

## **School Infrastructure NSW**

### **New Primary School in Mulgoa Rise**

## **Civil Engineering Schematic Design Report**

**20-306 / 12 August 2021 / SSDA Submission**

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# Document control

Rev	Date	Revision details	Approved	Verified	Prepared
A	05.05.21	SSDA Submission	KEC	JC	AP
B	10.08.21	Draft SSDA Submission			AP
C	12.08.12	SSDA Submission			AP

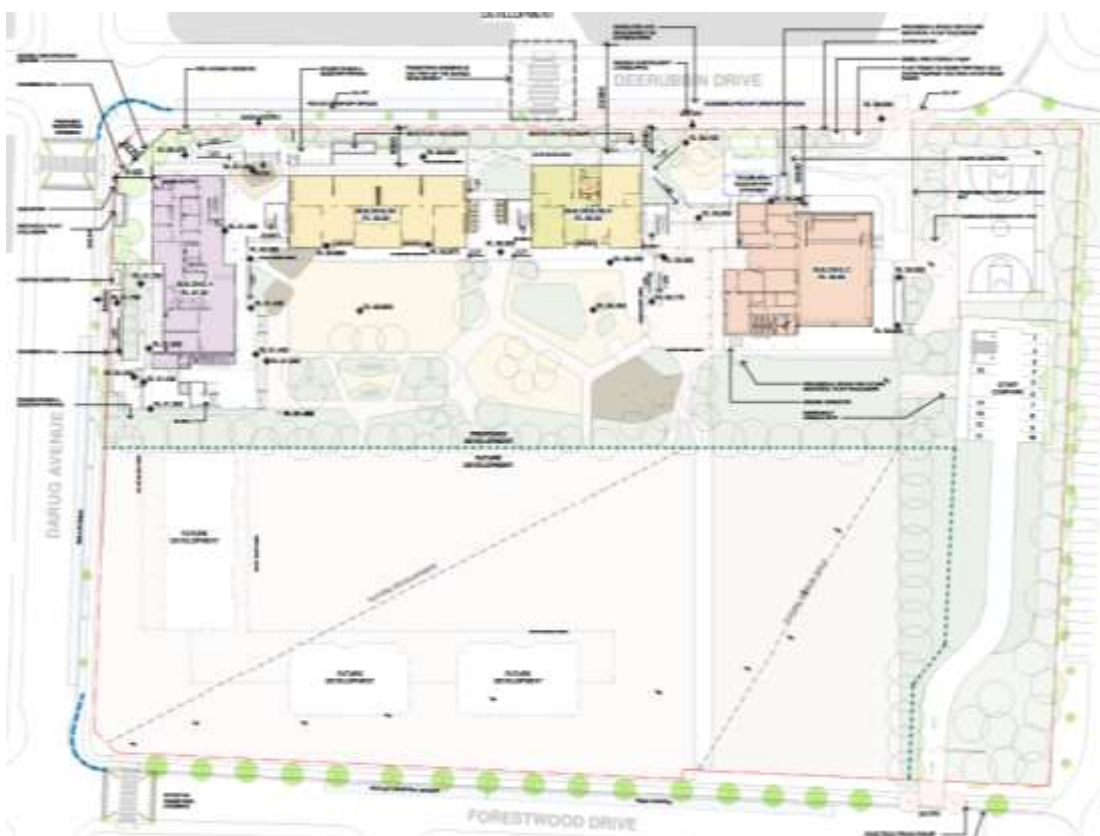
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# 1.0 Introduction

The proposed primary school at Mulgoa Rise / Glenmore park is a new school on a brownfield site, the site is a former quarry that has been filled to the current surface levels.

The new primary school in Mulgoa Rise /Glenmore Park is to be designed and built to significantly improve educational outcomes and address the capacity shortfall across the area for an approximate 414 students initially, with the potential expansion to 1000 as demand grows.

Refer Figure 1 below for the proposed site plan.



*Figure 1 Site Plan*

The purpose of this report is to document the proposed design of the civil earthworks, grading, stormwater drainage and flooding for the project.



## 2.0 Existing Site Conditions

### 2.1 Site Characteristics

The proposed primary school site ("The Site") is a brownfield site. The subject site is bounded to the north by Deerubbin Drive, to the south by Forestwood Drive, to the west by Darug Avenue and to the east by the existing Mulgoa Rise Sports Fields and on-grade carpark. The site is located within a parent subdivision, consisting of predominately low-density residential dwellings. The subject site is shown in Figure 2 below:



*Figure 2 New Primary School in Mulgoa Rise Site – Aerial Image. Source: Sixmaps (2021)*

The total existing site area is approximately 3 hectares based on the surveyed site boundaries. The site grades gently from a high point in the south-west corner, to a low point in the north east corner. An existing grassed batter (approximately 1V:10H) is located along the southern site boundary. Remaining gradients within the site, from the toe of the batter to the north west corner of the site, varies between 1% to 4%.

### 2.2 Stormwater Drainage System

Surface rainfall runoff from the site generally sheet flows over the pervious site areas, draining towards the north-east corner. An existing grass table drain is located along the eastern site boundary, which intercepts stormwater runoff from the existing paved carpark servicing the adjoining Mulgoa Rise Sports Fields.

An existing sag inlet stormwater pit is located in the north-east corner of the site to collect sheet flow and table drain runoff. The stormwater pit contains an existing 525mm diameter RCP outlet, which drains into the existing Council stormwater network within Deerubbin Drive, consisting of a kerb inlet pit and 900mm diameter RCP.

## 2.3 Review of Flood Controls

Preliminary investigations have indicated that The Site is potentially affected by two sources of flooding: riverine flooding from the Nepean River (including its tributaries) and local overland flooding.

Riverine flooding occurs when heavy rainfall causes the water levels in a river to rise and escape the main channel. Local overland flooding is run-off that travels over the land during heavy rainfall events, affected by urban features such as stormwater infrastructure, roads, fences, walls and other structures.

With respect to riverine flooding, correspondence with Penrith City Council has revealed that The Site is not flood affected by riverine flooding from the 1% Annual Exceedance Probability (AEP) design storm event. Refer to Appendix C – Council Flood Advice for further information.

With respect to local overland flooding, preliminary site investigations indicated that a large external catchment area is directed towards The Site. Due to the sizeable frontage of The Site, in combination with the limited channel capacity of the surrounding roadways, there is potential for overland flow flooding to be directed through The Site.

Based on the above investigations, Woolacotts engaged GRC Hydro to undertake two-dimensional overland flow flood modelling of the proposed development using TufLOW analysis software.

The TufLOW analysis has shown that The Site is subjected to overland flow flooding during the 1% Annual Exceedance Probability (AEP) storm event and Probable Maximum Flood (PMF) event. Refer to Figures 3 and 4 below.

During the 1% AEP storm event, existing overland flow flooding occurs in the north-western corner and eastern portion of The Site. This flooding is shallow (less than 300mm) and has a hazard classification of H1, which is the lowest level of hazard and is generally safe for people, vehicles, and buildings.

The impact of the proposed development on existing conditions is currently being undertaken by GRC Hydro for the revised site layout. However, it is anticipated the revised flood modelling will produce similar results to the previous investigation.

Refer to the *Flood Impact Assessment* report by Woolacotts, Revision B, dated 10<sup>th</sup> August 2021 and Appendix D Flood Summary Letter for further information on flooding.

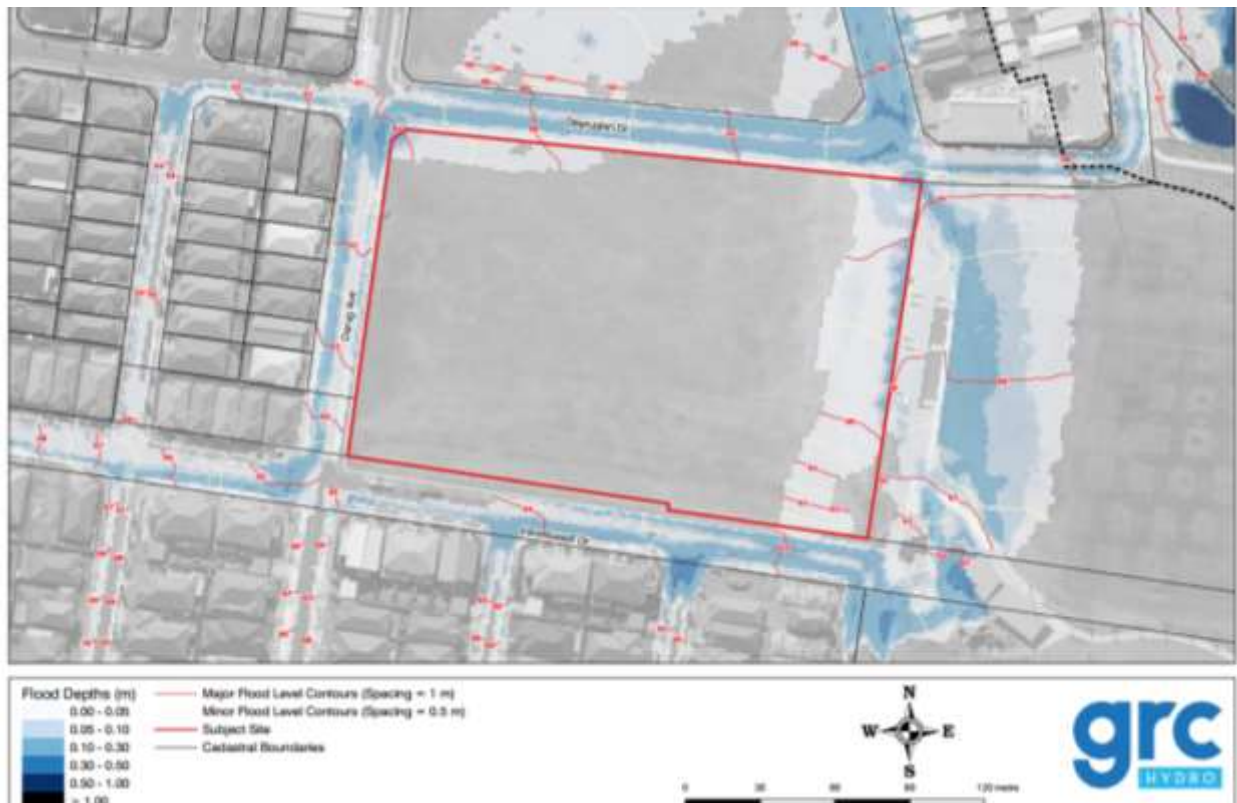


Figure 3 – 1% Pre-developed flood mapping (extract from Flood Impact Assessment)

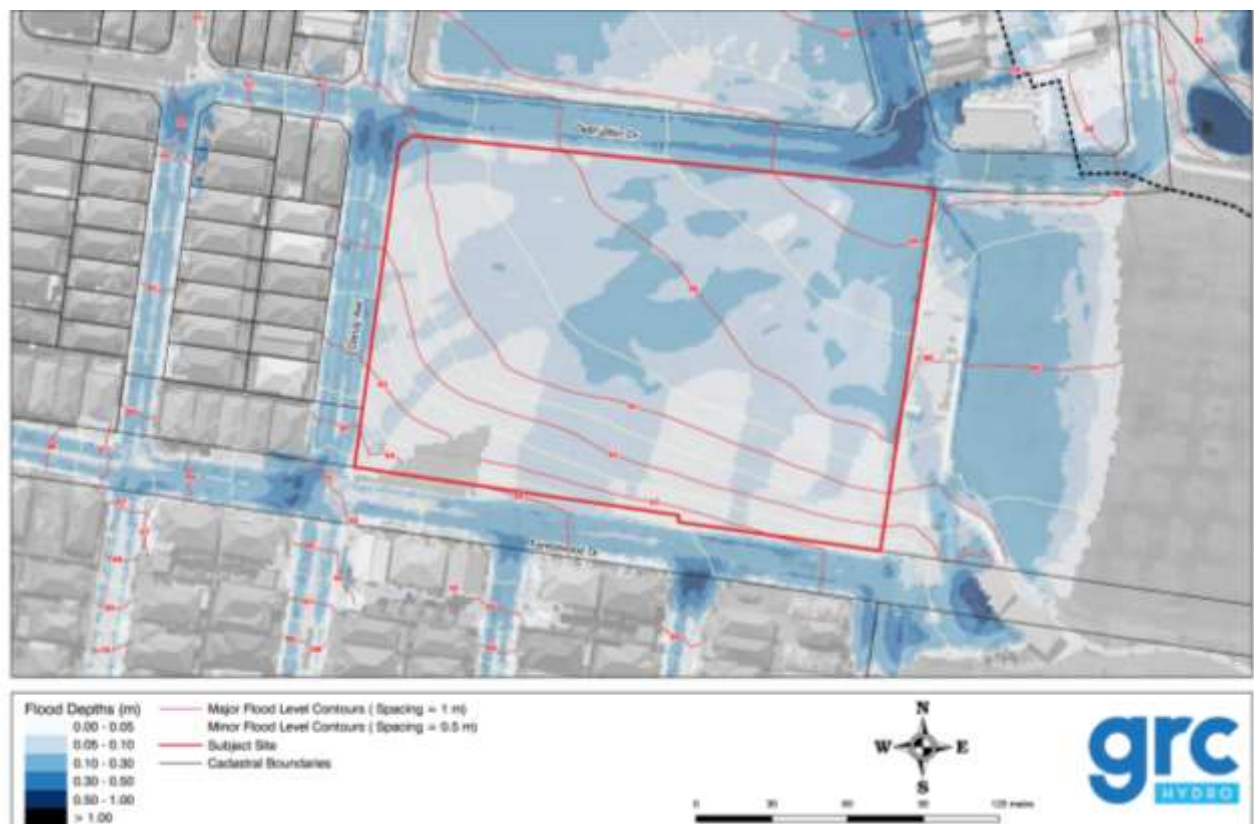


Figure 4 – PMF Pre-developed flood mapping (extract from Flood Impact Assessment)

## 3.0 Proposed Development

### 3.1 Site Characteristics

The new primary school in Mulgoa Rise /Glenmore Park is to be designed and built to significantly improve educational outcomes and address the capacity shortfall across the area for an approximate 414 students initially, with the potential expansion to 1000 as demand grows.

This proposal will facilitate a Core 21 school with 18 learning spaces (also known as Home bases) + 2 support classes, with the selected core facilities at Core 35, for the Hall, Library, Staff facilities and Admin.

The current proposal includes the following buildings:

Building A	Administration and Library
Buildings B2	Home bases learning
Building B3.S	Home bases learning and Support Unit Hub
Building C	Hall and ancillary facilities

### 3.2 Stormwater Drainage System

Stormwater runoff from all pervious and impervious surfaces within the proposed development will generally be collected by an in-ground pit and pipe gravity pipe system. The in-ground pit and pipe system has been sized to accommodate the 5% AEP (20-year ARI) storm flows for the site.

In the event of the in-ground system blockage or a major storm event greater than the 5% AEP (i.e. storm events up to and including the 1% AEP), overland flow paths have been provided around the proposed buildings to safely convey flows to the Deerubbin Drive road reserve, which acts as the overland flow path for the site catchment.

Due to the requirement to generally have building thresholds to be flush with external levels for DDA compliancy, a grading strategy has been adopted to incorporate falls away from thresholds to the in-ground stormwater system and eventually the site boundaries, during major storm events.

A schematic civil siteworks, grading and stormwater management plan has been developed for the site, which is enclosed as Appendix A to this report.



### 3.3 On-Site Detention

The subject site is located outside of Penrith City Council's identified On-Site Detention areas within the Stormwater Drainage Guidelines for Building Developments. Thus, OSD is not required for the proposed development. This has been confirmed in previous email correspondence between ACOR and Penrith City Council.

Additionally, it has also been confirmed with Penrith City Council that the downstream receiving stormwater system (both minor and major) has sufficient capacity to convey unattenuated flows from the site. Refer Appendix E of ACOR's concept report.

### 3.4 Pedestrian Crossings on Surrounding Roads

The proposed development will include a pedestrian crossings on Darug Avenue, Deerubbin Drive and Forestwood Drive adjacent the north-western corner of The Site. Refer Figure 1 above.

For the major storm event (i.e. the 1:100 year storm event) the below ground pit and pipe network is either blocked / or at full capacity. As a result, the remaining stormwater runoff travels as overland flow with the roadway acting as a channel. Refer Figure 3 above. The provision of a raised threshold or raised blisters on either side of the pedestrian crossing will reduce the channel capacity of the roadway to convey the overland flow from the major storm event.

Analysis of the two dimensional flood model has indicated that the provision of raised thresholds and / or blisters along Darug Avenue, Deerubbin Drive and Forestwood Drive will result in additional depth of flooding entering the site and neighbouring properties and will impact the required building FFLs. Even if additional / enlarged pits and pipes are installed adjacent the raised crossings, due to the potential for blockage and volume of overland flow, additional flooding will still enter the site and neighbouring properties.

Therefore, the proposed pedestrian crossings will not have raised thresholds or blisters and alternate details are to be adopted that satisfy the required traffic engineering aspects but do not impact the risk of overland flow flooding on adjacent properties during the 1:100-year flood event.

Refer to the *Flood Impact Assessment* report by Woolacotts, Revision A, dated 5<sup>th</sup> May 2021 for further information on the flood conditions.

### 3.5 Minimum Floor Levels

According to Council requirements, the Finished Floor Levels (FFL) must be located 500mm above the 1% AEP flood level. Refer Table 1 below.

The overland flow flooding along Darug Avenue and Deerubbin Drive governs the FFL of Buildings (1% AEP flood level plus 500mm freeboard). Refer to Table 1 below for the Minimum Finished Floor Levels.

Table 1 - Minimum Floor Level Information				
Building	A	B2	B3.S	C
Design flood level (1% AEP)	61.0m AHD*	60.4m AHD	59.9m AHD	59.5m AHD
Freeboard	0.5m	0.5m	0.5m	0.5m
Flood Planning Level (FPL)	61.5m AHD (1% AEP + 0.5m Freeboard)	61.9m AHD (1% AEP + 0.5m Freeboard)	60.4m AHD (1% AEP + 0.5m Freeboard)	60.0m AHD (1% AEP + 0.5m Freeboard)

\*Note: The 1% AEP Design Flood Level for Building A shown in Table 1 above, is along Deerubbin Drive. For Darug Avenue, the flood contours (along the western site boundary) vary from 64.5m to 61.0m AHD. As these levels are higher than the FFL of Building A, a diversion wall and embankment is required to maintain an FFL of 61.5m AHD. Refer to Section 3.6 below.

### 3.6 Diversion Wall and Embankment

A diversion wall is required along the northern half of the western boundary, along with a diversion embankment south of Building A, to maintain an FFL of 61.5m AHD for Building A. The location of the diversion wall and bund are required to not adversely impact the 1% AEP flood extents by increasing the depth / extents of flooding and floodwaters entering neighbouring properties. On this basis the diversion wall is slightly offset from the boundary in the north-western corner of the site. Refer to Appendix A for the location of the diversion wall and embankment.

The diversion wall and embankment have the following requirements:

- The height of these structures shall not be less than the flood planning level (i.e. 1% AEP flood level + 500mm)
- These structures must be constructed of flood compatible materials, and be capable of withstanding flood forces, up to the flood planning level

### 3.7 Water Sensitive Urban Design

Penrith City Council have indicated that water quality and water quantity treatment systems have been provided as part of the parent subdivision works. Refer Appendix B for the page 4 of the Pre-lodgement Advice dated 25<sup>th</sup> March 2021. However, it is also stated in the Pre-lodgement Advice that a Water Sensitive Urban Design (WSUD) strategy is required for the site to address water conservation, quality and quantity.

Woolacotts contacted Penrith City Council via telephone discussion on the 30<sup>th</sup> March 2021 who confirmed that due to the parent subdivision works previously undertaken, water quality modelling (using the program MUSIC) is not required for the site. However, site specific WSUD measures will be provided including rainwater reuse, litter baskets in grated inlet pits, small grassed swales and grassed buffer strips.

## 4.0 Earthworks

Earthworks for the site will involve benching and grading of the site areas for new building pads and carparking facilities.

Preliminary cut and fill estimates for the proposed development works were calculated as follows:

- Cut = -2900m<sup>3</sup>
- Fill = 2500m<sup>3</sup>
- **Net = 400m<sup>3</sup>**

The above estimates indicate that approximately 400m<sup>3</sup> of fill will need to be imported onto The Site for the construction of new primary school in Mulgoa Rise /Glenmore Park.

The earthworks will need to be prepared in accordance with the Geotechnical Investigation prepared by JK Geotechnics dated 16<sup>th</sup> November 2020 (Report No. 33177PN2rpt)

## 5.0 Soil Erosion and Sedimentation Control

During construction, erosion and sediment control measures will be provided in accordance with the requirements of “Managing Urban Stormwater Soils and Construction, 4th Edition (Blue Book)”.

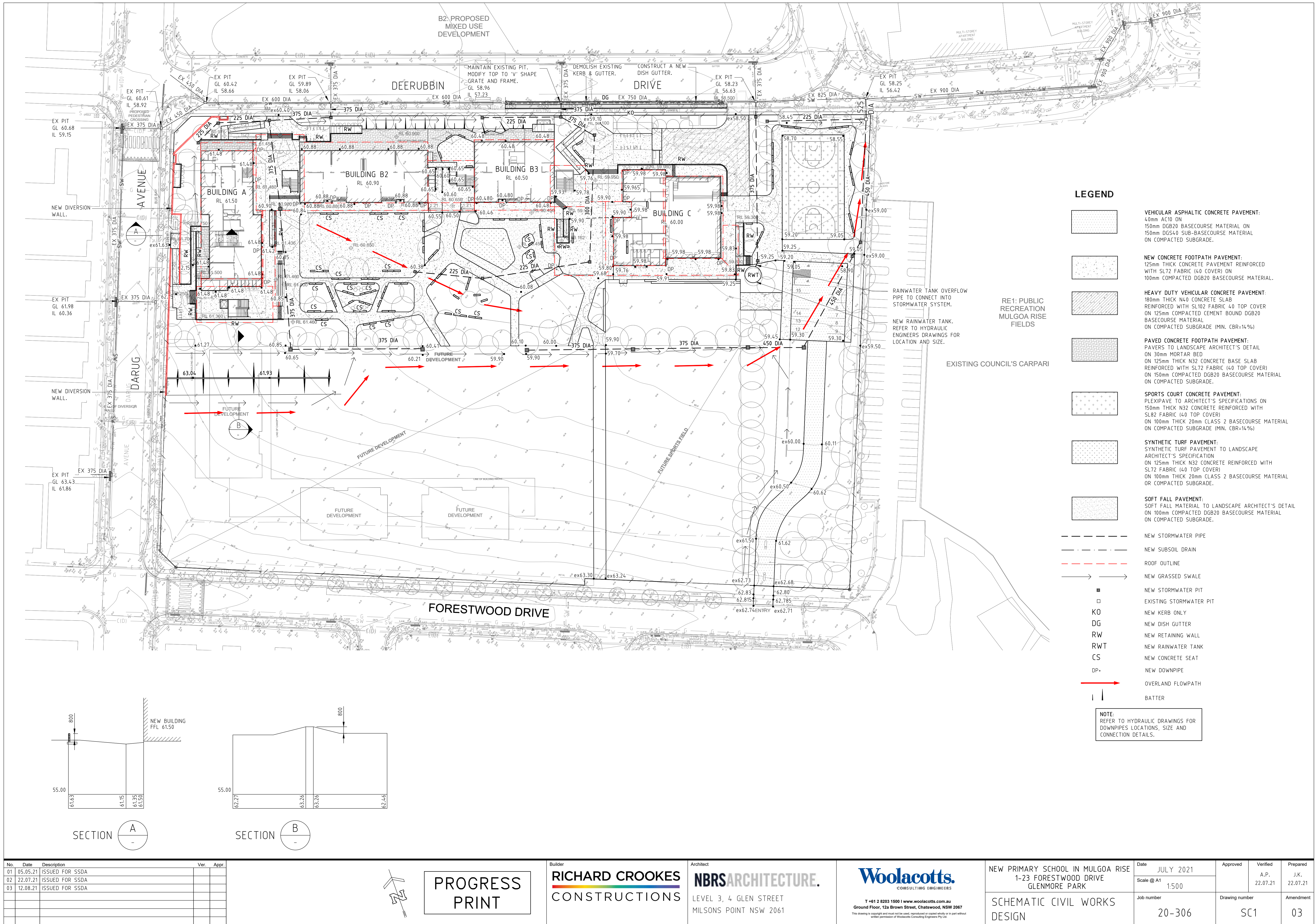
These measures will include silt fences on the low side of the site, silt traps at stormwater pits and a construction exit to remove silt from vehicles before they leave the site. Dust control measures will also be provided.

Refer to Appendix A of this report for the Erosion and Sediment Control Plan.

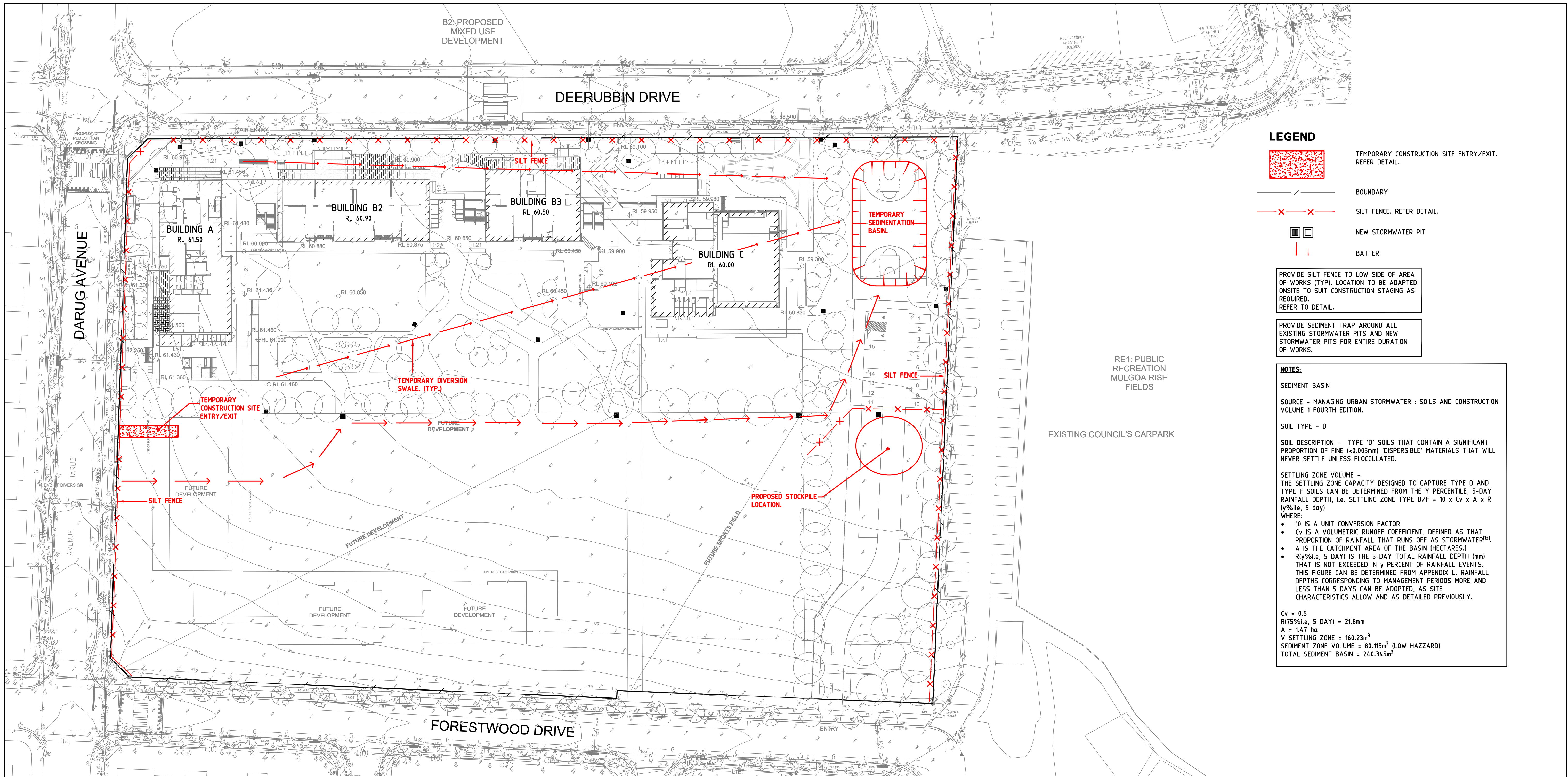
# **Appendix A**

## **Schematic Civil Drawings**

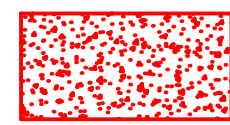




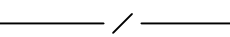




LEGEND



TEMPORARY CONSTRUCTION SITE ENTRY/EXIT.  
REFER DETAIL.



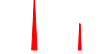
BOUNDARY



SILT FENCE. REFER DETAIL.



NEW STORMWATER PIT



BATTER

PROVIDE SILT FENCE TO LOW SIDE OF AREA OF WORKS (TYP). LOCATION TO BE ADAPTED ON SITE TO SUIT CONSTRUCTION STAGING AS REQUIRED. REFER TO DETAIL.

PROVIDE SEDIMENT TRAP AROUND ALL EXISTING STORMWATER PITS AND NEW STORMWATER PITS FOR ENTIRE DURATION OF WORKS.

NOTES:

SEDIMENT BASIN

SOURCE - MANAGING URBAN STORMWATER : SOILS AND CONSTRUCTION VOLUME 1 FOURTH EDITION.

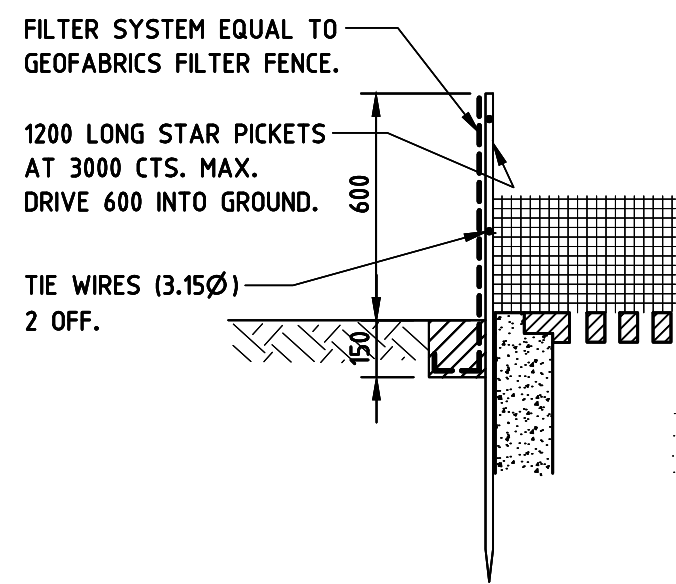
SOIL TYPE - D

SOIL DESCRIPTION - TYPE 'D' SOILS THAT CONTAIN A SIGNIFICANT PROPORTION OF FINE (<0.005mm) 'DISPERSIBLE' MATERIALS THAT WILL NEVER SETTLE UNLESS FLOCCULATED.

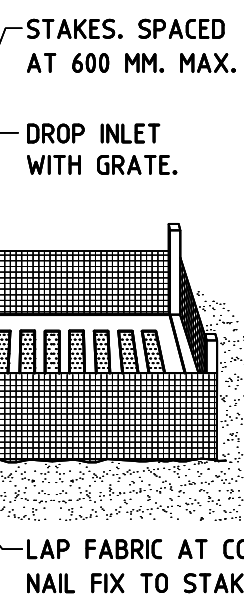
SETTLING ZONE VOLUME - THE SETTLING ZONE CAPACITY DESIGNED TO CAPTURE TYPE D AND TYPE F SOILS CAN BE DETERMINED FROM THE Y PERCENTILE, 5-DAY RAINFALL DEPTH, I.E. SETTLING ZONE TYPE D/F =  $10 \times C_v \times A \times R$  (y%ile, 5 day) WHERE:

- 10 IS A UNIT CONVERSION FACTOR
- $C_v$  IS A VOLUMETRIC RUNOFF COEFFICIENT, DEFINED AS THAT PROPORTION OF RAINFALL THAT RUNS OFF AS STORMWATER<sup>(3)</sup>.
- A IS THE CATCHMENT AREA OF THE BASIN (HECTARES.)
- $R(y\%ile, 5 \text{ DAY})$  IS THE 5-DAY TOTAL RAINFALL DEPTH (mm) THAT IS NOT EXCEEDED IN y PERCENT OF RAINFALL EVENTS. THIS FIGURE CAN BE DETERMINED FROM APPENDIX L, RAINFALL DEPTHS CORRESPONDING TO MANAGEMENT PERIODS MORE AND LESS THAN 5 DAYS CAN BE ADOPTED, AS SITE CHARACTERISTICS ALLOW AND AS DETAILED PREVIOUSLY.

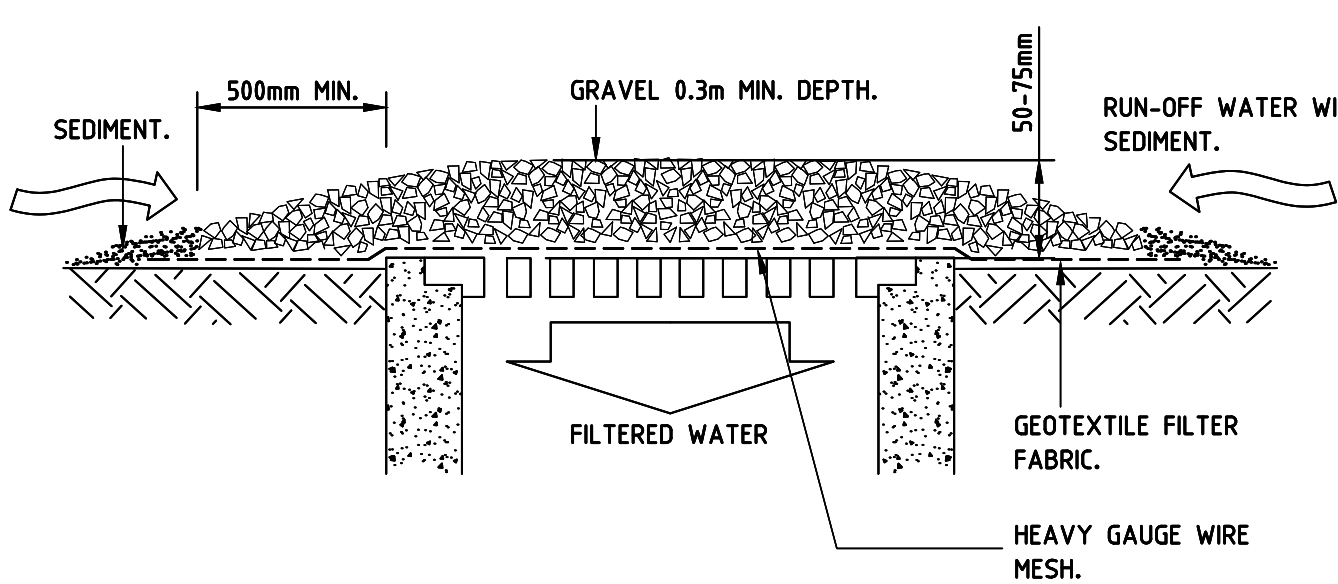
$C_v = 0.5$   
 $R(75\%ile, 5 \text{ DAY}) = 21.8\text{mm}$   
 $A = 1.47 \text{ ha}$   
 $V \text{ SETTLING ZONE} = 160.23\text{m}^3$   
 $\text{SEDIMENT ZONE VOLUME} = 80.115\text{m}^3 \text{ (LOW HAZZARD)}$   
 $\text{TOTAL SEDIMENT BASIN} = 240.345\text{m}^3$



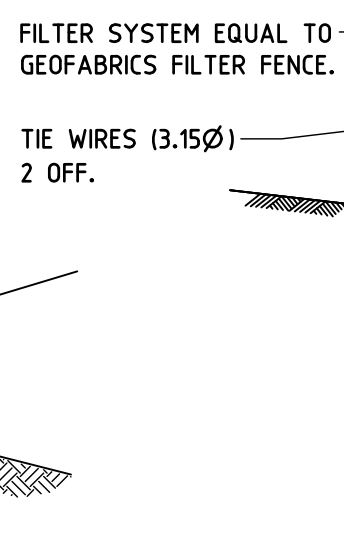
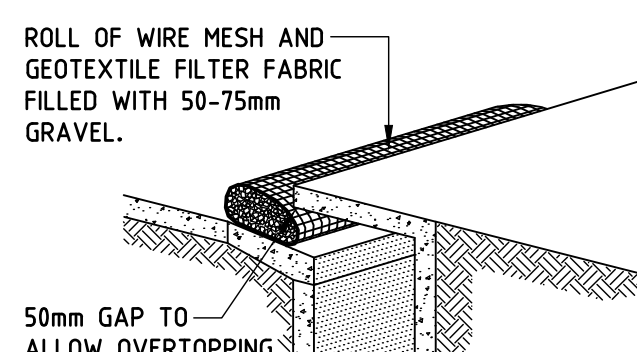
GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP.  
TO BE PROVIDED AT GRATED PITS WITHIN PERVIOUS AREAS.



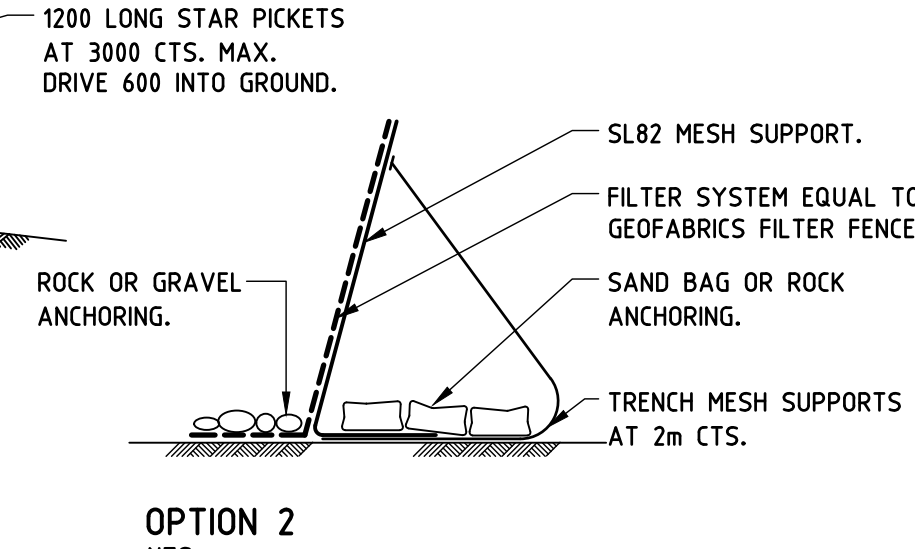
WIRE MESH AND GRAVEL DROP INLET SEDIMENT TRAP.  
TO BE PROVIDED AT GRATED PITS WITHIN IMPERVIOUS AREAS.



PORTABLE GRAVEL KERB INLET SEDIMENT TRAP  
TO BE PROVIDED AT KERB INLET PITS WITHIN AREA OF WORKS.

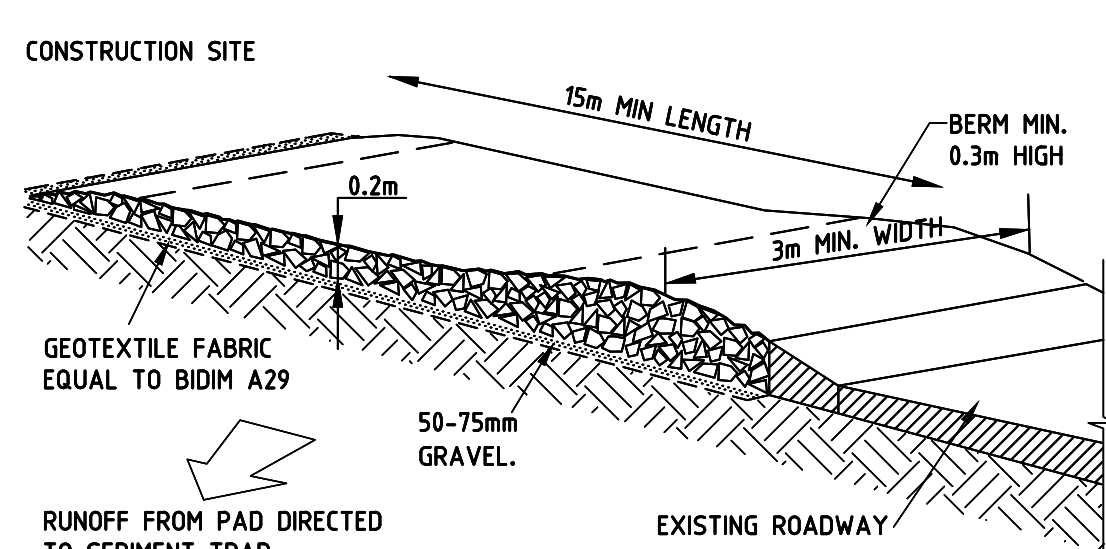


OPTION 1  
NTS



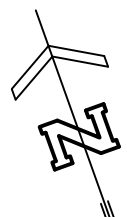
OPTION 2  
NTS

SILT FENCE DETAILS  
TO BE PLACED AROUND LOW SIDE OF PROPERTY BOUNDARY AND AROUND STORMWATER INLET STRUCTURES TO PREVENT SOIL WASHING OFF SITE.



TEMPORARY CONSTRUCTION ENTRY/EXIT  
TO BE LOCATED AT VEHICLE EXIT FROM SITE

No.	Date	Description	Ver.	Appr.
01	05.05.21	ISSUED FOR SSDA		
02	12.08.21	ISSUED FOR SSDA		



PROGRESS  
PRINT

Builder  
**RICHARD CROOKES**  
CONSTRUCTIONS

Architect  
**NBR**ARCHITECTURE.  
LEVEL 3, 4 GLEN STREET  
MILSONS POINT NSW 2061

**Woolacotts**  
CONSULTING ENGINEERS  
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NEW PRIMARY SCHOOL IN MULGOA RISE  
1-23 FORESTWOOD DRIVE  
GLENMORE PARK  
EROSION AND SEDIMENT  
CONTROL PLAN - STAGE 1

Date	MAY 2021	Approved	Verified	Prepared
Scale @ A1	1:500		A.P.	J.K.
Job number	20-306	Drawing number	SC2	Amendment
				02



## **Appendix B**

### **Pre-Lodgement Advice**



Our Ref: PL21/0017  
Contact: Gavin Cherry  
Telephone: (02) 4732 8125

25 March 2021

RPS Group  
Level 9 , No. 17 York Street  
SYDNEY NSW 2000

Attention: Anthony Maughan-Wright

Dear Mr Maughan-Wright,

**Pre-lodgement Advice**  
**Proposed Development: State Significant Development - Mulgoa Rise**  
**Public School**  
**Lot 1663 DP 1166869 , Address 60-78 Deerubbin Drive GLENMORE**  
**PARK NSW 2745**

Thank you for engaging with Council on 25 March 2021 to outline a proposed state significant development proposal for the above matter. The meeting was useful for Council in gaining an understanding of your proposal and allows for Council to advise on key consideration and submission documentation that should inform and accompany the proposed state significant development application.

The proposal is considered to provide positive educational opportunities for the local community and the design rationale and positioning of the development form on the site is generally supported.

These notes outline key matters for consideration in the finalisation of the design package and should inform the preparation of application documentation for lodgement with the Department.

If we can help you any further regarding the attached advice, please feel free to contact me on (02) 4732 8125.

Yours sincerely

**Gavin Cherry**  
**Development Assessment Coordinator**

Penrith City Council  
PO Box 60, Penrith  
NSW 2751 Australia  
T 4732 7777  
F 4732 7958  
penrithcity.nsw.gov.au

## **PRE-LODGE MENT ADVICE**

**Proposal** State Significant Development - Mulgoa Rise Public School

**Address** Lot 1663 DP 1166869

60-78 Deerubbin Drive GLENMORE PARK NSW 2745

### **Attendees:**

#### **Proponent**

Matthew Metlege- Schools Infrastructure NSW

Jack Bruderlin - Schools Infrastructure NSW

Anthony Maughan-Wright – Colliers

Jock Mitton - Colliers

Shaun Smith - RPS

Carmit HarnikSaar - NBRS

Parisa Ettehad - NBRS

Kasia Balsam - PTS

Andrew Morse – PTC

#### **Penrith City Council**

Gavin Cherry– Development Assessment Coordinator

Abby Younan – Planning Administration Officer

Joshua Romeo – Senior Waste Planning Officer

Craig Squires – Building Certification and Fire Safety Coordinator

Stephen Masters – Senior Development Engineer

Daniel Davidson – Senior Traffic Engineer

Michael Middleton – Team Leader Environmental Health

### **Matters Identified for Address in the Preparation of the SSD Application**

#### **INITIAL STEPS**

- As outlined within the body of these notes, there was a suggestion during the meeting that the indicated extent of overland flow and flooding affectation may not be as significant as diagrammatically reflected within the concept plans prepared. This is a critical aspect to investigate and clarify with Council's Development Engineers, as the outcome of these discussions may alter spatial restrictions on the site as well as flood planning level requirements which in turn affects finished floor levels. It is strongly encouraged that engagement directly with Council's Development Engineers

be pursued in the first instance, to verify if the current spatial arrangement or level differences across the site can or should be refined.

- Following clarification on overland and flooding, address of the traffic and parking matters is suggested. The concept plans require realignment of kerb lines for accessible drop off / pick up as well as pedestrian crossings, line marking and sign posting. It is recommended that in principle support for the road works and parking arrangements be discussed and secured with Council's Traffic Engineers and Development Engineers in the progression of the SSD documentation, so as to ensure that no complications will arise during later stages of the development including Section 138 Roads Act applications and engagement with the Local Traffic Committee.
- Following clarification on overland and flooding, an opportunity review developed landscape plans would be appreciated as the setback zones to the public road network and the resulting streetscape outcomes will be a key consideration for Council when the SSD application is lodged. This includes planting densities and pot sizes, selected species, fencing, lighting and any irrigation measures proposed.
- The outcome of the State Governments Design Review Panel process should be outlined to Council to confirm if there are any implications to the design or arrangement of the built form that has broader implications on other considerations applicable to the development.

## **ENGINEERING MATTERS:**

### **General Considerations**

- Council's engineering requirements for development, including policies and specifications listed herein, can be located on Council's website at the following link:  
<https://www.penrithcity.nsw.gov.au/Building-and-Development/Development-Applications/Engineering-requirements-for-developments/>
- All engineering works must be designed and constructed in accordance with Council's *Design Guidelines for Engineering Works for Subdivisions and Developments* and Council's *Engineering Construction Specification for Civil Works*.

### **Stormwater Management**

- Stormwater drainage for the site must be in accordance with the following:
  - Council's Development Control Plan,
  - *Stormwater Drainage Specification for Building Developments* policy, and
  - *Water Sensitive Urban Design Policy and Technical Guidelines*.
- A stormwater concept plan, accompanied by a supporting report and calculations, should be submitted with the application to the Department.

- Stormwater from the site is to be discharged into the drainage system within Deerubbin Drive along the northern boundary of the site. During construction of the subdivision, stub pipe connections were constructed to inside the property boundary to allow for future connection of stormwater. Please refer to an extract of the approved Construction Certificate plans (Ref: CCX11/0033) at the end of these notes, depicting the design catchment along with an extract of the Works as Executed plans showing the available connections at pits 1/8A, 1/9A, 1/10A & 1/11A.
- Water quality and water quantity treatment systems have been previously provided as part of the parent subdivision works. Pending capacity of the existing street drainage systems, On-site Stormwater Detention (OSD) is not required for the site
- A water sensitive urban design strategy prepared by a suitably qualified person is to be provided for the site. The strategy shall address water conservation, water quality, water quantity, and operation and maintenance. The strategy should demonstrate compliance with Council's Water Sensitive Urban Design Policy and Technical Guideline and include any Music Modelling (SQZ files).
- A sediment and erosion control plan shall be submitted with the application. Adequate sediment and erosion control measures shall be provided to prevent sediment loads entering the bio-retention basins within the Glenmore Park Riparian Corridor which are already online.

### **Local Overland Flows**

- It is noted that submitted plans show the lot is impacted by local overland flow flooding requiring provision of 0.5m freeboard to floor levels of buildings. Council's records indicate that the lot is not impacted by any local overland flows and is not coded as being affected by local overland flow flooding. Generally, when a residential subdivision is approved, local overland flows from the catchment are designed to be conveyed within the road system in a safe and acceptable manor and not through private lots unless an easement for drainage is provided to allow for the passage of overland flows through such lots.

It is suggested that the Hydraulic Engineer make contact with Council to ensure all available information from adjoining subdivisions was utilised when undertaking the flood study. Council will be able to provide scanned PDF plans of the adjoining subdivisions including drainage catchment plans and hydraulic calculations. Please contact the following representative from Council's Engineering Services Department to obtain any additional information:

**Stephen Masters**  
**Senior Engineer Major Developments**  
**M 0423781518**  
**E [stephen.masters@penrith.city](mailto:stephen.masters@penrith.city)**

## Roadworks

- Any works within the road reserve will require a separate Section 138 Roads Act approval from Penrith City Council as the Roads Authority under the Roads Act. A Section 138 Roads Act application shall be made to Penrith City Council for the raised pedestrian thresholds, modifications to any kerb & gutter or stormwater pits, vehicular crossings, and lead in public utility services. Any application for a Roads Act approval shall include detailed engineering plans that address the following requirements:
  - The design of the raised pedestrian crossing thresholds in Deerubbin Drive and in Darug Avenue shall not have any adverse impact upon the street drainage system nor any overland flow paths that may be conveyed within the street system.
  - The raised pedestrian crossing threshold in Darug Avenue shall not conflict with the existing kerb inlet pits and lintels, nor have any adverse impact upon inlet capacity.
  - It is noted that the development proposes to widen the existing car parking bays along the frontage of Darug Avenue to accommodate an on-street accessible parking pick-up / drop off bay. It is Council's preference that any accessible parking drop off areas be provided on-site. If the accessible parking bays are to be provided on the street, then the bays shall comply with AS2890.6, requiring widening of the existing parking bay by approximately 0.7m resulting in the loss of street trees. It is Council's preference that the verge area be widened by 0.7m so as street trees can be incorporated into the street scape. Having compensatory plantings within the school grounds, that will be located behind a large palisade fence, will detract from the streetscape.
  - Any kerb extension / blister treatment / raised threshold treatment in Darug Avenue shall include vehicular turn paths for all turning movements for a 12.5m Heavy Rigid Vehicle at the intersection with Deerubbin Drive.
  - Details of any pedestrian fencing are to be included.
  - The proposed bus bay may impede pedestrian sight lines at the raised pedestrian crossing threshold when a bus is stationary in the bus bay. Pedestrian and vehicular sight distances at the raised crossing are to be assessed and shall include assessment of a bus parked within the bus bay.
  - Details of the existing bus stop and boarding point are to be included. If the bus boarding point is to be relocated, the applicant shall contact Busways to seek approval.



- Details of regulatory 'No Stopping' zones for the raised pedestrian crossing threshold are to be included.
- Any signage and line marking within the public road will require approval from Council's Local Traffic Committee.
- Any driveways / vehicular crossings shall be located a minimum of 1m from any lintel of a kerb inlet pit and a minimum of 1m from any public utility service lids/covers.
- Bus shelters shall be provided at the existing bus stops on Darug Avenue south of Deerubbin Drive as part of the development.

### **Street Lighting**

- Any raised pedestrian threshold and associated marked crossings are to be lit in accordance with Australian Standards.

### **Earthworks**

- No retaining walls or filling is permitted for this development which will impede, divert or concentrate stormwater runoff passing through the site.

### **TRAFFIC MANAGEMENT AND PARKING:**

- A Signage and Line marking Plan is required to be included with SSD materials submitted and would likely include Bus Zone signage, No Parking signage (for kiss & ride), any unrestricted parking fronting site (rationale, if none, to be included in traffic report).
- The approved location of the Derrubbin Drive crossing as approved within Development Consent No. DA19/0348 should be verified and reflected within the plans as progressed. Information relating to this DA is available on the State Governments Sydney Western City Planning Panel website or Council's DA Tracker. Refer to Condition 79 within the SWCPP Assessment Report

<https://www.planningportal.nsw.gov.au/planning-panel/mixed-use-development-5>

The design of this crossing should be a raised threshold (wombat) crossing as depicted in plans presented during the meeting.

- Regarding the Darug Ave proposed pedestrian crossing point, Council recommends that the proponent undertake community consultation.
- The proposal must also ensure that proposed kerbside blister islands do not unduly impact the effective operation of existing kerb inlet pits.

- Pedestrian fencing adjacent to crossings (to corral peds to crossing point) would be appropriate and should be included on plans.
- During the meeting it was suggested that a reliance on Council's car parking may be investigated however as outlined during the meeting, it was considered from a planning and traffic perspective that any development (even a school) should provide sufficient onsite parking to cater for staffing needs without reliance on an adjacent car park which is provided for the community in support of recreational use of adjacent lands. This suggestion would also likely exacerbate on-street congestion resulting in greater competition for available on-street car parking spaces.
- Council requests a detailed Traffic Report be provided for assessment purposes, even though Council is not the determining authority, as it will assist Council in planning appropriate signage and ancillary works (particularly for adjacent sites) and provides further opportunity for feedback on the SSD. The report should include (but not be limited to) the following:
  - Detail modal share/split and rationale.
  - Include expected traffic generation (numbers of staff and parents) – percentage of car park coverage for staff accessing the site.
  - Address parking (onsite and offsite), demonstrating staff car parking requirements and how this is met onsite.
  - Detail proposed drop off pick up arrangement (signage, timing, etc). Will it operate both morning and afternoon and/or are there alternative arrangements that could work such as allowing longer term parking of an afternoon?
  - Detail proposed pedestrian connections.
  - Access points/gates (including gate to sporting field, how will this operate).
  - Include resident consultation results re: proposed Darug Avenue ped crossing in Traffic Report (we can then take it to LTC).
  - Accessible drop off to comply with clearances/shared zone requirements AS2890.6. and kerb ramp placements for wheelchairs. Must be demonstrated.
  - Waste vehicle swept paths to/from the site, as well as internal manoeuvring swept paths.

## **ENVIRONMENTAL MANAGEMENT:**

- The Environmental Impact Statement must address all applicable environmental considerations relating to the site and the proposed use. This includes an Acoustic Assessment noting the provision of outdoor play areas and any plant associated with the school operations.

- The application should be accompanied by a contamination assessment statement that addresses SEPP 55 considerations and ensures that the site is suitable or can be made suitable for the proposed use. It must be noted that via the overlay of SREP 20 and SEPP 55 clause provisions, requires that any remediation proposed on the site would require development consent and the submission of a remedial action plan in support of the application.

## **PLANNING & LANDSCAPING**

- The spatial arrangement of the built form is generally supported due to the presentation and activation of Deerubbin Drive and its interface with the approved mixed development to the north. The architectural building form and COLA features provide a deference in height and articulation which is supported noting that the landscape design will be critical in the ultimate streetscape outcomes achieved. It requested that Council's Landscape Architect be afforded an opportunity to review draft Landscape Plans prior to SSD Application lodgement.
- The proposed finished floor and ground levels and resulting ramping at the intersection of Deerubbin Drive & Darug Avenue will require sufficient planting density and maturity to ameliorate the presentation of any walls or elevated walkways as viewed from this critical intersection.
- The provision of sufficient on-site parking is considered a critical element to be addressed in this application. While that parking may be limited to staff only, this is considered necessary without sole reliance on Council's adjacent car park. Further, the separation distance of parking from the Stage 1 building works is of concern given the distance is approximately 150m and would be 200m if the adjacent car park was utilised. Considerations of safety, security and lighting would be critical, not to mention accessibility and accessible staff parking provision. Any investigations for access and use of the adjacent Council car park would require engagement with Council's Property Team and may necessitate a lease agreement or similar arrangement. Please liaise with Jarrod Murphy (Council's Program Manager - Business Development and Acquisitions) on (02) 4732 8082 if you wish to pursue these discussions.

- The Penrith LEP 2010 provides a maximum building height of 15m and it should be demonstrated that the proposal complies with this requirement. The proposal should also address the relevant provisions within the Penrith Development Control, Plan 2014 – Part E7 – Glenmore Park (Part B) Stage 2

## **WASTE MANAGEMENT:**

- **Service Classification:** The following controls relate to developments outlined within Part D – Land Use Controls of the Penrith Development Control Plan 2014.
- **Integrated On-site Waste Collection:** Waste collection vehicles proposed to service commercial and industrial developments are to be designed in accordance with the vehicle specifications outlined in section 3.5 of the *'Industrial, commercial and mixed-use waste management guideline'* document.

### On-site Collection (section 2.2.1)

The vehicle must be able to safely and efficiently access the site and the nominated collection point to perform on-site waste collection. There must be sufficient manoeuvring area on-site to allow the collection vehicle to enter and exit the site in a forward direction and service the development efficiently with little or no need to reverse.

### Architectural Plans (section 2.2.2)

Scaled architectural plans are required to support the development application which demonstrate the site's entry point, vehicle's route of travel and manoeuvring comply with a standard waste collection vehicle (section 3.5).

### Swept Path Models (section 2.2.3)

Swept path models to be provided illustrating how a standard waste collection vehicle (section 3.5) will enter, service and exit the site. A 0.5m unobstructed clearance is required from all obstructions for the vehicle's ingress and egress manoeuvres. The model to provide on-street parking on both sides of the road adjacent to the development to demonstrate unobstructed access during a 'business as usual' configuration.

### Service Clearances (section 2.2.4)

For rear loaded vehicles an additional 2m unobstructed loading zone is required behind the vehicle for the loading of 660L and 1,100L bins. Additionally, a 0.5m side clearance is required on either side of the vehicle for driver movements and accessibility.

### Plan of Operations (2.2.6)

All development applications to be submitted with accompanying 'Plan of Operations', outlining proposed; Bin Infrastructure Sizes, Collection Frequency, Waste Collection Vehicle Dimensions, Hours of Collection and Access to Waste Collection Room.

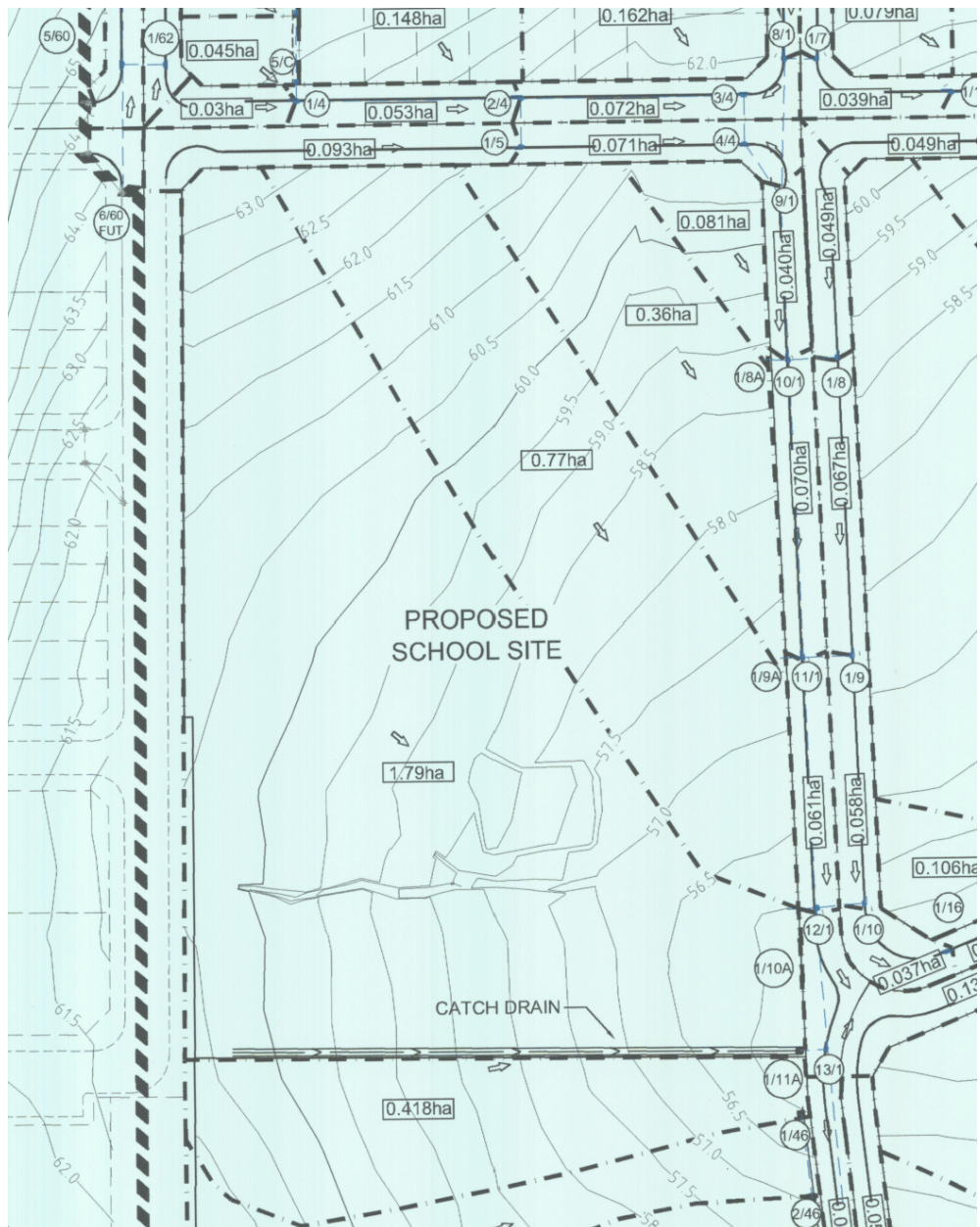
- **Waste Collection Infrastructure:** Waste collection infrastructure to be provided in accordance with section 3.1 of the '*Industrial, commercial and mixed-use waste management guideline*' document.
- **Waste Generation Rates:** Proposed generates rates for respective developments are required to be provided to permit waste collection in accordance with section 3.3 of the '*Industrial, commercial and mixed-use waste management guideline*' document.
- **Waste Collection Rooms**  
All developments are required to provide a waste collection room integrated wholly within the developments built form to permit a safe and efficient waste collection service. The room to incorporate the following into its design in accordance with section 3.4 of the '*Industrial, commercial and mixed-use waste management guideline*' document.
- **Waste Infrastructure Guidelines**  
For further specific waste operational and infrastructure information refer to the '*Industrial, commercial and mixed-use waste management guideline*' document attached:  
<https://www.penrithcity.nsw.gov.au/Building-and-Development/Development-Applications/Forms/>

## **Key Land Based Considerations**

Bushfire Prone Land will likely require lodgement of a Bushfire Assessment Report.

Flood Affected Land will require floor levels to Australian Height Datum (AHD).

Impacts to native vegetation (including grassland) will require an assessment under the NSW Biodiversity Offset Scheme and may require a Biodiversity Assessment Report or a Test of Significance.



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# **Appendix C**

## **Council Flood Advice**



## Alexander Phillips

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**From:** Caleb O'Reilly <Caleb.O'Reilly@penrith.city>  
**Sent:** Thursday, 21 January 2021 12:11 PM  
**To:** Alexander Phillips  
**Cc:** Justin Chirillo  
**Subject:** Engineering Advice - 1-23 Forestwood Drive, Glenmore Park (Lot 1663 DP 1166869) - Flood Advice  
**Attachments:** Penrith\_Overland\_Flow\_Overview\_Study Exclusion.pdf

Hi Alex,

As discussed over the phone, 1-23 Forestwood Drive, Glenmore Park (Lot 1663 DP 1166869) is not currently identified as flood effected by the 1% AEP design storm event. This information is based on data available to Council on the date of this email and may change in the future if new information becomes available.

If you have any further questions feel free to contact me.

Kind Regards,

**Caleb O'Reilly**  
Trainee Engineer

E [Caleb.O'Reilly@penrith.city](mailto:Caleb.O'Reilly@penrith.city)  
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**From:** Alexander Phillips <aphillips@woolacotts.com.au>  
**Sent:** Thursday, 21 January 2021 9:40 AM  
**To:** Caleb O'Reilly <Caleb.O'Reilly@penrith.city>  
**Cc:** Justin Chirillo <JChirillo@woolacotts.com.au>  
**Subject:** 1-23 Forestwood Dr, Glenmore Park - Flood Query

**EXTERNAL EMAIL: This email was received from outside the organisation. Use caution when clicking any links or opening attachments.**

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Hi Caleb,

I am currently working on the civil concept design for a Department of Education development at 1-23 Forestwood Drive, Glenmore Park and had a question regarding flooding.

Woolacotts have been unable to locate a Flood Study which includes The Site area. Has a separate flood study been prepared for the southern end of Glenmore Park where The Site is located?

The Site area is currently excluded from the Penrith Overland Flow Study by Cardno (2006), as seen in the attached extract. Additionally, further investigation has shown that The Site area has also not been covered by the following flood studies:

- Nepean River Flood Study – Final Report by Advisian, dated November 2018
- South Creek Floodplain Risk Management Study by Advisian, dated August 2019 (Exhibition Draft)
- Peach Tree and Lower Surveyors Creek Flood Study - Final Report by Catchment Simulation Solutions, dated April 2019
  - Although the Site area is included in the catchment map

Please advise if you have any additional information that may assist, thanks.

Regards,

**Alexander Phillips** | Associate Structural & Civil Engineer

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# **Appendix D**

## **Flood Summary Letter**

Our reference: 20-306

27 July 2021

Penrith City Council  
PO Box 60  
Penrith NSW 2751  
C/O – Colliers International

Attn: Stephen Masters

Dear Stephen,

**RE: NEW PRIMARY SCHOOL IN MULGOA RISE – OVERLAND FLOW FLOODING SUMMARY**

**Introduction**

A new primary school is proposed at Mulgoa Rise / Glenmore Park (hereon referred to as 'The Site'). The Site is currently undeveloped. The proposed works includes a facility which can accommodate in the order of 1000 students. However, the proposed development involves the construction and operation of a new public primary school that will initially accommodate 414 students.

The Site is bounded to the north by Deerubbin Drive, to the south by Forestwood Drive, to the west by Darug Avenue and to the east by the existing Mulgoa Rise Sports Fields and on-grade carpark. The site is located within a parent subdivision, consisting of predominately low-density residential dwellings. The subject site is shown in Figure 1 below.

Woolacotts Consulting Engineers (hereon referred to as 'Woolacotts') were engaged to undertake the civil design for the proposed new primary school.



*Figure 1 New Primary School in Mulgoa Rise Site – Aerial Image. Source: Sixmaps (2021)*

**WOOLACOTTS CONSULTING ENGINEERS PTY LTD**  
ABN 61 139 113 036

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[www.woolacotts.com.au](http://www.woolacotts.com.au)

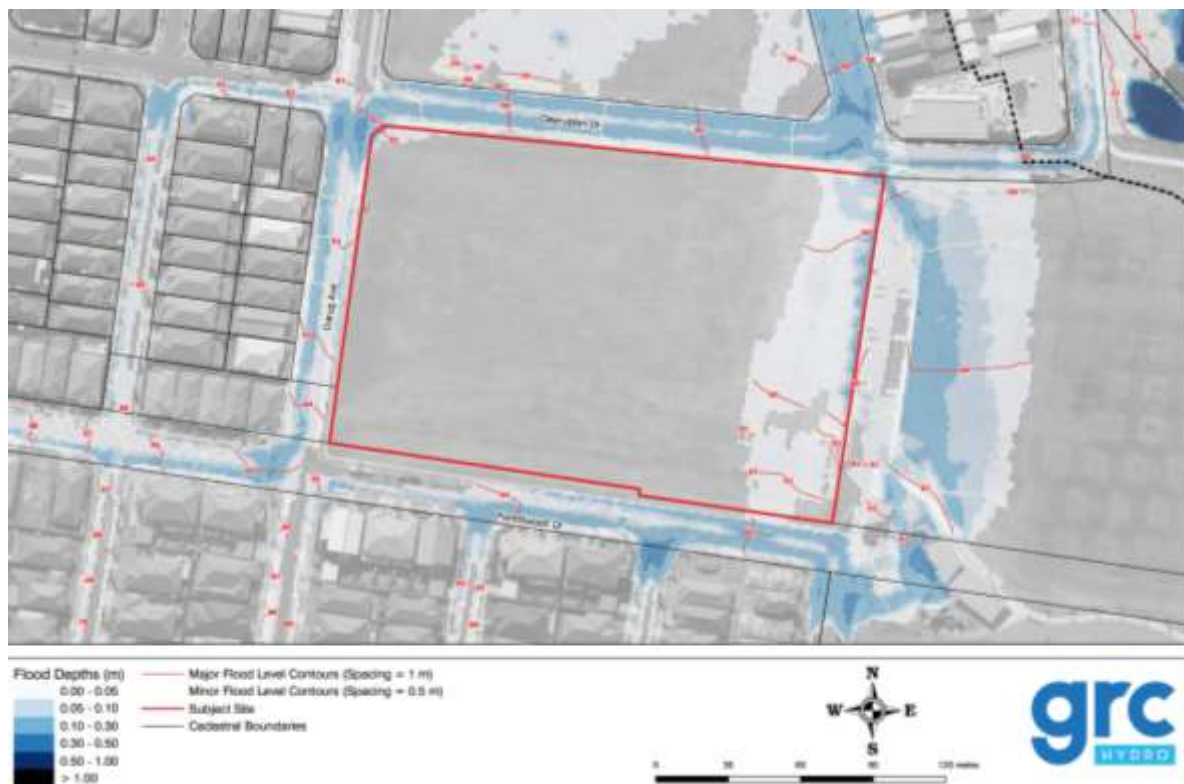
## **Flooding Background**

Initial investigations undertaken by Woolacotts indicated that The Site is potentially affected by local overland flow flooding. As result, Woolacotts carried out preliminary one-dimensional flood analysis. The results of this analysis indicated that Forestwood Drive, Darug Avenue and Deerubbin Drive all had insufficient channel capacity to fully contain the 1% Annual Exceedance Probability (AEP) flood event leading to overland flow flooding travelling through The Site and adjacent properties. However, due to the size of the catchment and complexity of the road network, two-dimensional flood modelling was required to accurately depict the capacity of the existing roadways.

Woolacotts liaised with Penrith City Council (hereon referred to as 'Council') on the 30<sup>th</sup> March 2021, who advised that Council did not have two-dimensional flood model of the area. Refer Attachment 1 email correspondence. As such, Woolacotts engaged GRC Hydro to undertake two-dimensional overland flow flood modelling of The Site and surrounding area using TUFLOW analysis software. TUFLOW analysis software is widely used and is considered best practice under the NSW Floodplain Risk Management Program.

## **Results of Flood Analysis**

The results of the two-dimensional flood modelling indicated that Forestwood Drive, Darug Avenue and Deerubbin Drive had insufficient channel capacity to fully contain the 1% AEP flood event leading to overland flow flooding travelling through The Site and adjacent properties. Refer Figure 2 below for the 1% AEP flood extents and Attachment 2 for the Flood Impact Assessment prepared by Woolacotts.



*Figure 2 1% AEP Flood Extents*

### Pedestrian Crossings on Surrounding Roads

The proposed development will include pedestrian crossings on Darug Avenue, Deerubbin Drive and Forestwood Drive. Refer Figure 3 below for the location of the pedestrian crossings.



*Figure 3 Pedestrian Crossing Locations*

It was originally proposed to provide raised pedestrian crossing thresholds in Deerubbin Drive, Darug Avenue and Forestwood Drive. The Pre-Lodgement Advice (dated 25<sup>th</sup> March 2021) for the new primary school in Mulgoa Rise states “The design of the raised pedestrian crossing thresholds in Deerubbin Drive and in Darug Avenue shall not have any adverse impact upon the street drainage system nor any overland flow paths that may be conveyed within the street system.” Refer Attachment 3 for the Pre-Lodgement Advice.

For the 1% AEP flood event, the provision of raised pedestrian crossing thresholds in Deerubbin Drive, Darug Avenue and Forestwood Drive will reduce the channel capacity of the roadway to convey the overland flow from the major storm event. As indicated in Figure 2, all three roadways currently have insufficient channel capacity to fully contain the 1% AEP flood event. Therefore, reducing the roadway’s channel capacity through the provision of raised pedestrian crossing thresholds will result in additional depth of flooding entering The Site and neighbouring properties and will impact the required building FFLs.

As a result, alternate details for the pedestrian crossings in Deerubbin Drive, Darug Avenue and Forestwood Drive are to be adopted that satisfy the required traffic engineering aspects but do not impact the risk of overland flow flooding on adjacent properties during the 1% AEP flood event.

Please request any further information you may require.

**Yours faithfully,**

**Woolacotts Consulting Engineers**

A handwritten signature in black ink, appearing to read 'A Phillips', with a stylized, flowing script.

**Alexander Phillips**

BE MIEAust CPEng

NER Civil – Membership No. 4192513

Attachment 1 – Email Correspondence with Council

Attachment 2 – Flood Impact Assessment

Attachment 3 - Pre-Lodgement Advice



## Alexander Phillips

---

**From:** Alexander Phillips  
**Sent:** Wednesday, 31 March 2021 10:35 AM  
**To:** Stephen Masters  
**Cc:** Maughan-Wright, Anthony; Tom Hemmett; Anthony Mayo; Mitton, Jock  
**Subject:** RE: Mulgoa Rise Public School - Local Overland Flows and Water Quality Requirements

Good morning Stephen,

Thank you for your time on the phone yesterday. As per our discussion, please see below:

1. Currently there is no two-dimensional flood model for the subdivision area. However you have drainage, catchment and Work-As-Executed plans that you will be providing to us for our review.
2. Considering the parent subdivision works, water quality modelling (using the program MUSIC) is not required for the site. However, we will provide site specific WSUD measures including rainwater reuse, litter baskets in grated inlet pits, small grassed swales and grassed buffer strips.

Regards,

**Alexander Phillips** | Associate Structural & Civil Engineer

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---

**From:** Alexander Phillips  
**Sent:** Tuesday, 30 March 2021 10:29 AM  
**To:** Stephen Masters <stephen.masters@penrith.city>  
**Cc:** Maughan-Wright, Anthony <Anthony.MaughanWright@colliers.com>; Tom Hemmett <HemmettT@richardcrookes.com.au>; Anthony Mayo <mayoa@richardcrookes.com.au>; Mitton, Jock <Jock.Mitton@colliers.com>  
**Subject:** Mulgoa Rise Public School - Local Overland Flows and Water Quality Requirements

Good morning Stephen,

I tired calling earlier to discuss two items raised in the Mulgoa Rise Public School Pre-DA meeting, specifically overland flow flooding and water quality requirements

1. **Overland flow flooding** – A large external catchment is directed towards the site as per the attached “External Catchment Area”. Our preliminary one-dimensional analysis indicated that both Forestwood Drive and Darug Avenue had insufficient channel capacity to fully contain the 1% AEP flood event leading to overland flow flooding travelling through the site. However, due to the size of the catchment and complexity of the road network, two dimensional flood modelling is required to accurately depict the capacity of the existing roadways. Do you have a two dimensional flood model for this area which shows that the 1% AEP flood event is fully conveyed within the road system and that the site is not affected by local overland flow flooding? And if so, could you please provide us with a copy of this model.
2. **Water Quality Requirements** – The Pre-DA meeting minutes indicate that water quality and water quantity have been provided as part of the parent subdivision works. However, it is also stated that a WSUD strategy is required for the site to address water conservation, quality and quantity. Could further guidance be



provided on the WSUD requirements for the site considering the water quality / quantity parent subdivision works.

If you require any further clarification on the above, please give me a call.

Regards,

**Alexander Phillips** | Associate Structural & Civil Engineer

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