

Civil Engineering Design Report

New High School for Jordan Springs

Prepared for NSW Department of Education / 18 December 2024

241459

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Rev	Date	Prepared By	Approved By	Remarks
0	15/11/2024	JL	CR	Schematic Design – Issued for Tender
1	22/11/2024	JL	CR	Final Draft – Issue for REF
2	05/12/2024	JL	CR	Final Draft – Issue for REF
3	06/12/2024	JL	CR	Final Draft – Issue for REF
4	13/12/2024	JL	CR	Final Draft – Issue for REF
5	18/12/2024	JL	CR	Final Draft – Issue for REF

1.0 Introduction

This Civil Engineering Design Report has been prepared to accompany a Review of Environmental Factors (REF) for the Department of Education (DoE) for the construction and operation of a New High School for Jordan Springs (the activity) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI).

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments – Consideration of environmental factors for health services facilities and schools, October 2024* (the Guidelines) by the Department of Planning, Housing and Infrastructure.

This report examines and takes into account the relevant environmental factors in the Guidelines and *Environmental Planning and Assessment Regulations 2021* under Section 170, Section 171 and Section 171A of the EP&A Regulation as outlined in Table 1.

Table 1: Summary of Relevant Section of the Part 5 Guidelines and EP&A Regulation

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Regulation/ Guideline Section	Requirement	Response	Report Section
Part 8 Section 171.2a	Consider any environmental impact on the community.	The water sensitive urban design (WSUD) includes erosion and sediment control measures as part of the temporary water quality management, along with rainwater tanks and gross pollutant traps (GPTs) as permanent water quality controls. This, in conjunction with the proposed precinct wide stormwater treatment, will ensure protection of neighbouring properties and downstream waterways from pollution associated with stormwater quality.	8.2, 8.3
Part 8 Section 171.2h	Consider any long-term effects on the environment.	The proposed activity, being part of Lendlease's Stage 5 precinct, incorporates a precinct-wide stormwater drainage plan to ensure stormwater flows for all events up to and including the 1% ARI from the school site will have no adverse impact upon the downstream properties and existing waterbodies.	8.1.2, 8.1.3, 8.2, 8.3
Part 8 Section 171.2i	Consider any pollution of the environment.	The WSUD includes erosion and sediment control measures as part of the temporary water quality management, along with rainwater tanks and GPTs as permanent water quality controls.	8.2, 8.3

		This, in conjunction with the proposed precinct wide stormwater treatment, will ensure protection of neighbouring properties and downstream waterways from pollution associated with stormwater quality.	
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1.1 Documentation Review

The following documents have been reviewed and referenced in preparing this report:

- Penrith City Council (PCC) Development Control Plan (DCP), 2014 - C3 Water Management;
- Penrith City Council (PCC) Stormwater Drainage Guidelines for Building Development, 2016;
- Blue Book – Managing Urban Stormwater Soils and Construction (Landcom NSW);
- NSW Department of Education Educational Facilities Standards and Guidelines;
- Australian Rainfall and Runoff 2019.

The following plans/reports identified in **Table 2** have been reviewed to inform the assessment contained within this report:

Table 2 – Plans and reports reviewed			
Discipline	Document name	Revision	Date
<u>Surveying</u>	Part 1 – Desktop Analysis Review for the Proposed New High School Jordan Springs by Astrea	B	9 May 2024
<u>Surveying</u>	Subsurface Utility Investigation by Astrea	N/A	18 April 2024
<u>Geotechnical</u>	Intrusive Geotechnical Investigation Report (Ref No. 305001663) by Stantec	3	14 November 2024
<u>Geotechnical</u>	Geotechnical DD- Preliminary Desktop Geotechnical Review (PDGR) by Stantec	2	29 April 2024
<u>Geotechnical</u>	Preliminary Desktop Site Investigation Report (Ref. No. 304100928) by Stantec	1	5 April 2024
<u>Geotechnical</u>	Geotechnical Assessment for the Proposed New High School, Jordan Springs, NSW by Green Geotechnics	N/A	29 February 2024
<u>Geotechnical</u>	Geotechnical Assessment for the Proposed New High School, Jordan Springs, NSW by Green Geotechnics	N/A	13 September 2023
<u>Civil</u>	Jordan Springs East – Stage 5 Civil Engineering Report by Enspire	1	28 May 2024
<u>Civil</u>	Jordan Springs East – Stage 5 Civil Engineering Drawings by Enspire	3	31 May 2024
<u>Civil</u>	Jordan Springs East Precinct Stormwater Quality	05	30 November 2020

	Management Report by Cardno		
Civil	Stormwater Detention Strategy (Central Precinct) by Cardno	2.0	23 January 2017

This report is to be read in conjunction with the following:

- New High School for Jordan Springs – Transport Access Impact Assessment Report by SCT Consulting;
- New High School for Jordan Springs Flood Impact and Risk Assessment by BMT;
- New High School for Jordan Springs Flood Emergency Response Plan by BMT;
- New High School for Jordan Springs Architectural Drawings by DJRD;
- New High School for Jordan Springs Landscape Drawings by Site Image.

2.0 Proposed Activity Description

The proposed activity for the construction and operation of a New High School for Jordan Springs is proposed to have a capacity of 1,000 students and 80 staff to meet forecast enrolment demand associated with population growth in Jordan Springs and Ropes Crossing. The school will provide permanent General Learning Spaces (GLS), Support Learning Spaces (SLS), staff facilities and a library across three (3), three storey buildings, a single storey hall, sports field, three (3) outdoor sport courts, 72 operational at grade parking spaces (including two (2) accessible spaces), 100 bicycle spaces and landscaping.

Public domain works and the permanent off-site OSD Basin are to be constructed by others under separate planning pathways.

3.0 Proposed Activity Scenarios

The project scope of works includes two (2) Scenarios, to allow construction and operation of the school, with (Scenario 1 – preferred option) or without (Scenario 2 – Interim Solution) the public domain works and permanent off-site basin being constructed by others under a separate planning pathway.

3.1 Scenario 1 – Preferred Option - Road Network completed and permanent OSD Basin Constructed

- **External works undertaken by others to facilitate Scenario 1**
 - Construction of Park Edge Road;
 - Any adjustments to Infantry Street;
 - Kiss and drop zone along Park Edge Road;
 - Support kiss and drop zone located along Infantry Street; and
 - Construction and operation of permanent OSD Basin off site.

Note – Scenario 1 is not to proceed if external works undertaken by others is not completed.

- **Scenario 1**
 - Construction and Operation of the New High School for Jordan Springs, including:
 - Decommissioning of existing on-site OSD basin;
 - Demolition of roads and associated services within the site boundary;
 - Tree removal within the site boundary
 - Earthworks;
 - Three (3) multi-storey classroom buildings;
 - One (1) school hall;
 - Three (3) outdoor sport's courts;
 - One (1) sport's field;
 - 72 at grade car parking spaces, including two (2) accessible parking spaces, and waste services, accessed via Park Edge Road;
 - 100 bicycle parking spaces across the site; and
 - Landscaping.

3.2 Scenario 2 - Interim Solution – Road network not completed, Permanent OSD Basin not constructed.

- **Scenario 2 - Stage 1**
 - Construction and operation of a temporary on-site OSD Basin;
 - Construction and operation of the New High School for Jordan Springs, including;
 - Demolition of roads and associated services within the site boundary;
 - Tree removal within the site boundary
 - Earthworks;
 - Three (3) multi-storey classroom buildings;
 - One (1) sport's field;
 - Temporary carpark - 72 at grade car parking spaces, including two (2) accessible parking spaces and waste services, located on the northwest corner of the site, accessed off Armoury Road;
 - 100 bicycle parking spaces across;
 - Temporary Kiss and drop facilities on Armoury Road; and
 - Associated landscaping.
- **Scenario 2 - Stage 2**

Stage 2 is not to be undertaken until the temporary on-site OSD basin under stage 1 works is completed and operational.

- Decommissioning of existing on-site OSD basin, prior to the following works being undertaken:
 - 72 at grade car parking spaces, including two (2) accessible parking spaces, and waste services, located on the southeast corner of the site. This car park cannot be constructed until the decommissioning of the existing OSD basin is completed and will be non-operational with no road connection until completion of Scenario 2 – Stage 3;
 - One (1) school hall;
 - Three (3) outdoor sport's courts; and
 - Associated landscaping.

External works undertaken by others to facilitate Stage 3

- Construction of Park Edge Road;
- Any adjustments to Infantry Street;
- Kiss and drop zone along Park Edge Road;
- Support kiss and drop zone located along Infantry Street; and
- Construction and operation of OSD Basin off site.

Note – Scenario 2 - Stage 3 is not to proceed until the external works undertaken by others have been completed.

• Scenario 2 - Stage 3

- Connection of the southeast carpark to Park Edge Road;
- Rectification works along Armoury Road to remove temporary kiss and drop facilities and cross over for temporary carpark;
- Demolition of temporary carpark, once permanent car park is operational; and
- Decommissioning of temporary OSD basin.



Figure 1: Contingent Option Site Plan (Source: DJRD)

Refer to Appendix C for the staging plan corresponding to each scenario outlined above.

4.0 Activity Site

The project site is located on the corner of Armoury Road and Infantry Street in Jordan Springs and is legally described as part of Lots 2 and 3 in DP 1248480.

Figure 2 provides an aerial photograph of the project site, outlines the boundaries of the project site (in red) and the boundaries of Lots 2 and 3 in DP 1248480 (in blue).



Figure 2: Aerial Photograph

The project site is within the Central Precinct of the St Mary's Release Area in the Penrith Local Government Area.

4.1 Existing Services

A Before You Dig Australia (BYDA) enquiry has been conducted to identify known in-ground public assets that may impact the site. The utilities survey by Astrea has also been reviewed in preparing this report. For further details, refer to the original report and drawings by Astrea.

The site survey contains locations of existing water, sewer, electricity, gas and communications services. These are proposed to be removed (by others) prior to the schoolworks.

The design must be progressed in accordance with the relevant services consultants' design advice and in consultation with all relevant statutory authorities.

4.2 Geotechnical Conditions

The geotechnical investigation reports by Stantec have been prepared as part of the proposed activity. This civil design report references information from the geotechnical reports relevant to the civil design.

The subsurface conditions across the site were found to contain fill material that generally consists of a mix of gravel, sand, silt, and clay, with occasional cobbles and boulders. The gravel and cobbles, typically sub-angular to angular, include brick, concrete, shale, and sandstone, extending to depths of approximately 2.3m

to 5.5m. Beneath this layer lies alluvial deposits and residual sandy and silty clay extending to depths of 10.15 to 11 meters, overlying a shale layer about 3 meters thick.

Groundwater ingress was encountered during borehole drilling at the site at depths of 4m to 7m in some of the samples. It is noted that variations in groundwater and seepage flows may occur due to changes in rainfall duration and intensity.

Pavement design advice and California Bearing Ratios (CBR) are covered in Section 5.1 of this report.

The detailed site investigation (DSI) identified potential sources of contamination as potentially creating exposure pathways. It is recommended that an intrusive investigation is conducted at the locations proposed for disturbance and new construction.

Refer to the original reports by Stantec for further information.

A geotechnical report for the proposed activity has been prepared by Stantec. The following parameters have been requested in relation to the Civil design:

- Subgrade specifications;
- Permanent and temp batters limits, including any stabilisation requirements;
- Ground improvement specification if required for the site pending investigation results;
- Pavement design advice including CBR's, subgrade improvement if required, and differential settlement;
- Identify any project risks and suggested mitigation measures, e.g. inground obstructions;
- Water table and potential impacts. Comment on suggested waterproofing systems for basements, e.g. tanked, drained, etc, if required for the site; and
- Provide comments on the proposed Lendlease Stage 5 earthworks proposal and specification including imported materials and compaction for the site.

4.3 Infrastructure Works Adjacent to the Site

The surrounding road network and residential developments were installed as part of the Jordan Springs East (JSE) Stage 5 works - delivered by Lendlease. These works include the construction of Armoury Road, Infantry Street, Lasetter Street as well as the existing roads, services and regional detention basin within the school site.

It is understood that reconstruction works to Infantry Street and Lasetter Street are proposed and are subject to a separate DA application (Ref. DA14/1228.02) which also includes the construction of Park Edge Road and a new regional detention basin off site to replace the existing basin within the school.

TTW have reviewed the JSE Stage 5 civil design report and drawings by Enspire and Cardno, as these works will interface with the final school site. These are referenced further in the following sections.

5.0 Other Approvals

External works and construction of the off-site OSD Basin are to be constructed by others.

6.0 Consultation with Local Council

Consultation with PCC has commenced in relation to the stormwater strategy for the proposed activity. A summary of these Council Consultation is provided below.

- 03 October 2024 - Council Stormwater Strategy Pre-meeting.
- 18 June 2024- PCC provided response to stormwater queries.
- 12 June 2024- TTW requested confirmation of stormwater requirements for the proposed activity.

Refer to Appendix A for council correspondence regarding the stormwater requirements for the proposed activity.

7.0 Flooding

TTW have reviewed the Flood Impact Risk Assessment (FIRA) report prepared by BMT. We note that the school site is above the 1 in 100 year flood level and that all proposed buildings are above the 1 in 500 year flood level. Due to the flood susceptibility of surrounding roads, a Flood Emergency Response plan (FERP) has been prepared by BMT. Since any extreme flooding events would develop slowly at this site, the recommended primary emergency response would be to close the school.

Refer to the original FIRA and FEMP reports for further detail.

8.0 Stormwater

8.1 Stormwater Quantity

8.1.1 Existing Stormwater

The site is a greenfield site with a total area of approximately 5.8 hectares. The existing site is considered to be approximately 90% pervious, with 10% of the site being the existing impervious internal roads.

The survey investigation identified in-ground stormwater drainage systems within the proposed internal roads. The stormwater network is highlighted in yellow in **Figure 3** below. These existing stormwater networks and existing basin are understood to be removed, and a new basin is to be constructed south of Infantry Street as part of the proposed JSE Stage 5 works prior to the construction of the school.

If the new basin by others is not installed ahead of the works, a temporary detention basin will be provided on-site, as outlined in section 3.2.

The northern part of the site is currently served by 375mm diameter pipes which drain to the existing detention basin. The southern portion of the site is served by additional 375mm pipes that discharges to an existing pit at the south-eastern side of the boundary. Both discharge points are believed to be ultimately discharging to South Creek.

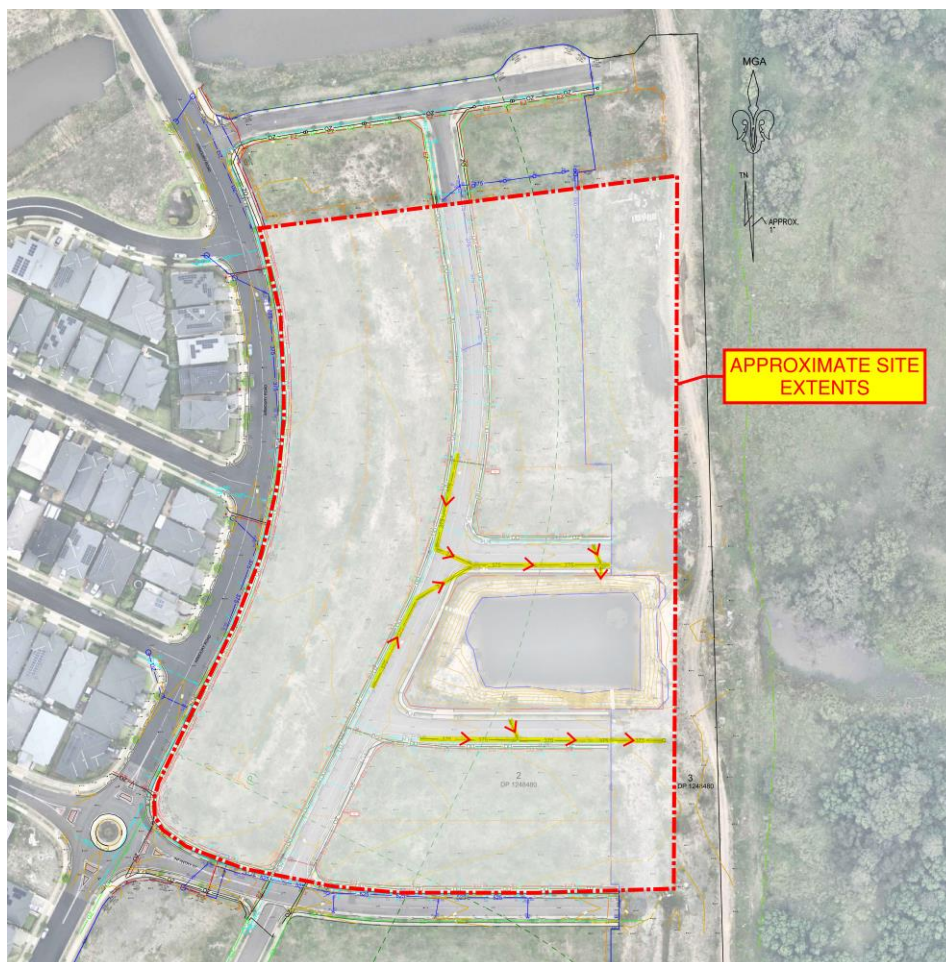


Figure 3: Site Utility Services Survey

8.1.2 Proposed Stormwater Design

The proposed stormwater design is to be in accordance with the relevant Australian Standards, Australian Rainfall and Runoff 2019 (ARR 2019), the Council's DCP, Council's Stormwater Drainage Guidelines for Building Developments and SINSW's EFSG requirements.

Council's DCP requires that an adequate stormwater system shall be designed and constructed to ensure that new works do not increase stormwater peak flows in any downstream areas for all storm events up to and including the 100-year average recurrence interval (ARI).

The stormwater design can be separated into two categories – roof stormwater and surface stormwater. All roof stormwater will be collected through the use of gutters and downpipes and directed to rainwater tanks for reuse for landscape irrigation. The overflow from rainwater tanks is conveyed to the in-ground pipes system for surface stormwater up to and including the 20% Annual Exceedance Probability (AEP) storm event. All surface stormwater shall be collected by a series of surface inlet pits and in-ground pipes. Stormwater flows in excess of the 20% AEP will be directed safely through overland flow paths to the eastern side of the site.

A number of possible stormwater connection points for the site are also shown in the JSE - Stage 5 civil engineering drawings by Enspire along the road corridors to the west, east and south-east corner of the site. A stormwater schematic design has been prepared by TTW and is provided in Appendix B. Five stormwater connections have been proposed and will be further reviewed and confirmed in the detailed design stage.

8.1.3 Onsite Stormwater Detention

Council's DCP Section C3: Water Management and Stormwater Drainage Guidelines stipulates that On-site Detention (OSD) systems are to be designed using a catchment wide approach and requires advice to be sought from PCC's Development Engineering Unit.

The Central Precinct Stormwater Detention Strategy report prepared for Lendlease by Cardno and the Jordan Springs East – Stage 5 Civil Engineering report prepared by Enspire have also been reviewed in writing this report.

As shown in **Figure 4** below, the proposed new school site is part of Lendlease's Stage 5 development with a regional stormwater drainage strategy for the catchment areas. It is therefore anticipated that a specific OSD for the proposed new school site will not be required on the basis that it has already been allowed for in the precinct wide stormwater strategy. Further information has been requested from the developer (Lendlease) to confirm this.

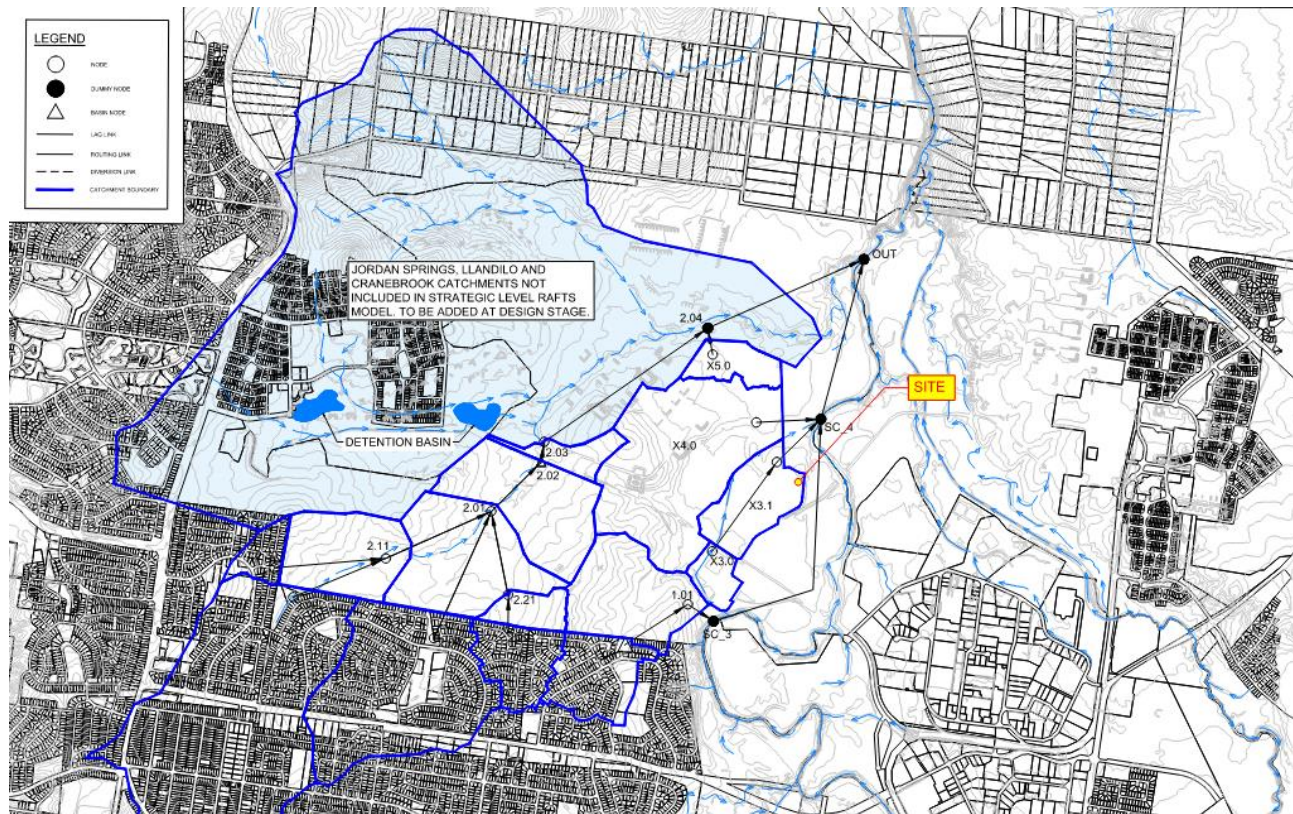


Figure 4: Extract of Central Precinct Pre-development Rafts Network and Catchment Plan (Cardno, 2017)

In accordance with the JSE – Stage 5 Civil Engineering Report (Enspire), the existing detention basin (referred to as Basin E) within the proposed school site is to be relocated south of Infantry Street, outside the proposed new school boundary. **Figure 5** below shows the proposed new location of basin E. It is also noted in the report that most of the northern part of the school (within catchment D – shaded pink) will drain directly into the riparian corridor to the east, whereas the south-eastern remainder of the site (within catchment C – shaded purple) will drain to the relocated basin E.

8.1.4 Additional Works: Scenario 2

A strategy has been developed to relocate the existing Basin E within the site as a temporary measure to allow construction of the school. The temporary basin would be constructed in Stage 1 of Scenario 2 works (refer to staging plans in Appendix C) and is proposed to match the detention volume of the existing basin. The basin volume is subject to confirmation from Council. It is proposed to be located at the north-eastern corner of the site as shown on the civil drawings. The temporary basin is included in the scenario 2 works described in Section 3.2 and will operate under pumped discharge to the natural discharge point to the east of the site until the Park Edge Road is constructed by others.

The basin will be backfilled once the permanent downstream detention facility is constructed off site by others (Scenario 2, stage 3). An estimate of earthworks quantities for the different scenarios is included in Section 8.2.



Figure 5: Extract of Proposed Basin Relocation and Catchments (Enspire, 2024)

8.2 Stormwater Quality

Stormwater quality treatment is required to comply with the requirements outlined in Section C3.2 Catchment Management and Water Quality of the PCC DCP 2014. Council aims to protect and improve water quality in groundwater and water systems, reduce flood risk and erosion, and integrate stormwater management design with water conservation strategies and treatment. Council's stormwater quality targets are depicted in **Figure 6** below.

- i) 90% reduction in the post development mean annual load total gross pollutant (greater than 5mm);
- ii) 85% reduction in the post development mean annual load of Total Suspended Solids (TSS);
- iii) 60% reduction in the post development mean annual load of Total Phosphorus (TP);
- iv) 45% reduction in the post development mean annual load of Total Nitrogen (TN);
- v) 90% Free Oils and Grease with no visible discharge.

Figure 6: PCC Water Quality Targets

The Jordan Springs East Precinct Stormwater Quality Management report prepared by Cardno and the Jordan Springs East – Stage 5 Civil Engineering report prepared by Enspire have been reviewed in writing this report.

Figure 7 below shows that the site is within the precinct wide stormwater quality strategy developed by Cardno. It has been modelled using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) to ensure pollutant load target reductions are met during continued site operation. The MUSIC modelling treatment train and results are shown in **Figure 8** demonstrating that the Stage 5 precinct in its entirety meets the Council stormwater quality targets by including the following stormwater quality improvement devices:

- Rainwater tanks on all residential lots;
- GPTs at each low flow outlet;
- 7 x regional bioretention basins;
- A vegetated riparian corridor from south to north throughout the precinct; and
- A vegetated northern channel (in Stage 6).

In order to ensure that the proposed activity does not adversely impact stormwater quality, it is proposed to provide rainwater tanks and GPTs as part of the school stormwater network. This approach is relevant to both Scenario 1 and Scenario 2.

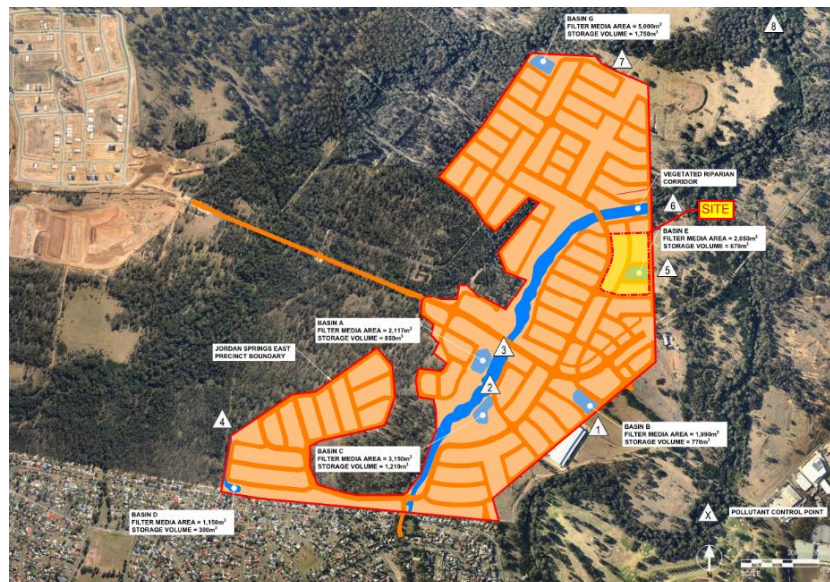
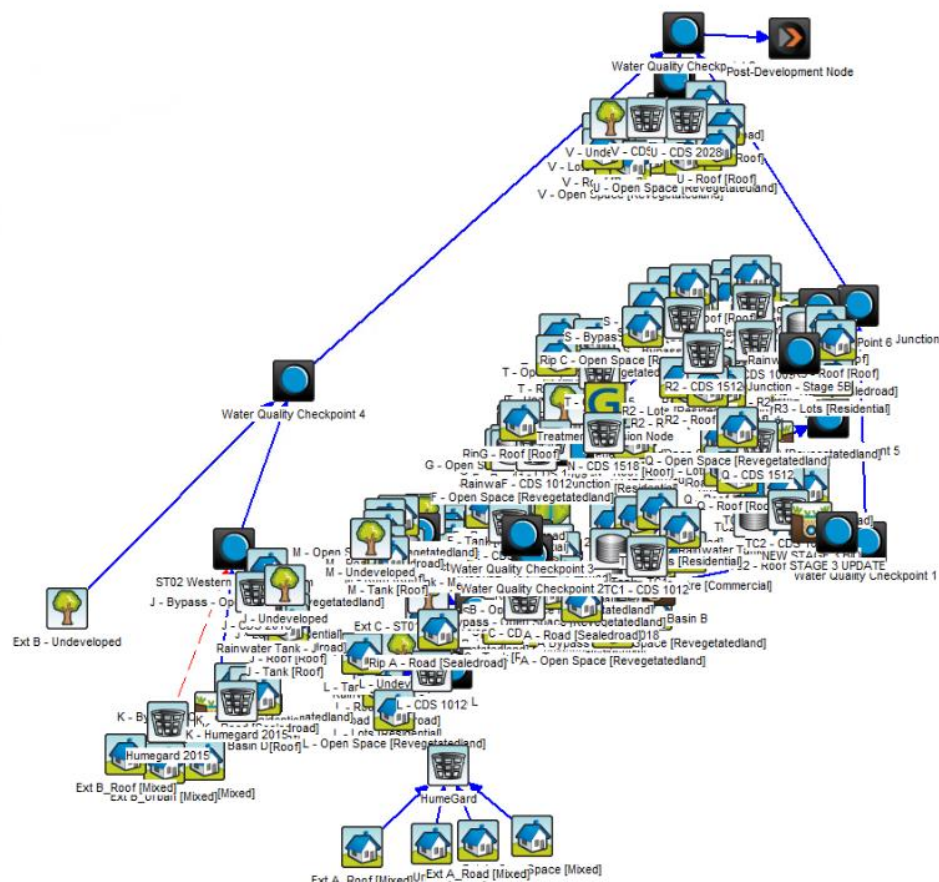


Figure 7: Jordan Springs East Stormwater Quality Management Strategy (Cardno, 2020)



Pollutant	Source Load	Residual Load	Pollutant Load Reduction	Council Reduction Target
Total Suspended Solids (kg/yr)	129,000	17,900	86.2%	85%
Total Phosphorus (kg/yr)	245	91	63.1%	60%
Total Nitrogen (kg/yr)	1650	904	45.5%	45%
Gross Pollutants (kg/yr)	21,800	384	98.2%	90%

Figure 8: Jordan Springs East MUSIC Modelling and Results (Source: Enspire, 2024)

8.3 Erosion and Sediment Control

An erosion and sediment control plan (ESCP) will be implemented during the construction stage to mitigate soil erosion and control the discharge of stormwater laden with sediment, nutrients and other pollutants to adjoining properties, bushland, roadways or receiving water bodies. Stormwater controls on site are detailed in ESCPs which are in accordance with Council's DCP and regulatory authority guidelines including Landcom NSW's Managing Urban Stormwater, Soils and Construction ("Blue Book").

The disturbance of the site during construction must be controlled through erosion prevention and sediment control measures. Typical provisions for a site of this type and scale would include:

- Silt fences to prevent silt and waste being washed into neighbouring sites and streets and may be integrated with safety fencing;
- Catch drains with hay bales to carry and treat site runoff.
- Sedimentation basin(s) to be installed at the low point of site excavation.

- Shaker grids at the construction site entrance(s) to ensure that vehicles and machinery leave the site with clean wheels.
- Pits will have silt protection installed to prevent silt from entering the stormwater system during construction.

The proposed Erosion and Sediment Control Plan for the site is attached in Appendix B. Refer to drawing no. JSHS-TTW-01-00-DR-C-02101 for details.

8.3.1 Additional Works: Scenario 2

The proposed site sedimentation basin is to be adjusted to match the volume of the existing detention basin, serving as the temporary basin for Scenario 2. In this scenario, the temporary basin would be retained until completion of all site works for sediment control and then be retained as onsite detention storage until completion of offsite works by others.

9.0 Civil Works

9.1 Pavement Design

The geotechnical report by Stantec indicated a California Bearing Ratio (CBR) value of 5%. However, since the CBR test was conducted on only one borehole sample, a CBR value of 3% was used for the pavement design. It is further noted that the combined CBR value for pavement and ground slab design (if any) will depend on the type of filling material brought to site to form the subgrade. This will be further developed with the final geotechnical report.

Pavements with vehicular traffic will need to be designed with capacity for the proposed design vehicle and vehicular movements and to cater for a minimum 25-year design life in accordance with the EFSG.

TTW has requested specific geotechnical advice related to road design parameters as part of the ongoing site investigation. Should inferior subgrade be present within proposed vehicular areas within the site, appropriate subgrade improvement may involve the placement of a select fill layer of good quality granular material below the pavement or lime stabilisation of the subgrade soils. This will be further developed with the final Geotechnical report.

The proposed pavement plan for the site, subject to detailed design, is included in Appendix B. Refer to drawing nos. JSHS-TTW-01-00-DR-C-7101 for details.

9.1.1 Scenario 2

The proposed temporary carpark for Scenario 2 – Stage 1 would be constructed in the northwest of the site with access from Armoury Road. The car park will be constructed with the same pavement buildup as the permanent carpark. The car park will be removed and reinstated as grass in Scenario 2 Stage 3 once the permanent car park is constructed following completion of external road works by others. Refer to staging plans in Appendix C.

9.2 Earthworks

It is understood that the JSE – Stage 5 proposed works (Lendlease) included removal of the existing fill materials and compaction of new fill from off-site. However, all works internal to the site are being undertaken by DoE. TTW understand that the proposed earthworks was proposed to replace material which has not been sufficiently compacted in the original filling operation. This strategy has been reviewed in respect of the proposed school site and geotechnical recommendations for the extent and preferred method of geotechnical remediation have been updated.

Earthworks for the school will consist of reshaping the site to provide flat building pads and suitably graded pavements, car parking and play areas. Requirements for the removal of topsoil and any ground improvement will be dependent on the finalisation of geotechnical investigations of the site, including any imported materials and the proposed finished level.

As per the geotechnical report prepared by Stantec, subgrade preparation is anticipated to include the following typical measures:

- Strip the surface of any vegetation and remove existing stockpile, basin bedding, or dispose of material (if any) as appropriate.
- Remove the existing filling to a depth of about 1000 mm within the proposed works.
- Proof roll the exposed surface with six passes of a 10-12 tonne roller, with the final pass carried out under observation by a geotechnical engineer to check for any soft or compressible zones. Any such zones should be over-excavated to a maximum depth of 300 mm and replaced with compacted granular material;

- Existing site fill materials are considered not suitable for reuse. New filling brought to site should be approved engineering fill by either the civil or geotechnical engineer before use. Moderately to highly reactive clay filling should be avoided.
- Filling should be placed in horizontal layers of 300 mm maximum loose thickness, with each layer placed and compacted to a minimum dry density ratio of 98% Standard at levels more than 500 mm below the proposed subgrade level; increasing to 100% Standard in the upper 500 mm of filling. Overcompaction of clayey filling should be avoided. The moisture content during filling should be controlled so that it is always within 2% of Standard optimum moisture content (SOMC) test.

Additionally, the report noted that vertical excavations in fill and sandy soils are not expected to remain stable for extended periods. Temporary slopes may be possible above the groundwater table, with cuts up to 3 meters deep recommended at a maximum slope of 2(H):1(V). For deeper cuts, gentler slopes or slopes with intermediate benches should be used, and stability analysis will be required to confirm suitable slope configurations. Given the poor condition of the fill encountered, permanent slopes are considered unsuitable. However, given the flat nature of the site, this is not considered to be a significant risk.

Refer to the original report by Stantec for further information.

9.2.1 Cut and Fill Volumes

The cut and fill volumes have been estimated for each of the construction scenarios described in Section 3.0.

Scenario 1 - External infrastructure Completed prior to School Works

	Cut (m³)	Fill (m³)	Net (m³)
Backfill of Basin	-3	12,119	12,116 (fill)
Site Works	-1,845	3,523	1,678 (fill)
Total for Scenario 1	-1,848	15,642	13,794 (fill)

Scenario 2 - External works not completed prior to School Works

	Cut (m³)	Fill (m³)	Net (m³)
Stage 1	-12,000*	0	-12,000 (cut)
Stage 2 Basin	-3	12,119	12,116 (fill)
Stage 2 Site Works	-1,845	3,523	1,678 (fill)
Stage 3 Backfill Temp Basin	0	12,000	12,000 (fill)
Total for Scenario 1	-13,848	27,642	13,794 (fill)

Note: (*) Suitable excess cut material from Stage 1 is to be stored on site and reused in Stage 2.

9.3 Public Domain Works

9.3.1 Public Domain works by others

The construction of roads and associated services infrastructure in the public domain to be carried out by others consist of the following activities:

- Demolition of the existing Infantry Street, replacement and recompaction of subgrade material and reconstruction of Infantry Street with amended alignment;
- Construction of Park Edge Road;

- Construction of regional detention basin south of Infantry Street;
- All associated kerbs, footpaths, underground services, stormwater networks and landscaping for the road reserve areas will be provided by others.

In scenario 1, the above works by others will be completed prior to the construction of the school. In Scenario 2, the above works will have not been completed prior to the construction of the school and so additional works are required including a temporary basin, car parking within the site and the temporary public domain works as discussed in 8.3.3.

9.3.2 Public Domain works assessed as part of this Activity

The public domain works to be undertaken by Schools Infrastructure as part of this activity includes:

- 2 x raised pedestrian crossing in Armoury Road (1) and Infantry Road (1);
- Footpath and kerb and gutter in Armoury Road;
- Vehicular access in Armoury Road and Park Edge Road;
- Median island with pedestrian refuge in Infantry Road;
- Signage and line marking in relation to above works.

Note that all works in Infantry Road and Park Edge Road can only be carried out following completion of the public domain works by others (Section 8.3.1).

9.3.3 Additional Works: Scenario 2

In the event that the Public domain works by others (8.3.1) for Infantry Road and Park Edge Road are not in place ahead of the school opening, the following temporary Public Domain works are proposed in Armoury Road:

- Kiss and Drop;
- Vehicle crossing for temporary carpark;
- Bus stops.

Refer to the drawings in Appendix B for public domain drawings and to the Transport Access Impact Assessment Report prepared by SCT Consulting for details of public domain proposals.

Following completion of offsite works by others, the kiss and drop would be relocated to Park Edge Road and the bus stop location moved to the permanent location on Armoury Road. The vehicle crossing to the temporary car park will also be reinstated as grass.

10.0 Mitigation Measures

The following mitigation measures shown in **Table 3** below are to be implemented as outlined in this report.

Table 3 – Mitigation Measures			
Mitigation Number/ Name	When is Mitigation Measure to be complied with	Mitigation Measure	Reason for Mitigation Measure
Decommissioning of existing on-site OSD Basin	Prior to commencement of any construction works. Prior to commencement of operation.	Off-site permanent basin or temporary on-site basin will be constructed prior to decommissioning of the existing on-site OSD Basin. The permanent basin needs to be constructed prior to the temporary basin being decommissioned.	To ensure there is no negative impact to the overall stormwater drainage strategy that relies on an operational OSD Basin.
Erosion and Sediment Control	Prior to commencement of any construction works and during construction works.	The proposed activity will implement measures as documented generally in accordance with NSW Department of Housing Managing Urban Stormwater as shown in drawing no. JSHS-TTW-01-00-DR-C-02101.	To ensure protection of downstream drainage lines, assets, ecosystems, or existing hydrological systems from silt, waste and sediment from the site.
Stormwater Peak Flows	Prior to commencement of operation.	The proposed activity, being part of Lendlease's Stage 5 precinct, incorporates a precinct-wide stormwater drainage plan.	To ensure stormwater flows for all events up to and including the 1% ARI from the activity site will have no adverse impact upon the downstream properties and existing waterbodies.
Stormwater Quality	Following the removal of temporary water quality (erosion and sediment control) measures.	The proposed activity will include provision of water quality treatment measures as part of a water-sensitive urban design (i.e. rainwater tanks, GPTs) as documented on this report and on the Civil Engineering drawings attached in Appendix B. This will apply to both temporary and permanent works (eg temporary carpark)	To ensure the proposed activity meets Council's requirements for pollutant reduction.

		Refer to Hydraulic documentation for rainwater tank sizing and reuse strategy.	
Pavement Design	During construction works	Pavements with vehicular traffic will be designed with capacity for the proposed design vehicle and vehicular movements.	To cater for a minimum 25-year design life in accordance with the EFSG.
Temporary On-Site Basin	Prior to decommissioning of existing basin	The temporary basin needs to be constructed prior to the existing basin being decommissioned. Note: Applies to Scenario 2 only	To ensure there is no negative impact to the overall stormwater drainage strategy that relies on an operational OSD Basin.
Temporary Public Domain Works	Prior to opening of the school	Temporary road works are planned to provide a kiss and drop and bus stop within Armoury Road prior to the completion of road works by others to Infantry Road and Park Edge Road. Note: Applies to Scenario 2 only	To ensure that the public domain provides a safe and convenient environment for school related traffic during the operation the facility.

11.0 Evaluation of Environmental Impacts

This report concludes that the proposed activity is suitable, will not result in unacceptable impact, and warrants approval subject to implementation of the mitigation measures discussed in Section 10.0.

12.0 Recommendation

The site has been designed in accordance with the Penrith Council DCP and all relevant supporting documents. The proposed activity is within the area covered by the Lendlease's JSE Stage 5 development application, which incorporates a regional stormwater drainage plan for the catchment areas. As such, it is proposed that a separate OSD system for the school is not required, as the precinct-wide stormwater plan has already accounted for it. A temporary strategy for the activity is proposed should the permanent basin not be constructed ahead of the completion of the school. To ensure that the activity does not negatively impact stormwater quality, rainwater tanks and GPTs are proposed as part of the school's stormwater management network. Erosion and sediment control measures have been proposed for the site during construction in accordance with the NSW Department of Housing Managing Urban Stormwater ('Blue Book').

Based on the above, the proposed civil and stormwater works complies with the Council's DCP requirements, as well as other relevant Australian standards. We recommend the civil and stormwater works for the proposed activity be generally in accordance with the Civil Engineering drawings attached in Appendix B.

The findings in this statement are based on current available information, regulations and correspondence undertaken at the time of writing.

Prepared by
TTW (NSW) PTY LTD



Engineer

Authorised By
TTW (NSW) PTY LTD



COLIN ROPE
Associate Director

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Appendix A

Council Correspondence

Jema Lopez

From: John Skaf <John.Skaf@penrith.city>
Sent: Tuesday, 18 June 2024 5:42 PM
To: Jema Lopez
Cc: Colin Rope; Kirusan Subakaran
Subject: RE: Site Stormwater Requirements for Jordan Springs

Follow Up Flag: Follow up
Flag Status: Completed

Some people who received this message don't often get email from john.skaf@penrith.city. [Learn why this is important](#)

[External Email]: Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Jema,

Thank you for your enquiry about the stormwater management for the educational facility at Jordan Springs East. Council has recently received a DA application from Lendlease for the development of Stage 5 which includes the area of the future educational facility. As part of this DA, there will be a proposed stormwater management strategy specifically designed for the catchment areas within this stage of the precinct. Whilst the stormwater management is still under review by Council, you may wish to view the DA information on Council's DA tracker or contact Lendlease who can provide you with more detailed information on the stormwater management for stage 5.

If you have any questions, please feel free to contact me.

Kind Regards,

John Skaf
Senior Engineer - Major Developments
Engineering Services

E John.Skaf@penrith.city
T +61247328085 | F | M +61427304533
PO Box 60, PENRITH NSW 2751
www.visitpenrith.com.au
www.penrithcity.nsw.gov.au



From: Jema Lopez <jema.lopez@ttw.com.au>
Sent: Wednesday, June 12, 2024 1:50 PM
To: Penrith City Council - RECORDS <council@penrith.city>
Cc: Colin Rope <colin.rope@ttw.com.au>; Kirusan Subakaran <kirusan.subakaran@ttw.com.au>
Subject: Site Stormwater Requirements for Jordan Springs

You don't often get email from jema.lopez@ttw.com.au. [Learn why this is important](#)

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

Good afternoon Council officer,

I hope you are well. I am seeking to confirm the stormwater requirements for a proposed educational facility at Jordan Springs bounded by Armoury Road to the west, Lasetter Street to the north and Infantry Charlie Street to the south. The approximate extent of the site is shown in the figure below.



We understand that a regional stormwater strategy will be implemented whereby trunk stormwater detention and WSUD systems will be provided in preference to multiple lot-based treatments. This is believed to include the above proposed site. As such, could you please confirm that a separate on-site detention and water quality treatment will not be required for the proposed site on the basis that the stormwater discharge has been allowed for in the trunk drainage systems? Could I also please request clarification of where the legal point of stormwater discharge should be connected to the new road drainage network to ensure that the flows have been accommodated in the downstream system?

Thank you and regards,
Jema



Jema Lopez | Civil Engineer

+61 2 9439 7288 | +61 2 9067 5017 | jema.lopez@ttw.com.au

TTW Engineers | Sydney

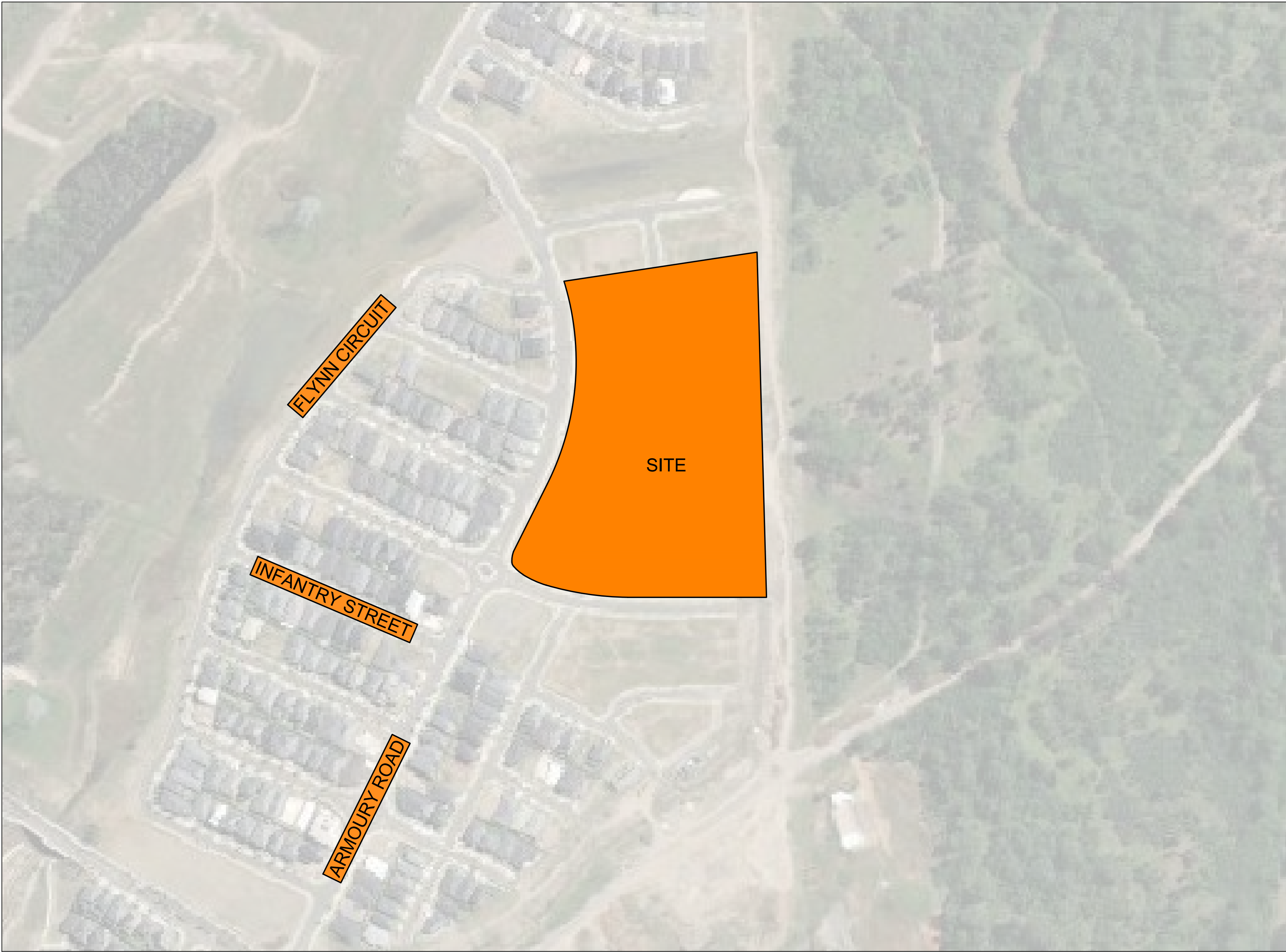
Read our latest news [here](#)

Appendix B

Civil Engineering Drawings

NEW HIGH SCHOOL FOR JORDAN SPRINGS

LOT 2 AND 3 DP1248480 JORDAN SPRINGS, NSW 2747



NUMBER	DRAWING TITLE
GENERAL-00000	
JSHS-TTW-01-00-DR-C-00001	GENERAL COVER SHEET
JSHS-TTW-01-00-DR-C-00003	GENERAL NOTES AND LEGEND SHEET 1
JSHS-TTW-01-00-DR-C-00303	DEMOLITION PLAN
JSHS-TTW-01-00-DR-C-00401	GENERAL ARRANGEMENT PLAN SHEET 1
JSHS-TTW-01-00-DR-C-00402	GENERAL ARRANGEMENT PLAN SHEET 2
JSHS-TTW-01-00-DR-C-00403	GENERAL ARRANGEMENT PLAN SHEET 3
JSHS-TTW-01-00-DR-C-00404	GENERAL ARRANGEMENT PLAN SHEET 4
EROSION AND SEDIMENT CONTROL-02000	
JSHS-TTW-01-00-DR-C-02001	EROSION AND SEDIMENT CONTROL NOTES AND LEGEND SHEET 1
JSHS-TTW-01-00-DR-C-02101	EROSION AND SEDIMENT CONTROL PLAN
EARTHWORKS-03000	
JSHS-TTW-01-00-DR-C-03101	EARTHWORKS CUT AND FILL VOLUMES PLAN
STORMWATER-04000	
JSHS-TTW-01-00-DR-C-04001	STORMWATER NOTES AND LEGEND SHEET 1
JSHS-TTW-01-00-DR-C-04101	STORMWATER AND SUBSOIL DRAINAGE PLAN SHEET 1
JSHS-TTW-01-00-DR-C-04102	STORMWATER AND SUBSOIL DRAINAGE PLAN SHEET 2
JSHS-TTW-01-00-DR-C-04103	STORMWATER AND SUBSOIL DRAINAGE PLAN SHEET 3
JSHS-TTW-01-00-DR-C-04104	STORMWATER AND SUBSOIL DRAINAGE PLAN SHEET 4
PAVEMENT-07000	
JSHS-TTW-01-00-DR-C-07001	PAVEMENT NOTES AND LEGEND
JSHS-TTW-01-00-DR-C-07101	PAVEMENT PLAN
JSHS-TTW-01-00-DR-C-07501	PAVEMENT DETAILS SHEET 1
JSHS-TTW-01-00-DR-C-07502	PAVEMENT DETAILS SHEET 2
JSHS-TTW-01-00-DR-C-07503	PAVEMENT DETAILS SHEET 3
SIGNAGE AND LINEMARKING-08000	
JSHS-TTW-01-00-DR-C-08101	SIGNAGE AND LINEMARKING PLAN
JSHS-TTW-01-00-DR-C-08102	SIGNAGE AND LINEMARKING INTERSECTION LAYOUT PLAN

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				Client:				Engineer:				Project:				Drawing Title:				Scale at A1			
												NEW HIGH SCHOOL FOR JORDAN SPRINGS				GENERAL COVER SHEET				Drawn			
																				ES			
																				JL			
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																				Project No			
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																				Type			
																				Role			
																				Sheet No.			
																				Rev			
																				JSHS-TTW-01-00-DR-C-00001-3			
																				17.12.2024 3:54 PM			

NOT FOR CONSTRUCTION

This drawing is copyright and is the property of TTW and must not be used without authorisation. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES AND LEGENDS

GENERAL

- CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORKS. ANY DISCREPANCIES TO BE REPORTED TO THE SUPERINTENDENT.
- STRIP ALL TOPSOIL FROM THE CONSTRUCTION AREA. ALL STRIPPED TOPSOIL SHALL BE DISPOSED OF OFF-SITE UNLESS DIRECTED OTHERWISE.
- MAKE SMOOTH CONNECTION WITH ALL EXISTING WORKS.
- COMPACT SUBGRADE UNDER BUILDINGS AND PAVEMENTS TO MINIMUM 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.1.1. COMPACTION UNDER BUILDINGS TO EXTEND 2M MINIMUM BEYOND BUILDING FOOTPRINT.
- ALL WORK ON PUBLIC PROPERTY, PROPERTY WHICH IS TO BECOME PUBLIC PROPERTY, OR ANY WORK WHICH IS TO COME UNDER THE CONTROL OF THE STATUTORY AUTHORITY; THE CONTRACTOR IS TO ENSURE THAT THE DRAWINGS USED FOR CONSTRUCTION HAVE BEEN APPROVED BY ALL RELEVANT AUTHORITIES PRIOR TO COMMENCEMENT SITE.
- ALL WORK ON PUBLIC PROPERTY, PROPERTY WHICH IS TO BECOME PUBLIC PROPERTY, OR ANY WORK WHICH IS TO COME UNDER THE CONTROL OF THE STATUTORY AUTHORITY IS TO BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT AUTHORITY. THE CONTRACTOR SHALL OBTAIN THESE REQUIREMENTS FROM THE AUTHORITY. WHERE THE REQUIREMENTS OF THE AUTHORITY ARE DIFFERENT TO THE DRAWINGS AND SPECIFICATIONS, THE REQUIREMENTS OF THE AUTHORITY SHALL BE APPLICABLE.
- FOR ALL TEMPORARY BATTERS REFER TO GEOTECHNICAL RECOMMENDATIONS.

REFERENCE DRAWINGS

- THESE DRAWINGS HAVE BEEN BASED FROM, AND TO BE READ IN CONJUNCTION WITH THE FOLLOWING CONSULTANTS DRAWINGS. ANY CONFLICT TO THE DRAWINGS MUST BE NOTIFIED IMMEDIATELY TO THE ENGINEER.

CONSULTANT	DRAWING TITLE	DRAWING NUMBER	REVISION	DATE
DJRD	ARCH	JSHS-DJRD-00-00-DR-A-0101	P03	11.11.2024
ASTREA	SURVEY	A4307-TOPO&UTIL		04.2024
ENSPIRE	JORDAN SPRINGS EAST STAGE 5	210054-52-DA-C01.40	3	31.05.24

BOUNDARIES AND EASEMENTS

- THE PROPERTY BOUNDARY AND EASEMENT LOCATIONS SHOWN ON TAYLOR THOMSON WHITTING DRAWING'S HAVE BEEN BASED ON INFORMATION RECEIVED FROM : SURVEYOR
- TAYLOR THOMSON WHITTING MAKES NO GUARANTEES THAT THE BOUNDARY OR EASEMENT INFORMATION SHOWN IS CORRECT. TAYLOR THOMSON WHITTING WILL ACCEPT NO LIABILITIES FOR BOUNDARY INACCURACIES. THE CONTRACTOR/BUILDER IS ADVISED TO CHECK/CONFIRM ALL BOUNDARIES IN RELATION TO ALL PROPOSED WORK PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. BOUNDARY INACCURACIES FOUND ARE TO BE REPORTED TO THE SUPERINTENDENT PRIOR TO CONSTRUCTION STARTING.

SURVEY

- ORIGIN OF LEVELS:
DATUM OF LEVELS:
COORDINATE SYSTEM:
SURVEY PREPARED BY:
SETOUT POINTS:

SSM 198983
AHD
MGA2020
ASTREA
CONTACT SURVEYOR
- TAYLOR THOMSON WHITTING DOES NOT GUARANTEE THAT THE SURVEY INFORMATION SHOWN ON THESE DRAWINGS IS ACCURATE AND WILL ACCEPT NO LIABILITY FOR ANY INACCURACIES IN THE SURVEY INFORMATION PROVIDED TO US FROM ANY CAUSE WHATSOEVER.

UNDERGROUND SERVICES - WARNING

- THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ON TAYLOR THOMSON WHITTINGS DRAWINGS HAVE BEEN PLOTTED FROM DIAGRAMS PROVIDED BY SERVICE AUTHORITIES. THIS INFORMATION HAS BEEN PREPARED SOLELY FOR THE AUTHORITIES OWN USE AND MAY NOT NECESSARILY BE UPDATED OR ACCURATE.
- THE POSITION OF SERVICES AS RECORDED BY THE AUTHORITY AT THE TIME OF INSTALLATION MAY NOT REFLECT CHANGES IN THE PHYSICAL ENVIRONMENT SUBSEQUENT TO INSTALLATION.
- THE CONTRACTOR MUST CONFIRM THE EXACT LOCATION AND EXTENT OF SERVICES PRIOR TO CONSTRUCTION AND NOTIFY ANY CONFLICT WITH THE DRAWINGS IMMEDIATELY TO THE ENGINEER/SUPERINTENDENT.
- THE CONTRACTOR IS TO GET APPROVAL FROM THE RELEVANT STATE SURVEY DEPARTMENT, TO REMOVE/ADJUST ANY SURVEY MARK. THIS INCLUDES BUT IS NOT LIMITED TO; STATE SURVEY MARKS (SSM), PERMANENT MARKS (PM), CADASTRAL REFERENCE MARKS OR ANY OTHER SURVEY MARK WHICH IS TO BE REMOVED OR ADJUSTED IN ANY WAY.
- TAYLOR THOMSON WHITTING PLANS DO NOT INDICATE THE PRESENCE OF ANY SURVEY MARK. THE CONTRACTOR IS TO UNDERTAKE THEIR OWN SEARCH.

BEFORE YOU DIG AUSTRALIA (BYDA)

- PUBLIC SERVICE UTILITY INFORMATION SHOWN ON PLAN HAS BEEN COMPLIED FROM INFORMATION RECEIVED FROM DIAL BEFORE YOU DIG INQUIRY, REFERENCE NUMBER NO.37849859
- OBTAINED ON 18.10.2024 UNLESS SPECIFICALLY SHOWN OTHERWISE, THIS LOCATION AND DEPTH OF SERVICES SHOWN ON THIS PLAN HAVE NOT BEEN VERIFIED
- THE LOCATION OF SERVICES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED AS ACCURATELY AS POSSIBLE FROM DIAGRAMS PROVIDED BY SERVICE AUTHORITIES AND SHOULD BE CONFIRMED BY SITE INSPECTION."

SITE WORKS

- ALL BASECOURSE MATERIAL TO COMPLY WITH RMS SPECIFICATION NO 3051 AND COMPACTED TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1.
- ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
- ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH AN APPROVED SELECT MATERIAL AND COMPACTED TO A MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1

PUBLIC DOMAIN WORKS

- PUBLIC DOMAIN WORKS ARE NOT TO COMMENCE UNTIL THESE DRAWINGS ARE STAMPED AS APPROVED.

TENDER DOCUMENTATION

- THESE DRAWINGS ARE PRELIMINARY DRAWINGS ISSUED FOR TENDER AS AN INDICATION OF THE EXTENT OF WORKS ONLY. THEY ARE NOT A COMPLETE CONSTRUCTION SET OF DRAWINGS.
- TO DETERMINE THE FULL EXTENT OF WORK, THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL DRAWINGS AND OTHER CONTRACT DOCUMENTS. ALLOW FOR ALL ITEMS SHOWN ON ARCHITECTURAL AND OTHER DRAWINGS AS NOT ALL ITEMS ARE SHOWN ON THE STRUCTURAL/CIVIL WORKS DRAWINGS.
- SHOULD ANY AMBIGUITY, ERROR, OMISSIONS, DISCREPANCY, INCONSISTENCY OR OTHER FAULT EXIST OR SEEM TO EXIST IN THE DOCUMENTS, IMMEDIATELY NOTIFY IN WRITING TO THE SUPERINTENDENT.
- RATES SHOWN ON THE DRAWINGS ARE FOR THE FINAL STRUCTURE/CIVIL WORKS IN PLACE AND DO NOT ALLOW FOR ANY WASTAGE, ROLLING MARGINS, OVER SUPPLY OR FABRICATION REQUIREMENTS. ETC.

DESIGN AND CONSTRUCT DOCUMENTATION

- THE LEVEL OF DETAIL / DESIGN REFLECTED IN THESE DOCUMENTS IS BASED ON THE UNDERSTANDING THIS WILL BE BUILT AS PART OF A DESIGN & CONSTRUCT CONTRACT.
- THE CONTRACTOR SHALL RETAIN THE RESPONSIBILITY TO UNDERTAKE DETAILED DESIGN, CONFIRM COMPLIANCE WITH RELEVANT STANDARDS, CONSENT CONDITIONS & THE SPECIFICATION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THE FINAL DESIGN IS CO-ORDINATED FULLY WITH OTHER CONSULTANTS.
- NO VARIATION WILL BE ACCEPTED FOR DESIGN AMENDMENTS REQUIRED TO MEET THE FUNCTIONAL OBJECTIVE OF THIS DOCUMENTATION.

SAFETY IN DESIGN

CONTRACTOR TO REFER TO APPENDIX B OF THE CIVIL SPECIFICATION FOR THE CIVIL RISK AND SOLUTIONS REGISTER.

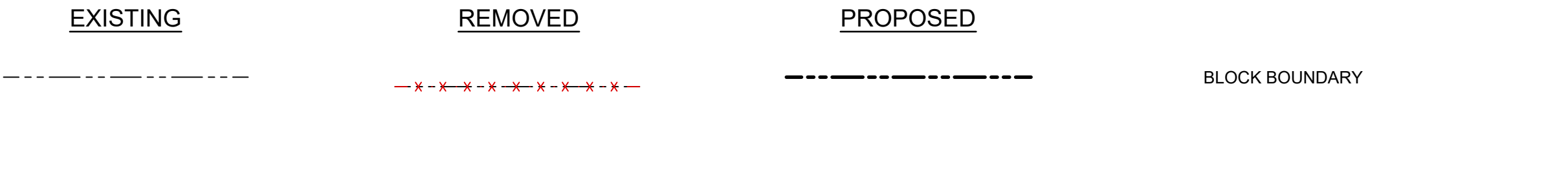
- EXISTING SERVICES
CONTRACTOR TO BE AWARE EXISTING SERVICES ARE LOCATED WITHIN THE SITE. LOCATION OF ALL SERVICES TO BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING WORKS. CONTRACTOR TO CONFIRM WITH RELEVANT AUTHORITY REGARDING MEASURES TO BE TAKEN TO ENSURE SERVICES ARE PROTECTED OR PROCEDURES ARE IN PLACE TO DEMOLISH AND/OR RELOCATE.
- EXISTING STRUCTURES
CONTRACTOR TO BE AWARE EXISTING STRUCTURES MAY EXIST WITHIN THE SITE. TO PREVENT DAMAGE TO EXISTING STRUCTURE(S) AND/OR PERSONNEL, SITE WORKS TO BE CARRIED OUT AS FAR AS PRACTICABLY POSSIBLE FROM EXISTING STRUCTURE(S).
- EXISTING TREES
CONTRACTOR TO BE AWARE EXISTING TREES EXIST WITHIN THE SITE WHICH NEED TO BE PROTECTED. TO PREVENT DAMAGE TO TREES AND/OR PERSONNEL, SITE WORKS TO BE CARRIED OUT AS FAR AS PRACTICABLY POSSIBLE FROM EXISTING TREES. ADVICE NEEDS TO BE SOUGHT FROM ARBORIST AND/OR LANDSCAPE ARCHITECT ON MEASURES REQUIRED TO PROTECT TREES.
- GROUNDWATER
CONTRACTOR TO BE AWARE GROUND WATER LEVELS ARE CLOSE TO EXISTING SURFACE LEVEL. TEMPORARY DE-WATERING MAY BE REQUIRED DURING CONSTRUCTION WORKS.
- EXCAVATIONS
DEEP EXCAVATIONS DUE TO STORMWATER DRAINAGE WORKS IS REQUIRED. CONTRACTOR TO ENSURE SAFE WORKING PROCEDURES ARE IN PLACE FOR WORKS. ALL EXCAVATIONS TO BE FENCED OFF AND BATTERS ADEQUATELY SUPPORTED TO APPROVAL OF GEOTECHNICAL ENGINEER.
- GROUND CONDITIONS
CONTRACTOR TO BE AWARE OF THE SITE GEOTECHNICAL CONDITIONS. REFER TO GEOTECHNICAL REPORT BY
 - STANTEC AUSTRALIA PTY LTD
 - INTRUSIVE GEOTECHNICAL INVESTIGATION REPORT (No. 304100928) DATED 22 AUGUST 2024
- HAZARDOUS MATERIALS
EXISTING ASBESTOS PRODUCTS & CONTAMINATED MATERIAL MAY BE PRESENT ON SITE. CONTRACTOR TO ENSURE ALL HAZARDOUS MATERIALS ARE IDENTIFIED PRIOR TO COMMENCING WORKS. SAFE WORKING PRACTICES AS PER RELEVANT AUTHORITY TO BE ADOPTED AND APPROPRIATE PPE TO BE USED WHEN HANDLING ALL HAZARDOUS MATERIALS. REFER TO GEOTECHNICAL/ENVIRONMENTAL REPORT BY
 - STANTEC AUSTRALIA PTY LTD
 - PRELIMINARY DESKTOP SITE INVESTIGATION REPORT (No. 304100928) DATED 5 APRIL 2024
- CONFINED SPACES
CONTRACTOR TO BE AWARE OF POTENTIAL HAZARDS DUE TO WORKING IN CONFINED SPACES SUCH AS STORMWATER PITS, TRENCHES AND/OR TANKS. CONTRACTOR TO PROVIDE SAFE WORKING METHODS AND USE APPROPRIATE PPE WHEN ENTERING CONFINED SPACES.
- MANUAL HANDLING
CONTRACTOR TO BE AWARE MANUAL HANDLING MAY BE REQUIRED DURING CONSTRUCTION. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ENSURE MANUAL HANDLING PROCEDURES AND ASSESSMENTS ARE IN PLACE PRIOR TO COMMENCING WORKS.
- WATER POLLUTION
CONTRACTOR TO ENSURE APPROPRIATE MEASURES ARE TAKEN TO PREVENT POLLUTANTS FROM CONSTRUCTION WORKS CONTAMINATING THE SURROUNDING ENVIRONMENT.
- SITE ACCESS/EGRESS
CONTRACTOR TO BE AWARE SITE WORKS OCCUR IN CLOSE PROXIMITY TO FOOTPATHS AND ROADWAYS. CONTRACTOR TO ERECT APPROPRIATE BARRIERS AND SIGNAGE TO PROTECT SITE PERSONNEL AND PUBLIC.
- VEHICLE MOVEMENT
CONTRACTOR TO SUPPLY AND COMPLY WITH TRAFFIC MANAGEMENT PLAN AND PROVIDE ADEQUATE SITE TRAFFIC CONTROL INCLUDING A CERTIFIED TRAFFIC MARSHALL TO SUPERVISE VEHICLE MOVEMENTS WHERE NECESSARY.

CIVIL INSPECTION CERTIFICATES

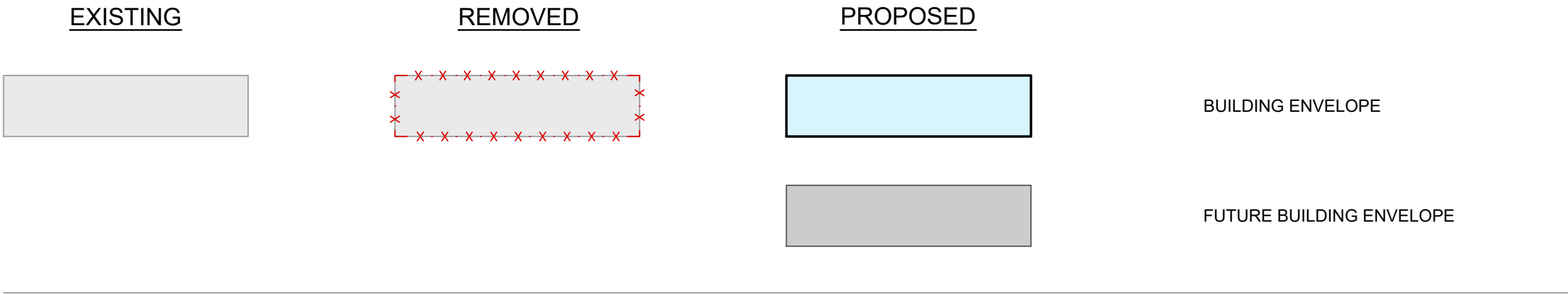
THE FOLLOWING MUST BE PROVIDED BY THE CONTRACTOR A MINIMUM 2 WEEKS PRIOR TO THE REQUESTED DATE OF A CIVIL INSPECTION CERTIFICATE FOR OCCUPATION CERTIFICATE. SUBMISSIONS MUST BE PROVIDED PROGRESSIVELY AS WORKS ARE COMPLETED IN ACCORDANCE WITH THE CIVIL SPECIFICATION. THE PROGRAM MUST ALLOW ADEQUATE TIME FOR DEFECTS TO BE RECTIFIED SHOULD THIS BE REQUIRED.

- NOTIFICATION THAT ALL CIVIL WORKS TO BE CERTIFIED HAVE BEEN COMPLETED TO ALLOW A FINAL INSPECTION TO BE UNDERTAKEN.
- WRITTEN CONFIRMATION FROM THE CONTRACTOR THAT ALL CIVIL SITE INSPECTION REPORTS HAVE BEEN CLOSED OUT.
- CCTV (INCLUDING WINCAN LOG OR EQUIVALENT) OF ALL CIVIL STORMWATER WORKS TO BE CERTIFIED.
- WAE FROM A REGISTERED SURVEYOR (PDF & DWG) FOR ALL CIVIL STORMWATER TO BE CERTIFIED.
- WAE FROM A REGISTERED SURVEYOR (PDF, DWG & 3D TIN) FOR ALL EXTERNAL CIVIL LEVELS TO BE CERTIFIED.
- HEAD CONTRACTORS STATEMENT OF CONSTRUCTION COMPLIANCE.
- HYDRAULIC CONTRACTORS INSTALLATION CERTIFICATE.
- 3RD PARTY INSTALLATION CERTIFICATES FOR PROPRIETARY PRODUCTS AND/OR D&C ELEMENTS.
- COMPACTION TEST RESULTS IN ACCORDANCE WITH THE CIVIL SPECIFICATION.
- MATERIALS CERTIFICATES PRIOR TO INSTALLATION IN ACCORDANCE WITH THE CIVIL SPECIFICATION.
- WRITTEN CONFIRMATION FROM TfNSW AND/OR COUNCIL CONFIRMING COMPLETION AND ACCEPTANCE OF S138 WORKS IF APPLICABLE.

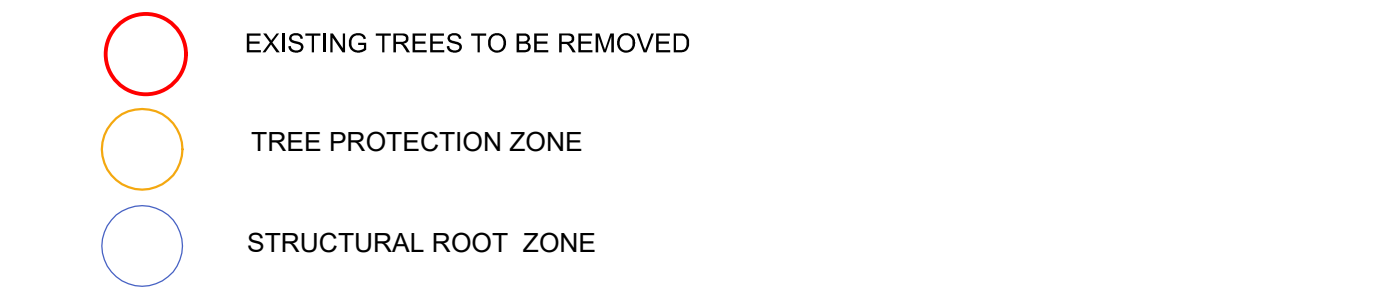
BOUNDARIES



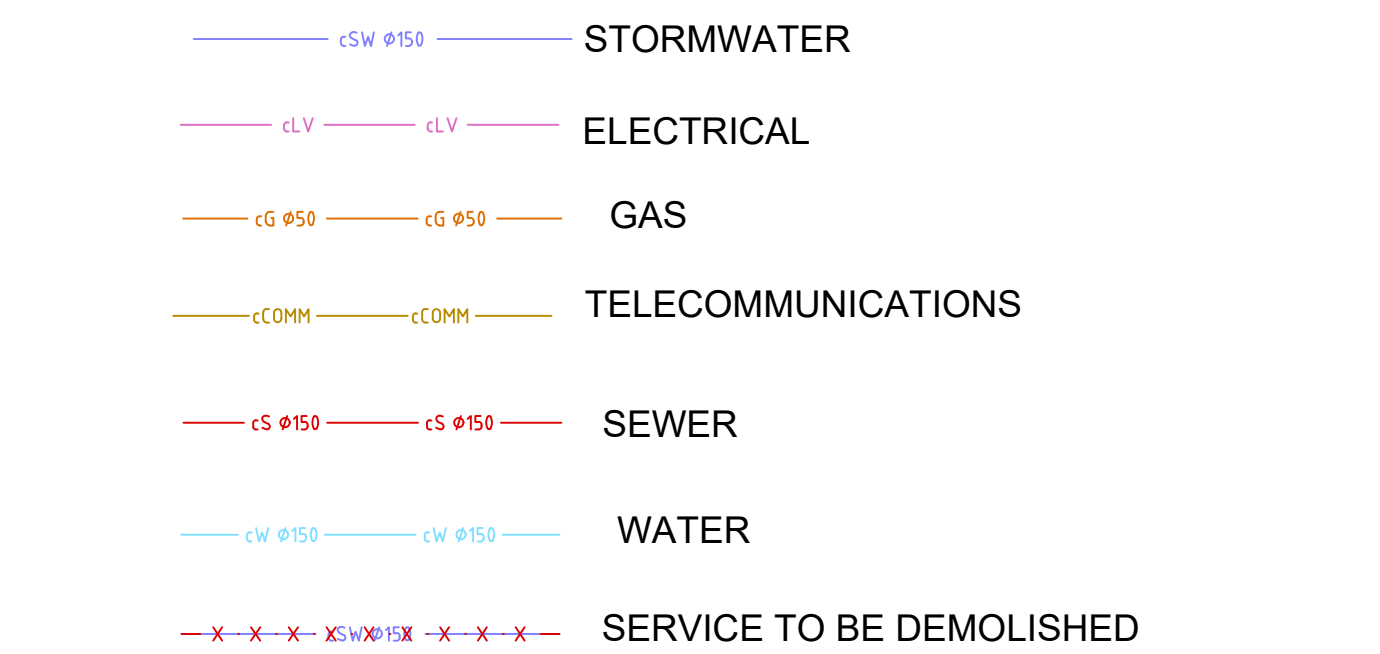
BUILDINGS



LANDSCAPE



EXISTING SERVICES



CLASSIFICATION OF EXISTING UTILITY INFORMATION

- A

-

SIGHTED, MUST BE LOCATED, THEN POTHOLED. UTILITY MUST BE PHYSICALLY SIGHTED AND MEASURED.
- B

-

ELECTRONICALLY DETECTED AND LOCATED ON SITE USING VARIOUS TRACING METHODS.
- C

-

ALIGNED FROM SURFACE FEATURES AND DIGITISED DATA.
- D

-

DIGITISED DATA (DIAL BEFORE YOU DIG).

NOTE

- BELOW GROUND SERVICES CAN BE REPRESENTED AS GREY FOR EXISTING AND BLACK FOR PROPOSED DEPENDING ON THE PLAN.
- EXISTING SERVICES PITS, STRUCTURES AND COLUMNS ARE ILLUSTRATED AS PER THE ORIGINAL SURVEY.

										NSW GOVERNMENT School Infrastructure NSW					Engineer: TTW www.ttwingineers.com					Project: NEW HIGH SCHOOL FOR JORDAN SPRINGS					Drawing Title: GENERAL NOTES AND LEGEND SHEET 1					Scale at A1 Drawn Designed Approved				
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															Project No Originator Type Role Sheet No. Rev																			
															JSHS-TTW-01-00-DR-C-00003-2																			
															05.12.2024 1:19 PM																			
Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date															
2	SCHEMATIC DESIGN FOR REF	JL	ES	06.12.2024																														
1	FINAL DRAFT ISSUE FOR REF	JL	ES	21.11.2024																														

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NOTE
EXISTING SITE SERVICES TO BE REMOVED INCLUDING BUT LIMITED TO:

- GAS
- ELECTRICAL (HV AND LV)
- TELECOMMUNICATIONS
- WATER
- SEWER
- STORMWATER
- STREET LIGHTING

ALL MATERIALS UNSUITABLE FOR REUSE AS FILL SHALL BE DISPOSED OFF SITE

EXISTING SEWER AND STORMWATER TO BE CAPPED AT SITE BOUNDARY AND REMOVED

EXISTING KIOSK SUBSTATION TO BE REMOVED/ RELOCATED. REFER L3 DESIGN.

EXISTING ROAD TO BE DEMOLISHED. ALL SERVICES TO BE TERMINATED/ CAPPED AT SITE BOUNDARY AND REMOVED IN ACCORDANCE WITH AUTHORITY REQUIREMENTS

EXISTING BASIN TO BE BACKFILLED REFER DRAWING 03101 - EARTHWORKS CUT AND FILL VOLUMMS PLAN

EXISTING ROAD TO BE DEMOLISHED. ALL SERVICES TO BE TERMINATED/ CAPPED AT SITE BOUNDARY AND REMOVED IN ACCORDANCE WITH AUTHORITY REQUIREMENTS

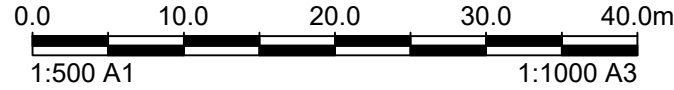
EXISTING SEWER TO BE CAPPED AT SITE BOUNDARY AND REMOVED

EXISTING ROAD TO BE DEMOLISHED. ALL SERVICES TO BE TERMINATED/ CAPPED AT SITE BOUNDARY AND REMOVED IN ACCORDANCE WITH AUTHORITY REQUIREMENTS

EXISTING WATER TO BE REMOVED. WATER SUPPLY TO BE TERMINATED AND CAPPED AT BOUNDARY. REFER HYDRAULIC CONSULTANTS DOCUMENTATION (TYPICAL)

EXISTING TREE TO BE REMOVED

EXISTING KIOSK SUBSTATION TO BE REMOVED/ RELOCATED. REFER L3 DESIGN.



Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date
2	SCHEMATIC DESIGN FOR REF	JL	ES	06.12.2024										
1	FINAL DRAFT ISSUE FOR REF	JL	ES	21.11.2024										

Client:

 **School Infrastructure NSW**

Engineer:

 **TTW**
www.ttwengineers.com

Project:

NEW HIGH SCHOOL FOR JORDAN SPRINGS

Drawing Title:

GENERAL DEMOLITION PLAN

Scale at A1	Drawn	Designed	Approved		
500	ES	JL	CR		
Project No	Originator	Type	Role	Sheet No.	Rev
JSHS-TTW-01-00-DR-C-00303-2					
05.12.2024 1:20 PM					



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[illegible]

School Infrastructure NSW



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Project: **NEW HIGH SCHOOL FOR JORDAN SPRINGS**

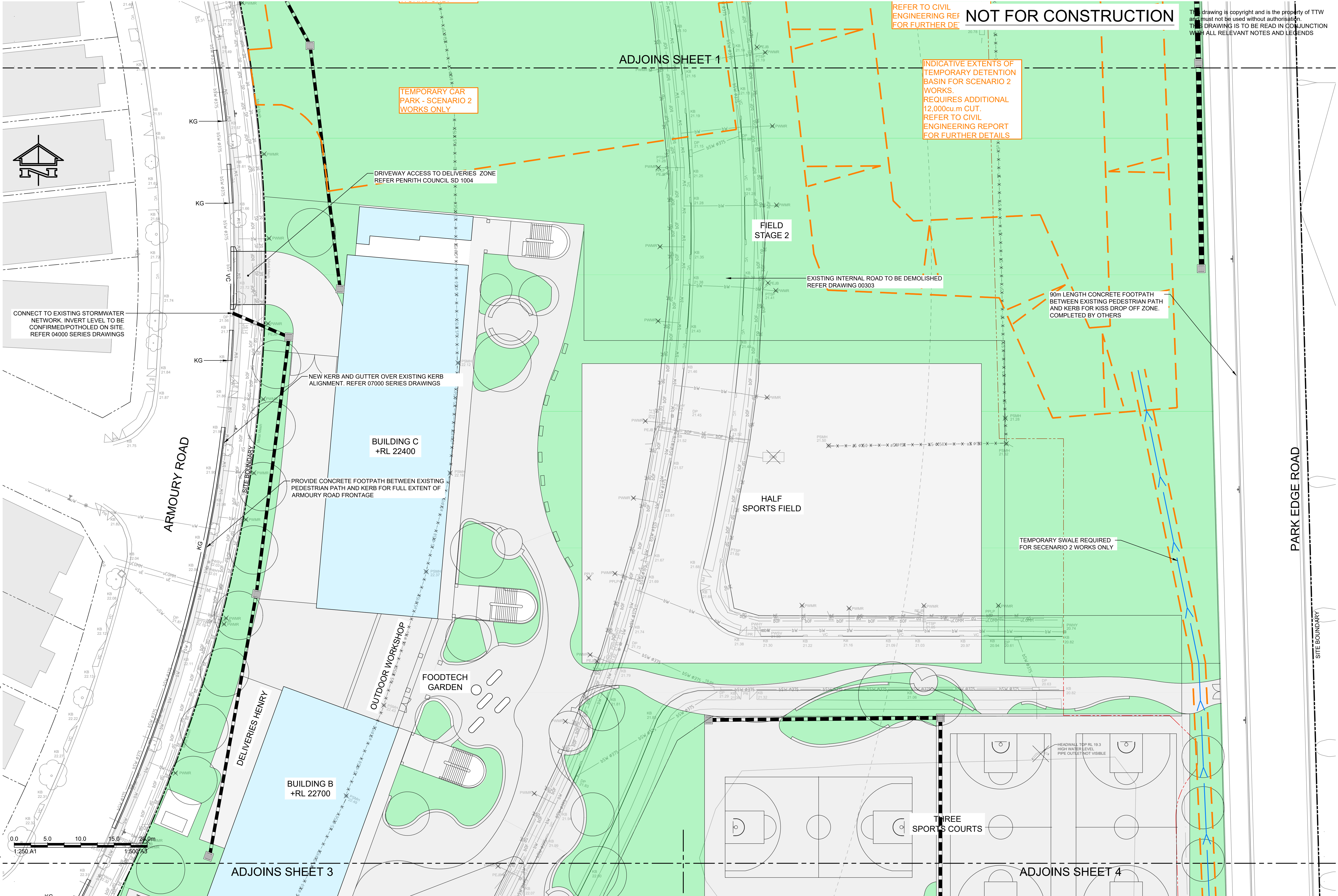
Drawing Title:
GENERAL
ARRANGEMENT PLAN
SHEET 1

250

Project No

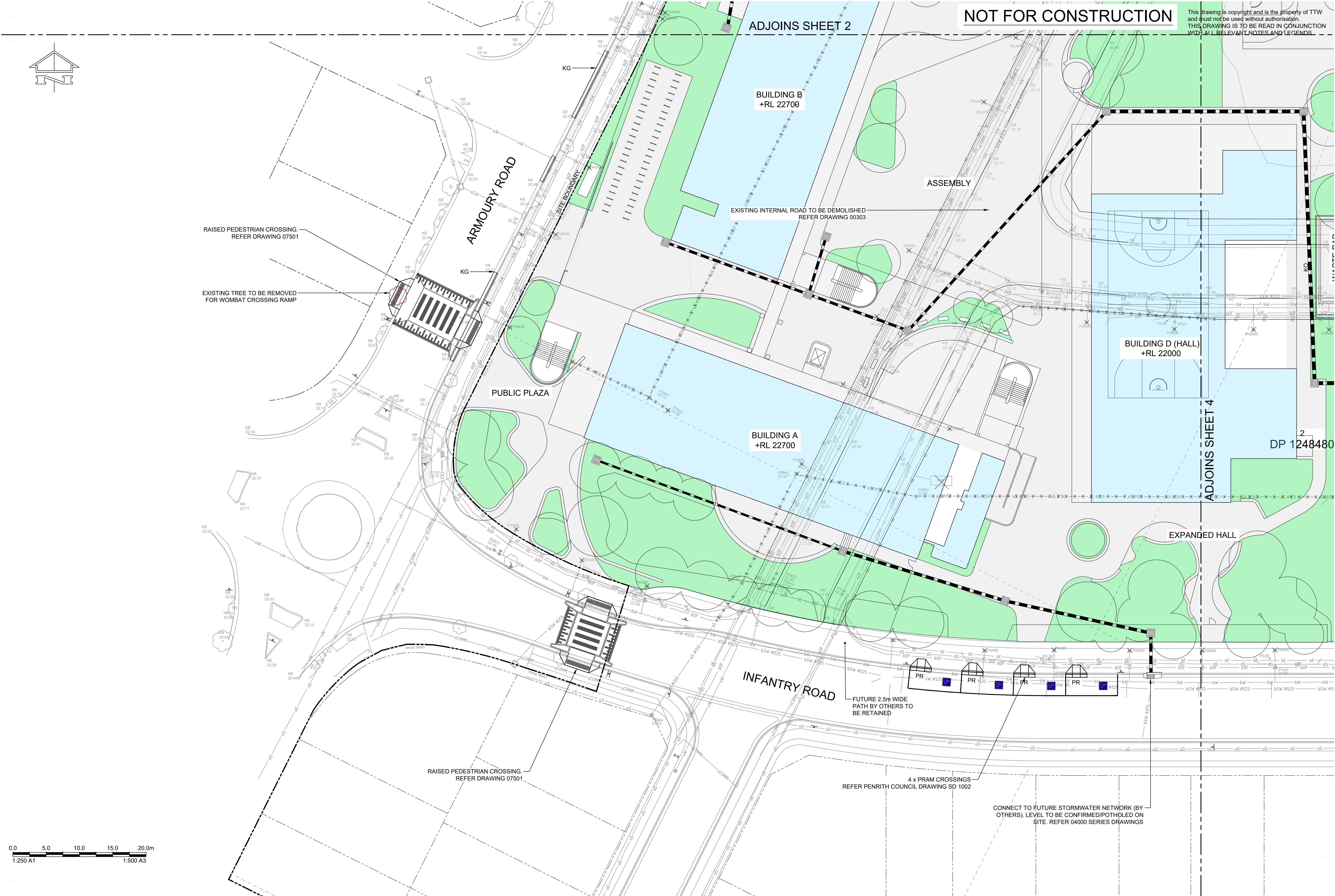
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17.12.2024 3:55 PM



Client:			Engineer:			Project:			Drawing Title:			Scale at A1:			Drawn:			Designed:			Approved:		
3 SCHEMATIC DESIGN FOR REF			JL ES 17.12.2024			NEW HIGH SCHOOL FOR JORDAN SPRINGS			GENERAL ARRANGEMENT PLAN SHEET 2			250			ES			JL			CR		
2 SCHEMATIC DESIGN FOR REF			JL ES 06.12.2024			Project No			Originator			Type			Role			Sheet No.			Rev		
1 FINAL DRAFT ISSUE FOR REF			JL ES 21.11.2024			JSHS-TTW-01-00-DR-C-00402-3			17.12.2024			3:55 PM											
Rev			Description			Eng Draft			Date														

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Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date
3	SCHEMATIC DESIGN FOR REF	JL	ES	17.12.2024										
2	SCHEMATIC DESIGN FOR REF	JL	ES	06.12.2024										
1	FINAL DRAFT ISSUE FOR REF	JL	ES	21.11.2024										

Client:

 School Infrastructure NSW

Engineer:

 **TTW**
www.ttwenr.com

Project:

**NEW HIGH SCHOOL FOR
JORDAN SPRINGS**

Drawing Title:

**GENERAL
ARRANGEMENT PLAN
SHEET 3**

Scale at A1: 250

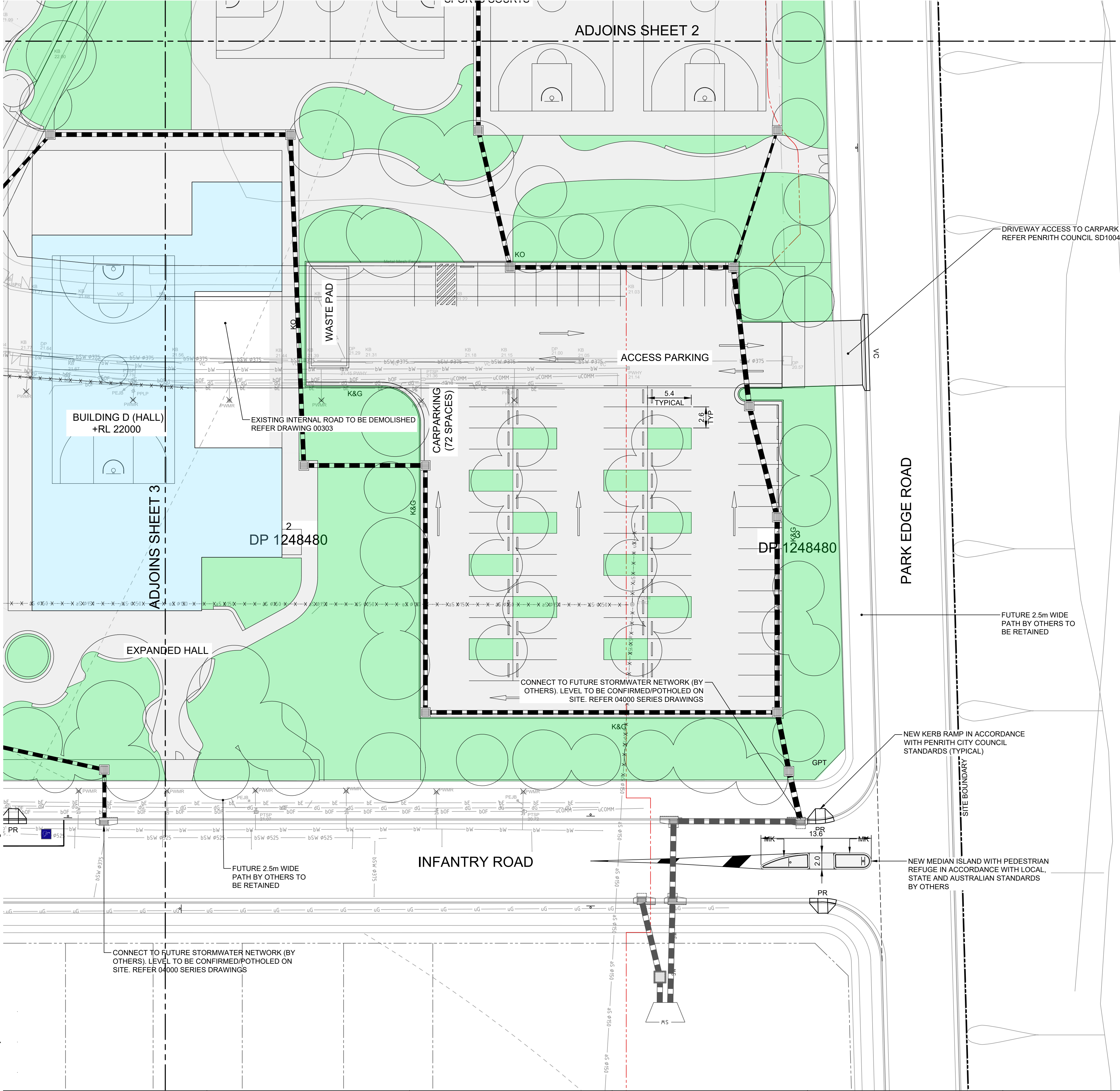
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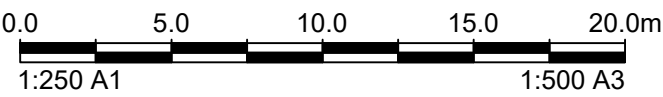
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Rev	Description	Eng Draft	Date	Rev	Description	Eng Draft	Date	Rev	Description	Eng Draft	Date
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2	SCHEMATIC DESIGN FOR REF	JL	ES 06.12.2024								
1	FINAL DRAFT ISSUE FOR REF	JL	ES 21.11.2024								

Client:
 School Infrastructure NSW

Engineer:

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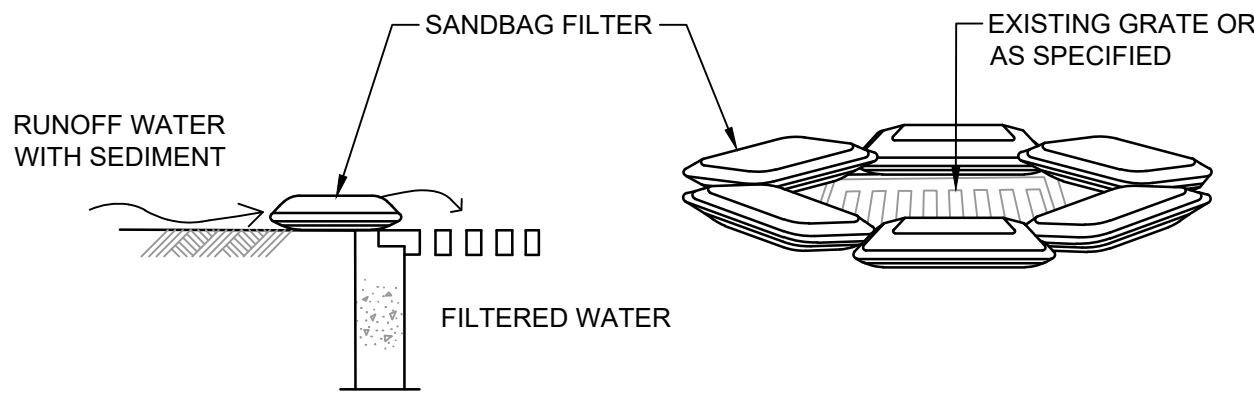
Project:
NEW HIGH SCHOOL FOR
JORDAN SPRINGS

Drawing Title:
GENERAL
ARRANGEMENT PLAN
SHEET 4

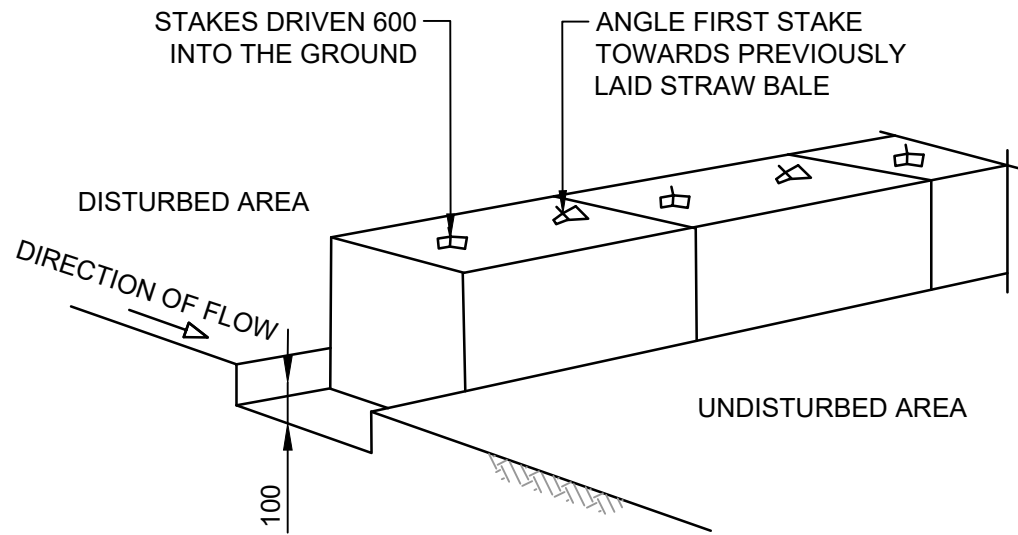
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Drawn
ES
Originator
Designed
JL
Type
Approved
CR
Role
Sheet No.
Rev

EROSION AND SEDIMENT CONTROL PUMP OUT NOTES

ANY ACCUMULATED WATER CONTAMINATED WITH SEDIMENT, FROM A SEDIMENT BASIN OR EXCAVATION PIT, IS TO BE FLOCCULATED OR FILTERED IN ORDER TO LOWER THE SUSPENDED SOLID LOAD TO LESS THAN 50MG PER LITRE
GYPSUM GAS OR OTHER APPROVED FLOCCULANT SHOULD BE APPLIED WITHIN 24 HOURS OF THE END OF THE STORM EVENT. THE GYPSUM MUST BE SPREAD EVENLY OVER THE ENTIRE WATER SURFACE. PUMPING IS NOT TO OCCUR FOR AT LEAST 36 HOURS AND PREFERABLY 48 HOURS AFTER APPLICATION. CLEAN WATER IS TO BE DISCHARGED TO THE WATER TABLE VIA A HALE BAIL SEDIMENT FILTER IN A WAY THAT DOES NOT PICK UP SEDIMENT THAT HAS DROPPED TO THE BOTTOM.
NOTE: GYPSUM IS A HYDRATED FORM OF CALCIUM SULPHATE AND IS AVAILABLE AT MANY SWIMMING POOL SHOPS AND HARDWARE STORES.

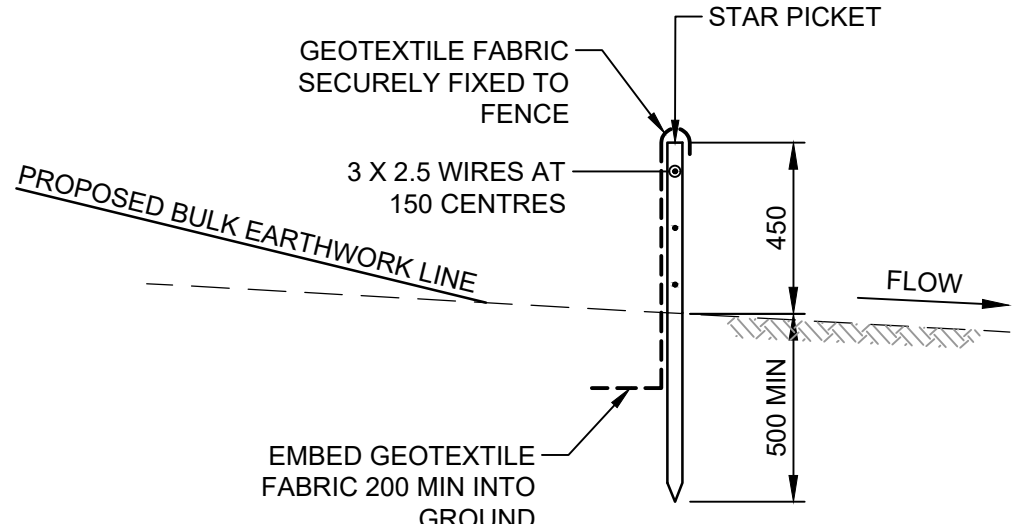


SANDBAG KERB SEDIMENT TRAP
NTS



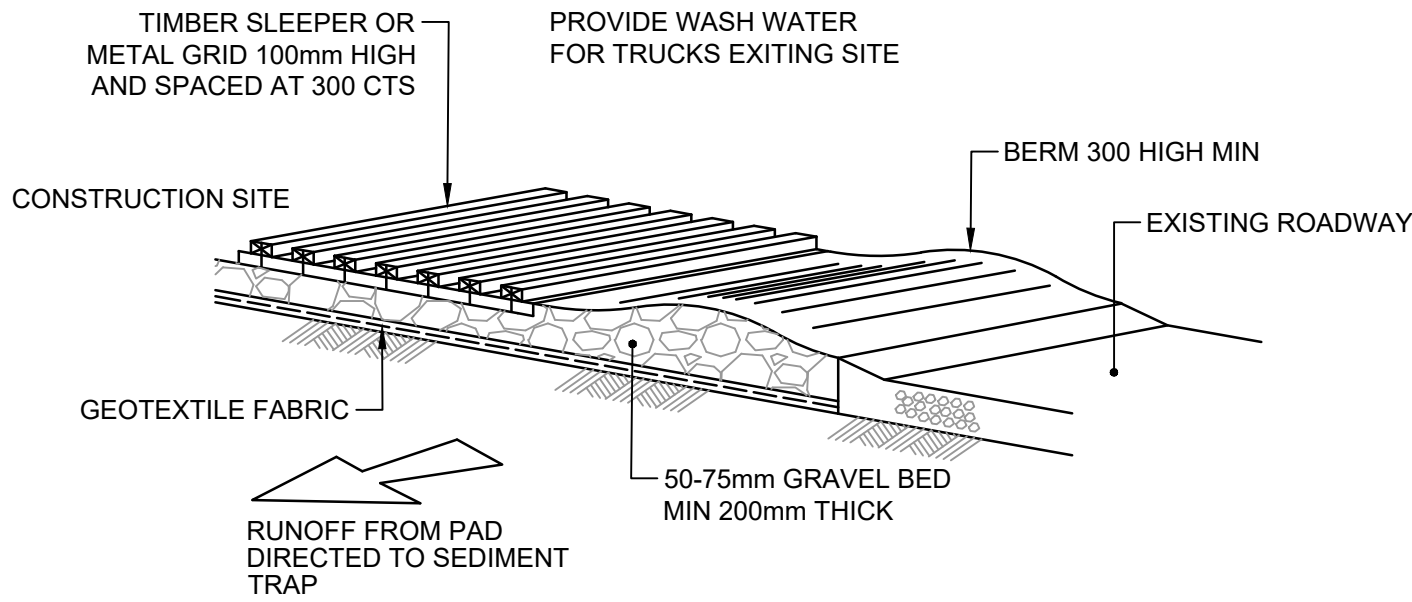
HAY BALE SEDIMENT FILTER
NTS

NOTE: STAKE TO BE EITHER TAR COATED
STAR OR 50 x 50 HARDWOOD

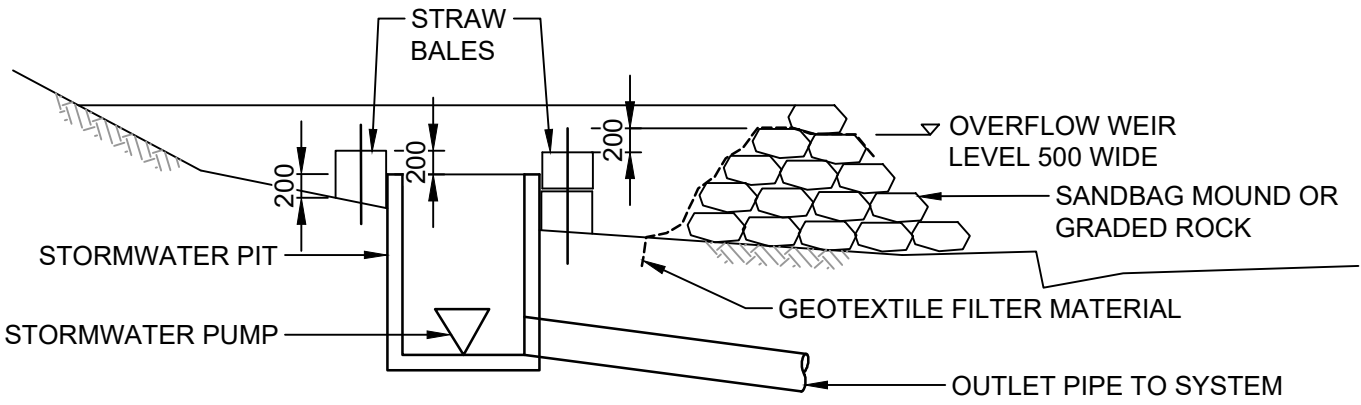


NOTE
ENDS OF SILTATION FENCE TO RETURNED
UP SLOPE TO PREVENT RUNOFF

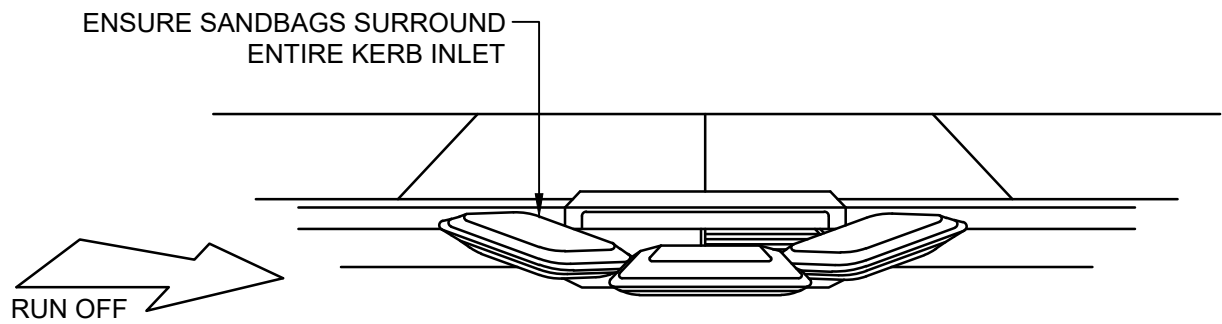
SILTATION FENCE DETAIL
SCALE 1:20



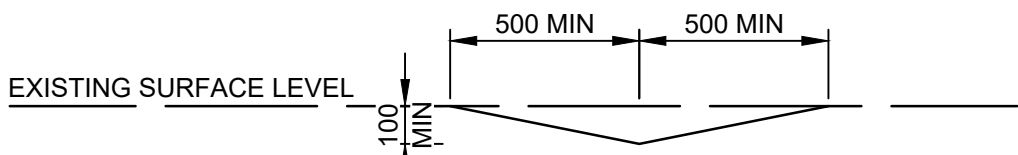
TEMPORARY CONSTRUCTION VEHICLE EXIT
NTS



SEDIMENTATION TRAP
NTS

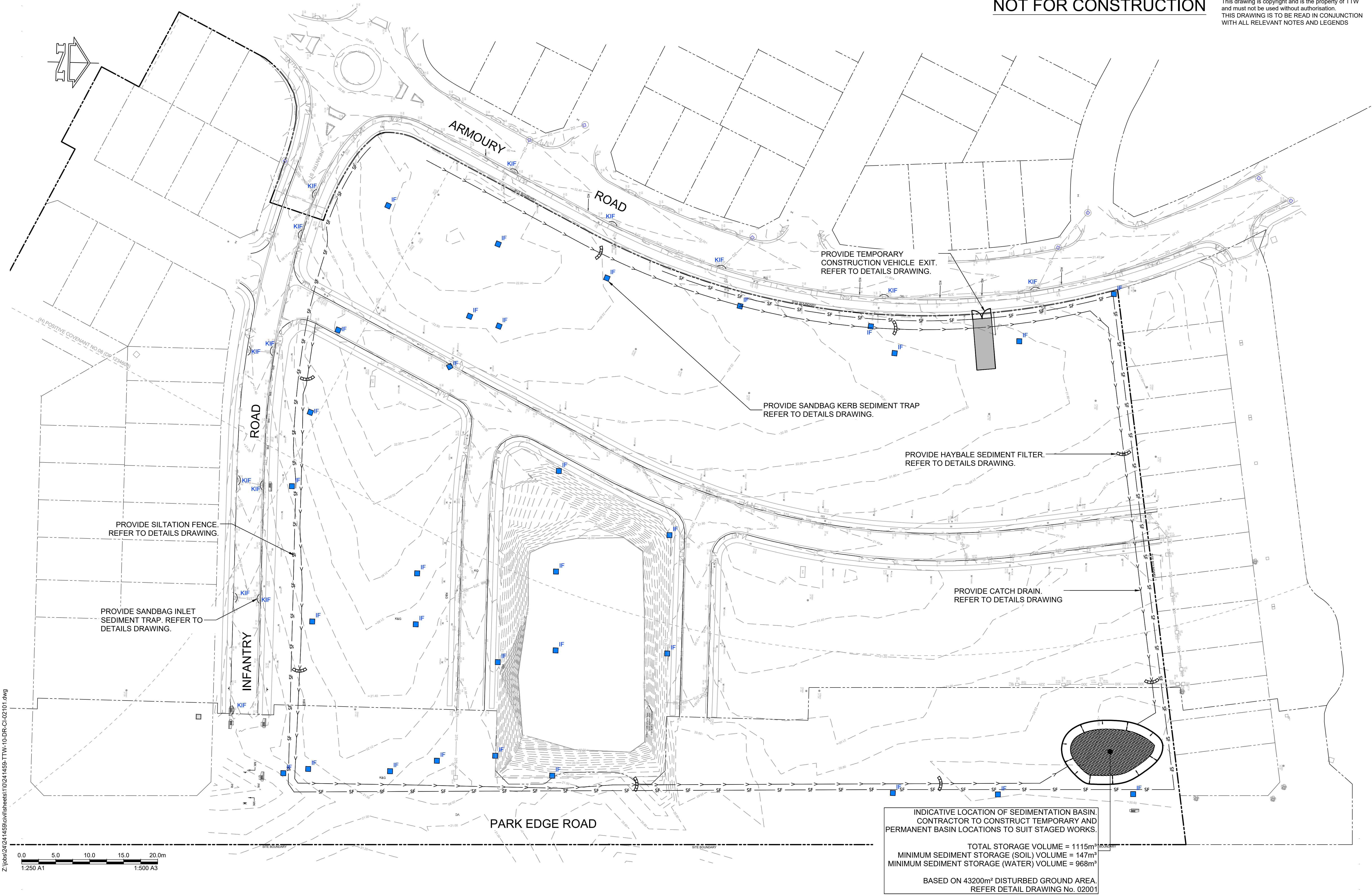


SANDBAG KERB INLET SEDIMENT TRAP
NTS



TYPICAL SECTION
THROUGH CATCH DRAIN
SCALE 1:20

										 School Infrastructure NSW										 www.ttwengineers.com										Project: NEW HIGH SCHOOL FOR JORDAN SPRINGS										Drawing Title: EROSION AND SEDIMENT CONTROL NOTES AND LEGEND SHEET 1										Scale at A1 ES JL CR									
																																								Project No Originator Type Role Sheet No. Rev																			
2 SCHEMATIC DESIGN FOR REF JL ES 06.12.2024																																								JSHS-TTW-01-00-DR-C-02001-2																			
1 FINAL DRAFT ISSUE FOR REF JL ES 21.11.2024																																								05.12.2024 1:25 PM																			
Rev Description Eng Draft Date										Rev Description Eng Draft Date										Rev Description Eng Draft Date																																							



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2	SCHEMATIC DESIGN FOR REF	JL	ES	06.12.2024										
1	FINAL DRAFT ISSUE FOR REF	JL	ES	21.11.2024										

Client:

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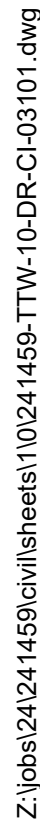
Project:

NEW HIGH SCHOOL FOR JORDAN SPRINGS

Drawing Title:

EROSION AND SEDIMENT CONTROL PLAN

Scale at A1	Drawn	Designed	Approved		
500	ES	JL	CR		
Project No	Originator	Type	Role	Sheet No.	Rev
JSHS-TTW-01-00-DR-C-02101-2					
05.12.2024 1:25 PM					



Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
CUT AND FILL EXCLUDING BASIN	1.000	1.000	25799.40sq.m	1844.83 Cu. M.	3523.01 Cu. M.	1678.19 Cu. M.<Fill>
CUT AND FILL OF BASIN	1.000	1.000	4179.26sq.m	3.24 Cu. M.	12119.03 Cu. M.	12115.79 Cu. M.<Fill>
Totals			29978.65sq.m	1848.07 Cu. M.	15642.04 Cu. M.	13793.97 Cu. M.<Fill>

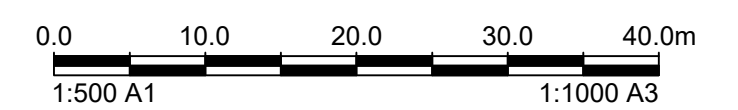
BULK EARTHWORKS NOTES

- relevant safety regulations.



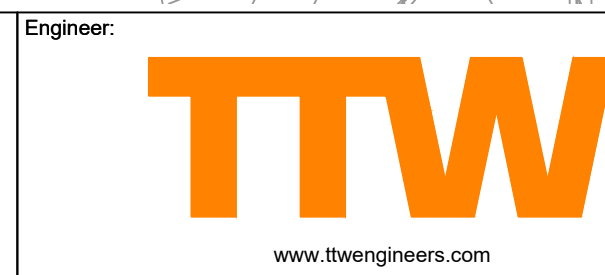
— — — BE308.80 — — — BULK EARTHWORKS CONTOUR

LEVELS TABLE			
No.	FROM LEVEL (m)	TO LEVEL (m)	COLOUR
1	-1.00	-0.50	
2	-0.50	0.00	
3	0.00	1.00	
4	1.00	2.00	
5	2.00	3.00	
6	3.00	4.00	
7	4.00	5.00	
8	5.00	6.00	



Client:

 **School Infrastructure NSW**



Drawing Title:
EARTHWORKS
CUT AND FILL
VOLUMES PLAN

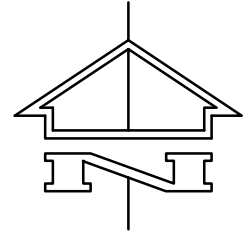
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Project No	Originator	Type	Role Sheet No. Rev
JSHS-TTW-01-00-DR-C-03101-2			
06.12.2024 4:03 PM			

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2. PIPES 300 DIA AND LARGER TO BE REINFORCED CONCRETE CLASS "4" APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS U.N.O.
3. PIPES UP TO 300 DIA MAY BE SEWER GRADE UPVC WITH SOLVENT WELDED JOINTS, SUBJECT TO APPROVAL BY THE ENGINEER
4. EQUIVALENT STRENGTH VCP OR FRP PIPES MAY BE USED SUBJECT TO APPROVAL.
5. PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL BY ENGINEER.
6. ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE MANUFACTURED FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
7. WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNSLOTTED UPVC SEWER GRADE PIPE IS TO BE USED.
8. GRATES AND COVERS SHALL CONFORM WITH AS 3996-2006, AND AS 1428.1 FOR ACCESS REQUIREMENTS.
9. PIPES ARE TO BE INSTALLED IN ACCORDANCE WITH AS 3725. ALL BEDDING TO BE TYPE H2 U.N.O.
10. CARE IS TO BE TAKEN WITH INVERT LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
11. ALL STORMWATER PIPES TO BE 150 DIA AT 1.0% MIN FALL U.N.O.
12. SUBSOIL DRAINS TO BE SLOTTED FLEXIBLE UPVC U.N.O.
13. ADOPT INVERT LEVELS FOR PIPE INSTALLATION (GRADES SHOWN ARE ONLY NOMINAL).

SW1-2 LINE NUMBER 1 - STRUCTURE NUMBER 2

[illegible]



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- NOTES:
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 - ALL NEW STORMWATER TO BE MIN 1% LONGITUDINAL GRADE, MIN. COVER 600mm.
 - MAXIMUM PIT DEPTH 2m UNLESS NOTED OTHERWISE.
 - ALL STORMWATER GRATED INLET PITS TO BE FITTED WITH 200 MICRON PIT FILTER BASKETS (OCEANGUARD OR SIMILAR)



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0.0 5.0 10.0 15.0 20.0m
1:250 A1 1:500 A3

Rev	Description	Eng Draft	Date	Rev	Description	Eng Draft	Date	Rev	Description	Eng Draft	Date
2	SCHEMATIC DESIGN FOR REF	JL	ES 06.12.2024								
1	FINAL DRAFT ISSUE FOR REF	JL	ES 21.11.2024								

Client:
 School Infrastructure NSW

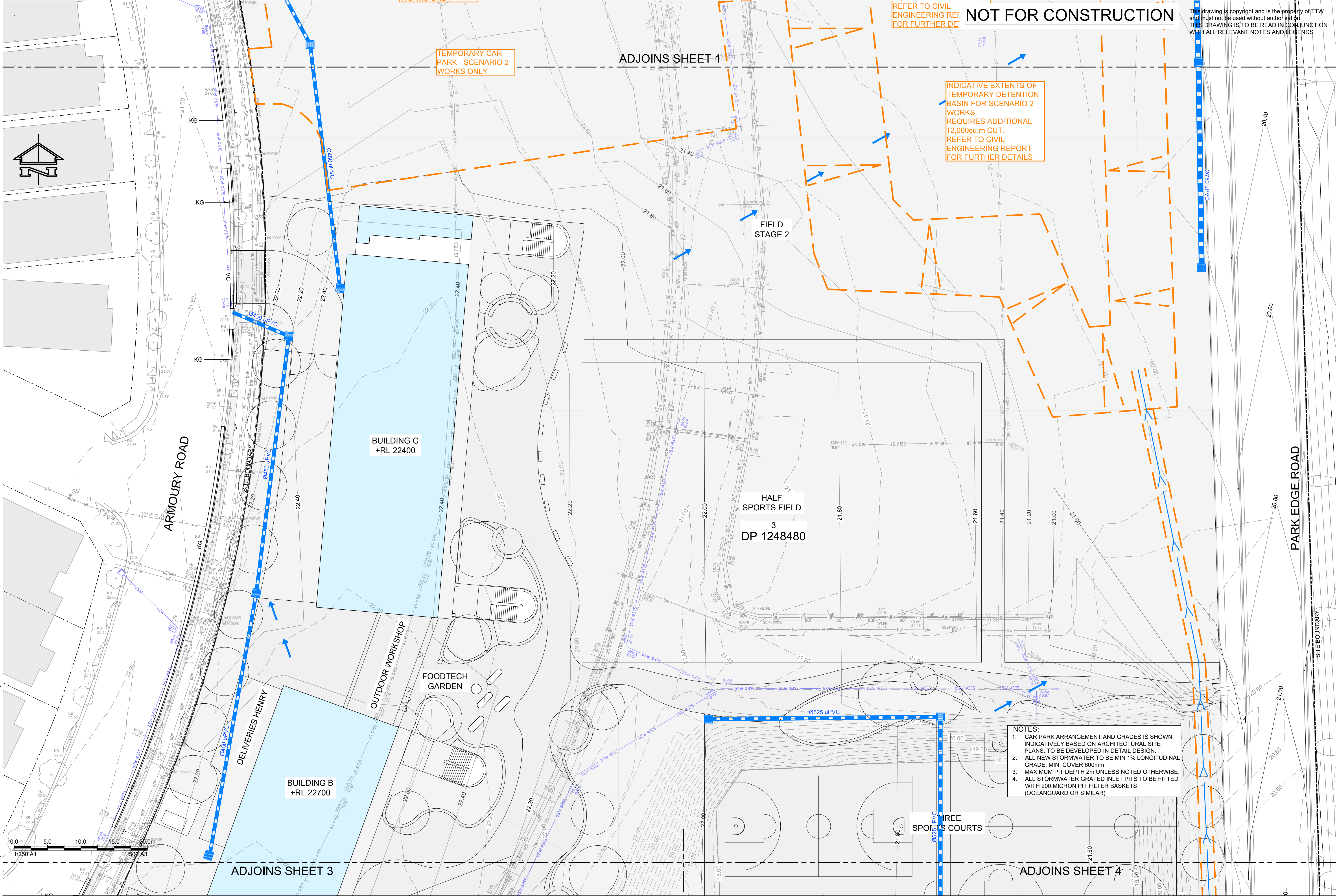
Engineer:

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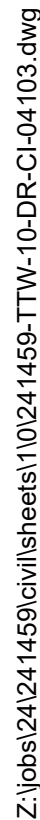
Project:
NEW HIGH SCHOOL FOR
JORDAN SPRINGS

Drawing Title:
STORMWATER
AND SUBSOIL DRAINAGE
PLAN SHEET 1

Scale at A1
250
Project No
06.12.2024 4:04 PM
Drawn
ES
Designed
JL
Role
CR
Sheet No.
JSHS-TTW-01-00-DR-C-04101-2
Rev



2 SCHEMATIC DESIGN FOR REF JL ES 06.12.2024			Client:  School Infrastructure NSW			Project: NEW HIGH SCHOOL FOR JORDAN SPRINGS			Drawing Title: STORMWATER AND SUBSOIL DRAINAGE PLAN SHEET 2			Scale at A1 250			Drawn ES			Designed JL			Approved CR		
1 FINAL DRAFT ISSUE FOR REF JL ES 21.11.2024			Engineer:  www.ttweengineers.com									Project No. Originator			Type Role Sheet No. Rev			JSHS-TTW-01-00-DR-C-04102-2			06.12.2024 4:01 PM		
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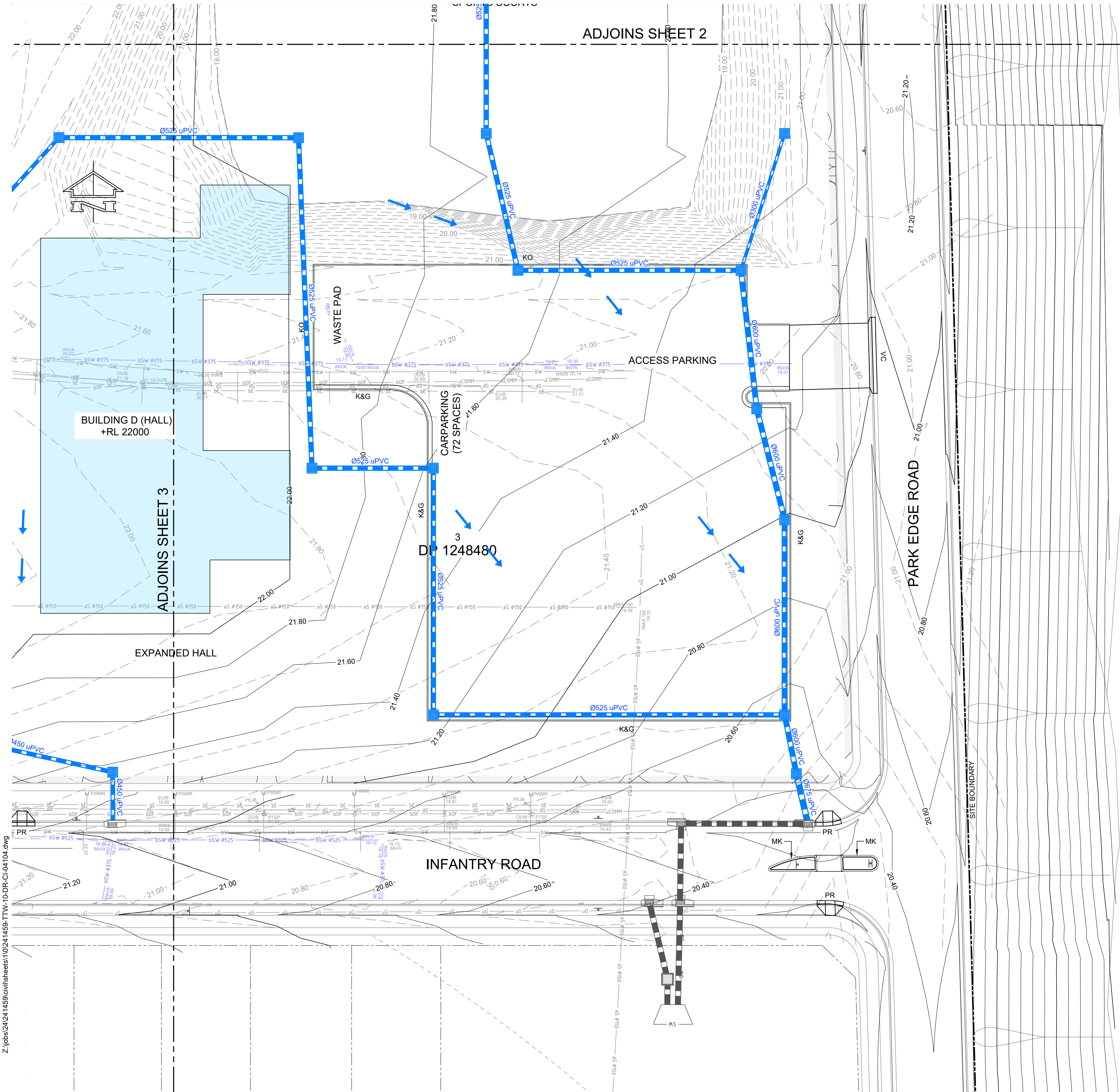
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0.0 5.0 10.0 15.0 20.0m
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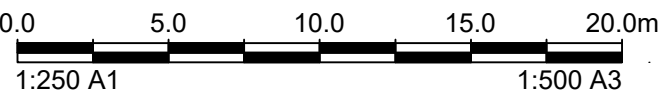
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2	SCHEMATIC DESIGN FOR REF	JL	ES 06.12.2024												
1	FINAL DRAFT ISSUE FOR REF	JL	ES 21.11.2024												

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Project:
NEW HIGH SCHOOL FOR
JORDAN SPRINGS

Drawing Title:
STORMWATER
AND SUBSOIL DRAINAGE
PLAN SHEET 4

Scale at A1	Drawn	Designed	Approved		
250	ES	JL	CR		
Project No	Originator	Type	Role	Sheet No.	Rev
JSHS-TTW-01-00-DR-C-04104-2					
05.12.2024 1:31 PM					

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1. PLACE CONCRETE OF THE FOLLOWING CHARACTERISTIC COMPRESSIVE STRENGTH f_c IN ACCORDANCE WITH AS 1379.
- 2.

3. USE TYPE 'GP' CEMENT, UNLESS OTHERWISE SPECIFIED.
4. ALL CONCRETE SHALL BE SUBJECT TO PROJECT ASSESSMENT AND TESTING TO AS 1379.
5. CONSOLIDATE BY MECHANICAL VIBRATION. CURE ALL CONCRETE SURFACES AS DIRECTED IN THE SPECIFICATION.
6. FOR ALL FALLS IN SLAB, DRIP GROOVES, REGLETS, CHAMFERS ETC. REFER TO ARCHITECTS DRAWINGS AND SPECIFICATIONS.
7. UGLS SHOWN ON THE DRAWINGS, THE LOCATION OF ALL CONSTRUCTION JOINTS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
8. NO HOLES OR CHASES SHALL BE MADE IN THE SLAB WITHOUT THE APPROVAL OF THE ENGINEER.
9. CONDUITS AND PIPES ARE TO BE FIXED TO THE UNDERSIDE OF THE TOP REINFORCEMENT LAYER.
10. SLURRY USED TO LUBRICATE CONCRETE PUMP LINES IS NOT TO BE USED IN ANY STRUCTURAL MEMBERS.
11. ALL SLABS CAST ON GROUND REQUIRE SAND BLINDING WITH A CONCRETE UNDERLAY

1. ALL EXPOSED CONCRETE PAVEMENTS ARE TO BE BROOMED FINISHED.
2. ALL EDGES OF THE CONCRETE PAVEMENT INCLUDING KEYED AND DOWELLED JOINTS ARE TO BE FINISHED WITH AN EDGING TOOL.
3. CONCRETE PAVEMENTS WITH GRADES GREATER THAN 10 % SHALL BE HEAVILY BROOMED FINISHED.
4. CARBORUNDUM TO BE ADDED TO ALL STAIR TREADS AND RAMPED CROSSINGS U.N.O.

1. THE DESIGN, CERTIFICATION, CONSTRUCTION AND PERFORMANCE OF THE FORMWORK, FALSEWORK AND BACKPROPPING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. PROPOSED METHOD OF INSTALLATION AND REMOVAL OF FORMWORK IS TO BE SUBMITTED TO THE SUPERINTENDENT FOR COMMENT PRIOR TO WORK BEING CARRIED OUT.

NOTES:

1. PAVEMENT BUILDUPS ARE INDICATIVE AND TO BE DEVELOPED IN DETAILED DESIGN
2. ADOPTED DESIGN PARAMETERS:
DESIGN TRAFFIC 5×10^5 ESA, SUBGRADE 4% CBR MIN.

1. FIX REINFORCEMENT AS SHOWN ON DRAWINGS. THE TYPE AND GRADE IS INDICATED BY A SYMBOL AS SHOWN BELOW. ON THE DRAWINGS THIS IS FOLLOWED BY A NUMERAL WHICH INDICATES THE SIZE IN MILLIMETRES OF THE REINFORCEMENT.

2. PROVIDE BAR SUPPORTS OR SPACERS TO GIVE THE FOLLOWING CONCRETE COVER TO ALL REINFORCEMENT UNLESS OTHERWISE NOTED ON DRAWINGS.

3. COVER TO REINFORCEMENT ENDS TO BE 50 mm U.N.O.
4. PROVIDE N12-450 SUPPORT BARS TO TOP REINFORCEMENT AS REQUIRED, LAP 500 U.N.O.
5. MAINTAIN COVER TO ALL PIPES, CONDUITS, REGLETS, DRIP GROOVES ETC
6. ALL COGS TO BE STANDARD COGS UNLESS NOTED OTHERWISE.
7. FABRIC END AND SIDE LAPS ARE TO BE PLACED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS TO ACHIEVE A FULL TENSILE LAP. FABRIC SHALL BE LAID SO THAT THERE IS A MAXIMUM OF 3 LAYERS AT ANY LOCATION.

FABRIC LAP

8. LAPS IN REINFORCEMENT SHALL BE MADE ONLY WHERE SHOWN ON THE DRAWINGS UNLESS OTHERWISE APPROVED. LAP LENGTHS AS PER TABLE BELOW.

COMPRESSION LAPS	
BAR SIZE	
N16	640
N20	800
N24	960
N28	1120
N32	1280
N36	1440

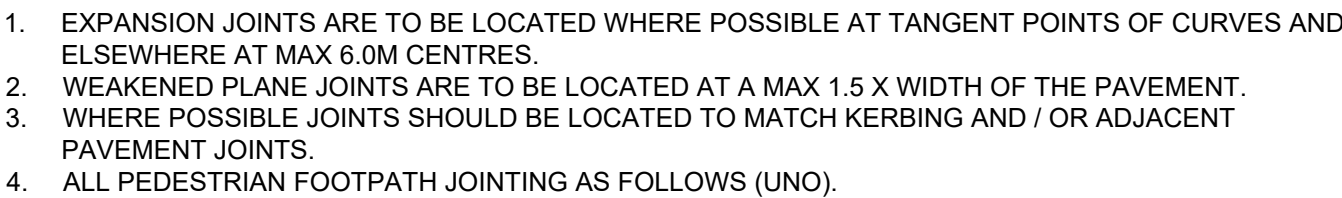
ASSUMPTIONS:

1. TOP BARS IN BANDS AND BEAMS:
MORE THAN 300mm OF CONCRETE BELOW THE BAR.
2. MINIMUM COVER OF 25mm AND MINIMUM STIRRUP SIZE OF N12 GIVING $C_d=37\text{mm}$; THEREFORE MINIMUM CLEAR SPACING BETWEEN BARS = $2 \times C_d = 74\text{mm}$. MINIMUM COVER IS BASED ON THE NEW A2 EXPOSURE CLASSIFICATION FOR INTERIOR, NON-RESIDENTIAL WHICH REQUIRES 25mm COVER FOR 32Mpa CONCRETE.
3. $f_c = 32\text{Mpa}$
ALL OTHER BARS:
1. LESS THAN 300mm OF CONCRETE BELOW THE BAR.
2. MINIMUM COVER OF 25mm GIVING $C_d = 25\text{mm}$; THEREFORE MINIMUM CLEAR SPACING BETWEEN BARS = $2 \times C_d = 50\text{mm}$.
3. $f_c = 32\text{Mpa}$.

COLUMNS:

1. COVER TO COLUMNS = 40mm $(30+10)\text{K}7 = 1.25$
2. COVERS FOR FIRE RATING ARE TO BE DESIGNED BY THE ENGINEER.

1. ALL VEHICULAR PAVEMENTS TO BE JOINTED AS SHOWN ON DRAWINGS.
2. DOWEL BARS ARE TO BE IN ACCORDANCE WITH GIVEN DETAIL. REFER 03000 SERIES DRAWINGS.
3. COVELEDED EXPANSION JOINTS SHOULD GENERALLY BE LOCATED AT A MAXIMUM OF 24.0M CENTRES.
4. SAWN JOINTS SHOULD GENERALLY BE LOCATED AT A MAXIMUM OF 6.0M CENTRES OR 1.5 X THE SPACING OF PERPENDICULAR SAWN JOINTS.
5. PROVIDE 10mm wide FULL DEPTH EXPANSION JOINTS BETWEEN BUILDINGS/STRUCTURES AND ALL CONCRETE OR CURB PAVERS.
6. THE TIMING OF THE SAW CUT IS TO BE CONFIRMED BY THE CONTRACTOR ON SITE. SITE OFFICIALS WILL DETERMINE HOW MANY HOURS AFTER THE CONCRETE POURS BEFORE THE SAW CUTS ARE COMMENCED. REFER TO THE SPECIFICATION FOR WEATHER CONDITIONS AND TEMPERATURES REQUIRED.
7. VEHICULAR PAVEMENT JOINTING AS FOLLOWS.

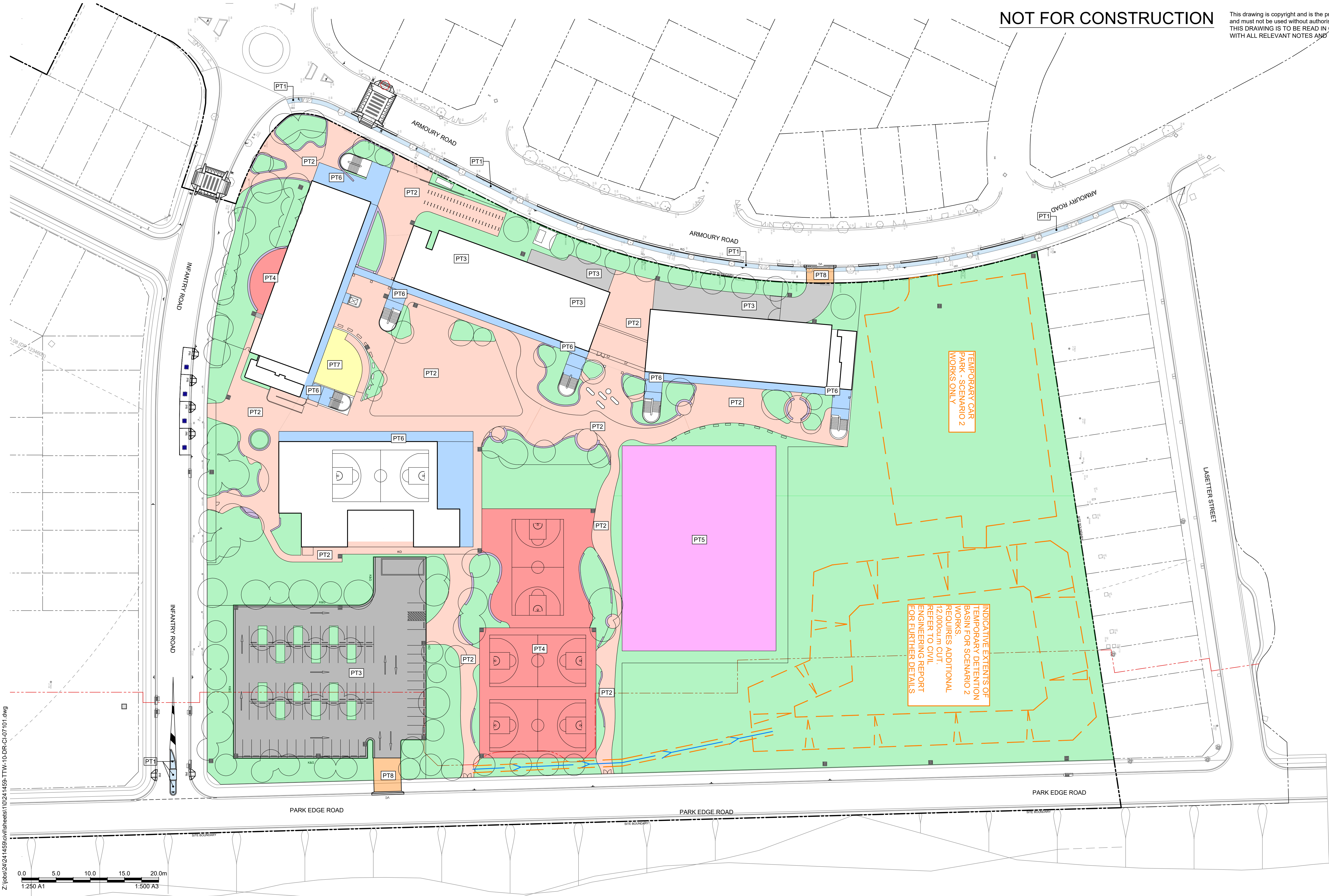


1. ALL KERBS, GUTTERS, DISH DRAINS AND CROSSINGS TO BE CONSTRUCTED ON MINIMUM 75mm GRANULAR BASECOURSE COMPACTED TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1.
2. EXPANSION JOINTS (EJ) TO BE FORMED FROM 10mm COMPRESSIBLE CORK FILLER BOARD FOR THE FULL DEPTH OF THE SECTION AND CUT TO PROFILE. EXPANSION JOINTS TO BE LOCATED AT DRAINAGE PITS, ON TANGENT POINTS OF CURVES AND ELSEWHERE AT 12M CENTRES EXCEPT FOR INTEGRAL KERBS WHERE THE EXPANSION JOINTS ARE TO MATCH THE JOINT LOCATIONS IN SLABS.
3. WEAKENED PLANE JOINTS TO BE MIN 3mm WIDE AND LOCATED AT 3M CENTRES EXCEPT FOR INTEGRAL KERBS WHERE WEAKENED PLANE JOINTS ARE TO MATCH THE JOINT LOCATIONS IN SLABS.
4. BROOMED FINISHED TO ALL RAMPED AND VEHICULAR CROSSINGS, ALL OTHER KERBING OR DISH DRAINS TO BE STEEL FLOAT FINISHED.
5. IN THE REPLACEMENT OF KERBS - EXISTING ROAD PAVEMENT IS TO BE SAWCUT 900mm FROM LIP OF GUTTER. UPON COMPLETION OF NEW KERBS, NEW BASE COURSE AND SURFACE IS TO BE LAID 900mm WIDE TO MATCH EXISTING MATERIALS AND THICKNESSES. EXISTING ALLOTMENT DRAINAGE PIPES ARE TO BE BUILT INTO THE NEW KERB WITH A 100mm DIA HOLE. EXISTING KERBS ARE TO BE COMPLETELY REMOVED WHERE NEW KERBS ARE SHOWN.

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Rev	Description	Eng Draft	Date	Rev	Description	Eng Draft	Date	Rev	Description	Eng Draft	Date
3	SCHEMATIC DESIGN FOR REF	JL	ES 17.12.2024								
2	SCHEMATIC DESIGN FOR REF	JL	ES 06.12.2024								
1	FINAL DRAFT ISSUE FOR REF	JL	ES 21.11.2024								

Client:

 **School Infrastructure NSW**

Engineer:

 **TTW**
www.ttwengineers.com

Project:

NEW HIGH SCHOOL FOR JORDAN SPRINGS

Drawing Title:

PAVEMENT PLAN

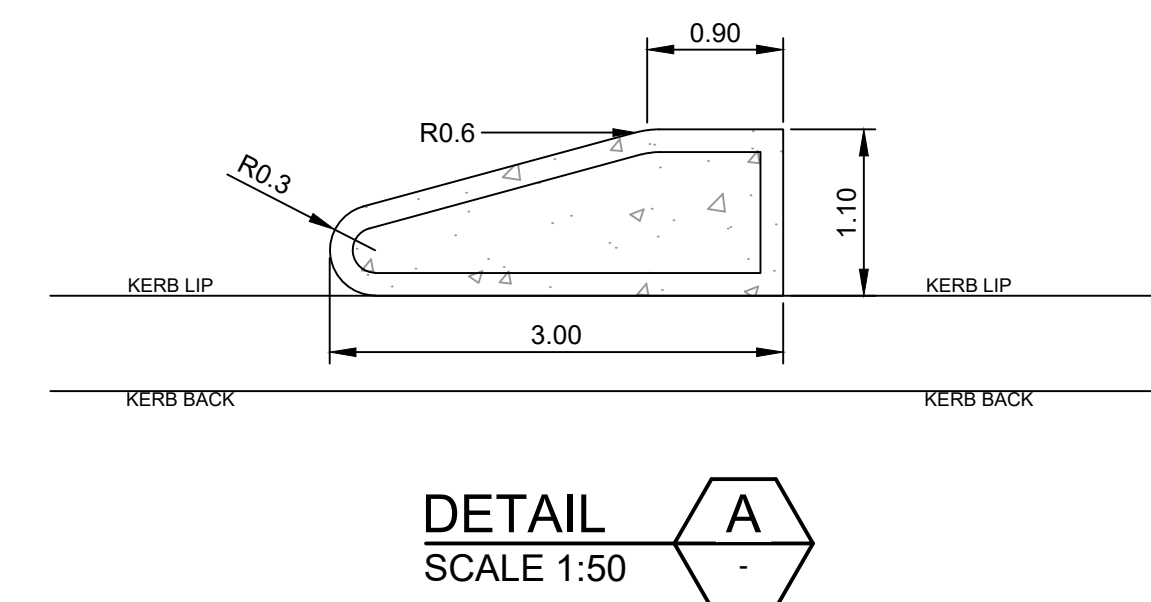
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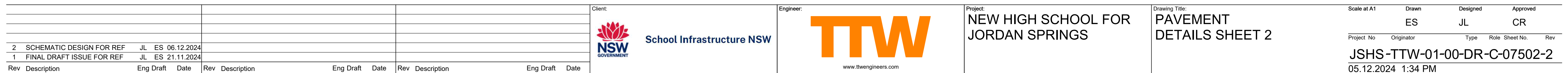
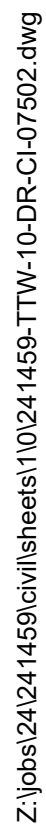
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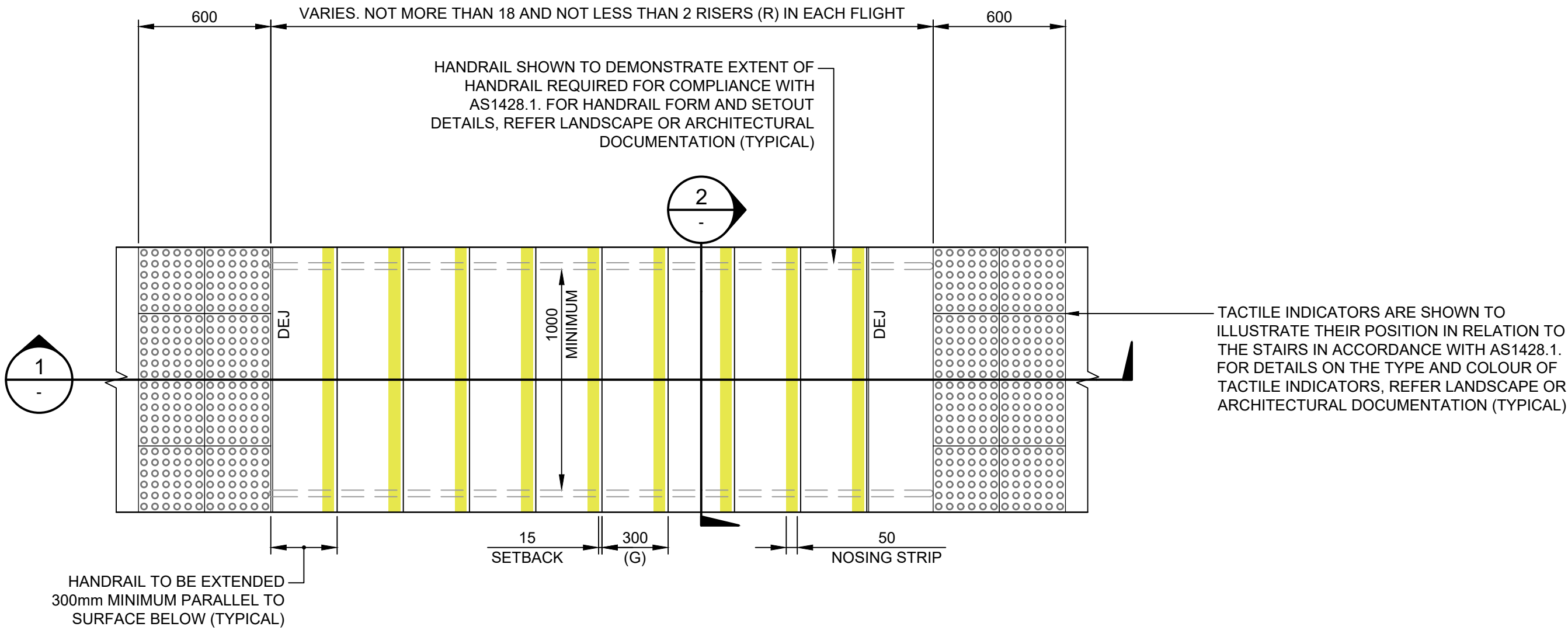
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Approved: CR

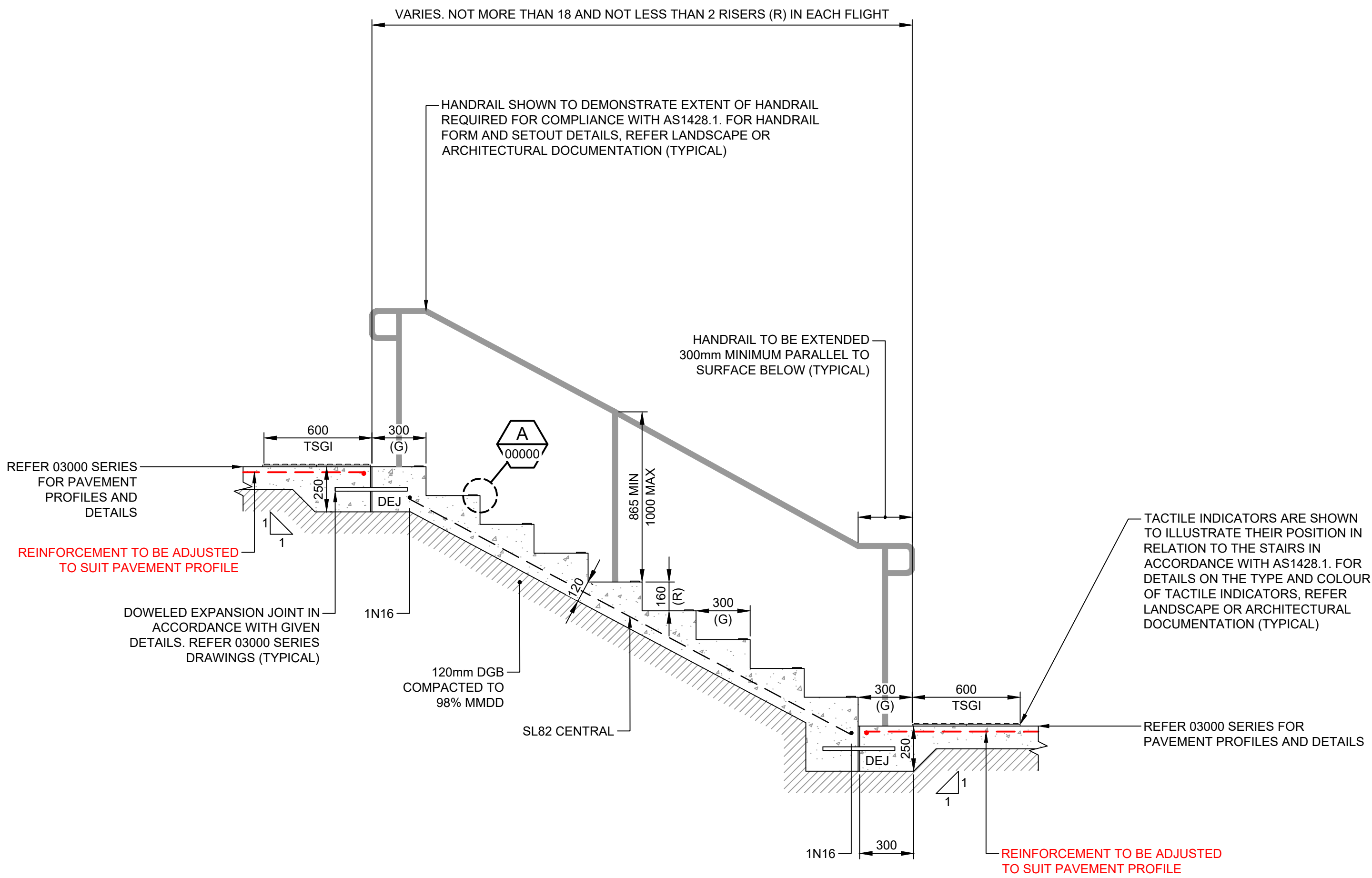
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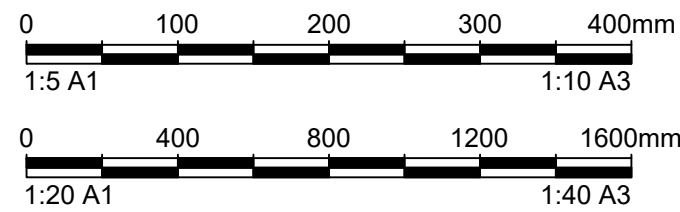




TYPICAL STAIR ON GRADE
SCALE 1:20



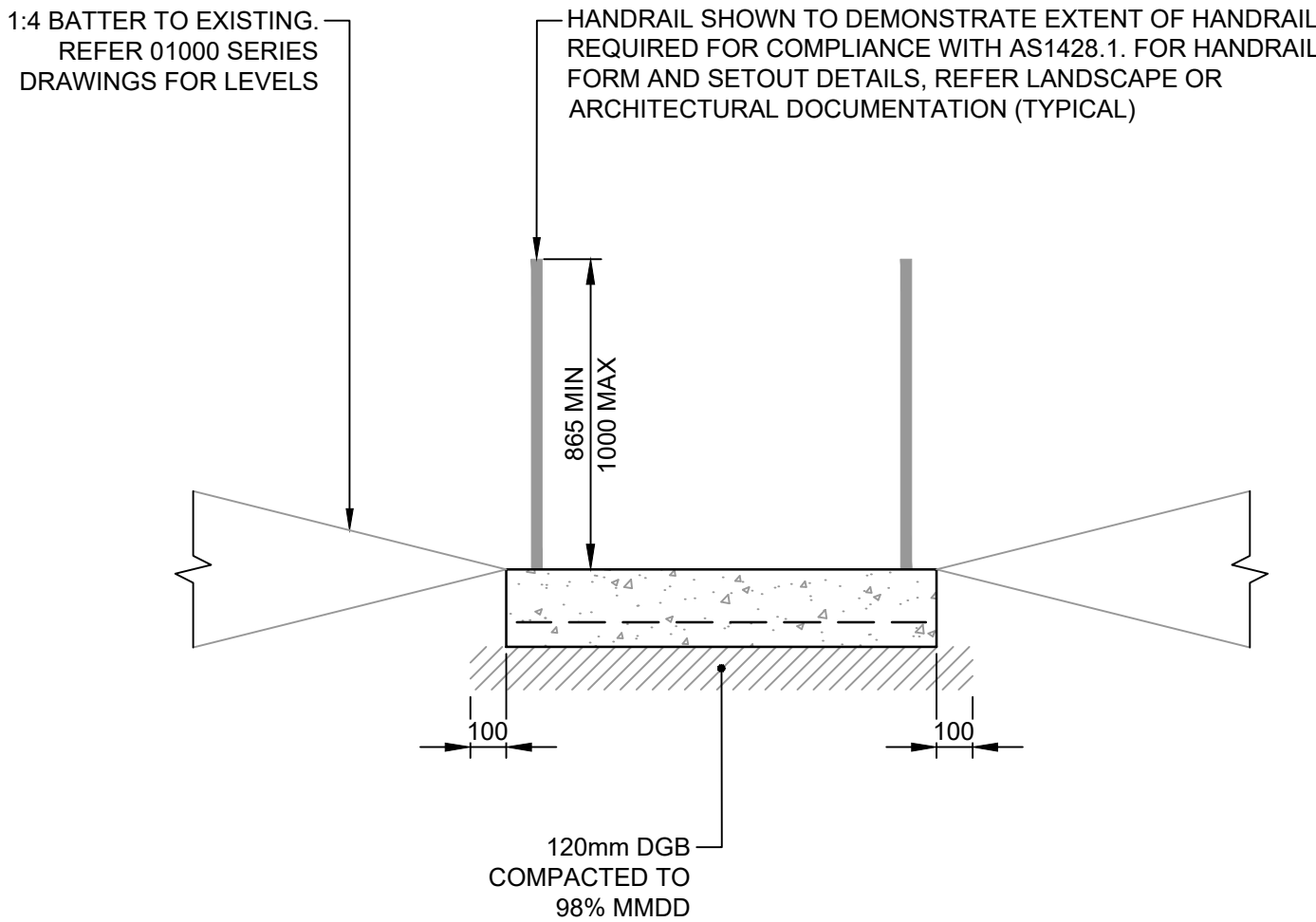
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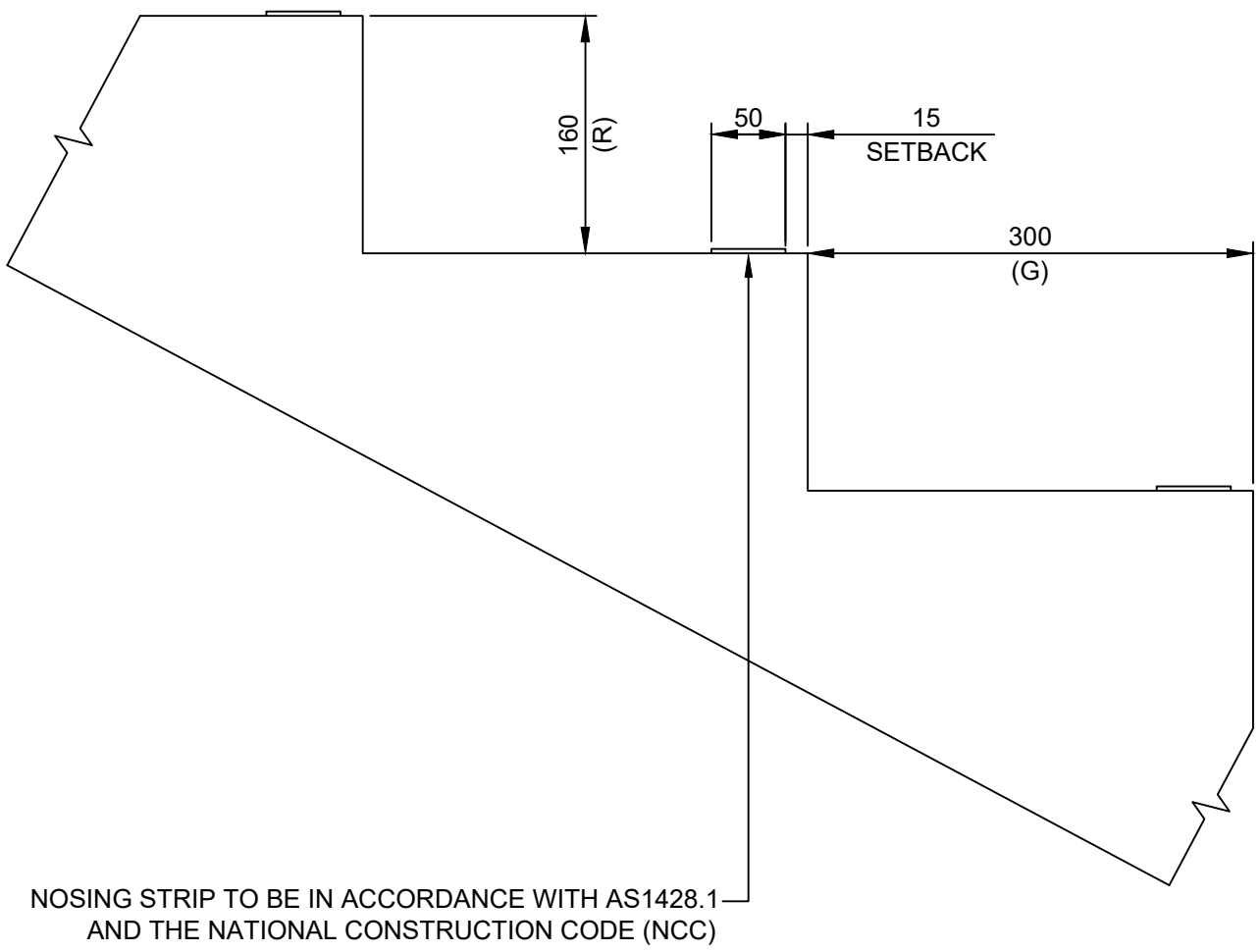
RISER AND GOING DIMENSIONS						
STAIR TYPE	RISER (R)		GOING (G)		SLOPE RELATIONSHIP (2R+G)	
	MAX	MIN	MAX	MIN	MAX	MIN
STAIRS (OTHER THAN SPIRAL)	190	115	355	240	700	550
SPIRAL	220	140	370	210	680	590

NOTES

- CONCRETE STRENGTH TO BE 32MPa
- REFER SITE PLANS FOR SETOUT, LEVELS AND GEOMETRY
- FOR MINIMUM SLIP RESISTANCE OF STAIR TREADS AND LANDINGS REFER LANDSCAPE OR ARCHITECTURAL DOCUMENTATION

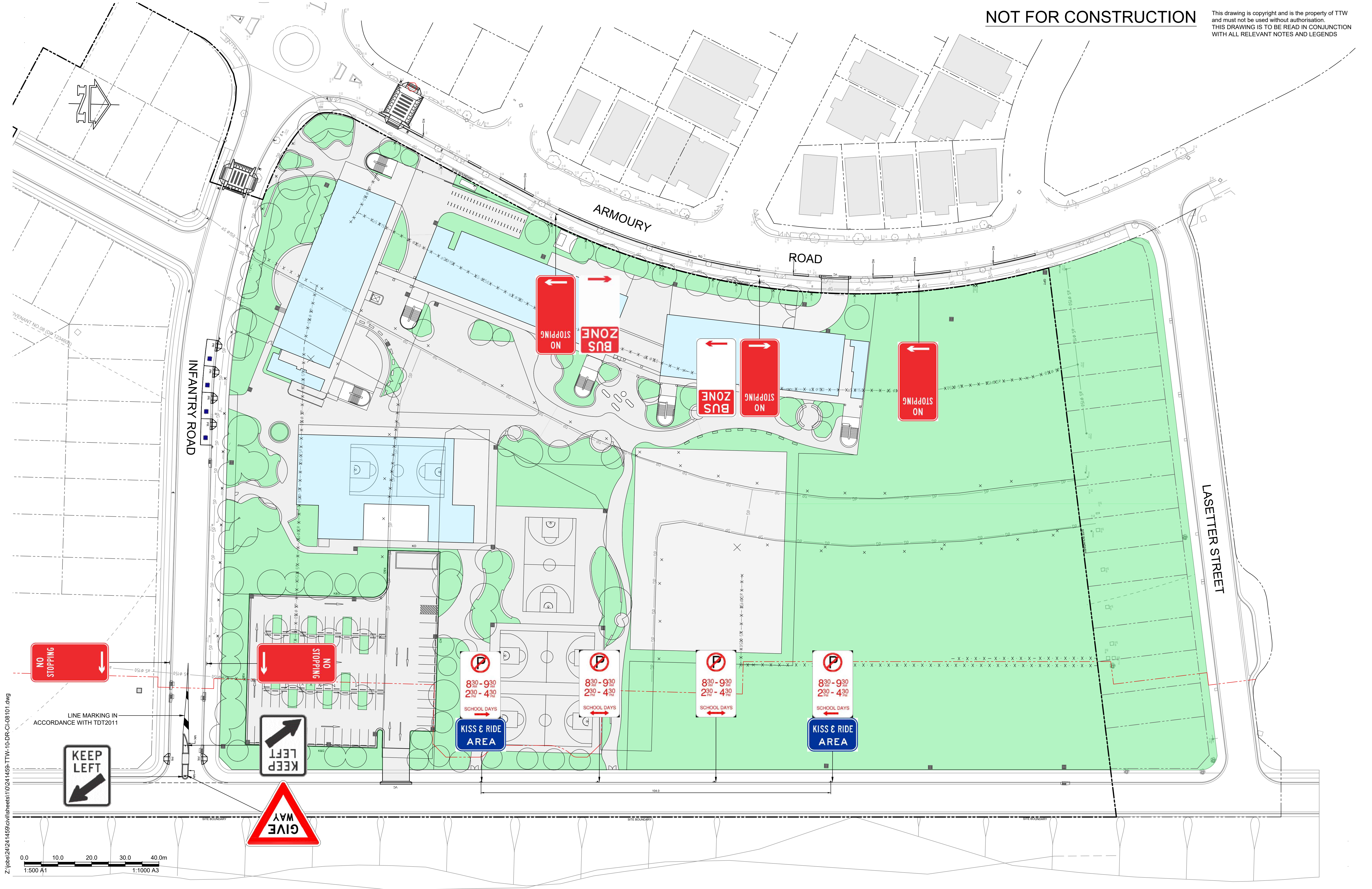


SECTION 2
SCALE 1:20



DETAIL A
SCALE 1:5

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1	FINAL DRAFT ISSUE FOR REF	JL	ES	21.11.2024										

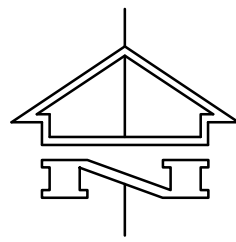
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Engineer:	



Project:
NEW HIGH SCHOOL FOR
JORDAN SPRINGS

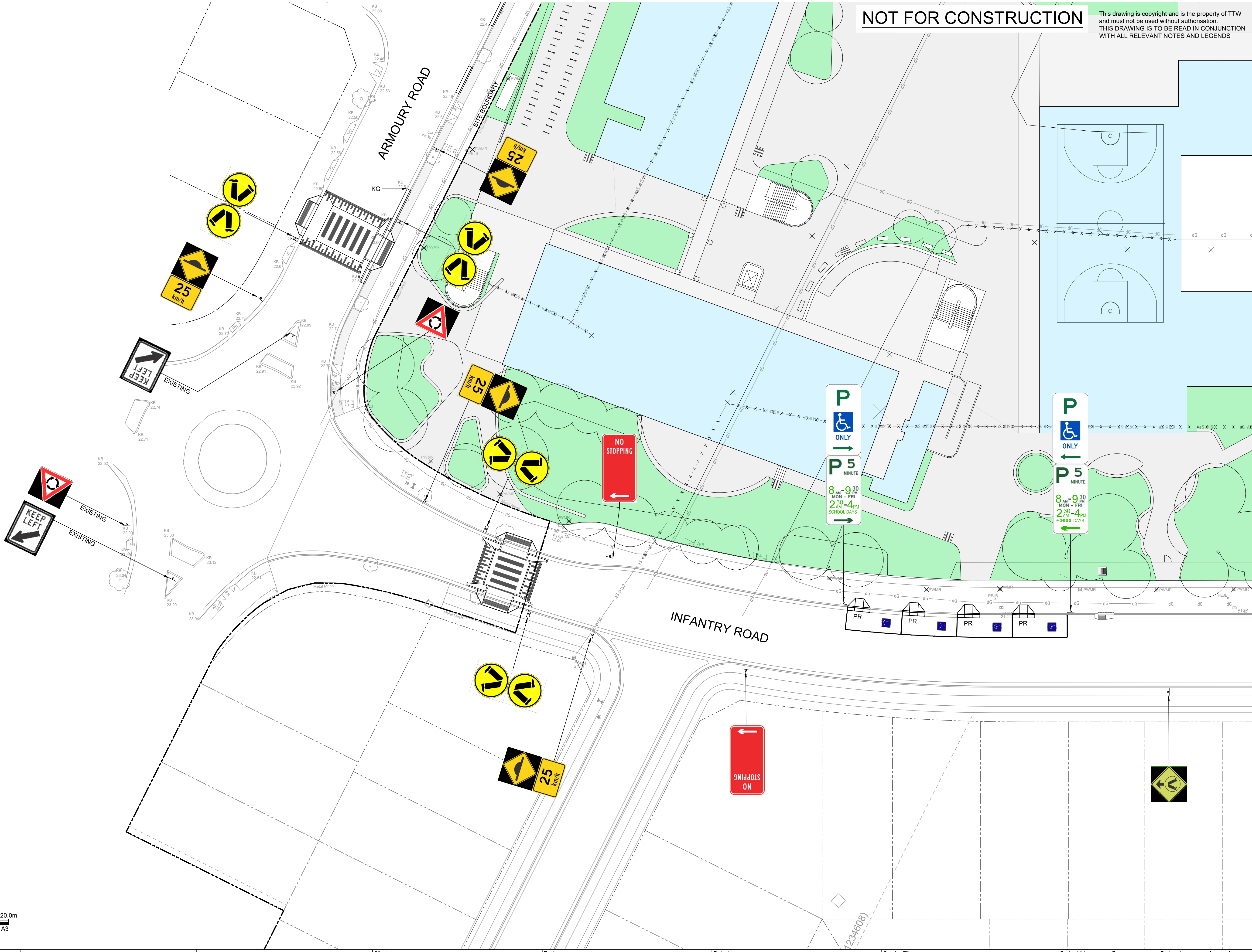
Drawing Title:
SIGNAGE AND LINEMARKING
PLAN

Scale at A1	Drawn	Designed	Approved		
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Project No	Originator	Type	Role	Sheet No.	Rev
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1:250 A1 1:500 A3

Rev	Description	Eng Draft	Date	Rev	Description	Eng Draft	Date	Rev	Description	Eng Draft	Date
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1	FINAL DRAFT ISSUE FOR REF	JL	ES 21.11.2024								

Client:
 School Infrastructure NSW

Engineer:

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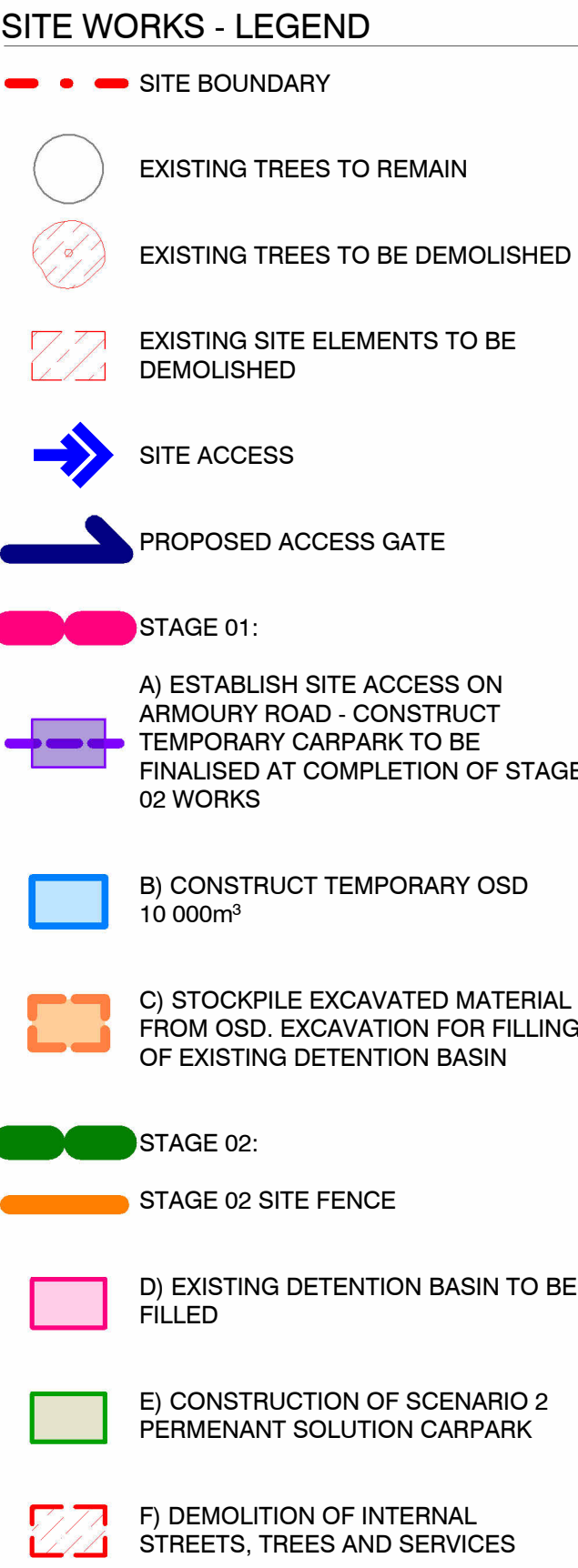
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NEW HIGH SCHOOL FOR
JORDAN SPRINGS

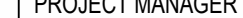
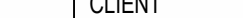
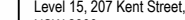
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SIGNAGE AND LINEMARKING
INTERSECTION LAYOUT
PLAN

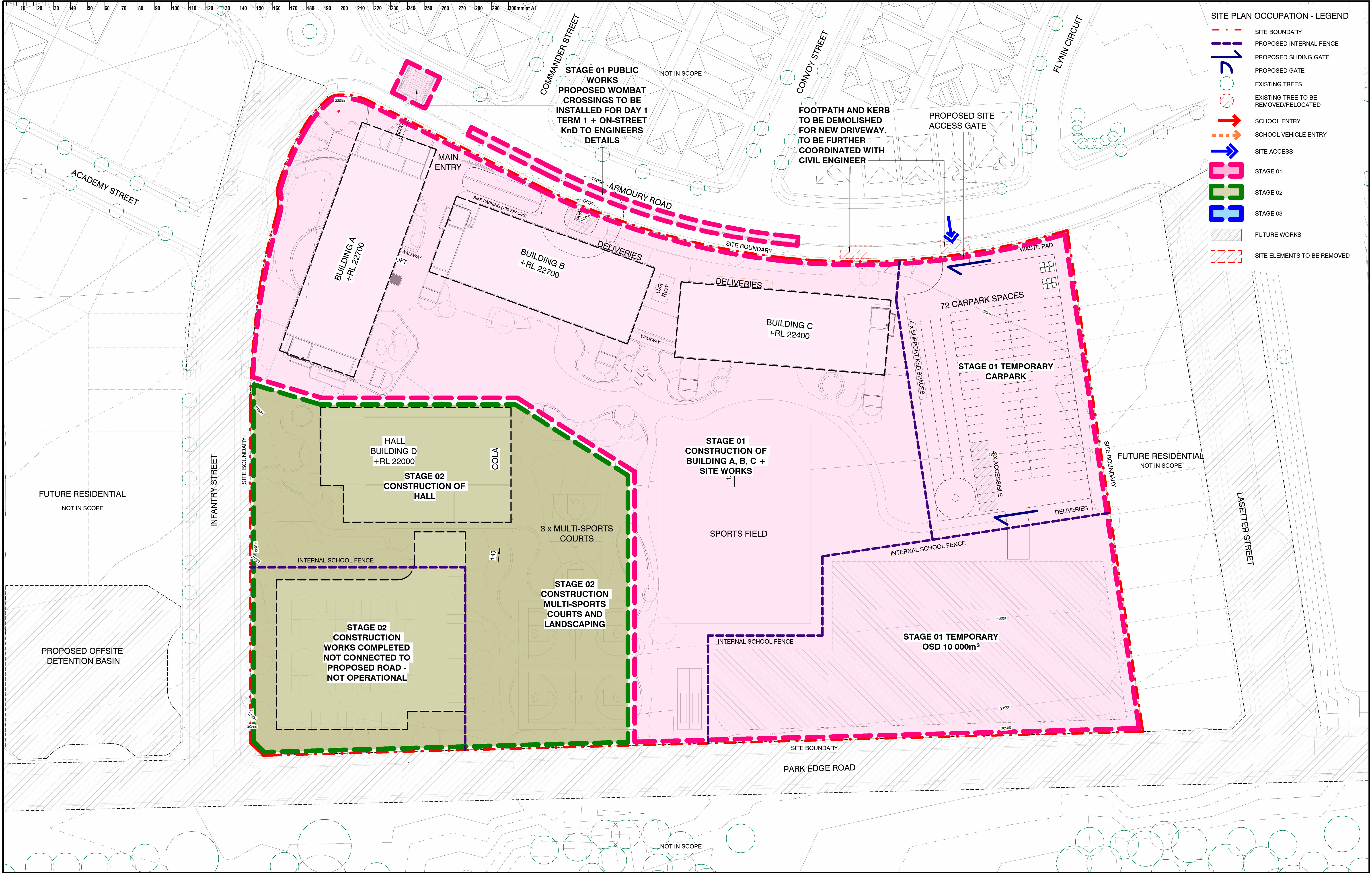
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Appendix C

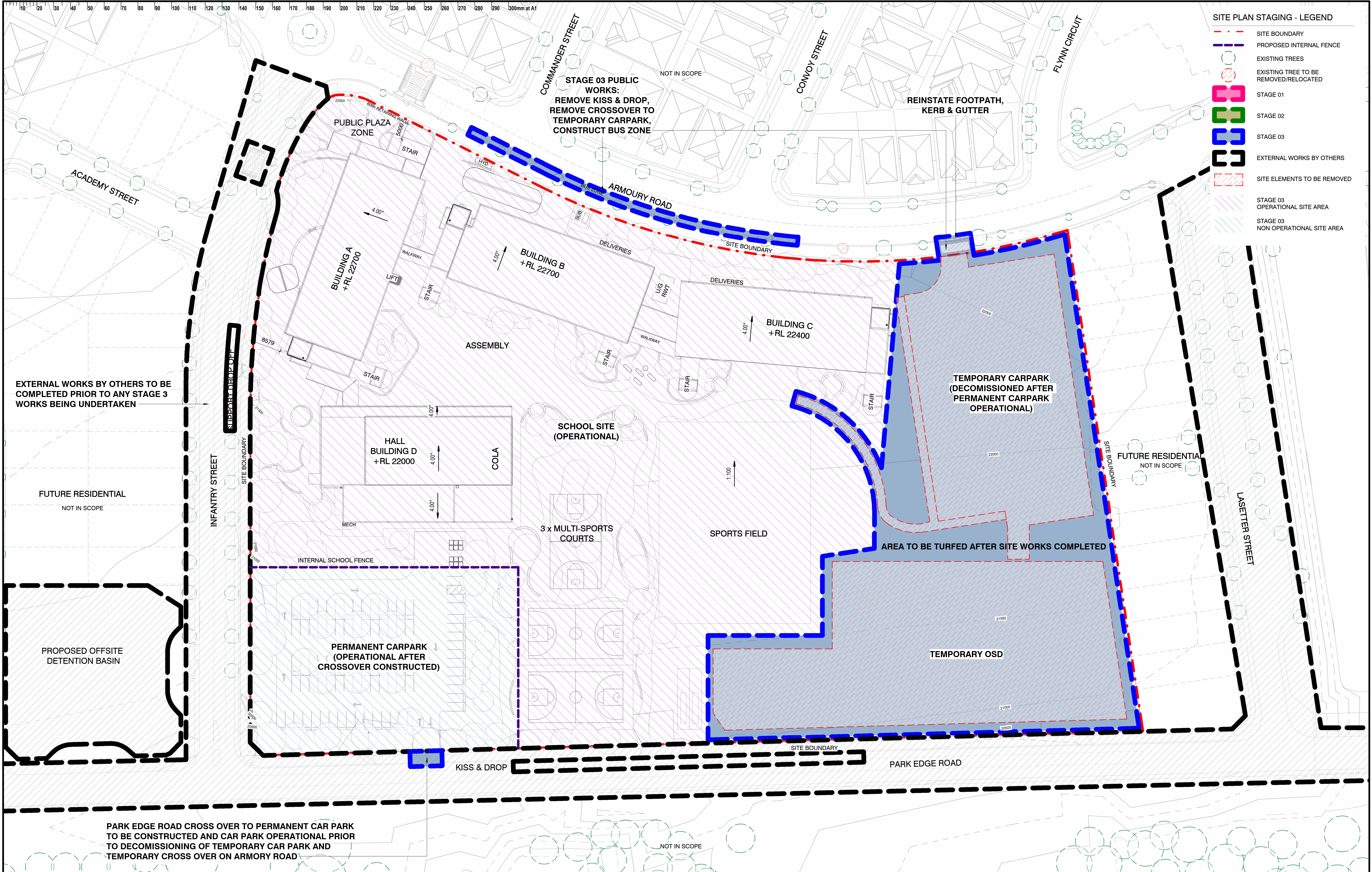
Proposed Activity Scenarios Staging Plans



ISSUE	DATE	SUBJECT	AUTHORISED	LANDSCAPE ARCHITECT	PROJECT MANAGER	CLIENT	PROJECT	DESCRIPTION						
P01	03/12/2024	REVISED STAGING FOR INFORMATION	TD	 Level 3/5 Bapst Street Sydney NSW 2000 T + 61 2 8332 5600	 Level 15, 207 Kent Street, Sydney NSW 2000 T + 1300 482 651	 Education School Infrastructure	NEW HIGH SCHOOL FOR JORDAN SPRINGS Armoury Road, Jordan Springs NSW 2747	SITE PLAN - SCENARIO 2 - STAGE 1 & 2 SITE WORKS						
P02	03/12/2024	REVISED STAGING FOR INFORMATION	TD											
P03	05/12/2024	REVISED STAGING FOR INFORMATION	TD											
				SERVICES  Level 6/13 Castlemain Street, Sydney NSW 2000 T + (02) 9697 2200	 Level 20, 66 Goulburn Street, Sydney NSW 2000 T + (02) 9299 1312	STRUCTURE & CIVIL  Level 6/73 Miller St, North Sydney NSW 2060 T + (02) 9439 7288	ARCHITECT  T +612 9319 2866 ABN: 48 942 01 1969 Notarised Architects Andrew Hopewell 6562 Daniel Sedelmeier 6192 63 Myrta Street Chippendale NSW 2008 Sydney Australia 691.com.au	DISCLAIMER This drawing should be read in conjunction with all the standard notes & abbreviations in the drawing pack, relevant contracts, specifications and drawings. Dimensions are in millimetres. Levels are metres. Do not scale off drawings. Use figured dimensions only. Check dimensions on Site. Report discrepancies immediately.	 0 5 10 15 25 1:500 DATE As indicated @ A1 SCALE PRINTED: 5/12/2024 5:01:13 PM	PURPOSE OF ISSUE FOR INFORMATION	STATUS S2	DRAWN BY AL	SHEET SIZE A1	ORIGIN DATE 10/02/24
							 0 5 10 15 25 1:500 DATE As indicated @ A1 SCALE PRINTED: 5/12/2024 5:01:13 PM	PROJECT No 24 410	DRAWING No JSHS-DJRD-00-00-DR-A-0504	REVISION P03				



ISSUE		DATE	SUBJECT	AUTHORISED	LANDSCAPE ARCHITECT	PROJECT MANAGER	CLIENT	PROJECT	DESCRIPTION
P01	03/12/2024	REVISED STAGING FOR INFORMATION		TD	 Level 3-5 Baptist Street Sydney, 2010 T + 61 2 8332 5600	 Level 15, 207 Kent Street, Sydney NSW 2000 T + 1300 462 651	 	NEW HIGH SCHOOL FOR JORDAN SPRINGS Armoury Road, Jordan Springs NSW 2747	SITE PLAN - SCENARIO 2 - STAGE 1 & 2 CONSTRUCTION
P02	03/12/2024	REVISED STAGING FOR INFORMATION		TD					
P03	05/12/2024	REVISED STAGING FOR INFORMATION		TD					
					SERVICES		STRUCTURE & CIVIL	ARCHITECT	
					 Level 6/9-13 Castlereagh Street, Sydney NSW 2000 T + 02 9567 2200	 Level 20, 66 Goulburn Street, Sydney NSW 2000 T + 02 9557 1312	 Level 6/73 Miller St, North Sydney NSW 2060 T + 02 9439 7288	 T +612 9319 2955 M: 02 943 921 969 Nominated Architects: Andrew Hopwell 6552 Daniel Beekwilder 6162 63 Myrtle Street Cherrybrook NSW 2008 Sydney Australia djrd.com.au	DISCLAIMER This drawing should be read in conjunction with all the standard notes & abbreviations in the drawing pack, relevant contracts, specifications and drawings. Dimensions are in millimetres. Levels are metres. Do not scale off drawings. Use figured dimensions only. Check dimensions on Site. Report discrepancies immediately.
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P01	03/12/2024	REVISED STAGING FOR INFORMATION		TD	 Level 3-5 Baptist Street Parramatta, 2150 T + 61 2 8332 5600	TSA Riley Level 15, 207 Kent Street, Sydney NSW 2000 T + 1300 462 651	 Education School Infrastructure	NEW HIGH SCHOOL FOR JORDAN SPRINGS Armoury Road, Jordan Springs NSW 2747	SITE PLAN - SCENARIO 2 - STAGE 3 SITE WORKS DECOMMISSIONING & CONSTRUCTION	
P02	03/12/2024	REVISED STAGING FOR INFORMATION		TD						
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					SERVICES		STRUCTURE & CIVIL	ARCHITECT	 0 5 10 15 25 1:500 SCALE 1:500 @ A1 DATE PRINTED: 5/12/2024 5:02:46 PM	
					STEENSEN VARMING					DISCLAIMER This drawing should be read in conjunction with all the standard notes & abbreviations in the drawing pack, relevant contracts, specifications and drawings. Dimensions are in millimetres. Levels are metres. Do not scale off drawings. Use figured dimensions only. Check dimensions on Site. Report discrepancies immediately.
					Level 8/9-13 Cadell Street, Sydney NSW 2000 T + 612 9667 1200	Level 20, 66 Goudburn Street, Sydney NSW 2000 T + 612 9667 1312	Level 6/73 Miller St North Sydney NSW 2060 T + 612 9439 1288	Cherrybrook NSW 2880 Sydney Australia djrd.com.au		



ISSUE		DATE	SUBJECT	AUTHORISED	LANDSCAPE ARCHITECT	PROJECT MANAGER	CLIENT	PROJECT	DESCRIPTION					
P01	03/12/2024	REVISED STAGING FOR INFORMATION		TD	 Level 3-5 Baptist Street Parramatta NSW 2150 T + 61 2 8332 5600	 Level 15/ 207 Kent Street, Sydney NSW 2000 T + 1800 482 651	 Education School Infrastructure		NEW HIGH SCHOOL FOR JORDAN SPRINGS Armoury Road, Jordan Springs NSW 2747	SITE PLAN - SCENARIO 1 & SCENARIO 2 STAGE 3 OPERATIONAL				
P02	03/12/2024	REVISED STAGING FOR INFORMATION		TD										
P03	05/12/2024	REVISED STAGING FOR INFORMATION		TD										
					SERVICES		STRUCTURE & CIVIL		ARCHITECT	 T + 61 2 9319 2955 ABN: 48 943 921 989 Nominated Architects Andrew Hignett: 6552 Daniel Steenkamp: 6152 63 Myrtle Street Cherrylands NSW 2008 Sydney Australia djird.com.au	DISCLAIMER This drawing should be read in conjunction with all the standard notes & abbreviations in the drawing pack, relevant contracts, specifications and drawings. Dimensions are in millimetres. Levels are metres. Do not scale off drawings. Use figured dimensions only. Check dimensions on Site. Report discrepancies immediately.			
					STEENSEN VARMING Level 6/9-13 Castlereagh Street, Sydney NSW 2000 T + 61 2 9567 1200	Level 6/ 65 Guilford Street, Sydney NSW 2000 T + 61 2 9689 1312	Level 6/73 Miller St North Sydney NSW 2060 T + 61 2 9439 7288	 SCALE As indicated @ A1 DATE PRINTED: 5/12/2024 5:03:16 PM			PROJECT No 24 410 DRAWING No JSHS-DJRD-00-00-DR-A-0508 REVISION P03			
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