

# Hunter River High School

## Services Strategy

Prepared by The APP Group on behalf of School Infrastructure NSW

Rev 01

3 May 2023

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# 1. Project Background

## 1.1. Introduction

Hunter River High School is situated within the Port Stephens Local Government Area (LGA) in the township of Heatherbrae and is located near Irrawang High School. Hunter River High School had enrolment of 842 students in 2022 and attracts students primarily from public schools in Raymond Terrace, Tanilba Bay, Karuah, Seaham and Salt Ash.

The site is roughly in a trapezium shape with a total site area of 9.15 ha. Access to Hunter River High School is currently focused on Elkin Avenue with staff parking, bus services, Kiss and Drop as well as pedestrian demands occurring along the frontage of the school.

The site in its surrounding locality and context is shown in Figure 1.



Figure 1 – Site Locality Plan

## 2. Proposed Project Works

### 2.1. Overview

The project is an upgrade of Hunter River HS to meet EFSG Stream 6 core facilities. This entails additional new general learning spaces including support classes and refurbishment of existing general learning spaces. In line with this, external works will require to be planned and developed that includes the public domain, transport & traffic and parking. The Development Application/REF is for the alterations and additions to Hunter River High School to upgrade existing facilities and provide additional modern learning areas to facilitate education delivery to students.

### 2.2. Demolition and Construction Works

The project scope including costs and timing have now been finalised for this first stage of work. This stage of work has been informed by priorities identified by stakeholders focusing on the provision of the following:

- ▶ Provision of 8 new support classrooms including new Emotionally Disturbed (ED) and Behaviourally Disturbed (BD) classrooms.
- ▶ New administration building
- ▶ New gymnasium
- ▶ External works to create new access road and car parking
- ▶ Core Facility Upgrades - Refurbishment to existing nominated classrooms
  - Building H – Computer Lab converted to Food Tech
  - Building C – Hospitality Kitchen converted to Visual Arts Space
  - Building A – Existing Admin Building converted to a Well-Being Hub
  - Building M - new furniture

### 2.3. Operation

The proposed works will occur during standard school operating hours and will be integrated with the existing educational establishment. The current school operating hours are as follows:

- ▶ Students on site between 8am and 4pm Monday, Tuesday, Wednesday, Thursday and Friday.
- ▶ Note that on Fridays school finishes at 1:50pm, though some students may remain on school site until 4pm.
- ▶ Staff are on site from 7AM to 5PM on Monday to Friday.
- ▶ Occasional school functions and community uses occur outside of these times.

### 2.4. Building Uses and Design

#### 2.4.1. Gymnasium

The new gymnasium provides an updated facility to service the needs of the current school population. Namely, the proposed building will provide for an undercover space for physical education lessons. This building will also provide a space for school assemblies and productions. The building can be utilised by external groups as a shared community facility in accordance with the NSW Department of Education's Sharing of School Facilities Policy.

The gymnasium is a single-storey building consisting of a basketball court, equipment storage, canteen kitchen, staff room, first aid room and change room amenities. The building has a maximum height of 8.892 meters

The floor plan and elevation plan are shown in the Figures below.

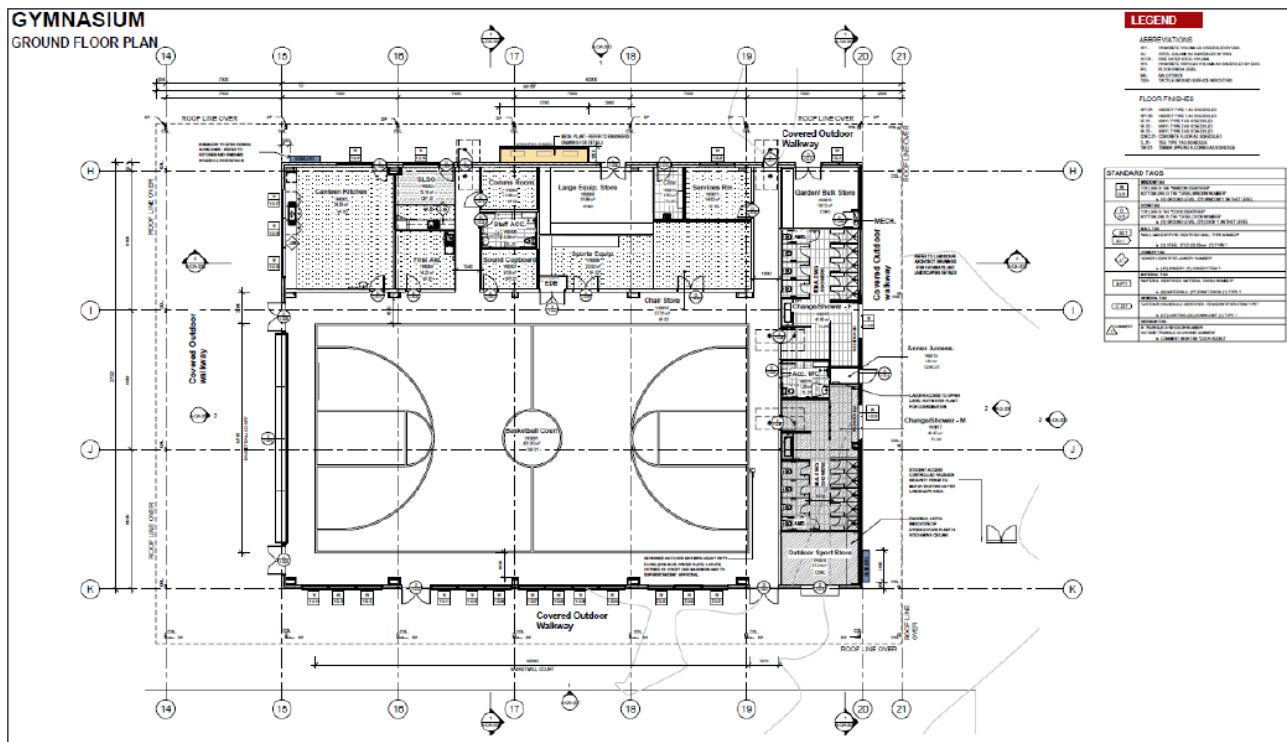


Figure 2 – Ground Floor Plan of Gymnasium, Source: EJE, dated: 14 April 2023

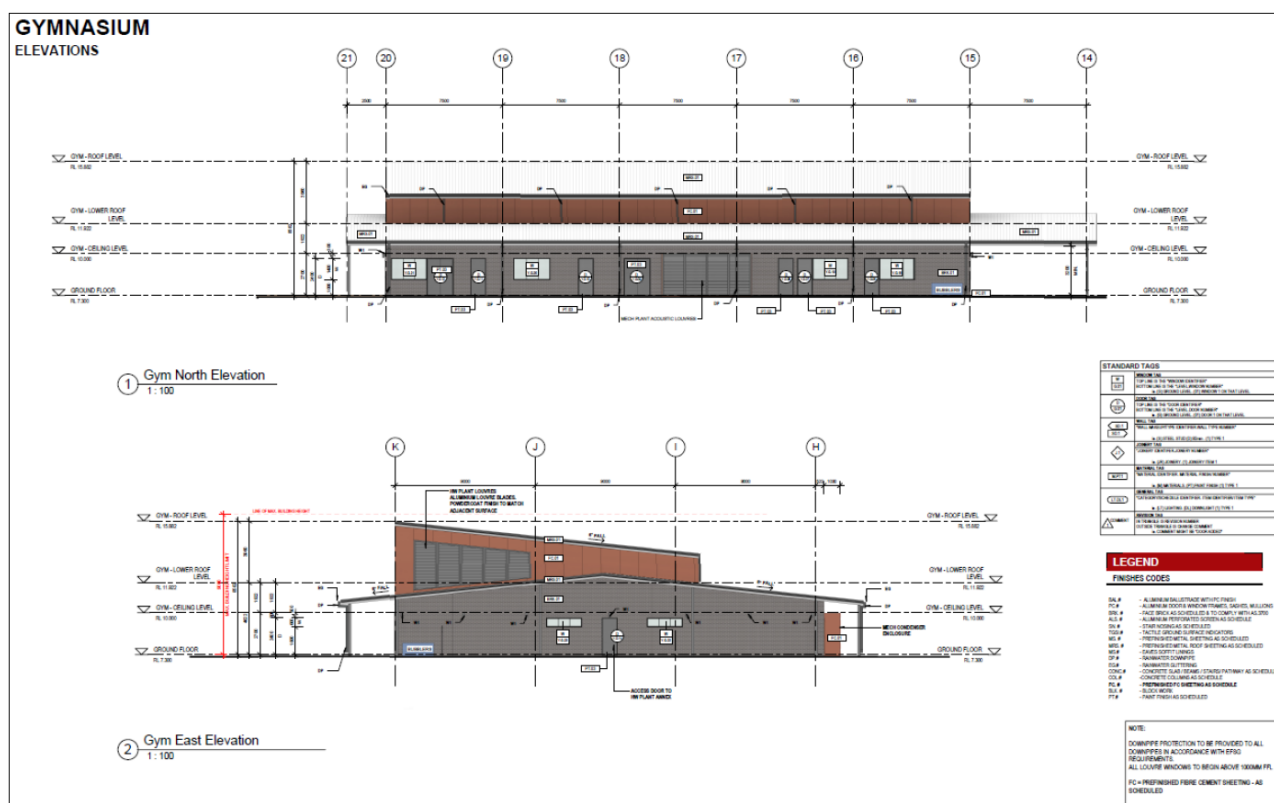


Figure 3 - Elevation plan of gymnasium, Source: EJE, dated: 14 April 2023

## 2.5. Access and Parking

### 2.5.1. Site Access

The main access point to the site is via Elkin Avenue. This road consists of a two roundabouts connecting as a figure-8. The southern portion of the figure-8 functions as a bus loading bay facilitating student drop-off and pick-up. Access to the site is located adjacent to the bus bay and provides on-site parking. Access to the school site is also provided at the western termination of Elkin Avenue. These two access points are identified as the main pedestrian and bicycle access points for the site. There are at least two pedestrian gates around the boundary of the school for access. These gates are located at the western end of Elkin Avenue and near the bus bay, which is an extension off the south of Elkin Avenue. The Development Application does not propose to alter these access points.

A third access point is located off Pacific Highway. The Development Application proposes to close the existing access available from Pacific Highway, identified as Gate 1.

### 2.5.2. Parking

Elkin Avenue currently provides access carpark 1 and carpark 2. Carpark 1 is located at the western termination of Elkin Avenue and contains 31 parking spaces including accessible parking spaces. There are no proposed alterations to carpark 1.

Carpark 2 is located off the southern roundabout to the west. This carpark consists of 24 parking spaces. This carpark is identified for future closure as part of a Part 5 Activity approval for the construction of the proposed administration building. Demolition will not be prior to the construction of proposed carpark 3.



The Development Application seeks the approval for the construction of a third carpark, nominated as Carpark 3. This carpark consists of 65 parking spaces including six (6) accessible parking spaces. The access to the carpark is reliant on the construction of the connecting road between Adelaide Street and Elkin Avenue. Accordingly, the carpark will not be constructed until such time that the linking road has been constructed.

At the conclusion of the overall program of development the site will contain 96 on-site parking spaces including eight (8) accessible parking spaces.

## 2.6. Landscaping

The proposed landscaping works includes a range of new screening shrubs and native trees, particularly at the western boundary of the site. A combination of natural and synthetic turf will be used in the internal recreation areas. The internal courtyard to the north of the Gymnasium will include seating and new landscaping, creating a natural reflective student space.

## 2.7. Stormwater and Drainage

The development will be serviced by the proposed Stormwater Management Strategy concept prepared by Stantec.

The existing school discharges stormwater via infiltration onto lawn/agricultural areas located at the rear of the site. Stormwater collected from the proposed gymnasium and carpark will be conveyed through a pit and pipe system and discharged via a storm chamber absorption trench which will filtrate over a minimum 60m<sup>2</sup> of lawn area located between the proposed gymnasium and Building Q. The proposed internal site service road will drain via grassed table drains with receiving grated inlet pits with absorption chambers at the base. The system will convey runoff to the public stormwater network. The proposed network ensures that post development flows will be equal to or less than pre-development flows.

Stormwater treatment devices have been included to minimise impacts on water quality and downstream water quality. The proposed treatment train includes the following:

- SPEL Hydrosystem HS. 1200/3
- SPEL Stormsacks

Music modelling demonstrates that associated stormwater quality treatment devices ensures that water quality meet Council's reduction targets. The stormwater water treatment network meets the stormwater treatment objectives and controls outlined in Port Stephens Council's Development Control Plan.

The stormwater system will be maintained in accordance with Section 11 of the Stormwater Management Plan to ensure the system continues to function effectively in perpetuity.

### **3. Appendices**

Appendix 1 – Hydraulic & Fire Service Report



14/04/2023

Simon Davies (APP)

Timothy Field (APP)

## **SCHEMATIC DESIGN REPORT – HUNTER RIVER HIGH SCHOOL**

This CAN provides a summary of the scope of works and recommendations for the Schematic Design report for the Hunter River High School.

### **1. SUMMARY:**

HDR will provide details on the existing conditions/desktop review, proposed works (including proposed changes from the concept design package), VE scope, risk/engineering advice and recommendations.

Note the following locations of supplementary documentation to the contents of this report:

- Appendix A – Existing Services Summary
- Appendix B – Hunter Water Pressure and flow report
- Appendix C – Fire Hydrant coverage sketch
- Appendix D – Fire Systems Gap Analysis
- Appendix E – Cost Estimate Summary

### **2. Proposed Scope**

HDR propose that the following scope of works are required for the site:

- Stormwater
  - Where new buildings are being constructed these shall be fitted with new pipe reticulation.
  - Any pipe reticulation will run in risers or on the façade of the building.
  - Pipe on the façade will be subject to confirmation with the architect.
  - We propose to re-use the existing connections for any buildings where a refurbishment is being completed.
  - The connection method for any new buildings will be to connect to the rainwater harvest tank. By Civil.
  - Where there are new buildings proposed, all new in ground pipe systems are to be provided and connected to the existing townsmain.
  - The connection method for any new buildings will be to connect to the rainwater harvest tank. By Civil.
- Sewer and sanitary drainage
  - Where new buildings are being constructed these shall be fitted with new pipe reticulation.
  - Ceiling voids over wet areas and spaces below labs/cooking areas will be needed to conceal pipe.
  - We propose to re-use the existing connections for any buildings where a refurbishment is being completed.

- The connection method for any new buildings will be to connect to a proposed developers site in the North-West corner of the site.
  - This is a future development that is agreed to be the most suitable connection for the site in the long term.
  - Existing buildings where refurbishment works are being undertaken shall re-use the existing infrastructure.
- Domestic/potable water
  - We proposed to re-use the existing water connection on Parkway Avenue.
  - The intent is to run new pipe from the connection to the new building and reticulation in service specific risers.
  - All pipe shall reticulate in ceiling voids or in agreed locations on exposed soffits.
  - There is sufficient water pressure available from the Hunter Water towns main.
  - Water connection are existing and not proposed to be upgraded for these works.
  - Existing buildings where refurbishment works are being undertaken shall re-use the existing infrastructure.
- LPG Gas
  - Note that due to ESD and SI agreements Gas is not being considered as the primary means of heating in this project. We will be moving towards electric methods of heating and supply for all systems.
  - We proposed to re-use the existing bottle storage for any future inclusion of gas in the project.
  - The intent is to allow space in risers for future extension and inclusion if required.
  - Where there is existing gas used in existing buildings there is not intent to remove this from these buildings. The exclusion of gas applies to new buildings only.
  - The existing LP Gas Vessels are to be relocated. These are subject to further design development in the future phases.
- Hot water
  - Per the ESD requirements a heat pump is to be provided for all hot water for the new buildings.
  - Existing buildings where refurbishment works are being undertaken shall re-use the existing infrastructure.
- Trade waste/Dilution pit
  - New trade waste shall be provided for the new cooking areas.
  - It is expected that under sink dilution or filter systems will be used for STEM areas. The final locations shall be coordinated with the architectural documentation.
  - Trade waste has been included in the design documentation. The final size shall be confirmed once negotiations commence with Hunter Water in the detailed design phase.
- Fire Hydrant
  - The existing booster assembly will need to be upgraded. Suction points are to be added which will require modification of the existing configuration.



- An FER will be needed to cover the location of the booster not being at the main entry to each building and due to it being behind a secure gate.
- Existing inground pipe shall be re-used where applicable. Any new branch lines will be extended as needed.
- New external fire hydrants will be provided to allow full coverage of the proposed buildings.
- We have received the Hunter water pressure and flow information and the preliminary advice is that no fire pump set will be required. The flows and pressures are sufficient.
- The existing towns main connection will be maintained for the works.
- Where existing areas are being refurbished, the scope is subject to clarification with the PCA.
- Design layouts for this scope have not been completed in this submission. This advice is still being assessed and was not adequately discussed prior to issuing the Schematic Design package.
- Fire Hose Reels
  - The NCC report notes Fire hose reels are applicable to 9b portions of the proposed works that are not classrooms.
  - The only element of the proposed works which may trigger fire hose reels to be provided would be the library extension. This area should already be covered by existing protection but if not then an additional Fire hose reel should be included in the next phase to be coordinated in the next phase.
- Fire Detection
  - This requires the Learning Hub and Gym to be fitted with a Detection and Occupant Warning system compliant with AS1670.1-2018.
  - There is no detection proposed to the Admin area, this is subject to confirmation with the NCC consultant and PCA.
  - Where existing areas are being refurbished, the direction from the PCA is to ensure compliant NCC deemed to satisfy systems are provided;
    - In this instance design options are to be proposed to correct shall falls in the existing systems compliant where documented.
    - Where new ducted A/C is provided and systems that meet the requirements of the NCC E2.2b, fire detection shall be provided.
- Fire extinguishers
  - Where require new shall be provided.
  - These shall be a combination of wall mounted and in protective cabinets.

### 3. Value Engineering and Cost Risks

For each system HDR have provided Value Engineering items and Cost Risks for consideration:

- Hot water
  - Heat pump size and cost implications
    - HDR are of the belief that due to the size and cost of this item it will be the first VE offered.
    - The costs can be reduced using conventional gas hot water systems.

- Plant space will be considerably reduced if a conventional gas system is used.
  - We have advised the following to the project team;
    - Costs have been issued to the Quantity Surveyor for review and inclusion in the cost plan.
    - Note that this is a raw cost for the plant supply; this does not include builders margins, system connections/pipework, labour or preliminaries of any kind.
    - The space allowances for this have been issued to EJE for review and planning.
  - Refer to section 3 and 5 of this document for details.
- Trade waste/Dilution pit
  - These will be new.
  - Under bench options have been included where required.
- Fire Detection
  - Under the most recent NCC advice, fire detection is required to any area where there is new duct A/C proposed. This include refurbishment areas where required.
  - Due to this point we will required the following options priced by the prospective tenderers:
    - Provide a full detection system to the Library building
    - Provide limited detection to the Library and fire isolated this area from the remainder of the building.
    - Work with the PCA and Fire engineering to see if a performance solution can be implemented to mitigate the need to retro fit fire detection to the building.
    - All other new buildings are documented to include detection.
  - Once confirmed this will need to be added and confirmed with the Quantity Surveyor for any cost implications.
- Fire Hydrant
  - There is an existing water supply connection for this system which we believe can be re-used. We would not need to provide a new connection per the previous design.
  - Any existing fire hydrants that are deemed to provide coverage to the new buildings or refurbishment areas will need to be converted to a dual head type. Single head hydrants are non-compliant and cannot be kept in place.
  - It is proposed to re-use the existing in ground pipe work and modify/extend as required. This will reduce the existing allowances included in the cost plan.
- Fire Hose Reels
  - These will be required in 9b portions of the buildings that are not classrooms.
  - It is expected that the Gym will require these throughout.
  - The other areas, at the time of this issuing, were not to require fire hose reels.
- Fire extinguishers – No risks are noted at this time.
- Cost estimates – Refer to Appendix E for our assessment.



#### **4. Works to be completed:**

HDR have identified the following items which have not been included in this package:

- Sewer
  - Final connection to the private main is via the proposed developers network. This will require ongoing coordination with the associated teams in future phases.
- Rainwater re-use
  - Final scope to be reviewed in conjunction with the Civil team on any proposed treatment provided in this re-use system.
- Fire Detection
  - The advice from the Mechanical services consultant and PCA/NCC consultant is as follows:
    - Detection is required in all areas where there is duct AC and NCC clause E2.2b (NSW specific) applies.
    - The library and the other existing buildings scope is to be confirmed. The options have been listed above and will need to be verified in the next phase.

#### **5. Assumptions:**

The following assumptions have been made when writing this scope of works:

- HDR professional advice only.
- All emissions data has been performed by others and this is a desktop review to confirm they both meet the nominated performance.
- No formal calculations have been completed, these shall be required by the contractor to determine any adjustments or modifications from the above scope.
- All documents noted above are included as Appendices in this CAN.

#### **Jamie Guajardo**

*Dip FSD, FPAS FSD, Accredited Practitioner (Fire Safety), Design Practitioner – Fire Systems*  
Associate – Project Lead

**HDR**



**Appendix List:**

- **Appendix A – Existing Services Summary**
- **Appendix B – Hunter Water Pressure and flow report**
- **Appendix C – Fire Hydrant coverage sketch**
- **Appendix D – Fire Systems Gap Analysis**
- **Appendix E – Cost Estimate Summary**



## Appendix A – Existing Services Summary

### Existing Conditions/desktop review

HDR determined that the following systems have been installed on site with notes below:

- Stormwater
  - There were pits and various items witnessed on site.
  - The survey shows no in ground pipe.
  - A sewer diagram has been requested and received from Hunter Water. This provides an overview of the existing in ground pipe that will need to be considered in the construction phase.
  - All buildings are fitted with downpipes that feed into an in ground system.
- Sewer
  - External drainage was witnessed on existing buildings, none will apply to the new buildings.
  - The survey shows no in ground pipe.
  - A sewer diagram has been requested and received from Hunter Water. This provides an overview of the existing in ground pipe that will need to be considered in the design documentation.
- Domestic/potable water
  - There is an existing water connection found to be feeding the site.
  - These are supplied from the Pacific highway townsmain.
  - The survey shows no in ground pipe.
- Natural Gas
  - There is an existing LPG bottle store on site.
  - There was gas provided to cooking areas.
  - There was no other information available from site or in the survey to show existing services.
- Hot water
  - The site has electric type heater for existing buildings.
  - There are bulk water storage units located outside existing buildings.
  - All the hot water systems appear to be building specific, there were no interconnections noted.
- Drainage
  - All are in ground and as such could not be sighted.
- Trade waste/Dilution pit
  - All are in ground and as such could not be sighted.
  - We were advised on the location of the existing pits during our site walk with the GA.
  - There were under sink dilution units on site.
- Fire Hydrant
  - An existing system was witnessed on site.
  - The booster assembly is located on Elkin Avenue.
  - This booster was fitted with boost/suction points and a backflow prevention device.



- Existing in ground pipe has been shown on the survey. There are no pipe sizes shown on this drawing.
  - There was no documentation to verify testing or compliance witnessed on site.
  - All existing fire hydrants were dual head type.
- Fire extinguishers
  - Were witnessed as present.
  - These were a combination of wall mounted and in protective cabinets.
- As built documentation
  - The Hunter Water sewer diagrams are attached in Appendix A
- Hunter Water
  - HDR have requested and received a pressure and flow report. Refer to Appendix B.
  - The summary of this is that the assumed fire hydrant flow/pressure requirements are sufficient from the townsmain supply.
  - Sewer connections are existing, and shall be re-used.
  - Domestic water connections are existing, and shall be re-used.



## **Appendix B – Hunter Water Pressure and flow report**



Hunter Water Corporation  
ABN 46 228 513 446

PO Box 5171  
HRMC NSW 2310  
36 Honeysuckle Drive  
NEWCASTLE NSW 2300  
1300 657 657 (T)  
hunterwater.com.au

HDR Pty Ltd  
24/25 Martin Place  
Sydney NSW 2000

16/06/2022

Dear Muhammad,

**Statement of Available Pressure and Flow**

Thank you for your application for a Statement of Available Pressure and Flow. We have assessed the pressure expected to be available at the nearest hydrant under the demand conditions identified in the table below.

The pressure and flow information provide in the table is to be read in conjunction with notes on the following page.

**Your REF:** 2020-1621  
**Property Address:** Lot 1 DP 120189, 36 Elkin Ave Heatherbrae NSW 2324  
**Approximate Ground Level:** 7.21 m AHD  
**Water Main Size and Location:** DN100 mm CICL located in Elkin Ave Heatherbrae NSW 2324  
**Hydrant No.** 362403

Expected Pressure at Hydrant	Additional Fire Flow (L/s)	Pressure (kPa)
Maximum pressure (Average Day Demand)	0	560
Minimum pressure (Peak Day Demand)	0	510
<b>Pressure expected under peak day demand conditions</b>		
Fire hose reel (x2)	0.66	505
<b>Pressure expected under 95%ile peak day demand conditions</b>		
Fire hydrant /sprinkler installations	0.0 L/s	520
Fire hydrant /sprinkler installations	5.0 L/s	495
Fire hydrant /sprinkler installations	10.0 L/s	440
Fire hydrant /sprinkler installations	15.0 L/s	345
Fire hydrant /sprinkler installations	20.0 L/s	215
Fire hydrant /sprinkler installations	30.0 L/s	Not available
Fire hydrant /sprinkler installations	40.0 L/s	Not available
Max available flow	25.0 L/s	145

For further information, please direct enquiries to [development.planning@hunterwater.com.au](mailto:development.planning@hunterwater.com.au)







Hunter Water Corporation  
ABN 46 228 513 446

PO Box 5171  
HRMC NSW 2310  
36 Honeysuckle Drive  
NEWCASTLE NSW 2300  
1300 657 657 (T)  
[hunterwater.com.au](http://hunterwater.com.au)

## Notes

This Pressure and Flow Statement is valid for **12 months**.

The provision of additional flow for firefighting is not a requirement under Hunter Water Act or our Operating licence.

We use an InfoWorks hydraulic model for determining flow and pressure in our networks. Pressure and flow in the models are determined using theoretical system demands based on customer connections and peaking factors to adjust peak demand conditions.

While these models are intermittently calibrated using field testing, the accuracy of the results cannot be guaranteed due to ongoing modifications to our networks and increasing demands resulting from growth.

While we endeavour to maintain minimum firefighting pressure above 15m, this cannot be guaranteed into the future and adequate allowance should be made to any firefighting assessment.

The flow and pressure generated by the Info Works model is calculated at the centre of the pipe. Pressure losses due to flow through the hydrant or additional appurtenances, such as standpipes, are not included in the above results and must be factored into any fire flow assessment for the site.

It is the **applicant's responsibility** to ensure that minimum firefighting requirements for the subject site are satisfied.

The use of, and access to, stop valves and hydrants is restricted to Hunter Water employees only. It is an **offence** under Section 25 of the Hunter Water Act to interfere with our assets without prior consent.

Persons accessing our assets without our prior consent may be issued with a **penalty** notice and will be held liable for all costs to repair, rectify and remediate the water supply system impacted by the unauthorised access.

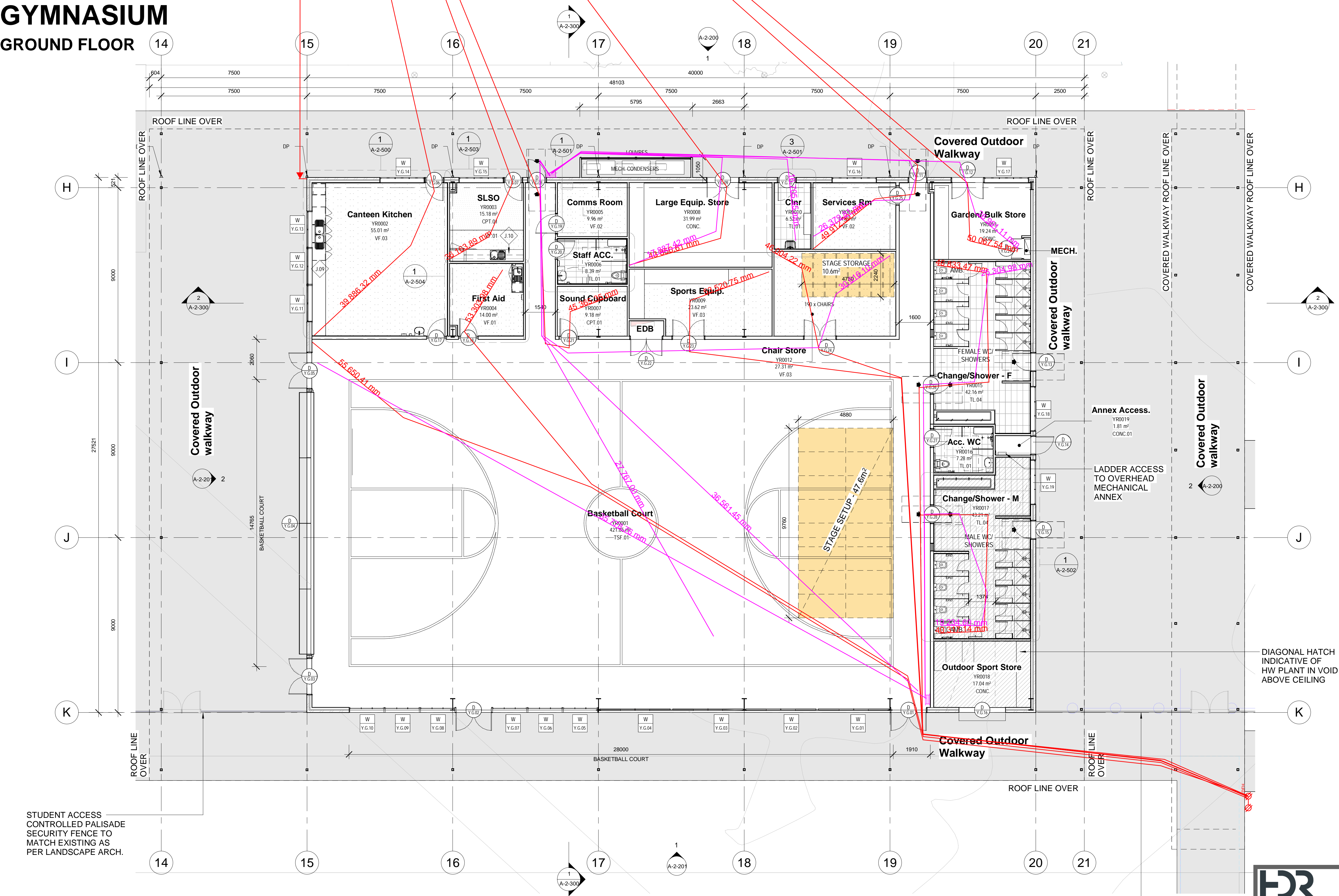
If you require access to our network to perform a flow test please email [development.planning@hunterwater.com.au](mailto:development.planning@hunterwater.com.au) for requirements.



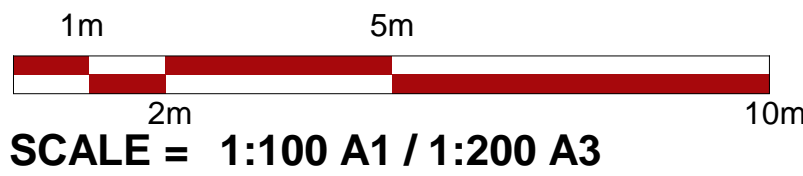


## Appendix C – Fire Hydrant coverage sketch

GYMNASIUM  
GROUND FLOOR



STUDENT ACCESS  
CONTROLLED PALISADE  
SECURITY FENCE TO  
MATCH EXISTING AS  
PER LANDSCAPE ARCH.



**EJE ARCHITECTURE**  
ACN 002 912 843 | ABN 82 644 649 849  
Nominated Architect - Bernard Collins  
P +61 2 4929 2353 | F +61 2 4929 3069 | E mail@eje.com.au | W www.eje.com.au  
A 412 KING STREET, NEWCASTLE, NSW 2300

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0 20mm 100mm 150mm ON ORIGINAL A1

1 Gymnasium - Proposed Ground Floor Plan  
1 : 100



REV	DATE	COMMENTS
A	23/06/2022	40% Schematic Design Issue
B	30/06/2022	60% Schematic Design Issue
C	07/07/2022	80% Schematic Design Issue
D	15/07/2022	95% Schematic Design Issue
E	29/07/2022	100% Schematic Design Issue
F	05/08/2022	Revised 100% Schematic Design Issue
G	09/08/2022	Revised 100% Schematic Design Issue
H	25/09/2022	Final Schematic Design Issue
J	21/12/2022	Revised Gym Issue For Coordination
K	07/03/2023	REQUESTED DESIGN CHANGES ISSUE

DRN	CHKD	VRFD
LD	HN	
LD	HN	
MJD	HN	
LD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	

PROJECT: Hunter River High School Upgrade

CLIENT: School Infrastructure NSW

SITE: 36 Elkin Ave,  
Heatherbrae, 2324

DRAWING: Gymnasium - Block Y  
(B00Y) Proposed Ground Floor plan

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

Autodesk Docs/Hunter River High School/HRHS-EJE-ZZ-ZZ-M3-A-0001.rvt

PROJECT No: 14276  
DRAWN: MJD  
DATE: 07/03/2023  
SCALES: As indicated @ A1  
NTS @ A3

PHASE: DD  
BUILDING ID: B00Y  
Level No: GF  
DRAWING No: A-2-100

REV: K



LEGEND

ABBREVIATIONS

CC-1	CONCRETE COLUMN AS SCHEDULED BY ENG.
SC	STEEL COLUMN AS SCHEDULED BY ENG.
SC FR	FIRE RATED STEEL COLUMN
CC-2	CONCRETE CIRCULAR COLUMN AS SCHEDULED BY ENG.
FFL	FLOOR FINISH LEVEL
BAL	BALUSTRADE
TGS	TACTILE GROUND SURFACE INDICATORS

FLOOR FINISHES

CPT-01	CARPET TYPE 1 AS SCHEDULED
CPT-02	CARPET TYPE 2 AS SCHEDULED
VF-01	VINYL TYPE 1 AS SCHEDULED
VF-02	VINYL TYPE 2 AS SCHEDULED
VF-03	VINYL TYPE 3 AS SCHEDULED
CONC-01	CONCRETE FLOOR AS SCHEDULED
TL-01	TILE TYPE 1 AS SCHEDULED
TSF-01	TIMBER SPRUNG FLOORING AS SCHEDULED

STANDARD TAGS	
W G.01	WINDOW TAG TOP LINE IS THE "WINDOW IDENTIFIER" BOTTOM LINE IS THE "LEVEL WINDOW NUMBER" E: (G) GROUND LEVEL, (01) WINDOW 1 ON THAT LEVEL
D G.01	DOOR TAG TOP LINE IS THE "DOOR IDENTIFIER" BOTTOM LINE IS THE "LEVEL DOOR NUMBER" E: (G) GROUND LEVEL, (01) DOOR 1 ON THAT LEVEL
SD.1 SD.1	WALL TAG "WALL MAKEUP/TYPE IDENTIFIER WALL TYPE NUMBER" E: (S) STEEL STUD (D) 92mm (1) TYPE 1
J.1	JOINERY TAG "JOINERY IDENTIFIER JOINERY NUMBER" E: (R) JOINERY (1) JOINERY ITEM 1
M.PT.1	MATERIAL TAG "MATERIAL IDENTIFIER MATERIAL FINISH NUMBER" E: (M) MATERIALS (PT) PAINT FINISH (1) TYPE 1
LT.DL.1	GENERAL TAG "CATEGORY/SCHEDULE IDENTIFIER ITEM IDENTIFIER ITEM TYPE" E: (LT) LIGHTING (DL) DOWNLIGHT (1) TYPE 1
COMMENT	REVISION TAG IN TRIANGLE IS REVISION NUMBER OUTSIDE TRIANGLE IS CHANGE COMMENT E: COMMENT MIGHT BE "DOOR ADDED"

Joinery - Gym / Block Y

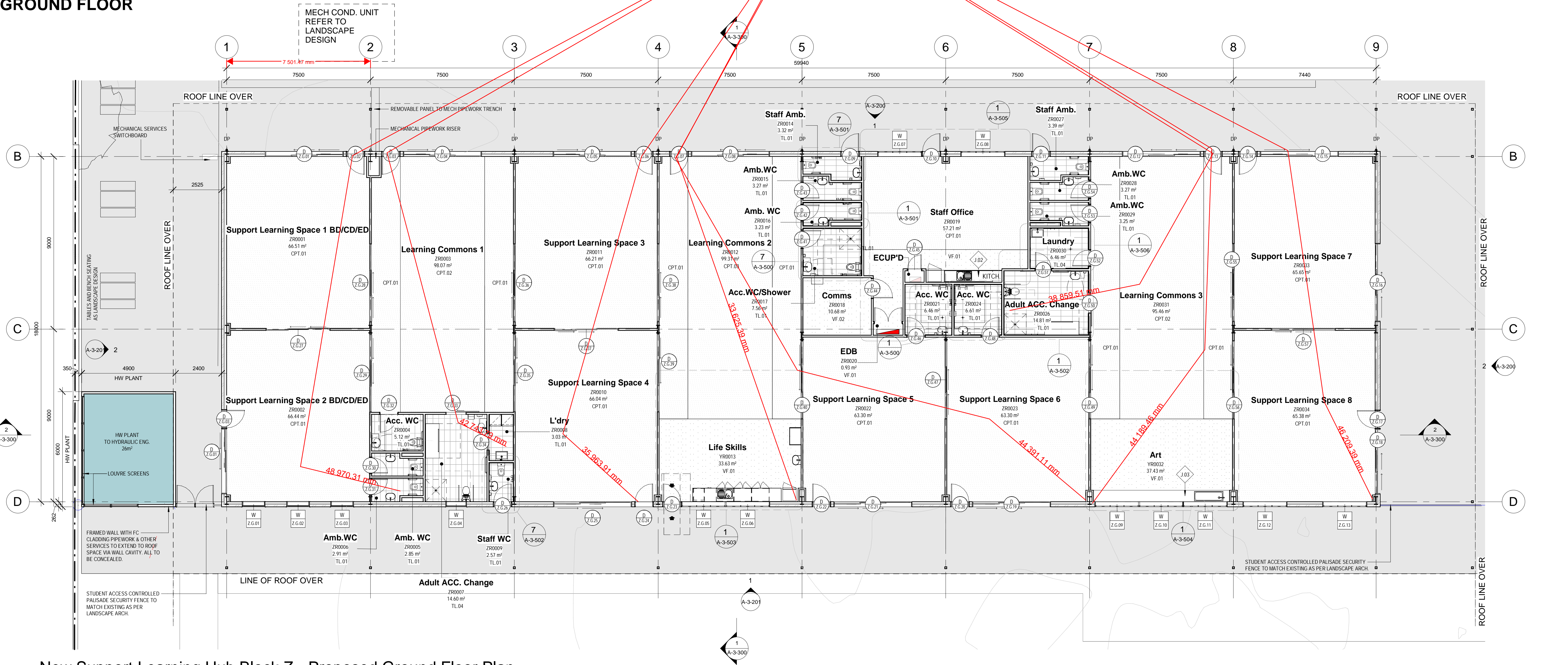
CODE	DESCRIPTION
J.05	CLINIC JOINERY
J.09	CANTEEN SERVRY
J.10	KITCHEN JOINERY

**SKF-001\_HRHS FIRE HYDRANT  
COVERAGE PLAN-R3**

14/04/2023



NEW SUPPORT LEARNING  
GROUND FLOOR



1 New Support Learning Hub Block Z - Proposed Ground Floor Plan

**LEGEND**

**ABBREVIATIONS**

CC1 - CONCRETE COLUMN AS SCHEDULED BY ENG.  
SC - STEEL COLUMN AS SCHEDULED BY ENG.  
SC FR - FIRE RATED STEEL COLUMN  
CC2 - CONCRETE CIRCULAR COLUMN AS SCHEDULED BY ENG.  
FLL - FLOOR FINISH LEVEL  
BAL - BALUSTRADE  
TGSi - TACTILE GROUND SURFACE INDICATORS

**FLOOR FINISHES**

CPT.01 - CARPET TYPE 1 AS SCHEDULED  
CPT.02 - CARPET TYPE 2 AS SCHEDULED  
VF.01 - VINYL TYPE 1 AS SCHEDULED  
VF.02 - VINYL TYPE 2 AS SCHEDULED  
VF.03 - VINYL TYPE 3 AS SCHEDULED  
CONC.01 - CONCRETE FLOOR AS SCHEDULED  
TL.01 - TILE TYPE 1 AS SCHEDULED  
TSF.01 - TIMBER SPRUNG FLOORING AS SCHEDULED

**STANDARD TAGS**

**WINDOW TAG**  
TOP LINE IS THE "WINDOW IDENTIFIER"  
BOTTOM LINE IS THE "LEVEL WINDOW NUMBER"  
ie. (G) GROUND LEVEL, (01) WINDOW 1 ON THAT LEVEL

**DOOR TAG**  
TOP LINE IS THE "DOOR IDENTIFIER"  
BOTTOM LINE IS THE "LEVEL DOOR NUMBER"  
ie. (G) GROUND LEVEL, (01) DOOR 1 ON THAT LEVEL

**WALL TAG**  
"WALL MAKEUP/TYPE IDENTIFIER WALL TYPE NUMBER"  
ie. (S) STEEL STUD (01) 92mm, (1) TYPE 1

**JOINERY TAG**  
"JOINERY IDENTIFIER/JOINERY NUMBER"  
ie. (JR) JOINERY, (1) JOINERY ITEM 1

**MATERIAL TAG**  
"MATERIAL IDENTIFIER, MATERIAL FINISH NUMBER"  
ie. (M) MATERIALS, (PT) PAINT FINISH (1) TYPE 1

**GENERAL TAG**  
"CATEGORY/SCHEDULE IDENTIFIER, ITEM IDENTIFIER/ITEM TYPE"  
ie. (LT) LIGHTING, (DL) DOWNLIGHT (1) TYPE 1

**REVISION TAG**  
IN TRIANGLE IS REVISION NUMBER  
OUTSIDE TRIANGLE IS CHANGE COMMENT  
ie. COMMENT MIGHT BE "DOOR ADDED"

**Joinery - NSL / Block Z**

CODE	DESCRIPTION	Comments
J.01	LIFE SKILLS JOINERY	JOINERY
J.02	OFFICE JOINERY UNIT WITH SINK	JOINERY
J.03	JOINERY UNIT WITH SINK	JOINERY

**SKF-001\_HRHS FIRE HYDRANT  
COVERAGE PLAN-R3**

**14/04/2023**

**1**

1m 5m 10m

**SCALE = 1:100 A1 / 1:200 A3**

**EJE ARCHITECTURE**  
ACN 002 912 843 | ABN 82 644 649 849  
Nominated Architect - Bernard Collins  
P +61 2 4929 2353 | F +61 2 4929 3069 | E mail@eje.com.au | W www.eje.com.au  
A 412 KING STREET, NEWCASTLE, NSW 2300

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NSW GOVERNMENT

REV	DATE	COMMENTS
A	22/06/2022	Issue for information
B	23/06/2022	40% Schematic Design Issue
C	30/06/2022	60% Schematic Design Issue
D	07/07/2022	80% Schematic Design Issue
E	15/07/2022	95% Schematic Design Issue
F	29/07/2022	100% Schematic Design Issue
G	05/08/2022	Revised 100% Schematic Design Issue
H	09/08/2022	Revised 100% Schematic Design Issue
J	25/08/2022	Final Schematic Design Issue
K	07/03/2023	REQUESTED DESIGN CHANGES ISSUE

DRN	CHKD	VRFD
LD	KG	
LD	HN	
LD	HN	
MJD	HN	
LD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	

PROJECT: Hunter River High School Upgrade

SITE: 36 Elkin Ave, Heatherbrae, 2324

CLIENT: School Infrastructure NSW

DRAWING: New Support Learning Hub Block Z (B00Z) Proposed Ground Floor Plan

PHASE: DD BUILDING ID: B00Z Level No: GF DRAWING No: A-3-100 REV: K

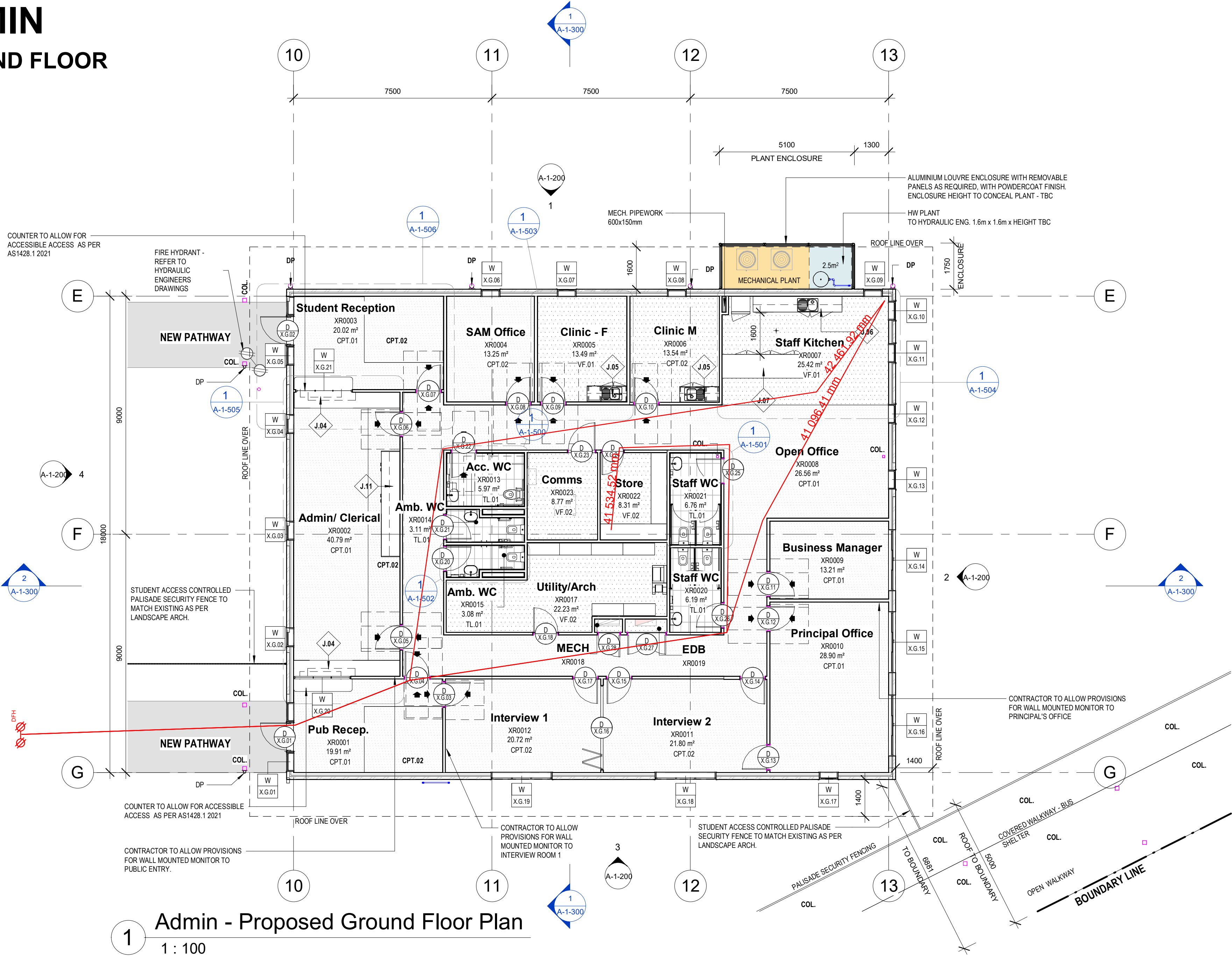
WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

Autodesk Docs/Hunter River High School/HRHS-EJE-ZZ-ZZ-M3-A-001.rvt

PROJECT No: 14276 DRAWN: MJD DATE: 07/03/2023 SCALES: As indicated @ A1 1:200 @ A3



ADMIN  
GROUND FLOOR



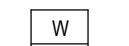
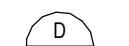
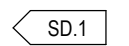

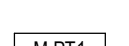


LEGEND

ABBREVIATIONS

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	<b>WALL TAG</b> "WALL MAKEUP/TYPE IDENTIFIER WALL TYPE NUMBER" ie. (S) STEEL STUD (D) 92mm (1) TYPE 1
	<b>JOINERY TAG</b> "JOINERY IDENTIFIER JOINERY NUMBER" ie. (SR) JOINERY, (1) JOINERY ITEM 1
	<b>MATERIAL TAG</b> "MATERIAL IDENTIFIER MATERIAL FINISH NUMBER" ie. (M) MATERIALS, (PT) PAINT FINISH (1) TYPE 1
	<b>GENERAL TAG</b> "CATEGORY/SCHEDULE IDENTIFIER, ITEM IDENTIFIER/ ITEM TYPE" ie. (LT) LIGHTING, (DL) DOWNLIGHT (1) TYPE 1
	<b>REVISION TAG</b> IN TRIANGLE IS REVISION NUMBER OUTSIDE TRIANGLE IS CHANGE COMMENT ie. COMMENT MIGHT BE "DOOR ADDED"

Joinery - Admin/ Block X

CODE DESCRIPTION

J.04 RECEPTION COUNTER  
J.05 CLINIC JOINERY  
J.06 KITCHEN BACK BENCH  
J.07 KITCHEN ISLAND JOINERY  
J.11 KITCHEN ISLAND JOINERY

1m 5m  
2m 10m  
SCALE = 1:100 A1 / 1:200 A3

**EJE ARCHITECTURE**  
ACN 002 912 843 | ABN 82 644 649 849  
Nominated Architect - Bernard Collins NSW Architects Registration No. 4438  
P +61 2 4929 2353 | F +61 2 4929 3069 | E mail@eje.com.au | W www.eje.com.au  
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0 25mm 100mm 150mm ON ORIGINAL A1



REV	DATE	COMMENTS
A	23/06/2022	40% Schematic Design Issue
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G	25/08/2022	Final Schematic Design Issue
H	07/09/2023	REQUESTED DESIGN CHANGES ISSUE
J	17/03/2023	REVISED DESIGN FOR COORDINATION
K	11/04/2023	FINAL ISSUE FOR COORDINATION

DRN	CHKD	VFRD
LD	HN	
LD	HN	
LD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	

PROJECT: **Hunter River High School Upgrade**

CLIENT: **School Infrastructure NSW**

SITE: **36 Elkin Ave, Heatherbrae, 2324**

DRAWING: **Admin - Block X (B00X) Proposed Ground Floor plan**

**SKF-001\_HRHS FIRE HYDRANT COVERAGE PLAN-R3**

14/04/2023

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

Autodesk Docs: \Hunter River High School\HRHS-EJE-ZZ-ZZ-M3-A-0001.rvt

PROJECT No: **14276** DRAWN: **MJD** DATE: **11/04/2023** SCALES: **As indicated @ A1 NTS @ A3**

PHASE: **DD** BUILDING ID: **B00X** Level No: **GF** DRAWING No: **A-1-100**

REV: **K** **EJE architecture**



## Appendix D – Fire Systems Gap Analysis

## Fire Systems Gap Analysis

**Project:** Hunter River High School

**Engineer:** JG/LW

**Project No:** 10344317

**Date:** 4/08/2022

**Risk assessment / Non-compliant level:**

Major risk/non-compliance - High or significant compliance, cost and space planning implications.
General Risk/Non-compliance - General or medium compliance, cost and space planning implications.
Low Risk/Non-compliance - Low or minor compliance or cost implications.
Item carries minimal risk or minor cost implications.
Item Closed

Risk/Non-compliance	System	Summary	Proposed solution	04/08/2022 update	Outcome	Other
Fire detection layout	Fire Detection & Alarm systems	Where there are Mechanical systems that trigger NCC E2.2a a fire detection and occupant warning system will be required.	Confirmation required by JHA to determine the unit sizing and then confirmation from PCA to confirm scope.	JHA have confirmed 04/08/22 that fire shut down is required. BM+G report indicates a fire compartment size issue but the JHA will require inclusion.		
Fire extinguishers	Fire Extinguishers	Existing fire extinguishers have been witnessed as having test tags and appear functional.	Provide new fire extinguishers for anywhere there are new works proposed.	Scope of works covers inclusion		
Fire Hose reel coverage	Fire Hose Reel System	There were no Fire Hose Reels witnessed on site.	Pending NCC consultant and PCA comment and review on specific locations this will be applied.	BM+G have advised on the 9b portions and class 6 requiring FHR. No advice on separation of classes have been issued.		
Townsmain Water Supply	Fire Hydrant System	No details available from site. No testing data or system duties available.	Waiting on Local Water Pressure and Flow statement to be provided. HDR are in the process of acquiring this information.	Pressure and flow required. A fire hydrant pump and domestic pump will be required. HDR to document.		
Hydrant system pipework	Fire Hydrant System	All pipe work is existing and in ground.	We will require the yearly system pressure testing data to confirm if there are any pipe work issues.	SI have provided testing data that confirms system has been pressure tested. Existing pipe will be re-used where possible.		
150kPa pressure loss calculation	Fire Hydrant System	There is not existing system information on site to determine the existing levels of compliance.	HDR to investigate system configuration and perform hydraulic calculations to determine any non-compliances.	Existing system will remain as is and hydraulic calcs to be completed in detailed design. Any new works have new pipe provided which can be altered in size as needed. Scope will include this included for the next phase.		
Existing external fire hydrant locations	Fire Hydrant System	All are existing, no details were available on maintenance schedules of works completed.	Further details required from maintenance contractor.	Testing data has been supplied. Item closed as testing has been completed regularly.		
Storz connections	Fire Hydrant System	Not all existing hydrants are fitted with Storz couplings.	Any not provided with Storz will be spec'd to be fitted with these couplings.	Any that are being used for the proposed scope will be upgraded to dual head types.		
Fire hydrant coverage map	Fire Hydrant System	Existing fire hydrants do not appear to fully cover the site. We have mapped the existing hydrants and used a 60m hose length to verify this.	HDR propose to provide additional external fire hydrants to provide compliant coverage to new buildings within the scope of works area. Refer to SKF-001 for the coverage map.	Scope to include this as noted by the NCC report.		
Block plan	Fire Hydrant System	There is no fire hydrant block plan on site. There is no system information available.	Add this to the scope of works for the future phases. NCC report in previous phase noted upgrade requirement for the scope; schematic design to include this scope to cover this.	NCC report does not cover this but BM+G noted in meeting 04/08/22 that if there are no walls/doors/structure being altered then there are no upgrades required. We are proposing to only provide coverage to new buildings only.		
Existing fire hydrant booster assembly	Fire Hydrant System	The current location is behind the main fence and is technically not at the main entry to each building. Access is restricted and there were no details on the locks provided on the access gates.	Input required from PCA, Fire engineering report may be needed to maintain the current location.	Scope of works covers inclusion		
Existing external fire hydrant locations	Fire Hydrant System	There are existing fire hydrants are within 10m from adjacent buildings.	If these fire hydrants are not being used to serve the proposed scope of works we would expect this to be included in our scope of works to rectify. NCC consultant and PCA to review.	Scope of works covers inclusion		
Fire hydrant booster access and location	Fire Hydrant System	The access is currently behind a locked fence but we can confirm is installed.	No action. Pending NCC consultant and PCA review/comment.	PCA agrees, no action in this phase.		

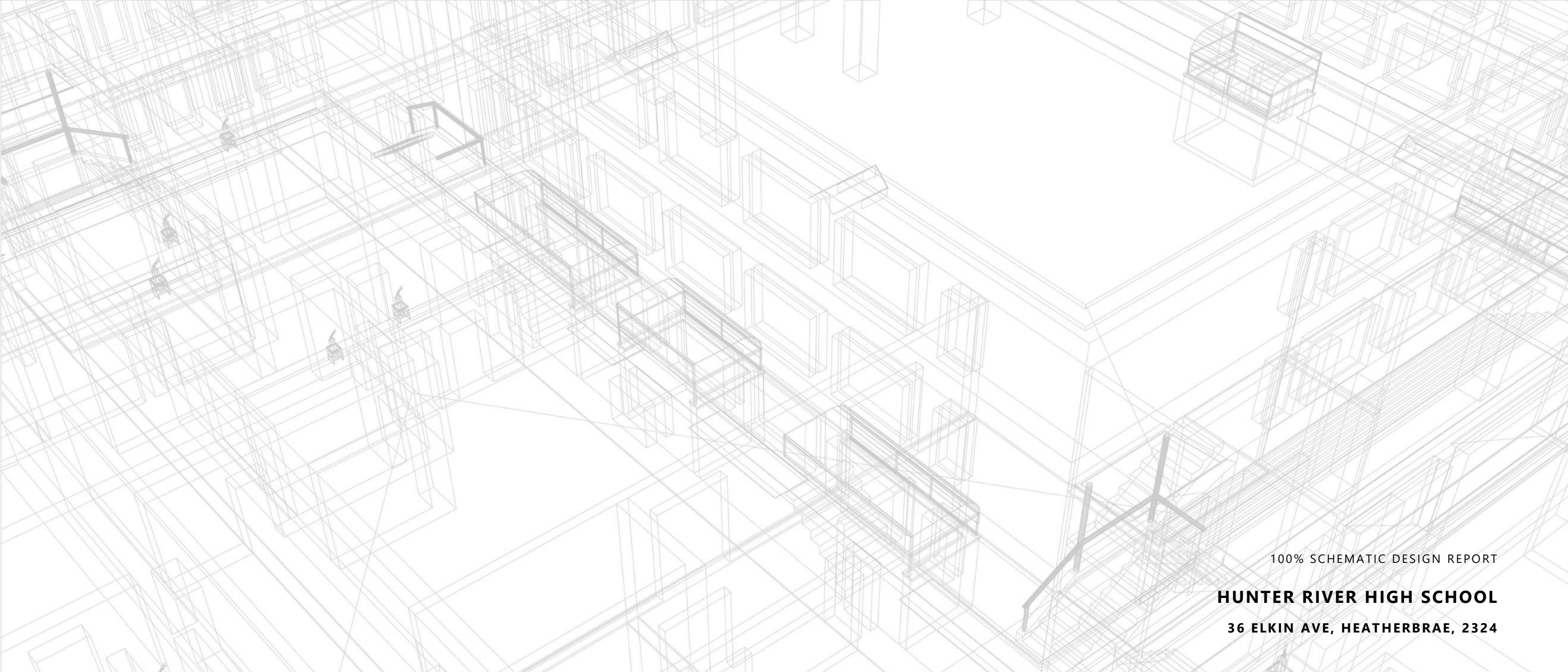


## Appendix E – Cost Estimate information



Appendix 2 – Electrical Services Engineering Report





100% SCHEMATIC DESIGN REPORT

**HUNTER RIVER HIGH SCHOOL**

**36 ELKIN AVE, HEATHERBRAE, 2324**

**ELECTRICAL SERVICES**

This report is prepared for the nominated recipient only and relates to the specific scope of work and agreement between JHA and the client (the recipient). It is not to be used or relied upon by any third party for any purpose.

DOCUMENT CONTROL SHEET

Project Number	220264
Project Name	Hunter River High School
Description	Electrical Services – 100% Schematic Design report
Key Contact	Marc Estimada

Prepared By

Company	JHA
Address	Level 23, 101 Miller Street, North Sydney NSW 2060
Phone	61-2-9437 1000
Email	Mike.Peh@jhaengineers.com.au
Website	www.jhaservices.com
Author	Mike Peh
Checked	Frank Liu
Authorised	Marc Estimada

Revision History

Issued To	Revision and Date								
APP, EJE, SIN SW	REV	P1	P2	P3	P4				
	DATE	26.07.22	29.07.22	09.08.22	20.04.23				
	REV								
	DATE								
	REV								
	DATE								

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## 2 EXECUTIVE SUMMARY

This Services Schematic Return Brief Report compiled by JHA Consulting Engineers identifies and summarises the key components which make up the **electrical services** elements (electrical, ICT and security services) of the project.

JHA in developing the Schematic Design Report will endeavour to provide value added advice, providing suitable solutions to cost benefits and build-ability, performance, maintenance, flexibility or other requirements of the project. This report is not designed as a specification or bill of materials, nor is it intended to provide detail of the equipment, fitting or services selection.

This report does not cover the following:

- Inspection of equipment in ceiling spaces, enclosed services risers and ducts
- Structure, civil and builder works
- Disassembly of equipment
- Detailed inspection of equipment condition
- Measurement of actual performance
- Verification of design

## 3 PROJECT DESCRIPTION

The Hunter River High school is a comprehensive, co-educational secondary school with a current enrolment of 917 students, approximately 22% of whom identify as Aboriginal and/or Torres Strait Islander. The School is located on Worimi land, nearby the Hunter River in the suburb of Heatherbrae.

The Index of Community Socio–educational Advantage (ICSEA) for Hunter River High is 906 which is one standard deviation below the average of 1000. Meaning that over 60% of student population are represented in the bottom quartile of ICSEA distribution. (Source: MySchool Snapshot, Education Rational, SINSW, received on 20.04.2020)

The scope comprises:

- New administration building
- New gymnasium and renovation of sports fields
- New support learning building
- Minor refurbishment works in Block A, C and H
- External works including landscape works, new bus bays and carpark for staff

## 4 GENERAL

The required electrical, ICT and security services works have been identified within this report for both the new and existing buildings. The required works are to achieve EFSG and BCA requirements as a minimum.

### 4.1 REFERENCED DOCUMENTATION

#### 4.1.1 GENERAL

AS1530	Fire tests for building materials, components and structures
NCC	National construction code (Building code of Australia)
EFSG	Educational Facilities Standards & Guidelines
	The SINSW Structured Cabling System Specification
	NSW Public Schools – Audio Visual standards for school learning displays

#### 4.1.2 ELECTRICAL SERVICES

AS/NZS 1158	Lighting for outdoor spaces
AS/NZS 1367	Coaxial cable and optical fibre systems for the RF distribution of analog and digital television and sound signals in single and multiple dwelling installation
AS/NZS 1680 set	Interior Lighting
AS/NZS 2293	Emergency escape lighting and exit signs
AS/NZS 3000	Electrical Installations – Wiring Rules
AS/NZS 3008.1.1	Electrical Installations – selection of cables – cables for alternating voltages up to and including 0.6/1 kV – typical Australian installation conditions
AS/NZS 3013	Electrical installations – Classification of the fire and mechanical performance of wiring system elements
AS/NZS 61439 set	Low-voltage switchgear and control gear assemblies
AS/CA 5009	Installation requirements for customer cabling (Wiring rules)
NSW SIR	NSW Service and Installation Rules

### 4.2 DEFINITIONS & ABBREVIATIONS

AFFL	Above finished floor level
AFSS	Annual fire safety statement
BCA	Building code of Australia
CCTV	Closed circuit television
DB	Distribution board
GPO	General power outlet
JHA	JHA Consulting Engineers
MSB	Main switchboard
MSSB	Mechanical services switchboard
NBN	National Broadband Network
NCC	National construction code
RCD	Residual current device
SPD	Services protection device

## 5 ELECTRICAL SERVICES

### 5.1 SITE INFRASTRUCTURE



Image: Six Maps

#### 5.1.1 SUBSTATIONS, EASEMENT & MAIN SWITCHBOARD

The site is currently being served by an existing outdoor kiosk substation 800kVA (S.56243) located adjacent to existing carpark (entry via Elkin Ave).

This substation currently services the entire High School which consists of the following existing buildings:

- Building A
- Building B
- Building C
- Building D
- Building E
- Building F
- Building G
- Building H
- Building I
- Building J
- Building K
- Building L
- Building M
- Building N

- Building O
- Building P
- Building Q
- Building R
- Building U

The following buildings are proposed to be refurbished:

- Building A
- Building C
- Building H

The following new buildings are proposed:

- Administration building
- Gymnasium
- Support Learning Hub

### 5.2 EXTENT OF WORKS

The extent of electrical works associated with the project is generally as following:

- Electrical Power supply (Substations and Easements)
- Consumer mains cabling
- Main switchboard & switchboard room
- Surge protection
- Earthing
- Consumer mains / Sub-mains cabling
- Pit and pipe works
- Electrical metering (Private & Authority)
- Distribution Boards
- Power distribution
- General internal and external lighting
- Emergency lighting and exit signage
- Photovoltaic system



5.3 PROPOSED INFRASTRUCURE WORKS

It is anticipated the following electrical infrastructure works will be carried out as part of the construction works (Refer to schematic design – site plan for further details).

- Supply and install new site MSB in new MSB room adjacent to existing substation.
- Existing site MSB to be converted into MDB to maintain existing supply to downstream DBs. New submains to be provided from new site MSB.
- A new MDB (within external cupboard) to be provided adjacent to Building A to serve new buildings (to reduce cabling sizes and voltage drop)
- New electrical submains from new site MSB to new MDB to be reticulated via inground conduits
- New electrical submains from new MDB to new buildings DB to be reticulated via inground conduits

Note this site is classified as bushfire risk. Refer to BCA report for backup supply requirement.

5.3.1 MAXIMUM DEMAND PER STAGE

The figure below shows proposed site maximum demand at each stage.

Space	Area (m^2)	Assumed general Lighting & power use (VA/m^2)	Assumed airconditioning use (VA/m^2)	Load (kVA)	Load per Phase (A)
Stage 1 - New Support Learning, Gymnasium, Admin, Sports Field and External Works					
Existing Retaining Buildings (Load demand as per electricity bill record)					
Building A	269.0	-	-	279.40	388.06
Building B	297.0				
Building C	295.0				
Building D	459.0				
Building E	317.0				
Building F	336.0				
Building G (Consist of Kitchennette)	679.0				
Building H	680.0				
Building I	686.0				
Building J	452.0				
Building K	1174.0				
Building L (Toilet)	80.0				
Building M	436.0				
Building N	90.0				
Building O	708.0				
Building P	400.0				
Building Q	171.0				
Building R	609.0				
Building U	431.0				
Canteen	-	-	-	23.04	32.00
Existing Retaining Sub-Total				302.44	420.06
New Build - (Electric type equipment provision)					
Support Learning Hub	1081.0	40	50	97.29	135.13
Gymnasium	1102.0	40	50	99.18	137.75
Gymnasium - Kitchen	-	-	-	57.60	80.00
Administration	415.0	40	50	37.35	51.88
New Build Sub-Total				291.42	404.75
Stage 1 - Total				593.86	824.81
Stage 2 - Minor Refurbishment (Building C & E)					
- Anticipated additional loads					
Building C	295.0	5	-	1.48	2.05
Building E	317.0	5	-	1.59	2.20
Refurbishment Sub-Total				3.06	4.25
Stage 2 - Total				596.92	829.06
Stage 3 - Minor Refurbishment (Building A, H & J)					
- Anticipated additional loads					
- Gas type equipment provision					
Building A	269.0	5	-	1.35	1.87
Building H	680.0	5	-	3.40	4.72
Building J	452.0	5	-	2.26	3.14
Refurbishment Sub-Total				7.01	9.73
Stage 3 - Total				603.93	838.78
20% Spare Capacity				120.79	167.76
Total				724.71	1006.54

Based on the estimated maximum demand, the proposed development including new and existing buildings will require 1006.54 A/ph supply. An application for connection form is required to be submitted to Ausgrid by electrical contractor to confirm the existing substation on site is capable of supplying the proposed load without any modification/upgrade works.

## 5.4 MAIN SWITCHBOARD

One new, free standing Main Switchboards to be provided within new 2hr fire rated main switch room with the following:

- Form 3b board
- Free Standing
- IP 43 rated
- Minimum fault current rating of 50kA
- Be equipped with surge protection
- Possess a minimum of 20% spare capacity (Busbar ratings)
- 30 years design life expectancy
- The colour of the board is to be 'Electric Orange X15';
- Consist of a minimum of the following sections:
  - Non-Essential Section
  - Unmetered Section (if applicable)
  - Essential / Safety Services Section
- Supply Authority Meters and Private Energy Meters
- Busbars to be sized to accommodate a minimum of 25% spare future load growth
- Provide a minimum of 25% or 6-off 3 phase spare spaces whichever is greater of MCCB's
- Fire rated consumers mains from the substation low voltage board to the MSBs. Coordinate route on site with all other services and structures.
- All cable trays, conduits etc. as required for installation of consumers mains
- Allow for remote control switching of the main switchboards in the fire control room as per AS3000. Contractor to liaise with Ausgrid to determine if these are required.

## 5.5 SURGE PROTECTION

New surge protection in the main switchboards (built into the board) equivalent to Erico Critec SES200.

Secondary surge protection (equivalent to Erico Critec TDS150) to all distribution boards.

## 5.6 EARTHING

An earthing system for the new main switchboards will be provided. At least 2-off 3m deep copper clad earth rods (with copper thickness greater than 25µm) will be provided and looped together. Each rod will be provided with an Erico polymer concrete inspection well (or equivalent) inset into the ground. The wells will be labelled with a brass plaque.

All metallic cable support systems including cable trays, skirting ducts, metal wall studs, roof trusses, steel covers, removable escutcheon panels housing electrical and communication cabling and metallic bathroom fittings shall be earthed in accordance with AS3000.

All metal stud walls where GPO are mounted shall be earthed to avoid the risk of electrocution.

Within the comms room a telecommunications earth will be provided, consisting of a wall-mounted earth bar for individual earth connections and using method outlined in the ICT specification (earthing section). All racks and frames will be connected to an earth bar in a star-wired fashion with independent fasteners. The earth bar will have sufficient holes for 100% future connections and will be connected to the technical earth point. Cable trays will be earthed to the local distribution board and will not make electrical connection to the racks.

## 5.7 CONSUMERS MAINS AND SUBMAINS CABLING

New mains and sub-mains cabling shall be such as to ensure a maximum of 7% voltage drop is achieved at the furthest point. Generally, this will consist of 0.8% consumer mains drop, 3.7% total submains drop and 2.5% sub-circuit drops.

Mains and sub-mains cabling to be sized to suit maximum demand assessments plus an allocation of spare capacity.

Mains and sub-mains cabling will be assigned spare capacity ranging from 10% to 30% depending on whether the submains are shared or dedicated, or on the nature of loads and areas supported.

To maximise submain distribution efficiency and diversity, distribution boards will be consolidated onto a number of single submain groups (i.e. rising mains with tee-offs etc)

All mains and sub-mains cabling shall be XLPE / PVC with the exception of NCC essential services which will have the appropriate level fire rating.

Mains and sub-mains cabling shall be predominantly reticulated in cable pits, conduits in underground trench and throughout the ceiling voids in trefoil arrangement in/on appropriately sized cable supports to minimize derating.

Supply Fire rated consumers mains and Fire rated mains to all essential services. Provide fire rated trays which support fire rated cabling.

## 5.8 PIT AND PIPE EXTERNAL WORKS

New Pit and Pipe as shown on the site plan to the quality section of this specification and to ESFG requirements.

## 5.9 POWER FACTOR CORRECTION

Power factor correction equipment for Main switchboard (for the common area sections) within the main switch room to achieve a power factor of minimum 0.95 lagging.

Allow to relocate and reuse existing if in good condition.

## 5.10 RESIDUAL CURRENT DEVICES (RCD) FOR GENERAL POWER AND LIGHTING

RCD's will be provided to all power point circuits and lighting circuits fed off local distribution boards, in accordance with AS3000. All RCD's will be of the 30mA type, and be integral to the miniature circuit breakers. Type D breakers will be proposed for workshop equipment to minimize nuisance tripping.

## 5.11 METERING

### 5.11.1 SUPPLY AUTHORITY METER

One off supply authority meter to main switchboard at the point of supply in the Main Switch room.

One off supply authority metering to each of the Tenancy Areas in the Main Switch room.

All supply authority meters shall be via removable current transformer links to allow future modifications to the metering configurations.

Meter will be arranged to the requirements of the supply authority and also the requirements stipulated within the NSW services and installation rules.

All authority meter panels will be Schneider Electric NMI certified meter panels to enable HLI interrogation of all energy usage.

### 5.11.2 PRIVATE SUB-METERING

New private metering facilities will be provided in accordance with the requirements of NCC, Section J and for Greenstar (if required).

Private energy meters complete with CT's will be installed at the following locations:

- MSB for bulk site incoming supply metering to enable to monitor site consumption;
- Solar PV supply (and generation will be displayed onto the digital signage screens);
- Loads in line with the Greenstar requirements. Refer to the EMS section for precise metering requirements;
- Separate Lighting and Power metering;
- Lift supplies;
- Mechanical plant and hydraulic plant;
- PV supplies

All metering cabling will be linked to common cable congregation points and the ground floor distribution board cupboards, and linked to the building power Energy Management System for monitoring educational purposes and Greenstar, which will be linked to the AV digital signage screens (TBC).

Allow for energy meters onsite to be Schneider PM5000 series or equivalent at MSB and MDBs and local distribution board to be provided with Schneider Acti-9 series or equivalent, with RS-485 and LAN provision for EMS monitoring purpose.

Gas and water pulse meters are also required to be measured to ensure compliance with Greenstar.

## 5.12 DISTRIBUTION BOARDS

New electrical distribution boards throughout new buildings.

The following areas will have dedicated switchboards:

- Food tech / Commercial Kitchen. The section shall be resettable by pressing the reset button at the switchboard and depressing the respective emergency stop button (key resettable).  
Provide contact interface to Gas Guard control panels in Gas fitting type rooms, to enable power shut off in these areas.
- General learning areas. General learning areas/ classrooms will have separate switchboards from workshop areas to minimize transients from workshop equipment.
- General House Power and Lighting
- External Power and Lighting

Spacing of the distribution boards will be such that sub circuits do not exceed 40 metres and strategically located.

All distribution boards will be fitted with RCD protection to all power and lighting sub-circuits as per AS3000.

Distribution boards to be housed in dedicated cupboard enclosures with lockable-hinged doors which open in common areas and workshop areas.

Enclosures to be fitted with smoke seals & be built with non-combustible materials where electrical cupboards are located within the path of egress to comply with BCA requirements.

Distribution boards will be fitted with private metering to separately monitor lighting and power consumption and circuit level power monitoring (selected Circuits as per the smart metering schedule) as per the requirements of the NCC and Greenstar.

New distribution boards to be provided with the following parameters:

- Be accessible from circulation areas or within staff access areas only be fitted with smoke seals on doors and be lined with a non-combustible material where applicable
- Form 2 construction
- Possess a minimum of 25% spare space or 6-off poles whichever is greater and capacity for future at the end of construction
- Consistent with Section J of the NCC with additional 15% and the size of the building, each distribution board will have separately metered sections for lighting and general power
- Secondary surge protection provided to all boards
- All lighting and power (socket) sub-circuits to be 30mA RCD protected
- Fault level of no less than 10kA
- A main switch / circuit breaker that is isolated from the board's internal chassis by fixed guards, so that one can work safely on the chassis once the main switch is off.
- Dedicated surge protections provided to communications and security equipment power circuits.

## 5.13 RENEWABLE ENERGY

The total renewable energy produced shall be less than 100kW to avoid being classified a large-scale provider.

### PHOTOVOLTAIC

A combined 61kW Solar Photovoltaic system is proposed to be installed on the roof area of Support Learning Hub building.

A complete photovoltaic Grid connected system including inverters, Solar Panels, Panel mounting hardware, cabling, interlocks, and co-ordination with other trades, commissioning and training for a fully functioning system inclusive of grid connected import export meter to be provided and installed at the MSB. Allow to liaise with the Authorities as require for the commissioning of the system.

The installation must comply with current versions of:

- AS5033 Installation of Photovoltaic Arrays
- AS4777 Grid connection of energy systems via inverters
- AS1170.2 Wind Loading
- AS3000 Electrical Wiring Rules
- AS1768 Surge arrestors

The proposed model of PV Panels is manufactured by SunPower Performance 385W panels or equivalent with dimensions 1690 (length) x 1160mm (wide).

## 5.14 ADAPTABILITY / FLEXIBILITY OF POWER SUPPLY

GPOs and permanent electrical connections will be generally distributed and co-ordinated with the architectural room layouts. GPOs will be wired to allow flexibility, charging of cordless tools and equipment and spare capacity for future alterations and space re-purposing.

Note, labs with Gas fittings are regarded as a Hazardous Area, as such ensure all services within are 'explosion protected' / spark proof and are in accordance with AS60079.

To ensure adaptability and flexibility of the workshop spaces and other learning spaces, allow for a flexible solution, enabling re-purposing with ease with minimal interruption and disruption.

## 5.15 LIGHTING CONTROL SYSTEM

Automatic operation of the internal common area lighting systems will be undertaken with real time clock, combined PIR (occupancy) and daylight sensors to comply with NCC J6 requirements.

Non-frequently occupied areas shall be controlled via lighting sensors only and shall be held on for a period of 20mins after motion is detected.

The classrooms provided with lighting control panel shall be provided with dimming controls to facilitate the presentation. The lights shall be separately controlled as following groups: the row in front of the screen and rest.

The open plan areas including covered cola also utilise daylight zone. perimeter zones shall be on a separate relay channel to the main occupancy zone.

The external access lighting provided to the building entrances, footpaths, roadways and carparks will be controlled at the Admin by real time clock, photocell and override manual switch.

### Smart Lighting Control System

A Dynalite Lighting Control System will be proposed due to familiarity in the industry and availability of contractors in the Sydney / Newcastle metropolitan area.

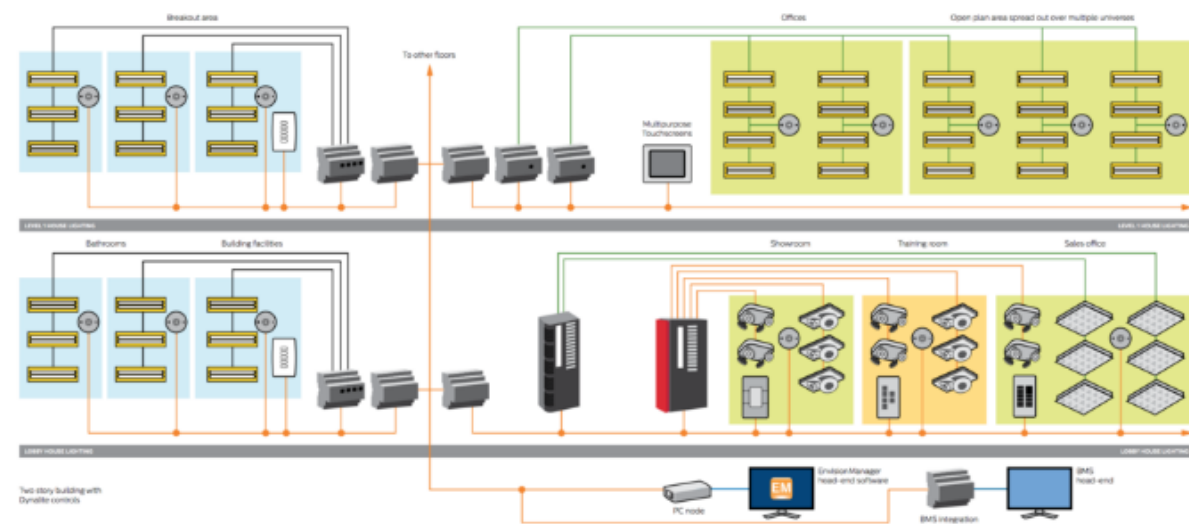


Figure: Lighting Control Topology

The lighting control system is to provide a seamless operation, enhance the visual and spatial aesthetics and also help in achieving reductions in energy use. Luminaires are to be grouped in zones with pre-set programmed scenes. It is important that the user interface is simple and uncomplicated. Lighting control system to match existing control system for easy maintenance regimes. Lighting control devices should be located away from general public's access.

Smaller areas may have local one/two button control and/or occupancy sensors as appropriate.

### Period Bell Linked Control

Contractor to investigate if school is using lighting system linked to period-bell-alarm timer to control luminaires. Allow to retain and maintain existing period bell linked control in out-of-scope areas.

## 5.16 EMERGENCY AND EXIT LIGHTING

Emergency and exit lighting will be manual testing type at local switchboard and be provided throughout the development to comply with the NCC and AS2293.

Exit signs will be of the edge lit blade type to minimise visual impact.

In carparks and internal spaces, 24m type exit signs will be proposed as standard.

In large open areas, jumbo type 40m exit signs will be proposed to maximize viewing distances.



Figure: Emergency lighting luminaires

All internal emergency and exit lighting shall be of the LED type.

## 5.17 LIGHTING METHODOLOGY

Refer to Appendix A – SG951 Schedule of Luminaires for further details.

### SPACE TOPOLOGY: GENERAL LEARNING SPACE

The functional use of this space ranges from individual and collaborative study environments, requiring clear visibility of equipment, presentation/ demonstration areas and demarcation of circulation zones. The lighting scheme should assist in way finding and directing people through the space. Consideration is to be given to expressing and highlighting key architectural elements within the space. Ambient lighting should be provided to the general area, with task lighting to functional zones. Lighting to vertical surfaces may also be beneficial to increase the perceived brightness of the space. Localised independently controlled task light in zones with tall ceiling spaces- luminaires to have centralised control to reset at the end of the day to daily pre-sets.

### SPACE TOPOLOGY: LARGE GROUP AREAS

Lighting is to be flexible, with dimmable luminaires to suit different purposes and functional requirements. The lighting design seeks to address the following key issues:

- Designing lighting atmosphere best suit the architectural context
- Lighting quality with respect to light distribution and illuminance levels. Australian Standard AS/NZS 1680 and EFSG luminaire schedule - SG951 should be used as guidance for illuminance levels. 160 lux general with 240-320 lux task lighting. However, the lit atmosphere and surface brightness should be used as design parameters rather than solely illuminance levels
- Maximization of daylight to reduce the need for electric lighting.
- The provision of a lighting control system that provides operational lighting to the various functional spaces to fulfil visual task requirements with optimum efficiency.

## SPACE TOPOLOGY: AMENITIES

Change room/ bathroom lighting may consider an integrated lighting approach, with lighting to the basin area and the toilet. Lighting is to be controlled via occupancy sensors for on/off control as an energy saving measure. The correlated colour temperature and lighting scheme is to support the architectural design intent and desired 'mood' and materiality of the space.

### 5.17.1 EXTERNAL LIGHTING AROUND

External lighting will be LED type light sources Lighting will be controlled via a combination of photo electric cells and timers via the lighting control system with a manual override control. Light fittings are to be provided with a finish to the Architect's colour scheme requirements.

Lighting shall generally be low height, low intensity and discreetly positioned so as to avoid spill lighting and compliance with AS1158.1 and AS4282.

Obtrusive lighting will be carefully considered during the external lighting design to ensure compliance with AS4282 and to minimize any spill onto neighbours or to the night sky. Detailed design concepts will be presented during concept design.



## 6 COMMUNICATIONS SERVICES

### 6.1 EXISTING LEAD IN TELECOMMUNICATIONS INFRASTRUCTURE

The Hunter River High School Site currently is serviced by a NBN fibre connection. The main comms fibre incoming feeds enter from Elkin Ave, around the school perimeter into Building K, where the campus distributor racks (Level 1 – Library) are currently located.

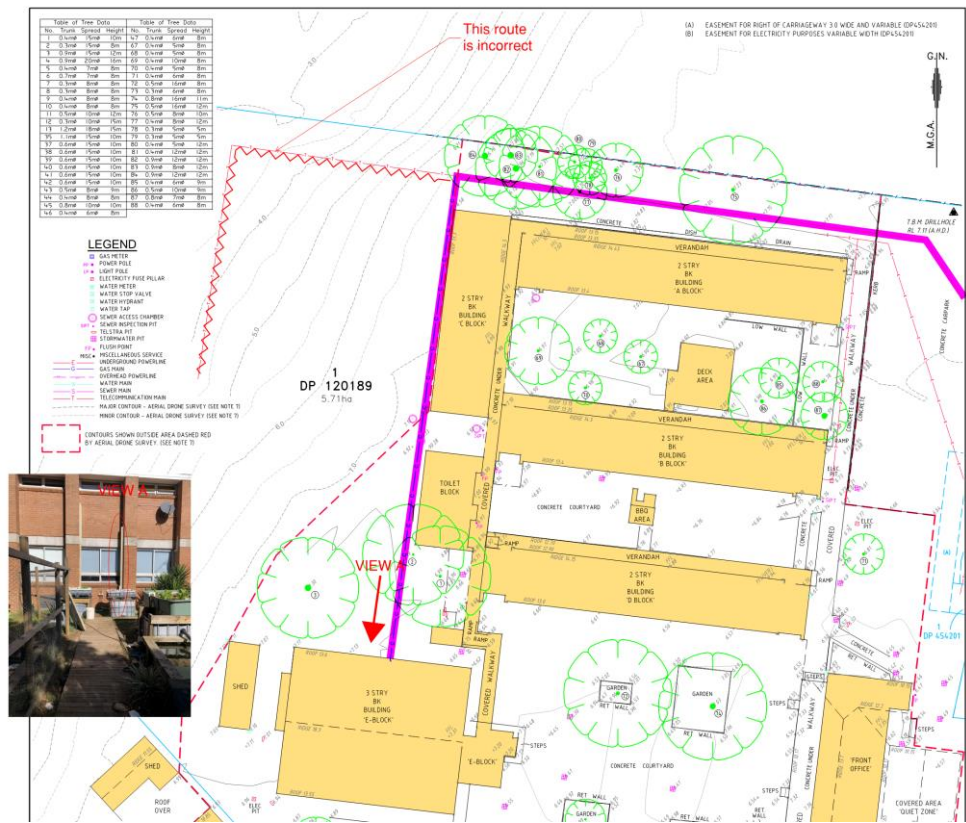


Figure: NBN Lead-in Fibre Services (Survey)

The ICT / Fibre Hub campus distributor is currently located in Building K – Level 1. There are two communications racks located within the library store area.



Figure: Existing campus distributor racks

### 6.2 EXTENT OF WORKS

The extent of communications works associated with the project is generally as follows:

- Existing campus distribution cabinets located in the library store in the Building K to remain
- Existing fibre optic lead-in to be retained and maintained, subject to the extent of excavation works for new main switch room and MSB near existing substation.
- New building distribution cabinets located in the dedicated building communication room (BCR) in each new building. Building A may require new building communication room, subject to the extent of refurbishment works.
- Backbone cabling from the campus distributor to building distributor for each new building (Building A TBC).
- Distributed horizontal cabling system within buildings and across existing buildings.
- Public address/Period bell alarms system

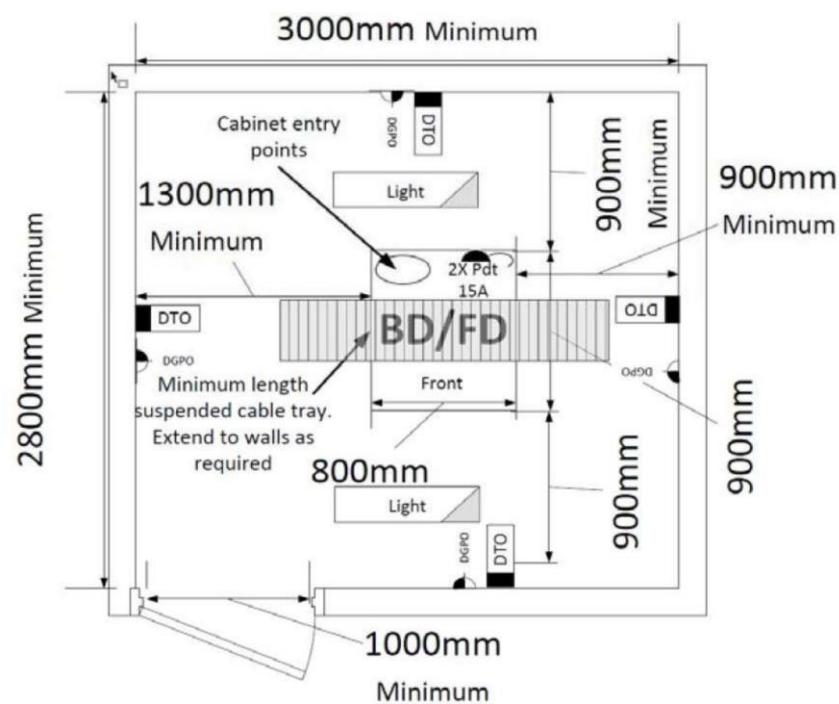
Refer to drawing HRHS-JHA-XX-XX-DR-E-0100 for the DoE ICT endorsed communications infrastructure staging works and drawing HRHS-JHA-XX-XX-DR-E-0003 for cabling reticulation pathway.

The existing active equipment will require to be upgraded. Refer to Appendix E for the extent of scopes provided by DoE ICT.

Refer to Appendix F and Audio Visual (AV) services document for Power and Data provisions for Audio Visual (AV) services in new gymnasium building.

6.3 BUILDING DISTRIBUTOR

The size of building distributor will be documented as per DoE Structured Cabling System Specification. Below is the arrangement and size of building distributor.



New building distributor shall house the following:

- Building distributor rack (BD)
- Security panel
- AV/PA rack
- Local UPS

6.4 TELECOMMUNICATIONS FIBRE TIE CABLING

Telecommunications Fibre Tie cabling from the existing campus distributor room (Building K) to the respective building distributor room will be provided in accordance with the DoE Structured cabling specification. Fibre connectivity is critical for future Gigabit connectivity and to future proof increased bandwidth requirements into the future.

6.5 TELECOMMUNICATIONS COPPER TIE CABLING

Telecommunications Copper Tie cabling from the campus distributor room to the respective building distributor room will be provided in accordance with the ICT Structured cabling specification. Copper connectivity is becoming superseded however this can be discussed in detail with ICT to determine whether Copper is still required.

6.6 TELECOMMUNICATIONS HORIZONTAL CABLING

The voice / data cabling system shall be fully integrated utilising a certified CAT 6A for all new data points. The system will consist of RJ-45 outlets wired in U/UTP cabling from patch panels within the respective building or floor communications rack.

6.7 TELECOMMUNICATIONS WIRELESS ACCESS POINTS

Provisions for a wireless network system will be made throughout the new development and strategically located for coverage throughout.

The provisions will include supply and install of a dedicated double data outlet for each Wireless Access Points (wired in CAT6A) throughout the High School.

WIFI access active equipment to be provided by the project and installed by building contractor.

These will be generally located in all the areas, ceiling mounted, or where the ceilings are greater than 3000mm high, the WAP point will be mounted at 2400mm AFFL on the wall. Heat mapping may need to be carried out, subject to ICT's selected and preferred vendor.

Data outlets for WAPs to be placed indicatively in a 10m x 10m grid configuration and generally within all enclosed spaces and allow for location service triangulation. Wi-Fi applications are to be provided by the ICT Ensure density and locations are suitable to provide:

- RTLS - greater than 5m accuracy
- Voice (IPTel) services
- Roaming
- High Speed Data

No additional dedicated AP's (Monitor Mode) are required for Wireless Intruder Prevention System (WIPS)

6.8 TELECOMMUNICATIONS PIT AND PIPE SYSTEMS

All pit and conduit underground communications works will be designed in accordance with the relevant authority standards and the latest version of the ICT Structured Cabling specification.

New underground pits and conduit systems will be required to be installed as part of the scope of works to reticulate between the existing campus distributors (Block H) to the new buildings. Refer to staging site plans for further details.

Generally, principals for the Pit and conduit systems will be as follows, which is in accordance with the ICT Structure Cabling specification:

- CD to Main pit system – Refer to site Plan
- Main pit system to New building entry point – Refer to site Plan
- Pit types / sizes (minimum) shall be as follows:
  - Main pit system – Type P8
  - Pits used to extend main campus pathway – Type P6
  - New building entry pit – Type P5

Drainage to pits will be provided with a drainage trench, 1.5m in length via 50mm slotted corrugated slotted Ag pipe.

6.9 EARTHING

Within the comms room a telecommunications earth will be provided, consisting of a wall-mounted earth bar for individual earth connections and using method outlined in the ICT specification (earthing section). All racks and frames will be connected to an earth bar in a star-wired fashion with independent fasteners. The earth bar will have sufficient holes for 100% future connections and will be connected to the technical earth point. Cable trays will be earthed to the local distribution board and will not make electrical connection to the racks.

## 6.10 PUBLIC ADDRESS / PERIOD BELL ALARM SYSTEM

The existing combined public address/period bell alarm system head end will be relocated to the new Admin building.

The period bells will be provided as a minimum coverage as follows:

- Classrooms
- Corridors per floor for the learning purpose buildings
- Corridors near library
- Outside the multi-purpose hall adjacent to the Canteen
- Courtyard
- Playing area
- Externally on the pupil side of Administration building

The PA loudspeakers will be provided throughout which will be separated from the fire alarm system speakers.

## 6.11 HEARING AUGMENTATION

A hearing augmentation system shall be provided and installed in accordance with NCC/BCA Clause D3.7 requirements, which shall reinforce audio sources for the hearing impaired.

Hearing augmentation system shall be provided to following scope areas:

- Public reception
- Interview Room
- GLS
- Hall/Gym (Refer to Audio Visual services documentation for further details)

Refer to "HRHS-JHA-XX-XX-SP-E-0001" for specification/ performance requirement. Allow to price ESFG hearing augmentation solution as separate line item. Implementation of EFSG requirement shall be further discussed and developed in detailed design phase.

## 6.12 ADDITIONAL COMMUNICATIONS EXPECTATION / SCOPING DOCUMENTATION

Refer to Appendices below for further communications requirements.

- Appendix B – DoE Structured Cabling System Specifications.
- Appendix C – ITD Vendor Guidelines
- Appendix D – HS tech data communications
- Appendix E – ICTOR Capital works IT AV schedule
- Appendix F – DoE AV standards for school communal halls and gymnasiums
- Appendix I – Hunter River HS Network Map

# 7 SECURITY SERVICES

## 7.1 EXISTING SECURITY SYSTEM

The Campus Security network is a **star topology** network with a main Security headend located in the meeting room cupboard of Building A.

The system consists of a number of Security Data Gathering Panels (DGPs) and Door Controllers (DCs) located in selective buildings with backbone security cables back to the Security headend. The system is an Inner Range Concept system. The spare capacity system to be confirmed with school's incumbent security contractor / DoE SSU.



Figure: Existing security headend

## 7.2 EXTENT OF WORKS

The extent of works associated with the project is generally as follows:

- Intruder detection alarm system
- Access control system
- CCTV system
- Alarm call system



### 7.3 INTRUDER DETECTION ALARM SYSTEM

A new Inner Range Integriti system will be provided in new Admin building. The existing Inner range Concept system in existing retaining/out-of-scope areas will be retained, maintained and re-cable to new Integriti system for fully function system.

Subject to the extent of Building A refurbishment works, existing Concept Headend located in Building A meeting room cupboard will be converted into data gathering panel to maintain the connectivity of existing field devices.

Below is a high-level summary of access control strategy:

- Integriti security headend to be installed in new building communications room in new Admin building.
- Re-cable existing Concept data gathering panels with new security backbone cabling to new Integriti headend.
- New underground fibre backbone cabling in dedicated security hd-upvc conduits and security pits.
- New security data gathering panels (DGPs) and door controllers to be installed in the building distributor room (new buildings) to service all security field devices.
- New security data gathering panels (DGPs) and door controllers to be installed adjacent to existing Concept DGPs in the existing buildings to service all new security field devices.

### 7.4 ACCESS CONTROL SYSTEM

Access control devices including door locks, staff card reader, door release button etc. will be provided to the designated doors/gates as required and per DoE SSU scoping document.

### 7.5 CCTV SYSTEM

The CCTV system shall be an expansion of the existing CCTV system. This CCTV system shall utilise the structured cabling on a separate VLAN for connection of CCTV cameras, active switches and digital video recorder etc.

Cameras will be IP based, HD fixed lens, indoor dome/box with inbuilt external IR, motion detection, 2.0 megapixel with minimum 6-week storage.

The new building / external cameras will be connected with fibre connectivity and/or Cat6A UTP cabling and terminated onto patch panels in the new building distributor racks. Ensure to provide dedicated NVR/storage arrays and new Pacom system headend server at the new Admin building Comms room. Reconfigure and commission the Block F Pacom system to enable camera display onto a new CCTV monitor in new Admin building comms room.

Allow to inspect system onsite as part of the tender to ensure all works are accounted for.

Contactor to provide CCTV camera to the following locations as a minimum:

- Adjacent to building entrances/exits – both internal and external to the buildings;
- Carparks entries;
- Along corridors expected to receive high volumes of pedestrian traffic (subject to SSU approval);
- Within areas expected to have high volumes of people congregate (subject to SSU approval).



*Figure: Dome Type CCTV Camera*

### 7.6 ALARM CALL SYSTEM

The alarm system will be provided to the access shower/toilet, sick bay and clinics.

### 7.7 ADDITIONAL SECURITY SCOPING DOCUMENTATION

Refer to Appendix below for further details.

- Appendix G – Hunter River HS SSU as-built
- Appendix H – DoE SSU Specifications & Guidelines
- Appendix K – Hunter River High School - Draft Security Design - 8627-2208-D0.A

## 8 EFSG DESIGN GUIDE DEPARTURE

Due to the existing site conditions / constraints, JHA have compiled a list of proposed EFSG design guide departure for SINSW for review and endorsement.

The proposed departures will also contribute to potential VE opportunity.

Refer to Appendix J for further details

## 9 APPENDIX A – SG951 SCHEDULE OF LUMINAIRES

Refer to the separate document – sg951\_luminaires\_v1\_2018\_09

## 10 APPENDIX B – DOE STRUCTURED CABLING SYSTEM SPECIFICATIONS

Refer to the separate document – doe\_structured\_cabling\_systems\_specifications\_v1.2\_2020\_accessible\_0

## 11 APPENDIX C – ITD VENDOR GUIDELINES

Refer to the separate document – ITD Vendor Guidelines 0.2

## 12 APPENDIX D – HS TECH DATA COMMUNICATIONS

Refer to the separate document – hs-techdata-communications\_2

## 13 APPENDIX E – ICTOR CAPITAL WORKS IT AV SCHEDULE

Refer to the separate document – 8219 ICTOR Capital Works IT AV schedule

## 14 APPENDIX F – DOE AV STANDARDS FOR SCHOOL COMMUNAL HALLS AND GYMNASIUMS

Refer to the separate document – doe\_av\_standards\_for\_school\_halls\_gymnasiums\_v1.1\_20210227\_accessible

## 15 APPENDIX G – 8627 HRHS SSU AS-BUILT

Refer to the separate document – 8627 HRHS SSU AS-BUILT

## 16 APPENDIX H - DOE SSU SPECIFICATIONS & GUIDELINES

Refer to the separate document – DoE SSU Specifications & Guidelines

## 17 APPENDIX I - HUNTER RIVER HS NETWORK MAP

Refer to the separate document – Hunter River HS Network Map

## 18 APPENDIX J – EFSG DESIGN DEPARTURE

Refer to the separate document – HRHS EFSG Design Guide Departures [P2]

## 19 APPENDIX K – DRAFT SECURITY DESIGN

Refer to the separate document – Hunter River High School - Draft Security Design - 8627-2208-D0.A

Appendix 3 – Civil Engineering Services Report



# Hunter River High School

## Stormwater Management Report

**Prepared for:** NSW Department of Education

**Date:** 20<sup>th</sup> April 2023

**Prepared by:** Jackson Bramley

**Ref:** 301350957

**Stantec Australia Pty Ltd**

Level 6, Building B, 207 Pacific Highway, St Leonards NSW 2065

Tel: +61 2 8484 7000 Web: [www.stantec.com](http://www.stantec.com)

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# Revision

Site Address: 36 Elkin Avenue, Heatherbrae, NSW 2324

Real Property Description: Lot 1, DP120189  
Lot 1, DP579025  
Lot 1, DP540114

Proposed Development: Educational Facility

Client: NSW Department of Education

Local Authority: Port Stephens Council

Authority Reference #: N/A

Stantec Reference: 301350957-SWMP\_004



**Renata Tracey CPEng NER**

**Civil Section Manager**

**Stantec Australia Pty Ltd**

Revision	Date	Comment	Prepared By	Approved By
001	26.07.22	Draft Schematic Design	JMB	RET
002	08.08.22	Final Schematic Design	JMB	RET
003	13.04.23	Revised Schematic Design	JMB	RET
004	20.04.23	Revised Schematic Design	JMB	RET

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# 1. Introduction

Stantec have been commissioned by NSW Department of Education to prepare this Stormwater Management Plan (SWMP) in support of the approval for the proposed additions to the existing High School development at 36 Elkin Avenue, Heatherbrae NSW 2324.

This report has been prepared to support:

- a) A development application for the construction of a Construction of gymnasium (Block Y), consisting of a basketball court, equipment storage, canteen kitchen, staff room, first aid room and change room amenities, construction of hardstand civic space north of the gymnasium, construction of full-size rugby field, the construction of new carpark consisting of sixty-five (65) parking spaces (including 6 accessible parking spaces) and the construction and connection of a reticulated sewer pipe.
- b) A Part 5 Activity Approval, development permitted without consent, for the construction of a new administration building, student learning hub and provision of essential services.
- c) A Part 5 Activity Approval, development permitted without consent, for the construction of a new linking road and kiss and drop bay between Adelaide Street and Elkin Avenue.

This SWMP outlines the conceptual level stormwater design for the proposed development of an upgraded secondary school.

This SWMP illustrates that the proposed development complies with the conditions set out by Port Stephens Council, Australian Rainfall and Runoff, Australian Standards and best engineering practices.

The purpose of this SWMP is to evaluate the quantity and quality of stormwater associated with the proposed development plan so as to demonstrate to Council that an appropriate stormwater management strategy has been adopted.

This SWMP specifically addresses the following items for both the construction and operational phases of the development:

- Stormwater runoff volumes;
- Stormwater quality treatment measures;
- Water Sensitive Urban Design (WSUD) measures
- Erosion Sedimentation Control
- Stormwater Network Maintenance during Operation

The following will be achieved with the correct application of this SWMP report:

- Appropriate standards to be maintained on all aspects of stormwater within the site,
- Pollution control to be maintained,
- Establishment of a unified, clear, and concise stormwater management strategy.





## 2. Abbreviations Definitions

- **AEP** Annual Exceedance Probability
- **AHD** Australian Height Datum
- **ARI** Average Recurrence Interval
- **ARR** Australian Rainfall and Runoff
- **DA** Development Application
- **DCP** Development Control Plan
- **DN** Diameter Nominal (mm)
- **EY** Exceedances per Year
- **GPT** Gross Pollutant Trap
- **IFD** Intensity-Frequency-Duration
- **IL** Invert Level
- **L/s** Litres per second
- **m/s** Metres per second
- **MUSIC** Model for Urban Stormwater Improvement Conceptualisation
- **OSD** On-site Stormwater Detention
- **PSD** Permissible Site Discharge
- **RCP** Reinforced Concrete Pipe
- **RL** Relative Level
- **SID** Safety In Design
- **SQID's** Stormwater Quality Improvement Devices
- **SSR** Site Storage Requirement
- **WQO's** Water Quality Objectives
- **WSC** Water Services Coordinator
- **WSUD** Water Sensitive Urban Design



### 3. Relevant Policies, Standards and Guidelines

The following listed policies, standards and guidelines were referred to in the preparation of this report:

- Port Stephens Council DCP (Section B General Provisions) 2022
- Port Stephens 0074 Stormwater Drainage Design (Development Design Specification) 2022
- Port Stephens 0043 Subsurface Drainage Design (Development Design Specification) 2022
- Australian Rainfall & Runoff 2016;
- AS3500 parts 0-5: 2013 Plumbing and Drainage
- Landcom Managing Urban Stormwater: Soils and Construction Volume 1 2004
- NSW Floodplain Development Manual 2005
- Guidelines for development adjoining land and water managed by DECCW (OEH, 2013)
- Educational Facilities Standards & Guidelines (EFSG), NSW Department of Education



## 4. Existing Site Characteristics

### 4.1 Property Detail

The proposed development forms part of the site with the following property details:

Site Address: 36 Elkin Avenue, Heatherbrae, NSW 2324

Real Property Description: Lot 1, DP120189  
Lot 1, DP579025  
Lot 1, DP540114

Development Area: Approximately 92,350 m<sup>2</sup> (9.235 Ha)

The proposed development can be seen on the Civil Design Documentation shown in Appendix A of this report.

The proposed development consists of refurbishment of existing buildings as well as additional school buildings, carparking changes to the bus drop-off/ pick-up facilities, as well as external general open play and sporting fields/ facilities.

The overall site is bounded by:

- Residential Neighbouring Properties to the North and South
- The Pacific Highway to the East
- Agricultural lots/ Floodplain to the West

Refer to locality plan in Figure 1 for further clarification.



Figure 1: Site Location Plan (Source: Nearmaps 2022)

## 4.2 Topography

The local topography around the site is extremely flat, as indicated in Figure 2 below. The high point of the site is located along the South-East boundary at a level of RL 7.5 m AHD and the low point located along the North-Western boundary at a level of RL 2 m AHD, this is an average slope of approximately 1%.



Figure 2: Site Topography (Mecone Mosaic 2022)

## 4.3 Stormwater Catchments

The surrounding area has been investigated to determine the likely impact of existing external stormwater catchments on the proposed site.

The site is currently surrounded by developments and roadway, so it is believed that no external catchments other than the flooding discussed in following sections impact the development site.

## 4.4 Existing Stormwater Infrastructure

Stormwater runoff generated from hardstand area is currently either collected and conveyed via pit and pipe network or runs overland on to pervious landscape surfaces. While there are multiple piped systems across the site, for the most part captured stormwater is ultimately conveyed and discharged to the western portion of the site within the school's agricultural area.

## 4.5 Existing Stormwater Discharge

Northrop's site observations (2020), determine that ultimately, stormwater collected within the formal pit and pipe drainage network discharges to the west of the main school buildings within the lower elevation school agricultural area.

Refer to Figure 3 for further information.







Figure 3: Stormwater Discharge

## 5. Local Authority Requirements

Design requirements for stormwater management on the site have been set out in The Port Stephens Council DCP (2022). These requirements are summarised in the sections below.

### 5.1 Stormwater Conveyance Requirements

The Port Stephens Council DCP (2022) states that the following design storm Annual Exceedance Probabilities (AEP)'s should be allowed for when designing the Stormwater runoff conveyance systems for the development.

Design Parameter	Annual Exceedance Probability (AEP)	Conveyance Method
Minor Drainage System	10% Flood Event	In Ground (Piped)
Major Drainage System	1% Flood Event	Overland

**Table 1: Stormwater Drainage Serviceability**

However, the Educational Facilities Standards & Guidelines (EFSG) nominates that *“Design the inground drainage piped system for a 20 year ARI Storm event or to the requirements of the Local Council whichever is more severe. Provide above ground overland flow paths for 100 year ARI storm events in accordance to NSW Floodplain Management Manual (2001).”*

For the minor drainage system, a 5% AEP storm event will be adopted, aligning with the EFSG's 20yr ARI storm event. For major drainage, Council and the EFSG policies align and will be adopted.

### 5.2 Infiltration System Requirements

According to the Port Stephens Council DCP (2022), on-site infiltration is required where post-development flow rate or volume exceeds the pre-development flow rate or volume, exceeds the total percentage of site area. The on-site infiltration system is to be sized so that post-development flow rate and volume equals the pre-development flow rate and volume for all storm events up to and including the 1% AEP.

The on-site infiltration system should be provided by either underground chambers, surface storage or a combination of the two and positioned under grassed areas for any cellular system, or under hardstand areas such as driveways or any concrete tank structures.

An on-site infiltration system is an alternative to a traditional pit and pipe stormwater network. Geotechnical investigations and Council soil mapping indicate that the site subsurface conditions could cater for this type of system.

Infiltration based systems can be provided in a variety of forms and will need to be explored during the design process. Providing an infiltration system will allow the reduction in any proposed stormwater pit and pipe sizes, as well as the removal of the main trunk line.

### 5.3 Stormwater Quality

The Port Stephens Council DCP (2022) states that the post-development stormwater runoff quality shall be improved to achieve the following reduction targets when compared to pre-development levels:

Total Suspended Solids	90% reduction in the average annual load of Total Suspended Solids
Total Nitrogen	45% reduction in the average annual load of Total Nitrogen
Phosphorus	60% reduction in the average annual load of Total Phosphorus



Gross Pollutants	90% reduction in the average annual load of Gross Pollutants (>5mm)
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**Table 2: Pollution Reduction Targets**



## 6. Flood Impact Assessment

When considering a new development, it is important to assess the impact of existing flooding on the proposed development and also the impact of the proposed development on existing or potential flooding both upstream and downstream of the development.

### 6.1 Existing Flooding

#### 6.1.1 Regional Flooding

A flood impact assessment report has been undertaken by BMT. The following outlines a summary of the extent of the report.

Runoff contributing to Hunter River forms the basis for flooding of the site. Substantial flood warning time of the order of days is anticipated through the lower Hunter.

The subject site is exposed to flooding during the 1% AEP (otherwise referred to as the 1 in 100yr flood event). During a 1% AEP flood event, floodwaters are expected to approach the site from the west inundating the low-lying school agricultural area. Flood waters during this event are expected to reach 4.7m AHD, and PMF levels are anticipated to reach 8.5m AHD. The corresponding flood planning level of 5.7m AHD is provided for the site.

Table 3 below summarises these flood levels.

Flood Levels	
Probable maximum flood level	8.5m AHD
Current day 1% AEP flood level	4.7m AHD
Adaptable minimum floor level	5.7m AHD

**Table 3: Site Flood Levels**

During the PMF event the existing buildings are expected to be inundated with flood waters up to approximately 1.5m in depth. While early evacuation is the recommended response to a PMF event (i.e. onsite refuge is not recommended), however should onsite refuge be desired then an adequate refuge area should be provided to house student and staff at a level about 8.5m AHD. Response time to peak flood levels during the PMF event is expected to be in the order of days for this site, and therefore sufficient response time should be available to safely evacuate the site prior to any buildings being inundated.

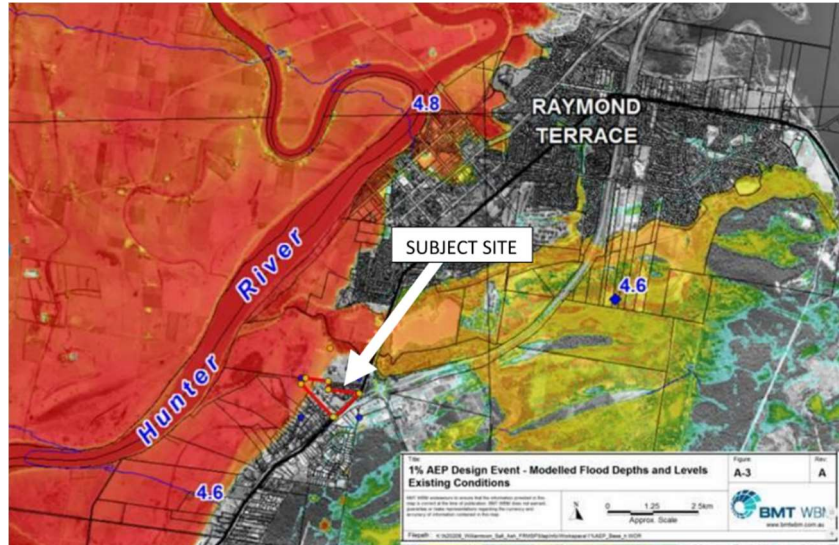
If not already in place, it is recommended a Flood Emergency Response Plan (FERP) is produced and implemented as part of the development. If there is a current FERP available for the site, then it is recommended this is reviewed and updated to align with current Council requirements and industry standards.

Refer to Figure 4 for 1% AEP design event flood depths.

The proposed design aims to have all new infrastructure functional and out of the 1% AEP flood extents.







**Figure 4: 1% AEP Design Event Flood Depths**

### 6.1.2 Local Flooding

Local or Nuisance flooding describes flooding occurring due to site specific constraints. Local flooding is often caused by local topographical constraints and stormwater drainage system capacity restrictions.

The topography of the site is such that there is no risk of local flooding on the site as it currently exists.

## 6.2 Flood Impacts

As previously mentioned, the proposed site is flood affected. The site currently has a major overland flow path from the South to the North-West.

This overland flow path mitigates impacts of flooding on the proposed development as well as impact from the development on existing flooding a channel through the site has been designed to control the flood water.

The overland flow path will follow the natural grade of the site from South to the North-West of the site, where it will discharge into the existing infiltration/ discharge area. It has been designed such that there are no building entrances or wall penetrations located in the overland flow path.

## 7. Stormwater Conveyance

This section of the report discusses the systems proposed to allow for stormwater to be conveyed across the site to the legal point of discharge.

As discussed in Section 5.1 of this report council have set serviceability requirements for the stormwater conveyance network such that minor flows are conveyed through piped drainage, and major flows are discharged via controlled overland flow.

### 7.1 Roof Drainage

The drainage system will be designed in accordance with AS3500.3-2003 to convey the minor design storm runoff from the roof to the in-ground drainage system. For storm events exceeding the design storm event, flows will surcharge the roof drainage system and discharge onto the surrounding ground where it will then convey through the inground pits to the stormwater network within the site.

### 7.2 Surface Drainage

The surface areas will be drained through a variety of methods, discussed below, in accordance with AS3500.3:2003 and Council's stormwater drainage guidelines.

#### 7.2.1 In Ground Drainage

The in-ground drainage has been designed to meet the following criteria:

- In the minor design storm event (5% AEP) there will be no surcharging of the in-ground drainage system and;
- In the major design storm event (1% AEP) there will be no uncontrolled discharge from the site onto neighbouring properties or the surrounding street

Surface runoff from the roads and hardstand areas will be directed to the proposed inground stormwater network using the design topography of these elements. The inlet structures have been designed to adequately convey the surface runoff into the in-ground drainage network.

The runoff will then be conveyed underground across the site to the legal point of discharge using gravity and the geometric falls of the pipe system.

### 7.3 Legal Point of Discharge

As discussed in Section 4.5, the development area discharges via infiltration onto lawn/ agricultural areas. The collected stormwater is proposed to discharge to the lawn area between existing building Q and the proposed new gymnasium building via a storm chamber absorption trench, that will filtrate over minimum 60m<sup>2</sup> of the lawn. The new carpark will also have the proposed runoff discharged to landscaped lawn area via a storm chamber absorption trench, that will filtrate over minimum 60m<sup>2</sup>.

Roads are proposed to drain via grassed table drains with receiving grated inlet pits with absorption chambers at the base.



## 8. Stormwater Attenuation

As discussed in section 4.2 the attenuation of stormwater discharge from the site will be provided in accordance with The Port Stephens Council Development Control Plan requirements (2022) and the Educational Facilities Standards & Guidelines (EFSG). Hydraulic modelling in DRAINS software has been used to determine the required on-site detention so as to restrict discharge from the development site back to pervious predevelopment discharge rates for all storm events from the 10% AEP event up to the 1% AEP event.

Two SPEL Stormchamber has been proposed for the site for stormwater disposal. This absorption trench is proposed to have a pre-treatment SPEL Hydrosystem HS. 1200/3 or approved equivalent. The storm chamber will ensure filtration over a minimum of 60m<sup>2</sup> lawn area for each of the zones. The SPEL Stormchamber is an inground modular arch system which is used for onsite detention, retention and infiltration applications. The system is encased by an impermeable LLDPE liner which is sealed and watertight. The open-bottom arches allow the stormwater runoff to balance across the tank through the clean aggregate stone which surround the arches.

The system helps counter drought conditions by maintaining groundwater base flow to streams, extensive range of 4 different arch heights and the ability to increase the size of the tank to suit the volume required in the available footprint, can be implemented in landscape areas, structural design of the arch allows for superior load ratings which comply with AS5100 & W80 wheel loads, and the system is fast to install and easy to maintain.

Several grassed table drains have been proposed, which fall towards deep stormwater pits with heel guard galvanised grating. An Atlantis cell will be provided at the base of the pits for absorption.

AEP Rainfall Event	Pre-development Discharge (m <sup>3</sup> /s)	Infiltration tank Discharge (m <sup>3</sup> /s)	Total Site Peak Discharge (m <sup>3</sup> /s)
10%	0.315	0.245	0.245
1%	0.525	0.395	0.395

**Table 4: Pre vs. Post Development Discharge**

## 9. Water Quality Treatment

As discussed in section 5.3 of this report The Port Stephens Council DCP (2022) require stormwater quality treatment on new developments to reduce the pollutant loading of stormwater discharged into the council drainage system.

This section of the report describes the proposed Stormwater Quality Improvement Devices (SQID's) and the effectiveness of the treatment system in achieving the reduction targets set by council for the proposed development.

### 9.1 Potential Pollutants

There are a wide range of potential stormwater pollutant sources which occur from urbanised catchments, many which can be managed through appropriate stormwater quality treatment. Typical urban pollutants may include:

- Atmospheric deposition
- Erosion (including that from subdivision and building activities)
- Litter and debris
- Traffic emissions and vehicle wear
- Animal droppings
- Pesticides and fertilisers
- Application, storage and wash-off of car oil, detergents and other household and commercial solvents and chemicals
- Solid's accumulation and growth in stormwater systems
- Weathering of buildings

The following specific pollutants in urban stormwater assessed through water quality modelling and management include:

- Suspended Solids
- Litter
- Nutrients such as Nitrogen and Phosphorous
- Biological oxygen demand (BOD) and chemical oxygen demand (COD) materials
- Micro-organisms
- Toxic organics
- Trace metals
- Oils and surfactants

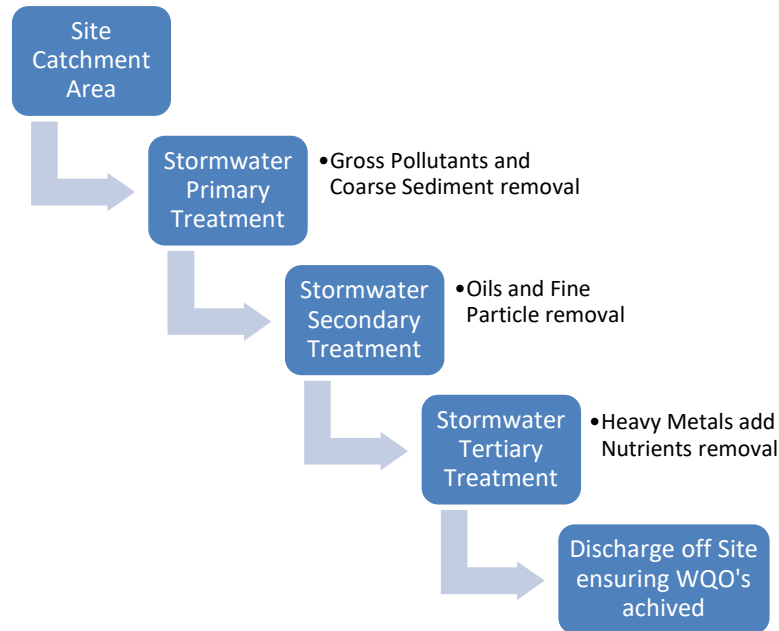
While only the key pollutants underlined above will be examined within the modelling, the Stormwater Quality Improvement Devices implemented are expected to assist in reducing a wide range of pollutants. For example, heavy metals are commonly associated with, and bound to fine sediments. This reduces the discharge of fine sediment during the construction and operational phases will also reduce the discharge of heavy metals to existing stormwater systems.



## 9.2 Pollutant Reduction System

In order to achieve the pollutant reduction targets specified in section 5.3 of this report, a series of treatment devices are proposed within the stormwater network which form a treatment train.

The diagram below shows a typical treatment train:



**Figure 4: Treatment Train**

### 9.2.1 Water Treatment Modelling

In order to demonstrate that the proposed treatment train meets the required reduction targets, a pollutant reduction model has been generated using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) Software program Version 6.3 by eWater CRC. Pollutant export rates are currently only available for Total Suspended Solids (TSS), Total Nitrogen (TN), Total Phosphorus (TP) and Gross Pollutants (GP). Therefore, only quantitative modelling for TSS, TN, TP & GP has been undertaken using MUSIC.

Modelling has only been undertaken on the post-development proposal with SQUID's installed so as to demonstrate the percentage reduction for each pollutant type.

The proposed treatment train includes the following:

- SPEL Hydrosystem HS. 1200/3
- SPEL Stormsacks

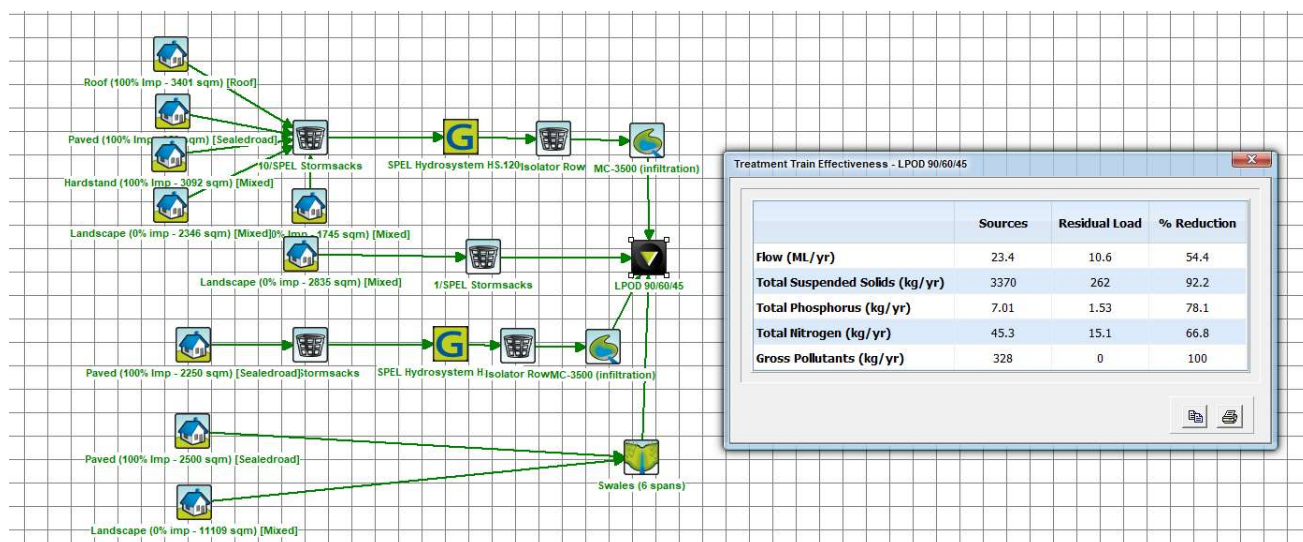


Figure 5: MUSIC Model Treatment Train

Pollutant/Issue	Target	Reduction	Target Achieved
TSS	90%	92.2%	YES
Phosphorus	60%	78.1%	YES
Nitrogen	45%	66.8%	YES
Gross Pollutants	90%	100%	YES

Table 5: MUSIC Results vs. Site Targets

As can be seen in the table above, the MUSIC model show that the proposed design meets council's reduction target. Refer to Appendix C for Port Stephens Council MUSIC Link report.

## 9.2.2 SPEL Hydrosystem

The SPEL Hydrosystem is a specialist stormwater filter, designed for installation within load bearing shafts and chambers of concrete or plastic construction. The SPEL Hydrosystem uses an up-flow process. This means there is minimal head drop between the inlet and the outlet. The stormwater is treated within the unit but the following processes: sedimentation, filtration, adsorption, and precipitation. It is suitable for heavy metal, TSS and nutrient reduction.



Figure 6: SPEL Hydrosystem (Source: SPEL Website)

### 9.2.3 SPEL Stormsacks

The SPEL stormsack is specifically designed for the capture of gross pollutants: sediment, litter and oil and grease. It is a water quality device that is deployed directly in the stormwater system to capture contaminants close to the surface for ease of maintenance. The benefits of the SPEL stormsack include:

- Low cost gross pollutant capture
- Quick and easy installation
- Simple maintenance
- At source capture
- Adjusts to custom pit sizes



**Figure 7: SPEL Stormsack (Source: SPEL Website)**

## 10. Water Sensitive Urban Design Strategy

### WSUD Background Information

Design guidelines for Water Sensitive Urban Design (WSUD) on the site have been set out in the Port Stephens Council DCP (2022). WSUD integrates land use and water management in the aim of minimising impacts of urban development on the natural water cycle. The WSUD design strategy for the proposed development is as follows. No previous WSUD studies have been done for this site.

### Site Context

Full site context has been provided in Section 4 above.

### Proposed Development

The proposed development has been outlined in Section 7-9 above, as well as in Appendix A with the Civil Design Documentation.

### WSUD Objectives and Targets

As discussed in Section 9 above, the site will implement stormfilters and stormsacks in order to minimise the development impact on the natural water cycle.

### Constraints and Opportunities

There are always opportunities to adopt a range of WSUD measures for any development. There were no major constraints within or neighbouring the site such as flood plains, watercourses or sensitive environments that are required to be preserved or remediated as part of the proposed works.

### Stormwater Management

The proposed stormwater system has been designed as per Liverpool Development Control Plan (LDGP) 2008. The full extent of the stormwater management procedures undertaken in the design has been explored throughout the entirety of this SWMP.

### Water Table Management

It is not expected that the proposed development will have any impact on the existing water table. No impervious areas of the site will discharge to the ground and hence no groundwater quality measures are required to ensure WSUD requirements are met.





# 11. Stormwater Network Maintenance Schedule

In order to ensure the ongoing effective operation of the stormwater network and water quality treatment devices, the devices must be maintained in accordance with manufacturer recommendations/requirements and general best practice. It is noted that all pits are to be inspected in a safe manner that assesses localised risk and in accordance with maintenance contractor safe work method statements (SWMS).

The below summaries the various stormwater network components that will need to be maintained, whilst Schedule 1 below details required maintenance of specific items within the network requiring maintenance.

## 11.1 Pit and Pipe Network

A general inspection of the stormwater pit network is to be undertaken every six (6) months and after major storm events. The general inspection involves visual inspection inside pits, removal and disposal of larger gross pollutants within pits in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Inspection of general pits can coincide with inspection and maintenance of water quality pit inlets (if applicable).

## 11.2 Water Quality Treatment Devices

The filtration inserts, located within the pits, are to undergo minor service every three (3) months and after major storm events or a hazardous material spill. This involves inspection and evaluation of the filter bad and its condition, removal of captured pollutants, and the appropriate disposal of captured material in accordance with waste disposal regulations. The minor service is designed to return the ocean guard back to optimal operating performance. An inspection of the condition is to be particularly undertaken following major storm events to check for damage and higher than normal sediment accumulation. Refer to manufacturer's maintenance procedures for details of safely undertaking hand maintenance or vacuum maintenance of the ocean guards.

A major service of the ocean guards is undertaken on an as-required basis and involves the inspection of ocean guards to determine the need for filter bag replacement and support frame rectification. Replacement is based on the outcomes from the minor service whereby damage is detected. Contact manufacturer for assessment and replacement components and refer to manufacturer's maintenance procedures for safely replacing components.

A general inspection of the filtration cartridges located in a Stormfilter chamber within the OSD tank, is to be undertaken every six (6) months and after major storm events or a hazardous material spill. The general inspection involves visual inspection of the Stormfilter cartridges and chamber, removal and disposal of larger gross pollutants from the device in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Cartridges are also to be checked to ensure they are all firmly connected to the connectors.

A minor service of the Stormfilters, undertaken every twelve (12) months and after major storm events or a hazardous material spill, involves the evaluation of the Stormfilter cartridges and media, removal of accumulated sediment and a wash-down of the Stormfilter chamber. Refer to Ocean Protect maintenance procedures for details of safely undertaking maintenance of the Stormfilter cartridges. During this service, the cartridge media is to be inspected and replaced if it is revealed that the cartridge media is exhausted. If this is the case, a major service is to be undertaken to replace the Stormfilter cartridge media. Contact manufacturer for assessment and replacement components and refer to manufacturer's maintenance procedures for details of safely replacing the media components.

## 11.3 Civil Structures

A general inspection of civil structures and associate drainage across a site should be undertaken annually. The general inspection involves visual inspection, with identified defects assessed by applicable qualified engineers



## 11.4 Stormwater and OSD Maintenance Schedule

Maintenance Action	Frequency	Responsibility	Procedure
<b>Pit and Pipe Network</b>			
Blockages of inlet and outlet pipes within pits	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge from within pits.
Condition of inlet grates	Six Monthly	Maintenance Contractor	Clear vegetation and any debris from the pit grate and repair as required.
Condition of pit structures and section of pipes at inlets/ outlets.	Two Years	Maintenance Contractor	Remove grate to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required. Notify structural engineer if detrimental features observed.
Overland flow paths and drainage swales	Six Monthly	Maintenance Contractor	Walk along the flow path and swale. Check batters and condition of path extent. Remove any debris/litter/sludge.
Survey pipe condition with CCTV's and repair defects as necessary	Five Years	Maintenance Contractor	Remove grate. Clear blockages for camera access. Operate camera in accordance with manufacturer specifications and operator standard procedures.
<b>Water Quality Devices</b>			
Blockages and debris within stormwater pit filtration inserts/ storm sacks	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge from within inserts.
Blockages and debris within filtration tanks and devices	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge. Hose out tank and devices from outside tank.
Blockages and debris within filtration cartridges inside storage tanks.	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge. Hose out tank and devices from outside tank.
Blockages and water conveyance within filtration stormwater lines	Annual	Maintenance Contractor	Remove grate. Flow water through filtration stormwater line from inspection openings to remove blockages.
Condition of stormwater pit filtration inserts/ storm sacks	Annual	Manufacturer's Contractor	Remove inserts from pit to inspect. Repair as required.
Condition and performance of treatment tank components	Annual	Manufacturer's Contractor	Remove grate and follow SWMS procedures to enter into the tank. View and repair damaged components.



Condition and performance of filtration cartridges	Annual	Manufacturer's Contractor	Remove cartridges from pit to inspect. Repair as required.
<b>Civil Structures</b>			
Check subsoil behind retaining walls drainage capacity via hose flushing	Annual	Maintenance Contractor	Blast with hose, water into inspection openings and pits to ensure conveyance through lines. Review outlets to ensure flow through line.
Condition of retaining walls and other structures, including cracking and stability	Annual	Maintenance Contractor	Walk along and inspect all visible faces of wall structure. Observe for cracking, crack width, any lean in on wall and moisture within structure. Notify structural engineer if detrimental features observed.
Check batters for signs of scour and erosion	Annual	Maintenance Contractor	Walk along bottom of embankments where possible. Check batter stability and vegetation. Notify civil engineer if detrimental features observed.



## 12. Erosion & Sedimentation Control

Landcom have published a design guide entitled “Managing Urban Stormwater - Soils and Construction” which is regarded as the standard to which erosion and sedimentation control should be designed to within NSW.

The control of erosion and sedimentation describes the measures incorporated during and following construction of a new development to prevent the pollution and degradation of the downstream watercourse.

A Soil and Water Management Plan has prepared as part of the development application documentation and is included in Appendix A of this report.

### 12.1 Stormwater Drainage Infrastructure Inlets

Risk:

- Sediment from the construction site washing into the existing stormwater drainage inlet infrastructure.

Consequence:

- The sediment will then be conveyed into the downstream waterbody by stormwater runoff, contaminating the waterbody.
- The sediment will build up blocking the stormwater infrastructure and preventing stormwater conveyance to the downstream waterbody and impacting drainage upstream.

Mitigation:

- Sediment traps protection will be installed surrounding all existing stormwater drainage infrastructure inlets to prevent sediment entering the system.
- Temporary Stormwater Systems are to be installed where required to capture all site runoff within the zone of excavation. Runoff will be allowed to settle out suspended particles and debris, and an acceptable water of 50mg per litre of Non Filterable Residues (NFR) is required to be achieved prior to discharge.
- Installation of a fence around the perimeter of the basin is required as well as a rip rap to allow for bobcat access for periodic removal of sediment. Also, a perforated riser outlet pipe needs to be placed for the connection and discharge to an existing pit.

Maintenance:

- Frequent inspection of the sandbags to ensure they are arranged in a manner that prevents sediment from accessing the drainage system. If sediment is building up on the sandbags they should be cleared of sediment and re-established.
- All soil erosion and sediment control structures including temporary sediment basins and sediment traps shall be inspected following each storm event and any necessary maintenance work shall be undertaken to ensure their continued proper operation.

### 12.2 Construction Exit Protection

Risk:

- Spoil such as soil being conveyed from the site on the wheels of vehicles.



Consequence:

- Spoil being tracked onto the public road corridors where it is then washed into the existing stormwater drainage infrastructure and is then washed downstream polluting the downstream waterbody.
- Spoil being tracked onto the public road creating dangerous driving conditions for other road users.

Mitigation:

- A shaker grid and wash down facility will be installed at all exits from the construction site. All vehicles leaving the site will have their wheels washed down and pass over the shaker grid to remove any spoil collected on their wheels and retaining the spoil on site.

Maintenance:

- Frequent inspection of the shaker grid to ensure it is clean and still functioning.

## 12.3 Downstream Site Boundaries

Risk:

- Rainfall runoff falling on the site collecting sediment from the construction site and conveying it overland onto downstream properties and waterbodies.

Consequence:

- Sediment discharge polluting downstream properties and waterbodies.

Mitigation:

- Installation of sediment fences on all downstream boundaries of the site to collect sediment and prevent it discharging onto downstream properties or waterbodies.

Maintenance:

- Regular inspection of the sediment fences to ensure they are functioning correctly and are intact.
- If sediment build up is present it should be removed to ensure correct functionality of the fences.

## 12.4 Sediment Runoff

Risk:

- Sediment from the construction site washing into the existing stormwater drainage inlet infrastructure.

Consequence:

- The sediment will build up blocking the stormwater infrastructure and preventing stormwater conveyance to the downstream waterbody and impacting drainage upstream.

Mitigation:

- A sediment basin will be installed, and all overland flow directed towards it. The basin will attenuate stormwater flows allowing for the settlement of sediment preventing discharge into the downstream infrastructure.

Maintenance:

- Frequent inspection of the basin to ensure there is sufficient volume for the storage of settlement. If there is insufficient storage the basin should be cleared of sediment and re-established.



# Appendix A Civil Design Documentation







# SCHOOL INFRASTRUCTURE NSW



# HUNTER RIVER HIGH SCHOOL

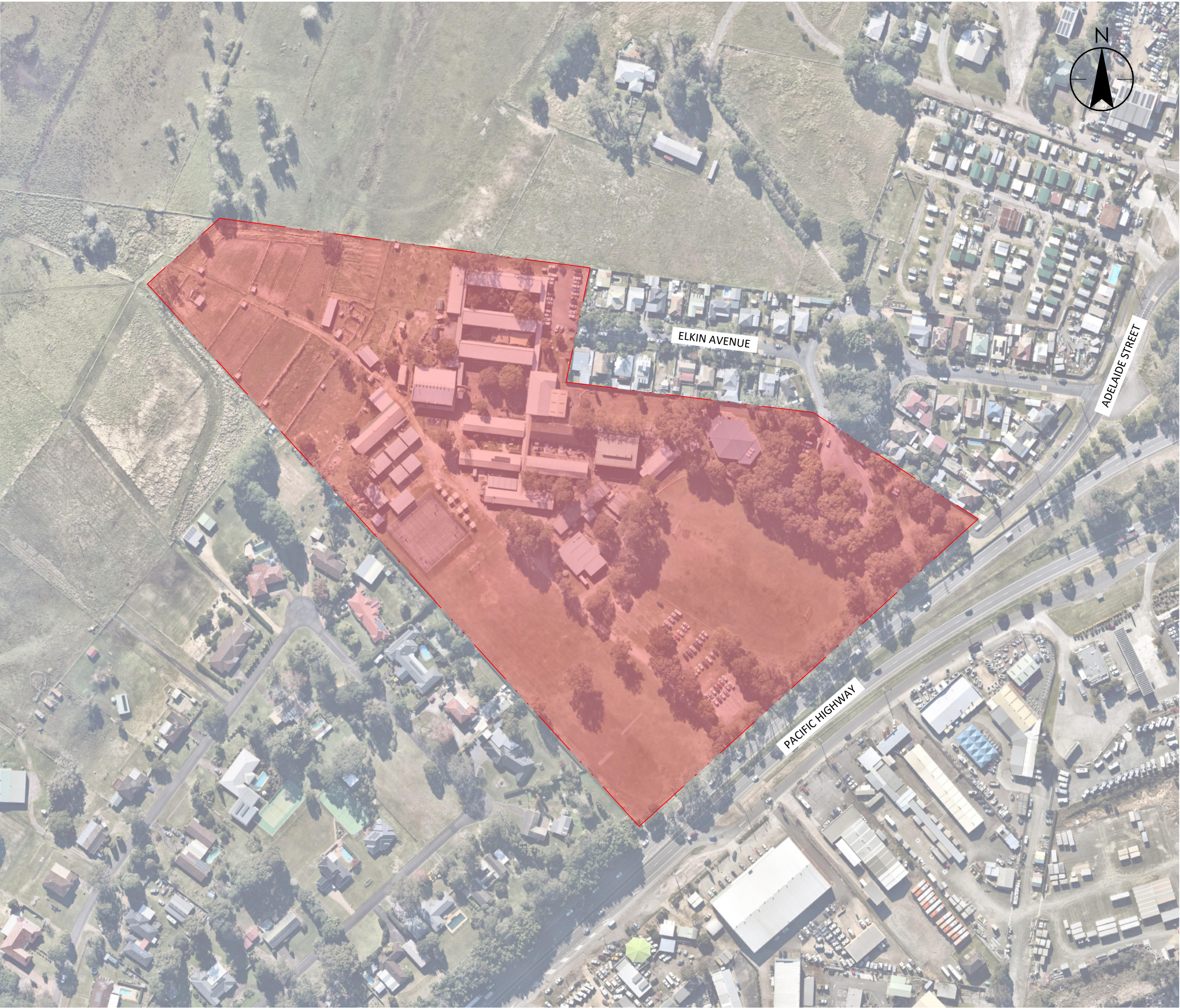
36 ELKIN AVENUE,  
HEATHERBRAE NSW  
2324

REVISED SCHEMATIC DESIGN ISSUE  
13/04/2023

Stantec Project Number: 301350909

DRAWING LIST	
NO.	DRAWING NAME
HRHS-STNC-XX-XX-DR-C-000001	COVER SHEET, DRAWING REGISTRY AND LOCALITY PLAN
HRHS-STNC-XX-XX-DR-C-007001	GENERAL NOTES
HRHS-STNC-XX-XX-DR-C-050001	EXISTING CONDITIONS PLAN
HRHS-STNC-XX-XX-DR-C-055001	DEMOLITION PLAN
HRHS-STNC-XX-XX-DR-C-060001	GENERAL ARRANGEMENT PLAN SITE WIDE
HRHS-STNC-XX-XX-DR-C-060101	SITEWORKS PLAN-SHEET 1
HRHS-STNC-XX-XX-DR-C-060102	SITEWORKS PLAN-SHEET 2
HRHS-STNC-XX-XX-DR-C-060103	SITEWORKS PLAN-SHEET 3
HRHS-STNC-XX-XX-DR-C-060104	SITEWORKS PLAN-SHEET 4
HRHS-STNC-XX-XX-DR-C-060105	SITEWORKS PLAN-SHEET 5
HRHS-STNC-XX-XX-DR-C-060106	SITEWORKS PLAN-SHEET 6
HRHS-STNC-XX-XX-DR-C-060107	SITEWORKS PLAN-SHEET 7
HRHS-STNC-XX-XX-DR-C-060108	SITEWORKS PLAN-SHEET 8
HRHS-STNC-XX-XX-DR-C-060109	SITEWORKS PLAN-SHEET 9
HRHS-STNC-XX-XX-DR-C-070001	EROSION AND SEDIMENT CONTROL PLAN
HRHS-STNC-XX-XX-DR-C-076001	EROSION AND SEDIMENT CONTROL DETAILS
HRHS-STNC-XX-XX-DR-C-100001	BULK EARTHWORKS PLAN
HRHS-STNC-XX-XX-DR-C-403001	ROADS TYPICAL SECTIONS SHEET 1
HRHS-STNC-XX-XX-DR-C-406001	ROADS DETAILS SHEET 1
HRHS-STNC-XX-XX-DR-C-406002	ROADS DETAILS SHEET 2
HRHS-STNC-XX-XX-DR-C-406003	ROADS DETAILS SHEET 3
HRHS-STNC-XX-XX-DR-C-440101	PAVEMENT PLAN SHEET 1
HRHS-STNC-XX-XX-DR-C-440102	PAVEMENT PLAN SHEET 2
HRHS-STNC-XX-XX-DR-C-440103	PAVEMENT PLAN SHEET 3
HRHS-STNC-XX-XX-DR-C-440104	PAVEMENT PLAN SHEET 4
HRHS-STNC-XX-XX-DR-C-440105	PAVEMENT PLAN SHEET 5
HRHS-STNC-XX-XX-DR-C-440106	PAVEMENT PLAN SHEET 6
HRHS-STNC-XX-XX-DR-C-440107	PAVEMENT PLAN SHEET 7
HRHS-STNC-XX-XX-DR-C-440108	PAVEMENT PLAN SHEET 8

HRHS-STNC-XX-XX-DR-C-440109	PAVEMENT PLAN SHEET 9
HRHS-STNC-XX-XX-DR-C-520001	STORMWATER DRAINAGE PLAN SITE WIDE
HRHS-STNC-XX-XX-DR-C-526001	STORMWATER DRAINAGE DETAILS SHEET 1
HRHS-STNC-XX-XX-DR-C-526002	STORMWATER DRAINAGE DETAILS SHEET 2
HRHS-STNC-XX-XX-DR-C-526003	STORMWATER DRAINAGE DETAILS SHEET 3
HRHS-STNC-XX-XX-DR-C-526004	STORMWATER DRAINAGE DETAILS SHEET 4
HRHS-STNC-XX-XX-DR-C-527001	STORMWATER DRAINAGE PIT SCHEDULE



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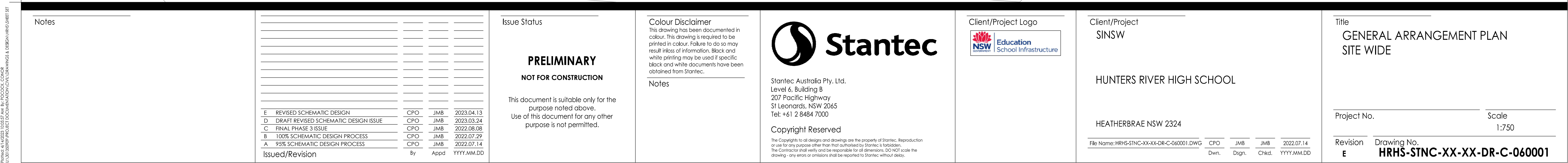




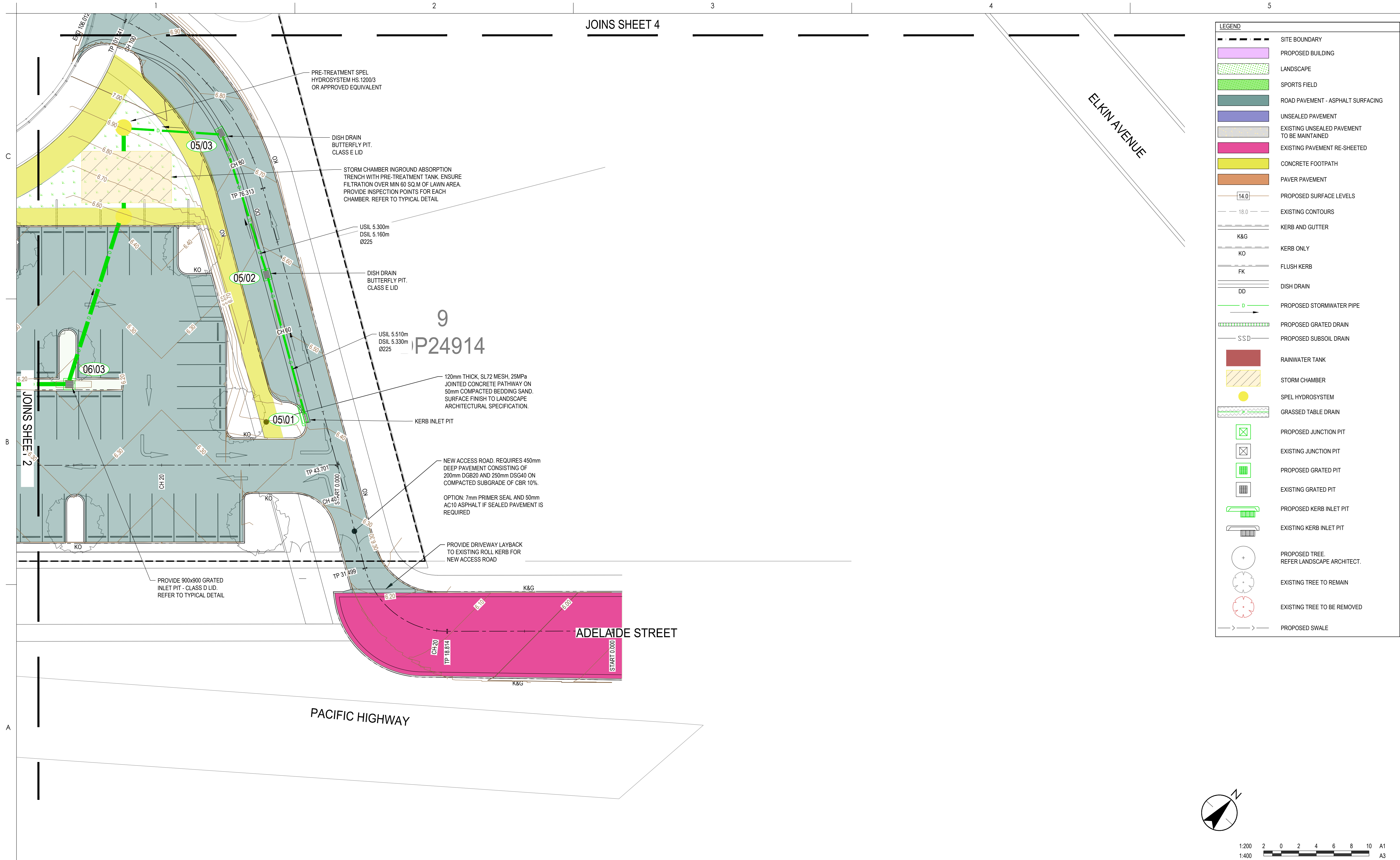












Notes

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C	FINAL PHASE 3 ISSUE	CPO	JMB	2022.08.08
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By

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Client/Project Logo

Education

School Infrastructure

Client/Project

SINSW

HUNTERS RIVER HIGH SCHOOL

HEATHERBRAE NSW 2324

File Name: HRHS-STNC-XX-XX-DR-C-060101.DWG

CPO

JMB

JMB

2022.07.14

Dwn.

Dign.

Chkd.

YYYY.MM.DD

Title

SITWORKS PLAN-SHEET 1

Project No.

Scale

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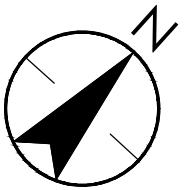
Revision

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Drawing No.

HRHS-STNC-XX-XX-DR-C-060101





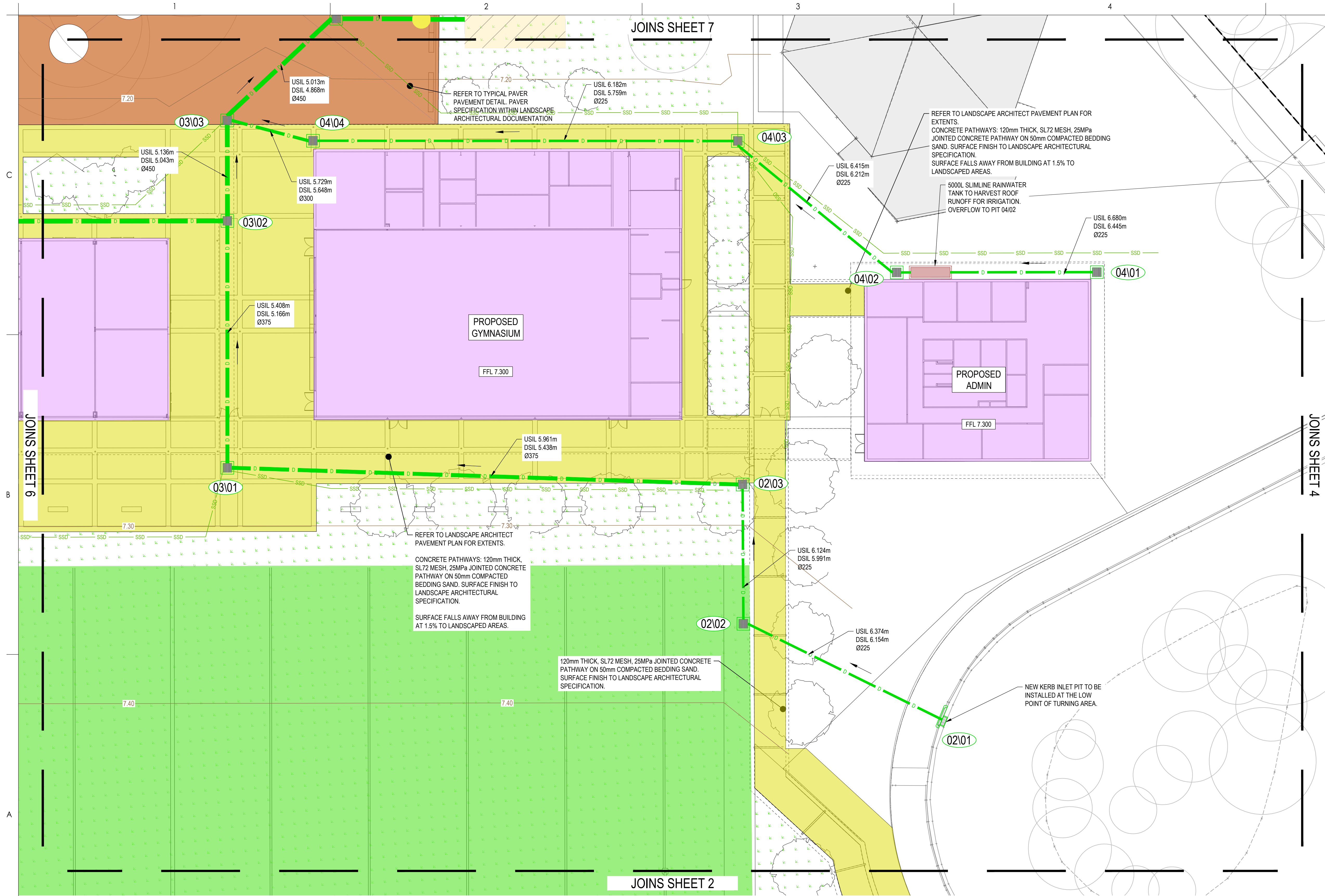
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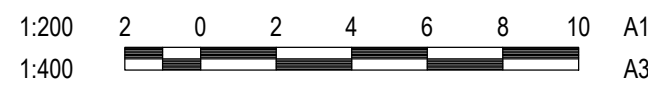
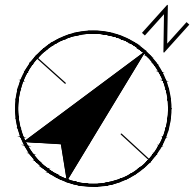








LEGEND	
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	LANDSCAPE
	SPORTS FIELD
	ROAD PAVEMENT - ASPHALT SURFACING
	UNSEALED PAVEMENT
	EXISTING UNSEALED PAVEMENT TO BE MAINTAINED
	EXISTING PAVEMENT RE-SHEETED
	CONCRETE FOOTPATH
	PAVER PAVEMENT
	PROPOSED SURFACE LEVELS
	EXISTING CONTOURS
	KERB AND GUTTER
	KERB ONLY
	FLUSH KERB
	DISH DRAIN
	PROPOSED STORMWATER PIPE
	PROPOSED GRATED DRAIN
	PROPOSED SUBSOIL DRAIN
	RAINWATER TANK
	STORM CHAMBER
	SPEL HYDROSYSTEM
	GRASSED TABLE DRAIN
	PROPOSED JUNCTION PIT
	EXISTING JUNCTION PIT
	PROPOSED GRATED PIT
	EXISTING GRATED PIT
	PROPOSED KERB INLET PIT
	EXISTING KERB INLET PIT
	PROPOSED TREE. REFER LANDSCAPE ARCHITECT.
	EXISTING TREE TO REMAIN
	EXISTING TREE TO BE REMOVED
	PROPOSED SWALE



Notes

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Client/Project  
SINSW

HUNTERS RIVER HIGH SCHOOL

HEATHERBRAE NSW 2324

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CPO	JMB	JMB	2022.07.14
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Title  
SITWORKS PLAN-SHEET 5

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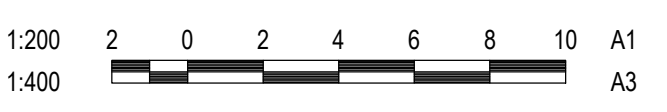
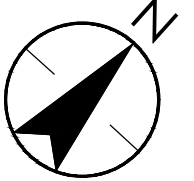
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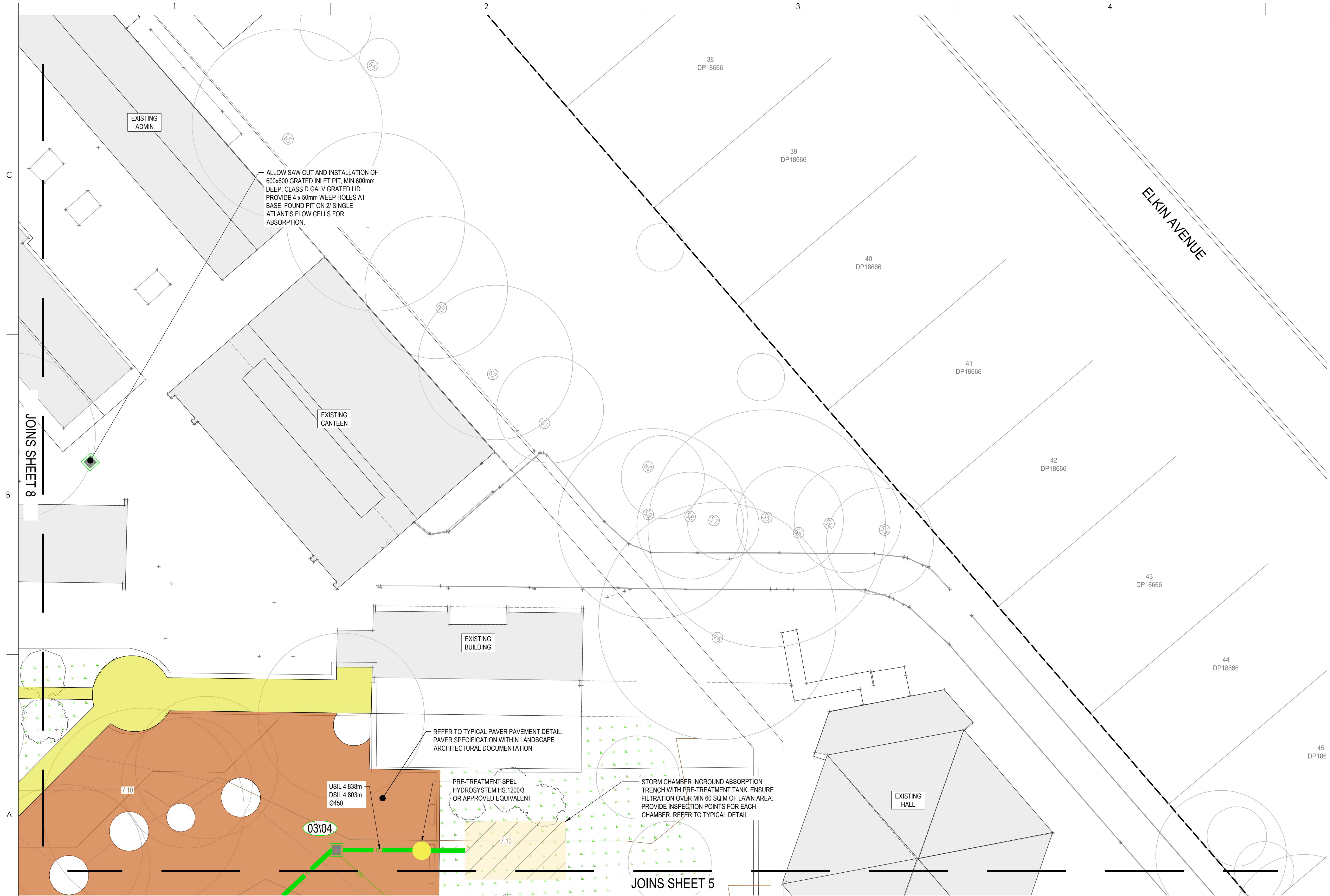
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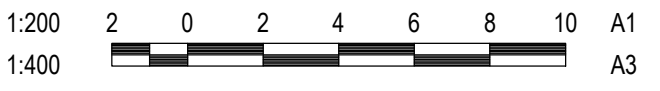
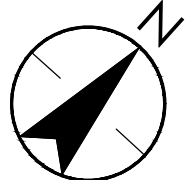
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**LEGEND**

- SITE BOUNDARY
- PROPOSED BUILDING
- LANDSCAPE
- SPORTS FIELD
- ROAD PAVEMENT - ASPHALT SURFACING
- UNSEALED PAVEMENT
- EXISTING UNSEALED PAVEMENT TO BE MAINTAINED
- EXISTING PAVEMENT RE-SHEETED
- CONCRETE FOOTPATH
- PAVER PAVEMENT
- 14.0 PROPOSED SURFACE LEVELS
- 18.0 EXISTING CONTOURS
- K&G KERB AND GUTTER
- KO KERB ONLY
- FK FLUSH KERB
- DD DISH DRAIN
- D PROPOSED STORMWATER PIPE
- PROPOSED GRATED DRAIN
- SSD PROPOSED SUBSOIL DRAIN
- RAINWATER TANK
- STORM CHAMBER
- SPEL HYDROSYSTEM
- GRASSED TABLE DRAIN
- PROPOSED JUNCTION PIT
- EXISTING JUNCTION PIT
- PROPOSED GRATED PIT
- EXISTING GRATED PIT
- PROPOSED KERB INLET PIT
- EXISTING KERB INLET PIT
- PROPOSED TREE. REFER LANDSCAPE ARCHITECT.
- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- PROPOSED SWALE



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NSW Education School Infrastructure

Client/Project

SINSW

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HEATHERBRAE NSW 2324

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Title

SITWORKS PLAN-SHEET 7

Project No.

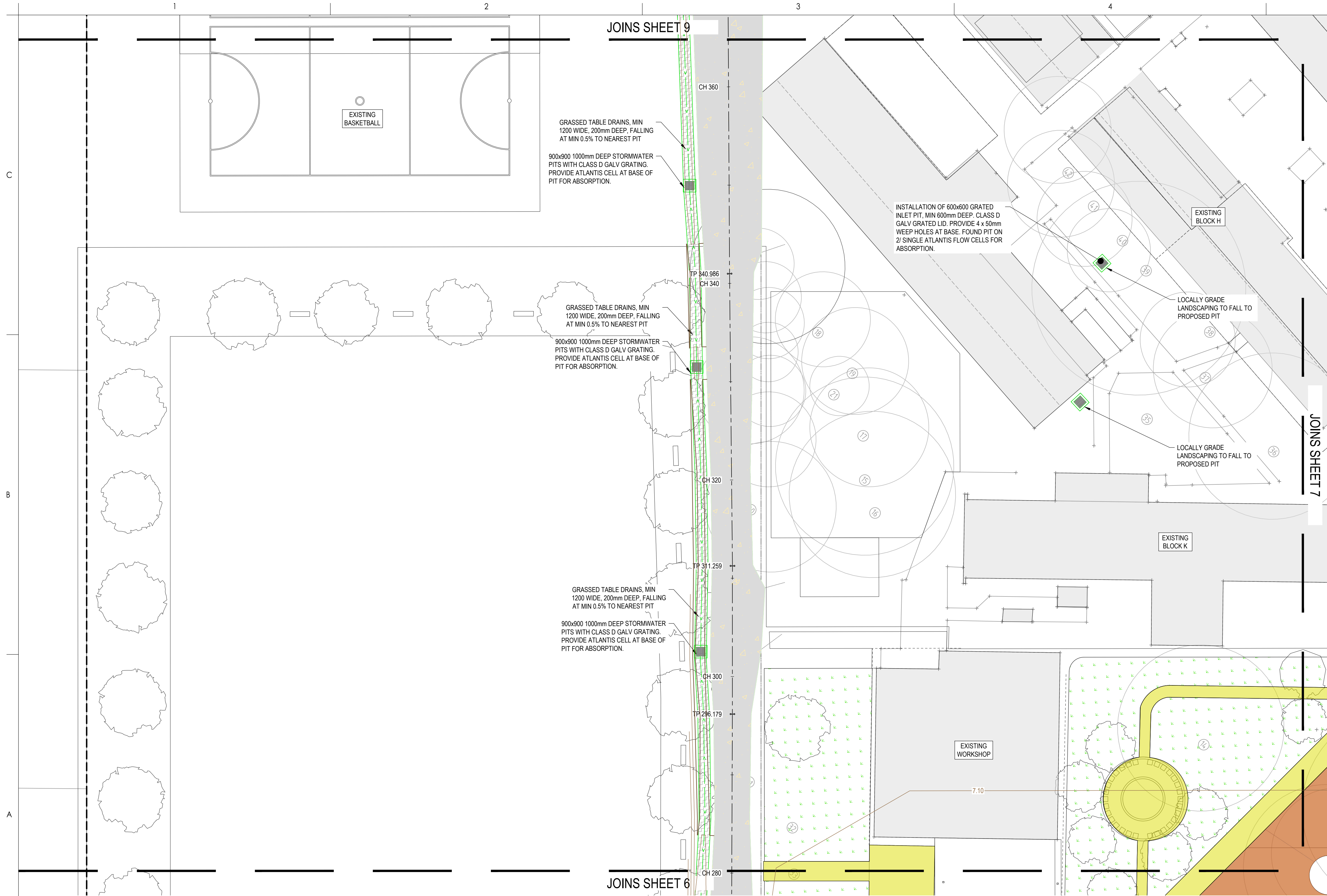
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Revision E

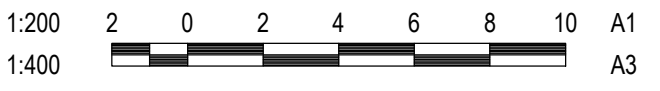
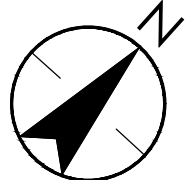
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UN30130709 PROJECT DOCUMENTS AND DRAWINGS & DESIGN VIEWS SHEET SET





LEGEND	
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	LANDSCAPE
	SPORTS FIELD
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	UNSEALED PAVEMENT
	EXISTING UNSEALED PAVEMENT TO BE MAINTAINED
	EXISTING PAVEMENT RE-SHEETED
	CONCRETE FOOTPATH
	PAVER PAVEMENT
	PROPOSED SURFACE LEVELS
	EXISTING CONTOURS
	KERB AND GUTTER
	KERB ONLY
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	RAINWATER TANK
	STORM CHAMBER
	SPEL HYDROSYSTEM
	GRASSSED TABLE DRAIN
	PROPOSED JUNCTION PIT
	EXISTING JUNCTION PIT
	PROPOSED GRATED PIT
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	PROPOSED KERB INLET PIT
	EXISTING KERB INLET PIT
	PROPOSED TREE. REFER LANDSCAPE ARCHITECT.
	EXISTING TREE TO REMAIN
	EXISTING TREE TO BE REMOVED
	PROPOSED SWALE



Notes

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HEATHERBRAE NSW 2324

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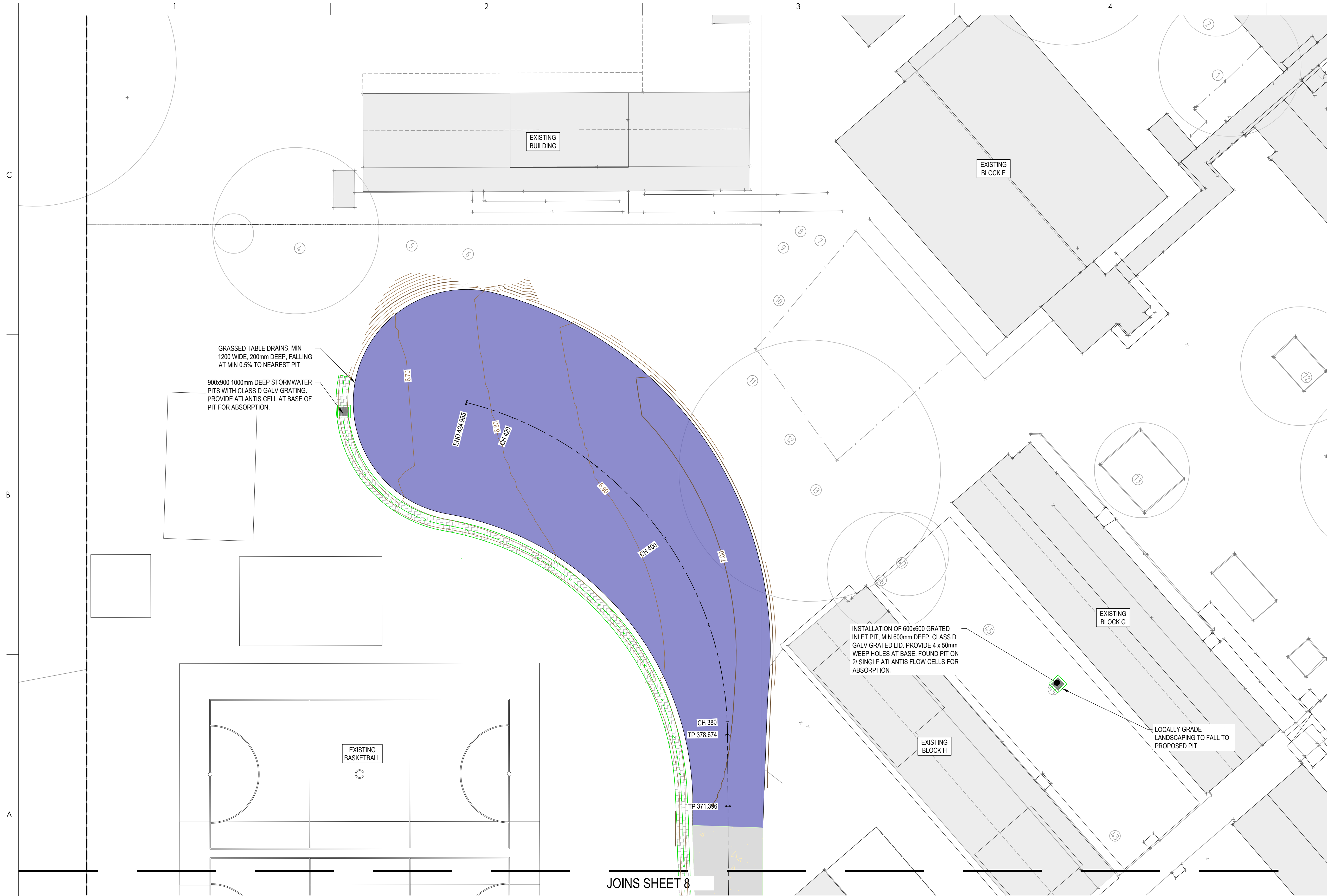
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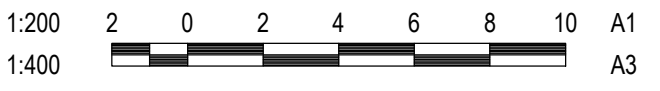
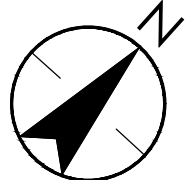
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LEGEND	
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	SPORTS FIELD
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	UNSEALED PAVEMENT
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	EXISTING PAVEMENT RE-SHEETED
	CONCRETE FOOTPATH
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	EXISTING JUNCTION PIT
	PROPOSED GRATED PIT
	EXISTING GRATED PIT
	PROPOSED KERB INLET PIT
	EXISTING KERB INLET PIT
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	EXISTING TREE TO REMAIN
	EXISTING TREE TO BE REMOVED
	PROPOSED SWALE



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A	95% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.14

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By

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Client/Project

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HUNTERS RIVER HIGH SCHOOL

HEATHERBRAE NSW 2324

File Name: HRHS-STNC-XX-XX-DR-C-060101.DWG

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Title

SITWORKS PLAN-SHEET 9

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Scale

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Revision

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Drawing No.

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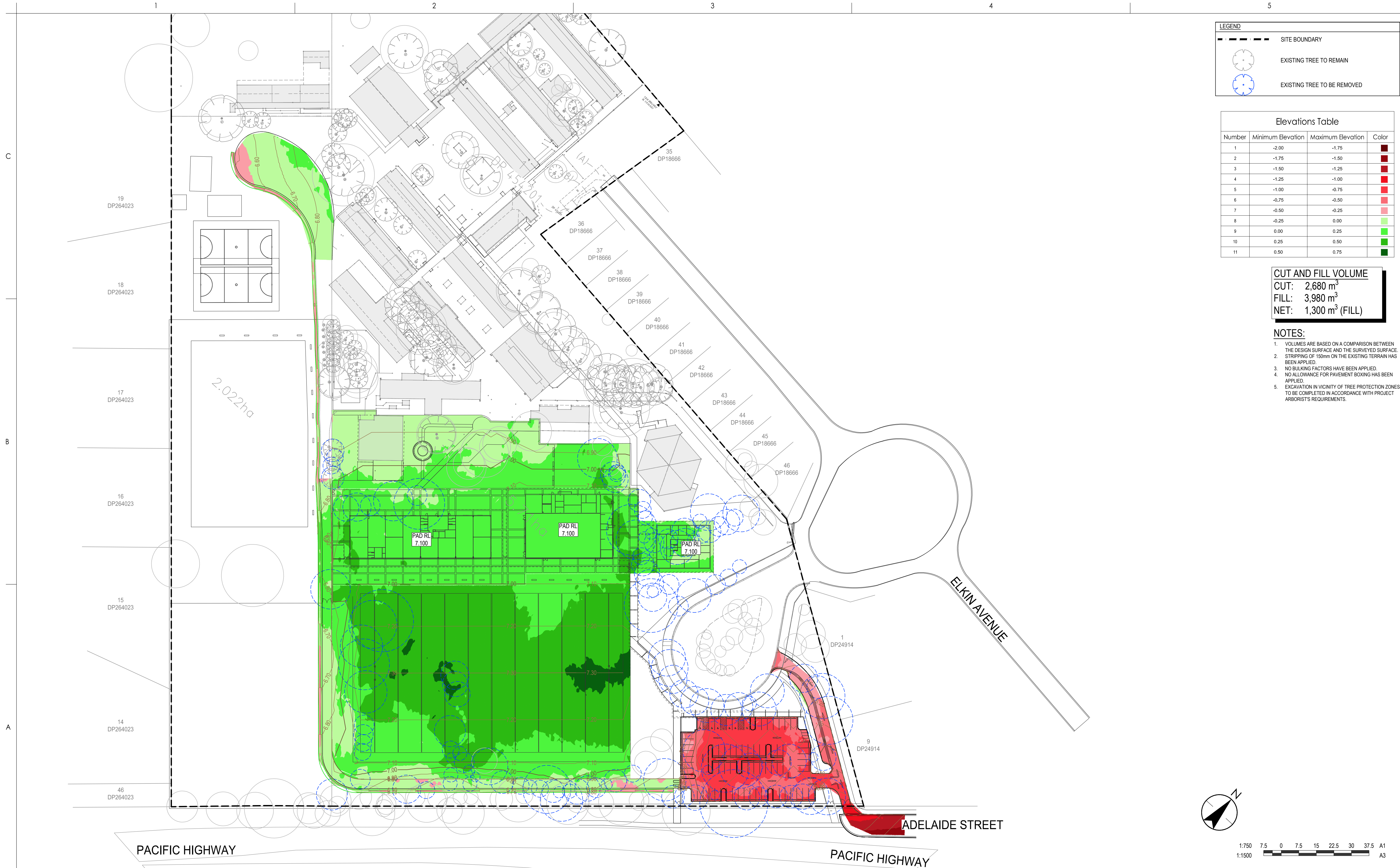










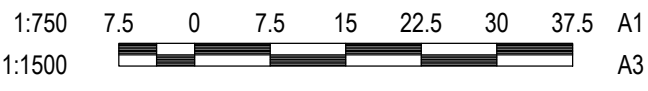
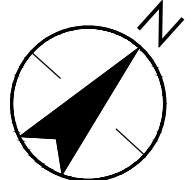


LEGEND	
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	EXISTING TREE TO REMAIN
	EXISTING TREE TO BE REMOVED

Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-2.00	-1.75	
2	-1.75	-1.50	
3	-1.50	-1.25	
4	-1.25	-1.00	
5	-1.00	-0.75	
6	-0.75	-0.50	
7	-0.50	-0.25	
8	-0.25	0.00	
9	0.00	0.25	
10	0.25	0.50	
11	0.50	0.75	

**CUT AND FILL VOLUME**  
CUT: 2,680 m<sup>3</sup>  
FILL: 3,980 m<sup>3</sup>  
NET: 1,300 m<sup>3</sup> (FILL)

- NOTES:**
- VOLUMES ARE BASED ON A COMPARISON BETWEEN THE DESIGN SURFACE AND THE SURVEYED SURFACE STRIPPING OF 150mm ON THE EXISTING TERRAIN HAS BEEN APPLIED.
  - NO BULKING FACTORS HAVE BEEN APPLIED.
  - NO ALLOWANCE FOR PAVEMENT BOXING HAS BEEN APPLIED.
  - EXCAVATION IN VICINITY OF TREE PROTECTION ZONES TO BE COMPLETED IN ACCORDANCE WITH PROJECT ARBORISTS REQUIREMENTS.



Notes

D	REVISED SCHEMATIC DESIGN	CPO	JMB	2023.04.13
C	DRAFT REVISED SCHEMATIC DESIGN ISSUE	CPO	JMB	2023.03.24
B	FINAL PHASE 3 ISSUE	CPO	JMB	2022.08.08
A	100% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.29
Issued/Revision	By	Appd	YYYY.MM.DD	

Issue Status

**PRELIMINARY**

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Notes

Client/Project Logo

Client/Project

SINSW

HUNTERS RIVER HIGH SCHOOL

HEATHERBRAE NSW 2324

File Name: HRHS-STNC-XX-XX-DR-C-100001.DWG

CPO JMB JMB 2022.07.29

Dwn. Dign. Chkd. YYYY.MM.DD

Title

BULK EARTHWORKS PLAN

Project No.

Scale

1:750

Revision

D

Drawing No.

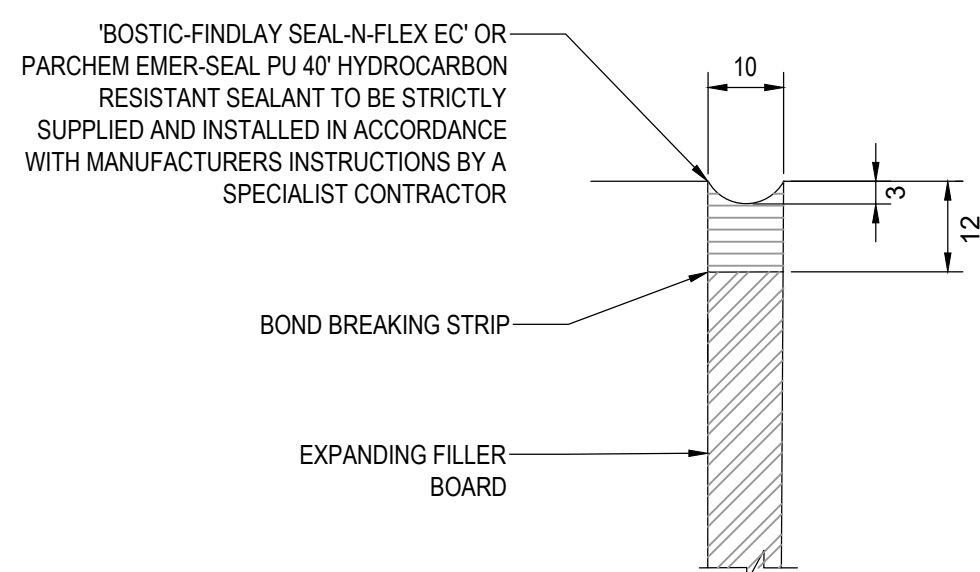
HRHS-STNC-XX-XX-DR-C-100001



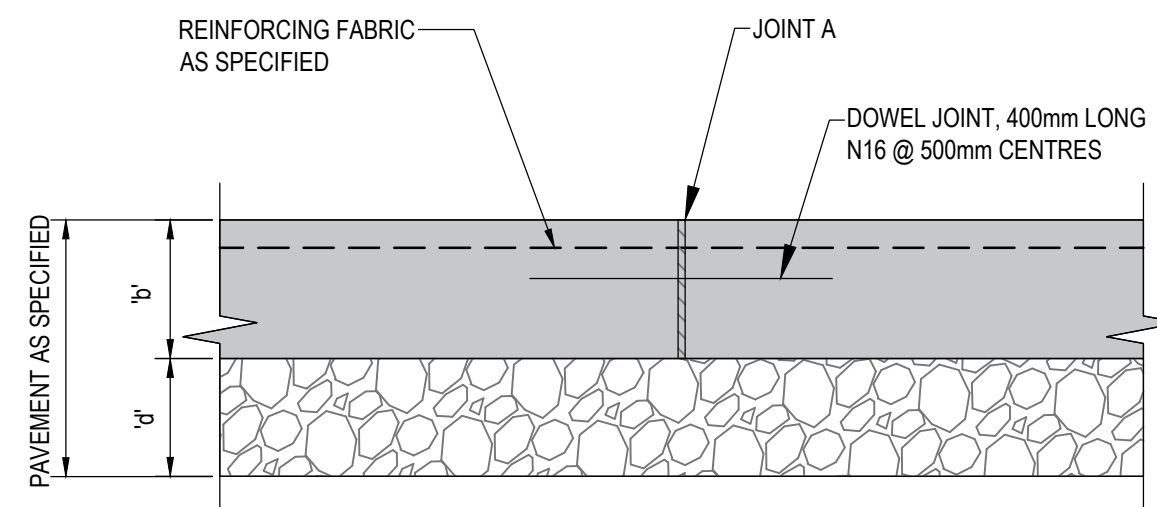




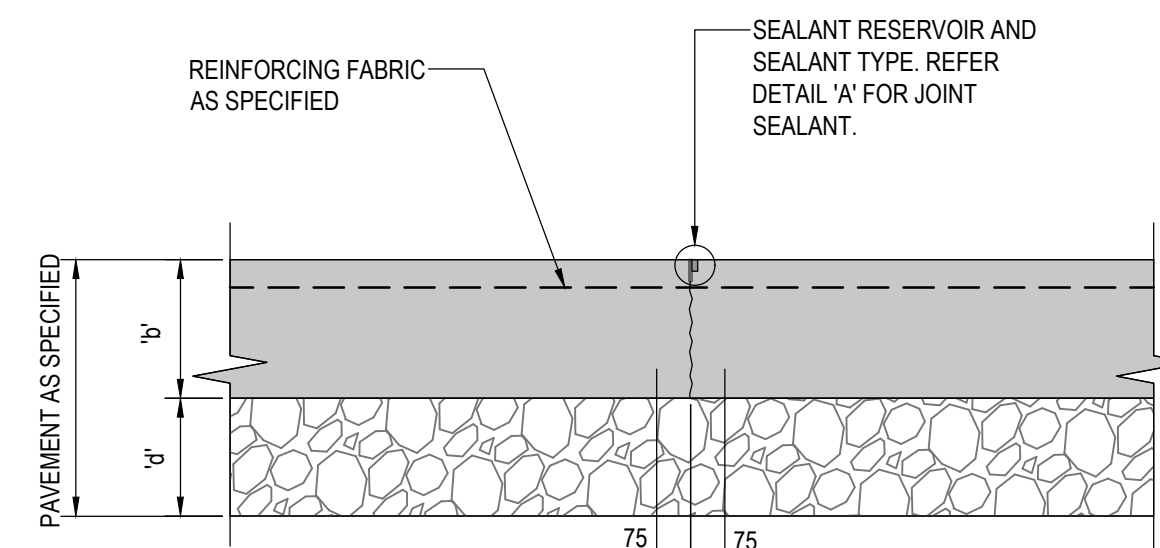




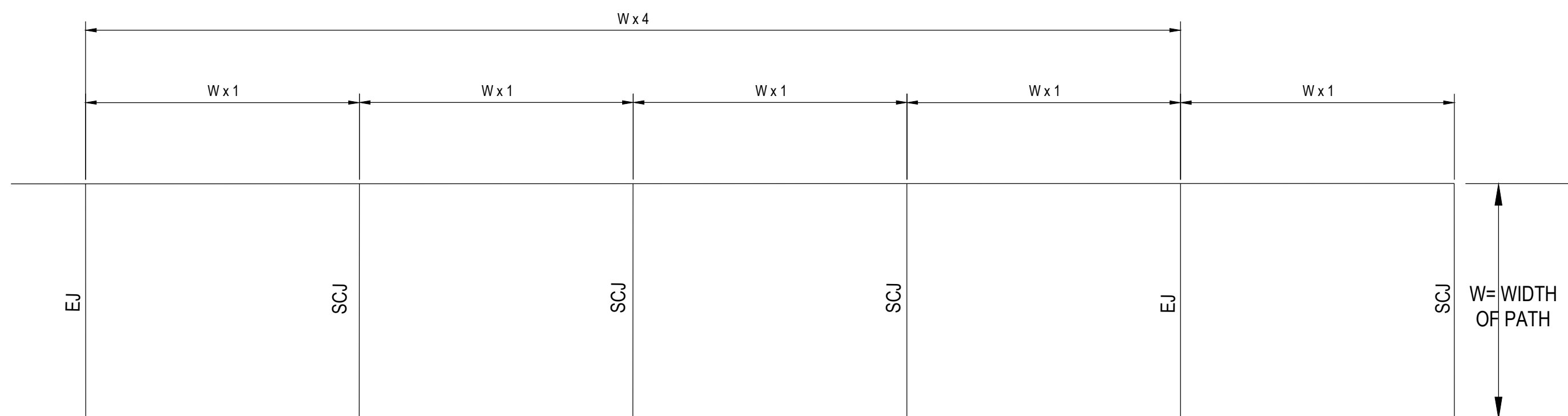
### JOINT SEALANT DETAIL 'B'



(SCALE 1:10)



SHOWN AS 'SCJ' ON PLAN  
N.T.S  
'd'= SUBBASE THICKNESS TO MATCH DEPTH OF PAVEMENT SUBBASE, BUT NOT LESS THAN 30

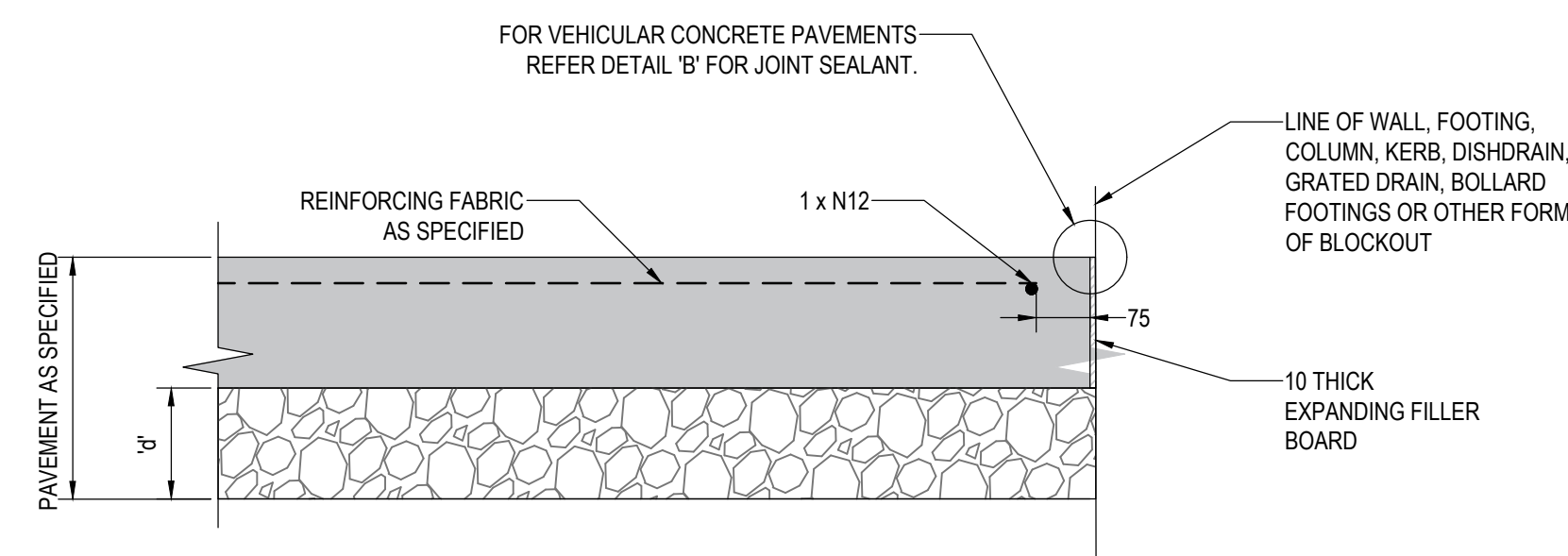


N.T.S

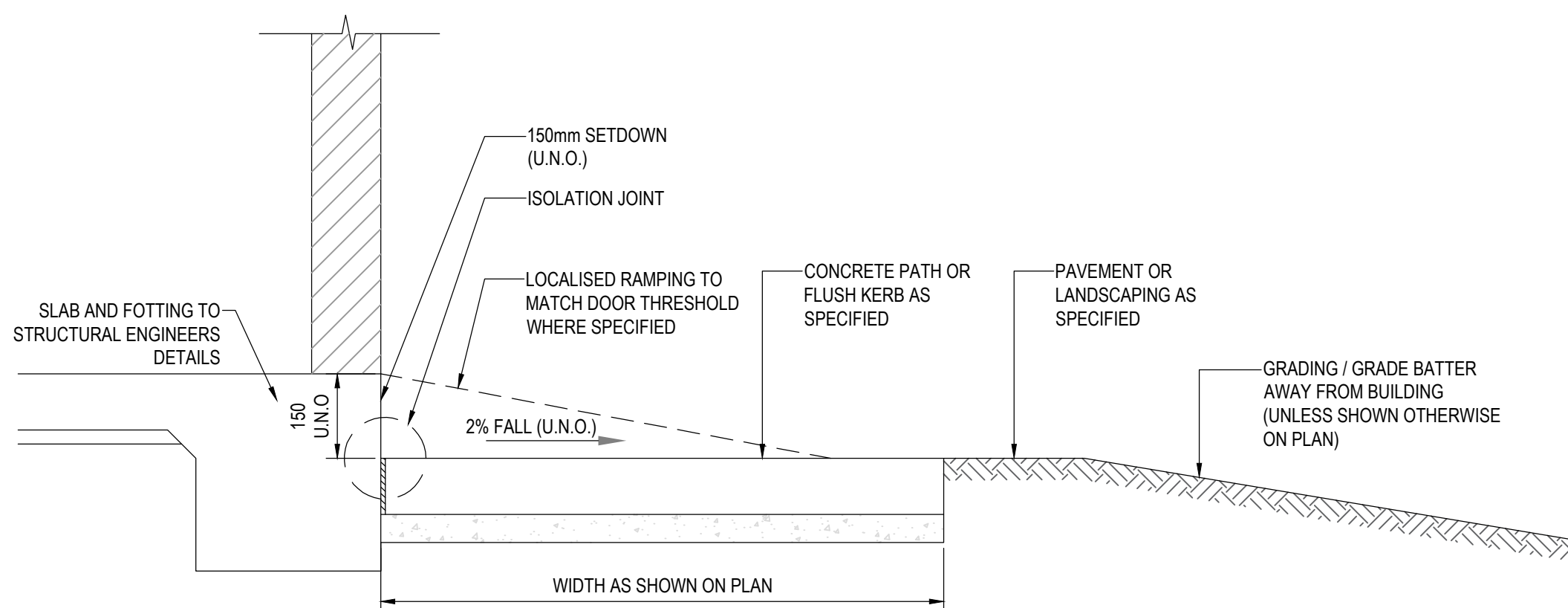
CONCRETE TO HAVE BROOM FINISH WITH SMOOTH TROWELLED EDGES.

SCJ- FOOTPATH SAWCUT JOINT. REFER TO DETAIL

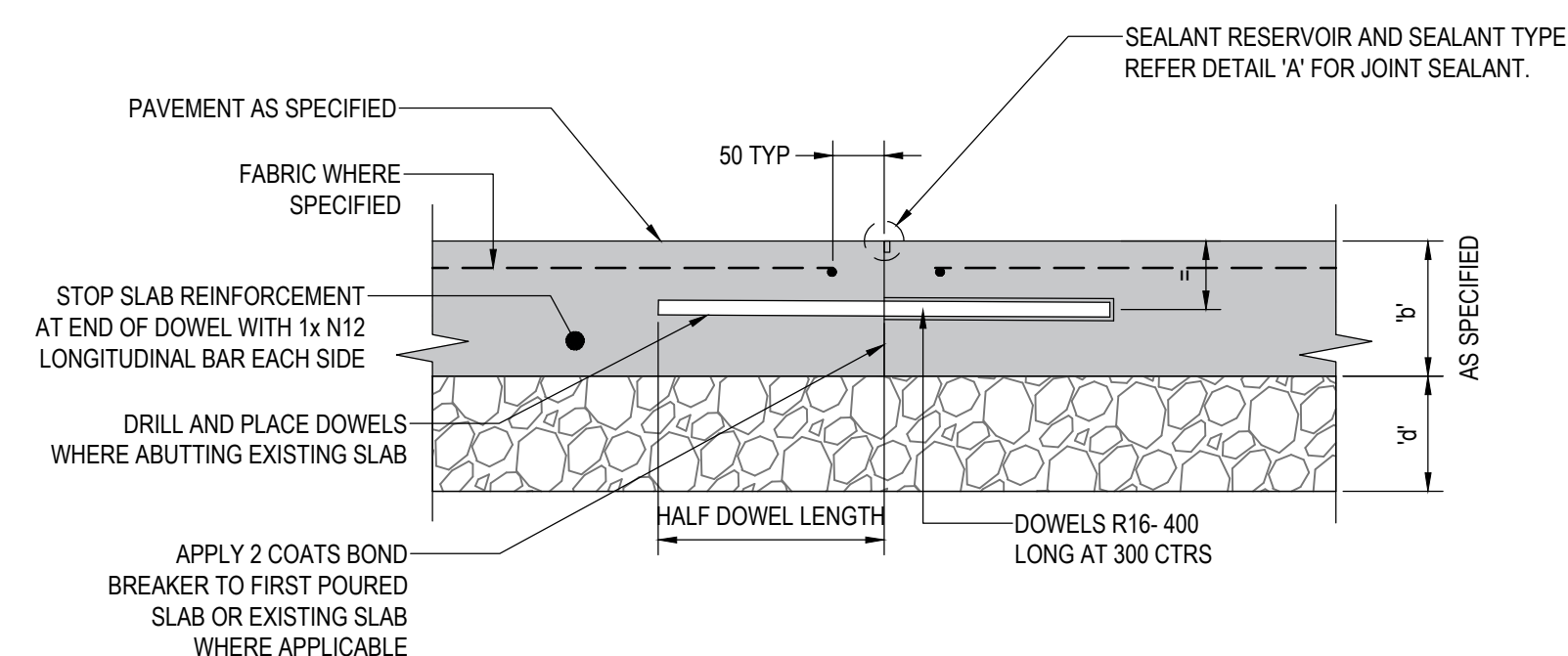
EJ- FOOTPATH EXPANSION JOINT. REFER TO DETAIL



SHOWN AS '1J' ON PLAN  
N.T.S  
NOTE: TO ALSO BE CONSTRUCTED IN LOCATIONS WHERE CONCRETE PAVEMENTS  
ABUT FORMS OF BLOCKOUT AS SPECIFIED BY THIS ISOLATION JOINT DETAIL.  
'd' = SUBBASE THICKNESS TO MATCH DEPTH OF PAVEMENT SUBBASE, BUT NOT LESS  
THAN 30



NTS

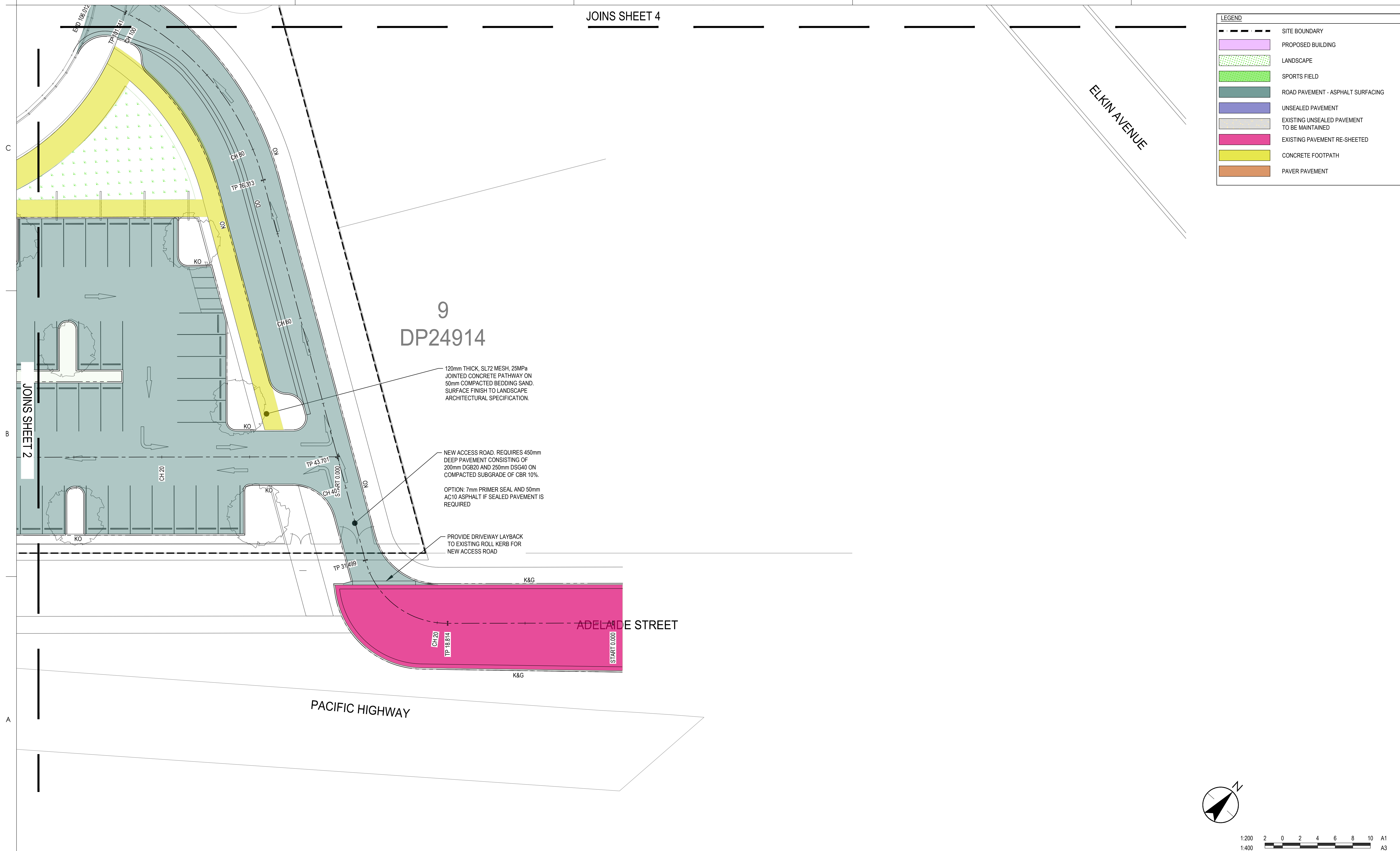


SHOWN AS 'DCJ' ON PLAN  
N.T.S  
'd'= SUBBASE THICKNESS TO MATCH DEPTH OF PAVEMENT SUBBASE, BUT NOT LESS THAN 30

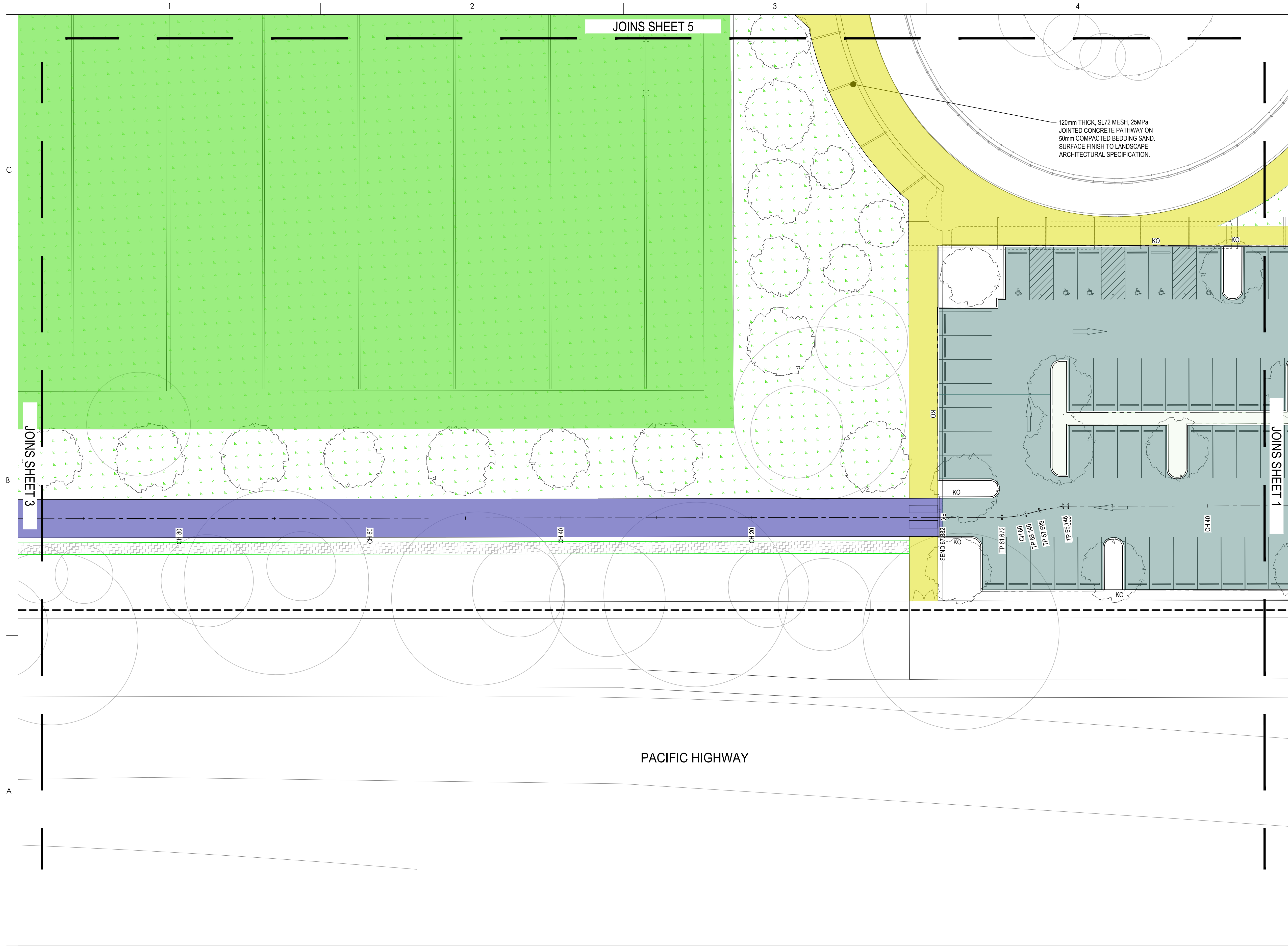




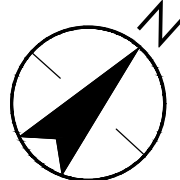








LEGEND	
	SITE BOUNDARY
	PROPOSED BUILDING
	LANDSCAPE
	SPORTS FIELD
	ROAD PAVEMENT - ASPHALT SURFACING
	UNSEALED PAVEMENT
	EXISTING UNSEALED PAVEMENT TO BE MAINTAINED
	EXISTING PAVEMENT RE-SHEETED
	CONCRETE FOOTPATH
	PAVER PAVEMENT



Notes

D	REVISED SCHEMATIC DESIGN	CPO	JMB	2023.04.13
C	DRAFT REVISED SCHEMATIC DESIGN ISSUE	CPO	JMB	2023.03.24
B	FINAL PHASE 3 ISSUE	CPO	JMB	2022.08.08
A	100% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.29

Issued/Revision

By

Appd

YYYY.MM.DD

Issue Status

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Notes

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St Leonards, NSW 2045  
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Client/Project Logo

Client/Project

SINSW

HUNTERS RIVER HIGH SCHOOL

HEATHERBRAE NSW 2324

File Name: HRHS-STNC-XX-XX-DR-C-440101.DWG

CPO	JMB	JMB	2022.07.29
Dwn.	Dign.	Chkd.	YYYY.MM.DD

Title

PAVEMENT PLAN SHEET 2

Project No.

Scale

1:200

Revision

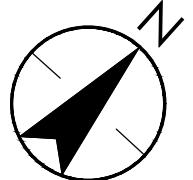
D

Drawing No.

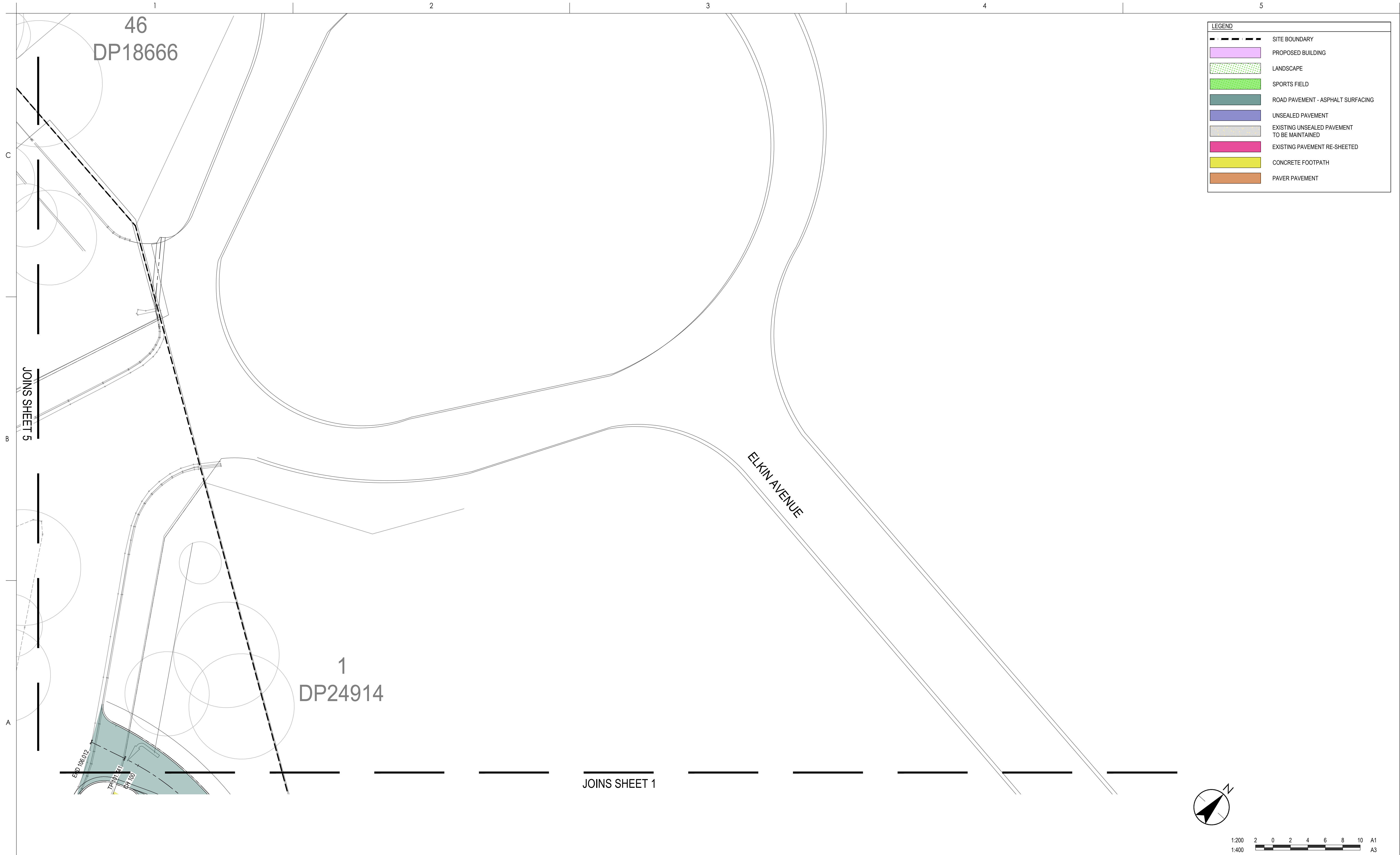
HRHS-STNC-XX-XX-DR-C-440102

PRINTED: 4/11/2023 10:00:00 AM BY: POCOCK, CONOR  
UN30130769 PROJECT DOCUMENTS AND DRAWINGS & DESIGN/REVISED SHEET SET





ORIGINAL SHEET - ISO A1    COORD - MGA/YY-Zone    DATUM - mAHD



Notes

D	REVISED SCHEMATIC DESIGN	CPO	JMB	2023.04.13
C	DRAFT REVISED SCHEMATIC DESIGN ISSUE	CPO	JMB	2023.03.24
B	FINAL PHASE 3 ISSUE	CPO	JMB	2022.08.08
A	100% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.29
Issued/Revision		By	Appd	YYYY.MM.DD

Issue Status

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Notes

Client/Project Logo

 **Education**  
School Infrastructure

Client/Project  
**SINSW**

**HUNTERS RIVER HIGH SCHOOL**

HEATHERBRAE NSW 2324

File Name: HRHS-STNC-XX-XX-DR-C-440101.DWG

CPO

JMB

JMB

2022.07.29

Dwn.

Dign.

Chkd.

YYYY.MM.DD

Title

**PAVEMENT PLAN**

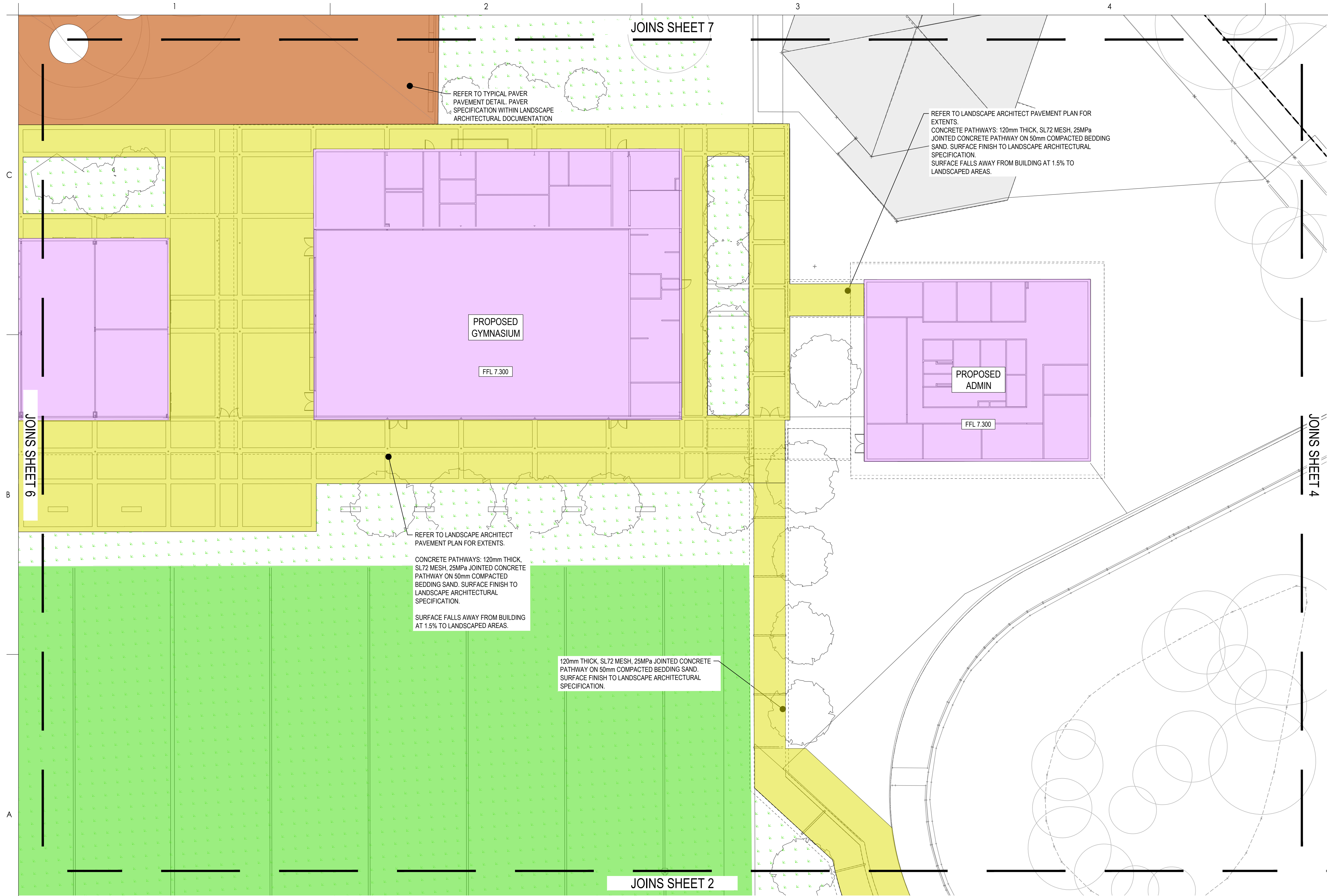
**SHEET 4**

Project No. \_\_\_\_\_ Scale \_\_\_\_\_

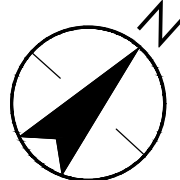
Revision **D** Drawing No. **HRHS-STNC-XX-XX-DR-C-440104**

Plotted: 4/11/2023 10:01:13 AM By: POCOCK, CONOR  
UN30130709 PROJECT DOCUMENTS\DRAWINGS & DESIGN\VRHS\SET





LEGEND	
	SITE BOUNDARY
	PROPOSED BUILDING
	LANDSCAPE
	SPORTS FIELD
	ROAD PAVEMENT - ASPHALT SURFACING
	UNSEALED PAVEMENT
	EXISTING UNSEALED PAVEMENT TO BE MAINTAINED
	EXISTING PAVEMENT RE-SHEETED
	CONCRETE FOOTPATH
	PAVER PAVEMENT



Notes

D	REVISED SCHEMATIC DESIGN	CPO	JMB	2023.04.13
C	DRAFT REVISED SCHEMATIC DESIGN ISSUE	CPO	JMB	2023.03.24
B	FINAL PHASE 3 ISSUE	CPO	JMB	2022.08.08
A	100% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.29

Issued/Revision

By

Appd

YYYY.MM.DD

Issue Status

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Client/Project Logo

Client/Project

SINSW

HUNTERS RIVER HIGH SCHOOL

HEATHERBRAE NSW 2324

File Name: HRHS-STNC-XX-XX-DR-C-440101.DWG

CPO	JMB	JMB	2022.07.29
Dwn.	Dign.	Chkd.	YYYY.MM.DD

Title

PAVEMENT PLAN SHEET 5

Project No.

Scale

1:200

Revision

D

Drawing No.

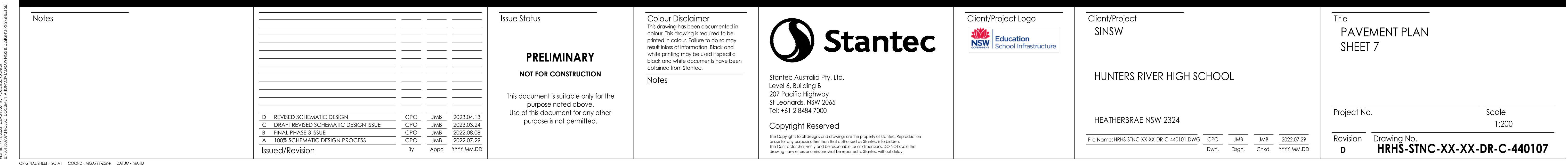
HRHS-STNC-XX-XX-DR-C-440105

PRINTED: 4/11/2023 10:09:21 AM BY: POCOCK, CONOR  
UN30130769 PROJECT DOCUMENTS\DRAWINGS & DESIGN\VRD\SHEET SET



















PRINTED: 4/11/2023 10:10:26 AM By: POCOCK, CONOR  
UN30130709 PROJECT DOCUMENTATION/DRAWINGS & DESIGN/VRD/SHEET SET

#### Notes

E	REVISED SCHEMATIC DESIGN	CPO	JMB	2023.04.13
D	DRAFT REVISED SCHEMATIC DESIGN ISSUE	CPO	JMB	2023.03.24
C	FINAL PHASE 3 ISSUE	CPO	JMB	2022.08.08
B	100% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.29
A	95% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.14

Issued/Revision

By Appd

#### Issue Status

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#### Client/Project Logo



Client/Project  
SINSW

HUNTERS RIVER HIGH SCHOOL

HEATHERBRAE NSW 2324

File Name: HRHS-STNC-XX-XX-DR-C-520001.DWG  
CPO JMB JMB 2022.07.14  
Dwn. Dign. Chkd. YYYY.MM.DD

#### Title

**STORMWATER DRAINAGE PLAN**  
**SITE WIDE**

Project No.

Scale

1:750

Revision  
**E**

Drawing No.  
**HRHS-STNC-XX-XX-DR-C-520001**

C

B

A

19  
DP264023

18  
DP264023

17  
DP264023

16  
DP264023

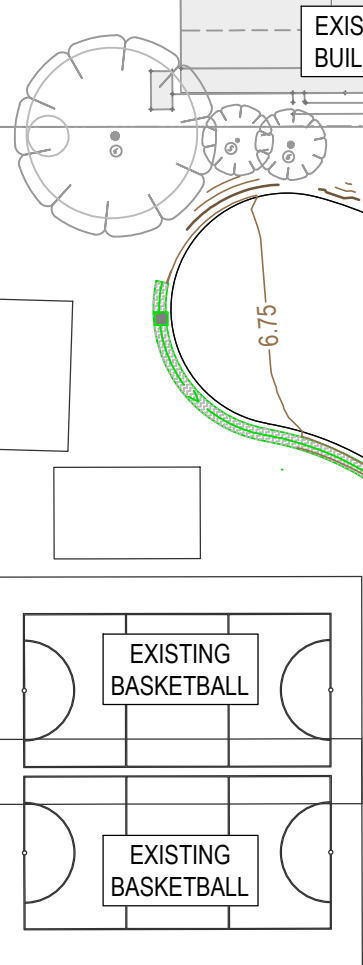
15  
DP264023

14  
DP264023

46  
DP264023

PACIFIC HIGHWAY

2.022ha



EXISTING BLOCK E

EXISTING BLOCK C

EXISTING BLOCK D

EXISTING BLOCK B

EXISTING BLOCK A

EXISTING BLOCK G

EXISTING BLOCK J

EXISTING BLOCK H

EXISTING ADMIN

EXISTING OFFICE

EXISTING CANTEN

EXISTING BLOCK K

EXISTING WORKSHOP

EXISTING BUILDING

EXISTING HALL

PROPOSED LEARNING HUB

FFL 7.300

PROPOSED GYMNASIUM

FFL 7.300

PROPOSED ADMIN

FFL 7.300

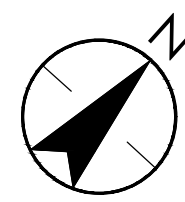
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DP24914

9  
DP24914

ADELAIDE STREET

PACIFIC HIGHWAY

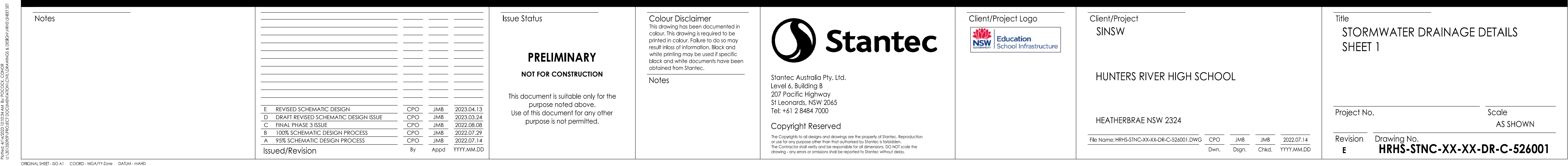
ELKIN AVENUE



1:750 7.5 0 7.5 15 22.5 30 37.5 A1  
1:1500 A3

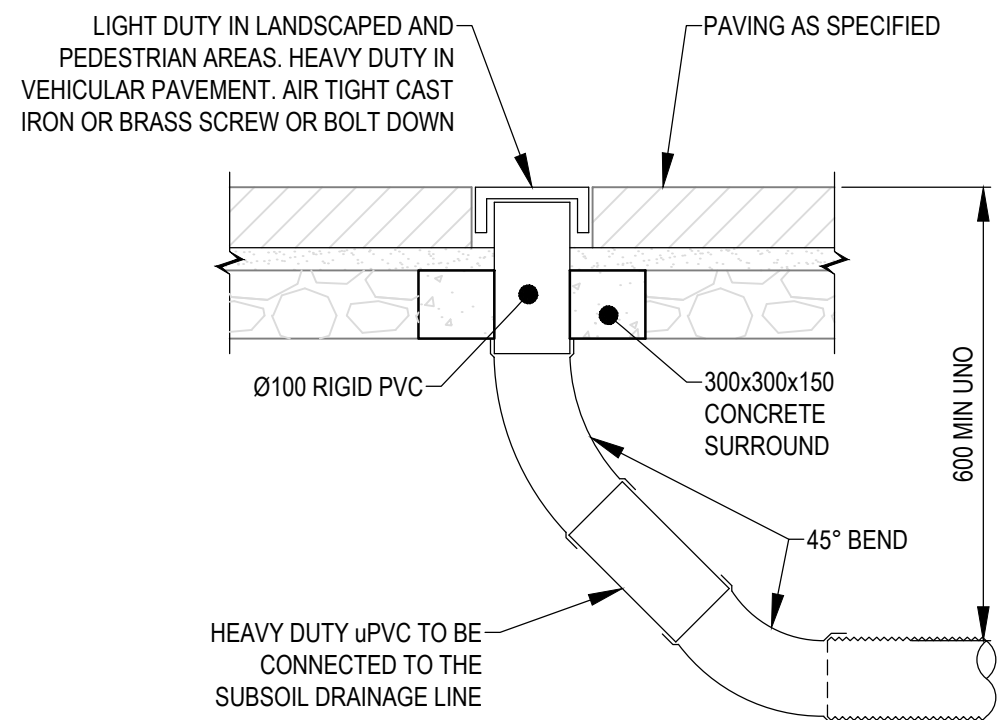
LEGEND	
	SITE BOUNDARY
	PROPOSED BUILDING
	PROPOSED STORMWATER PIPE
	PROPOSED GRATED DRAIN
	PROPOSED SUBSOIL DRAIN
	ON SITE DETENTION (OSD) TANK
	RAINWATER TANK
	STORM CHAMBER
	SPEL HYDROSYSTEM
	GRASSED TABLE DRAIN
	PROPOSED JUNCTION PIT
	EXISTING JUNCTION PIT
	PROPOSED GRATED PIT
	EXISTING GRATED PIT
	PROPOSED KERB INLET PIT
	EXISTING KERB INLET PIT
	PIT TAG
	PROPOSED TREE. REFER LANDSCAPE ARCHITECT.
	EXISTING TREE TO REMAIN



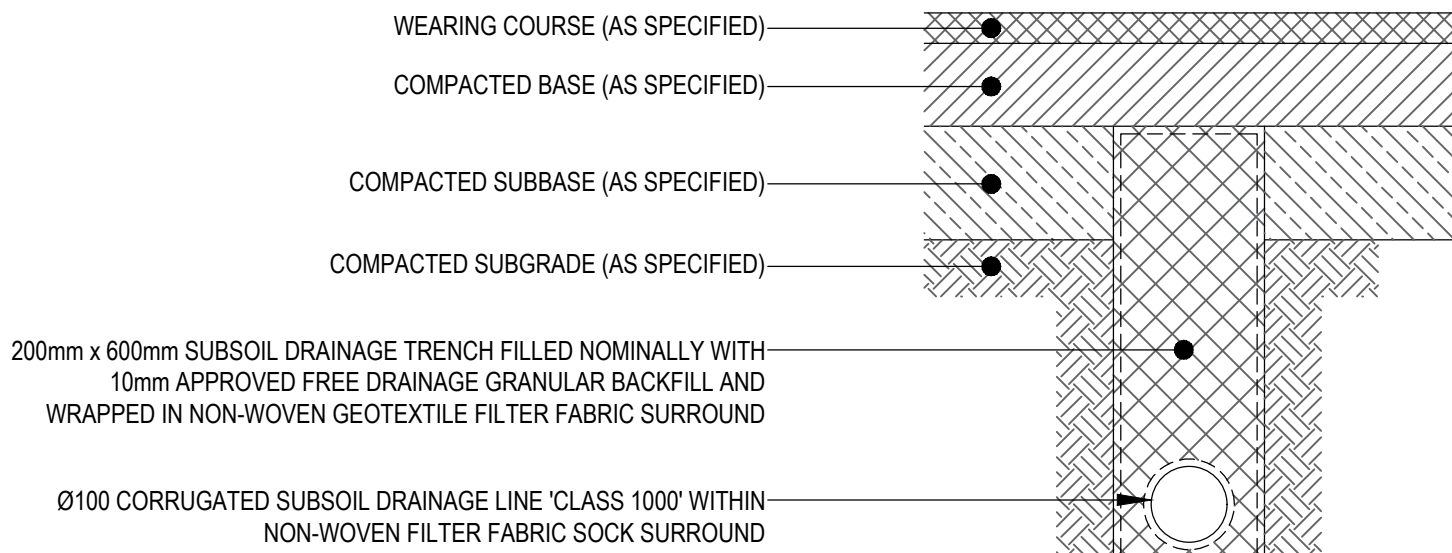




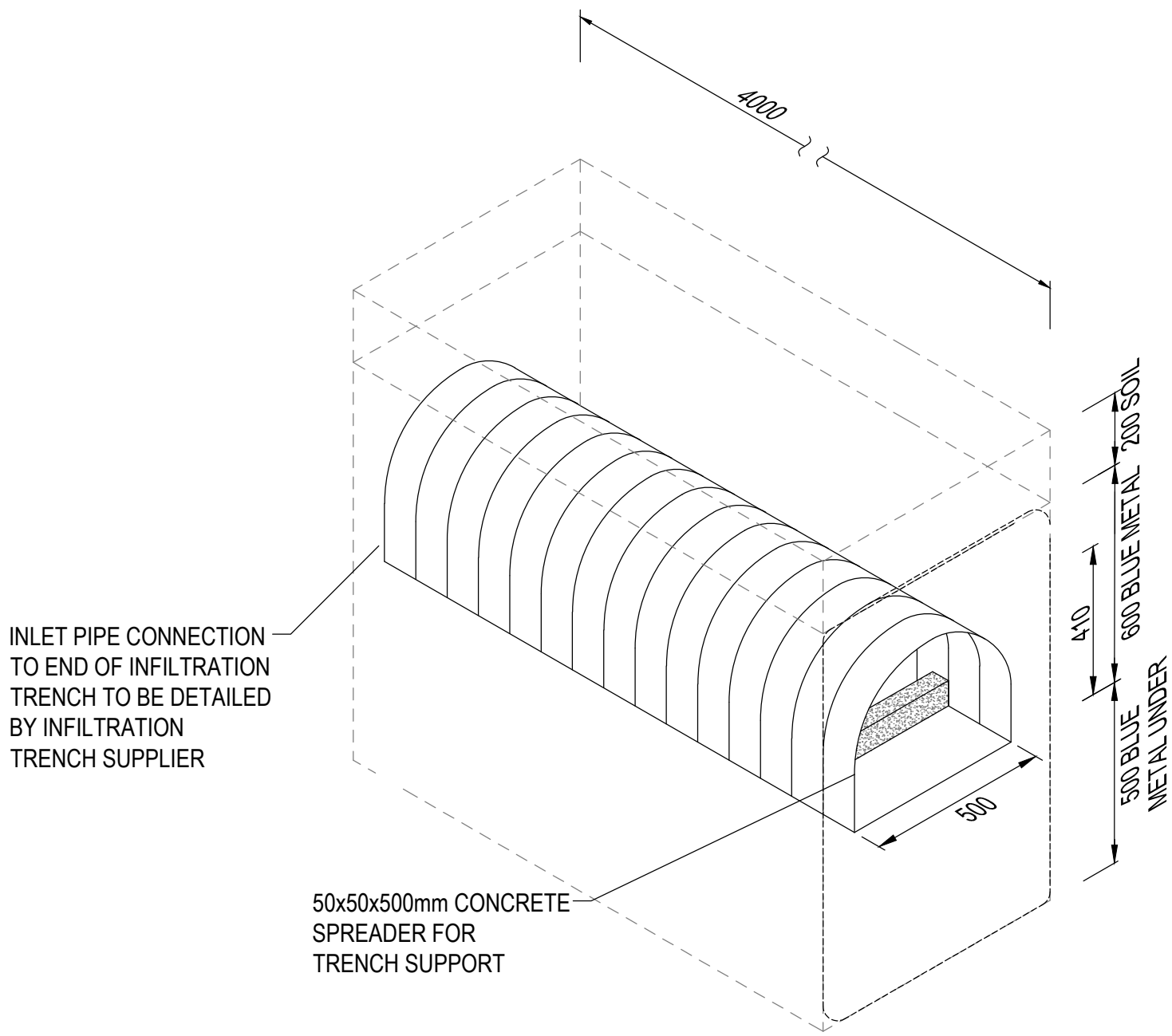
C



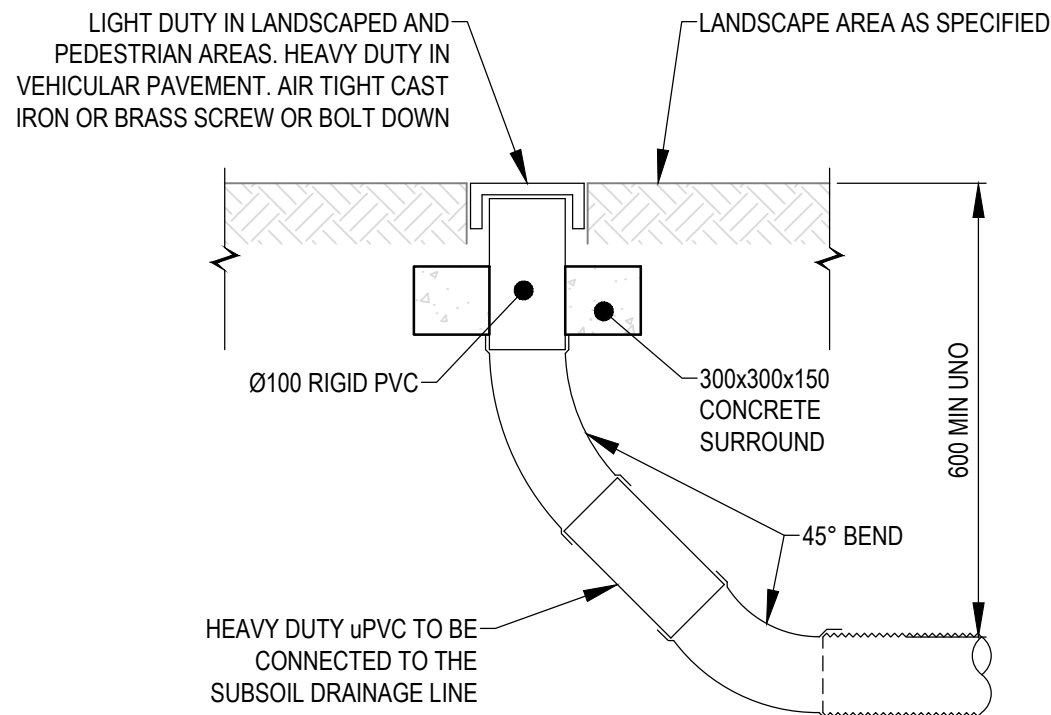
FLUSH OUT RISER IN PAVED AREAS  
(SCALE 1:10)



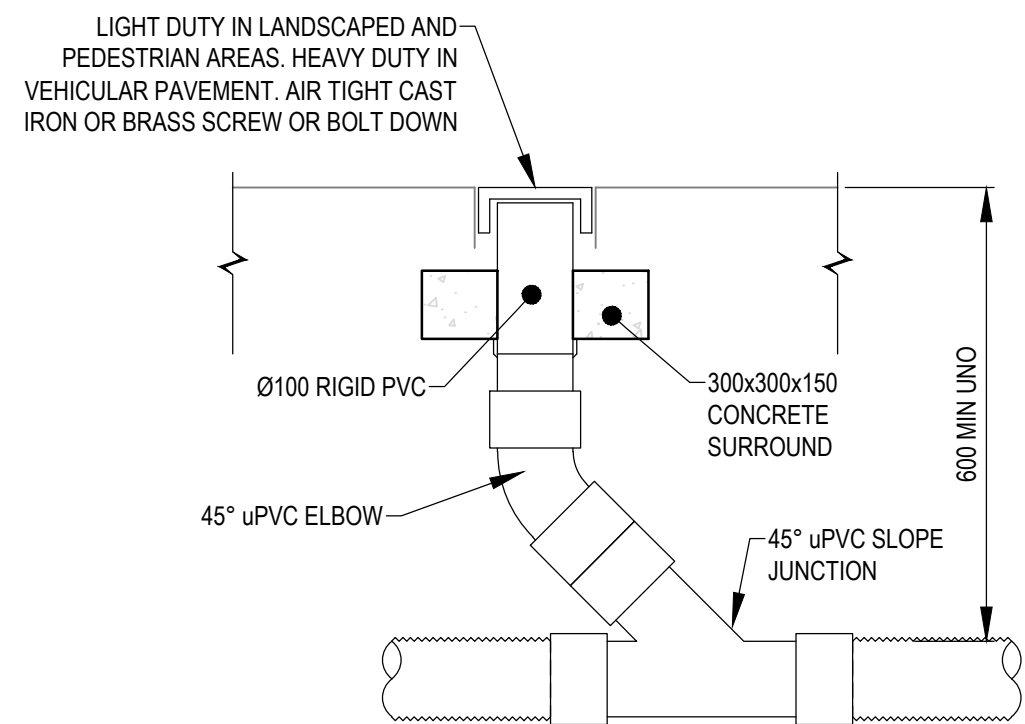
SUBSOIL DRAINAGE TRENCH DETAIL  
(SCALE 1:10)



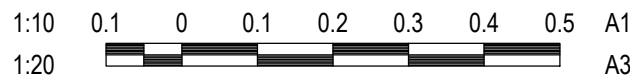
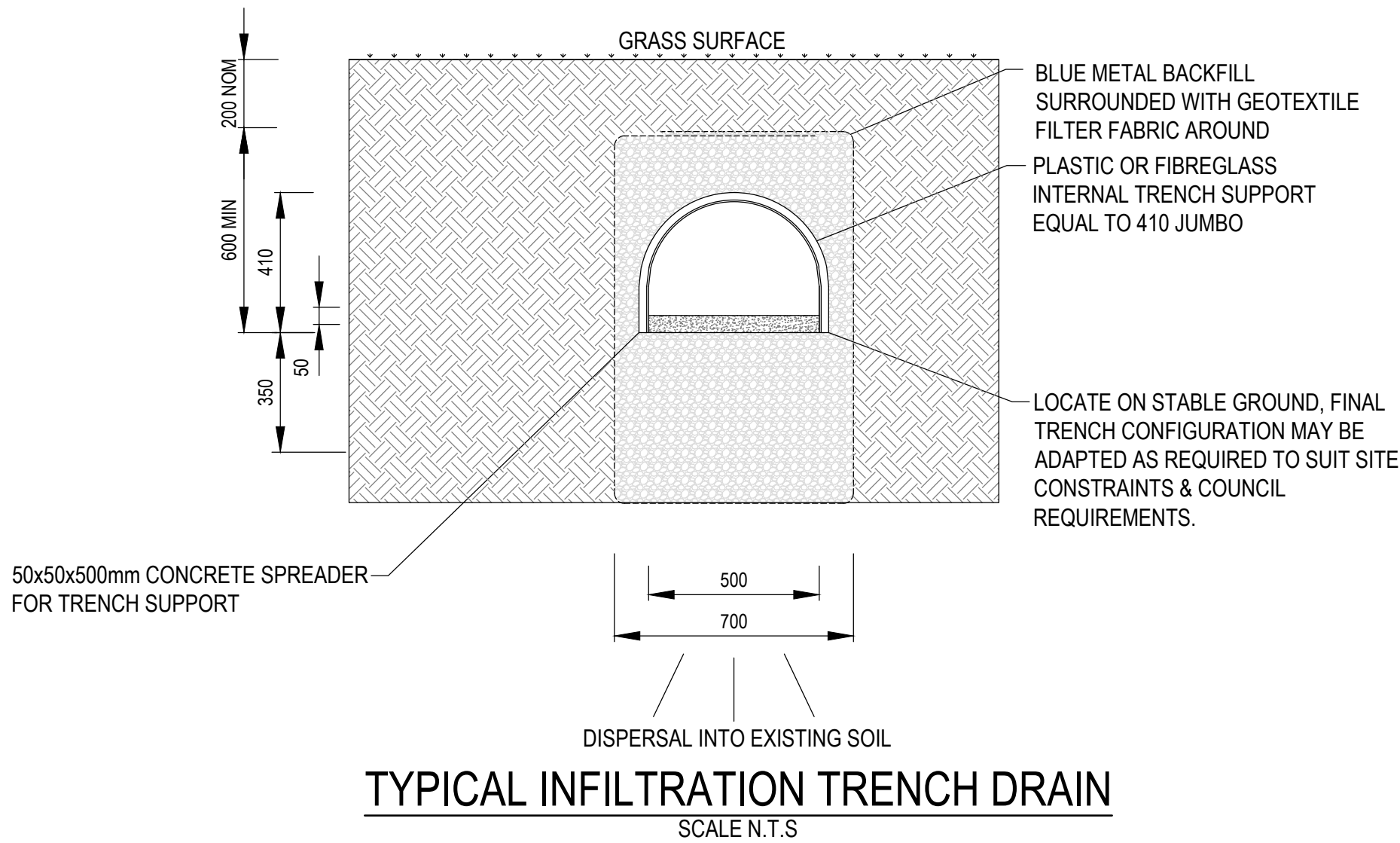
B



FLUSH OUT RISER IN LANDSCAPED AREAS  
(SCALE 1:10)



INTERMEDIATE FLUSH OUT RISER  
(SCALE 1:10)



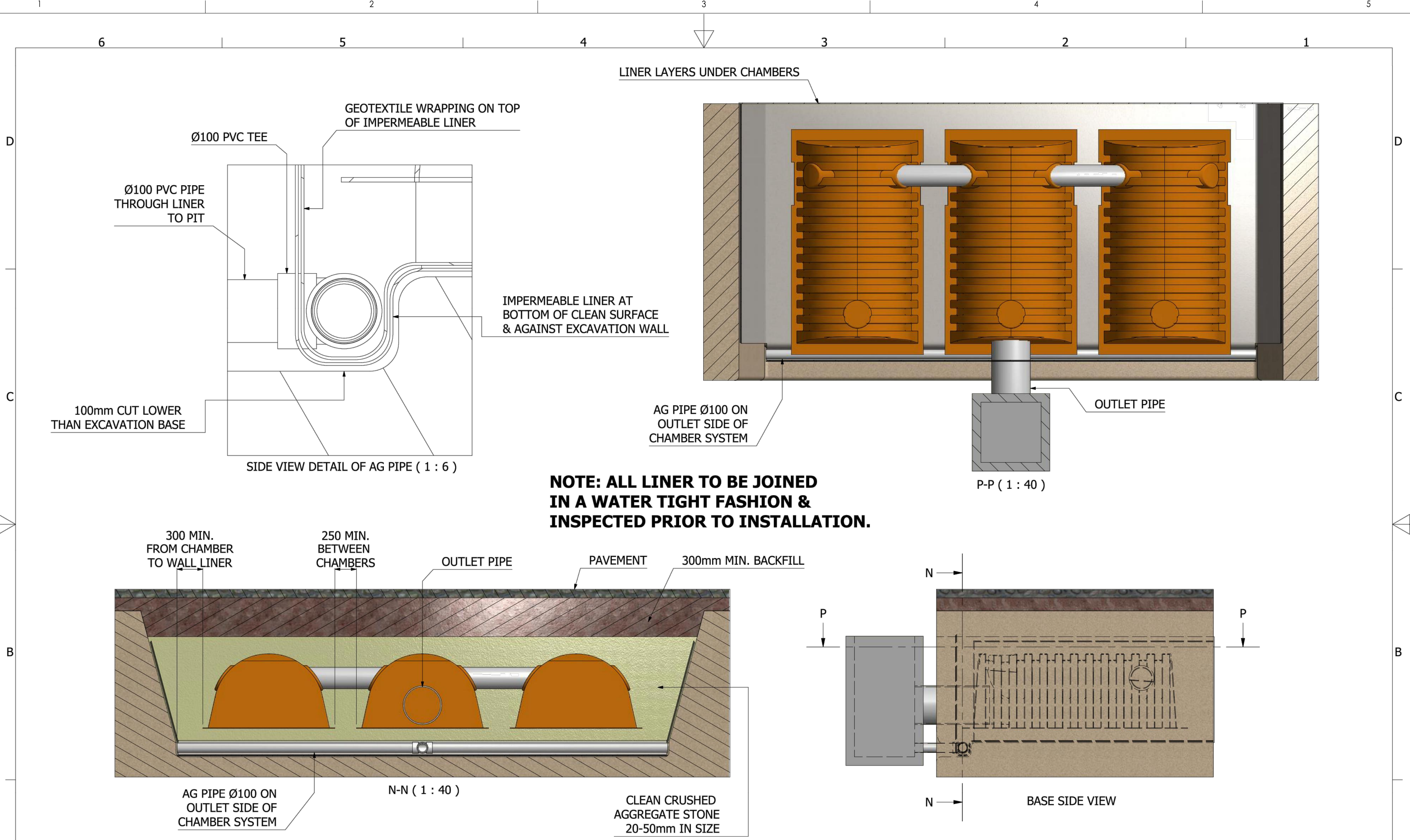
Plotted: 4/11/2023 11:03:37 AM By: POCOCK, CONOR  
UN30130709 PROJECT DOCUMENTATION/DRAWINGS & DESIGN/VRD/SHEET SET

Notes				Issue Status				Colour Disclaimer				Client/Project Logo				Client/Project				Title																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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TOLERANCE: ALL DIMENSIONS ±10mm UNLESS OTHERWISE STATED.

CLIENT:



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NG	21/01/2015
CHECKED BY:	DATE:
VERIFIED BY:	DATE:
APPROVED BY:	DATE:
DRAWING REQUEST NUMBER:	
RN1102	



TITLE: SPEL STORMCHAMBER - INSTALLATION DETAIL GENERAL ARRANGEMENT			
PROJECT NUMBER:	SIZE:	SHEET:	REV:
PROJECT NUMBER	A3	1	1
SCALE:	DWG No:		
N.T.S	SP15-SS2070-S		

Notes

E	REVISED SCHEMATIC DESIGN	CPO	JMB	2023.04.13
D	DRAFT REVISED SCHEMATIC DESIGN ISSUE	CPO	JMB	2023.03.24
C	FINAL PHASE 3 ISSUE	CPO	JMB	2022.08.08
B	100% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.29
A	95% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.14

Issued/Revision

By

Appd

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Issue Status

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Notes

Client/Project Logo

Client/Project

SINSW

HUNTERS RIVER HIGH SCHOOL

HEATHERBRAE NSW 2324

File Name: HRHS-STNC-XX-XX-DR-C-526001.DWG

CPO

JMB

JMB

2022.07.14

Dwn

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Client/Project

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HEATHERBRAE NSW 2324

File Name: HRHS-STNC-XX-XX-DR-C-526001.DWG

CPO

JMB

JMB

2022.07.14

Dwn

Dign

Chkd

YYYY.MM.DD

Title

STORMWATER DRAINAGE DETAILS SHEET 4

Project No.

Scale

NTS

Revision

Drawing No.

HRHS-STNC-XX-XX-DR-C-526004

Stantec

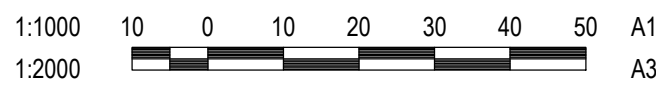
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UN30130709 PROJECT DOCUMENTS AND DRAWINGS & DESIGN VIEWS SHEET SET



CBA

## Notes

D	REVISED SCHEMATIC DESIGN	CPO	JMB 2023.04.13
C	DRAFT REVISED SCHEMATIC DESIGN ISSUE	CPO	JMB 2023.03.24
B	FINAL PHASE 3 ISSUE	CPO	JMB 2022.08.08
A	100% SCHEMATIC DESIGN PROCESS	CPO	JMB 2022.07.29
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Client/Project Logo

The logo for the NSW Government Education School Infrastructure project. It features the NSW Government crest (a red kangaroo) on the left, followed by the text "NSW GOVERNMENT" in blue. To the right of this, the words "Education" and "School Infrastructure" are stacked vertically in a larger blue font.

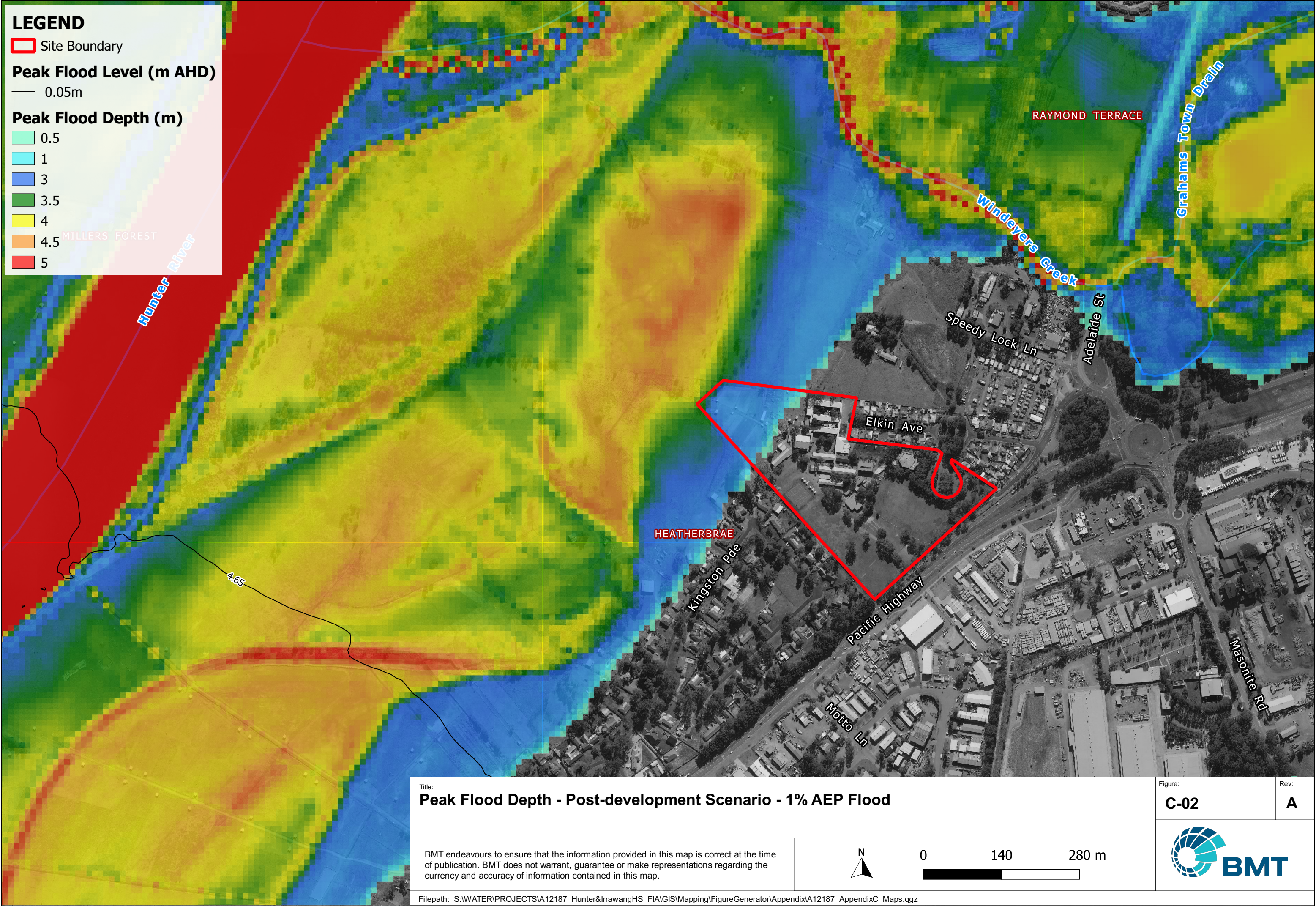
Client/Project			
SINSW			
HUNTERS RIVER HIGH SCHOOL			
HEATHERBRAE NSW 2324			
File Name: HRHS-SINC-XX-XX-DR-C-527001.DWG			
CPO	JMB	JMB	2022.07.29
Dwn.	Dign.	Chkd.	YYYY.MM.DD

Title	
STORMWATER DRAINAGE PIT SCHEDULE	
Project No.	Scale
	AS SHOWN
Revision <b>D</b>	Drawing No. <b>HRHS-STNC-XX-XX-DR-C-527001</b>

## Appendix B Existing Flood Information









## Appendix C MUSIC Link Report





**MUSIC-link Report**

Project Details		Company Details	
Project:	301359957 Hunter River PS	Company:	Starlec Australia
Report Export Date:	13/04/2023	Contact:	Jackson Bramley
Catchment Name:	230116 Elkin C Revised	Address:	Lvl 9, 203 Pacific Hwy St Leonards
Catchment Area:	3.023ha	Phone:	0421193028
Impervious Area*:	40.32%	Email:	jackson.bramley@starlec.com
Rainfall Station:	WILLIAMTOWN RAFF - Station 061078 - Zone C		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1998 - 31/12/2007 11:54:00 PM		
Mean Annual Rainfall:	1238mm		
Evapotranspiration:	1394mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.34		
Study Area:	Raymond Terrace		
Scenario:	Default Catchment - Sandy soils		

\* takes into account areas from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness		Treatment Nodes		Source Nodes	
Node: LP009060/45	Reduction	Node Type	Number	Node Type	Number
Flow	54.4%	Swale Node	1	Urban Source Node	13
TSS	92.2%	Infiltration System Node	2		
TP	78.1%	Generic Node	2		
TN	66.8%	GPT Node	5		
QP	100%				

**Comments**

No compliances identified in relation to high flow and swale min grade. High flow is not an issue on this site due to absorption method of stormwater disposal. Swale min grade required to be 0.5% due to alignment of existing topography, minimising excavation in potentially contaminated existing material and sandy soil substrate minimising risks to ponded water issues.

Passing Parameters					
Node Type	Node Name	Parameter	Min	Max	Actual
GPT	1/SPEL Stormsacks	H-flow bypass rate (cum/sec)	None	99	0.15
GPT	10/SPEL Stormsacks	H-flow bypass rate (cum/sec)	None	99	0.15
GPT	5/SPEL Stormsack	H-flow bypass rate (cum/sec)	None	99	0.09
Infiltration	MC-3500 (infiltration)	Area (sqm)	None	None	244.6
Infiltration	MC-3500 (infiltration)	Area (sqm)	None	None	244.6
Infiltration	MC-3500 (infiltration)	Filter area (sqm)	None	None	193.2
Infiltration	MC-3500 (infiltration)	Filter area (sqm)	None	None	193.2
Infiltration	MC-3500 (infiltration)	H-flow bypass rate (cum/sec)	None	None	100
Infiltration	MC-3500 (infiltration)	H-flow bypass rate (cum/sec)	None	None	100
Receiving	LPOD 906045	% Load Reduction	None	None	54.4
Receiving	LPOD 906045	GP % Load Reduction	90	None	100
Receiving	LPOD 906045	TN % Load Reduction	45	None	66.8
Receiving	LPOD 906045	TP % Load Reduction	60	None	78.1
Receiving	LPOD 906045	TSS % Load Reduction	90	None	92.2
Urban	Hardstand (100% imp - 3092 sqm)	Area Imperious (ha)	None	None	0.309
Urban	Hardstand (100% imp - 3092 sqm)	Area Imperious (ha)	None	None	0.309
Urban	Hardstand (100% imp - 3092 sqm)	Area Penious (ha)	None	None	0
Urban	Hardstand (100% imp - 3092 sqm)	Area Penious (ha)	None	None	0
Urban	Hardstand (100% imp - 3092 sqm)	Total Area (ha)	None	None	0.309
Urban	Hardstand (100% imp - 3092 sqm)	Total Area (ha)	None	None	0.309
Urban	Landscape (0% imp - 11109 sqm)	Area Imperious (ha)	None	None	0
Urban	Landscape (0% imp - 11109 sqm)	Area Penious (ha)	None	None	1.11
Urban	Landscape (0% imp - 11109 sqm)	Total Area (ha)	None	None	1.11
Urban	Landscape (0% imp - 1745 sqm)	Area Imperious (ha)	None	None	0
Urban	Landscape (0% imp - 1745 sqm)	Area Penious (ha)	None	None	0.175
Urban	Landscape (0% imp - 1745 sqm)	Total Area (ha)	None	None	0.175
Urban	Landscape (0% imp - 2346 sqm)	Area Imperious (ha)	None	None	0
Urban	Landscape (0% imp - 2346 sqm)	Area Imperious (ha)	None	None	0
Urban	Landscape (0% imp - 2346 sqm)	Area Penious (ha)	None	None	0.235
Urban	Landscape (0% imp - 2346 sqm)	Area Penious (ha)	None	None	0.235
Urban	Landscape (0% imp - 2346 sqm)	Total Area (ha)	None	None	0.235
Urban	Landscape (0% imp - 2346 sqm)	Total Area (ha)	None	None	0.235
Urban	Landscape (0% imp - 2835 sqm)	Area Imperious (ha)	None	None	0
Urban	Landscape (0% imp - 2835 sqm)	Area Penious (ha)	None	None	0.284
Urban	Landscape (0% imp - 2835 sqm)	Total Area (ha)	None	None	0.284
Urban	Paved (100% imp - 2250 sqm)	Area Imperious (ha)	None	None	0.225
Urban	Paved (100% imp - 2250 sqm)	Area Penious (ha)	None	None	0
Urban	Paved (100% imp - 2250 sqm)	Total Area (ha)	None	None	0.225
Urban	Paved (100% imp - 2500 sqm)	Area Imperious (ha)	None	None	0.25
Urban	Paved (100% imp - 2500 sqm)	Area Penious (ha)	None	None	0

Only certain parameters are reported when they pass validation



Node Type	Node Name	Parameter	Min	Max	Actual
Urban	Paved (100% Imp - 2500 sqm)	Total Area (ha)	None	None	0.25
Urban	Paved (100% Imp - 950 sqm)	Area Impervious (ha)	None	None	0.095
Urban	Paved (100% Imp - 950 sqm)	Area Impervious (ha)	None	None	0.095
Urban	Paved (100% Imp - 950 sqm)	Area Penious (ha)	None	None	0
Urban	Paved (100% Imp - 950 sqm)	Area Penious (ha)	None	None	0
Urban	Paved (100% Imp - 950 sqm)	Total Area (ha)	None	None	0.095
Urban	Paved (100% Imp - 950 sqm)	Total Area (ha)	None	None	0.095
Urban	Road (100% Imp - 3401 sqm)	Area Impervious (ha)	None	None	0.34
Urban	Road (100% Imp - 3401 sqm)	Area Impervious (ha)	None	None	0.34
Urban	Road (100% Imp - 3401 sqm)	Area Penious (ha)	None	None	0
Urban	Road (100% Imp - 3401 sqm)	Area Penious (ha)	None	None	0
Urban	Road (100% Imp - 3401 sqm)	Total Area (ha)	None	None	0.34
Urban	Road (100% Imp - 3401 sqm)	Total Area (ha)	None	None	0.34

Only certain parameters are reported when they pass validation

**Failing Parameters**

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	Isolator Row	H-flow bypass rate (cum/sec)	None	99	100
GPT	Isolator Row	H-flow bypass rate (cum/sec)	None	99	100
Infiltration	MC-3500 (infiltration)	Evaporative Loss as % of PET	100	100	0
Infiltration	MC-3500 (infiltration)	Evaporative Loss as % of PET	100	100	0
Swale	Swales (6 spans)	Bed slope	0.01	0.05	0.005

Only certain parameters are reported when they pass validation



Design with  
**community** in mind

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Appendix 4 – Hunter Water Stamped Plans







BUILDING PLAN ASSESSMENT

Clear of Hunter Water Assets

Reference No: 81063

☒ Water available for connection

☒ Sewer not available for connection

Development Assessment (Section 50) application has been submitted and is being reviewed by Hunter Water. A Hydraulic Design Assessment application is required if development is larger than 2 units or commercial/industrial.

Only valid for 81063

Date Processed: 20 April 2023

Applicant: Hdr - Laura Wang

Property Location: 38 - 40 ELKIN AVE  
HEATHERBRAE NSW 2324

PLEASE TAKE INTO CONSIDERATION

This is not a compliance certificate. This stamp indicates that Hunter Water has undertaken an initial assessment of the proposed development to identify possible impacts to our infrastructure. Conditions of Hunter Water easements apply. For information on Hunter Water's processes please refer to our 'Land Development Manual' on our website or contact us on 1300 657 657. Version 3.3 (22 December 2021)

1 Overall Site Plan  
1 : 1000

**EJE ARCHITECTURE**  
ACN 002 912 843 | ABN 82 644 649 849  
Nominated Architect - Bernard Collins  
P +61 2 4929 2353 | F +61 2 4929 3069 | E mail@eje.com.au | W www.eje.com.au  
A 412 KING STREET, NEWCASTLE, NSW 2300

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REV	DATE	COMMENTS
E	15/07/2022	95% Schematic Design Issue
F	29/07/2022	100% Schematic Design Issue
G	03/08/2022	Revised 100% Schematic Design Issue
H	05/08/2022	Revised 100% Schematic Design Issue
J	09/08/2022	Revised 100% Schematic Design Issue
K	25/08/2022	Final Schematic Design Issue
L	25/01/2023	Revised Carparking & Access Road For Review
M	07/03/2023	REQUESTED DESIGN CHANGES ISSUE
N	17/03/2023	REVISED DESIGN FOR COORDINATION
P	22/03/2023	REVISED BUS BAYS FOR COORDINATION
Q	11/04/2023	FINAL ISSUE FOR COORDINATION

DRN	CHKD	VRFD
LD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	
MJD	HN	

PROJECT: **Hunter River High School Upgrade**

CLIENT: **School Infrastructure NSW**

SITE: **36 Elkin Ave, Heatherbrae, 2324**

DRAWING: **Overall Site Plan**

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

Autodesk Docs: \Hunter River High School\HRHS-EJE-ZZ-ZZ-M3-A-0001.rvt

PROJECT No: **14276** DRAWN: **MJD** DATE: **11/04/2023** SCALES: **As indicated @ A1 1 : 2000 @ A3**

PHASE: **DD** BUILDING ID: **000** Level No: **000** DRAWING No: **A-0-001**

## LEGEND

### CONSTRUCTION LEGEND:

- NEW CONSTRUCTIONS
- EXISTING BUILDING BLOCKS FOR REFURBISHMENT
- SCOPE OF AREAS WITHIN EXISTING BLOCKS TO BE REFURBISHED
- EXISTING BUILDINGS OUT OF SCOPE
- EXISTING ACTIVE PLAY
- EXISTING HARDSTAND PLAY
- NEW COVERED WALKAWAY

- EXISTING TREES TO BE RETAINED

- NEW TREES AS LANDSCAPE

- EXISTING PALISADE FENCING

- PROPOSED LOW HEIGHT FENCE – 1000mm MIN.

- PROPOSED PALISADE SECURITY FENCING TO MATCH EXISTING (EXTERIOR SECURITY BOUNDARY FENCING)

- PROPOSED PALISADE SECURITY FENCING (INTERNAL SCHOOL ACCESS CONTROL)

- PROPOSED SECURITY ACCESS GATES TO BOUNDARY FENCING (EXTERIOR SECURITY)

- PROPOSED CONTROLLED ACCESS GATES TO INTERNAL SCHOOL ACCESS FENCING

**NOTE:**  
REFER SSU DRAFT SECURITY DESIGN FOR SITE & BUILDING SECURITY & ACCESS REQUIREMENTS, AS WELL AS GATE TYPES, AUTOMATION & ELECTRONIC ACCESS & MONITORING REQUIREMENTS.

REFER TO A-0-005 TYPICAL COVERED WALKWAY FOR GENERAL CONSTRUCTION DETAILS

### LEGEND

- RETURN SINGLE COVERED PATH
- NEW COVERED PEDESTRIAN ENTRY PATHWAY, PROVIDING COVERED LINK BETWEEN BUS ZONE AND SCHOOL REFER TO A-0-005 FOR TYPICAL COVERED WALKWAY DETAILS
- CONTROLLED PUBLIC ACCESS PEDESTRIAN GATE - COMMUNITY USE
- EXISTING ROAD ALIGNMENT TO INCLUDE NEW BUS DROP OFF/PICK UP ZONE AND PEDESTRIAN PATHWAYS.
- RETURN SECONDARY PATH
- NEW KISS AND DROP ZONE
- NEW DRIVEWAY EXTENSION TO PROVIDE VEHICLE ACCESS FROM ADELAIDE STREET TO SCHOOL CARPARK, KISS AND DROP LANE, PLAYING FIELD, AND SERVICE AREAS.
- NEW STAFF & VISITOR CARPARK. SUBJECT TO AUTHORITIES' APPROVAL

- CONTROLLED VEHICLE ACCESS GATE SCHOOL ACCESS USE ONLY
- CONTROLLED PUBLIC ACCESS PEDESTRIAN GATE COMMUNITY USE
- NEW PALISADE FENCE TO MARRY WITH EXISTING BOUNDARY SECURITY FENCING





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Enquiries: 1300 657 657

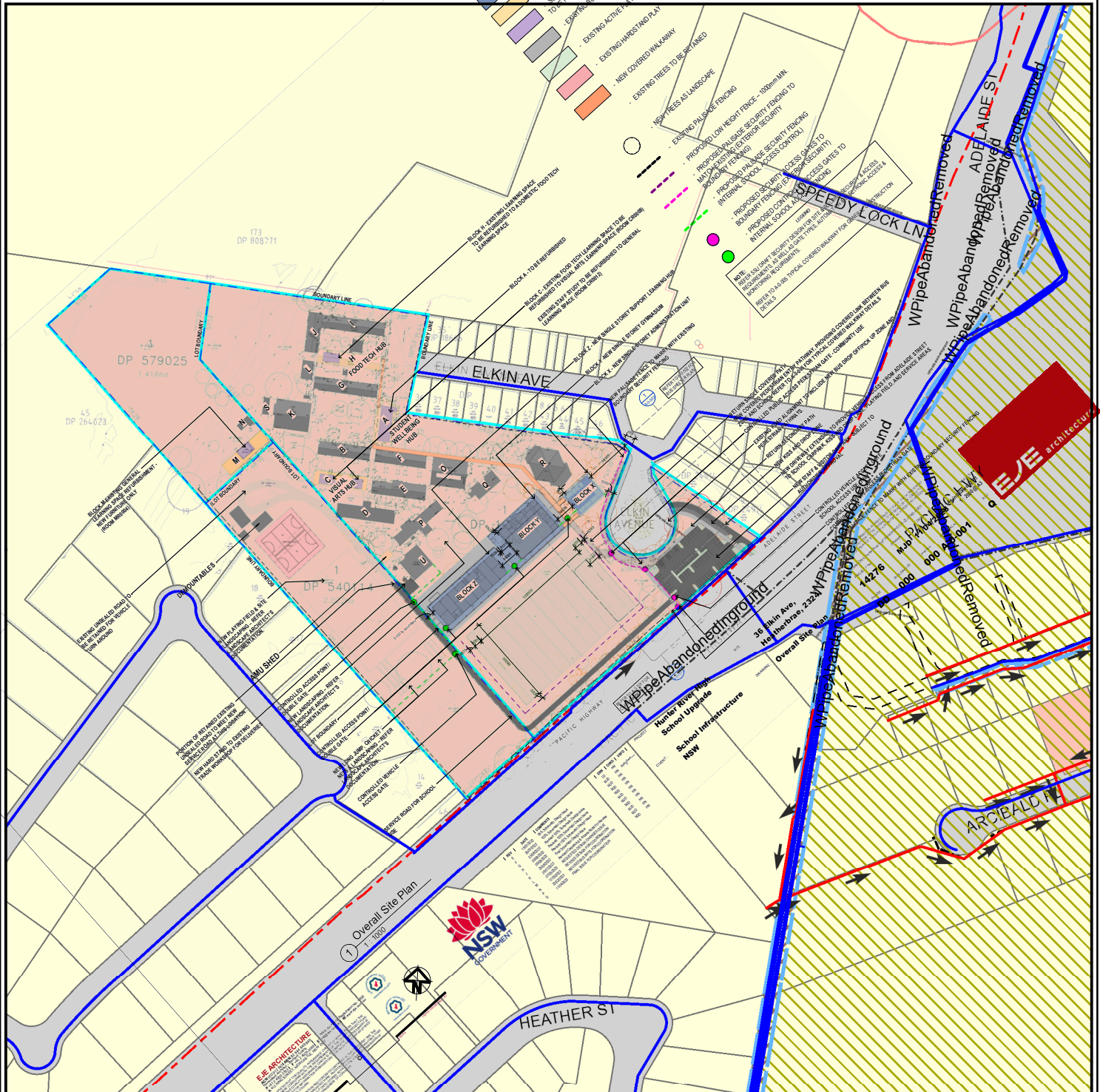
ArcGIS Web Map



RATEABLE\_PREMISE\_NO.: 9550300559

LOT/SECTION/DP: 1//120189

PROPERTY ADDRESS: 38-40 ELKIN AVE HEATHERBRAE 2324



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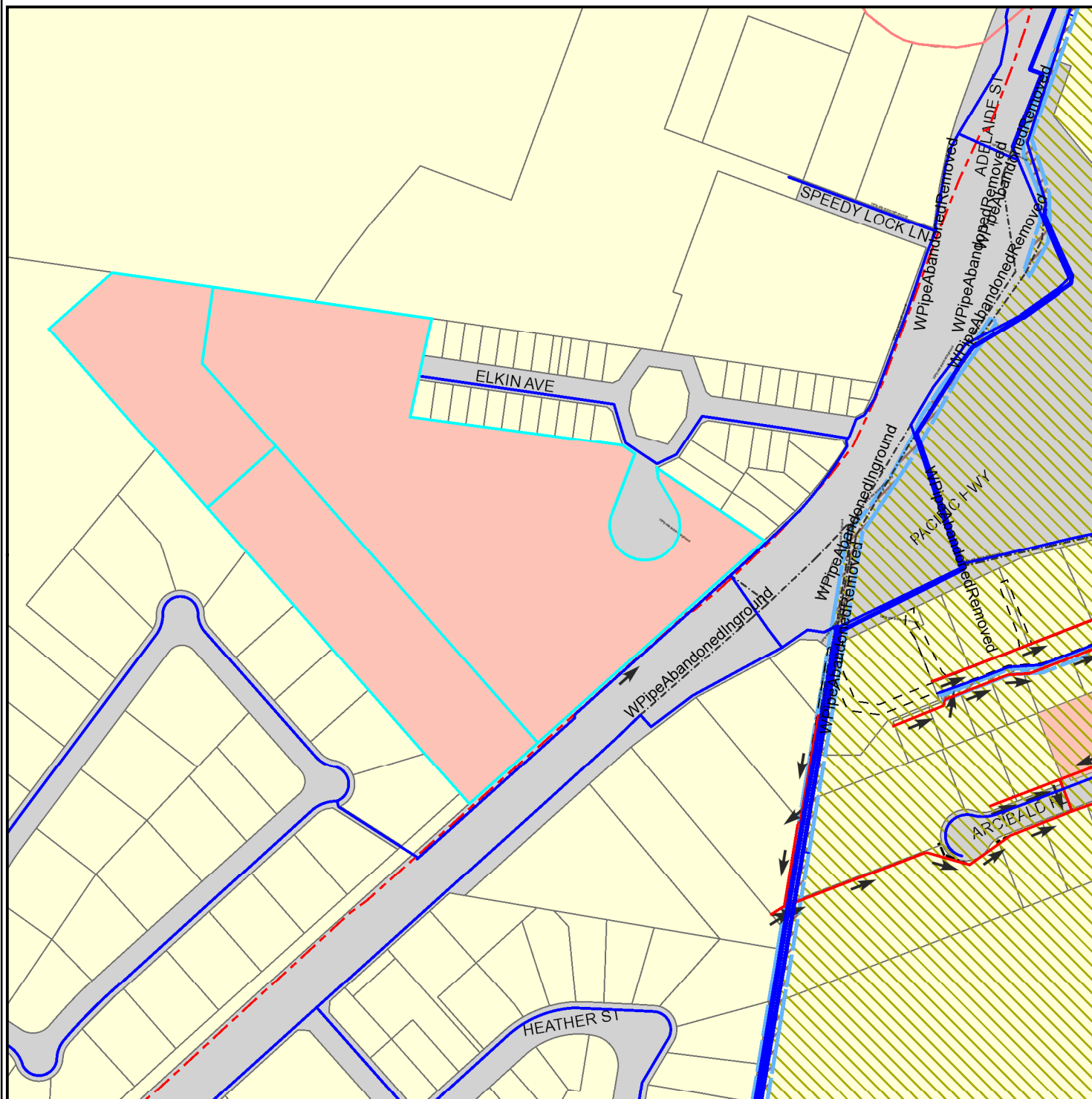
ArcGIS Web Map



RATEABLE\_PREMISE\_NO.: 9550300559

LOT/SECTION/DP: 1//120189

PROPERTY ADDRESS: 38-40 ELKIN AVE HEATHERBRAE, 2324



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Appendix 5 – Sewer Connection Mark-Up







EV	DESCRIPTION OF CHANGE	CHECKED BY	ISSUED BY	DATE
P1	95% SCHEMATIC DESIGN ISSUE	JG	JG	14/07/22
P2	SCHEMATIC DESIGN ISSUE	JG	JG	29/07/22
P3	REVISED SCHEMATIC DESIGN ISSUE	JG	JG	14/04/23

ARCHITECT



**EVE** architecture

CONSULTANTS

---

**HDR**

Level 24, 25 Martin Place, Sydney NSW 2000 Australia  
+61 (2) 9956 2666 | [hdrinc.com](http://hdrinc.com)  
HDR Pty. Limited ABN 76 158 075 220 trading as HDR

**HUNTER RIVER HIGH SCHOOL  
UPGRADE  
36 ELKIN AVE, HEATHERBRAE NSW**

DRAWING TITLE

**HYDRAULIC SERVICES  
SITE PLAN**

STATUS **PRELIMINARY**

SCALE	DATE
1:1000 @ A1	14/04/23

PROJECT NUMBER	DRAWING NUMBER	ISSUE
10344317	HRHS-HDR-XX-GF-PL-H-0010	P3

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