Structural
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Civil Engineering Report

Lismore South Public School (the activity)

Prepared for NSW Department of Education / 06 June 2025

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Rev	Date	Prepared By	Approved By	Remarks
0	07.06.2024	DT	GC	100% Concept Design
1	27.06.2024	DT	GC	100% Concept Design
2	29.11.2024	DT	GC	100% Schematic Design
3	13.12.2024	DT	TM	Issue for REF
4	20.02.2025	DT	GC	Issue for REF
5	06.06.2025	ML	GC	Issue for REF

1.0 Introduction

This Civil Engineering Report has been prepared to support a Review of Environmental Factors (REF) for the rebuild of Lismore South Public School (the activity). The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) as "development permitted without consent" on land carried out by or on behalf of a public authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37 of the T&I SEPP.

The activity will be carried out at Lismore South Public School (LSPS) located 69-79 Kyogle Street, South Lismore (the site).

The purpose of this report is to address the civil engineering design of the LSPS activity including stormwater quantity, overland flow, stormwater quality, pavements, and earthworks design. The relevant requirements of the Lismore City Council Development Control Plan and engineering specifications as well as SINSW's 'Educational Facilities Standards and Guidelines' (EFSG) will be addressed.

1.1 Guidance Documents

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

- Lismore City Council Development Control Plan 2012
- Northern Rivers Local Government – Handbook of Stormwater Drainage Design, 2019
- Blue Book – Managing Urban Stormwater Soils and Construction (Landcom NSW)
- Australian Rainfall and Runoff 2019
- NSW Department of Education: Educational Facilities Standard and Guidelines, 2022
- Lismore South Public School Geotechnical Report, JK Geotechnics, 12/11/2024 (36310LTrpt)
- Lismore South Public School Detailed Site Investigation, JK Geotechnics, 8/11/2024 (Ref: E36310PTrpt3-DSI DRAFT).
- Correspondence with Lismore City Council in Appendix B.

2.0 Site Description

The site, located at 69-79 Kyogle Street, South Lismore, consists of two separate land parcels situated on either side of Wilson Street. The proposed activity will be undertaken on the eastern parcel, where most of the school's existing structures are located. The western parcel contains sports fields and temporary learning facilities. Figure 2-1 outlines the school's boundary, covering approximately 2.5 hectares. Due to flood damage, the existing buildings on the eastern parcel are currently unused, and students are temporarily using facilities on the sports field and oval, located on the western side of Wilson Street, adjacent to the primary school.

The eastern parcel's site topography is generally flat, consisting of the existing school site. The site's high point is in the middle of the site at approximately RL11.00 and falls to approximately RL10.50 at each boundary, equating to a fall of approximately 1%.

Figure 2-1: Aerial Image of Site (Source: Nearmap)

2.1 Existing Services

A Before You Dig Australia (BYDA) enquiry as well as a site survey have been assessed to identify known in-ground assets that may impact development of the site.

Based on the BYDA, a low voltage underground cable belonging to Essential Energy exists across the western boundary edge. NBN cables exist on site across the western, northern and southern boundaries. A Telstra cable crosses from the northern boundary into the centre of the site. Pending confirmation on what existing services are to be retained the civil design will progress to accommodate these where possible.

Existing stormwater pits and pipes are located around the entirety of the site; pending landscape architect review, some of this stormwater infrastructure may be retained.

2.2 Geotechnical Conditions

The findings in a geotechnical report for the site by JK Geotechnics, dated 13 December 2024 (36310LTrpt), have been addressed and incorporated into the civil design. The following excerpt from Section 4.1 of the report outlines site conditions relevant to the civil design. For further reference, refer to the report from JK Geotechnics.

4.1 Geotechnical Considerations

From a geotechnical perspective, the site will be challenging to develop due to the presence of the deep alluvial clay profile which is also highly reactive. We consider that the main geotechnical considerations relating to the design and construction of the proposed activity will be as follows:

- The alluvial clays are highly reactive and therefore footings will need to consider the potential for large shrink-swell movements with changes in moisture content within the design, particularly considering the possibility of periodic flooding. Additional consideration will need to be given to detailing of services, vegetation etc. which may affect the future performance of structures.
- The alluvial clays will likely undergo substantial strength loss when wet and they have very low CBR values. Although major earthworks are not anticipated, a working platform will be required to facilitate trafficability of the site for plant and construction of pavements and floor slabs. Development will require the use of relatively thick pavements, with some form of subgrade treatment to improve the subgrade quality, or bound subbases for concrete pavements.
- The alluvial clays are generally of stiff to very stiff strength to depths greater than 30m and appear to be normally consolidated or at best slightly over-consolidated below depths of approximately 15m. Due to the depth of the soil profile footings will need to be founded within the clays which, depending on the footing system adopted and the founding depth, will need to consider the potential for consolidation and possibly some creep settlement. Further in-situ and laboratory testing to assess stiffness and consolidation parameters for the clays is recommended
- The total depth of the soil profile is unknown. Although CPT refusal occurred in five of the seven probes this may have occurred on dense/hand layers within the alluvial profile rather than the surface of the underlying bedrock. For earthquake design we recommend that the site sub-soil classification be Class D_e unless additional investigation confirming the total soil profile depth is carried out.
- The site is located on a floodplain bound by Wilsons River, Leycester Creek and Hollingworth Creek. Design of the proposed structures must take into account the effect that fluctuations in groundwater levels will have on the performance of structures.
- Following demolition of the existing buildings, additional investigation should be completed to confirm the subsurface conditions in those areas which cannot currently be accessed.

Further comments on these issues are provided within the following sections of this report.

Figure 2-2: Geotechnical Considerations (Extract from Section 4.1 p7-8 JK Geotechnics, 13 December 2024, 36310LTrpt)

3.0 Proposed Activity Description

The proposed activity comprises the rebuild of the LSPS on the eastern parcel of the existing site, in South Lismore, and will be delivered in a single stage. The western parcel is out of the scope of the activity. Any works required on the western parcel (such as removal of demountable classrooms) will be subject to separate approval (if required).

A detailed description of the proposal is as follows:

1. Retention of the existing play equipment, Building K and covered outdoor learning area (COLA) on the western parcel.
2. Bulk earthworks, comprising fill and excavation and other site preparation works on the eastern parcel.
3. Construction of a new building on the eastern parcel for LSPS including:
    a. A one storey building (with undercroft areas below) fronting Kyogle Street containing a general learning space (GLS) hub, hall, library, support hub, administration, and pre-school.
    b. Undercroft outdoor learning areas as well as amenities and storage located on ground level.
4. Landscaping and public domain works, including tree planting, a games court in the northeast corner and an outdoor playing area adjacent to the preschool.
5. A car park on the eastern side of the site, with access from Kyogle Street.
6. Waste collection area access from Kyogle Street.
7. Multiple entrance points, including:
    a. Primary and secondary entries distributed on site frontages.
    b. Vehicular access point to provide access to waste collection/delivery areas and car parking.
8. Ancillary public domain mitigation measures.

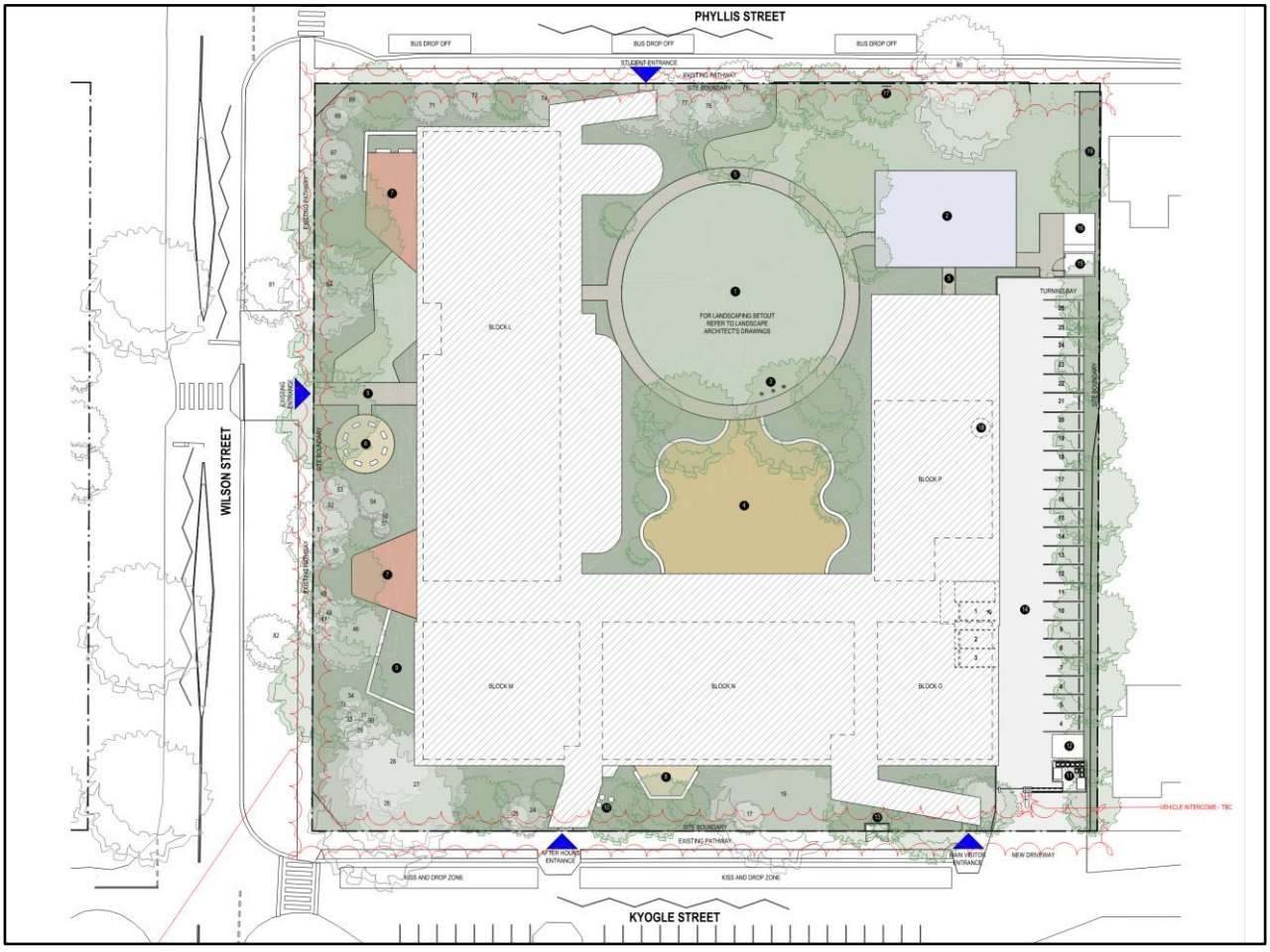

Figure 3-1: Architectural Proposed Site Plan

4.0 Stormwater

4.1 Stormwater Quantity

4.1.1 Existing Stormwater

Based on received survey data, the existing site is approximately 1.063 ha and 44% impervious. A below ground services survey shows stormwater currently flows off site via drainage pipes and overland flow to all boundary outlets. A low point exists at the southeast corner where the majority of stormwater drainage flows to. The outlet pipe in this southeast corner is 525mm in diameter and connects to the Council drainage on Kyogle Street.

4.1.2 Proposed Stormwater Design

Stormwater quantity controls are outlined in the Lismore City Council DCP – Chapter 22 – Water Sensitive Design. Stormwater discharge will be primarily conveyed to the existing Council's Street network on Kyogle Street. Stormwater is to be conveyed internally by new stormwater drainage inlet pits and pipes, as well as a swale adjacent to the northern boundary, and discharge at the site outlets in the southeast corner as well as the northern boundary. Overland flow paths have been designed to cater for increased frequency of discharge and will not have a detrimental impact on onsite or downstream locations when compared with existing conditions.

Roof catchments are to be collected through the use of gutters and downpipes, documented by the hydraulic engineer, and directed to in ground drainage pits and pipes.

No changes to public domain stormwater infrastructure is proposed, except for the new connection from the site outlet to the existing kerb inlet pit on Kyogle Street on the south boundary, and one pipe connection on Phyllis Street on the north boundary. No new piped connection has been proposed to Wilson Street located east of the site.

See Figure 4-1 and Figure 4-2 showing the catchment plan of the site in both the pre-development and post-development case and detail roof catchments (purple), impervious hardstand catchments (red) and pervious catchments and landscaping (green). This guides the strategy of the stormwater quantity and quality designs.

See Table 4-1 for a summary on the pervious and impervious catchment split for both the pre-development and post-development sites.

Table 4-1: Pre vs Post Development Impervious-Pervious Splits

	Pervious Area (Ha)	Pervious Area (%)	Impervious Area (Ha)	Impervious Area (%)	Total Area (Ha)
Pre-Development	0.595	56	0.468	44	1.063
Post-Development	0.479	45	0.584	55	1.063

Figure 4-1: Pre-development Site Catchment Plan (purple = roof, red = hardstand, green = soft landscape)

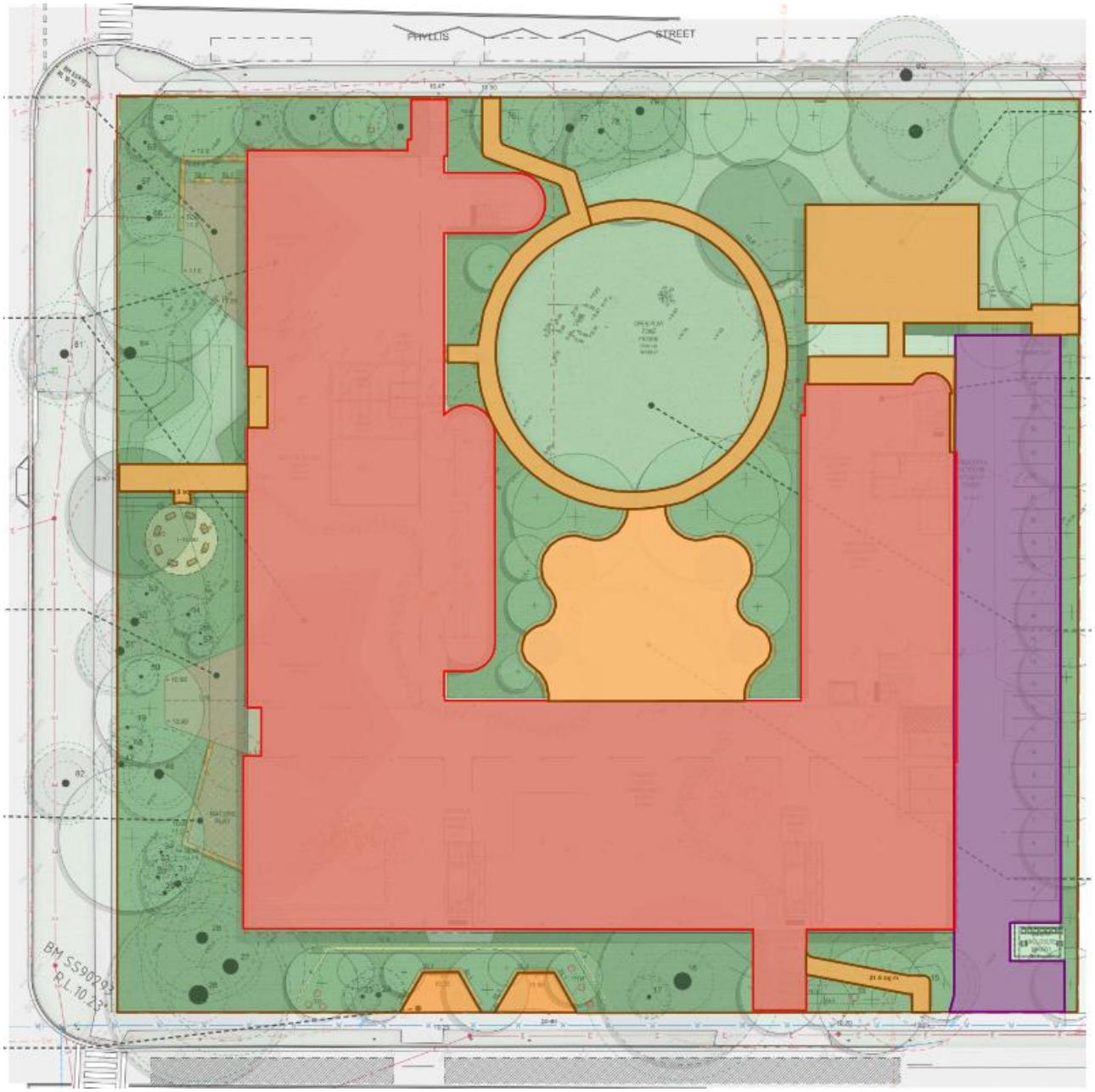

Figure 4-2: Post-development Site Catchment Plan (purple = roof, red = hardstand, green = soft landscape)

4.1.3 Onsite Stormwater Detention

Based on confirmation from Lismore Council (refer Appendix B), on-site stormwater detention (OSD) will not be required for the development. As the site is flooded in a 1 in 10-year flood event, incorporation of an OSD tank located below the flood level will not be effective and could worsen the downstream condition by delaying stormwater discharge to coincide with the river peak flow. Further to this, the tailwater condition requirements provided in council's DCP (see Figure 4-3 – condition 5.c) requires a water level 150mm below the pit surface level to be set. Given the site is topography is flat and the existing street stormwater very shallow, this condition would reduce the effectiveness of a below ground tank during even the 1-yr ARI storm event.

5. **Tailwater Levels** to be adopted are as follows (refer Appendix D for River Tidal Gradients for effected Councils) :
   a. Pipe obvert for free outfalls
   b. Design ARI flood level or River Half-Tide Levels (refer Appendix D) for receiving / tidal waters
   c. 150mm below kerb invert for existing systems with unknown HGL
   d. Surcharge height for surcharge outlet
   e. A nominal minimum freeboard of 150mm should be achieved between surface level and water surface elevation, determined by a hydraulic grade line design, in a stormwater structure
   f. The use of reinforced concrete box culverts should be considered in low flat areas

Figure 4-3: Tailwater Conditions (Northern Rivers Local Government - Handbook of Stormwater Drainage Design, 2019)

A detailed DRAINS model has been prepared to show that the stormwater network has been designed to effectively handle the 20% AEP storm event and lower. Modelling for all storms has assumed a tailwater level 150mm below the pit surface level in accordance with Council's modelling requirements above. It is expected that this modelling is conservative and would be reflective on worst case conditions, particularly for the 1EY storm event model. Modelling of larger storm events is not feasible provided the site is flood affected in the 10% storm and higher, and therefore the stormwater network would become inundated regardless of the capacity of the stormwater infrastructure proposed on the site.

The model layout and the flow rates for the two design storms (1-yr ARI and 20%AEP) are shown in Figure 4-4 to Figure 4-6. As discussed, the site and surrounding flow paths will be inundated with flood water during storms including the 10% AEP and higher. A separate flooding assessment by TTW has been prepared to address this requirement.

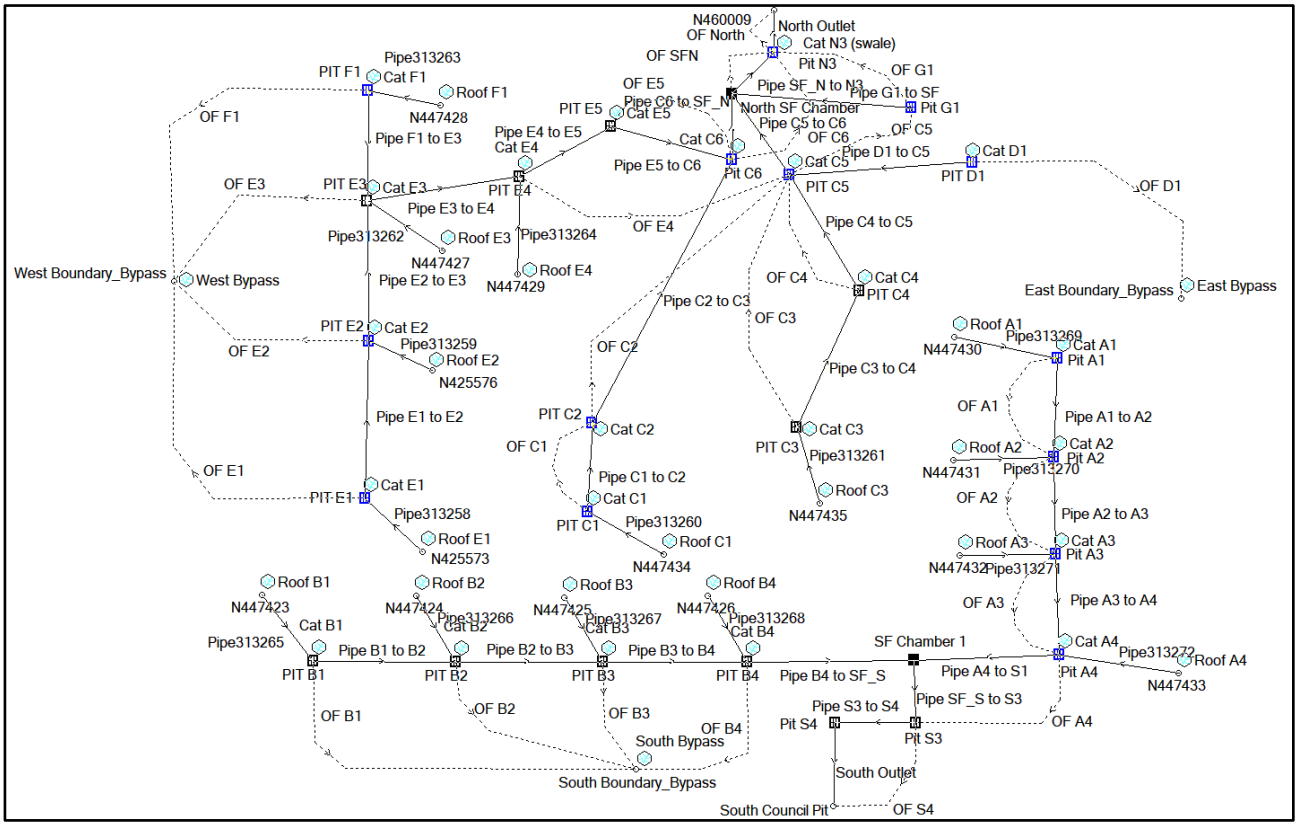

Figure 4-4: DRAINS Model Layout

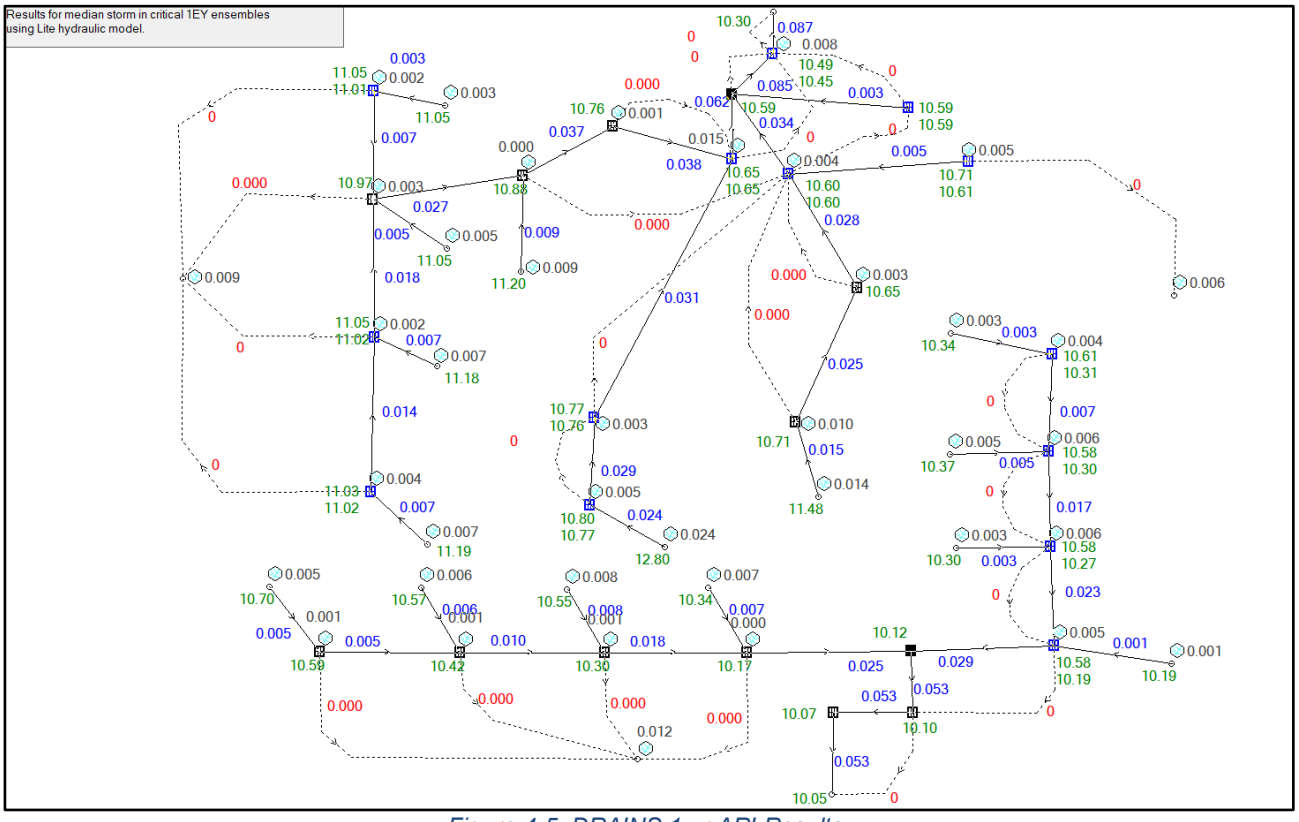

Figure 4-5: DRAINS 1-yr ARI Results

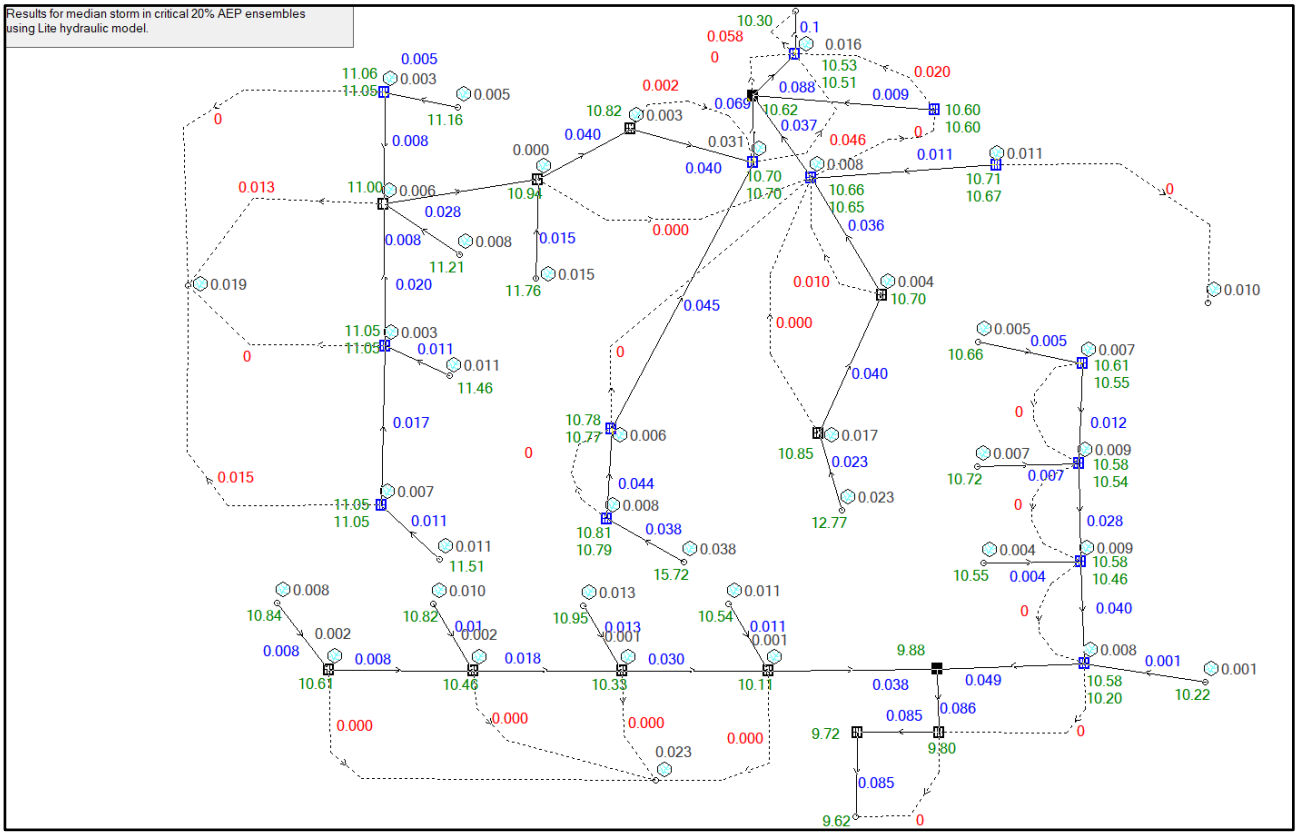

Figure 4-6: DRAINS 20% AEP Results

4.2 Stormwater Quality

Stormwater quality treatment for the development will be subject to requirements outlined in Chapter 22 – Water Sensitive Design of the Lismore City Council DCP, 2012. Water quality treatment devices must achieve the water quality targets outlined in Figure 4-7, see below.

Stormwater Quality		
Total Suspended Solids	75% reduction in the mean annual load compared to baseline	Minimise the risk of water quality degradation in downstream waterways and thereby protect aquatic ecosystems
Total Phosphorus	65% reduction in the mean annual load compared to baseline	
Total Nitrogen	40% reduction in the mean annual load compared to baseline	
Gross Pollutants	90% reduction in the mean annual load compared to baseline	

Figure 4-7: Water quality targets (Lismore City Council DCP Chapter 22, 2012)

A detailed MUSIC model has been prepared to assess the required treatment devices to achieve Council's reduction targets. Stormwater quality targets are to be met through the use of the following devices:

- 41 x 460mm PSorb Ocean Protect Stormfilter Cartridges (or approved equivalent).
- 22 x Ocean Protect Oceanguard Pit inserts (or approved equivalent).
- Rainwater Tank (RWT), refer to documentation by others.
- 1 x Grass swales, and
- Landscaping and existing planted buffering at site boundaries.

Figure 4-8 shows the layout of the MUSIC model and Figure 4-9 shows the results of the MUSIC model. It is evident in Figure 4-9 that all stormwater quality targets set out by Council have been achieved.

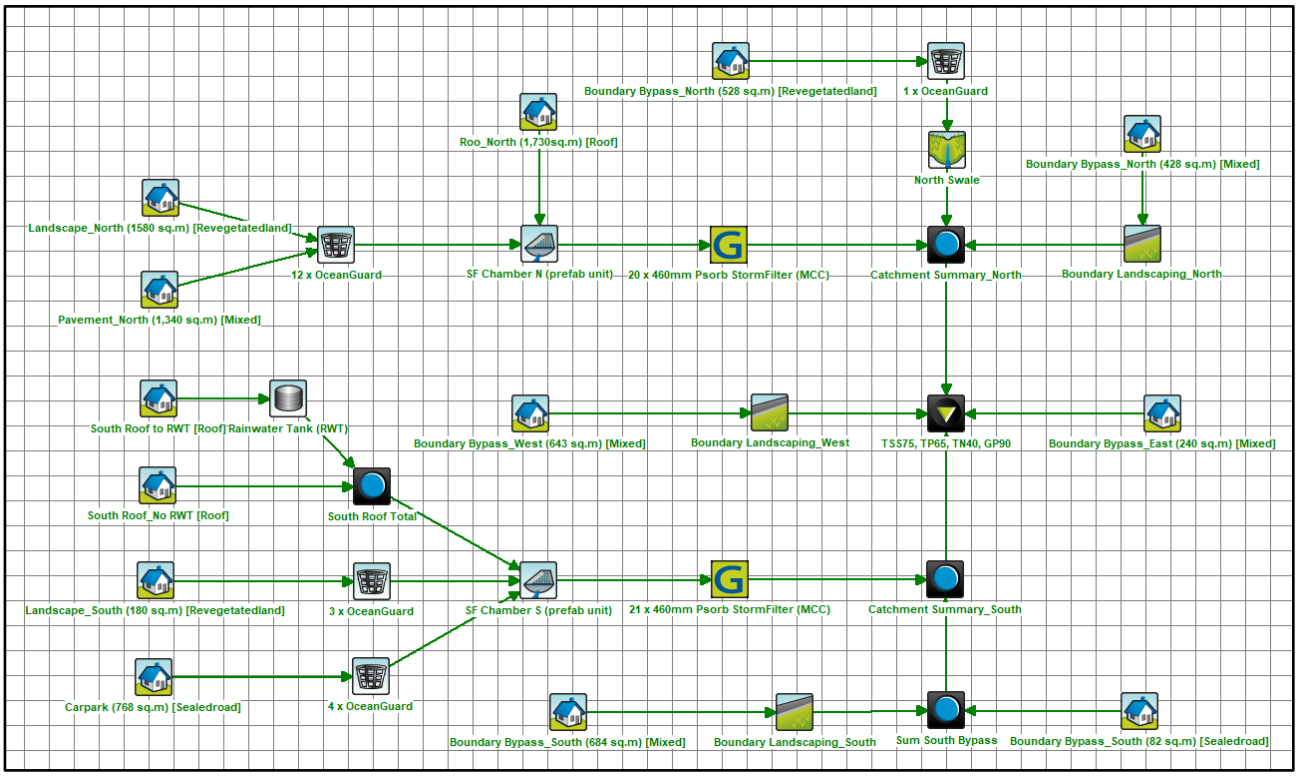

Figure 4-8: MUSIC Model Layout

	Sources	Residual Load	% Reduction
Flow (ML/yr)	7.54	7.33	2.7
Total Suspended Solids (kg/yr)	810	176	78.2
Total Phosphorus (kg/yr)	1.99	0.696	65
Total Nitrogen (kg/yr)	17.7	9.68	45.3
Gross Pollutants (kg/yr)	171	15.6	90.9

Figure 4-9: MUSIC Model Results

4.3 Erosion and Sediment Control

During the construction stage of the project, an erosion and sediment control plan is to be implemented to prevent sediment laden stormwater from flowing into adjoining properties, bushland, roadways or receiving water bodies. Stormwater controls on site are detailed in erosion and sediment control plans which are in accordance with relevant regulatory authority guidelines including Landcom NSW's Managing Urban Stormwater, Soils and Construction ("Blue Book"). The proposed Erosion and Sediment Control Plan is included in Appendix A.

4.4 Integrated Water Management Plan

An Integrated Water Management Plan (IWMP) relating to civil items has been developed to ensure requirements put forward by the Department of Climate Change, Energy, the Environment and Water – Biodiversity, Conservation and Science (DCCEEW BCS) have been met. Listed below are the Standard Environmental Assessment Requirements (SEARs) relating to civil which need to be addressed as part of the IWMP, along with TTW responses.

Table 4-2: SEARs and Water Management Plan

Environmental Assessment Requirement	Civil Water Management Strategy
7. The EIS must describe background conditions for any water resource likely to be affected by the project, including: a) Existing Surface. b) Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations. c) Water Quality Objectives (as endorsed by the NSW Government). d) Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government.	a) Existing surface water is currently captured by on-site stormwater infrastructure and connects to multiple outlets on the site. As the site is flat, much of the existing surface water ponds in localised catchments around site and either flows to stormwater pits or infiltrates the pervious surfaces. Section 4.1.1 further addresses existing stormwater information for the site. b) The comparison in volumes and flows of existing and proposed stormwater is addressed in Section 4.1 of this report, showing that post-development flows are restricted for the design storms to pre-development levels. Flows at each specific stormwater intake point are also shown in the DRAINS model figures for the two design storms. Quality of stormwater discharges are addressed in Section 4.2 of this report, showing that stormwater pollutant levels are reduced to the required percentages set out by Lismore City Council. c) Quality of stormwater discharges are addressed in Section 4.2 of this report, showing that stormwater pollutant levels are reduced to the required percentages set out by Lismore City Council. d) Quality of stormwater discharges are addressed in Section 4.2 of this report, showing that stormwater pollutant levels are reduced to the required percentages set out by Lismore City Council.

9. The EIS must assess the impact of the project hydrology, including: f) Mitigating effects of proposed stormwater management during and after construction on hydrological attributes such as volumes, flow rates, management methods.	f) In terms of mitigating effects of stormwater during construction, Section 4.3 of this report along with the Erosion and Sediment Control drawings in Appendix A outline measures to be taken to limit high flows and poor-quality stormwater runoff from the site. Section 4.1 and Section 4.2 of this report outlines the proposed stormwater strategy to mitigate volumes and flow rates to below pre-development levels and ensure the stormwater flowing from the site meets water quality requirements which have been stipulated for the project.

5.0 Civil Works

5.1 Pavement Design

Pavement thickness and strength is designed based on the following recommendations in accordance with the geotechnical assessment by JK Geotechnics (36310LTrpt Section 4.7):

- The existing subgrade consists of alluvial clay with high plasticity and is susceptible to shrink-swell effects. The pavement will be designed to prevent excessive groundwater ingress into the subbase and subgrade.
- Due to the existing subgrade having a low CBR value (0.5%), it is recommended that subgrade improvement via a select fill layer is undertaken to bring the overall strength of the subgrade up (to approximately 10%). External pavements have been designed to factor in this subgrade improvement. All subgrade improvements and preparation are to be in accordance with the geotechnical engineers' recommendations and requirements.
- It has been recommended that a 300mm piling rig platform be installed to strengthen the subgrade for piling for the building and 2m beyond the building footprint extents. This platform will remain in place after piling for the laying of pedestrian pavement in the undercroft area, which has been factored into the design. The piling rig platform is to be in accordance with the geotechnical engineer and piling contractors' requirements and specifications.

Pavements have also been designed in accordance with the NSW Department of Education - Education Facilities Standards and Guidelines (EFSG) 2022 Section 0.02 – Civil Works. Figure 5-1 to Figure 5-4 outline the design requirements for pavements within education facilities. These guidelines have been addressed to inform the design of the pavements for the Lismore South Public School activity. Pavement types for the development include concrete pedestrian pavement, vehicular loaded asphaltic concrete and a games court.

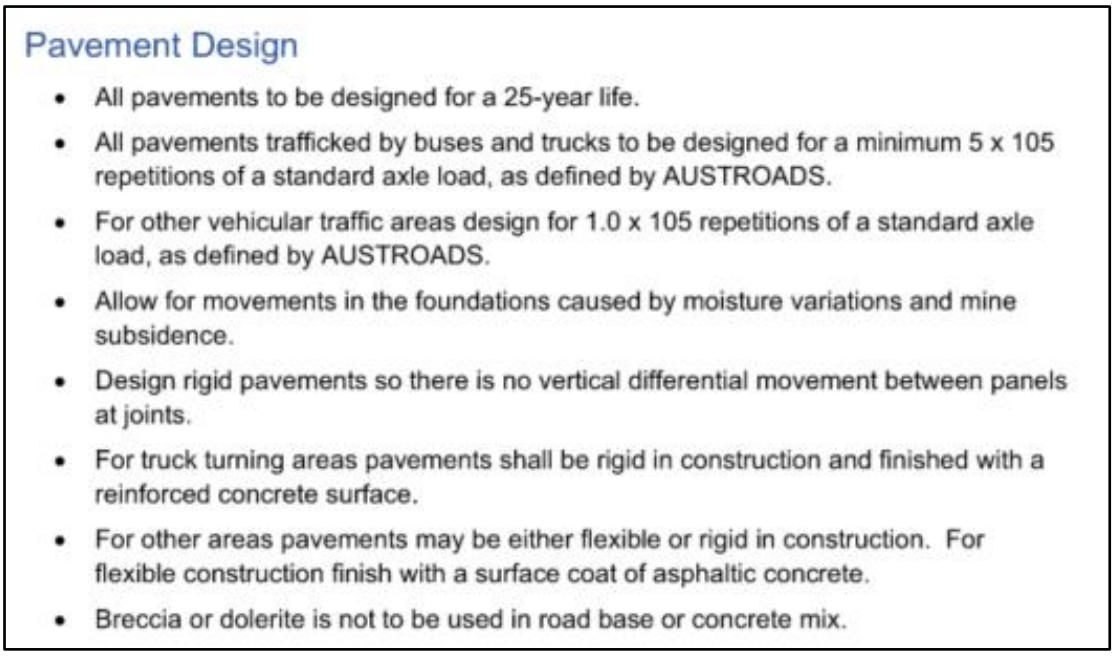

Figure 5-1: Pavement Requirements - all types (NSW Department of Education - Education Facilities Standards and Guidelines (EFSG) 2022 Section 0.02 – Civil Works)

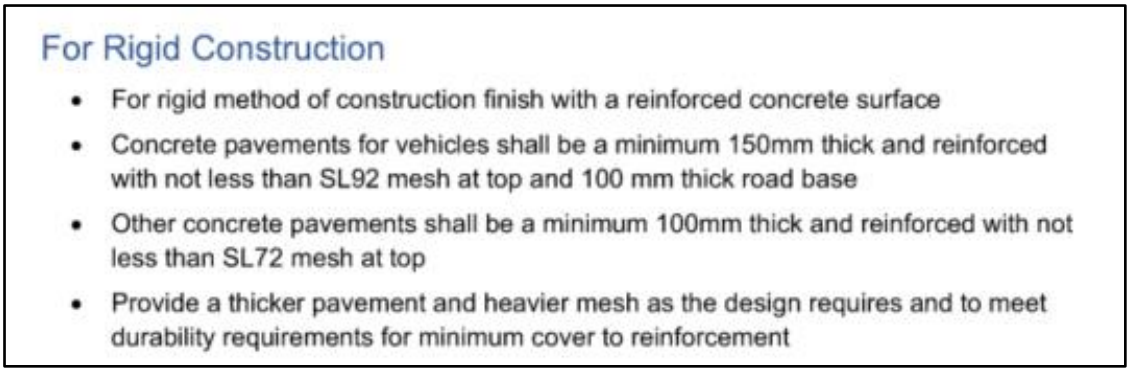

Figure 5-2: Pavement Requirements - Rigid Construction (NSW Department of Education - Education Facilities Standards and Guidelines (EFSG) 2022 Section 0.02 – Civil Works)

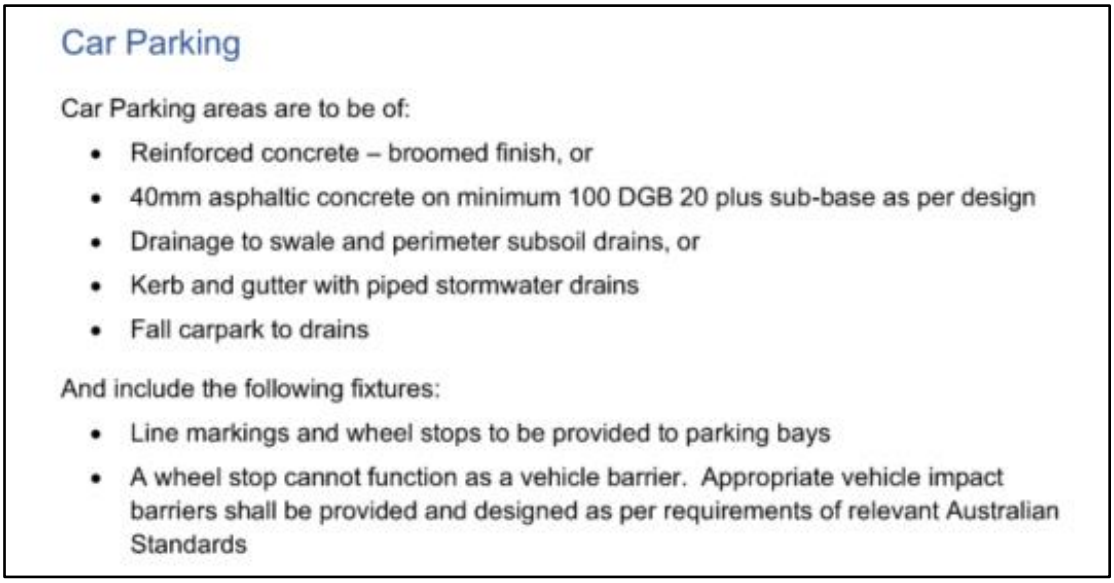

Figure 5-3: Pavement Requirements - Car Parking (NSW Department of Education - Education Facilities Standards and Guidelines (EFSG) 2022 Section 0.02 – Civil Works)

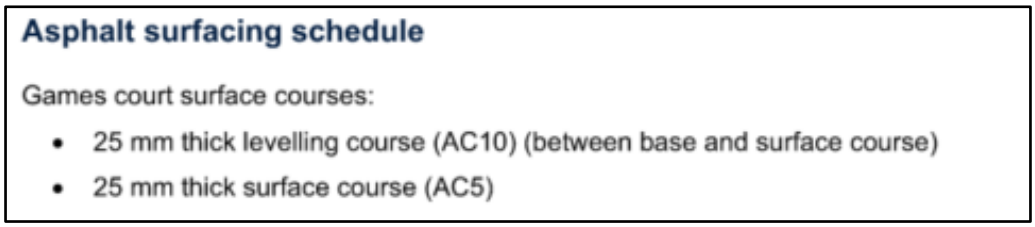

Figure 5-4: Pavement Requirements - Games courts (NSW Department of Education - Education Facilities Standards and Guidelines (EFSG) 2022 Section 0.02 – Civil Works)

5.2 Earthworks

Site preparation will be in accordance with the geotechnical engineer's recommendations and requirements as follows:

> **4.3 Earthworks**
>
> All earthworks recommendations provided below should be complemented by reference to AS3798-2007 'Guidelines on Earthworks for Commercial and Residential Developments'.
>
> **4.3.1 Site Drainage**
>
> The alluvial clay subgrade at the site is expected to undergo substantial loss in strength when wet as evident from the low CBR values. Furthermore, the clay has a very high shrink-swell potential. Therefore, it is important to provide good and effective site drainage both during construction and for long-term site maintenance. The principal aim of the drainage is to promote run-off and reduce ponding. A poorly drained clayey subgrade may become un-trafficable when wet, and consideration should be given to providing a crushed rock or crushed concrete working platform to minimise delays following rainfall. The earthworks should be carefully planned and scheduled to maintain good crossfalls during construction. Good surface and subsurface drainage must also be provided post construction to improve the long-term performance of the external paved areas.

4.3.2 Site Preparation

Following demolition of the existing buildings and pavements, and removal of trees (including their root balls), all grass, topsoil, root affected soils and any deleterious fill or contaminated soil should be stripped. The topsoil is not considered suitable for reuse as engineered fill however may be reused for landscaping purposes.

Care must be taken not to undermine or remove support from the site boundaries during stripping and subsequent bulk excavation works.

4.3.3 Excavation

Excavation for the proposed activity is generally not anticipated to extend below depths of 0.5m however locally deeper excavations may be required for footings or services. Excavations will encounter the existing fill and alluvial clay. This material can be excavated using hydraulic excavators.

Where slab on-grade construction is proposed then all existing fill should be stripped to the surface of the alluvial clay. Due to the limited depths of excavations and the results of our limited monitoring, we do not anticipate that excavations will encounter the groundwater table. As the site is located within an area prone to flooding following flood/heavy rainfall events, we anticipate that the groundwater table will be elevated for a period of time after the flood/heavy rainfall. In this regard, excavations may become inundated with water for a period following flooding/heavy rainfall and if this occurs then sump and pump techniques may be required to dewater excavations to allow construction to proceed.

4.3.4 Subgrade Preparation

Following stripping and any minor bulk excavation, the exposed subgrade should be proof rolled with at least six passes of a static (non-vibratory) smooth drum roller of at least 12 tonnes deadweight. The final pass of proof rolling should be carried out under the direction of an experienced geotechnical engineer for the detection of unstable or soft areas.

Subgrade heaving during proof-rolling is anticipated to occur in areas where the clays have become 'saturated' and/or are of firm to stiff strength. The CPT probes and boreholes indicate that firm to stiff clays may be encountered across a large proportion the subgrade. In this regard, bridging layer support using appropriately sized well graded durable crushed rock, and possibly high tensile geogrids, could be considered to facilitate construction of pavements and trafficability of the site during construction. If only small areas require improvement, then this may be achieved by locally removing the heaving/soft material to a stable base and replacing with engineered fill, as outlined below.

If the area requiring subgrade improvement is large, then a minimum 300mm thick bridging layer comprising well graded, coarse grained, durable crushed rock or crushed concrete of nominal 40-70mm size, with a dense grade non-woven geotextile filter fabric placed on the surface of the subgrade to control subsoil erosion, may be required. We forewarn that if crushed concrete is used, then it must contain less than 10%

brick and tile fragments. Brick and tile fragments break down during compaction of the bridging layer, and have the propensity to absorb moisture, thus potentially negating the performance of the layer. Options and detailed design of subgrade improvement works must be provided by the geotechnical engineer following the proof rolling inspection.

If soil softening occurs after rainfall periods or flooding, the clay subgrade should be over-excavated to below the depth of moisture softening and replaced with engineered fill. If the clay subgrade exhibits shrinkage cracking, then the surface must be moistened with a water cart and rolled until the shrinkage cracks are no longer evident. Care must be taken not to over-water the subgrade as this will result in softening.

Engineered fill must be used to raise site levels.

4.3.5 Engineered Fill

General

From a geotechnical perspective, due to the relatively limited height of filling proposed, the reactivity of compacted clays and issues with moisture control of clay fill our preference is for the alluvial clay soils not be reused as engineered fill.

Engineered fill should preferably comprise well-graded, non-reactive granular material such as crushed basalt. The fill material should be tentatively compacted in maximum 300mm thick loose layers using a large static (non-vibratory) smooth-drum roller (say, at least 12 tonnes deadweight) to a density ratio strictly between 98% and 100% of Standard Maximum Dry Density (SMDD).

Service Trenches

Backfilling of service trenches must be carried out using engineered fill in order to reduce post-construction settlements. Due to the reduced energy output of compaction plant that can be placed in trenches, backfilling should be carried out in maximum 150mm thick loose layers and compacted using a trench roller, a pad-foot roller attachment fitted to an excavator, and/or a vertical rammer compactor (also known as a 'Wacker Packer'). Due to the reduced loose layer thickness, the maximum particle size of the backfill material should also reduce to 50mm. The compaction specification provided above is applicable. Alternatively, consideration could be given to backfilling service trenches with stabilised sand which does not require compactive effort.

Earthworks Inspection and Testing

Density tests should be regularly carried out on the engineered fill to confirm the above specifications are achieved, as outlined below:

- The frequency of density testing for general engineered fill should be at least one test per layer per 2500m^2 or one test per 500m^3 distributed reasonably evenly throughout the full depth and area, or 3 tests per lot (as defined in Clause 1.2.8 of AS3798-2007), whichever requires the most tests (assumes maximum 350mm thick loose layers);
- The frequency of density testing for trench backfill should be at least one test per two layers per 40 linear metres (assumes maximum 150mm thick loose layers);
- The frequency of density testing for retaining wall backfill should be at least one test per two layers per 50m^2 (assumes maximum 150mm thick loose layers).

Density testing should be regularly carried out on any engineered fill to confirm that the project specification has been met. Supervision and regular density testing in accordance with Level 1 requirements of AS3798-2007 'Guidelines on Earthworks for Commercial and Residential Developments' is recommended if engineered fill is required to support structural loads from buildings. In pavement or landscaped areas, or where fill is placed as form fill below buildings, Level 2 testing may be carried out.

Figure 5-5: Excavation Recommendations (Extract from Section 4.3 JK Geotechnics, 12 November 2024, 36310LTrpt)

A cut and fill plan has been produced using the latest 3D survey and proposed bulk excavation levels, shown in Appendix A.

6.0 Mitigation Measures

Mitigation Number/Name	Aspect/Section	Mitigation Measure	Reason for Mitigation Measure
Stormwater Quality Improvement Devices (SQIDs)	Stormwater during operation	Installation of 41x460mm PSorb Stormfilters, 22 x Ocean Protect Oceanguard Pit inserts, a RWT, and associated landscaping measures including grassed swales and planted buffering to remove the quantity of gross pollutants, suspended solids, nitrogen and phosphorous to council water quality requirements or equivalent.	Improve stormwater quality.
On-Site Detention	Stormwater during operation	Provision of OSD will not be required per correspondence with Council (refer Appendix B). Provision of adequate stormwater pits and pipes, swales and overland flow paths has been provided to limit the quantity of stormwater runoff. Final site design will not impart negative impacts to downstream conditions and neighboring properties.	Reduce stormwater runoff.
Erosion and Sedimentation Control Plan	Stormwater during construction	Design of an erosion and sedimentation control plan to reduce the debris and pollution in surface stormwater runoff from the site during the construction phase in accordance with the drawing submitted within this civil package.	Reduce stormwater runoff and improve quality in the construction phase.

7.0 Evaluation of Environmental Impacts

This section summarises the key findings of this report:

- Stormwater quantity has been designed in accordance with Lismore City Council and EFSG specifications and to support ESD initiatives proposed for the site. The inground stormwater system has been designed using the hydraulic analysis program DRAINS in line with requirements outlined in by EFSG and the Lismore City Council DCP. Discharge from the site is provided in two locations at the southeast corner to Kyogle Street and northern boundary to Phyllis Street.
- Stormwater water quality reduction targets of 90% GP, 75% TSS, 65% TP, and 40% TN have been achieved as demonstrated by the MUSIC modelling through the use of the following devices:
    - 41x460mm PSorb Stormfilters,
    - 22 x Ocean Protect Oceanguard GPT pit inserts
    - Rainwater Tank documented by others, and
    - Associated landscaping measures including grassed swales and planted buffering at site boundaries associated with existing TPZ's.
- Bulk Earthworks are required for the laying of pavement across the site and raising building levels to satisfy flood related requirements. No retaining walls are proposed for the site, with the exception of sandstone log seating noting this is not intended to service a retaining function. Pavements have been designed for a 25-year design life as per EFSG guidelines and have been designed factoring in subgrade improvement as per geotechnical advice.

Overall, the activity – from a civil design perspective – will not cause any adverse or significant impact on the environment, subject to implementing the mitigation measures in Section 6.0.

Prepared by
TTW (NSW) PTY LTD

MITCHELL LEIGHTON
Engineer

Authorised By
TTW (NSW) PTY LTD

GRACE CARPP
Associate

Appendix A

Civil Engineering Drawings

LISMORE SOUTH PUBLIC SCHOOL

LISMORE, NSW

CIVIL PLANS

REF ISSUE

LOCALITY PLAN

DRAWING INDEX

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

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NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
A	ISSUED FOR REF	ML JHH	06.06.2025

Client: NSW GOVERNMENT School Infrastructure NSW

Engineer: TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project: LISMORE SOUTH PUBLIC SCHOOL CIVIL PLANS REF ISSUE

Drawing Title: GENERAL COVER SHEET AND DRAWING INDEX

Scale at A1	Drawn	Designed	Approved
AS NOTED	ARW	DT	GC

Project No	Originator	Func	Spat	Type	Role	Sheet No.	Rev
LSPS	TTW	00	00	DR	C	00001	A

06.06.2025 5:07 PM

GENERAL

1. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORKS. ANY DISCREPANCIES TO BE REPORTED TO THE SUPERINTENDENT.
2. STRIP ALL TOPSOIL FROM THE CONSTRUCTION AREA. ALL STRIPPED TOPSOIL SHALL BE DISPOSED OF OFF-SITE UNLESS DIRECTED OTHERWISE.
3. MAKE SMOOTH CONNECTION WITH ALL EXISTING WORKS.
4. 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.
5. 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.
6. 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.
7. FOR ALL TEMPORARY BATTERS REFER TO GEOTECHNICAL RECOMMENDATIONS.

REFERENCE DRAWINGS

1. 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
BEVERIDGE WILLIAMS	2202780-DET-007-A	DET-007	A	10/02/2023
EJE	GROUND FLOOR PLAN	A-101	G	22/11/2024

BOUNDARIES AND EASEMENTS

1. THE PROPERTY BOUNDARY AND EASEMENT LOCATIONS SHOWN ON TAYLOR THOMSON WHITTING DRAWING'S HAVE BEEN BASED ON INFORMATION RECEIVED FROM : BEVERIDGE WILLIAMS

2. 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:	SSM 90368
DATUM OF LEVELS:	AHD
COORDINATE SYSTEM:	MGA2020
SURVEY PREPARED BY:	BEVERIDGE WILLIAMS
SETOUT POINTS:	SSM90369 - E525509.072, N6813052.44 - RL10.23

1. 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

1. 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.
2. 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.
3. 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.
4. 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.
5. 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)

1. PUBLIC SERVICE UTILITY INFORMATION SHOWN ON PLAN HAS BEEN COMPLIED FROM INFORMATION RECEIVED FROM DIAL BEFORE YOU DIG INQUIRY, REFERENCE NUMBER No.36541553 OBTAINED ON 24.04.2024 UNLESS SPECIFICALLY SHOWN OTHERWISE, THIS LOCATION AND DEPTH OF SERVICES SHOWN ON THIS PLAN HAVE NOT BEEN VERIFIED.
2. 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

1. 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.
2. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
3. 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

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

TENDER DOCUMENTATION

1. 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.
2. 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.
3. 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.
4. 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

1. 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.
2. THE CONTRACTOR SHALL RETAIN THE RESPONSIBILITY TO UNDERTAKE DETAILED DESIGN, CONFIRM COMPLIANCE WITH RELEVANT STANDARDS, CONSENT CONDITIONS & THE SPECIFICATION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THE FINAL DESIGN IS CO-ORDINATED FULLY WITH OTHER CONSULTANTS.
4. 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.

1. 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.

2. 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).

3. 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.

4. GROUNDWATER
   CONTRACTOR TO BE AWARE GROUND WATER LEVELS ARE CLOSE TO EXISTING SURFACE LEVEL. TEMPORARY DE-WATERING MAY BE REQUIRED DURING CONSTRUCTION WORKS.

5. 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.

6. GROUND CONDITIONS
   CONTRACTOR TO BE AWARE OF THE SITE GEOTECHNICAL CONDITIONS. REFER TO GEOTECHNICAL REPORT BY
   - JK GEOTECHINICS
   - LISMORE SOUTH PUBLIC SCHOOL GEOTECHNICAL REPORT (36310ltrpt), 13/12/2024.

7. 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
   - JK GEOTECHINICS
   - LISMORE SOUTH PUBLIC SCHOOL GEOTECHNICAL REPORT (36310ltrpt), 13/12/2024.

8. 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.

9. 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.

10. WATER POLLUTION
    CONTRACTOR TO ENSURE APPROPRIATE MEASURES ARE TAKEN TO PREVENT POLLUTANTS FROM CONSTRUCTION WORKS CONTAMINATING THE SURROUNDING ENVIRONMENT.

11. 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.

12. 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.

BOUNDARIES

EXISTING	REMOVED	PROPOSED	
			BLOCK BOUNDARY
			BLOCK BOUNDARY EXTINGUISHED

BUILDINGS

EXISTING	REMOVED	PROPOSED	
			BUILDING ENVELOPE
			FUTURE BUILDING ENVELOPE
			BASEMENT OUTLINE
			BUILDING AWNING
			BUILDING DOUBLE DOOR ENTRY
			BUILDING SINGLE DOOR ENTRY
			BUILDING SLIDING DOOR ENTRY

LANDSCAPE

EXISTING	REMOVED	PROPOSED	
			FENCE LINE
			FENCE LINE ON BOUNDARY
			PROPERTY ACCESS GATE
			TREES TREE REPRESENTATION MAY VARY BASED ON LANDSCAPE CONSULTANT OR SURVEY INFORMATION
			PAVEMENT
			SOFT LANDSCAPE
			TREE PROTECTION ZONE
			STRUCTURAL ROOT ZONE

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NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
A	ISSUED FOR REF	ML	JHH 06.06.2025

Client: NSW GOVERNMENT School Infrastructure NSW

Engineer: TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project: LISMORE SOUTH PUBLIC SCHOOL CIVIL PLANS REF ISSUE

Drawing Title: GENERAL NOTES AND LEGEND

Scale at A1	Drawn	Designed	Approved
NTS	ARW	DT	GC

Project No	Originator	Func	Spat	Type	Role	Sheet No.	Rev
LSPS	TTW	00	00	DR	C	00002	A

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BULK EARTHWORKS NOTES

1. All bulk earthworks setout from grid lines U.N.O.
2. All batters at a slope of 2 (H) : 1 (V) U.N.O.
3. Excavated material may be used as structural fill provided,
   (i) it complies with the specification requirements for fill material,
   (ii) the placement moisture content complies with the Geotechnical Consultants requirements, and allows filling to be placed and proofrolled in accordance with the specification. Where necessary the Contractor must moisture condition the excavated material to meet these requirements.

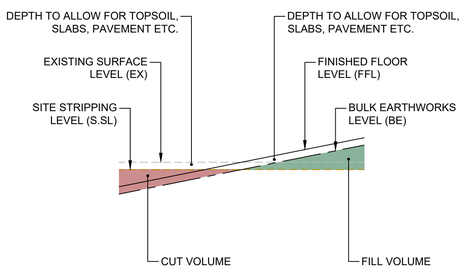
4. Compact fill areas and subgrade to not less than:

Location	Standard dry density (AS 1289 5.1.1.)	Moisture (OMC)
Under building slabs on ground:	98%	±2%
Under roads and carparks:	98%	±2%
Landscaped areas:	95%	±2%

5. Before placing fill, proof roll exposed subgrade with a 12 tonne minimum roller to test subgrade and then remove soft spots(areas with more than 3mm movement under roller). Soft spots to be replaced with granular fill U.N.O.
6. Contractor shall place safety barriers around excavations in accordance with relevant safety regulations.
7. For interpretation of bulk earthworks foot print line shown on the bulk earthworks drawings refer to the bulk earthworks construction legend.
8. Bulk earthwork drawings are not to be used for detailed excavation.
9. Refer to Geotechnical Report prepared by "JK GEOTECHNICS Pty Ltd" 36310LTrpt Draft SECTION 4.7 DATED 13/12/2024.
10. Detailed earthworks such as piling, pile caps, ground beams, lift pits, service trenching & landscape mounding etc is excluded.

BULK EARTHWORKS					
LOCATION	AREA (m²)	CUT (m³)	FILL (m³)	NET (m³)	AV. DEPTH (mm)
	10,585	-706	-1,887	1,181	

	BUILD - UPS (mm)
STRUCTURAL SLAB	850
GROUND FLOOR	100
CONCRETE FOOTPATH	250
ROADWAY (CARPARKING)	280
PLAYING COURT	150
LANDSCAPING	300



EARTHWORKS TYPICAL SECTION

DEPTH RANGE COLOUR TABLE

Lower_value		Upper_value	Unit	Colour
-5.0	to	-2.50	m	
-2.50	to	-2.25	m	
-2.25	to	-2.00	m	
-2.00	to	-1.75	m	
-1.75	to	-1.50	m	
-1.50	to	-1.25	m	
-1.25	to	-1.00	m	
-1.00	to	-.75	m	
-.75	to	-.50	m	
-.50	to	-.25	m	
-.25	to	0.00	m	
0.00	to	0.25	m	
0.25	to	.50	m	
.50	to	.75	m	
.75	to	1.00	m	
1.00	to	1.25	m	
1.25	to	1.50	m	
1.50	to	1.75	m	
1.75	to	2.00	m	

ASSUMPTIONS

1. Existing topsoil assumed 150mm stripped.
2. Bulk quantities represent difference between existing levels and proposed levels.
3. Set down for Structural slab is 850mm. (Stairs, Lift, Bathroom and Pump room)
4. Set down for Building Ground is 100mm.
5. Set down for concrete footpath pavement assumed to be 250mm, Asphalt roadway carparking area assumed to be 280mm, and landscape areas assumed to be 300mm based on 3% CBR. Further investigation is required by Geotechnical Engineer.
6. Pavement buildup in undercroft area is only documented to subgrade level. A 300mm piling rig working platform is to be set up in hardstand area and 2m beyond it's extents as per Geotechnical advice from JK Geotechnics Geotechnical investigation 36310ltrpt draft section 4.7.
7. Pavement buildups only address above the subgrade level.Subgrade improvement to approximately cbr 10% is required as per Geotechnical advice from JK Geotechnics Geotechnical investigation 36310ltrpt draft section 4.7 dated 12/11/2024.

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Rev	Description	Eng Draft	Date
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Client: NSW GOVERNMENT School Infrastructure NSW

Engineer: TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project: LISMORE SOUTH PUBLIC SCHOOL CIVIL PLANS REF ISSUE

Drawing Title: EARTHWORKS NOTES AND LEGEND

Scale at A1	Drawn	Designed	Approved
NTS	JHH	DT	GC

Project No	Originator	Func	Spat	Type	Role	Sheet No.	Rev
LSPS-TTW-00-00-DR-C-02001-A							

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PHYLLIS STREET

WILSON STREET

KYOGLE STREET

SITE BOUNDARY

TPZ
RETAIN EXISTING SURFACE

TPZ
RETAIN EXISTING SURFACE

TPZ
RETAIN EXISTING SURFACE

TPZ
RETAIN EXISTING SURFACE

TPZ
RETAIN EXISTING SURFACE

FL 10.53

FL 10.48

FL 10.55

FL 10.80

FL 10.80

FL 10.66

FL 10.65

FL 11.00

FL 10.83

BEL = (FFL - 250mm
PAVEMENT THICK.)

BEL = (RL - 850mm
STRUCTURAL SLAB)

TANK 2 IL 9.69
BEL 9.39
= (IL - 300mm
STRUCTURAL SLAB)

BEL = (FFL - 150mm
PAVEMENT THICK.)

BEL = (FFL - 250mm PAVEMENT THICK.)

FL 10.97

FL 10.85

FL 10.99

BEL = (RL - 850mm
STRUCTURAL SLAB)

LANDSCAPE
BEL = (FFL - 300mm SETDOWN)

BEL = (FFL - 250mm
PAVEMENT THICK.)

BEL = (RL - 850mm
STRUCTURAL SLAB)

FL 10.60

FL 10.93

FL 10.93

FL 10.96

FL 11.04

BEL = (FFL - 250mm PAVEMENT THICK.)

BEL = (RL - 850mm
STRUCTURAL SLAB)

FL 11.00

FL 10.57

FL 10.57

ROADWAY
BEL = (FFL - 280mm PAVEMENT THICK.)

GROUND FLOOR RL 11.30
BEL = (RL - 100mm PAVEMENT THICK.)

GROUND FLOOR
RL 11.30

BEL = (RL - 850mm STRUCTURAL SLAB)

FL 10.57

FL 10.69

FL 10.64

FL 11.07

FL 11.07

TANK 1 IL 9.58
BEL 9.28
= (IL - 300mm
STRUCTURAL SLAB)

FL 10.30

SITE BOUNDARY

BEL = (FFL - 250mm PAVEMENT THICK.)

No. 67
HB STOREY WB
HOUSE

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

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Client: NSW GOVERNMENT School Infrastructure NSW

Engineer: TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project: LISMORE SOUTH PUBLIC SCHOOL
CIVIL PLANS
REF ISSUE

Drawing Title: EARTHWORKS CUT AND FILL VOLUMES PLAN

Scale at A1	Drawn	Designed	Approved
1:250	JHH	DT	GC

Project No	Originator	Func	Spat	Type	Role	Sheet No.	Rev
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CONCRETE

1. PLACE CONCRETE OF THE FOLLOWING CHARACTERISTIC COMPRESSIVE STRENGTH f'c IN ACCORDANCE WITH AS 1379.
2.

LOCATION	f'c MPa (28 DAYS)	SPECIFIED SLUMP	NOMINAL AGG. SIZE
KERBS	S20	80	20
RETAINING WALL FOOTINGS	S40	80	20

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. UNLESS 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

CONCRETE FINISHING

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.

FORMWORK

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.

CONCRETE REINFORCEMENT

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.

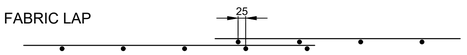
SYMBOL	TYPE	GRADE
N	HOT ROLLED RIBBED BAR	DN500N
R	PLAIN ROUND BAR	R250N
SL	SQUARE MESH	500L
RL	RECTANGULAR MESH	500L

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

LOCATION	COVER (MM)
FOOTINGS	50
WALLS	30

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.

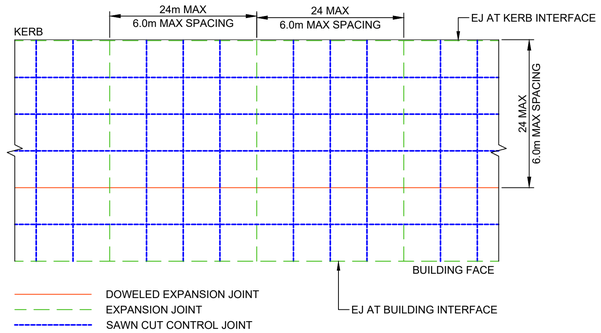
TENSION LAPS		
BAR SIZE	TOP BARS IN BANDS AND BEAMS	ALL OTHER BARS
N12	570	480
N16	800	700
N20	1150	950
N24	1500	1250
N28	1850	1500
N32	2250	1800
N36	2700	2100

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 Cd=37mm; THEREFORE MINIMUM CLEAR SPACING BETWEEN BARS = 2 X Cd = 74mm. MINIMUM COVER IS BASED ON THE NEW A2 EXPOSURE CLASSIFICATION FOR INTERIOR, NON-RESIDENTIAL WHICH REQUIRES 25mm COVER FOR 32Mpa CONCRETE,
3. f'c = 32Mpa
   ALL OTHER BARS:
1. LESS THAN 300mm OF CONCRETE BELOW THE BAR.
2. MINIMUM COVER OF 25mm GIVING Cd = 25mm; THEREFORE MINIMUM CLEAR SPACING BETWEEN BARS = 2 X Cd = 50mm.
3. f'c = 32Mpa.
   COLUMNS:
1. COVER TO COLUMNS = 40mm (30+10)k7 = 1.25
2. COVERS FOR FIRE RATING ARE TO BE DESIGNED BY THE ENGINEER.

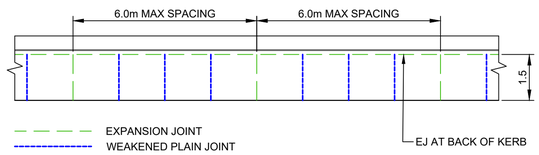
VEHICULAR PAVEMENT JOINTING (03000 SERIES DRAWINGS)

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. DOWELED 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 UNIT PAVERS.
6. THE TIMING OF THE SAW CUT IS TO BE CONFIRMED BY THE CONTRACTOR ON SITE. SITE CONDITIONS WILL DETERMINE HOW MANY HOURS AFTER THE CONCRETE POUR BEFORE THE SAW CUTS ARE COMMENCED. REFER TO THE SPECIFICATION FOR WEATHER CONDITIONS AND TEMPERATURES REQUIRED.
7. VEHICULAR PAVEMENT JOINTING AS FOLLOWS.



PEDESTRIAN PATH JOINTING (03000 SERIES DRAWINGS)

1. EXPANSION JOINTS ARE TO BE LOCATED WHERE POSSIBLE AT TANGENT POINTS OF CURVES AND ELSEWHERE AT MAX 6.0M CENTRES.
2. WEAKENED PLANE JOINTS ARE TO BE LOCATED AT A MAX 1.5 X WIDTH OF THE PAVEMENT.
3. WHERE POSSIBLE JOINTS SHOULD BE LOCATED TO MATCH KERBING AND / OR ADJACENT PAVEMENT JOINTS.
4. ALL PEDESTRIAN FOOTPATH JOINTING AS FOLLOWS (UNO).



KERBING

INCLUDES ALL KERBS, GUTTERS, DISH DRAINS, CROSSINGS AND EDGES.

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.

NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
A	ISSUED FOR REF	ML JHH	06.06.2025

Client: NSW GOVERNMENT School Infrastructure NSW

Engineer: TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project: LISMORE SOUTH PUBLIC SCHOOL CIVIL PLANS REF ISSUE

Drawing Title: PAVEMENT NOTES AND LEGEND SHEET 1

Scale at A1	Drawn	Designed	Approved
NTS	JHH	DT	GC

Project No	Originator	Func	Spat	Type	Role	Sheet No.	Rev
LSPS	TTW	OO	00	DR	C	03001	A

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PHYLLIS STREET

WILSON STREET

KYOGLE STREET

SITE BOUNDARY

GROUND FLOOR
RL 11.30

SOFTFALL WITHIN THE UNDERCROFT FINISH TO LANDSCAPE ARCHITECT'S DETAIL.
ALLOW FOR 200MM COMPACTED DGB20 UNDERNEATH SOFTFALL BUILD UP"

PAVEMENT BUILDUP IN UNDERCROFT AREA IS ONLY DOCUMENTED TO SUBGRADE LEVEL. A 300mm PILING RIG WORKING PLATFORM IS TO BE SET UP IN HARDSTAND AREA AND 2M BEYOND IT'S EXTENTS AS PER GEOTECHNICAL ADVICE FROM JK GEOTECHNICS GEOTECHNICAL INVESTIGATION 36310LTrpt Draft SECTION 4.7 AND PER TETRA TECH COFFEY ADVICE.

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

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PT1	100mm THICK CONCRETE (f'c = 20MPa) WITH SL72 PLACED CENTRALLY, ON 50mm SAND BEDDING LAYER, ON 100mm DBG20
PT2	40mm COMPACTED THICKNESS AC10 WEARING COURSE ON PRIME AMC 1 ON 120mm COMPACTED THICKNESS DGB20 CLASS 1 BASE TO 98% MMDD AT ±2% ON 120mm COMPACTED THICKNESS DGB20 SUBBASE TO 98% MMDD AT ±2% OMC ON SUBGRADE MINIMUM CBR 10% COMPACTED TO 98% SMDD AT ±2% OMC
PT3	25mm AC5, ON 25mm AC10, ON 100mm DBG20
PT4	100mm THICK CONCRETE (f'c = 20MPa) WITH SL72 PLACE CENTRALLY
L1	TURF LANDSCAPING REFER LANDSCAPE ARCHITECTS DOCUMENTATION
L2	TURF LANDSCAPING REFER LANDSCAPE ARCHITECTS DOCUMENTATION
L3	PLAY ZONE REFER LANDSCAPE ARCHITECTS DOCUMENTATION FINISH TO LANDSCAPE ARCHITECT'S DOCUMENTATION ON 200MM COMPACTED THICKNESS DGB20
SB1	STAIR AND BATHROOM SLABS TO BE DOCUMENTED BY STRUCTURAL
TPZ	TREE PROTECTION ZONE
	PUBLIC DOMAIN WORKS DRIVEWAY LAYBACK VEHICULAR CROSSING TO LISMORE CITY COUNCIL STANDARDS. REFER TO DWG. No.03042

EXISTING TREE LEGEND

TPZ
SRZ
EXISTING TREE RETAINED

GENERAL NOTES

PAVEMENT BUILDUPS ONLY ADDRESS ABOVE THE SUBGRADE LEVEL.SUBGRADE IMPROVEMENT TO APPROXIMATELY CBR 10% IS REQUIRED AS PER GEOTECHNICAL ADVICE FROM JK GEOTECHNICS GEOTECHNICAL INVESTIGATION 36310LTrpt Draft SECTION 4.7 DATED 12/11/2024 AND PER TETRA TECH COFFEY ADVICE.

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Client: NSW GOVERNMENT School Infrastructure NSW

Engineer: TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project: LISMORE SOUTH PUBLIC SCHOOL CIVIL PLANS REF ISSUE

Drawing Title: PAVEMENT PLAN

Scale at A1	Drawn	Designed	Approved
1:250	JHH	DT	GC

Project No	Originator	Func	Spat	Type	Role	Sheet No.	Rev
LSPS	TTW	00	00	DR	C	03011	A

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STORMWATER DRAINAGE

1. STORMWATER DESIGN CRITERIA

   (A) AVERAGE EXCEEDANCE PROBABILITY: -
   - 1% AEP FOR ROOF DRAINAGE TO FIRST EXTERNAL PIT
   - 5% AEP FOR PAVED AND LANDSCAPED AREAS

   (B) RAINFALL INTENSITIES : -
   - TIME OF CONCENTRATION: 5 MINUTES
   - 1% AEP = 271mm/hr
   - 5% AEP = 208mm/hr

   (C) RAINFALL LOSSES: -
   - IMPERVIOUS AREAS: IL = 1.5mm CL = 0.0mm/hr
   - PERVIOUS AREAS: IL = 19.6mm CL = 0.92mm/hr

2. PIPES 300 DIA AND LARGER TO BE REINFORCED CONCRETE CLASS 2 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).

STORMWATER PIPE INFORMATION

PIPE INFORMATION

USIL	UPSTREAM INVERT LEVEL
Ø000	PIPE INTERNAL DIAMETER
--- '-'	PIPE MATERIAL AND CLASS
0.0m	PIPE LENGTH
0.0 m/s	HYDRAULIC FLOW RATE
%0.0	PIPE GRADE
DSIL	DOWNSTREAM INVERT LEVEL

TIE INFORMATION

SW	
L 10.0m	TIE LENGTH
D 1.0m	TIE DEPTH
Ø150	TIE DIAMETER

STORMWATER STRUCTURE IDENTIFICATION

SW1-2 LINE NUMBER 1 - STRUCTURE NUMBER 2

SUBSOIL DRAINAGE

1. ALL SUBSOIL DRAINAGE WORKS ARE TO BE COMPLETED IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS OUTLINED IN THE PROJECT SPECIFICATION.
2. WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS UNSLOTTED uPVC SEWER GRADE PIPE IS TO BE USED.
3. SUBSOIL DRAINS TO BE Ø100 SLOTTED FLEXIBLE uPVC UNLESS NOTED OTHERWISE.
4. ALL SUBSOIL DRAINS ARE TO BE AT MINIMUM 1% GRADE UNLESS NOTED OTHERWISE.
5. ALL SUBSOIL DRAINS TO BE RODDED PRIOR TO THE PLACEMENT OF ASPHALT.
6. ALL SUBSOIL DRAINS ARE DRAWN DIAGRAMMATICALLY FOR CLARITY. REFER TO TYPICAL DETAIL FOR SUBSOIL SETOUT.

STORMWATER LEGEND

GPT — GROSS POLLUTANT TRAP

OVERLAND FLOW ARROW

CONCRETE INCASED PIPE

SWALE DRAIN

STORMWATER ANNOTATIONS

IL	PIPE INVERT LEVEL
OL	PIPE OBVERT LEVEL
CL	PIT COVER LEVEL
WL	WATER LEVEL

NOTE

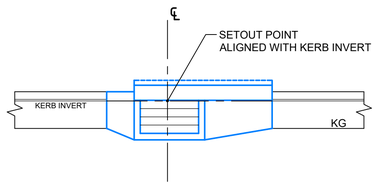
STORMWATER DRAINAGE NOTES AND LEGEND IS TO READ IN CONJUNCTION WITH GENERAL NOTES AND LEGEND. REFER DRAWING No. 00002

SUBSOIL TO BE INSTALLED BEHIND KERBS, RETAINING WALLS, BUILDING EDGES AND PAVEMENT INTERFACES WITH SOIL

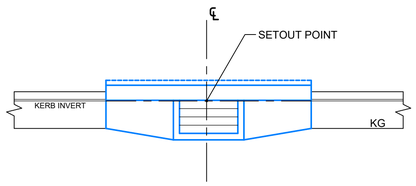
PIT SCHEDULE

Note: Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheets – Final internal pit dimensions are to comply with AS3500

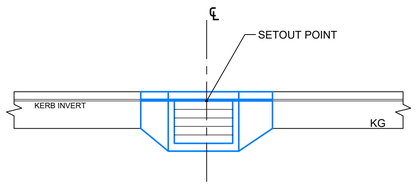
Type	Description	Cover (Clear Opening)	Number
A	Surface Inlet Pit	900 x 900 Class B galvanised mild steel heel safe grate hinged framefitted with Ocean Protect OceanGuard insert.	B1–B3, C1–C6,D1, E1–E5,F1,G1 N1,S4
B		Existing pit to be retained.	EX1,EX2
C	Kerb Inlet Pit	450 x 900 Class D galvanised mild steel heel safe grate hinged framefitted with Ocean Protect OceanGuard insert.	A1–A4
D	Junction Pit	450 x 450 Class D cast iron cover with concrete infill	S3
E	Chamber Access Hatch	900 x 900 Class D cast iron cover with concrete infill	S1,S2,N1,N2



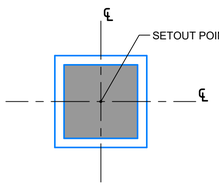
KERB INLET SUMP (KIS) ON GRADE
SCALE 1:50



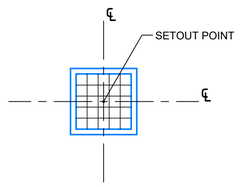
KERB INLET SUMP (KIS) IN SAG
SCALE 1:50



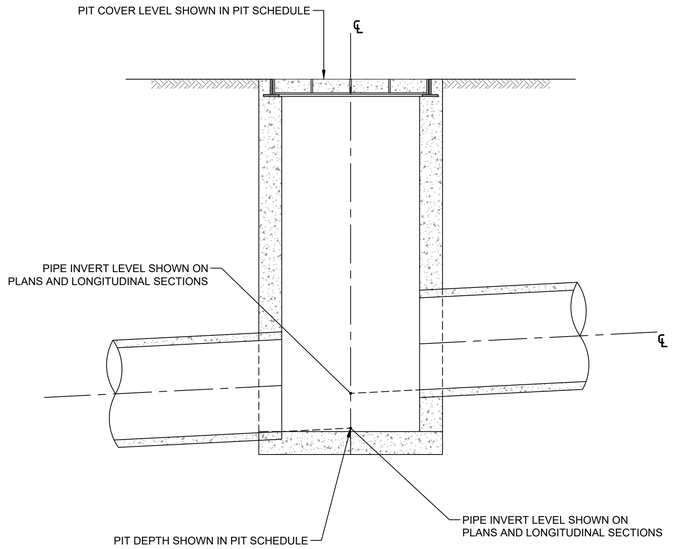
KERB GRATED INLET SUMP (KGI)
SCALE 1:50



JUNCTION PIT
SCALE 1:50



GRATED INLET SUMP
SCALE 1:50



DESIGN INVERT LEVELS
AT STORMWATER STRUCTURES
SCALE 1:20

0 400 800 1200 1600mm
1:20 A1 1:40 A3

0.0 1000 2000 3000 4000mm
1:50 A1 1:100 A3

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NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
A	ISSUED FOR REF	ML	JHH 06.06.2025

Client: NSW GOVERNMENT School Infrastructure NSW

Engineer: TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project: LISMORE SOUTH PUBLIC SCHOOL CIVIL PLANS REF ISSUE

Drawing Title: STORMWATER NOTES AND LEGEND

Scale at A1	Drawn	Designed	Approved
AS NOTED	ARW	DT	GC

Project No	Originator	Func	Spat	Type	Role	Sheet No.	Rev
LSPS-TTW-00-00-DR-C-04001-A							

06.06.2025 5:13 PM

PHYLLIS STREET

WILSON STREET

KYOGLE STREET

SWALE 1.0mW

20 x 460mm PSORB STORMFILTERS

OVERFLOW PATH FROM OVAL OVER PATH TOWARDS SWALE

21 x 460mm PSORB STORMFILTERS

CONCRETE ENCASE STORMWATER LINE BENEATH CARPARK (TYP).

GROUND FLOOR RL 11.30

FALL

2.5%

4.88%

5.0%

1:20

COVERED ASSEMBLY AREA

TWO STOREY BRICK BUILDING

No. 67 TWO STOREY WB HOUSE

STORMWATER LEGEND

- FINISHED LEVEL
- SW — PROPOSED STORMWATER PIPE WITH FLOW DIRECTION
- USIL 85.63 Ø300 'S' 1.0% DSIL 85.62 — UPSTREAM INVERT LEVEL; PIPE INTERNAL DIAMETER AND CLASS; PIPE GRADE; DOWNSTREAM INVERT LEVEL
- PROPOSED STORMWATER RHS PIPE
- OVERLAND FLOW
- CONCRETE ENCASEMENT
- PROPOSED SWALE LINE
- GD — PROPOSED GRATE DRAIN
- PROPOSED SURFACE INLET PIT
- uSW — EXISTING STORMWATER PIPE

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

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Client: NSW GOVERNMENT School Infrastructure NSW

Engineer: TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project: LISMORE SOUTH PUBLIC SCHOOL CIVIL PLANS REF ISSUE

Drawing Title: STORMWATER MANAGEMENT PLAN

Scale at A1	Drawn	Designed	Approved
1:250	JHH	DT	GC

Project No	Originator	Func	Spat	Type	Role	Sheet No.	Rev
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06.06.2025 5:14 PM

PHYLLIS STREET

WILSON STREET

KYOGLE STREET

SITE BOUNDARY

GROUND FLOOR
RL 11.30

20.0m

25.0m

NO PARKING
8:30 - 9:30 AM
3-4 PM
SCHOOL DAYS

PUBLIC DOMAIN WORKS - LAYBACK VEHICULAR CROSSING TO LISMORE CITY COUNCIL STANDARDS. REFER DWG. No.03042

No. 67
TWO STOREY WB HOUSE

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

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Client: NSW GOVERNMENT School Infrastructure NSW

Engineer: TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project: LISMORE SOUTH PUBLIC SCHOOL
CIVIL PLANS
REF ISSUE

Drawing Title: PUBLIC DOMAIN WORKS PLAN

Scale at A1	Drawn	Designed	Approved
1:250	JHH	DT	GC

Project No	Originator	Func	Spat	Type	Role	Sheet No.	Rev
LSPS	TTW	00	00	DR	C	07011	A

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EROSION AND SEDIMENT CONTROL NOTES

1. ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH:-
   - LOCAL AUTHORITY REQUIREMENTS,
   - EPA POLLUTION CONTROL MANUAL FOR URBAN STORMWATER,
   - LANDCOM NSW - MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION ("BLUE BOOK").
2. EROSION AND SEDIMENT CONTROL DRAWINGS AND NOTES ARE PROVIDED FOR THE WHOLE OF THE WORKS. SHOULD THE CONTRACTOR STAGE THESE WORKS THEN THE DESIGN MAY BE REQUIRED TO BE MODIFIED. VARIATION TO THESE DETAILS MAY REQUIRE APPROVAL BY THE RELEVANT AUTHORITIES. THE EROSION AND SEDIMENT CONTROL PLAN SHALL BE IMPLEMENTED AND ADAPTED TO MEET THE VARYING SITUATIONS AS WORK ON SITE PROGRESSES.
3. THE EROSION & SEDIMENT CONTROL PLAN IS PREPARED FOR INFORMATION & PLANNING APPROVALS ONLY. THE CONTRACTOR SHALL PREPARE THE CONSTRUCTION EROSION & SEDIMENT CONTROL PLAN BASED ON THEIR WORKS STAGING & PROPOSED SITE FACILITIES.
4. MAINTAIN ALL EROSION AND SEDIMENT CONTROL DEVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE LOCAL AUTHORITY.
5. WHEN STORMWATER PITS ARE CONSTRUCTED PREVENT SITE RUNOFF ENTERING THE PITS UNLESS SILT FENCES ARE ERECTED AROUND PITS.
6. MINIMISE THE AREA OF SITE BEING DISTURBED AT ANY ONE TIME.
7. PROTECT ALL STOCKPILES OF MATERIALS FROM SCOUR AND EROSION. DO NOT STOCKPILE LOOSE MATERIAL IN ROADWAYS, NEAR DRAINAGE PITS OR IN WATERCOURSES.
8. ALL SOIL AND WATER CONTROL MEASURES ARE TO BE PUT BACK IN PLACE AT THE END OF EACH WORKING DAY, AND MODIFIED TO BEST SUIT SITE CONDITIONS.
9. CONTROL WATER FROM UPSTREAM OF THE SITE SUCH THAT IT DOES NOT ENTER THE DISTURBED SITE.
10. ALL CONSTRUCTION VEHICLES SHALL ENTER AND EXIT THE SITE VIA THE TEMPORARY CONSTRUCTION ENTRY/EXIT.
11. ALL VEHICLES LEAVING THE SITE SHALL BE CLEANED AND INSPECTED BEFORE LEAVING.
12. MAINTAIN ALL STORMWATER PIPES AND PITS CLEAR OF DEBRIS AND SEDIMENT. INSPECT STORMWATER SYSTEM AND CLEAN OUT AFTER EACH STORM EVENT.
13. CLEAN OUT ALL EROSION AND SEDIMENT CONTROL DEVICES AFTER EACH STORM EVENT.

SEQUENCE OF WORKS

1. PRIOR TO COMMENCEMENT OF EXCAVATION THE FOLLOWING SOIL MANAGEMENT DEVICES MUST BE INSTALLED.

1.1. CONSTRUCT SILT FENCES BELOW THE SITE AND ACROSS ALL POTENTIAL RUNOFF SITES.
1.2. CONSTRUCT TEMPORARY CONSTRUCTION ENTRY/EXIT AND DIVERT RUNOFF TO SUITABLE CONTROL SYSTEMS.
1.3. CONSTRUCT MEASURES TO DIVERT UPSTREAM FLOWS INTO EXISTING STORMWATER SYSTEM.
1.4. CONSTRUCT SEDIMENTATION TRAPS/BASIN INCLUDING OUTLET CONTROL AND OVERFLOW.
1.5. CONSTRUCT TURF LINED SWALES.
1.6. PROVIDE SANDBAG SEDIMENT TRAPS UPSTREAM OF EXISTING PITS.

2. CONSTRUCT GEOTEXTILE FILTER PIT SURROUND AROUND ALL PROPOSED PITS AS THEY ARE CONSTRUCTED.
3. ON COMPLETION OF PAVEMENT PROVIDE SAND BAG KERB INLET SEDIMENT TRAPS AROUND PITS.
4. PROVIDE AND MAINTAIN A STRIP OF TURF ON BOTH SIDES OF ALL ROADS AFTER THE CONSTRUCTION OF KERBS.

WATER QUALITY TESTING REQUIREMENTS

1. PRIOR TO DISCHARGE OF SITE STORMWATER, GROUNDWATER AND SEEPAGE WATER INTO COUNCIL'S STORMWATER SYSTEM, CONTRACTORS MUST UNDERTAKE WATER QUALITY TESTS IN CONJUNCTION WITH A SUITABLY QUALIFIED ENVIRONMENT CONSULTANT OUTLINING THE FOLLOWING: -

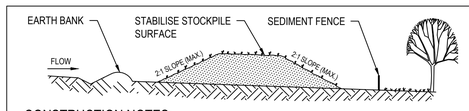
- COMPLIANCE WITH THE CRITERIA OF THE AUSTRALIAN AND NEW ZEALAND GUIDELINES FOR FRESH AND MARINE WATER QUALITY (2000)
- IF REQUIRED SUBJECT TO THE ENVIRONMENTAL CONSULTANTS ADVICE, PROVIDE REMEDIAL MEASURES TO IMPROVE THE QUALITY OF WATER THAT IS TO BE DISCHARGED INTO COUNCILS STORM WATER DRAINAGE SYSTEM.THIS SHOULD INCLUDE COMMENTS FROM A SUITABLY QUALIFIED ENVIRONMENTAL CONSULTANT CONFIRMING THE SUITABILITY OF THESE REMEDIAL MEASURES TO MANAGE THE WATER DISCHARGED FROM THE SITE INTO COUNCILS STORM WATER DRAINAGE SYSTEM. OUTLINING THE PROPOSED, ONGOING MONITORING, CONTINGENCY PLANS AND VALIDATION PROGRAM THAT WILL BE IN PLACE TO CONTINUALLY MONITOR THE QUALITY OF WATER DISCHARGED FROM THIS SITE. THIS SHOULD OUTLINE THE FREQUENCY OF WATER QUALITY TESTING THAT WILL BE UNDERTAKEN BY A SUITABLY QUALIFIED ENVIRONMENTAL CONSULTANT.

EROSION AND SEDIMENT CONTROL LEGEND

SF	SEDIMENT FENCE (SD6-8)
IF	GRATED SURFACE INLET PIT WITH GEOTEXTILE FILTER SURROUND (SD6-12)
KIF	KERB INLET PIT WITH GEOTEXTILE FILTER SURROUND (SD6-11)
	STRAW BALE FILTER (SD6-7)
	CATCH DRAIN (SD5-5)

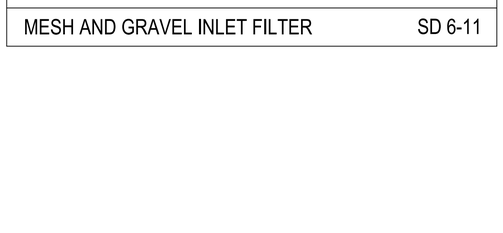
CONSTRUCTION NOTES:
1. INSTALL A 400mm MINIMUM WIDE ROLL OF TURF ON THE FOOTPATH NEXT TO THE KERB AND AT THE SAME LEVEL AS THE TOP OF THE KERB.
2. LAY 1.4 METRE LONG TURF STRIPS NORMAL TO THE KERB EVERY 10m.
3. REHABILITATE DISTURBED SOIL BEHIND THE TURF STRIP FOLLOWING THE ESCP/SWMP.

KERBSIDE TURF STRIP SD 6-13



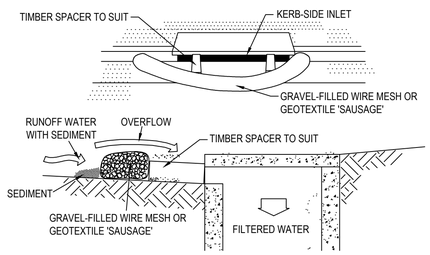
CONSTRUCTION NOTES:
1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. ALL STOCKPILES ARE TO BE LOCATED AND PLACED IN ACCORDANCE WITH THE CONTRACTOR'S EROSION AND SEDIMENT CONTROL PLAN.
5. WHERE STOCKPILES ARE TEMPORARY (<14 DAYS) NO STABILISATION IS REQUIRED. REVIEW THE ADEQUACY OF SEDIMENT CONTROLS IF RAINFALL IS PREDICTED.
6. WHERE STOCKPILES ARE TEMPORARY (<14 DAYS) THE FOLLOWING ADDITIONAL CONTROLS ARE REQUIRED:
   -MAXIMUM BATTER SLOPE REDUCED TO 1:4
   -CONSTRUCT A CONTOUR DRAIN ON THE LOW SIDE OF THE STOCKPILE, AND DISCHARGING THROUGH A STRAW BALE OR 200mm HIGH GRAVEL DAM
   -ESTABLISH GRASS COVER TO SURFACE OF STOCKPILE WITHIN 14 DAYS, USING HYDROMULCH WITH A 75:25 MIX OF SEASONAL AND PERMANENT GRASS SEEDS, AND A STRAW MULCH THICKNESS OF NO LESS THAN 5mm.
7. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2 METRES DOWNSLOPE.

STOCKPILES SD 4-1



CONSTRUCTION NOTES:
1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC.REDUCE THE PICKET SPACING TO 1m CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

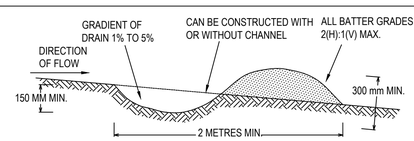
GEOTEXTILE INLET FILTER SD 6-12



NOTE: THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN AN APPROVED SWMP/ESCP.

CONSTRUCTION NOTES:
1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH X 400mm WIDE.
4. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

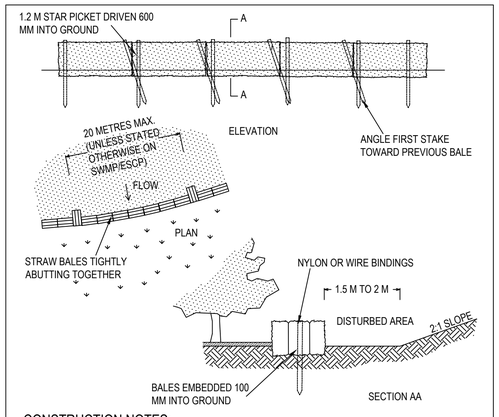
MESH AND GRAVEL INLET FILTER SD 6-11



NOTE: ONLY TO BE USED AS TEMPORARY BANK WHERE MAXIMUM UPSLOPE LENGTH IS 80 METRES.

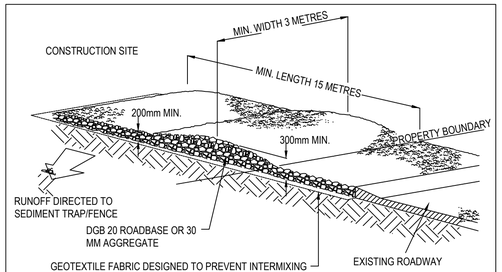
CONSTRUCTION NOTES:
1. BUILD WITH GRADIENTS BETWEEN 1 PERCENT AND 5 PERCENT.
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE - WORK AROUND THEM.
3. ENSURE THE STRUCTURES ARE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT COULD IMPEDE WATER FLOW.
4. BUILD THE DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTIONS, NOT V SHAPED.
5. ENSURE THE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE.
6. COMPLETE PERMANENT OR TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION.

EARTH BANK (LOW FLOW) SD 5-5



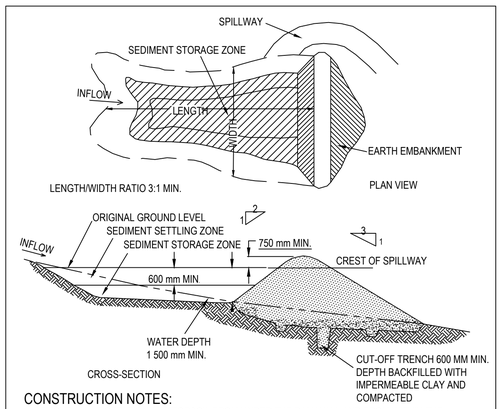
CONSTRUCTION NOTES:
1. CONSTRUCT THE STRAW BALE FILTER AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE.
2. PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS ARE TO BE PLACED PARALLEL TO GROUND.
3. ENSURE THAT THE MAXIMUM HEIGHT OF THE FILTER IS ONE BALE.
4. EMBED EACH BALE IN THE GROUND 75 mm TO 100 mm AND ANCHOR WITH TWO 1.2 METRE STAR PICKETS OR STAKES. ANGLE THE FIRST STAR PICKET OR STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BALE.DRIVE THEM 600 mm INTO THE GROUND AND, IF POSSIBLE, FLUSH WITH THE TOP OF THE BALES. WHERE STAR PICKETS ARE USED AND THEY PROTRUDE ABOVE THE BALES, ENSURE THEY ARE FITTED WITH SAFETY CAPS.
5. WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWNSLOPE FROM A DISTURBED BATTER, ENSURE THE BALES ARE PLACED 1 TO 2 METRES DOWNSLOPE FROM THE TOE.
6. ESTABLISH A MAINTENANCE PROGRAM THAT ENSURES THE INTEGRITY OF THE BALES IS RETAINED - THEY COULD REQUIRE REPLACEMENT EACH TWO TO FOUR MONTHS.

STRAW BALE FILTER SD 6-7



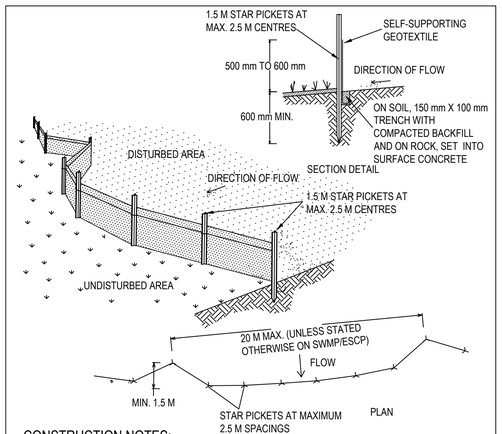
CONSTRUCTION NOTES:
1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3m WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE

STABILISED SITE ACCESS SD 6-14



CONSTRUCTION NOTES:
1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. CONSTRUCT A CUT-OFF TRENCH 500 MM DEEP AND 1,200 MM WIDE ALONG THE CENTRELINE OF THE EMBANKMENT EXTENDING TO A POINT ON THE GULLY WALL LEVEL WITH THE RISER CREST.
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 95 PER CENT STANDARD PROCTOR DENSITY.
4. SELECT FILL FOLLOWING THE SWMP THAT IS FREE OF ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL.
5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100 MM TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE.
6. SPREAD THE FILL IN 100 MM TO 150 MM LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP.
7. CONSTRUCT THE EMERGENCY SPILLWAY. 8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP.

EARTH BASIN - WET (APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY) SD 6-4



CONSTRUCTION NOTES:
1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND AT 2.5m INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

SEDIMENT FENCE SD 6-8

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NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
A	ISSUED FOR REF	ML JHH	06.06.2025

Client: NSW GOVERNMENT School Infrastructure NSW

Engineer: TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project: LISMORE SOUTH PUBLIC SCHOOL
CIVIL PLANS
REF ISSUE

Drawing Title: ENVIRONMENTAL EROSION CONTROL NOTES, LEGEND AND DETAILS

Scale at A1	Drawn	Designed	Approved
NTS	ARW	DT	GC

Project No	Originator	Func	Spat	Type	Role	Sheet No.	Rev
LSPS-TTW-00-00-DR-C-09201-A							

06.06.2025 5:15 PM

PHYLLIS STREET

WILSON STREET

KYOGLE STREET

SITE BOUNDARY

POSSIBLE STOCKPILE SITE
TBC BY CONTRACTOR (SD4-1)

POTENTIAL AMBULANCE ENTRY

PROVIDE SEDIMENT FENCE TYPICAL (SD6-8)

PROVIDE CATCH DRAIN TYPICAL (SD5-5)

PROVIDE STRAW BALES TO CATCH DRAINS TYPICAL (SD6-7)

PROVIDE STABILISED ENTRY/EXIT POINT WITH LOCKABLE ACCESS GATE (SD6-14)

PROVIDE GRATED INLET FILTER TO EXISTING GRATED INLET PITS TYPICAL (SD6-12)

PROVIDE KERB INLET FILTER TO EXISTING KERB INLET PITS TYPICAL (SD6-11)

PROVIDE TEMPORARY SEDIMENT BASIN
VOLUME REQUIRED = 241m³
VOLUME TO BE ADJUSTED PER STAGE.

1 DP 157090

2 DP 157090

21 22 23 26 11 2

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

\\ttw\dfs\ttwcad\jobs\23\23188 2\civil\sheets\0\123188 2-TTW-01-DR-CI-09211.dwg

NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
A	ISSUED FOR REF	ML JHH	06.06.2025

Client: NSW GOVERNMENT School Infrastructure NSW

Engineer: TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project: LISMORE SOUTH PUBLIC SCHOOL CIVIL PLANS REF ISSUE

Drawing Title: ENVIRONMENTAL EROSION CONTROL PLAN

Scale at A1	Drawn	Designed	Approved
1:250	ARW	DT	GC

Project No	Originator	Func	Spat	Type	Role	Sheet No.	Rev
LSPS	TTW	00	00	DR	C	09211	A

06.06.2025 5:15 PM

Appendix B

Consultation with Lismore City Council

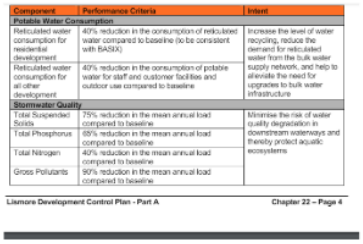
From: Dominic Tate <dominic.tate@ttw.com.au>
Sent: Wednesday, April 24, 2024 11:00 AM
To: Records <Council@lismore.nsw.gov.au>
Cc: Grace Carpp <grace.carpp@ttw.com.au>
Subject: Lismore South Public School - OSD requirements and capacity of existing drainage

CAUTION: This email was sent from outside our organisation. Be cautious, particularly with links and attachments unless you recognise the sender and know the content is safe.

Hello,

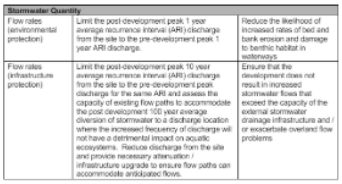
We are undertaking the stormwater design for a redevelopment at Lismore South Public School – 69-70 Kyogle Street, Lismore South (SINSW04692 23-LSP). The design intends to achieve the targets screenshotted below in the Lismore City Council DCP – Chapter 22 – Water Sensitive Design. We would like some clarification on a couple of items:

1. Does pre-development refer to the site as a fully greenfield site or does that include the existing buildings currently on site?
2. If available, are you able to give us information regarding pipe sizes and invert levels of the council stormwater system along the boundary of the site. We would also like to know where this system flows to. Any information you have on this system would be greatly appreciated.



Component	Performance Criteria	Intent
Potable Water Consumption		
Reticulated water consumption for residential development	40% reduction in the consumption of reticulated water compared to baseline (to be consistent with BASIX)	Increase the level of water recycling, reduce the demand for reticulated water from the bulk water supply network, and help to alleviate the need for upgrades to bulk water infrastructure
Reticulated water consumption for all other development	40% reduction in the consumption of potable water for staff and customer facilities and outdoor use compared to baseline	
Stormwater Quality		
Total Suspended Solids	75% reduction in the mean annual load compared to baseline	Minimise the risk of water quality degradation in downstream waterways and thereby protect aquatic ecosystems
Total Phosphorus	65% reduction in the mean annual load compared to baseline	
Total Nitrogen	40% reduction in the mean annual load compared to baseline	
Gross Pollutants	90% reduction in the mean annual load compared to baseline	

Lismore Development Control Plan - Part A — Chapter 22 – Page 4



Stormwater Quantity		
Flow rates (environmental protection)	Limit the post-development peak 1 year average recurrence interval (ARI) discharge from the site to the pre-development peak 1 year ARI discharge.	Reduce the likelihood of increased rates of bed and bank erosion and damage to benthic habitat in waterways.
Flow rates (infrastructure protection)	Limit the post-development peak 10 year average recurrence interval (ARI) discharge from the site to the pre-development peak discharge for the same ARI and assess the capacity of existing flow paths to accommodate the post development 100 year average diversion of stormwater to a discharge location where the increased frequency of discharge will not have a detrimental impact on aquatic ecosystems. Reduce discharge from the site and provide necessary attenuation / infrastructure upgrade to ensure flow paths can accommodate anticipated flows.	Ensure that the development does not result in increased stormwater flows that exceed the capacity of the external stormwater drainage infrastructure and / or exacerbate overland flow problems

Kind regards,

Dom

From: Lucas Myers <lucas.myers@lismore.nsw.gov.au>
Sent: Monday, May 13, 2024 8:25 AM
To: Dominic Tate <dominic.tate@ttw.com.au>
Cc: Grace Carpp <grace.carpp@ttw.com.au>; Shane Reinhold <shane.reinhold@lismore.nsw.gov.au>
Subject: Lismore South Public School - OSD requirements and capacity of existing drainage

Some people who received this message don't often get email from lucas.myers@lismore.nsw.gov.au. 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.

Morning Dominic,

In regards to your question below;

1. I believe pre-development does refer to when the site was greenfield, however for this development given there has always been a school there I think it is very reasonable that pre-development be taken to include the previous school footprint.
2. Please see image below, there is limited information as you will see. It is my understanding that the system flows to the Kyogle Street railway land.

Regards
Lucas Myers | Strategic Engineer | Lismore City Council
PO Box 23A, Lismore, 2480 | T 66 250 500 | M 0447 743 518 | www.lismore.nsw.gov.au
Lismore City Council acknowledges the people of the Bundjalung Nation, traditional custodians of the land on which we work.
From: Dominic Tate <dominic.tate@ttw.com.au>
Sent: Monday, May 20, 2024 12:24 PM
To: Lucas Myers <lucas.myers@lismore.nsw.gov.au>
Cc: Grace Carpp <grace.carpp@ttw.com.au>; Shane Reinhold <shane.reinhold@lismore.nsw.gov.au>
Subject: RE: Lismore South Public School - OSD requirements and capacity of existing drainage

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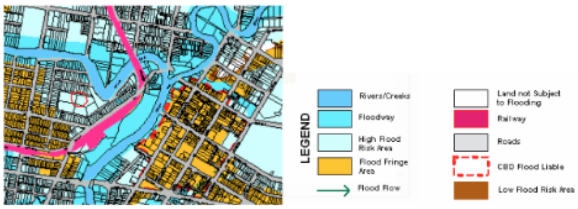
Hi Lucas,

Thank you for this information. I would like to confirm, as the site is in a high flood risk area, does it still require an OSD?



Looking forward to your response.

Regards,

Dom

TTW
Dominic Tate | Graduate Civil Engineer
+61 2 9439 7288 | +61 2 9067 5063 | dominic.tate@ttw.com.au
TTW Engineers | Sydney
Read our latest news here

From: Lucas Myers <lucas.myers@lismore.nsw.gov.au>
Sent: Monday, 20 May 2024 12:30 PM
To: Dominic Tate <dominic.tate@ttw.com.au>
Cc: Grace Carpp <grace.carpp@ttw.com.au>; Shane Reinhold <shane.reinhold@lismore.nsw.gov.au>
Subject: RE: Lismore South Public School - OSD requirements and capacity of existing drainage

You don't often get email from lucas.myers@lismore.nsw.gov.au. Learn why this is important

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Afternoon Dominic,

Yes you will still need OSD and to satisfy DCP Chapter 22.

Regards

Lucas Myers | Strategic Engineer | Lismore City Council
PO Box 23A, Lismore, 2480 | T 66 250 500 | M 0447 743 518 | www.lismore.nsw.gov.au
Lismore City Council acknowledges the people of the Bundjalung Nation, traditional custodians of the land on which we work.

From: Dominic Tate <dominic.tate@ttw.com.au>
Sent: Friday, October 4, 2024 10:54 AM
To: Lucas Myers <lucas.myers@lismore.nsw.gov.au>
Cc: Grace Carpp <grace.carpp@ttw.com.au>; Shane Reinhold <shane.reinhold@lismore.nsw.gov.au>
Subject: RE: Lismore South Public School - OSD requirements and capacity of existing drainage

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Hi Lucas,

The 10% AEP (1 in 10 yr) storm event is at RL11, which is the proposed ground floor level of the proposed site. Any underground OSD in this case would be inundated by the 1 in 10 yr storm. This makes the OSD ineffective for any storm greater than or equal to the 1 in 10-year storm.

Chapter 22 of the DCP requires the OSD to reduce post-development flows to pre-development flows for the 1-yr and 10-yr ARI storms. This will not be possible as the site is flooded in the 10-yr event.

As a result, can you confirm whether OSD is still required, as meeting DCP requirements will not be acheivable.

Thanks,

Dom

From: Lucas Myers <lucas.myers@lismore.nsw.gov.au>
Sent: Wednesday, 9 October 2024 9:14 AM
To: Dominic Tate <dominic.tate@ttw.com.au>
Cc: Grace Carpp <grace.carpp@ttw.com.au>; Shane Reinhold <shane.reinhold@lismore.nsw.gov.au>
Subject: RE: Lismore South Public School - OSD requirements and capacity of existing drainage

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

Morning Dominic,

The site is inundated with a 10 year flood event, but not necessarily a 10 year storm event. In this regard it is my understanding that when flood modelling is done it is for a Lismore wide storm event whereas Chapter 22 is more catchment focussed. If you could demonstrate that the existing drainage network cannot cope and the site gets inundated during a 10 year storm event for that catchment then you are right that OSD would be ineffective.

DCP Chapters can be varied but it is up to you to provide adequate justification as to why it should be varied.

Regards

Lucas Myers | Acting Building Surveyor Coordinator / Strategic Engineer | Lismore City Council
PO Box 23A, Lismore, 2480 | T 66 250 500 | M 0447 743 518 | www.lismore.nsw.gov.au
Lismore City Council acknowledges the people of the Bundjalung Nation, traditional custodians of the land on which we work.

From: Dominic Tate <dominic.tate@ttw.com.au>
Sent: Tuesday, January 7, 2025 10:14 AM
To: Lucas Myers <lucas.myers@lismore.nsw.gov.au>
Cc: Grace Carpp <grace.carpp@ttw.com.au>; Shane Reinhold <shane.reinhold@lismore.nsw.gov.au>; Tim Moore (TTW) <Tim.Moore@ttw.com.au>
Subject: Re: Lismore South Public School - OSD requirements and capacity of existing drainage

CAUTION: This email was sent from outside our organisation. Be cautious, particularly with links and attachments unless you recognise the sender and know the content is safe.

Hi Lucas,

Hope you had a good break.

In the screenshot below are the tailwater conditions provided in the Lismore handbook of stormwater drainage design. As the proposed site is flood affected (to 0.5m above ground level in some locations) the tailwater level to be adopted must be option b. In this case, as the entire ground level of the site is flooded, an OSD would be ineffective as it would be fully inundated. To further this, it may detrimentally affect flood risk by holding back flows.

5. **Tailwater Levels** to be adopted are as follows (refer Appendix D for River Tidal Gradients for effected Councils) :
   a. Pipe obvert for free outfalls
   b. Design ARI flood level or River Half-Tide Levels (refer Appendix D) for receiving / tidal waters
   c. 150mm below kerb invert for existing systems with unknown HGL
   d. Surcharge height for surcharge outlet
   e. A nominal minimum freeboard of 150mm should be achieved between surface level and water surface elevation, determined by a hydraulic grade line design, in a stormwater structure
   f. The use of reinforced concrete box culverts should be considered in low flat areas

For these reasons can you please reassess the necessity of OSD for this site.

Regards,

Dom

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From: Lucas Myers <lucas.myers@lismore.nsw.gov.au>
Sent: 07 January 2025 10:28
To: Dominic Tate <dominic.tate@ttw.com.au>
Cc: Grace Carpp <grace.carpp@ttw.com.au>; Shane Reinhold <shane.reinhold@lismore.nsw.gov.au>; Tim Moore (TTW) <Tim.Moore@ttw.com.au>
Subject: RE: Lismore South Public School - OSD requirements and capacity of existing drainage

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

Morning Domonic,

Hope you also had a good break.

Thankyou for providing the information below, based on the justification it appears that an OSD would be ineffective for the site and thus not necessary for the development.

Regards

Lucas Myers | Development/Strategic Engineer | Lismore City Council
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Lismore City Council acknowledges the people of the Bundjalung Nation, traditional custodians of the land on which we work.