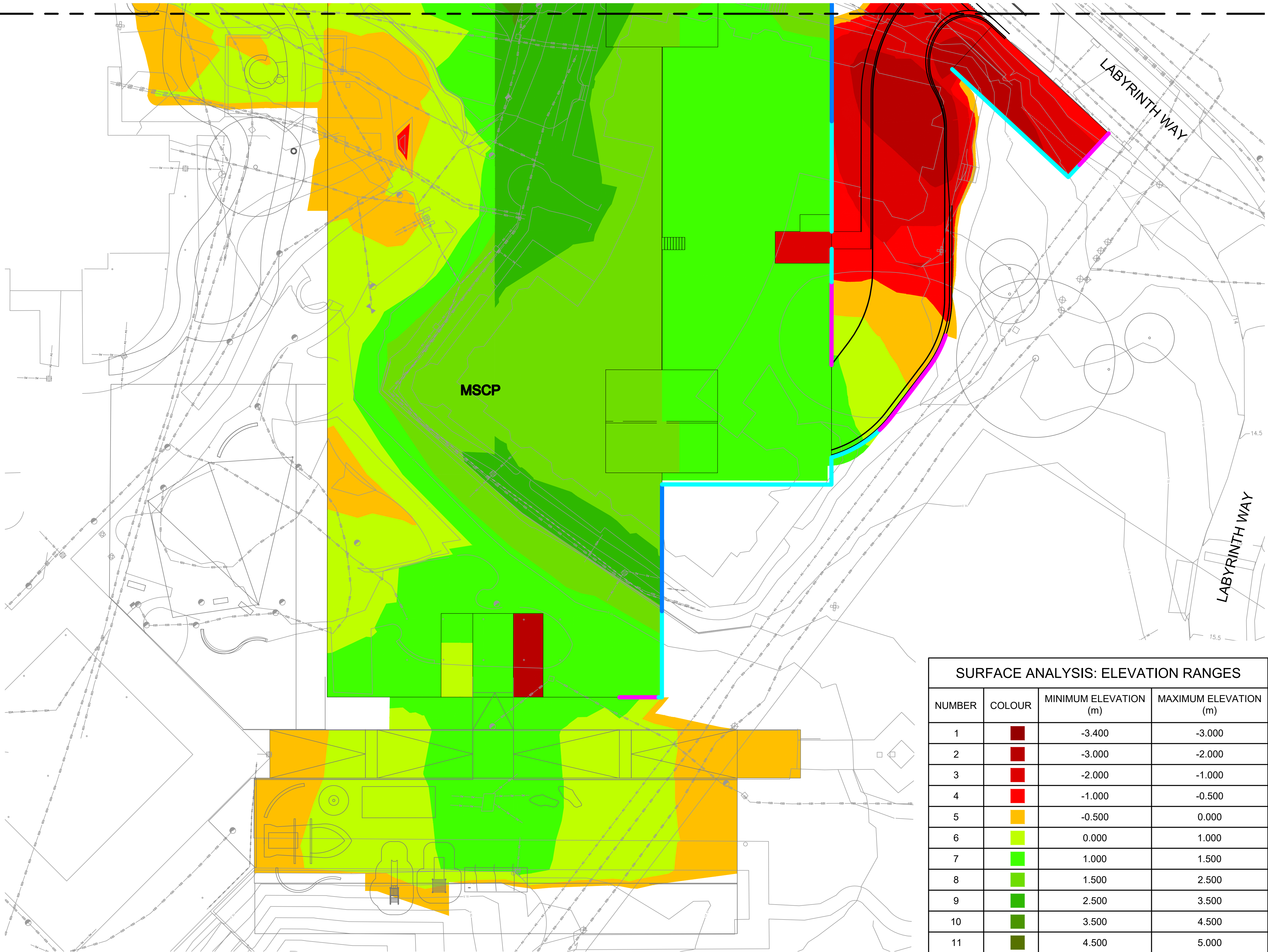
Drawing Title
BULK EARTHWORKS
MSCP
PLAN - SHEET 1 OF 2
Drawing Status
SCHEMATIC DESIGN
Job No
271985-00
Drawing No
CHW-ARP-CV-DG-MP-00-XX201
Issue
4

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR



NOTE:

- FOR GENERAL NOTES REFER DRG No. CHW-ARP-CV-DG-MP-00-XX106.
- LEVELS AND ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
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 - GENERAL SITE SCRAPE TO REMOVE EXISTING STRUCTURES, FOUNDATIONS, PAVEMENT, TOP SOIL, ETC.
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 - 650 mm DEPTH BELOW TOP OF PAVEMENT SURFACE FOR PAVEMENT PROFILE
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 - 300 mm DEPTH BELOW TOP OF LANDSCAPE LEVEL FOR TOPSOIL
 - 1200 mm DEPTH BELOW FINISHED LEVEL OF BASEMENT FOR STRUCTURAL CORES
 - 2700 mm DEPTH BELOW FINISHED LEVEL OF BASEMENT FOR LIFT SHAFTS
- PILING CUT VOLUME BASED ON STRUCTURAL CALCULATIONS.
- REFER TO CHW-ARP-CV-DG-PS-00 FOR PSB DESIGN DRAWINGS AND REPORT DATED 18/12/2020 FOR BULK EARTHWORKS BALANCING BETWEEN THE PSB AND MSCP SITES.
- THE RETAINING WALLS, CUT AND FILL AND ELEVATION RANGES TABLES HAVE BEEN UPDATED FROM THE DRAFT ISSUE FOR COST PLAN DATED 27/11/2020 TO REFLECT THE ADDITIONAL 350mm RAISING OF THE MSCP GROUND SLAB (SUBJECT TO CONFIRMATION) TO ACCOMMODATE BULK EARTHWORKS STORAGE.



NOT FOR CONSTRUCTION



Design Model Version
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| Issue | Date | By | Chkd | Appd |

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| 3 | 24.03.21 | TT | TT | BH |
| SCHEMATIC DESIGN UPDATE | | | | |
| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |
| Issue | Date | By | Chkd | Appd |

Client

Engineering Certification (CEng)
Name:
Signature: Date:

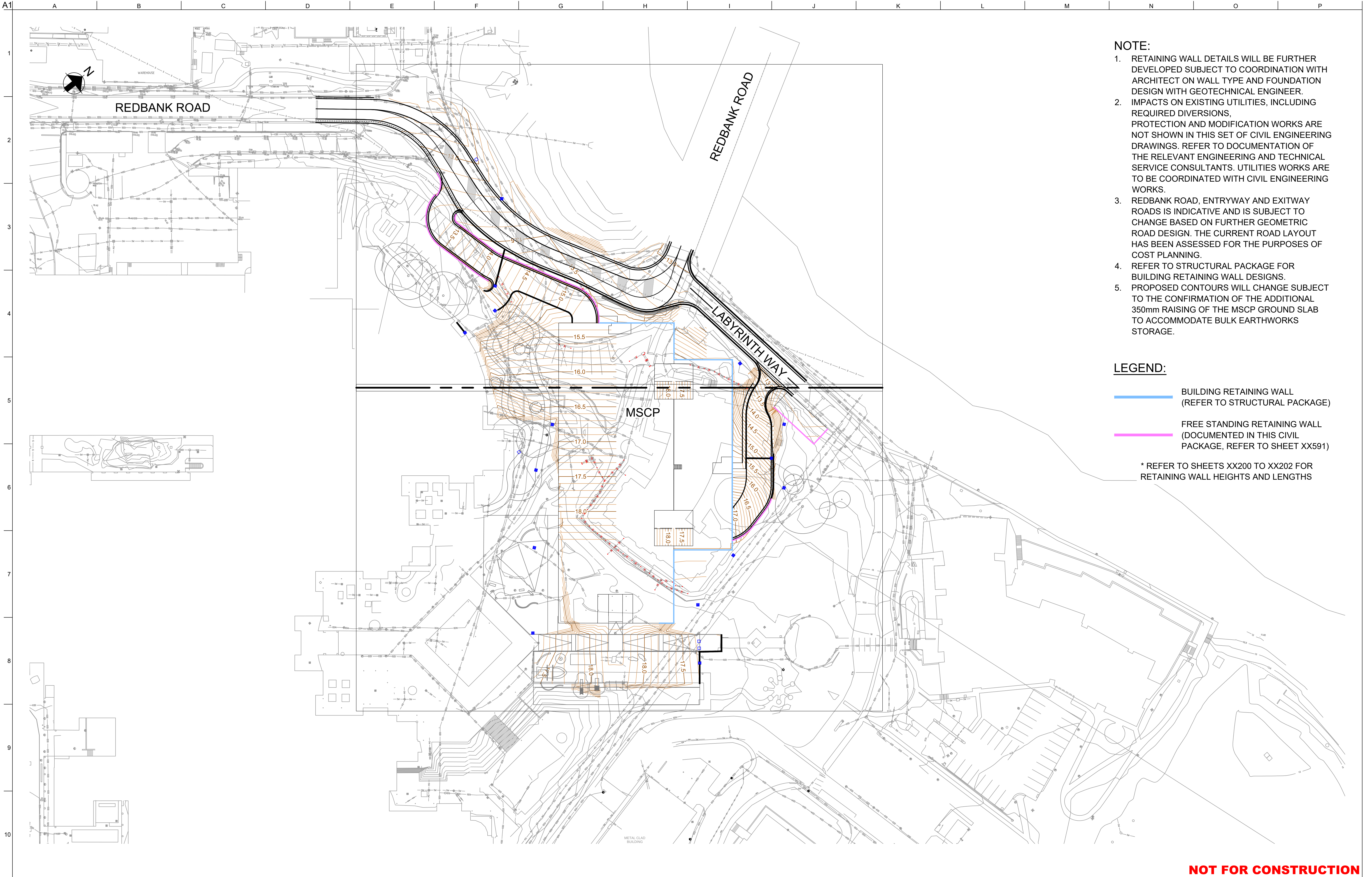
Job Title
CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN
Scale at A1 1:200m
Discipline Civil

ARUP

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
BULK EARTHWORKS
MSCP
PLAN - SHEET 2 OF 2
Drawing Status
SCHEMATIC DESIGN
Job No 271985-00
Drawing No CHW-ARP-CV-DG-MP-00-XX202
Issue 3



- NOTE:**
1. RETAINING WALL DETAILS WILL BE FURTHER DEVELOPED SUBJECT TO COORDINATION WITH ARCHITECT ON WALL TYPE AND FOUNDATION DESIGN WITH GEOTECHNICAL ENGINEER.
 2. IMPACTS ON EXISTING UTILITIES, INCLUDING REQUIRED DIVERSIONS, PROTECTION AND MODIFICATION WORKS ARE NOT SHOWN IN THIS SET OF CIVIL ENGINEERING DRAWINGS. REFER TO DOCUMENTATION OF THE RELEVANT ENGINEERING AND TECHNICAL SERVICE CONSULTANTS. UTILITIES WORKS ARE TO BE COORDINATED WITH CIVIL ENGINEERING WORKS.
 3. REDBANK ROAD, ENTRYWAY AND EXITWAY ROADS IS INDICATIVE AND IS SUBJECT TO CHANGE BASED ON FURTHER GEOMETRIC ROAD DESIGN. THE CURRENT ROAD LAYOUT HAS BEEN ASSESSED FOR THE PURPOSES OF COST PLANNING.
 4. REFER TO STRUCTURAL PACKAGE FOR BUILDING RETAINING WALL DESIGNS.
 5. PROPOSED CONTOURS WILL CHANGE SUBJECT TO THE CONFIRMATION OF THE ADDITIONAL 350mm RAISING OF THE MSCP GROUND SLAB TO ACCOMMODATE BULK EARTHWORKS STORAGE.

- LEGEND:**
- BUILDING RETAINING WALL (REFER TO STRUCTURAL PACKAGE)
 - FREE STANDING RETAINING WALL (DOCUMENTED IN THIS CIVIL PACKAGE, REFER TO SHEET XX591)
- * REFER TO SHEETS XX200 TO XX202 FOR RETAINING WALL HEIGHTS AND LENGTHS

NOT FOR CONSTRUCTION

Scales
0 10 20m
A1 / A3
1:500 / 1:1000

Design Model Version
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| Issue | Date | By | Chkd | Appd |

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| 3 | 24/03/21 | TT | TT | BH |
| SCHEMATIC DESIGN UPDATE | | | | |
| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |
| Issue | Date | By | Chkd | Appd |

Client

Engineering Certification (CEng)
Name: _____
Signature: _____ Date: _____

Job Title
CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN
Scale at A1 1:500m
Discipline Civil

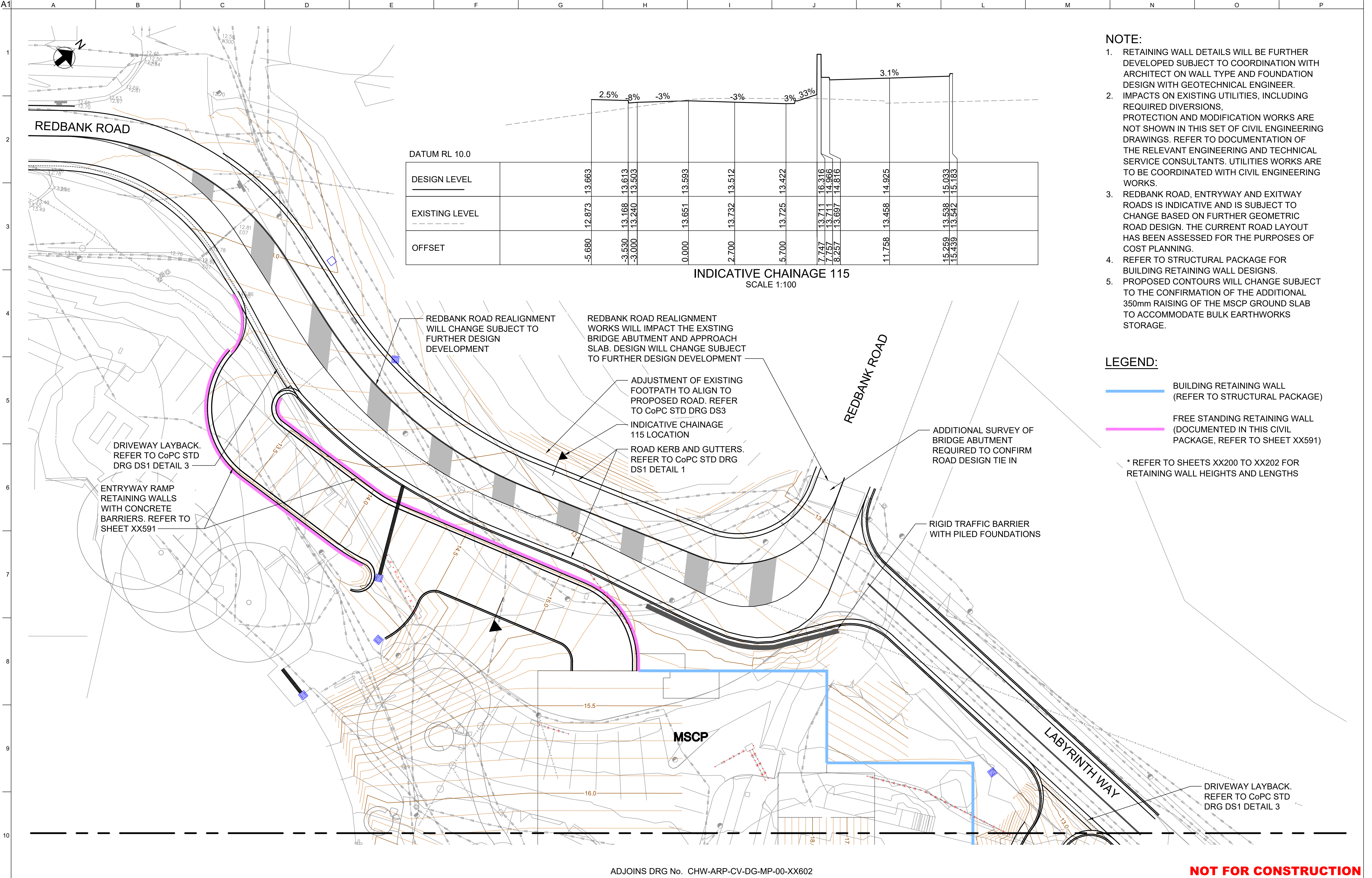
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Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title
CIVIL WORKS
MSCP
OVERALL PLAN
Drawing Status
SCHEMATIC DESIGN
Job No 271985-00
Drawing No CHW-ARP-CV-DG-MP-00-XX500
Issue 3

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR



- NOTE:**
- 1. RETAINING WALL DETAILS WILL BE FURTHER DEVELOPED SUBJECT TO COORDINATION WITH ARCHITECT ON WALL TYPE AND FOUNDATION DESIGN WITH GEOTECHNICAL ENGINEER.
 - 2. IMPACTS ON EXISTING UTILITIES, INCLUDING REQUIRED DIVERSIONS, PROTECTION AND MODIFICATION WORKS ARE NOT SHOWN IN THIS SET OF CIVIL ENGINEERING DRAWINGS. REFER TO DOCUMENTATION OF THE RELEVANT ENGINEERING AND TECHNICAL SERVICE CONSULTANTS. UTILITIES WORKS ARE TO BE COORDINATED WITH CIVIL ENGINEERING WORKS.
 - 3. REDBANK ROAD, ENTRYWAY AND EXITWAY ROADS IS INDICATIVE AND IS SUBJECT TO CHANGE BASED ON FURTHER GEOMETRIC ROAD DESIGN. THE CURRENT ROAD LAYOUT HAS BEEN ASSESSED FOR THE PURPOSES OF COST PLANNING.
 - 4. REFER TO STRUCTURAL PACKAGE FOR BUILDING RETAINING WALL DESIGNS.
 - 5. PROPOSED CONTOURS WILL CHANGE SUBJECT TO THE CONFIRMATION OF THE ADDITIONAL 350mm RAISING OF THE MSCP GROUND SLAB TO ACCOMMODATE BULK EARTHWORKS STORAGE.

- LEGEND:**
- BUILDING RETAINING WALL (REFER TO STRUCTURAL PACKAGE)
 - FREE STANDING RETAINING WALL (DOCUMENTED IN THIS CIVIL PACKAGE, REFER TO SHEET XX591)
 - * REFER TO SHEETS XX200 TO XX202 FOR RETAINING WALL HEIGHTS AND LENGTHS

ADJOINS DRG No. CHW-ARP-CV-DG-MP-00-XX602

NOT FOR CONSTRUCTION

Scales

0 2.5 5m
1:100 / 1:200

0 5 10m
1:200 / 1:400

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|-------------------------|----------|----|------|------|
| 3 | 21.01.21 | CL | TT | LC |
| SCHEMATIC DESIGN UPDATE | | | | |
| 5 | 24.03.21 | TT | TT | BH |
| SCHEMATIC DESIGN UPDATE | | | | |
| 4 | 11.02.21 | DJ | TT | BH |
| SCHEMATIC DESIGN UPDATE | | | | |
| Issue | Date | By | Chkd | Appd |
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| 3 | 21.01.21 | CL | TT | LC |
| SCHEMATIC DESIGN UPDATE | | | | |
| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |
| Issue | Date | By | Chkd | Appd |
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Client

NSW **Health**
GOVERNMENT **Infrastructure**

Engineering Certification (CEng)
Name: _____ Date: _____
Signature: _____

Job Title

CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN

Scale at A1 AS SHOWN

Discipline Civil

ARUP

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Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title

CIVIL WORKS
MSCP
PLAN - SHEET 1 OF 2

Drawing Status

SCHEMATIC DESIGN

Job No 271985-00 Drawing No CHW-ARP-CV-DG-MP-00-XX501 Issue 5

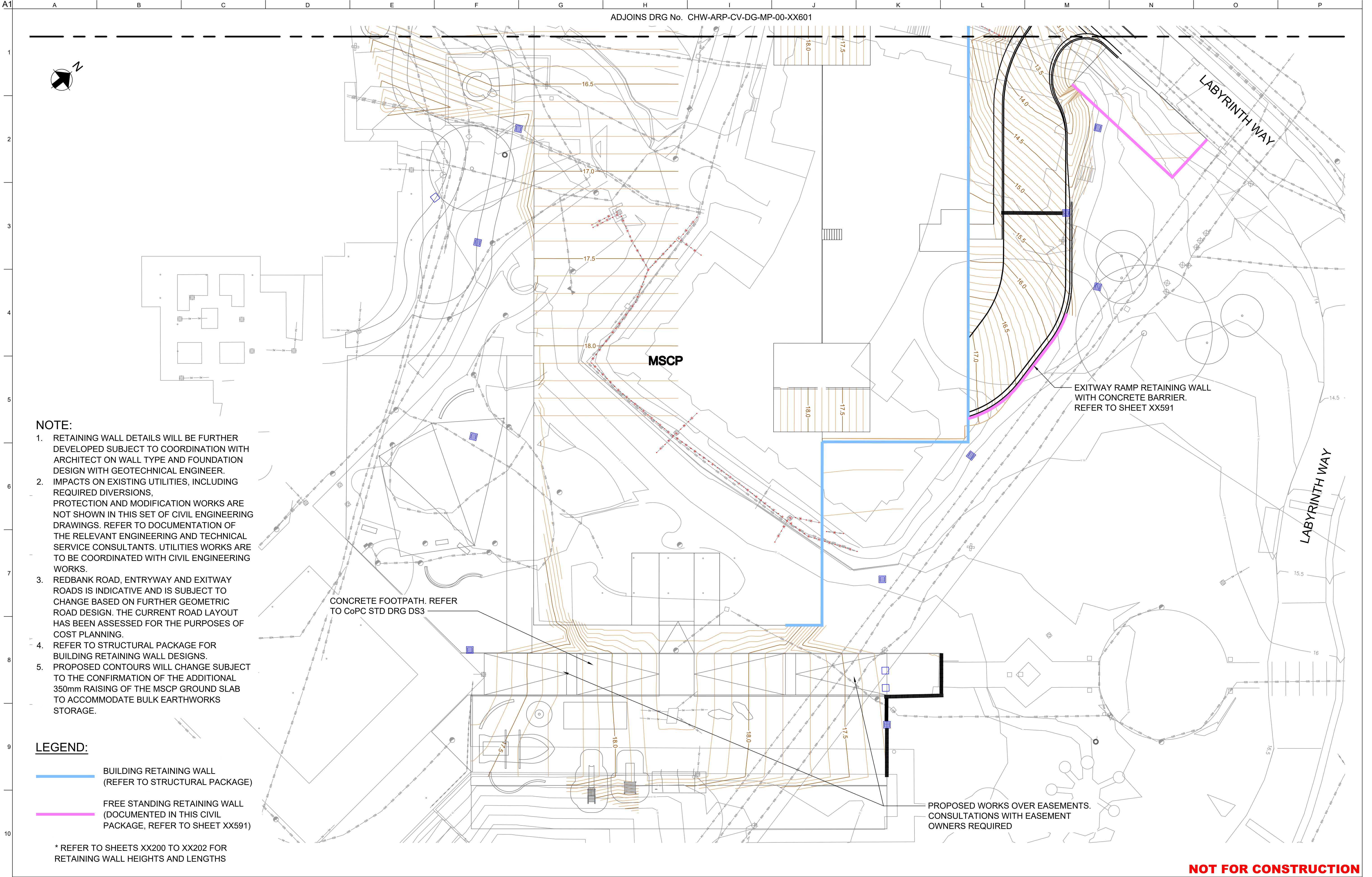
Design Model Version

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Do not scale

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NOT FOR CONSTRUCTION

Scales

0 5 10m

A1 / A3
1:200 / 1:400

| Issue | Date | By | Chkd | Appd |
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|---------------------------|----------|----|----|----|
| 3 | 24.03.21 | TT | TT | BH |
| SCHEMATIC DESIGN UPDATE | | | | |
| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |

| Issue | Date | By | Chkd | Appd |
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Client

NSW Health Infrastructure

Engineering Certification (CEng)

Name: _____ Date: _____

Signature: _____

Job Title

CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN

Scale at A1

1:200m

Discipline

Civil

ARUP

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Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title

CIVIL WORKS
MSCP
PLAN - SHEET 2 OF 2

Drawing Status

SCHEMATIC DESIGN

Job No

271985-00

Drawing No

CHW-ARP-CV-DG-MP-00-XX502

Issue

3

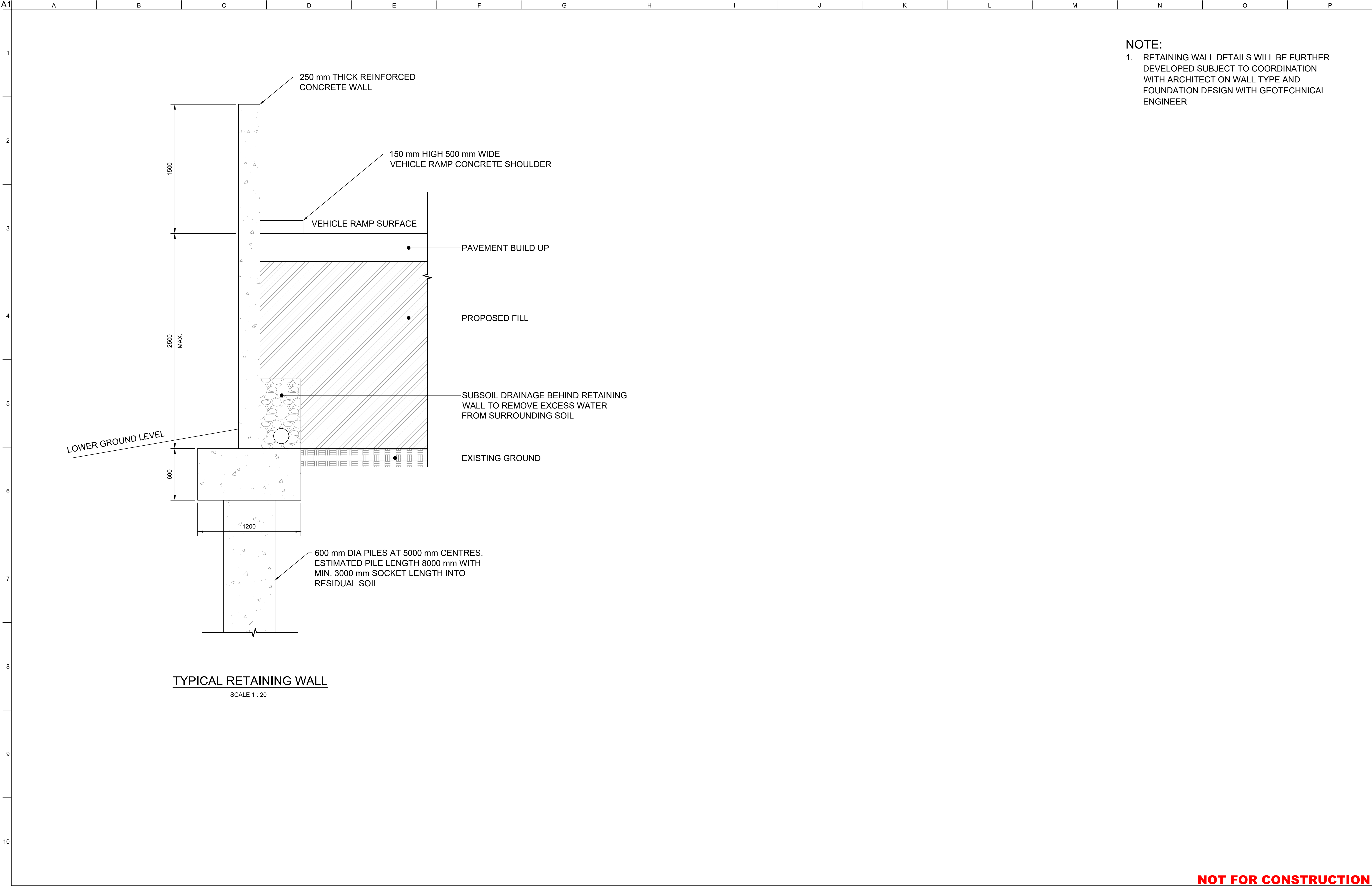
Design Model Version

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Do not scale

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NOTE:
1. RETAINING WALL DETAILS WILL BE FURTHER DEVELOPED SUBJECT TO COORDINATION WITH ARCHITECT ON WALL TYPE AND FOUNDATION DESIGN WITH GEOTECHNICAL ENGINEER

TYPICAL RETAINING WALL
SCALE 1 : 20

NOT FOR CONSTRUCTION

Scales

0 500 1000mm A1 / A3
1:20 / 1:40

Design Model Version


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| Issue | Date | By | Chkd | Appd |
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| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |

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| Issue | Date | By | Chkd | Appd |
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Client

 **Health**
Infrastructure

Engineering Certification (CEng)
Name:
Signature: Date:

Job Title


CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN

Scale at A1 AS SHOWN

Discipline Civil

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Member Firm
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ABN 16 000 966 165

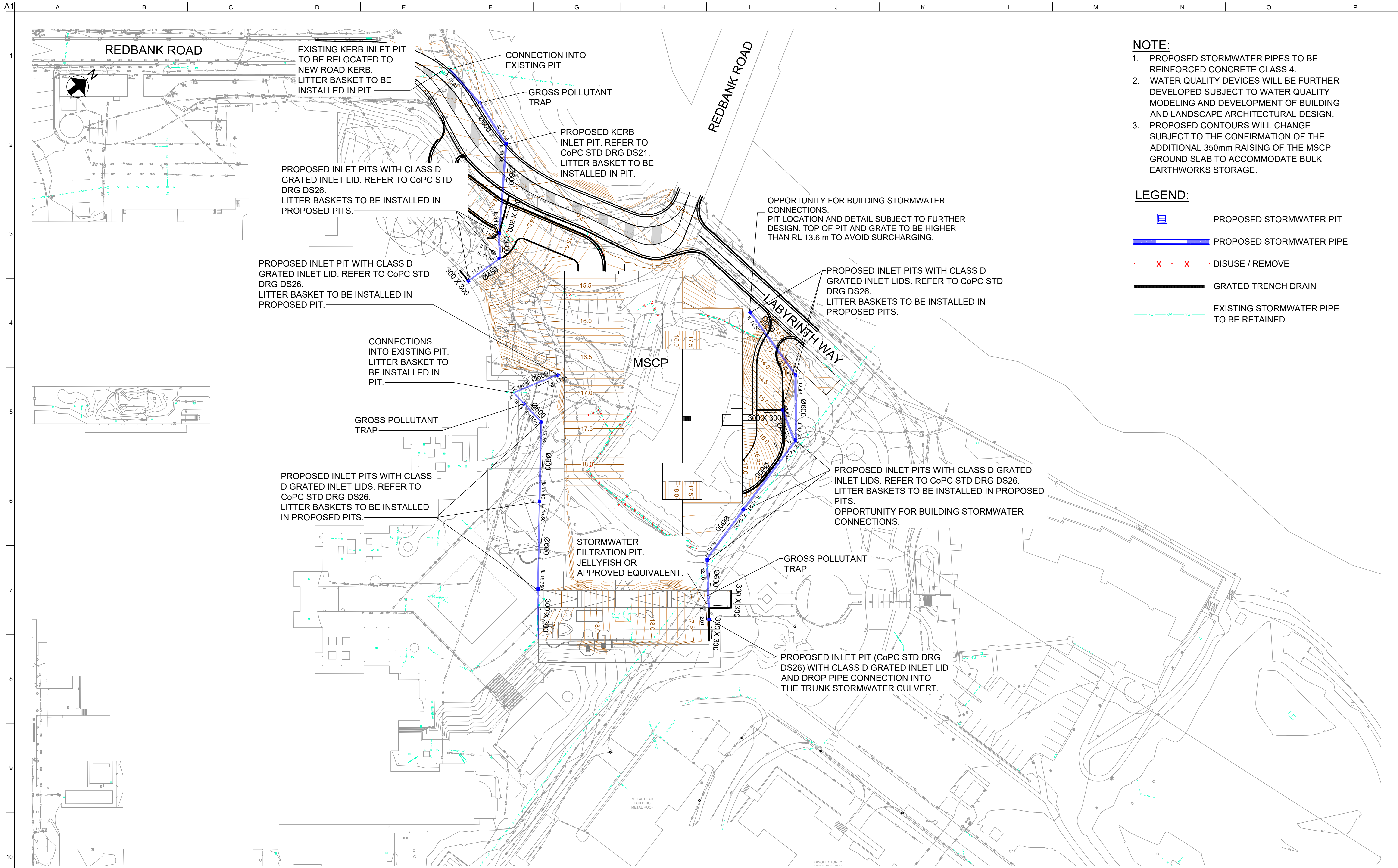
Drawing Title

CIVIL WORKS
MSCP
DETAILS

Drawing Status

SCHEMATIC DESIGN

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| Job No | Drawing No | Issue |
| 271985-00 | CHW-ARP-CV-DG-MP-00-XX591 | 2 |



- NOTE:**
1. PROPOSED STORMWATER PIPES TO BE REINFORCED CONCRETE CLASS 4.
 2. WATER QUALITY DEVICES WILL BE FURTHER DEVELOPED SUBJECT TO WATER QUALITY MODELING AND DEVELOPMENT OF BUILDING AND LANDSCAPE ARCHITECTURAL DESIGN.
 3. PROPOSED CONTOURS WILL CHANGE SUBJECT TO THE CONFIRMATION OF THE ADDITIONAL 350mm RAISING OF THE MSCP GROUND SLAB TO ACCOMMODATE BULK EARTHWORKS STORAGE.

- LEGEND:**
- PROPOSED STORMWATER PIT
 - PROPOSED STORMWATER PIPE
 - DISUSE / REMOVE
 - GRATED TRENCH DRAIN
 - EXISTING STORMWATER PIPE TO BE RETAINED

NOT FOR CONSTRUCTION

Scales
0 10 20m
A1 / A3
1:500 / 1:1000

Design Model Version
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|---------------------------|----------|----|------|------|--|
| 3 | 11.02.21 | DJ | TT | BH | |
| SCHEMATIC DESIGN UPDATE | | | | | |
| 2 | 18.12.20 | JC | TT | BH | |
| 100% SCHEMATIC DESIGN | | | | | |
| 1 | 27.11.20 | JC | TT | BH | |
| DRAFT ISSUE FOR COST PLAN | | | | | |
| Issue | Date | By | Chkd | Appd | |

Client

Engineering Certification (CEng)
Name: _____
Signature: _____ Date: _____

Job Title
CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN
Scale at A1
1:500m
Discipline
Civil

ARUP

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www.arup.com

Member Firm
Arup Pty Ltd
ABN 16 000 998 165

Drawing Title
DRAINAGE
MSCP
OVERALL PLAN
Drawing Status
SCHEMATIC DESIGN
Job No
271985-00
Drawing No
CHW-APP-CV-DG-MP-00-XX630
Issue
3

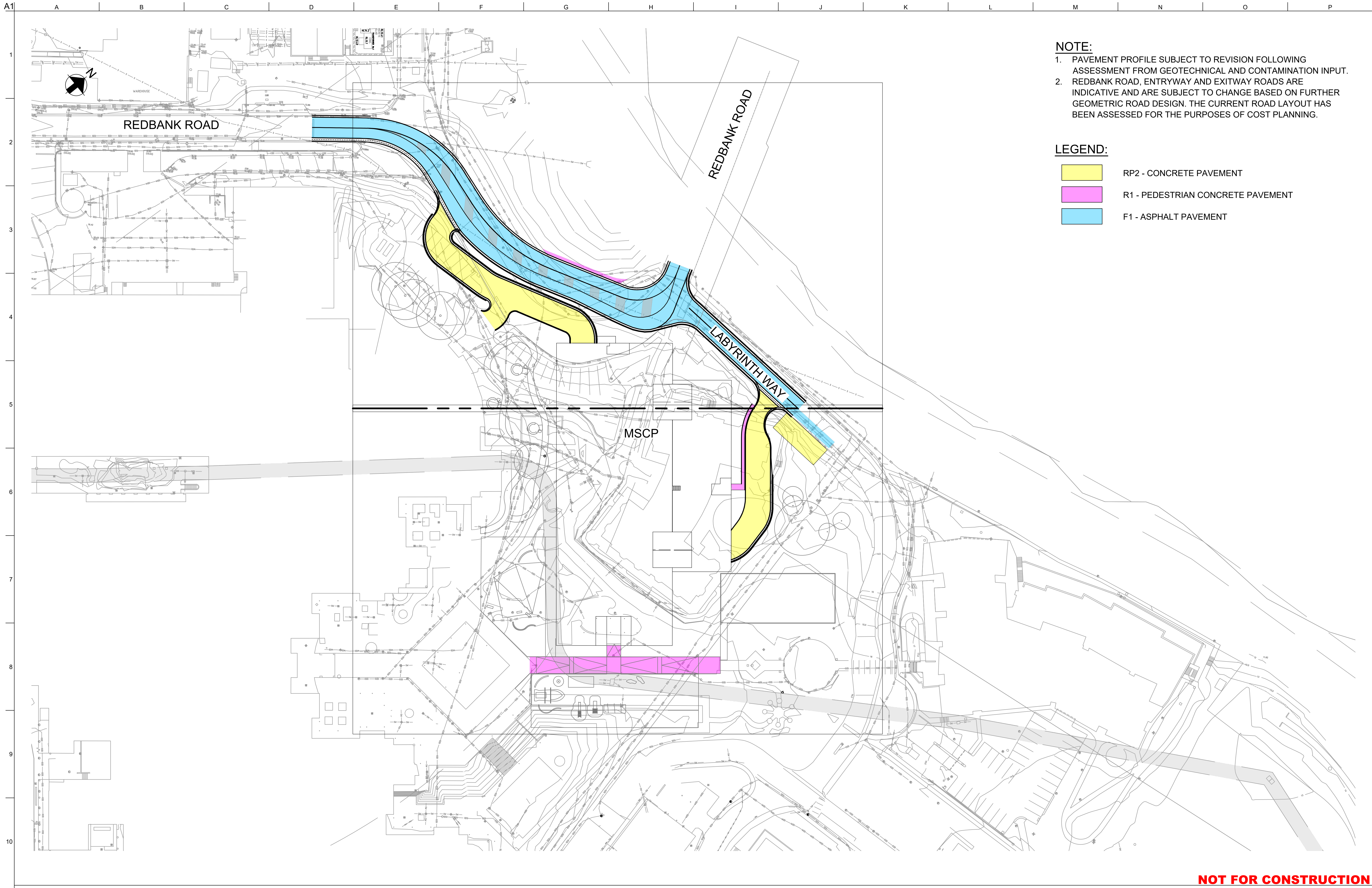
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| TYPE | MIN STD COMPACTION |
|--------------|-----------------------|
| COHESIVE | 50%*1 |
| COHESIONLESS | 85%*2 |

NOTE:

1. PROPOSED STORMWATER PIPES TO BE REINFORCED CONCRETE CLASS 4 INSTALLED TO HS3 CONDITIONS.
2. PIPE INSTALLATION DETAILS SUBJECT TO REVISION FOLLOWING RECEIPT OF GEOTECHNICAL AND CONTAMINATION INPUT.



NOTE:

1. PAVEMENT PROFILE SUBJECT TO REVISION FOLLOWING ASSESSMENT FROM GEOTECHNICAL AND CONTAMINATION INPUT.
2. REDBANK ROAD, ENTRYWAY AND EXITWAY ROADS ARE INDICATIVE AND ARE SUBJECT TO CHANGE BASED ON FURTHER GEOMETRIC ROAD DESIGN. THE CURRENT ROAD LAYOUT HAS BEEN ASSESSED FOR THE PURPOSES OF COST PLANNING.

LEGEND:

- RP2 - CONCRETE PAVEMENT
- R1 - PEDESTRIAN CONCRETE PAVEMENT
- F1 - ASPHALT PAVEMENT

NOT FOR CONSTRUCTION

Scales

0 10 20m

A1 / A3
1:500 / 1:1000

Design Model Version

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| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |
| Issue | Date | By | Chkd | Appd |
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Client

NSW GOVERNMENT

Health Infrastructure

Engineering Certification (CEng)

Name: _____ Date: _____

Signature: _____

Job Title

CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN

Scale at A1

1:500m

Discipline

Civil

ARUP

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CONSULT AUSTRALIA

Member Firm
Anup Pty Ltd
ABN 16 000 986 165

Drawing Title

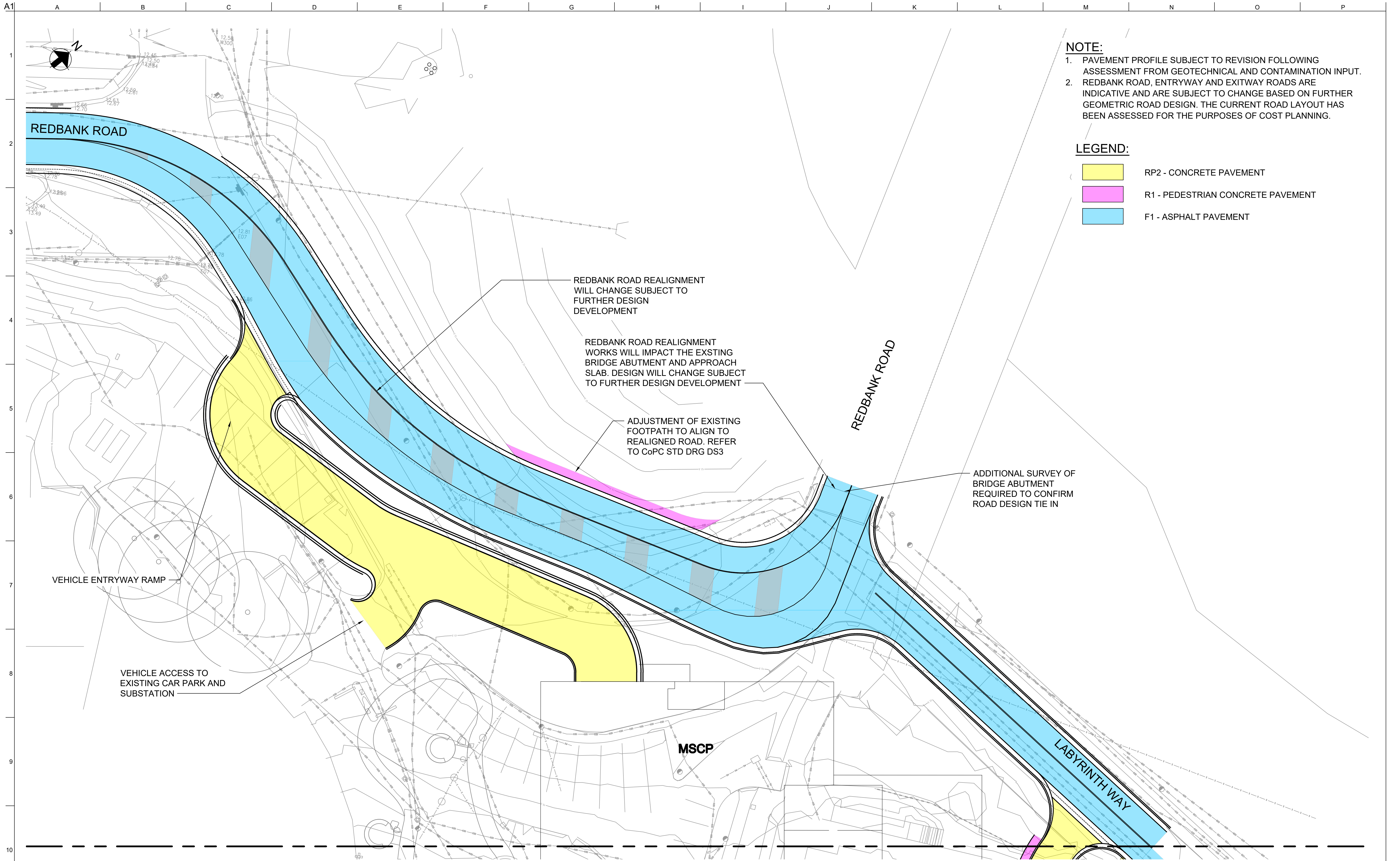
PAVEMENT
MSCP
OVERALL PLAN

Drawing Status

SCHEMATIC DESIGN

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| Job No | Drawing No | Issue |
| 271985-00 | CHW-ARP-CV-DG-MP-00-XX700 | 2 |

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- NOTE:**
1. PAVEMENT PROFILE SUBJECT TO REVISION FOLLOWING ASSESSMENT FROM GEOTECHNICAL AND CONTAMINATION INPUT.
 2. REDBANK ROAD, ENTRYWAY AND EXITWAY ROADS ARE INDICATIVE AND ARE SUBJECT TO CHANGE BASED ON FURTHER GEOMETRIC ROAD DESIGN. THE CURRENT ROAD LAYOUT HAS BEEN ASSESSED FOR THE PURPOSES OF COST PLANNING.

- LEGEND:**
- RP2 - CONCRETE PAVEMENT
 - R1 - PEDESTRIAN CONCRETE PAVEMENT
 - F1 - ASPHALT PAVEMENT

ADJOINS DRG No. CHW-ARP-CV-DG-MP-00-XX602

NOT FOR CONSTRUCTION

Scales
0 5 10m
A1 / A3
1:200 / 1:400

Design Model Version
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| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |
| Issue | Date | By | Chkd | Appd |

Client

Engineering Certification (CEng)
Name:
Signature: Date:

Job Title
CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN
Scale at A1
1:200m
Discipline
Civil

ARUP

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www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 16 000 968 165

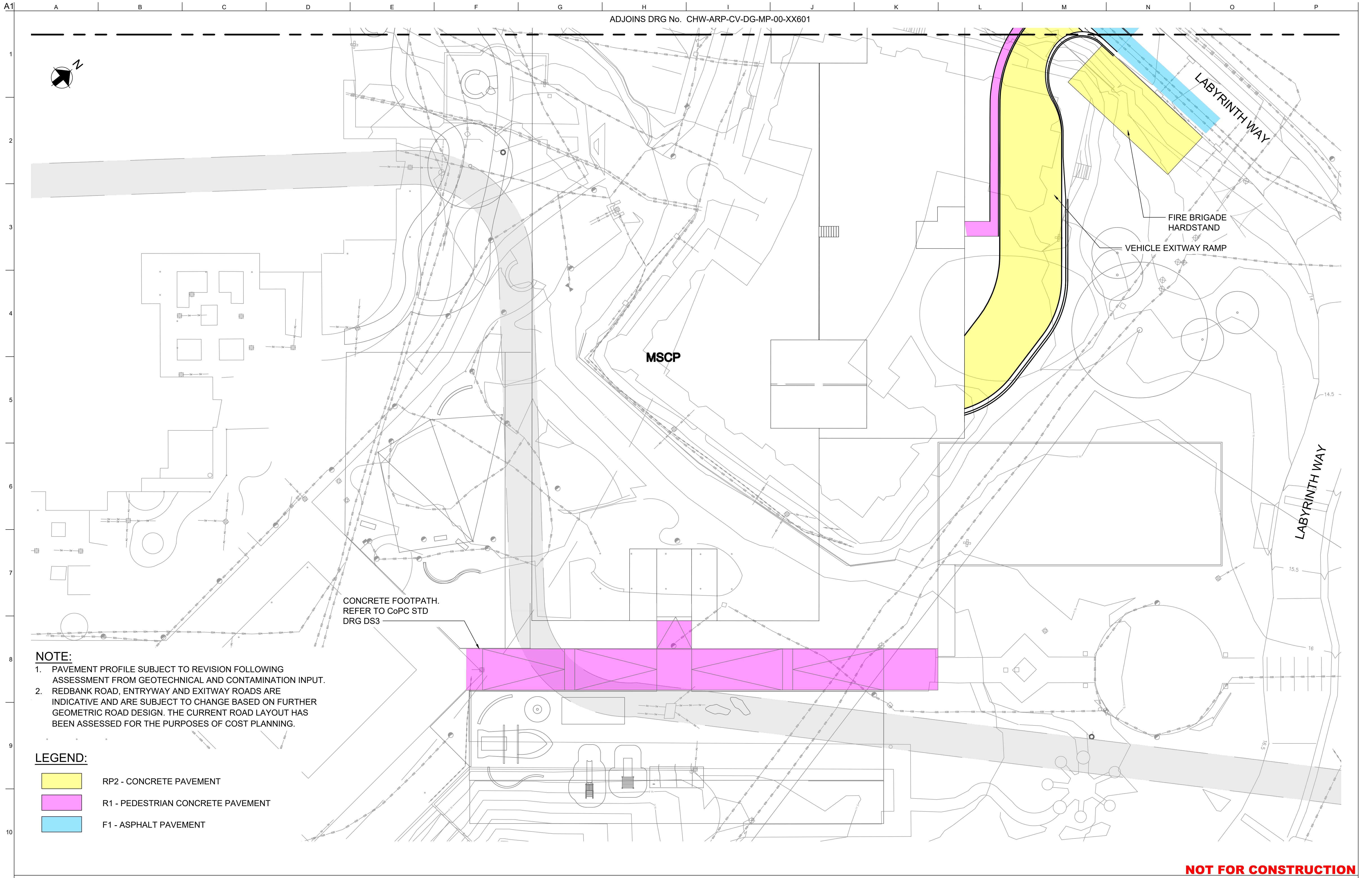
Drawing Title
PAVEMENT
MSCP
PLAN - SHEET 1 OF 2

Drawing Status
SCHEMATIC DESIGN

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| Job No | Drawing No | Issue |
| 271985-00 | CHW-ARP-CV-DG-MP-00-XX701 | 2 |

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NOTE:

1. PAVEMENT PROFILE SUBJECT TO REVISION FOLLOWING ASSESSMENT FROM GEOTECHNICAL AND CONTAMINATION INPUT.
2. REDBANK ROAD, ENTRYWAY AND EXITWAY ROADS ARE INDICATIVE AND ARE SUBJECT TO CHANGE BASED ON FURTHER GEOMETRIC ROAD DESIGN. THE CURRENT ROAD LAYOUT HAS BEEN ASSESSED FOR THE PURPOSES OF COST PLANNING.

- LEGEND:**
- RP2 - CONCRETE PAVEMENT
 - R1 - PEDESTRIAN CONCRETE PAVEMENT
 - F1 - ASPHALT PAVEMENT

NOT FOR CONSTRUCTION

Scales

0 5 10m

A1 / A3

1:200 / 1:400

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| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |

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Client

NSW GOVERNMENT

Health Infrastructure

Engineering Certification (CEng)

Name: _____

Signature: _____ Date: _____

Job Title

CHILDREN'S HOSPITAL WESTMEAD

STAGE 2

MULTI-STOREY CAR PARK

SCHEMATIC DESIGN

Scale at A1

1:200m

Discipline

Civil

ARUP

Anup, Level 5, 151 Clarence St

Sydney, NSW, 2000

Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321

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CONSULT AUSTRALIA

Member Firm

Anup Pty Ltd

ABN 16 000 986 165

Drawing Title

PAVEMENT

MSCP

PLAN - SHEET 2 OF 2

Drawing Status

SCHEMATIC DESIGN

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| Job No | Drawing No | Issue |
| 271985-00 | CHW-ARP-CV-DG-MP-00-XX702 | 2 |

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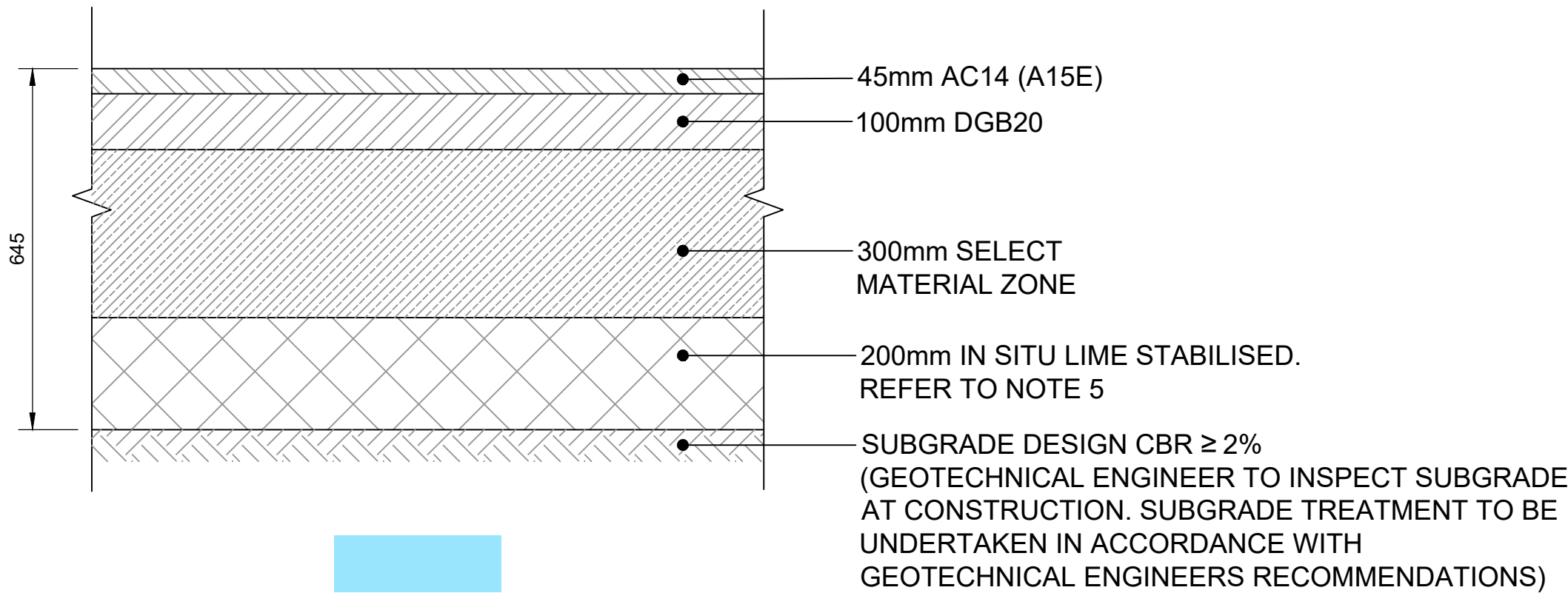
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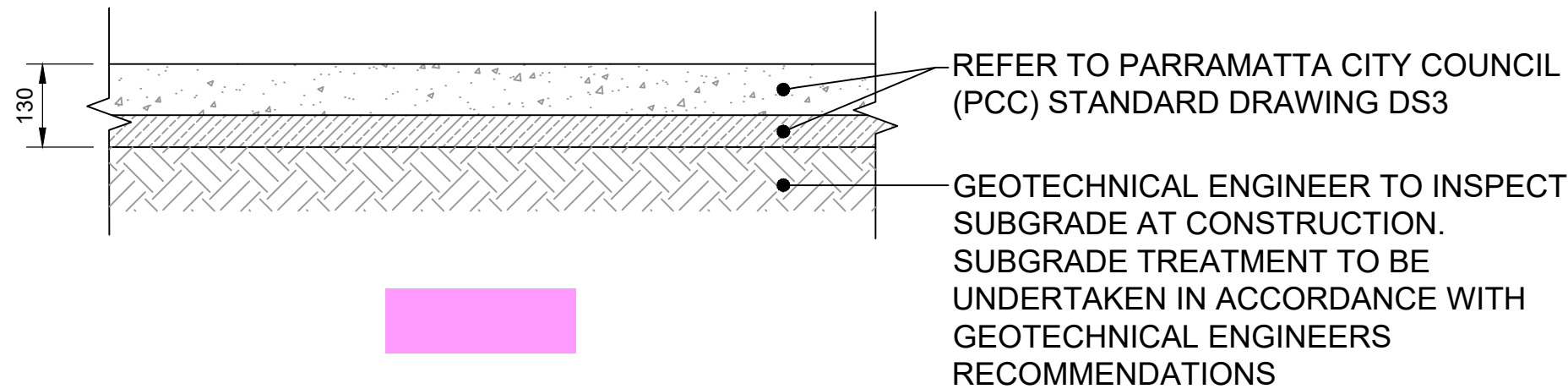
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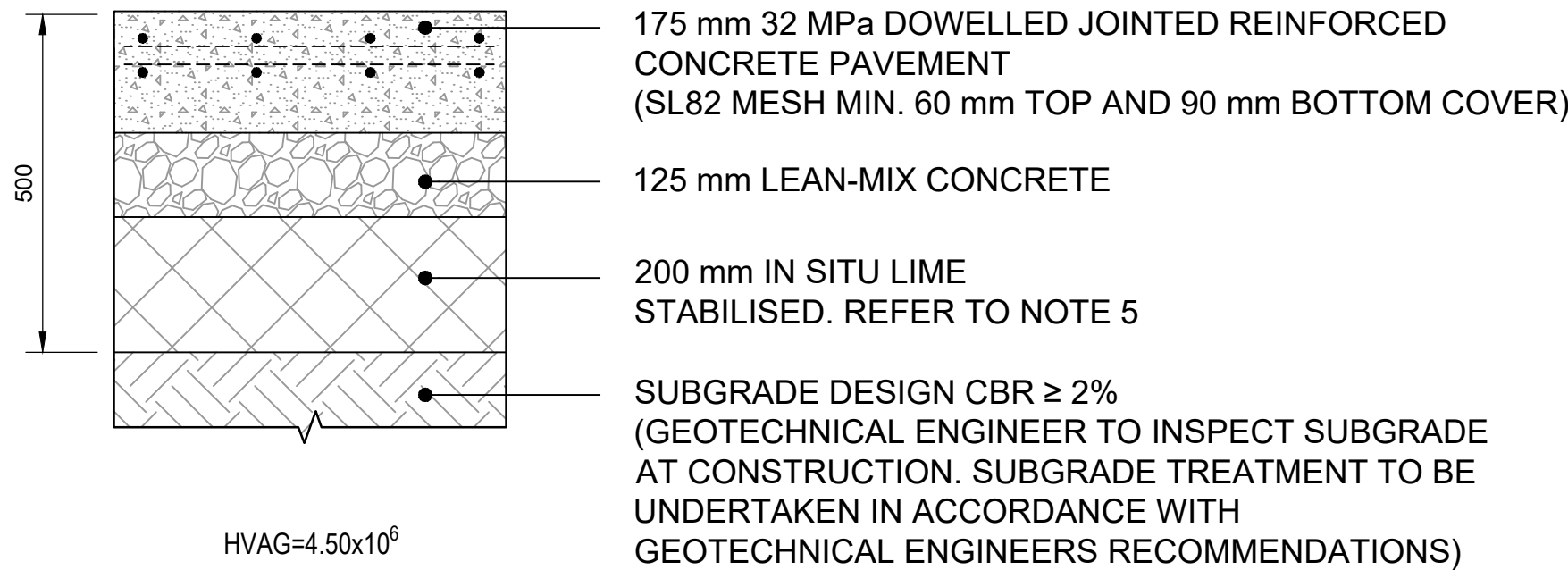
PAVEMENT TYPE F1
ASPHALT PAVEMENT

SCALE 1:10



PAVEMENT TYPE R1
PEDESTRIAN FOOTPATH PAVEMENT

SCALE 1:10



PAVEMENT TYPE RP2
JOINTED REINFORCED CONCRETE PAVEMENT (JRCP)
OVER LEAN-MIX CONCRETE SUBBASE

SCALE 1:10

NOTE:

- FOOTPATH PAVEMENT JOINT DETAILS SHALL FOLLOW CoPC TYPICAL FOOTPATH DRAWING DS3. TYPICAL JOINT SPACINGS ARE AS FOLLOWS:
 - EXPANSION JOINTS (EJ) - EVERY 6.0 m (MAX) INTERVALS
 - TOOLED DUMMY JOINT - EVERY 1.5 m (MAX) INTERVALS
- ROAD PAVEMENT JOINT DETAILS SHALL FOLLOW CoPC CBD PAVING, DRIVEWAY AND KERB RAMP DETAILS (DS40). TYPICAL JOINT SPACINGS ARE AS FOLLOWS:
 - ISOLATIONS JOINTS (IJ) - BETWEEN PAVEMENT AND CONCRETE KERB OR BUILDING LINE
 - EXPANSION JOINTS (EJ) - EVERY 6.0 m (MAX) INTERVALS
 - CONTROL JOINTS (CJ) - EVERY 2.0 m (MAX) INTERVALS
- PAVEMENT SUBSOIL DRAINS SHALL FOLLOW CoPC SUBSOIL DRAINAGE DETAILS (DS33).
- PAVEMENT PROFILES SUBJECT TO REVISION FOLLOWING ASSESSMENT OF GEOTECHNICAL ENGINEER INPUT.
- WHERE THE MATERIAL BELOW DESIGN LEVEL OF CUTTING OF EMBANKMENT IS SOFT (CBR < 3%) OR EXPANSIVE (CBR TEST SWELL > 2.5%) INSITU LIME STABILISE THE SUBGRADE MATERIAL TO A MINIMUM DEPTH OF 200 mm. THE LIME STABILISED MATERIAL MUST HAVE A CBR ≥ 5% AND SWELL < 1% (10-DAY LAB SOAKED CBR TEST). LIME STABILISATION MUST BE IN ACCORDANCE WITH RMS SPECIFICATION R50.



Design Model Version

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| 2 | 18.12.20 | JC | TT | BH |
| 100% SCHEMATIC DESIGN | | | | |
| 1 | 27.11.20 | JC | TT | BH |
| DRAFT ISSUE FOR COST PLAN | | | | |
| Issue | Date | By | Chkd | Appd |

Client



Health
Infrastructure

Engineering Certification (CEng)

Name:

Signature: Date:

Job Title

CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN

Scale at A1

AS SHOWN

Discipline

Civil

ARUP

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Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com



Member Firm
Arup Pty Ltd
ABN 16 000 986 165

Drawing Title

PAVEMENT
MSCP
DETAILS

Drawing Status

SCHEMATIC DESIGN

Job No

271985-00

Drawing No

CHW-ARP-CV-DG-MP-00-XX791

Issue

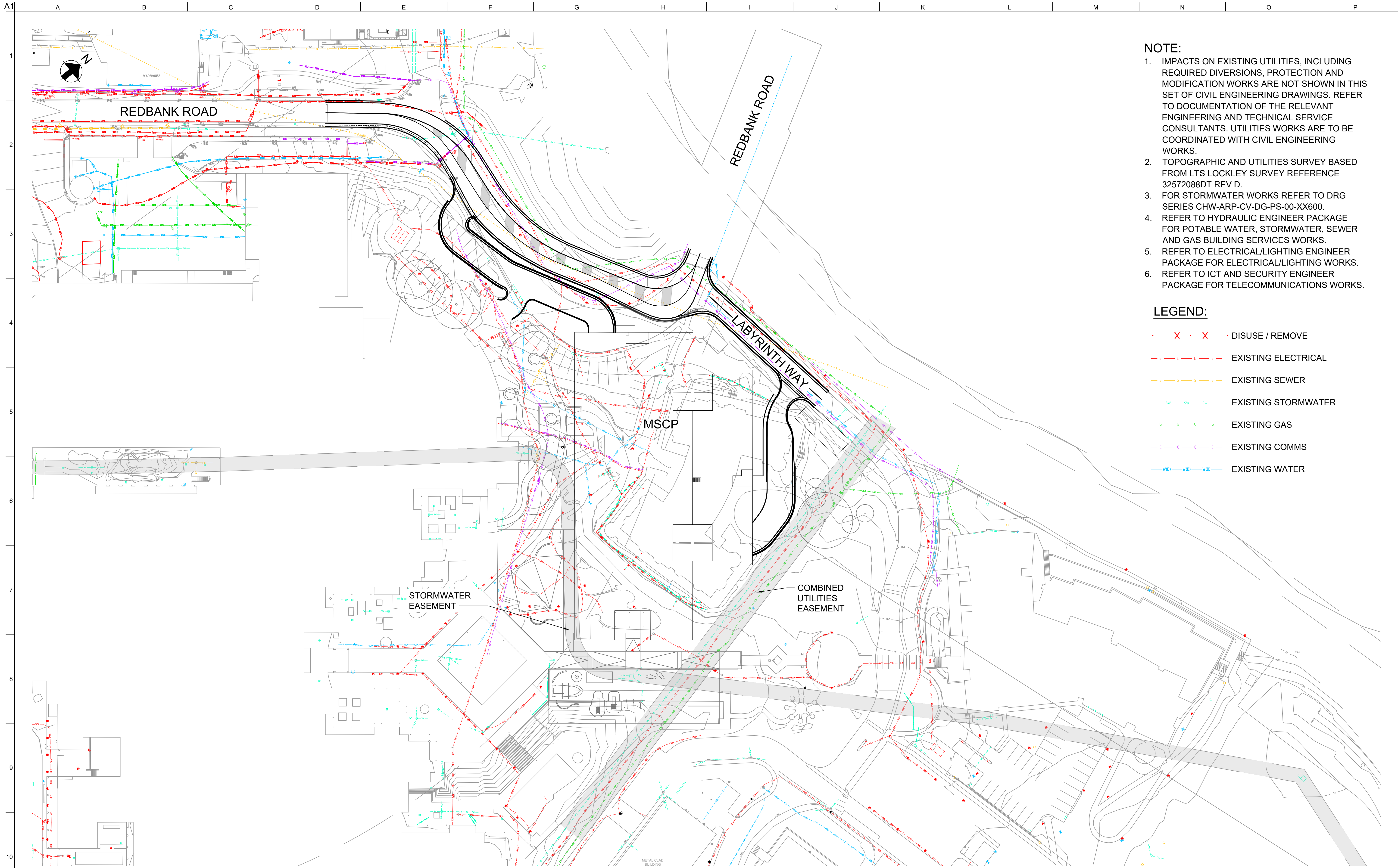
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NOT FOR CONSTRUCTION

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

Do not scale

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- NOTE:**
1. IMPACTS ON EXISTING UTILITIES, INCLUDING REQUIRED DIVERSIONS, PROTECTION AND MODIFICATION WORKS ARE NOT SHOWN IN THIS SET OF CIVIL ENGINEERING DRAWINGS. REFER TO DOCUMENTATION OF THE RELEVANT ENGINEERING AND TECHNICAL SERVICE CONSULTANTS. UTILITIES WORKS ARE TO BE COORDINATED WITH CIVIL ENGINEERING WORKS.
 2. TOPOGRAPHIC AND UTILITIES SURVEY BASED FROM LTS LOCKLEY SURVEY REFERENCE 32572088DT REV D.
 3. FOR STORMWATER WORKS REFER TO DRG SERIES CHW-ARP-CV-DG-PS-00-XX600.
 4. REFER TO HYDRAULIC ENGINEER PACKAGE FOR POTABLE WATER, STORMWATER, SEWER AND GAS BUILDING SERVICES WORKS.
 5. REFER TO ELECTRICAL/LIGHTING ENGINEER PACKAGE FOR ELECTRICAL/LIGHTING WORKS.
 6. REFER TO ICT AND SECURITY ENGINEER PACKAGE FOR TELECOMMUNICATIONS WORKS.

- LEGEND:**
- X · X · DISUSE / REMOVE
 - E — E — E — EXISTING ELECTRICAL
 - S — S — S — EXISTING SEWER
 - SW — SW — SW — EXISTING STORMWATER
 - G — G — G — EXISTING GAS
 - C — C — C — EXISTING COMMS
 - W(D) — W(D) — W(D) — EXISTING WATER

NOT FOR CONSTRUCTION

Scales
0 10 20m
A1 / A3
1:500 / 1:1000

Design Model Version

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| Issue | Date | By | Chkd | Appd | |

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| Issue | Date | By | Chkd | Appd | |

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| 1 | 18.12.20 | JC | TT | BH | |
| 100% SCHEMATIC DESIGN | | | | | |
| Issue | Date | By | Chkd | Appd | |

Client

Engineering Certification (CEng)
Name: _____
Signature: _____ Date: _____

Job Title
CHILDREN'S HOSPITAL WESTMEAD
STAGE 2
MULTI-STOREY CAR PARK
SCHEMATIC DESIGN
Scale at A1
1:500m
Discipline
Civil

ARUP

Arup, Level 5, 151 Clarence St
Sydney, NSW, 2000
Tel +61 (02) 9320 9320 Fax +61 (02) 9320 9321
www.arup.com

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 16 000 986 165

Drawing Title
EXISTING SERVICES
MSCP
PLAN
Drawing Status
SCHEMATIC DESIGN
Job No
271985-00
Drawing No
CHW-ARP-CV-DG-MP-00-XX801
Issue
1

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Appendix B

Flood Assessment and
Stormwater Strategy
Presentation and Meeting
Minutes

Meeting Minutes

The Children's Hospital Westmead Stage 2 – Health Infrastructure / Parramatta Council Meeting

Meeting No.: 04

Date/Time: 1 February 2021

Start: 11:30am

End: 12:30 pm

Venue: Video Conference

Attendance

| Name | | Organisation | Role |
|--------------------|----|----------------------------|-----------------------|
| Caleb Teh | CT | Health Infrastructure | Project Director |
| Jim Tsom | JT | City of Parramatta Council | Catchment Development |
| Paul Clarke | PC | City of Parramatta Council | Catchment Development |
| Brian Hetherington | BH | Arup | Civil Engineer |
| Terrence Tang | TT | Arup | Civil Engineer |
| Nathan Cheah | NC | Arup | Civil Engineer |
| Hanan Hussaini | HH | PwC | Project Manager |
| Mary Sakr | MS | PwC | Project Manager |

| Item | Topic - Actions | Action | By |
|------------|---|--------|----|
| 1.0 | Apologies and Introductions | | |
| 1.1 | Apologies and introductions noted. | Note | - |
| 1.2 | PwC noted the purpose of the session is to review the stormwater and flood mapping for the Westmead Health Precinct , prior to the EIS submission for the Paediatric Services Building (PSB) and Multi Storey Car Park (MSCP) as previously requested by CoPC. | Note | - |
| 2.0 | Flood and Stormwater Strategy | | |
| 2.1 | Arup presented the stormwater and flood strategy for the PSB and MSCP (Attachment 1). | Note | - |
| 2.2 | Arup confirmed that the PSB and MSCP are proposed to be connected to private stormwater lines to eliminate the impact on the CoPC assets. | Note | - |
| 2.3 | CoPC noted that the overland flow-path will impact the existing CHW fire egress pedestrian pathway and recommended the review of the velocity and depth in that location. | Note | - |
| 2.4 | Arup noted the stormwater strategy includes direct connections into the existing stormwater network to discharge flow before river peak. Arup noted that the current site conditions are marginally impacted and therefore there is no requirement for an OSD tank. CoPC was generally in support, although queried the regulation of water quality. Arup to investigate as design progresses. | Note | - |
| 3.0 | Other Items | | |
| 3.1 | Nil to report. | Note | - |
| 4.0 | Next Meeting | | |
| 4.1 | To be confirmed. | Note | - |

Attachments:

- **Attachment 1: Presentation**

Attachment 1: Presentation

CHW Stage 2 - Stormwater and Flood Risk Management

Agenda:

1. Children's Hospital Stage 2 Redevelopment overview and site appreciation
2. Outline the work that has been done since
3. Existing flood/stormwater conditions
4. Paediatric Services Building (PSB) Schematic Design
 - Proposed design
 - Development flood/stormwater assessment
 - Summary and next steps
5. Multistorey Car Park (MSCP) Schematic Design
 - Proposed design
 - Development flood/stormwater assessment
 - Summary and next steps

CHW Stage 2 – Stormwater and Flood Risk Management



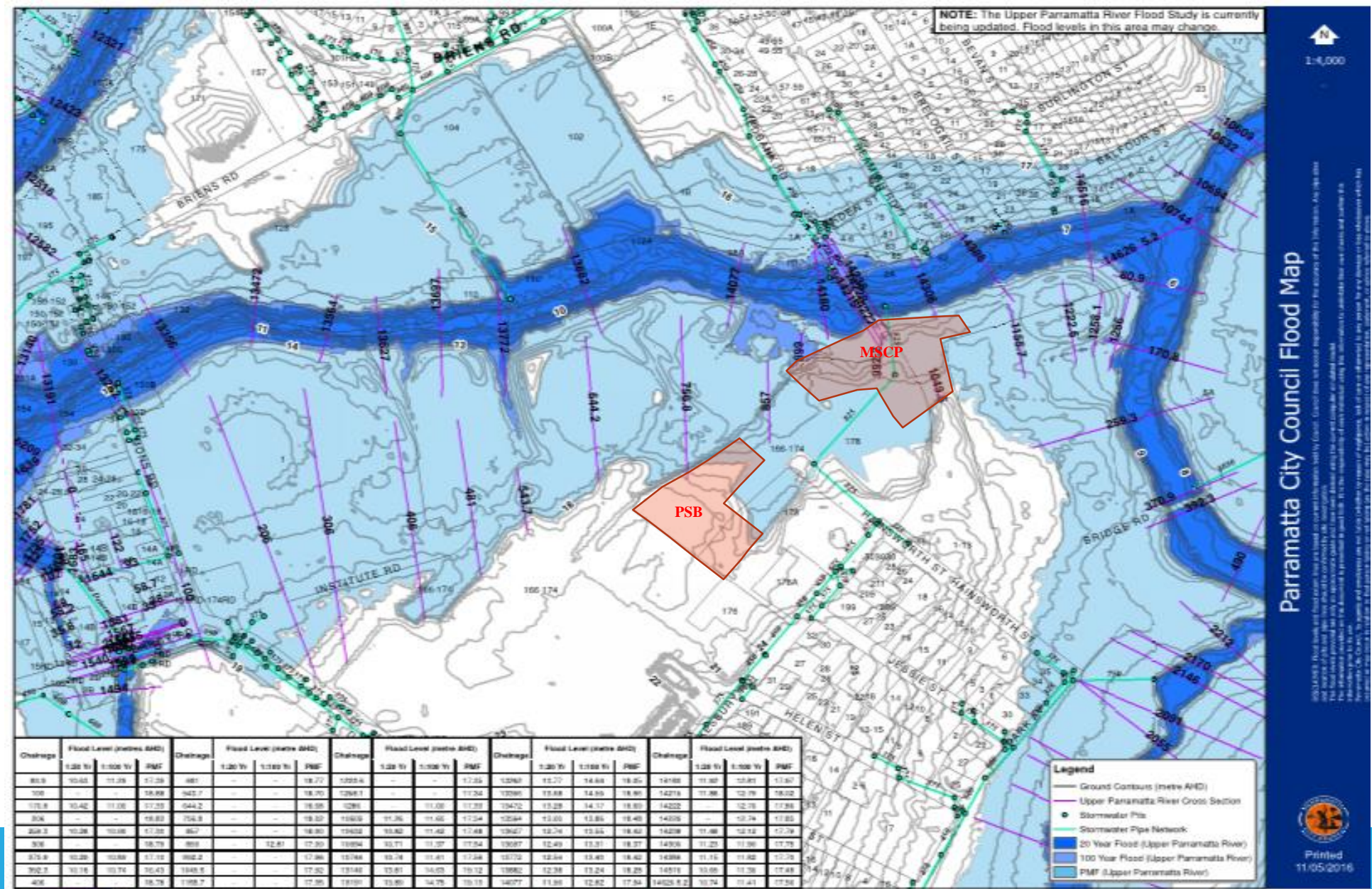
CHW Stage 2 – Stormwater and Flood Risk Management



Work Done:

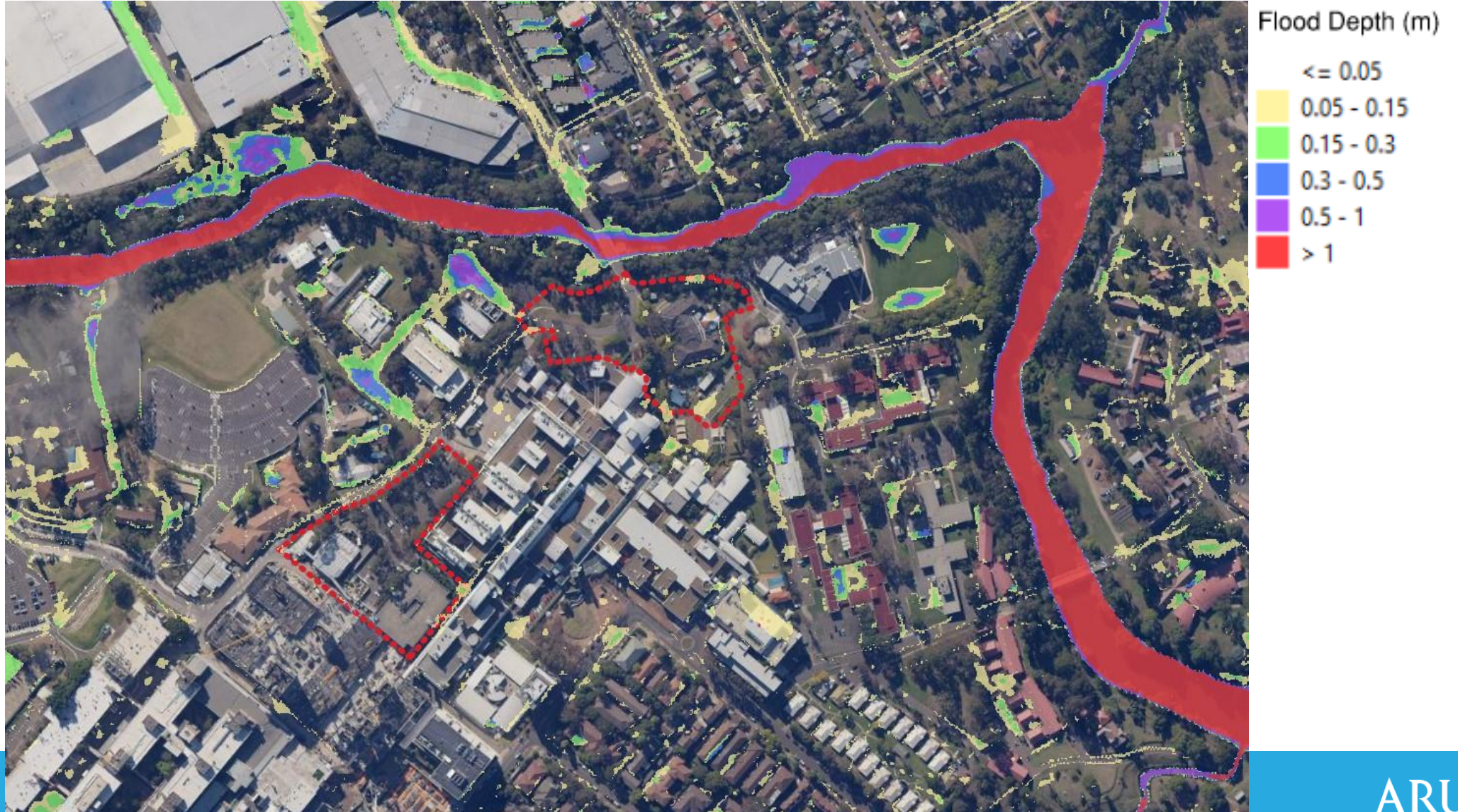
- CASB Arup flood model (2017) (purple)
- PLR flood model (2019) (blue)
- PSB and MSCP site survey information (green)
- Arup combined the above information and created combined river and overland models

CHW Stage 2 – Stormwater and Flood Risk Management



CHW Stage 2 – Stormwater and Flood Risk Management

Existing conditions - 1% AEP Overland



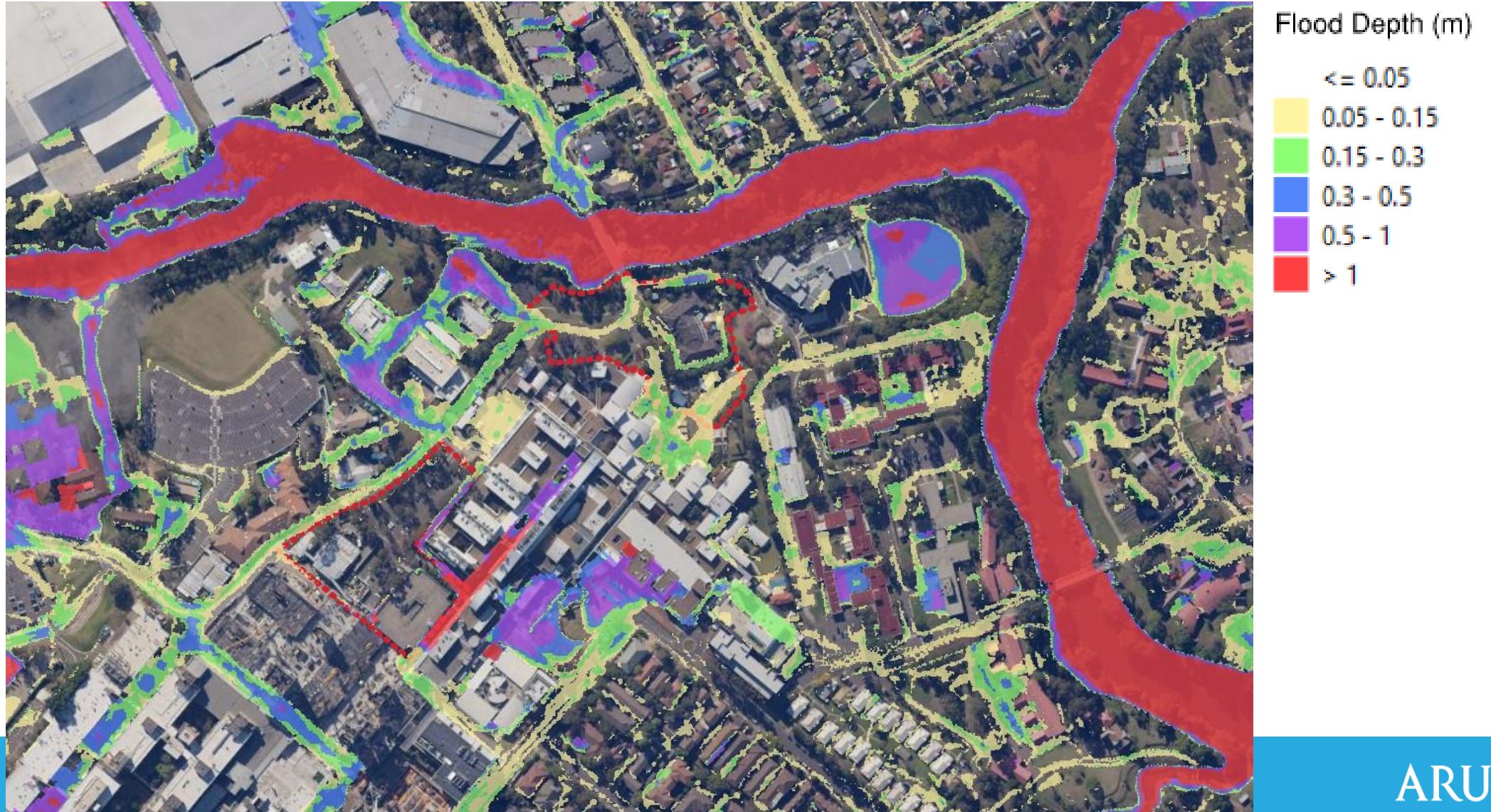
CHW Stage 2 – Stormwater and Flood Risk Management

Existing conditions - 1% AEP River



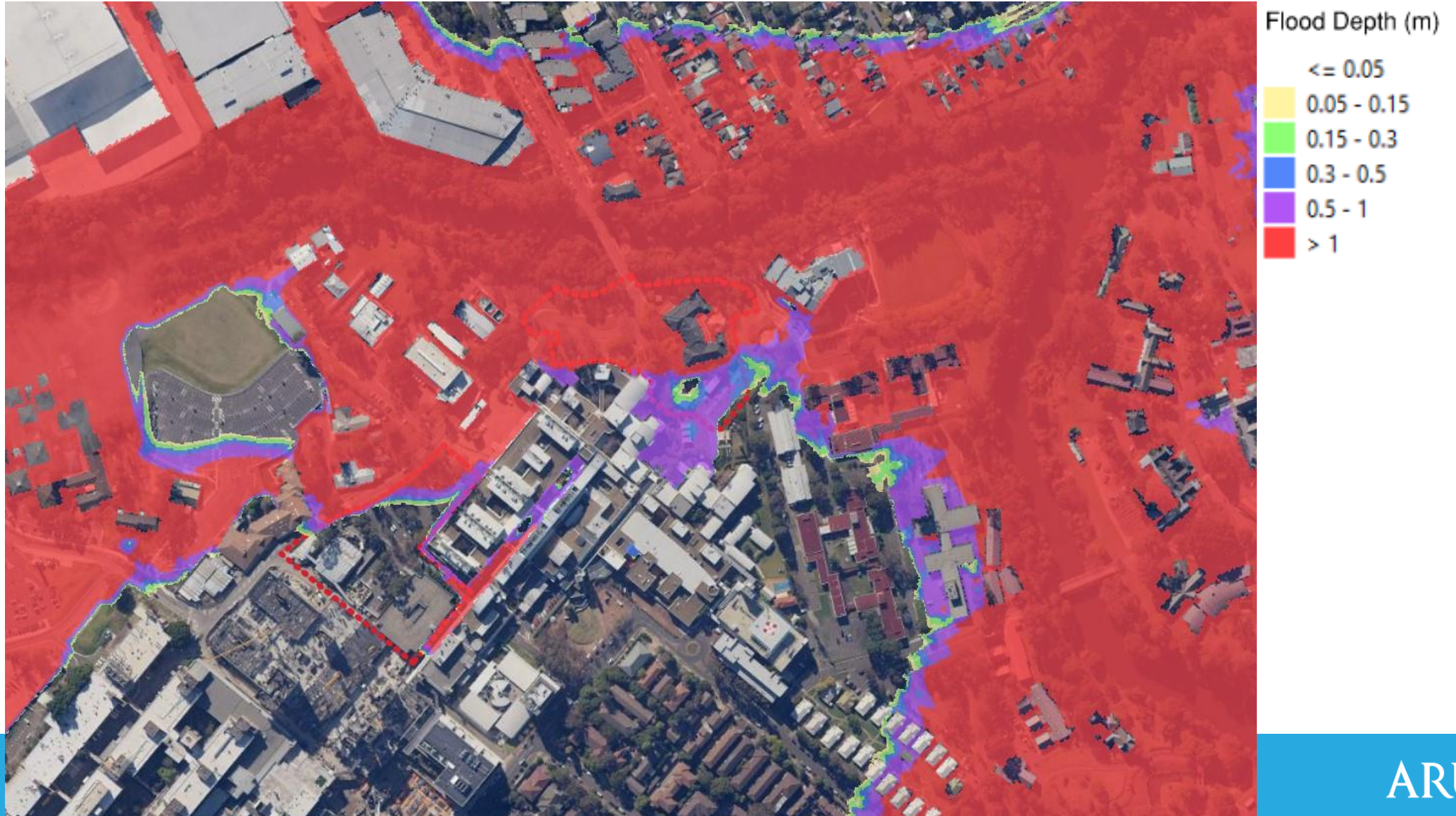
CHW Stage 2 – Stormwater and Flood Risk Management

Existing conditions – PMF Overland (30 mins)



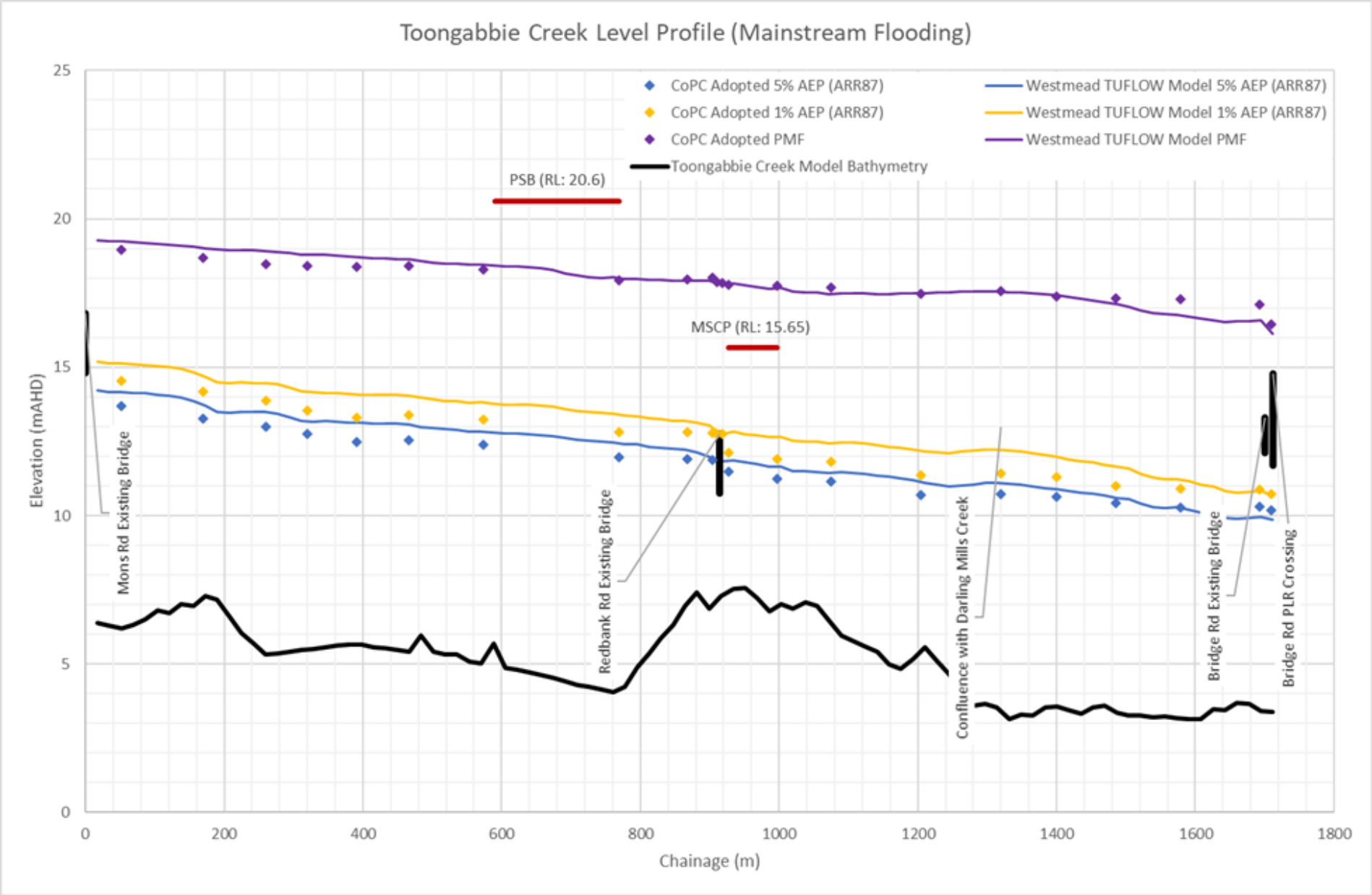
CHW Stage 2 – Stormwater and Flood Risk Management

Existing conditions – PMF River (3 hours)



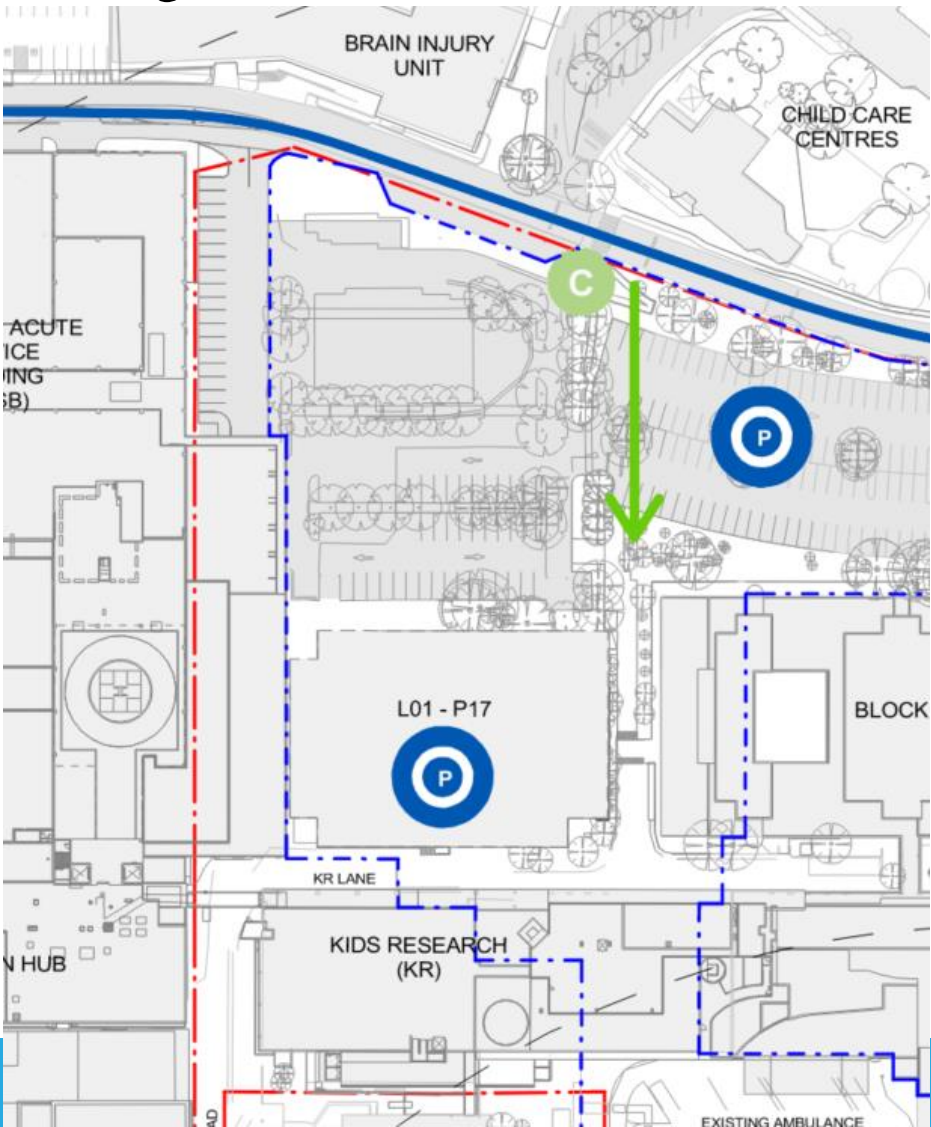
CHW Stage 2 – Stormwater and Flood Risk Management

Calibration

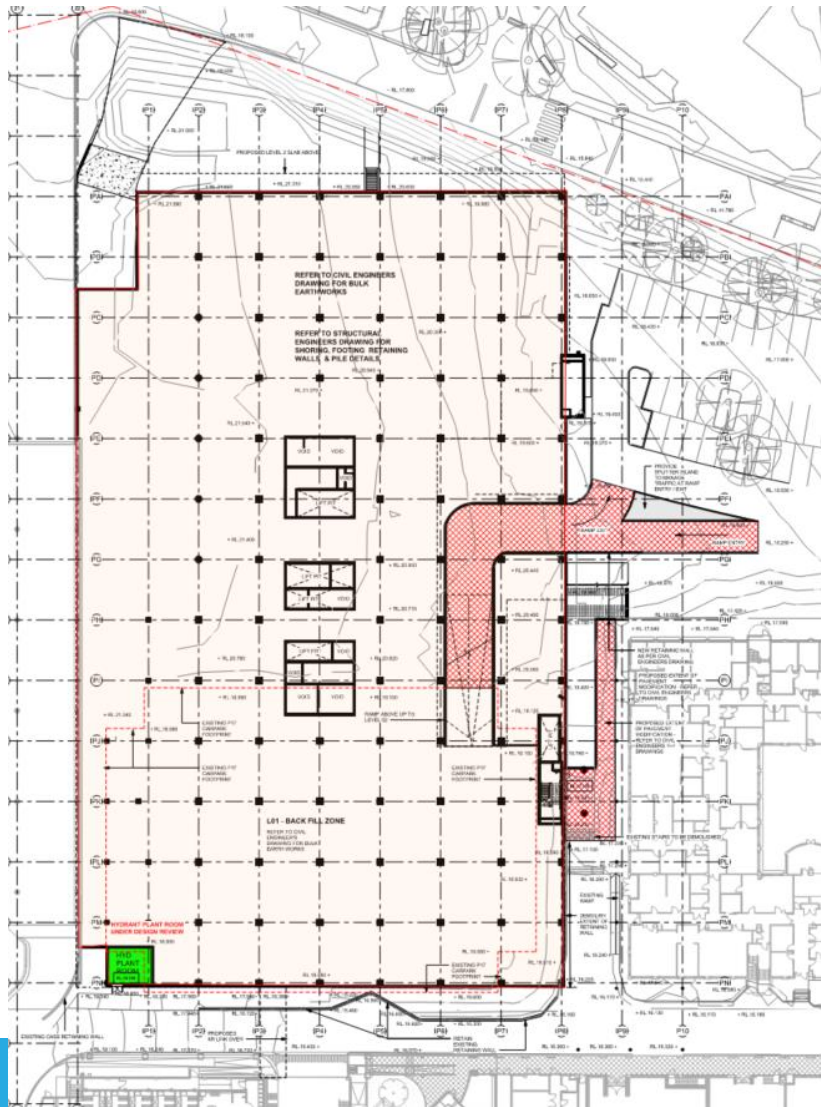


PSB – Stormwater and Flood Risk Management

Existing Site

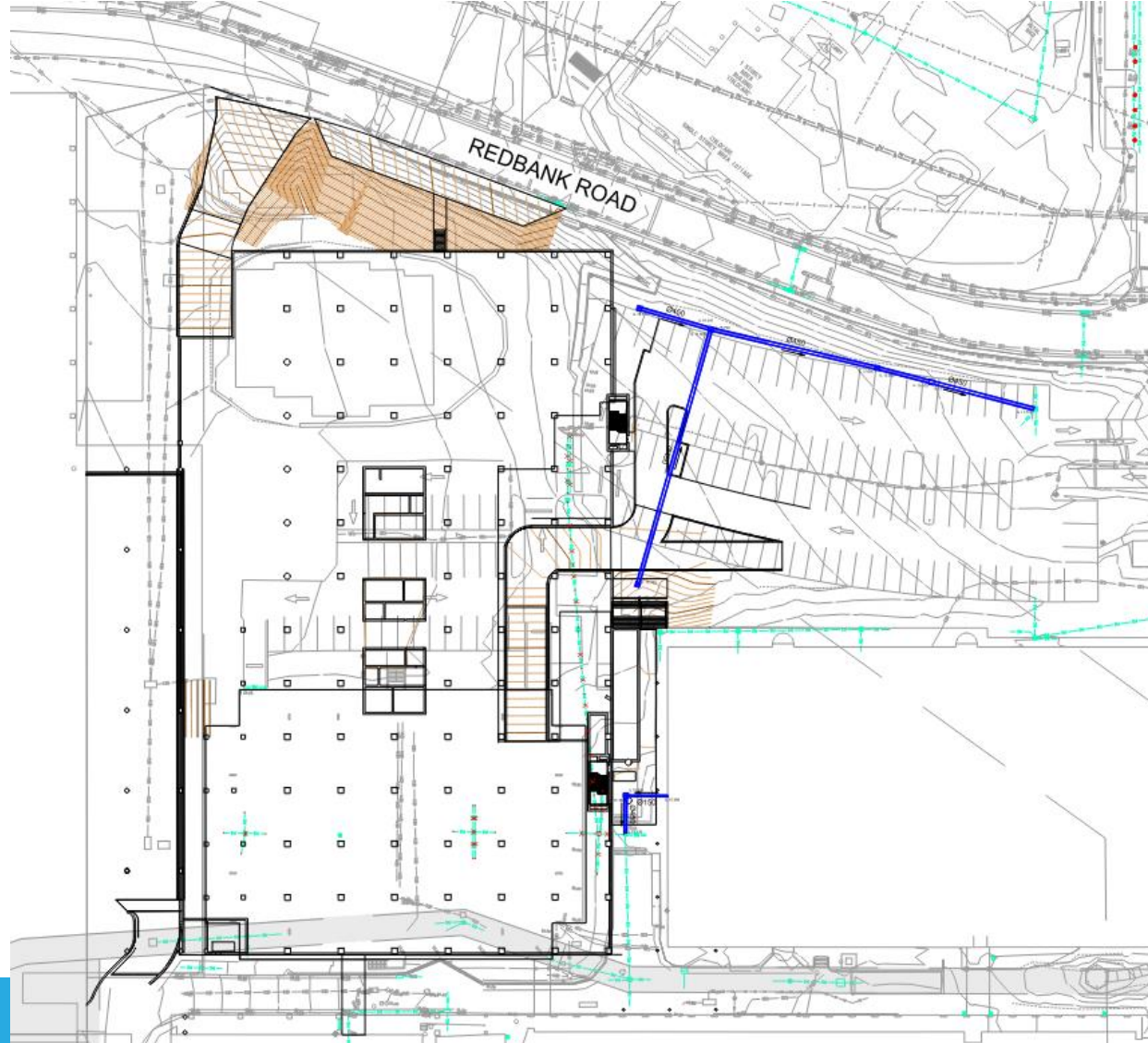


Proposed Architectural Design



PSB – Stormwater and Flood Risk Management

Proposed Stormwater Strategy



PSB – Stormwater and Flood Risk Management

Proposed design flood results – 1% AEP Overland



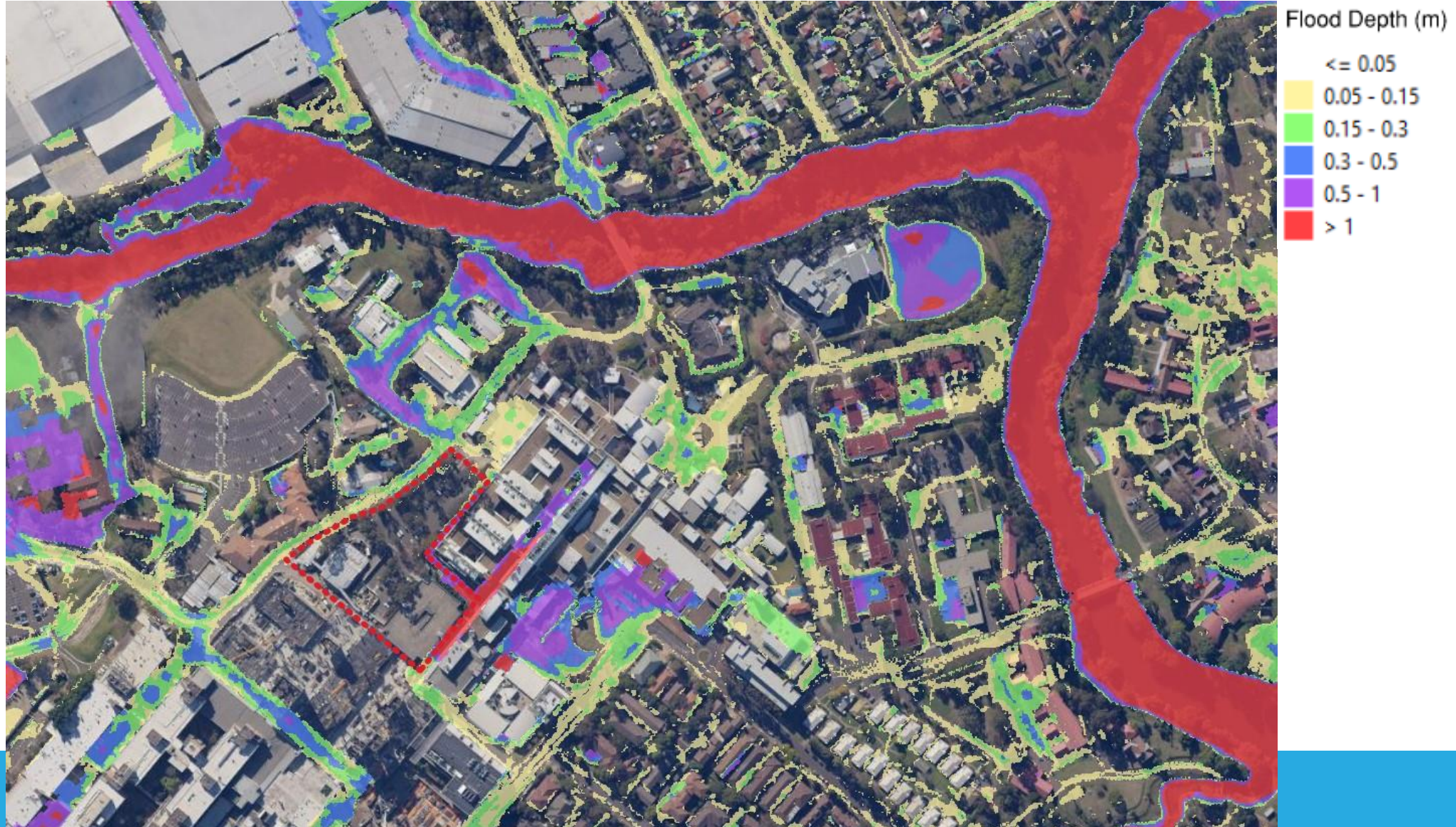
PSB – Stormwater and Flood Risk Management

Proposed design flood results – 1% AEP River



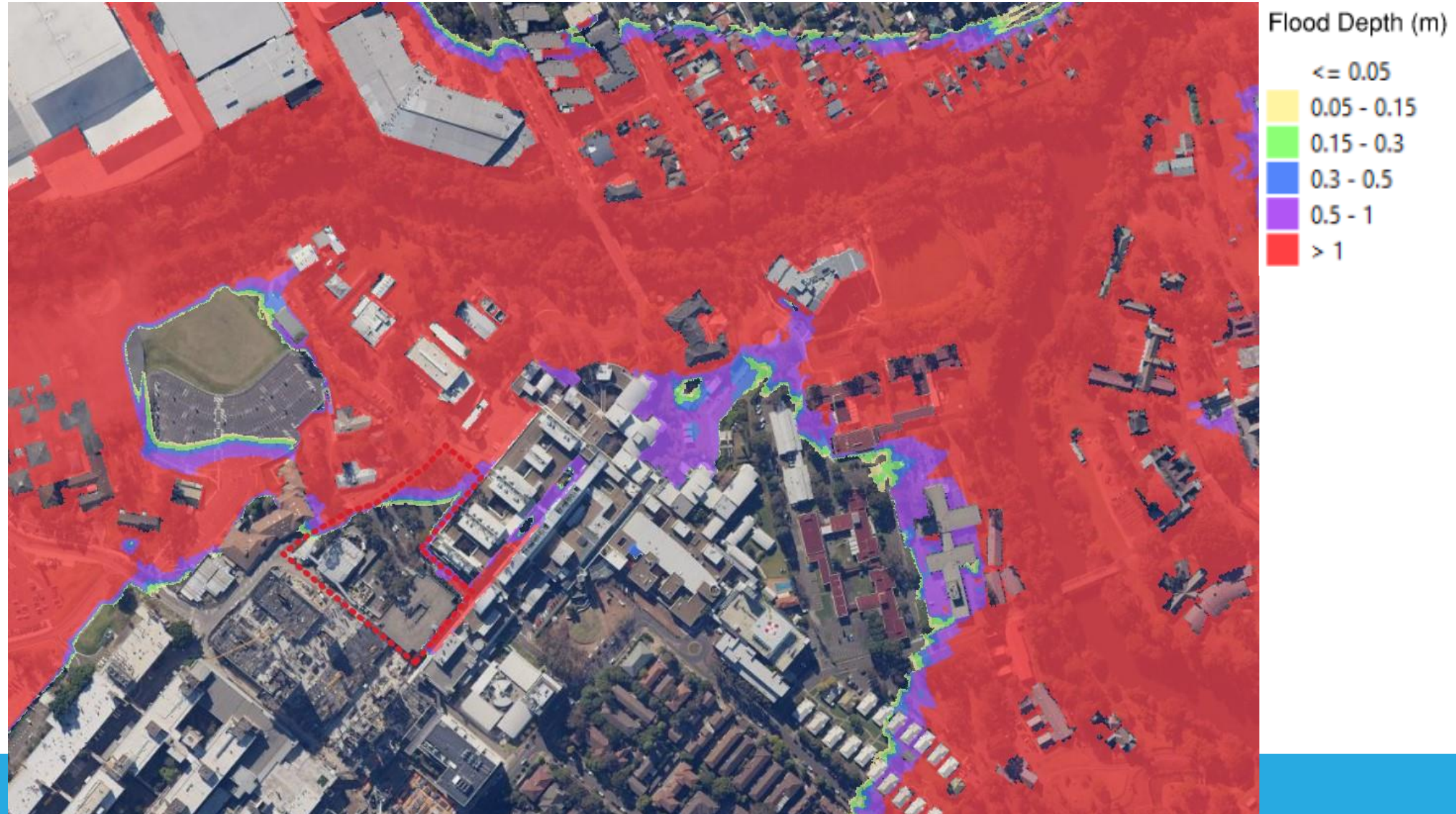
PSB – Stormwater and Flood Risk Management

Proposed design flood results – PMF Overland



PSB – Stormwater and Flood Risk Management

Proposed design flood results – PMF River



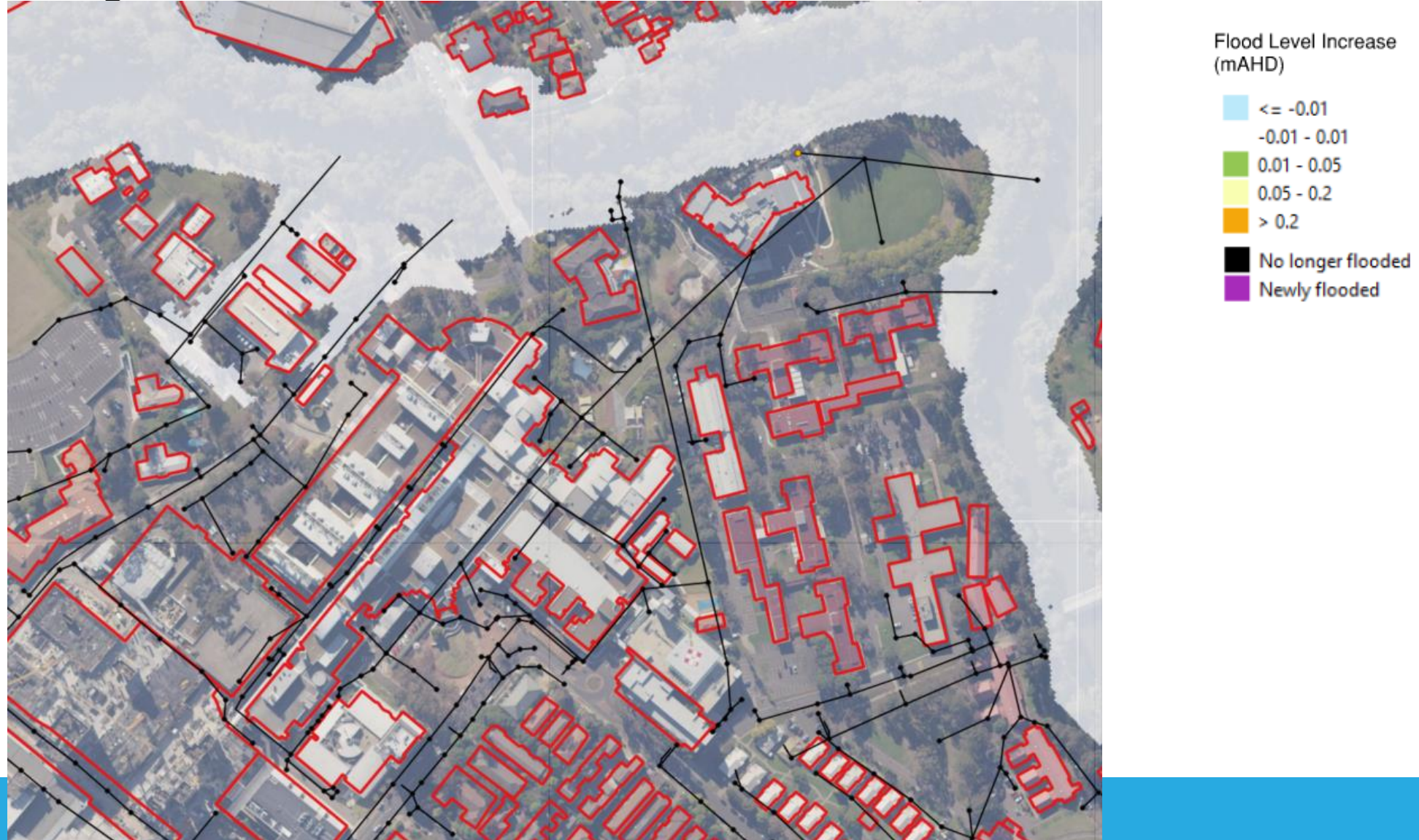
PSB – Stormwater and Flood Risk Management

Proposed design flood results - 1% AEP Afflux Overland



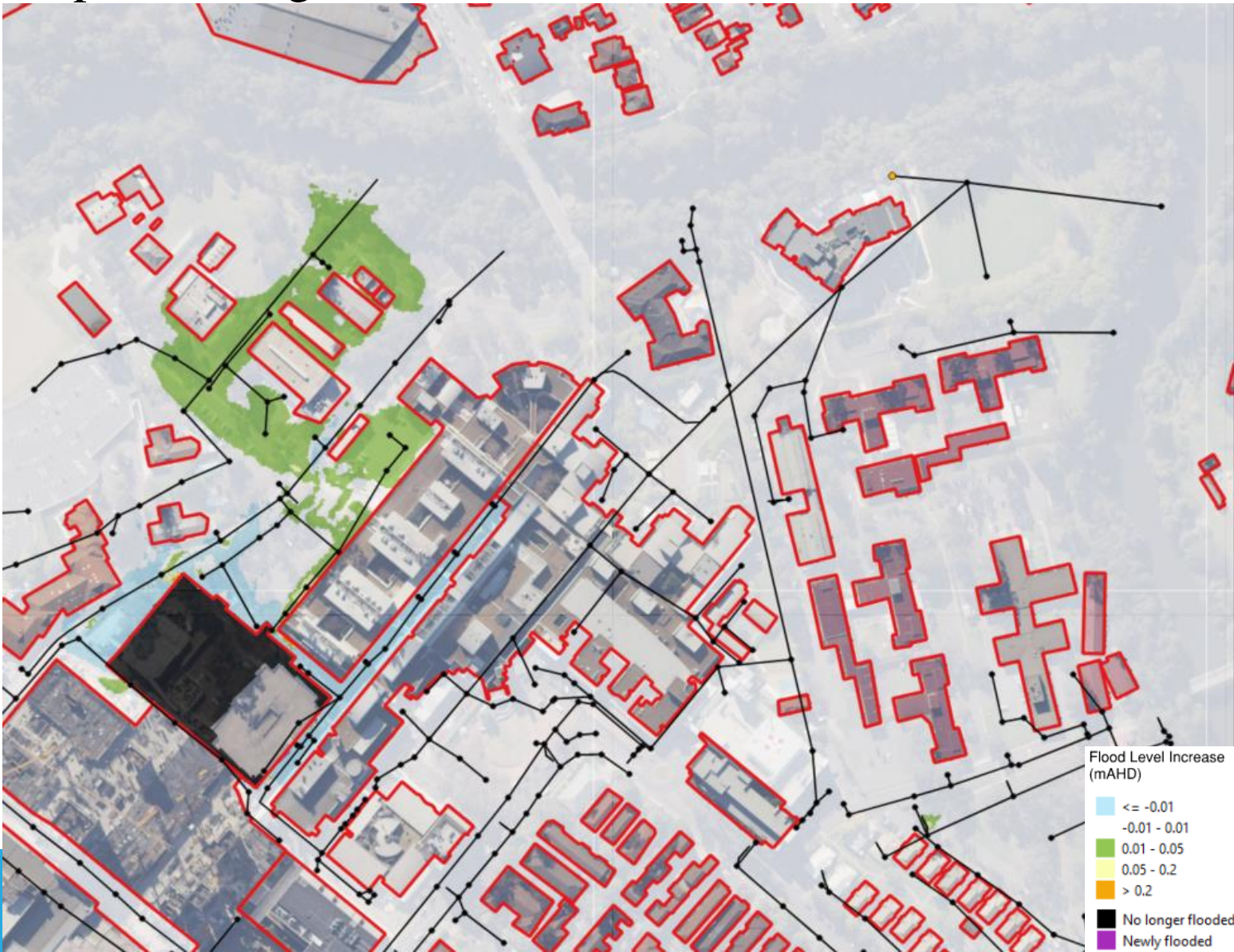
PSB – Stormwater and Flood Risk Management

Proposed design flood results – 1% AEP Afflux River

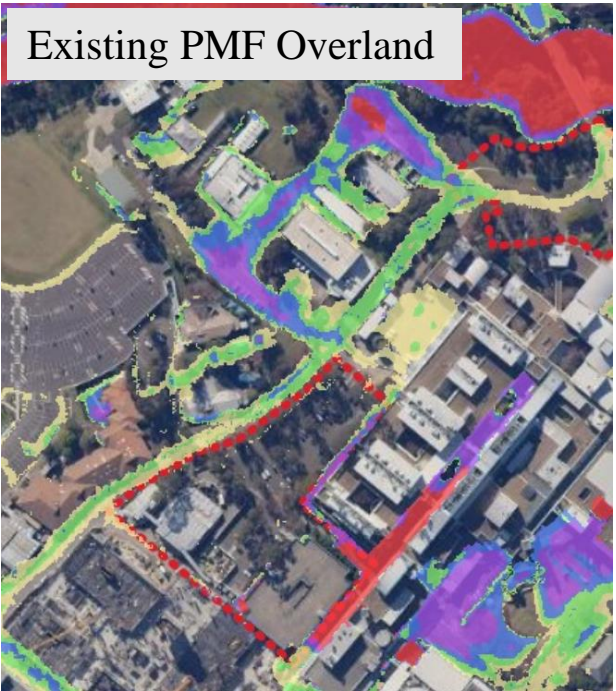


PSB – Stormwater and Flood Risk Management

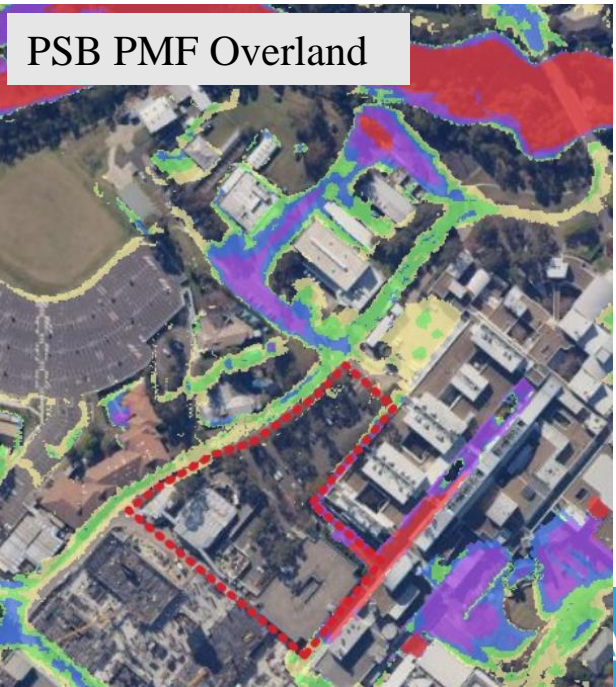
Proposed design flood results - PMF Afflux Overland



Existing PMF Overland



PSB PMF Overland

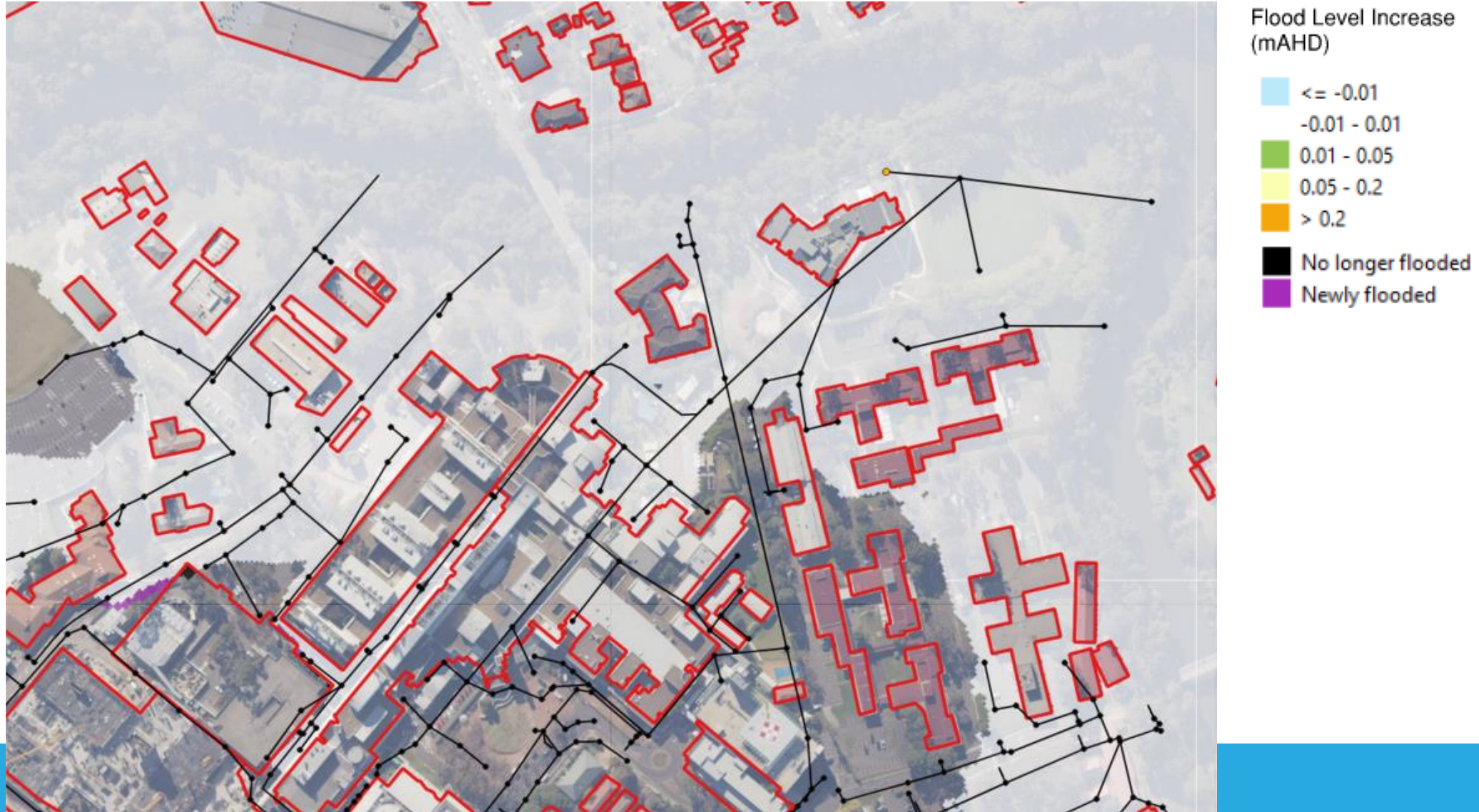


Flood Depth (m)

- <= 0.05
- 0.05 - 0.15
- 0.15 - 0.3
- 0.3 - 0.5
- 0.5 - 1
- > 1

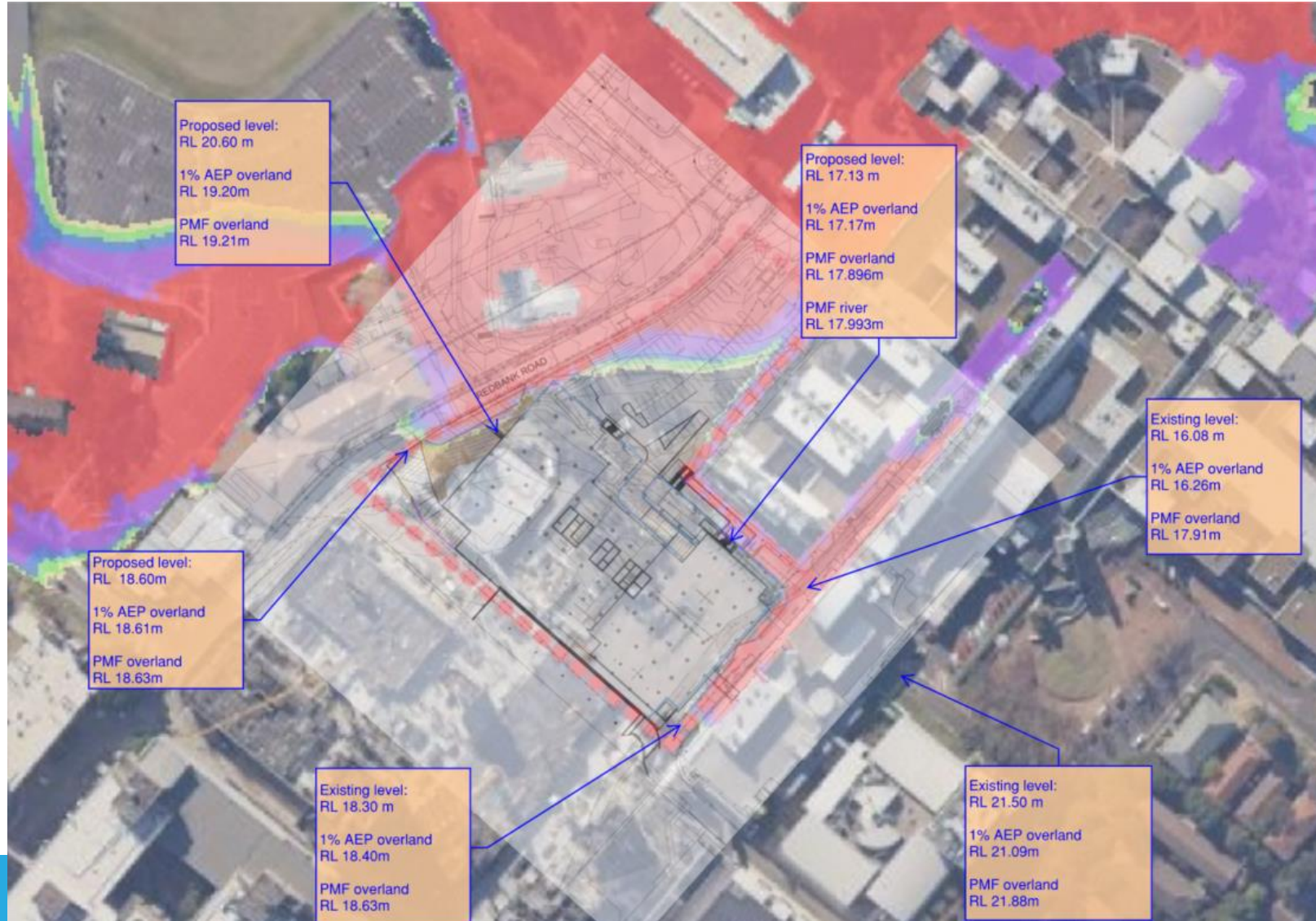
PSB – Stormwater and Flood Risk Management

Proposed design flood results – PMF Afflux River



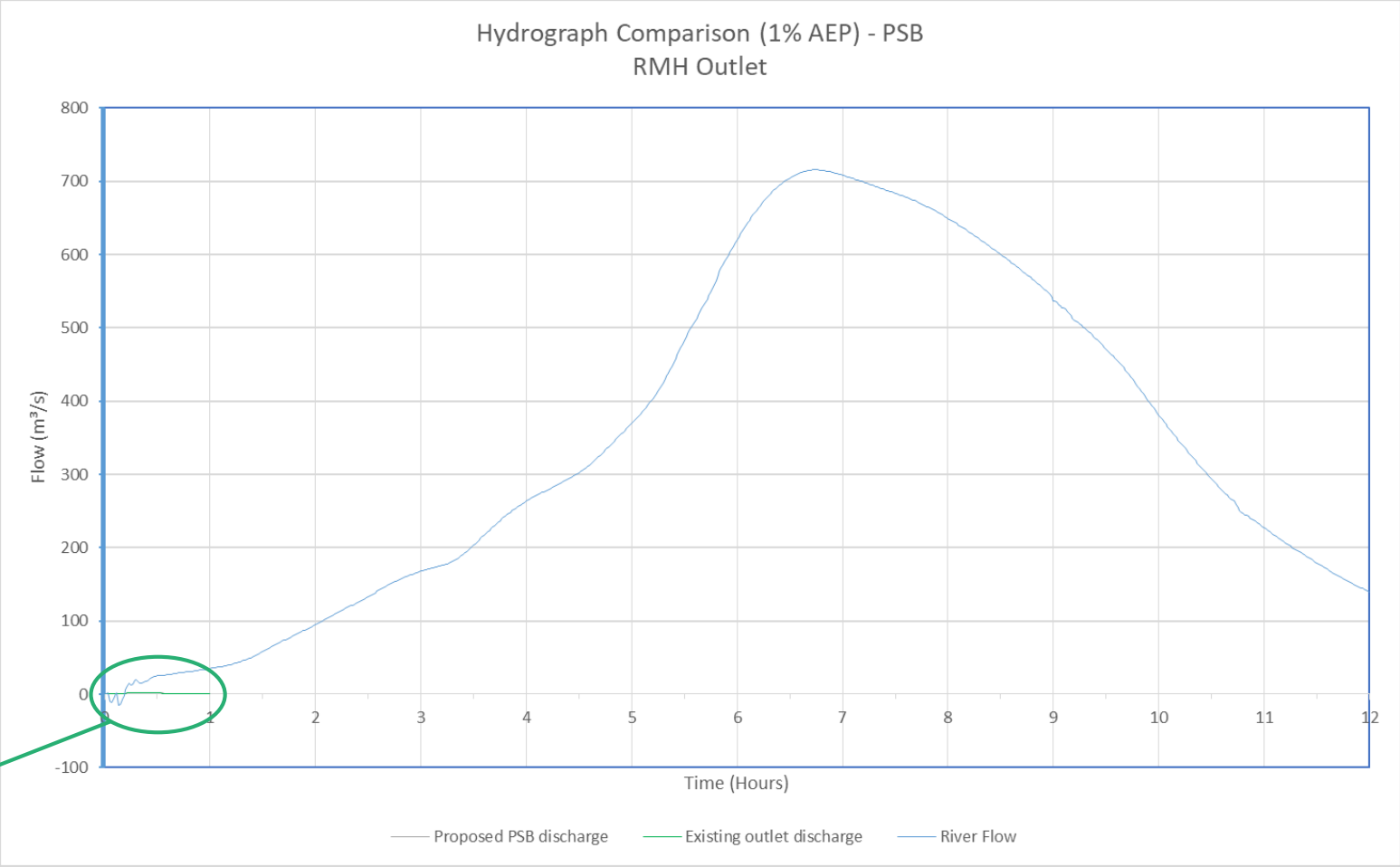
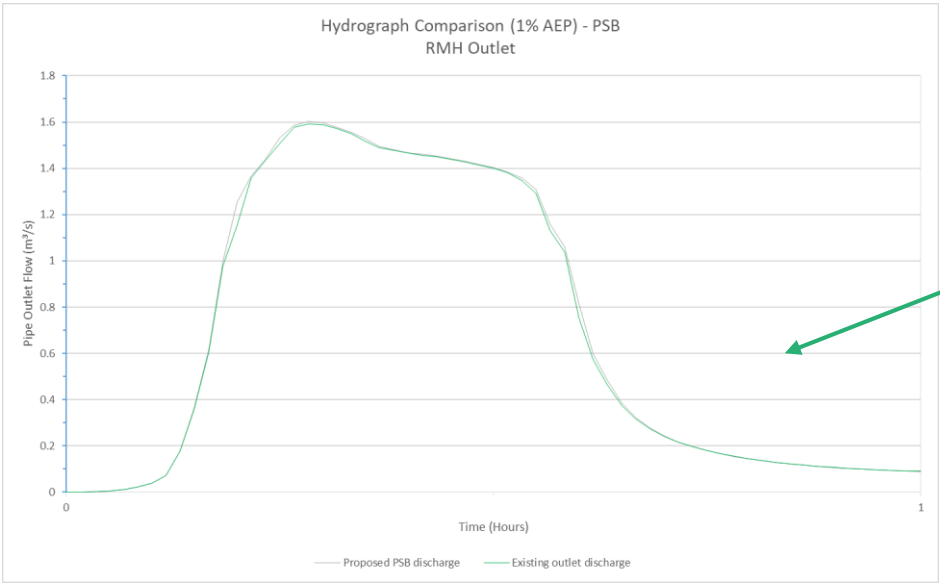
PSB – Stormwater and Flood Risk Management

Proposed flood levels and building thresholds



PSB – Stormwater and Flood Risk Management

Downstream outlet assessment



PSB – Stormwater and Flood Risk Management

PSB summary:

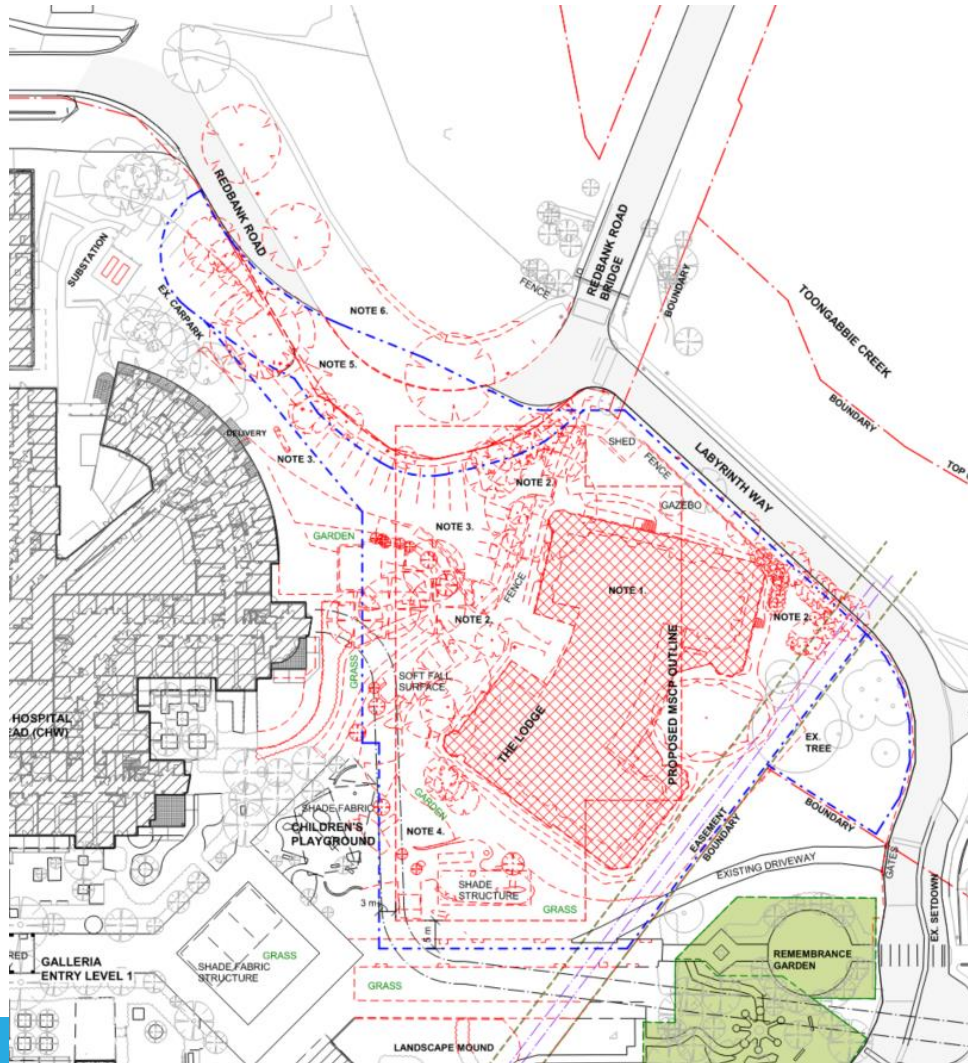
- Direct stormwater connections into the existing stormwater network to discharge flows before river peak.
- Generally no significant flood impacts nearby areas.

Next steps:

- Existing CHW forecourt modelled, but further design development required for proposed CHW forecourt and PSB entryway threshold.

MSCP – Stormwater and Flood Risk Management

Existing Site

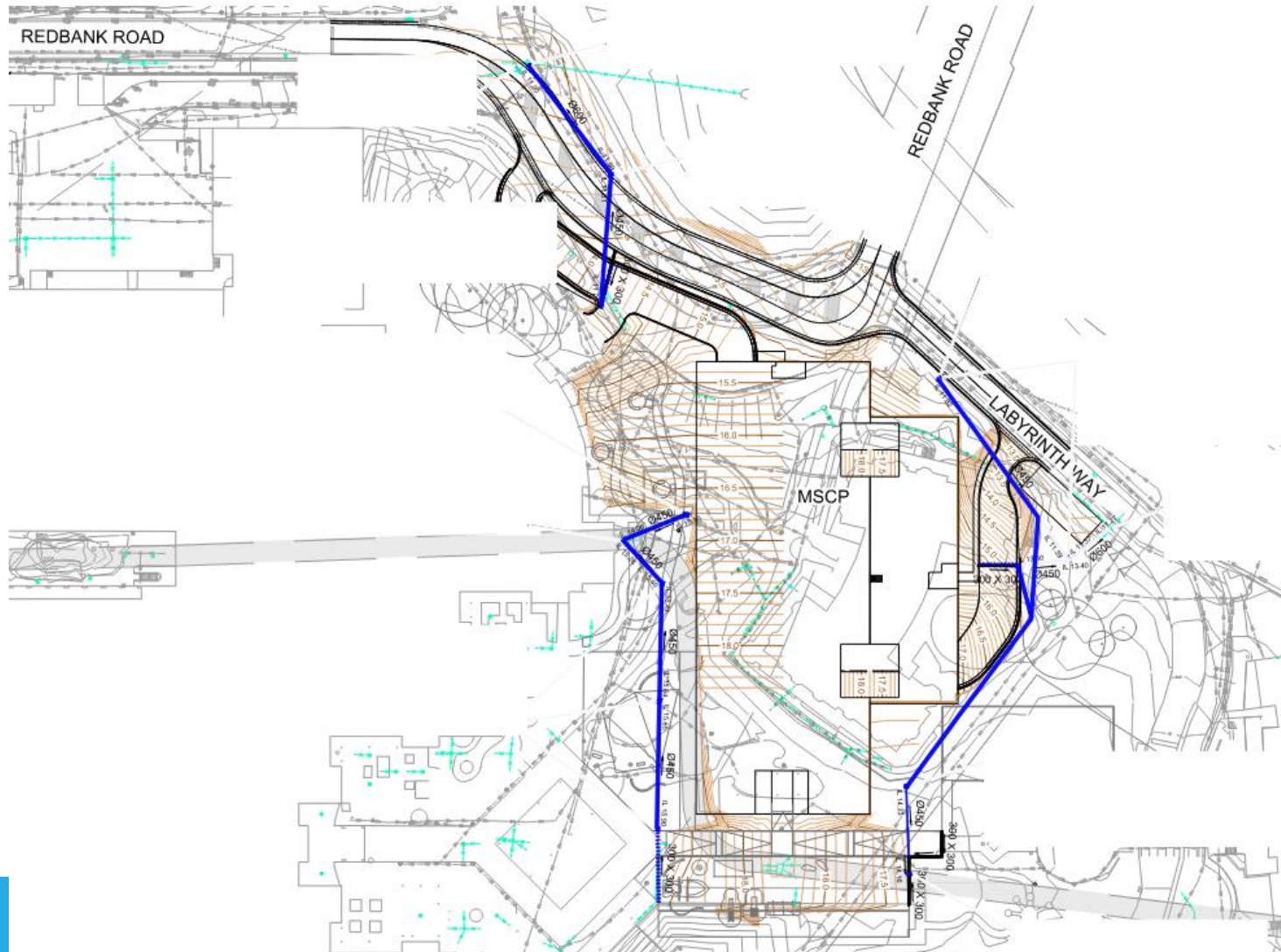


Proposed design



MSCP – Stormwater and Flood Risk Management

Proposed Stormwater Strategy



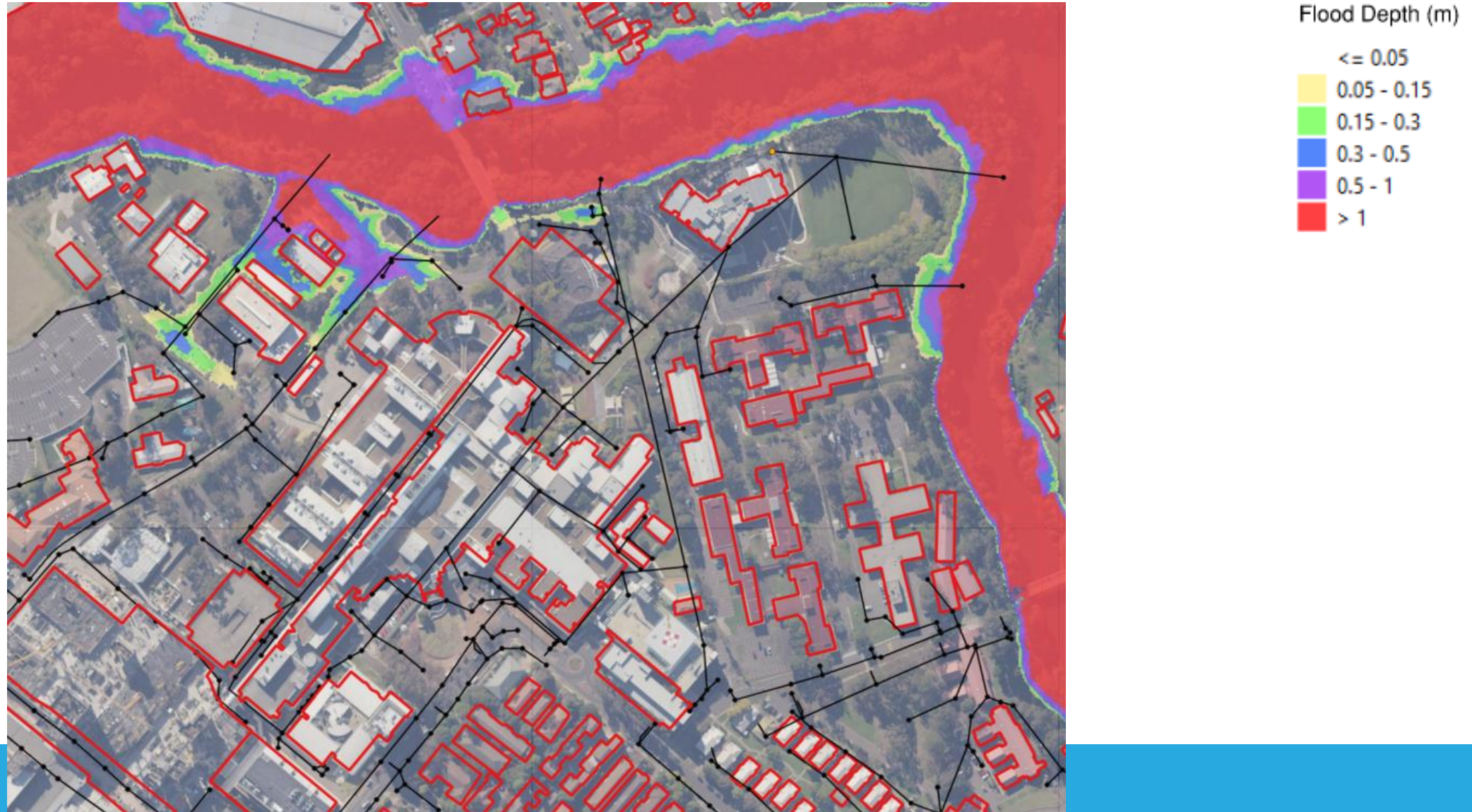
MSCP – Stormwater and Flood Risk Management

Proposed design flood results – 1% AEP Overland



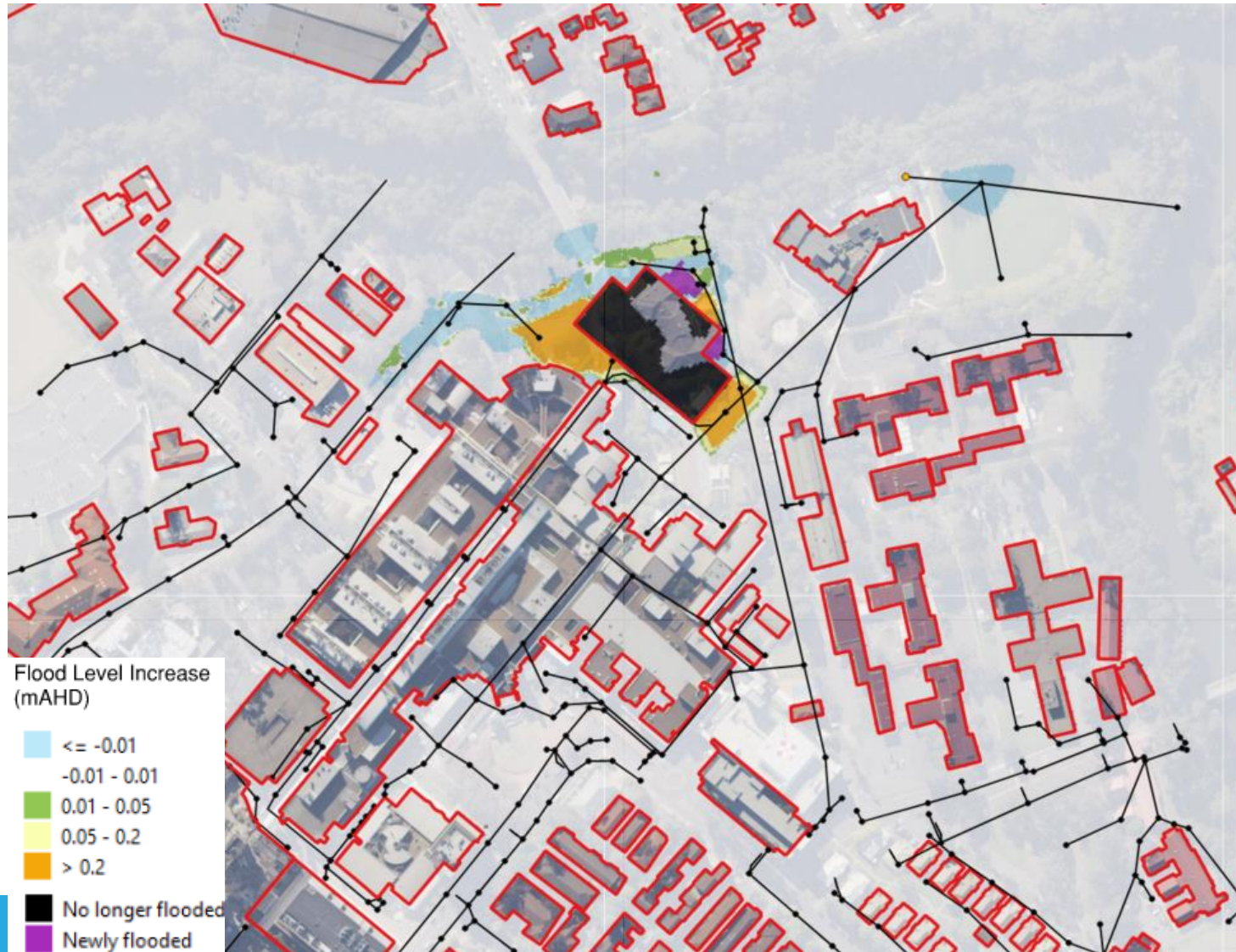
MSCP – Stormwater and Flood Risk Management

Proposed design flood results – 1% AEP River



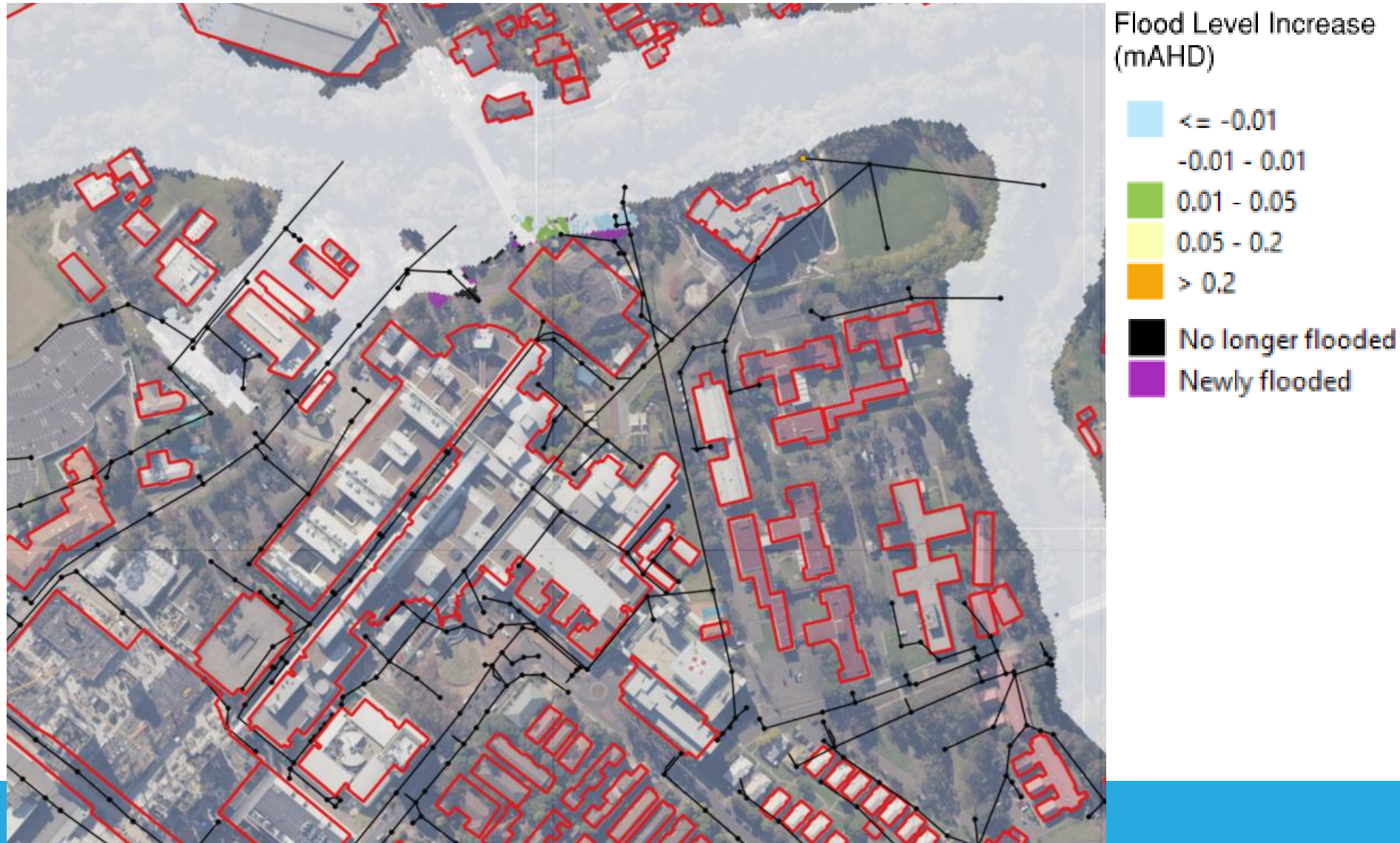
MSCP – Stormwater and Flood Risk Management

Proposed design flood results - 1% AEP Afflux Overland



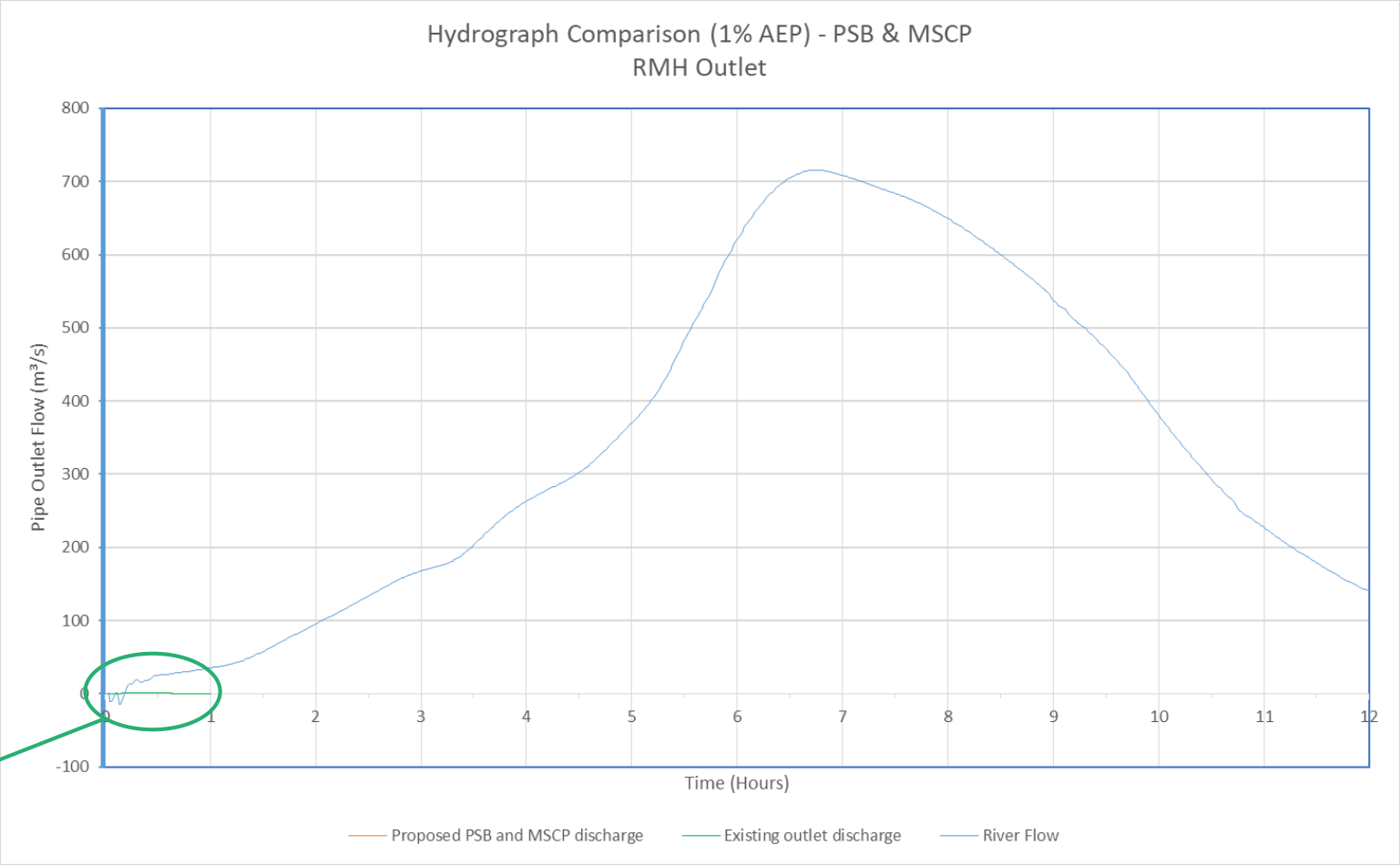
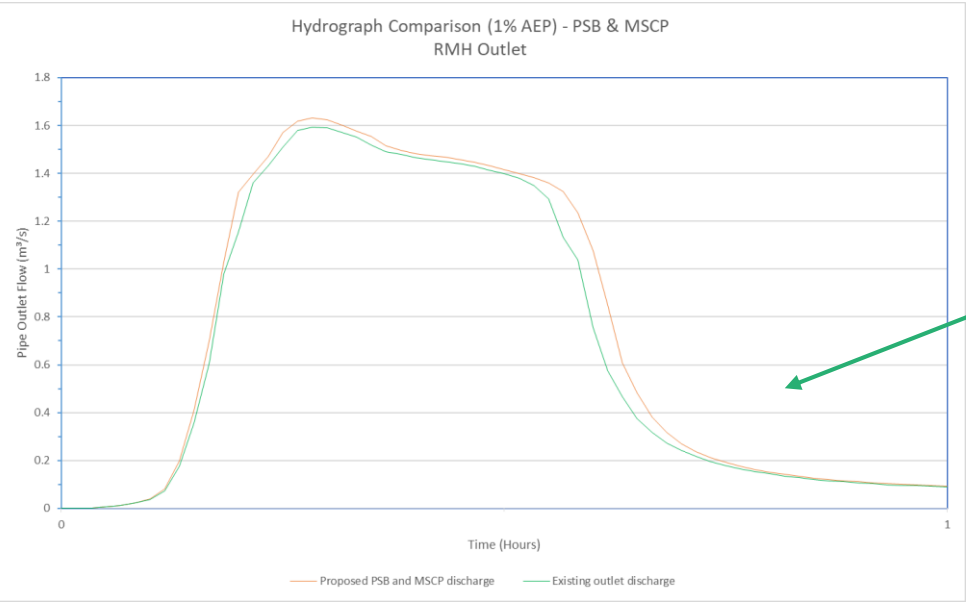
MSCP – Stormwater and Flood Risk Management

Proposed design flood results – 1% AEP Afflux River



MSCP – Stormwater and Flood Risk Management

Downstream outlet assessment



MSCP – Stormwater and Flood Risk Management

MSCP summary:

- Direct stormwater connection into the existing stormwater network to discharge flows before river peak.
- Afflux due to raising of proposed levels.

Next steps:

- Further MSCP design development to external battering and stormwater infrastructure to reduce afflux to adjacent CHW building.
- Further modelling of PMF and climate change events.