Stormwater Management Report

New Public School in Wagga Wagga

Estella Road, Wagga Wagga NSW 2678

REPORT

PREPARED FOR
Hansen Yunken

PREPARED BY
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INFRASTRUCTURE MANAGEMENT PLAN

Activity Schedule

Date	Revision	Issue	Prepared By	Approved By
18.10.2019	A	Draft Issue	N. Sutherland	J. Gilligan

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1. INTRODUCTION

Northrop Consulting Engineers (Northrop) have been engaged by Hansen Yunken to prepare documentation in support of Development Application for the proposed school development at Estella Road, Wagga Wagga – otherwise known as the New Public School in Wagga Wagga. Northrop has been engaged to prepare a stormwater management strategy for the proposed development. The proposed development will involve the construction of a new public school, consisting of several new buildings as well as grassed playing ovals.

Northrop has been engaged to prepare a stormwater management report (and accompanying plans) for the proposed development. The report outlines the stormwater management strategy developed for managing stormwater runoff from the proposed development, so to document that the proposed concepts meet following specifications and requirements.

- Wagga Wagga Local Environmental Plan 2010,
- Wagga Wagga City Council Development Control Plan (2005).

This report should be read in conjunction with Northrop's prepared civil engineering concept drawing package.

2. EXISTING SITE DESCRIPTION

The address of the subject site is Estella Road, Wagga Wagga otherwise known as Lot 4 DP 1218378. The site is located in a residential area within Wagga Wagga City Council Local Government Area (LGA). Refer to **Figure 1** for the site location.

Figure 1 – Locality Plan

The site is generally rectangular in shape and covers an area of approximately 3.0Ha. The site is enclosed by Charles Sturt University carpark on the Northern boundary, Peter Hastie Oval on the Eastern boundary, Estella Road on the Southern boundary and vacant land on the Western boundary. The site is currently mostly consisting of vacant land with pedestrian linkage between Estella Road and the car park. Broadly, the topography slopes at gentle gradients to a low point at the intersection of Boorooma St and Estella Rd.

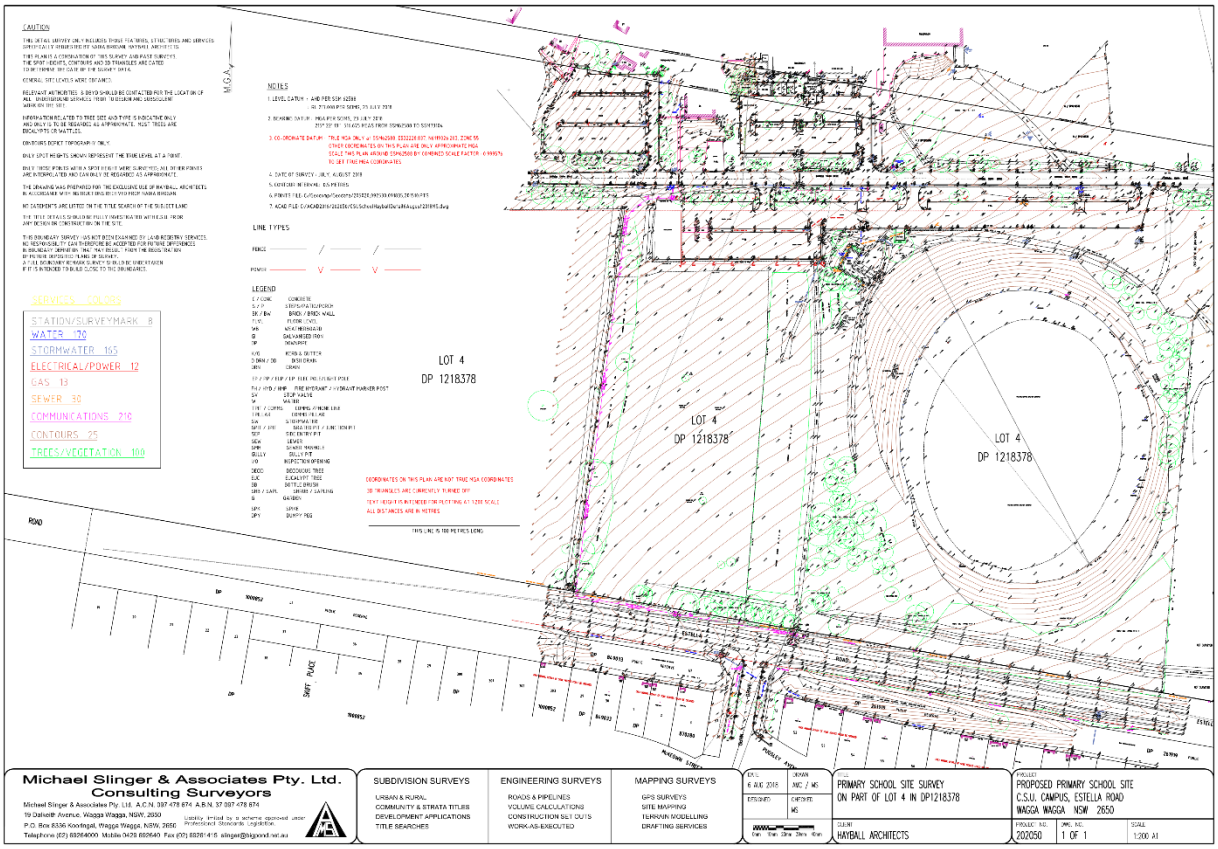

Figure 2 – Existing Survey Plan

2.1 Proposed Development

The proposed development will involve the construction of various school facilities and associated infrastructure and services works.

Refer to the architectural drawings prepared by Perumal Pedavoli Architects for more details.

A stormwater management strategy has been developed for the site to manage stormwater quantity and quality runoff. The strategy has been developed to Council's guidelines and requirements as specified in the Wagga Wagga DCP 2010. To achieve Council's requirements, a stormwater management strategy has been developed which incorporates the use of an on-site detention basin incorporating water quality treatment measures and stormwater network. Details of the proposed stormwater strategy is discussed in Section **Error! Reference source not found.**, and reference should also be made to Northrop's civil engineering concept drawing set.

3. SUBJECT SITE FLOOD ASSESSMENT

The new public school in Estella, Wagga Wagga has been reviewed in conjunction with the regional flood study conducted by WMA Water dated April 2018. The report has been used by Northrop for preliminary flood assessment of the subject site.

Following review of the aforementioned report in conjunction with preliminary site plans, detailed site survey and Wagga Wagga DCP 2010 we believe the site is not affected by mainstream flooding up to the PMF event as indicated in **Figure 3** below.

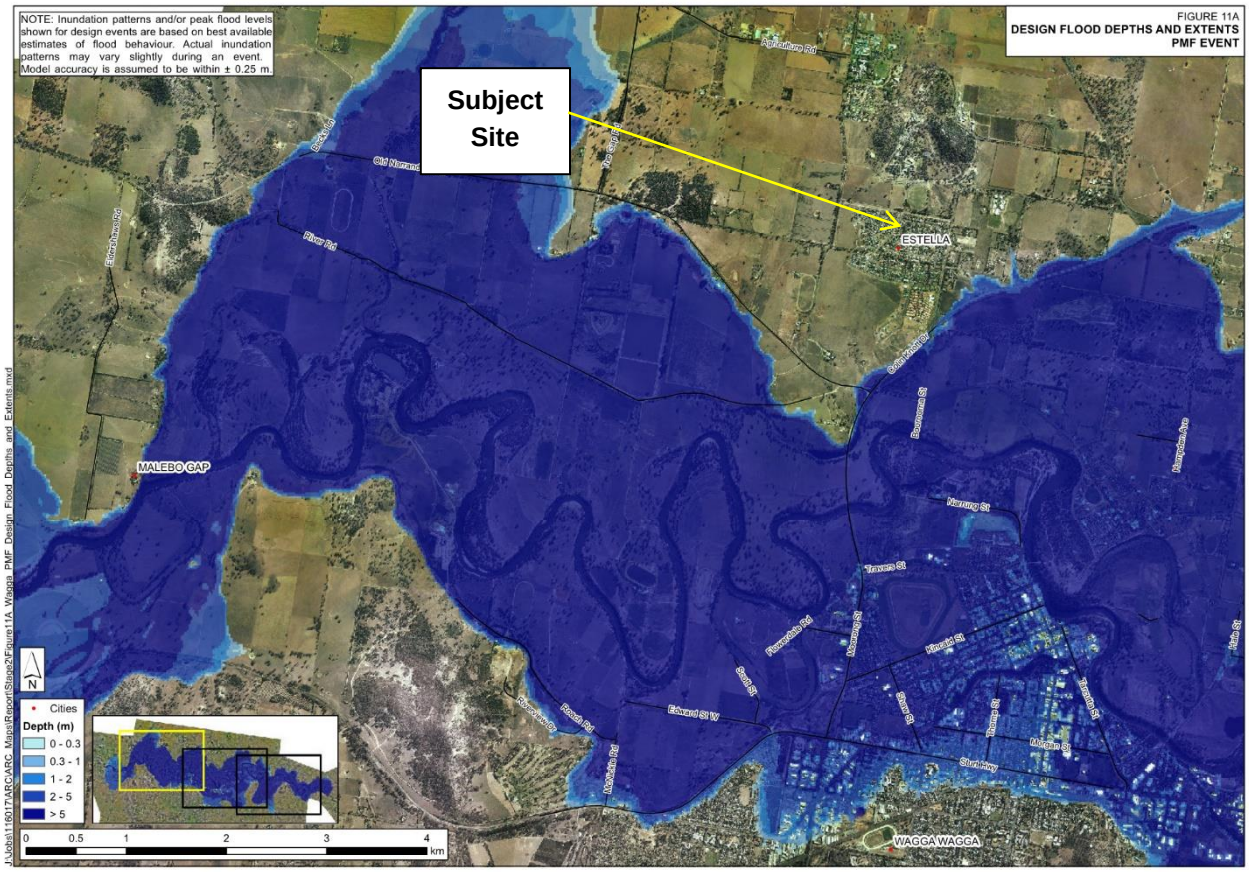

Figure 3 – Design Flood Depths for PMF Event – Figure 11A from WMA Report

In order to mitigate the risk of overland flow to the proposed school, all the habitable and non-habitable levels of the proposed school structure to be complied with the flood levels proposed in the flood study.

Results provided in this assessment have been based on desktop investigation with certain assumptions. Site investigations have been carried out, including field surveys, geotechnical work and design work to aid in the preparation of this Flood Assessment and we refer to the detailed Wagga Wagga Revised Murrimbidgee River Floodplain Risk Management Study and Plan performed by WMA Water.

4. CONCEPT STORMWATER MANAGEMENT PLAN

This section of the report will outline the stormwater management strategy for the proposed development. The strategy has been developed in accordance with Wagga Wagga development control plan (2010).

The main objectives are:

- To ensure sediment and erosion control measures can mitigate the risk of sediment runoff during the construction of the development;
- To achieve the required Site Storage Requirement (SSR) and Permissible Site Discharge (PSD) rate for the proposed On-site Stormwater Detention (OSD) system;
- To satisfy water quality measures can meet the pollutant reduction levels specified.

4.1 Sediment and Erosion Control

The objectives of sediment and erosion control for the development site are to ensure that adequate measures are implemented prior to the commencement of construction and are maintained throughout the construction period to control sediment and erosion within the site. The sediment and erosion control measures are to be in accordance with:

- Wagga Wagga City Council Development Control Plan (2005); and
- Principals outlined in the NSW Department of Housing Manual, “Managing Urban Stormwater, Soils and Construction”, 4th Edition, March 2004 (“Blue Book”).

4.1.1 Sediment and Erosion Control Measures

The concept sediment and erosion control measures and details are documented on Northrop Consulting Engineers concept drawing DAC102.01. Prior to any demolition or earthworks commencing on site, erosion and sediment control measures will be implemented generally in accordance with the design drawings. These measures are intended to be a minimum treatment only, as the contractor will be required to modify the measures to suit the construction program, sequencing and techniques. These measures will include but are not limited to:

- Temporary Construction Access;
- Sediment Fencing;
- Mesh and gravel inlet filters;
- Sediment basin;
- Geotextile inlet filters; and
- Diversion swales;

4.2 Concept Stormwater Drainage Network

Stormwater generated across the site will be captured and conveyed across the site via an in-ground stormwater pit and pipe network. The pit, pipe and roof drainage systems collect/convey site runoff and control discharge to specific points of connection to the street drainage system. It is proposed that the stormwater systems within the private development site and the public park will function separately from each other to ensure no overlap of public and private infrastructure.

A dedicated on-site stormwater detention basin controls the rate of discharge from the development site. The runoff generated from the site's catchment is proposed as being discharged to an existing external stormwater network located to the south of the site. Following discussions with council engineers it is proposed to provide a low flow outlet connected to the stormwater network in Gunn Drive letting overland flows continue to the established table drain running along Estella Road.

4.3 Stormwater Quantity Management

The DRAINS software package has been used to model the hydrologic and hydraulic characteristics of stormwater runoff and flow across the site. The model has been prepared to assess the 5 and 100 year ARI storm event.

4.3.1 Existing Stormwater Drainage Infrastructure

The location of the existing site drainage infrastructure has been obtained from aerial imagery and site survey. The existing stormwater drainage system consists of:

- A table drain running along Estella Road from the west down towards Boorooma Street
- Council's 375mm dia. Stormwater pit and pipe system across Estella Road from the site continuing south along Gunn Drive

Stormwater runoff and overland flows generated on the proposed school site and upstream catchment would drain into Council's stormwater drainage system located on Estella Road and Gunn Drive and eventually drains downstream into the Lake Albert Catchment.

4.3.2 Hydrology/Hydraulic Assessment

DRAINS models were prepared to model the pre-development and post development conditions with and without on-site detention (OSD).

The modelling input parameters adopted for the pre-developed model are as described:

- ILSAX Hydrologic routing method
- Soil Type 3
- Paved Area Depression Storage 1 mm
- Supplementary Area Depression Storage 3 mm
- Grassed Area Depression Storage 5 mm.
- IFD Data obtained from the Bureau of Meteorology for Wagga Wagga

Figure 4 illustrates the extents of the Site catchment.

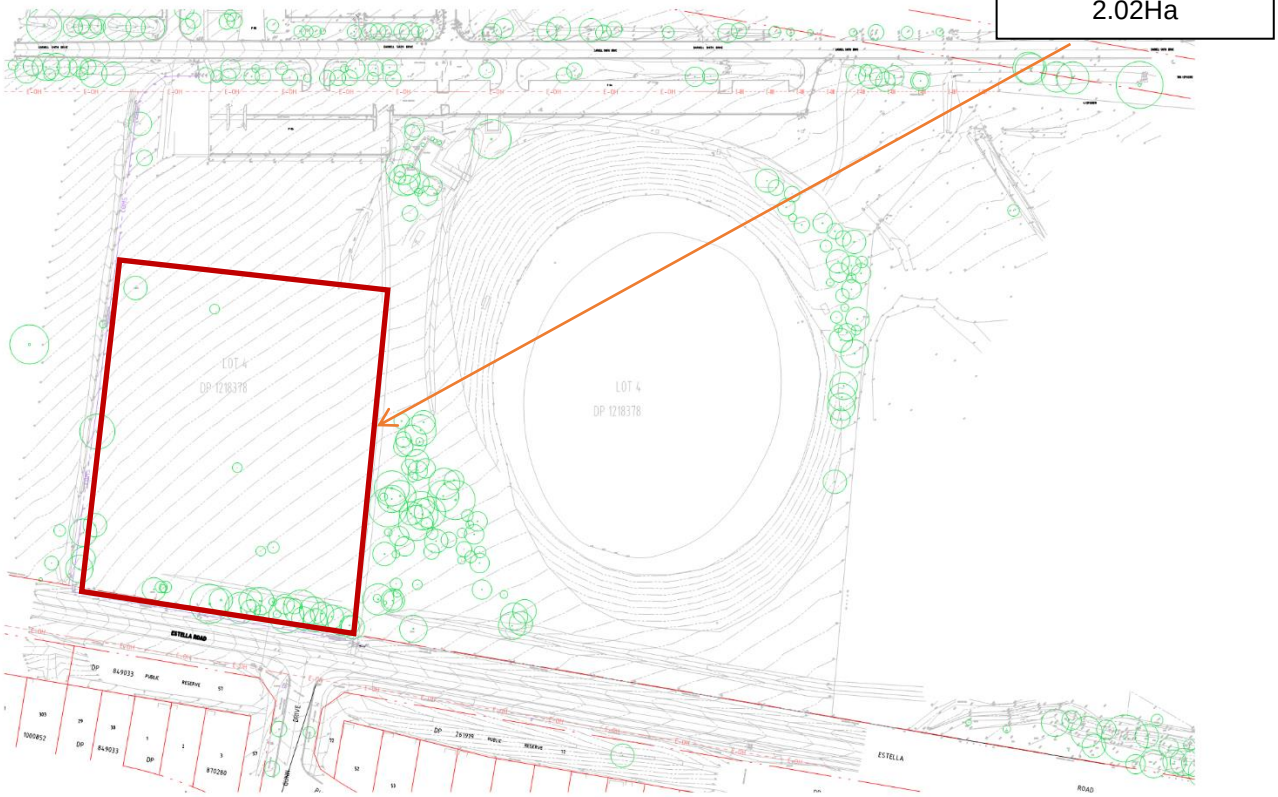

Figure 4 –Catchment Plan of Subject Site under Existing/Pre-developed Conditions.

The results of the pre-developed DRAINS model for the Site catchment are present in **Table 1**. The permissible site discharge for the site must not exceed pre-development conditions.

	5-year ARI		**100-year ARI**	
Catchments	Peak Flow (m^3/s)	Storm Duration (mins)	Peak Flow (m^3/s)	Storm Duration (mins)
Site Discharge	0.233	15	0.716	10

Table 1 – Hydrologic/Hydraulic Modelling Results of Subject Site under Pre-developed Conditions

A second model has been developed to establish the impacts of the proposed school development on peak discharge rates across the site. The second model has adopted the same input modelling parameters adopted for the previous model.

Figure 5 illustrates the post development conditions.

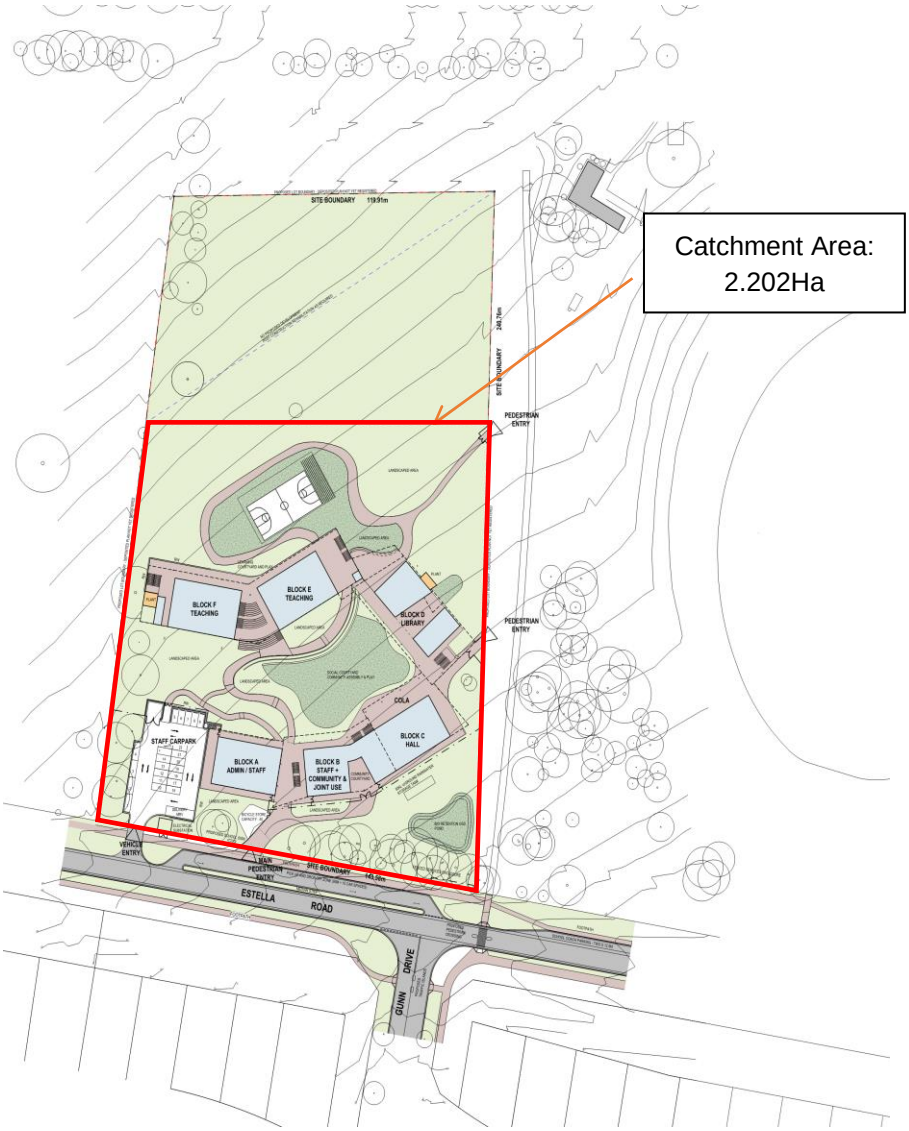

Figure 5 - Plan of Subject Site under Proposed Development Conditions.

The results of the post developed DRAINS model are present in **Table 2**. The modelling results have not incorporated the use of OSD within the site.

	5-year ARI		**100-year ARI**	
Catchment	Peak Flow (m^3/s)	Storm Duration (mins)	Peak Flow (m^3/s)	Storm Duration (mins)
Site Discharge	0.349	10	0.793	10

Table 2 – Hydrologic/Hydraulic Modelling Results of Subject Site under Post-Development Conditions without OSD.

The results presented in **Table 2** illustrate that the proposed development will result in an increase in peak flows across the Site Catchment, and therefore On-Site Detention will be required. In order to manage the peak flows discharged from the site, OSD will need to be incorporated within the proposed stormwater network.

	5-year ARI		100-year ARI	
Catchment	Peak Flow (m^3/s)	Storm Duration (mins)	Peak Flow (m^3/s)	Storm Duration (mins)
Site Discharge	0.233	10	0.258	10

Table 3 – Hydrologic/Hydraulic Modelling Results of Subject Site under Post-Development Conditions with OSD.

The results presented in **Table 3** illustrate that utilising these measures and incorporating circular culvert controlled discharge pits can effectively reduce peak flows discharged from site. The results show that the peaks flows under proposed conditions can be appropriately managed to ensure that the peak stormwater flows do not exceed flows rates generated under pre-developed conditions. Overall, the results demonstrate that Council's OSD and stormwater quantity management requirements can be achieved.

4.3.3 On-Site Detention Details

To manage stormwater quantity discharge for this development, On-Site Stormwater Detention is incorporated into the stormwater management strategy. The concept design proposes a combined above ground and below ground on-site detention system with a total volume of 266m^3. Note that based on site constraints the OSD volume above ground is 104m^3 (allowing maximum ponding of 200mm), where the remaining volume is provided below ground.

For further details on the proposed on-site detention requirements for the subject site, refer to Northrop's DA civil design drawings.

4.4 Stormwater Quality Management

4.4.1 Construction phase

During the bulk earthworks and construction of roads and associated infrastructure for the proposed development, sediment and erosion control facilities will be designed and constructed/installed in accordance with Council's specification and with the requirements of the publications "Managing Urban Stormwater – Soils and Construction".

A sediment and erosion control plan have been prepared and is illustrated in the concept stage design drawings, and illustrates the strategies proposed to prevent excessive pollutant loads being exported from the site in runoff during immediately following constructions. The plan incorporates the use of clean and dirty water diversion bunds with silt fences to control the direction of flow to minimise transportation of sediment and contamination.

4.4.2 Permanent Controls

4.4.2.1 Gross Pollutant Trap

To meet stormwater quality objectives to Council's requirements a Gross Pollutant Trap (GPT) is considered as part of the overall stormwater management for the site. The GPT is proposed to be located downstream of the OSD facility.

4.4.2.2 Rainwater Re-use Tank

A below ground 50KL Rainwater Re-use Tank (RWT) is proposed for the school. All the roof runoff is to be collected and connected to the RWT. The RWT is proposed to be re-used for irrigation and toilet flushing. Once the RWT is at full capacity the overflow is connected to the OSD facility before discharging from the site.

5. CONCLUSION

Northrop Consulting Engineers (Northrop) have been engaged by Hansen Yunken to prepare documentation in support Development Application for the proposed school development at Estella Road, Wagga Wagga – otherwise known as the New Public School in Wagga Wagga. Northrop has been engaged to prepare a stormwater management strategy for the proposed development.

A stormwater management strategy has been developed in accordance with Council's DCP 2010 and Development Engineering Standards. The stormwater management strategy will include the implementation of a stormwater network and OSD basin. Concept modelling of the effectiveness of the stormwater detention facility has been undertaken using the DRAINS software package. The modelling results have been able to manage flows in accordance with Council's Requirements.

Overall, Northrop are generally satisfied that stormwater runoff generated across the proposed development can be appropriately managed. We are of the opinion that the proposed stormwater management strategy can effectively manage stormwater runoff to ensure that under proposed conditions, the development will not result in an increase in pollutants or stormwater flows and result in any negative impacts to receiving water ways or downstream infrastructure.

6. ATTACHMENT A – CIVIL CONCEPT DRAWING PACKAGE

NEW PUBLIC SCHOOL IN WAGGA WAGGA

CIVIL DOCUMENTATION

SOURCE : NEARMAP.COM.AU (©2019)

LOCALITY PLAN

DRAWING SCHEDULE	
DRG No.	DRAWING TITLE
DAC101.01	COVER SHEET, DRAWING SCHEDULE AND LOCALITY PLAN
DAC101.11	SPECIFICATION NOTES
DAC101.21	GENERAL ARRANGEMENT PLAN
DAC102.01	CONCEPT SEDIMENT AND SOIL EROSION CONTROL PLAN
DAC102.11	CONCEPT SEDIMENT AND SOIL EROSION CONTROL DETAILS
DAC104.01	STORMWATER MANAGEMENT PLAN - SHEET 01
DAC104.02	STORMWATER MANAGEMENT PLAN - SHEET 02
DAC104.03	STORMWATER MANAGEMENT PLAN - SHEET 03
DAC104.04	STORMWATER MANAGEMENT PLAN - SHEET 04

NOT FOR CONSTRUCTION

AMMENDMENTS			
REV	BY	DATE	DESCRIPTION
A	JT	11.07.19	ISSUED FOR INFORMATION
B	JO	18.10.19	ISSUED FOR INFORMATION

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY. THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE.

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NEW PUBLIC SCHOOL IN WAGGA WAGGA

DRAWING NAME
COVER SHEET, DRAWING SCHEDULE AND LOCALITY PLAN

PROJECT NORTH

SCALE 1:2500 @ A1 0 20 40 60 80 100 120m

DRAWN	CHECKED	VERIFIED	DATE
JT	JG		

DRAWING NUMBER
PROJECT CODE SCH.REF. DISC. BLOCK# SERIES#
NHQC2-WW-CV-S-DAC101.01

REVISION B

NOTE: ALL CIVIL ENGINEERING CONSTRUCTION WORKS TO BE CARRIED OUT IN ACCORDANCE WITH WAGGA WAGGA CITY COUNCIL DEVELOPMENT GUIDELINES .THE AFOREMENTIONED GUIDELINES INCLUSIVE OF ALL SPECIFICATIONS TAKE PRECEDENCE OVER NOTES PROVIDED BELOW.

RAINWATER RE-USE

1. PROVIDE RAINWATER RE-USE SYSTEM TO SUPPLY WATER FOR TOILET FLUSHING.
2. GUTTER GUARD TO BE INSTALLED ON ALL EAVES GUTTERS.
3. A PERMANENT SIGN IS TO BE LOCATED IN THE VICINITY OF THE TANK STATING THE WATER IS "NON POTABLE WATER" WITH APPROPRIATE HAZARD IDENTIFICATION.
4. PIPEWORK USED FOR RAINWATER SERVICES SHALL BE COLOURED LILAC IN ACCORDANCE WITH AS1345.
5. ALL VALVES AND APERTURES SHALL BE CLEARLY AND PERMANENTLY LABELLED WITH SAFETY SIGNS TO COMPLY WITH AS1319.
6. RAINWATER TANK RETICULATION SYSTEM AND MAINS WATER BYPASS ARRANGEMENT TO BE INSTALLED IN ACCORDANCE WITH AS/NZS 3500.1.2-2003 AND THE NSW CODE OF PRACTICE : PLUMBING AND DRAINING.
7. A FIRST FLUSH FILTRATION DEVICE IS TO BE PROVIDED AT RAINWATER TANK.

GENERAL NOTES

THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH OTHER SUCH WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

ALL DIMENSIONS ARE IN MILLIMETRES & ALL LEVELS ARE IN METRES, UNO (UNLESS NOTED OTHERWISE).

NO DIMENSION SHALL BE OBTAINED BY SCALING THE DRAWINGS.

ALL LEVELS AND SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORK.

EXISTING SERVICES WHERE SHOWN HAVE BEEN PLOTTED FROM SUPPLIED DATA AND SUCH THEIR ACCURACY CAN NOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORK.

ON COMPLETION OF STORMWATER INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS AND ROAD PAVEMENTS, UNLESS DIRECTED OTHERWISE.

ALL STORMWATER MANAGEMENT MEASURES SHOWN ON THIS DRAWING HAVE BEEN PREPARED FOR DEVELOPMENT APPLICATION PURPOSES TO DEMONSTRATE FEASIBILITY. ALL MEASURES WILL BE SUBJECT TO DETAIL DESIGN AT THE CONSTRUCTION CERTIFICATE STAGE AND MAY BE SUBJECT TO VARIATION PROVIDED THAT THE DESIGN INTENT IS MAINTAINED.

STORMWATER DRAINAGE

1. ALL PIPES SHALL BE CLASS 2 RUBBER-RING JOINTED RCP U.N.O. WHERE uPVC PIPES HAVE BEEN SPECIFIED, THE FOLLOWING CLASS PIPEWORK IS TO BE ADOPTED U.N.O. Ø100mm OR LESS TO BE CLASS 'SN10' AND ABOVE Ø100mm TO BE CLASS 'SN8'. CLASS 4 PIPES ARE TO BE USED WHERE COVER OVER THE PIPE IS BELOW 600mm AND BENEATH A TRAFFICABLE PAVEMENT.
2. uPVC STORMWATER LINES PASSING UNDER FLOOR SLABS TO BE CONCRETE ENCASED.
3. FRC PIPES EQUAL TO THAT OF THE STEEL REINFORCED CONCRETE PIPE CLASS SPECIFIED ON THE DRAWINGS MAY BE USED SUBJECT TO APPROVAL FROM THE SUPERINTENDENT.
4. ALL PIPE ARE TO BE LAID AT 1.0% MIN GRADE U.N.O.
5. COVERS
   - 5.1. USE HOT DIPPED GALVANISED COVERS AND GRATES COMPLYING WITH RELEVANT COUNCIL AND AUSTRALIAN STANDARDS.
   - 5.2. ALL COVERS AND GRATES TO BE POSITIONED IN A FRAME AND MANUFACTURED AS A UNIT.
   - 5.3. ALL COVERS AND GRATES TO BE FITTING WITH POSITIVE COVER LIFTING KEYS
   - 5.4. OBTAIN SUPERINTENDENTS APPROVAL FOR THE USE OF CAST IRON SOLID COVERS AND GRATES. CAST IRON SOLID COVERS (IF APPROVED) TO CONSIST OF CROSS-WEBBED, CELLULAR CONSTRUCTION WITH THE RIBS UPPERMOST TO ALLOW INFILLING WITH CONCRETE. INSTALL POSITIVE COVER LIFTING KEYS AND PLASTIC PLUGS.
   - 5.5. UNLESS DETAILED OR SPECIFIED OTHERWISE, COVERS AND GRATES TO BE CLASS 'D' IN VEHICULAR PAVEMENTS AND CLASS 'B' ELSEWHERE.
   - 5.6. ALL GRATED TRENCH DRAINS SHOULD BE 'CLASS D' CAST IRON WITHIN VEHICULAR PAVEMENTS AND CLASS 'B' HEEL SAFE WITHIN PEDESTRIAN PAVEMENTS.
6. ALL PIPE BENDS, JUNCTIONS, ETC ARE TO BE PROVIDED USING PURPOSE MADE FITTINGS OR STORMWATER PITS.
7. ALL CONNECTIONS TO EXISTING DRAINAGE STRUCTURES SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
7. ENSURE PIPEWORK DOES NOT PROTRUDE BEYOND THE INSIDE FACE OF THE PIT WALL. PIPEWORK IS TO FINISH FLUSH WITH INTERNAL WALL (UNLESS OTHERWISE NOTED OR DETAILED). CONNECTION TO BE RENDERED AND MADE NEAT ON THE INSIDE FACE OF THE PIT
8. THE CONTRACTOR SHALL SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPEWORK.
9. U.N.O. MATERIAL USED FOR BEDDING OF PIPES SHALL BE APPROVED NON-COHESIVE GRANULAR MATERIAL HAVING HIGH PERMEABILITY AND HIGH STABILITY WHEN SATURATED AND FREE OF ORGANIC AND CLAY MATERIAL.
10. BEDDING SHALL BE U.N.O TYPE HS2 UNDER ROADS AND H2 UNDER GENERAL AREAS IN ACCORDANCE WITH CURRENT RELEVANT INDUSTRY STANDARDS AND GUIDELINES.
11. THE CONTRACTOR SHALL ENSURE AND PROTECT THE INTEGRITY OF ALL STORMWATER PIPES DURING CONSTRUCTION. ANY AND ALL DAMAGE TO THESE PIPES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE DIRECTION OF THE SUPERINTENDENT AND AT NO EXTRA COST TO THE CONTRACT.
12. NOTE THAT THE PIT COVER LEVEL NOMINATED IN GUTTERS ARE TO THE INVERT OF THE GUTTER WHICH ARE 40mm LOWER THAN THE PAVEMENT LEVEL AT LIP OF GUTTER. REFER KERB DETAILS FOR CONFIRMATION.

SUBSOIL DRAINAGE

13. Ø100mm SUBSOIL DRAINAGE LINES WITH NON-WOVEN GEOTEXTILE FILTER SOCK SURROUND SHALL BE CONNECTED TO A STORMWATER DRAINAGE PIT (AT MIN 1% LONGITUDINAL GRADE) AND PROVIDED IN THE FOLLOWING LOCATIONS;
   - 13.1. THE HIGH SIDE OF PROPOSED TRAFFICKED PAVEMENT AREAS.
   - 13.2. ALL PLANTER AND TREE BEDS PROPOSED ADJACENT TO PAVEMENT AREAS.
   - 13.3. BEHIND RETAINING WALLS (IN ACCORDANCE WITH RETAINING WALL DETAILS).
   - 13.4. UPSTREAM OF STORMWATER PITS
   - 13.5. BENEATH FLEXIBLE PAVEMENT ALONG A SAG PROFILE
   - 13.6. ALL OTHER AREAS SHOWN ON DRAWINGS.
   - 13.7. CONTRACTOR IS TO MAKE ALLOWANCE IN BOTH TENDER AND CONSTRUCTION COSTING TO ALLOW FOR SUBSURFACE DRAINAGE BEHIND ALL RETAINING WALLS / ABOVE LOCATIONS AND TO MAKE CONNECTION TO STORMWATER SYSTEM.
14. WHERE SUBSOIL DRAINAGE PASSES BENEATH BUILDINGS / PAVED AREAS AND/OR PAVEMENTS. CONTRACTOR TO ENSURE Ø100mm CLASS 'SN10' uPVC DRAINAGE LINE IS USED AND THAT PROPRIETARY FITTINGS ARE USED TO RECONNECT SUBSOIL DRAINAGE LINE.
15. THE CONTRACTOR SHALL INSTALL INSPECTION OPENINGS / CLEAROUTS TO ALL SUBSOIL DRAINAGE LINES AND DOWNPIPE LINES AS SPECIFIED ON DRAWINGS AND IN ACCORDANCE WITH COUNCIL SPECIFICATIONS. HOWEVER AS A MINIMUM THEY ARE TO BE PLACED AT MAXIMUM 30m CENTRES AND AT ALL UPSTREAM ENDPOINTS.
16. PROVIDE 3.0m LENGTH OF Ø100 SUBSOIL DRAINAGE LINE WRAPPED IN NON-WOVEN GEOTEXTILE FILTER FABRIC TO THE UPSTREAM SIDE OF STORMWATER PITS, LAID IN STORMWATER PIPE TRENCHES AND CONNECTED TO DRAINAGE PIT.
17. IN AREAS WHERE DUMPED / HAND PLACED ROCK IS USED AS A MEANS OF SCOUR PROTECTION, CONTRACTOR IS TO EXCAVATE A MINIMUM OF 100mm FROM PROPOSED SURFACE, LEVEL AND COMPACT SUBGRADE AS SPECIFIED. ROCK TO THEN BE PLACED ON GEOTEXTILE FILTER FABRIC A34.
18. THE CONTRACTR IS TO ENSURE THAT A MINIMUM 150mm CLEARANCE IS PROVIDED BETWEEN THE INTERNAL FACE OF PIPE AND ADJACENT INTERNAL PIT WALLS
19. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN 50mm CONCRETE BED (OR 75mm THICK BED OF 12mm BLUE METAL) UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK. (E.G. CLEAN 5-12mm AGGREGATE)

SEDIMENT AND SOIL EROSION

1. THE SEDIMENT & EROSION CONTROL PLAN PRESENTS CONCEPTS ONLY. THE CONTRACTOR SHALL AT ALL TIMES BE RESPONSIBLE FOR THE ESTABLISHMENT & MANAGEMENT OF A DETAILED SCHEME MEETING COUNCILS AND OTHER REGULATORY AUTHORITY REQUIREMENTS AND MAKE PAYMENT OF ALL FEES.
2. THE CONTRACTOR SHALL INSTIGATE ALL SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH STATUTORY REQUIREMENTS AND IN PARTICULAR THE 'BLUE BOOK' (MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION), PRODUCED BY THE DEPARTMENT OF HOUSING AND COUNCILS POLICIES. THESE MEASURES ARE TO BE INSPECTED AND MAINTAINED ON A DAILY BASIS.
3. THE CONTRACTOR SHALL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS INSTRUCTED IN THE DRAWINGS AND ADHERE TO ALL REGULATORY AUTHORITY REQUIREMENTS.
4. THE CONTRACTOR SHALL INFORM ALL SUB CONTRACTORS OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSTREAM LANDS AND WATERWAYS.
5. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE SHALL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE;
   - 5.1. CONSTRUCT TEMPORARY STABILISED SITE ACCESS INCLUSIVE OF SHAKE DOWN / WASH PAD.
   - 5.2. INSTALL ALL TEMPORARY SEDIMENT FENCES AND BARRIER FENCES. WHERE FENCES ADJACENT EACH OTHER, THE SEDIMENT FENCE CAN BE INCORPORATED INTO THE BARRIER FENCE.
   - 5.3. INSTALL SEDIMENT CONTROL MEASURES AS OUTLINED ON THE APPROVED PLANS.
6. UNDERTAKE SITE DEVELOPMENT WORKS SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF MINIMUM WORKABLE SIZE.
7. AT ALL TIMES AND IN PARTICULAR DURING WINDY AND DRY WEATHER, LARGE UNPROTECTED AREAS WILL BE STABILISED / KEPT MOIST (NOT WET) TO KEEP DUST UNDER CONTROL ENSURING CONFORMITY TO REGULATORY AUTHORITY REQUIREMENTS.
8. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) SHALL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
9. WATER SHALL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN STABILISED AND/OR ANY LIKELY SEDIMENT BEEN FILTERED OUT.
10. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES SHALL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE STABILISED / REHABILITATED.
11. ALLOW FOR GRASS STABILISATION OF EXPOSED AREAS, OPEN CHANNELS AND ROCK BATTERS DURING ALL PHASES OF CONSTRUCTION.
12. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED TO ENSURE THAT THEY OPERATE EFFECTIVELY. REPAIRS AND/OR MAINTENANCE SHALL BE UNDERTAKEN REGULARLY AND AS REQUIRED, PARTICULARLY FOLLOWING RAIN EVENTS.
13. RECEPTORS FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER SHALL BE DISPOSED OF IN ACCORDANCE WITH REGULATORY AUTHORITY REQUIREMENTS. CONTRACTOR TO PAY ALL FEES AND PROVIDE EVIDENCE OF SAFE DISPOSAL.
14. IF A TEMPORARY SEDIMENT BASIN IS REQUIRED, ENSURE SAFE BATTER SLOPES IN ACCORDANCE WITH THE GEOTECHNICAL REPORT. MAINTAIN ADEQUATE STORAGE VOLUME IN ACCORDANCE WITH PLANS. TEMPORARY PUMP 'CLEAN FLOCCULATED' WATER TO AUTHORITIES STORMWATER SYSTEM. ENSURE WHOLE DISTURBED SITE RUN-OFF IS DIRECTED TO TEMPORARY SEDIMENT BASIN.

NOT FOR CONSTRUCTION

AMMENDMENTS

REV	BY	DATE	DESCRIPTION
A	JT	11.07.19	ISSUED FOR INFORMATION
B	JO	18.10.19	ISSUED FOR INFORMATION

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PERUMAL PEDAVOLI ARCHITECTS

NEW PUBLIC SCHOOL IN WAGGA WAGGA

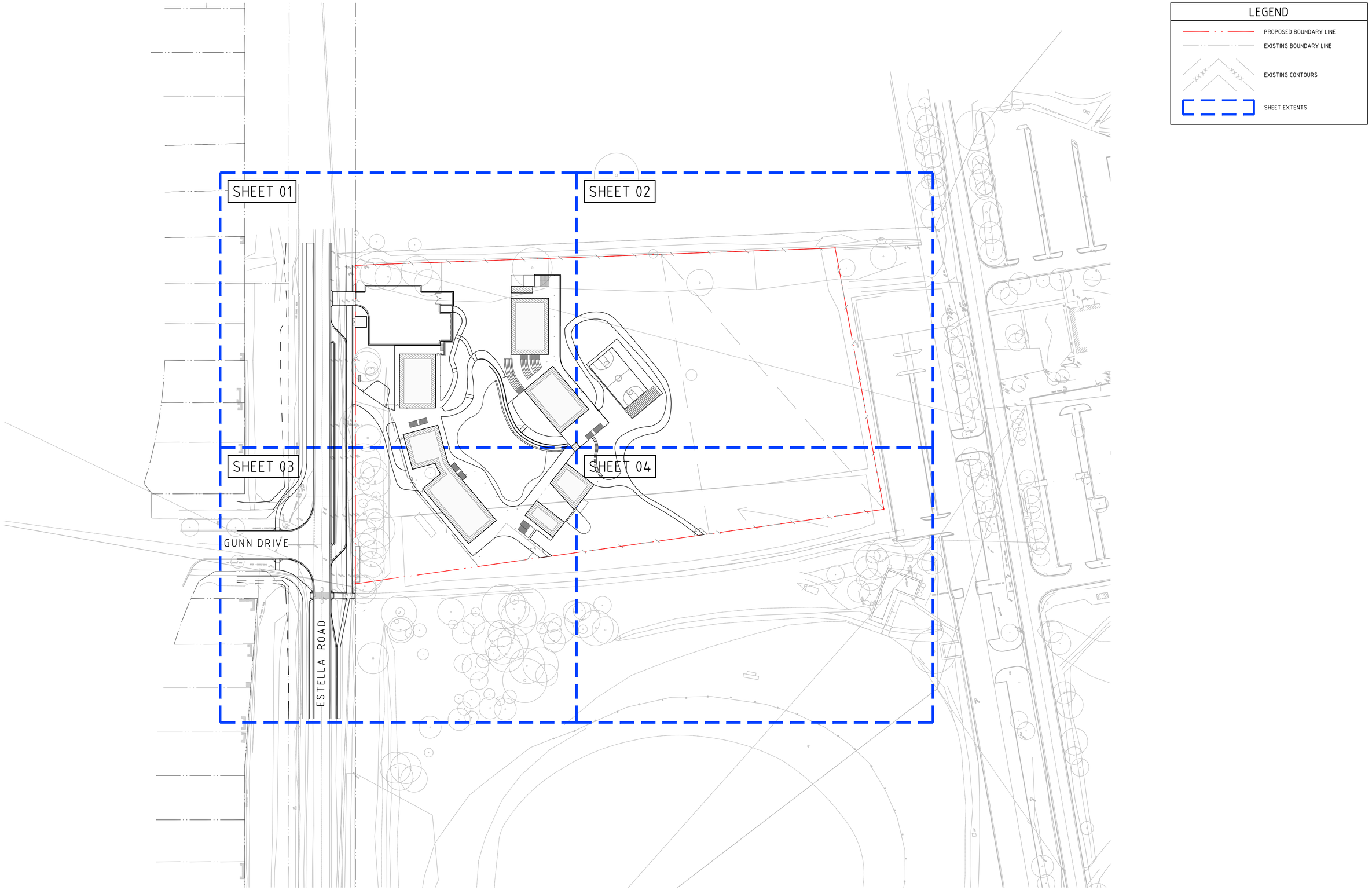
DRAWING NAME
SPECIFICATION NOTES

PROJECT NORTH

DRAWN	CHECKED	VERIFIED	DATE
JT	JG		

DRAWING NUMBER

PROJECT CODE SCH.REF. DISC. BLOCK# SERIES# REVISION
NHQC2-WW-CV-S-DAC101.11 B



LEGEND

- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- EXISTING CONTOURS
- SHEET EXTENTS

NOT FOR CONSTRUCTION

AMMENDMENTS

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NEW PUBLIC SCHOOL IN WAGGA WAGGA

DRAWING NAME
GENERAL ARRANGEMENT PLAN

PROJECT NORTH

NORTH

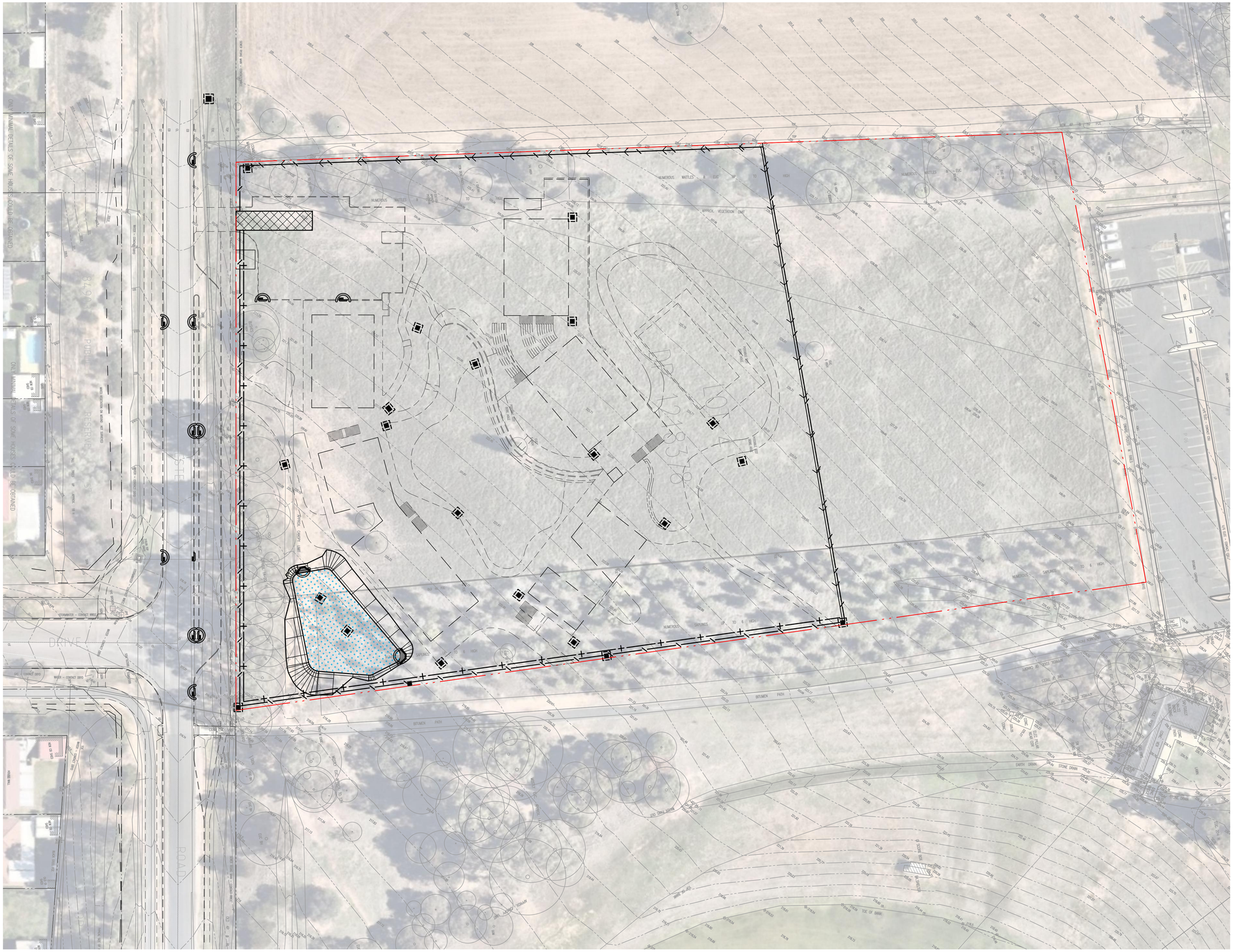
SCALE 1:800 @ A1 0 10 20 30 40m

DRAWN	CHECKED	VERIFIED	DATE
JT	JG		

DRAWING NUMBER

PROJECT CODE SCH.REF. DISC. BLOCK# SERIES# REVISION

NHQC2-WW-CV-S-DAC101.21 B



LEGEND

- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- EXISTING CONTOURS
- SEDIMENT FENCE
- SECURITY FENCE
- WIRE MESH AND GRAVEL SEDIMENT FILTER
- DROP INLET SEDIMENT TRAP
- DRAINAGE SWALE
- STABILISED SITE ACCESS
- STOCKPILE
- SEDIMENT BASIN

NOT FOR CONSTRUCTION

AMMENDMENTS

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NEW PUBLIC SCHOOL IN WAGGA WAGGA

DRAWING NAME
CONCEPT SEDIMENT AND SOIL EROSION CONTROL PLAN

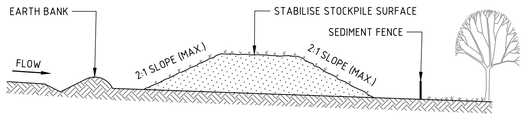
PROJECT NORTH
NORTH

SCALE 1:500 @ A1 0 5 10 15 20 25m

DRAWN	CHECKED	VERIFIED	DATE
JT	JG		

DRAWING NUMBER
PROJECT CODE SCH.REF. DISC. BLOCK# SERIES#
NHQC2-WW-CV-S-DAC102.01

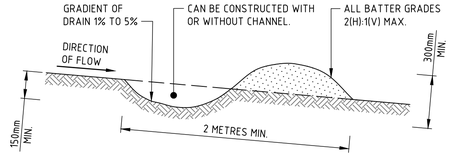
REVISION
B



CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2m (PREFERABLY 5m) 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 2m IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. 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 2m DOWNSLOPE.

STOCKPILE

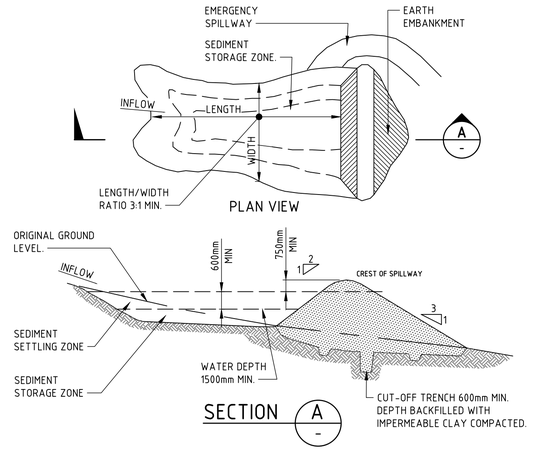


CONSTRUCTION NOTES

1. BUILD WITH GRADIENTS BETWEEN 1 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.

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

DRAINAGE SWALE

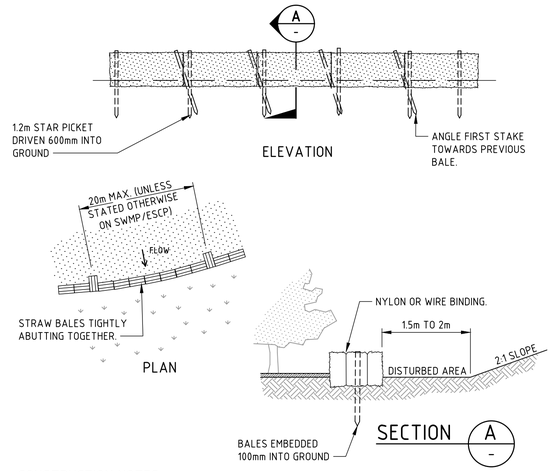


CONSTRUCTION NOTES

1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. CONSTRUCT A CUT-OFF TRENCH 500mm DEEP AND 1200mm 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 100mm TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE.
6. SPREAD THE FILL IN 100mm TO 150mm LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP.
7. CONSTRUCT THE EMERGENCY SPILLWAY.
8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP.

(APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY)

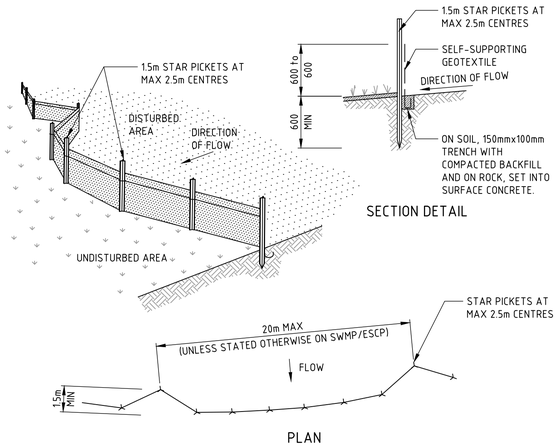
SEDIMENT BASIN - WET



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 75mm TO 100mm 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 600mm 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.

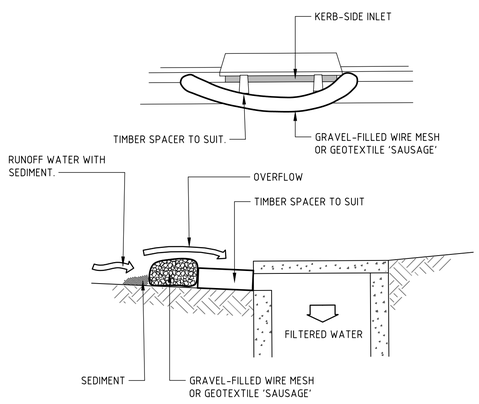
STRAW BALE FILTER



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 2.5 METRE 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

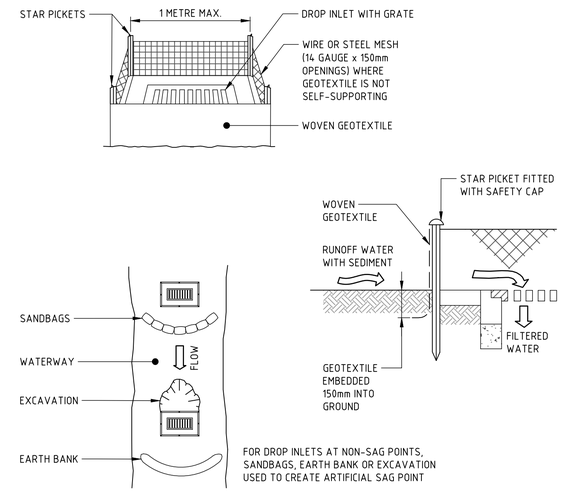


NOTE:THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN APPROVED SWMP/ESCP.

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.

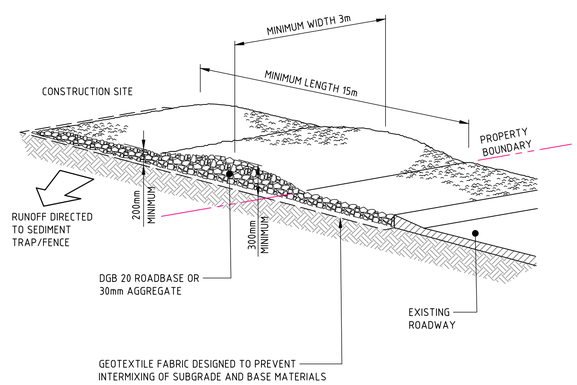
WIRE MESH AND GRAVEL SEDIMENT FILTER



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 1 METRE 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 TRAPS



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 3 METRES 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

NOT FOR CONSTRUCTION

AMMENDMENTS

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NEW PUBLIC SCHOOL IN WAGGA WAGGA

DRAWING NAME
CONCEPT SEDIMENT AND SOIL EROSION CONTROL DETAILS

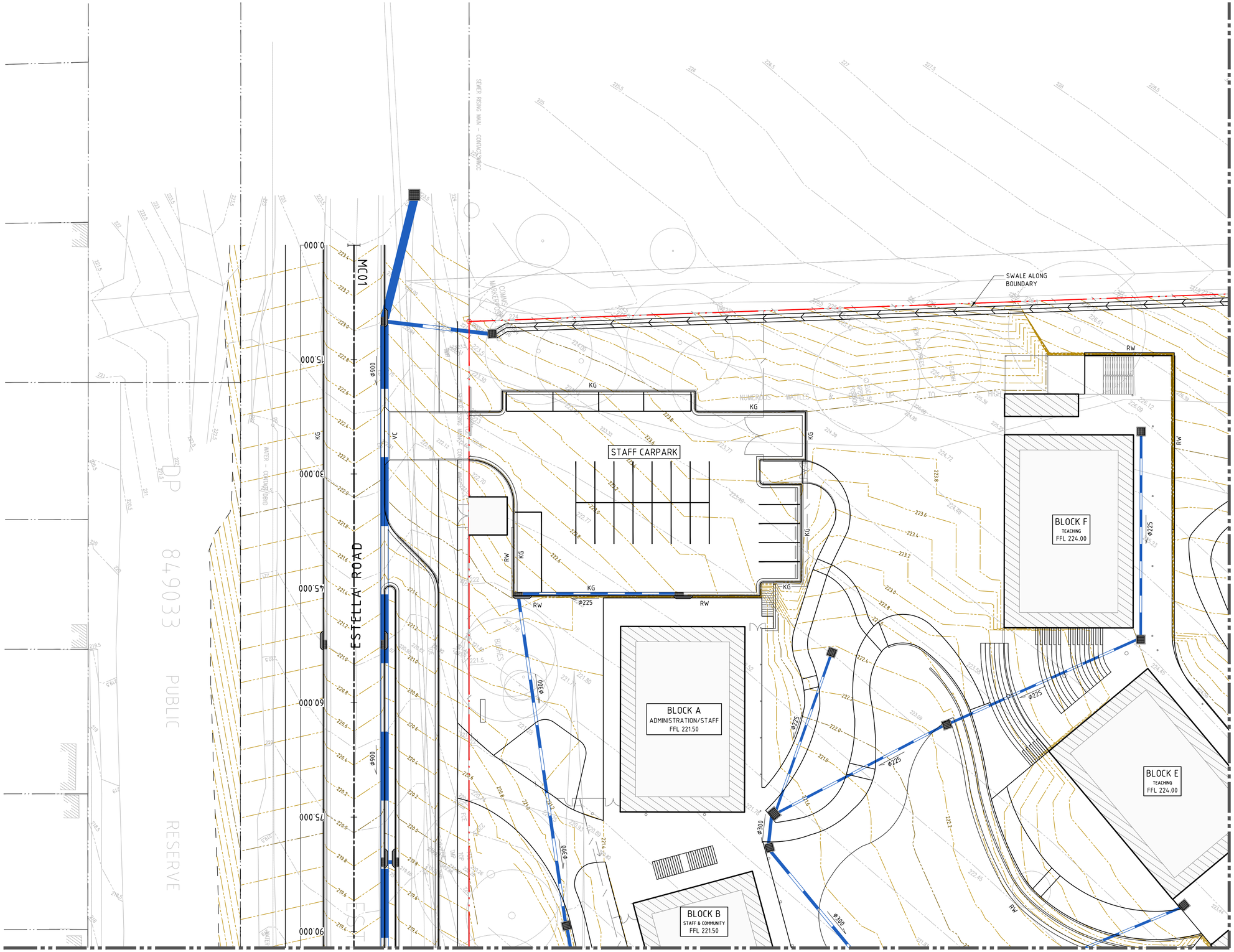
PROJECT NORTH

DRAWN	CHECKED	VERIFIED	DATE
JT	JG		

DRAWING NUMBER
NHQC2-WW-CV-S-DAC102.11

REVISION B

PROJECT CODE SCH.REF. DISC. BLOCK# SERIES#



LEGEND

- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- EASEMENT LINE
- REDUNDANT BOUNDARY LINE
- PROPOSED KERB
- EXISTING KERB
- FUTURE KERB
- SAWCUT AND PAVEMENT INFILL
- eXX — EXISTING KERB 'TYPE AS BELOW'
- KO — KERB ONLY
- KG — KERB AND GUTTER
- VC — VEHICULAR CROSSING
- KR — KERB RAMP
- WS — WHEEL STOP
- MTE — MATCH TO EXISTING
- • RLXX.XX — PROPOSED SPOT HEIGHT
- × eRLXX.XX — EXISTING SPOT HEIGHT
- FSLXX.XX — PROPOSED FINISHED FLOOR LEVEL
- X.X — DIRECTION OF GRADE
- BATTERS
- XX.XX — CONTOURS
- EXISTING CONTOURS
- V-SHAPED CHANNEL
- DRAINAGE SWALE
- EXISTING DRAINAGE STRUCTURE
- NEW DRAINAGE STRUCTURE
- •B — BOLLARD
- RW1 — RETAINING WALL - TYPE 1
- MC01 — CONTROL LINE
- LIMIT OF WORKS
- LIMIT OF WORKS

NOT FOR CONSTRUCTION

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NEW PUBLIC SCHOOL IN WAGGA WAGGA

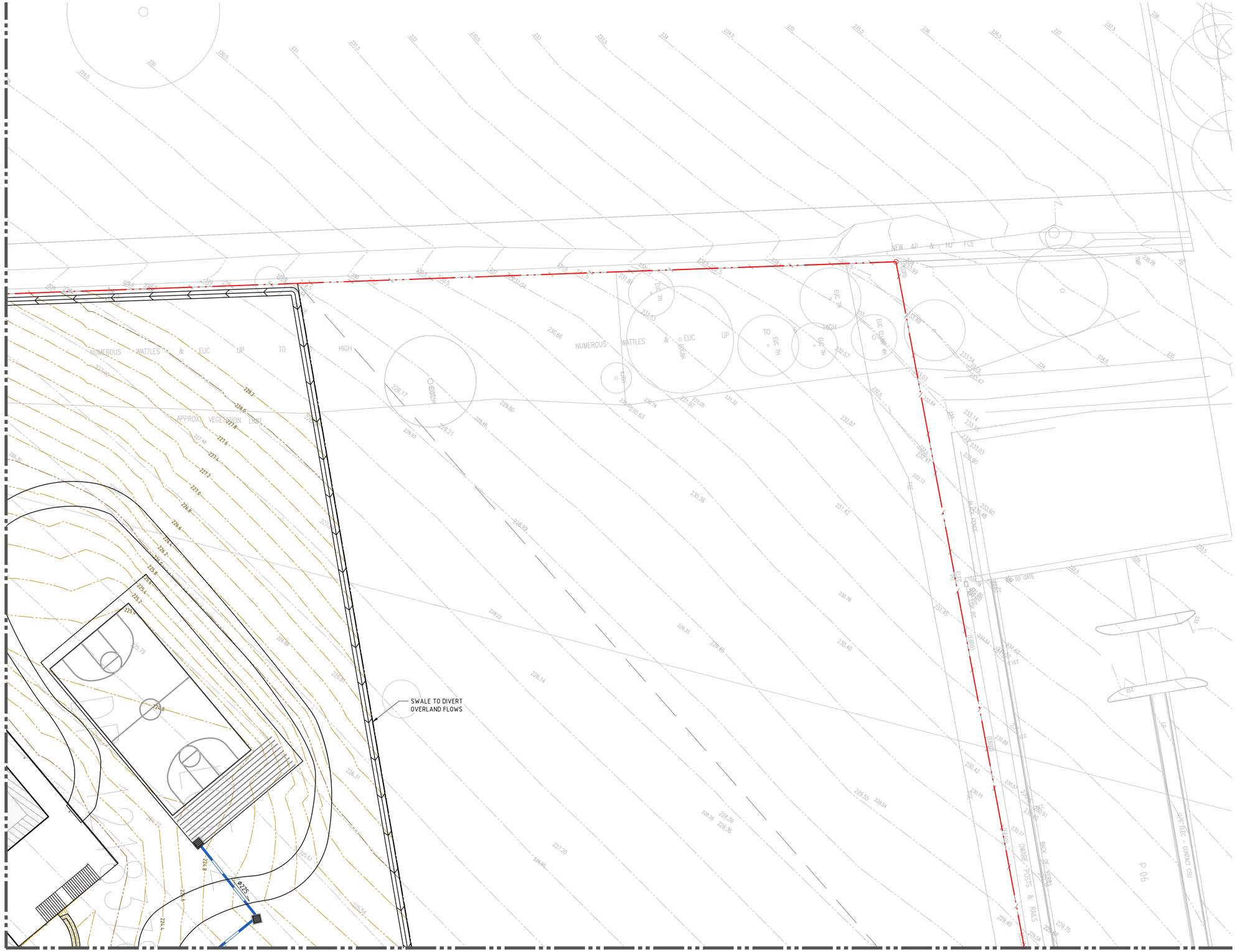
DRAWING NAME
STORMWATER MANAGEMENT PLAN - SHEET 01

PROJECT NORTH
NORTH

SCALE 1:250 @ A1 (0 2 4 6 8 10 12m)

DRAWN	CHECKED	VERIFIED	DATE
JT	JG		

DRAWING NUMBER: NHQC2-WW-CV-S-DAC104.01
PROJECT CODE | SCH.REF. | DISC. BLOCK# | SERIES#
REVISION: B



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NOMINATED ARCHITECT:
Vince Pedavoli NSW reg No.5045

PERUMAL PEDAVOLI ARCHITECTS

NEW PUBLIC SCHOOL IN WAGGA WAGGA

DRAWING NAME
STORMWATER MANAGEMENT
PLAN - SHEET 02

PROJECT NORTH
NORTH

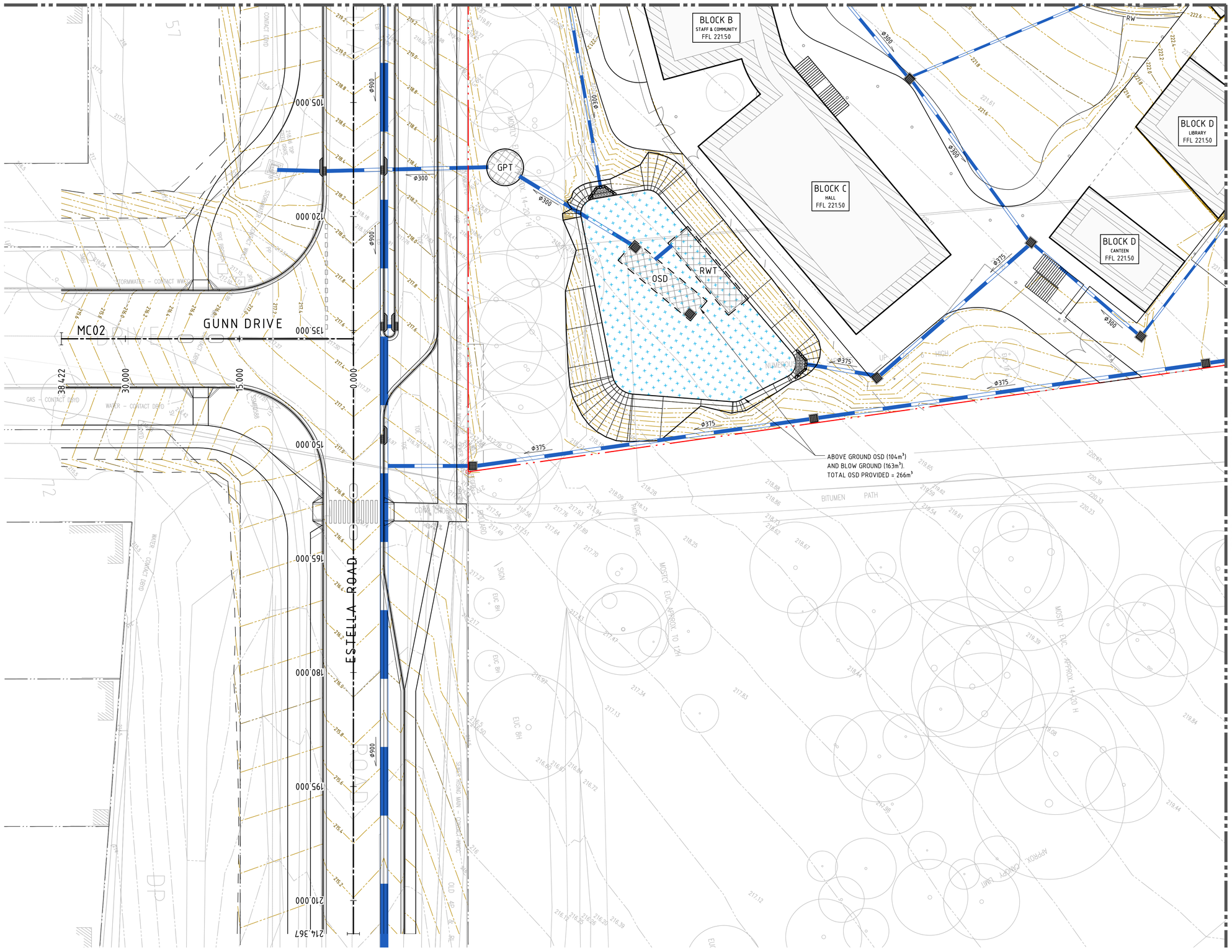
SCALE 1:250 @ A1 (0 2 4 6 8 10 12m)

DRAWN	CHECKED	VERIFIED	DATE
JT	JG		

DRAWING NUMBER
PROJECT CODE SCH.REF. DISC. BLOCK# SERIES#
NHQC2-WW-CV-S-DAC104.01

REVISION
B

FOR CONTINUATION REFER TO SHEET 01



FOR CONTINUATION REFER TO SHEET 04

LEGEND

- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- EASEMENT LINE
- REDUNDANT BOUNDARY LINE
- PROPOSED KERB
- EXISTING KERB
- FUTURE KERB
- SAWCUT AND PAVEMENT INFILL
- eXX — EXISTING KERB 'TYPE AS BELOW'
- KO — KERB ONLY
- KG — KERB AND GUTTER
- VC — VEHICULAR CROSSING
- KR — KERB RAMP
- WS — WHEEL STOP
- MTE — MATCH TO EXISTING
- • RLXX.XX — PROPOSED SPOT HEIGHT
- × eRLXX.XX — EXISTING SPOT HEIGHT
- FSLXX.XX — PROPOSED FINISHED FLOOR LEVEL
- X.X — DIRECTION OF GRADE
- BATTERS
- XX.XX — CONTOURS
- EXISTING CONTOURS
- V-SHAPED CHANNEL
- DRAINAGE SWALE
- EXISTING DRAINAGE STRUCTURE
- NEW DRAINAGE STRUCTURE
- • B — BOLLARD
- RW1 — RETAINING WALL - TYPE 1
- MC01 — CONTROL LINE
- LIMIT OF WORKS — LIMIT OF WORKS
- LIMIT OF WORKS — LIMIT OF WORKS

NOT FOR CONSTRUCTION

AMMENDMENTS

REV	BY	DATE	DESCRIPTION
A	JT	11.07.19	ISSUED FOR INFORMATION
B	JO	18.10.19	ISSUED FOR INFORMATION

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY. THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE.

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NOMINATED ARCHITECT:
Vince Pedavoli NSW reg No.5045

PERUMAL PEDAVOLI ARCHITECTS

NEW PUBLIC SCHOOL IN WAGGA WAGGA

DRAWING NAME
STORMWATER MANAGEMENT
PLAN - SHEET 03

PROJECT NORTH
NORTH

SCALE 1:250 @ A1 (0 2 4 6 8 10 12m)

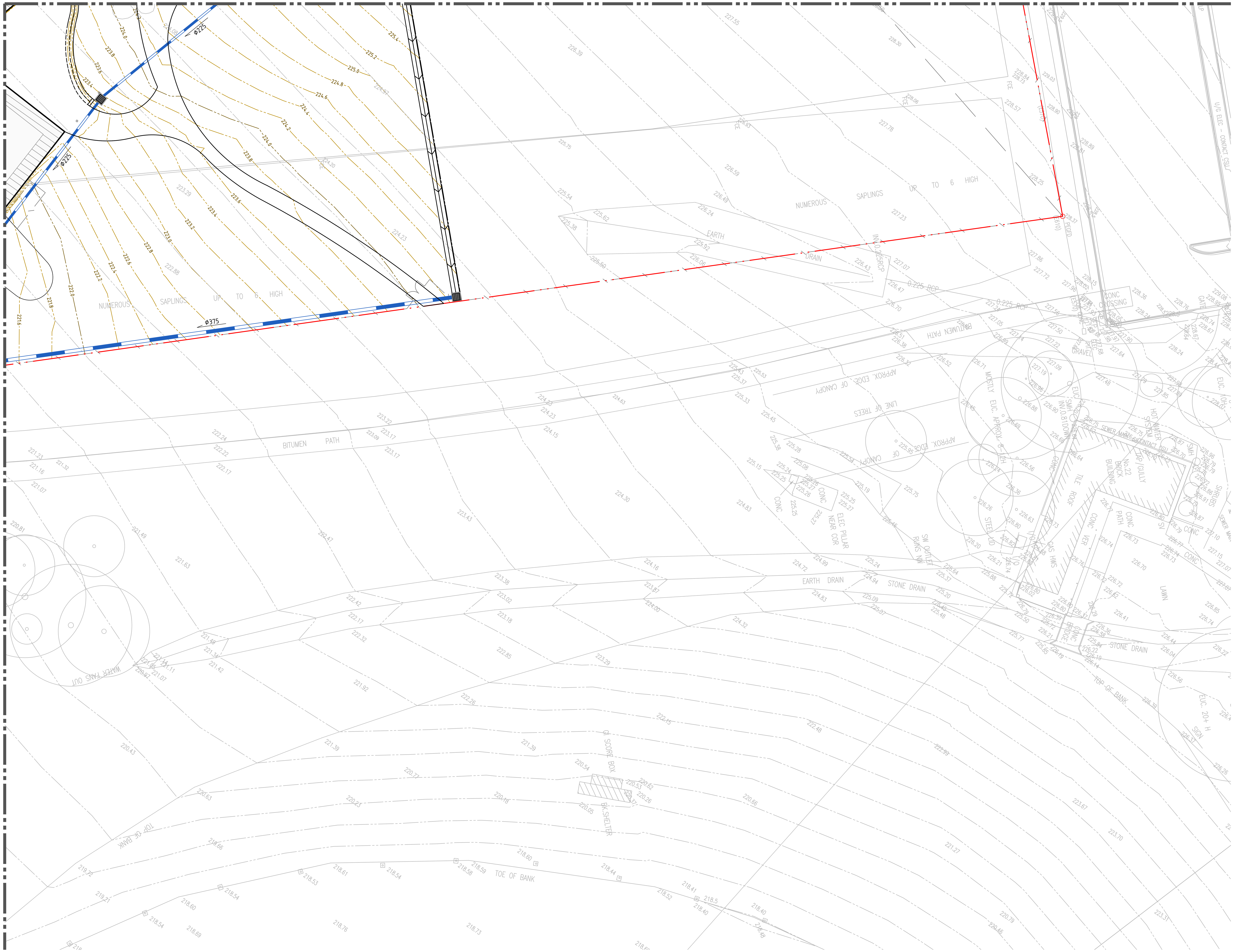
DRAWN	CHECKED	VERIFIED	DATE
JT	JG		

DRAWING NUMBER

PROJECT CODE	SCH.REF	DISC. BLOCK#	SERIES#	REVISION
NHQC2-WW-CV-S-DAC104.01				B

FOR CONTINUATION REFER TO SHEET 02

FOR CONTINUATION REFER TO SHEET 03



LEGEND

	PROPOSED BOUNDARY LINE
	EXISTING BOUNDARY LINE
	EASEMENT LINE
	REDUNDANT BOUNDARY LINE
	PROPOSED KERB
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RW1	RETAINING WALL - TYPE 1
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AMMENDMENTS

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NEW PUBLIC SCHOOL IN WAGGA WAGGA

DRAWING NAME
STORMWATER MANAGEMENT PLAN - SHEET 04

PROJECT NORTH

SCALE 1:250 @ A1 (0 2 4 6 8 10 12m)

DRAWN	CHECKED	VERIFIED	DATE
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REVISION
B