Appendix G23
Electrical Services Masterplan

Environmental Impact Statement

for Alterations and Additions to

St Philip's Christian College, Cessnock

ELECTRICAL SERVICES MASTER PLAN

FOR

SPCC CESSNOCK

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Project Title: SPCC Cessnock - SSD Electrical Services Master Plan
Project Number: 21513

Revision History

Rev No.	Date	Description	By	Checked	Approved
A	25.11.21	Original Issue	PM	PM	PM
B	18.01.22	Final Issue	PM	PM	PM

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1.1 GENERAL

This Electrical Services Master Plan report which is referred to in this report as the Master plan, has been prepared on behalf of St Philips Christian College Cessnock, to accompany their SSD submission.

This Master Plan has reviewed the existing power supply to the site, including existing spare capacity and using the Architectural Master Plan provided, determines what the future power demands for the site are expected to be, and provides an outline as to what power upgrades are required an when they would likely be required.

1.2 EXISTING SUPPLY TO SITE

The site is currently fed via an on-site 800kVA kiosk substation, which provide a 1000A supply to a 1000A rated Main switchboard located within the existing main switchroom.

The Site plan attached at Annex B, and the Single Line diagrams attached at Annex C provide a high-level overview of where the main site electrical infrastructure is located and what supplies what area/building.

1.3 EXPECTED LOAD GROWTH

Using the Architectural Master Plan provided, we have estimated the expected load growth on site, and this is shown in Table 1, attached at Annex A.

This load growth estimate indicates that the existing 1000A supply capacity will be exceeded once the Senior School stage 2, and Junior Schools Stages 3 & 4 are occupied, so an upgrade of the supply to the site is required before that time, which based on the proposed timeline is around 2024.

It also indicated that the total power supply requirement for the site based on the Architectural Master Plan up to 2050 is around 2250A, and that can be accommodated in the proposed upgrade as described below.

1.4 REQUIRED POWER SUPPLY UPGRADES

As determined from the estimated the expected load growth, the power supply to the site is required to be upgraded and this would involve the following works, and as noted below.

In order to limit the outage time to the school, the following supply upgrade sequence is recommended:

a. Construct a new main switchroom in the vicinity of the existing main switchroom. This main switchroom shall be large enough to accommodate two main switchboards as it was determined that the existing main switchroom is not suitable to accommodate an additional main switchboard.

b. Install a new 1300A rated main switchboard (MSB) in the new main switchroom and connect this to a new 1000kVA substation which is to be installed adjacent to the existing 800kVA substation. The new substation is to be located adjacent to the existing substation as this lessen any additional infrastructure as this will just be an extension of the existing Ausgrid infrastructure on site, so eliminates the need for any additional external infrastructure or additional connections to the site.

c. Relocate the supplies from the existing 1000A MSB to new 1300A MSB. This will then allow the existing 1000A MSB to be removed and the existing main switchroom to be demolished.

d. Provide a new 1000A MSB in the new main swithroom. The existing MSB may be suitable for re-use but may need to be assessed in terms of compliance as there has been upgrades to the switchboard standard since that MSB was constructed.

e. Connect this new 1000A main switchboard to existing 800kva substation and relocate supplies that were temporarily connected to the 1300A main switchboard.

The new 1300A MSB will feed the northern precinct, which is mainly the School site, and the new 1000A MSB will feed the southern precinct, which includes Cafe, Chapel, Dale Narnia, Aquatic Centre etc.

There will need to be a clear demarcation line/labelling on site in relation to the two supplies so that supply segregation can be maintained, but this is less of an issue as both MSB's are proposed to be in the same location and will share a common earthing system.

We also note that this may need to be adjusted to suit actual loads as the site develops, so having the two MSB's in the same location also allows supplies to be moved from one MSB to the other should this be required.

1.5 SUMMARY

We have found in our Electrical Services Master Plan review that based on the proposed Architectural Master Plan, that the existing 1000A power supply to the site will not be adequate, and that an upgrade of the power supply to the site would be required prior to the Senior School stage 2, and Junior Schools Stages 3 & 4 being occupied.

The upgrade consists of installing a new 1000kVA kiosk substation adjacent to the existing 800kVA kiosk substation which will provide an additional 1300A of supply capacity for a total of 2300A. This upgrade provides sufficient power capacity for all planned works as noted up until 2050.

Further to this we believe that no external additional infrastructure is required, and that additional onsite infrastructure would be subject to consultation in the future.

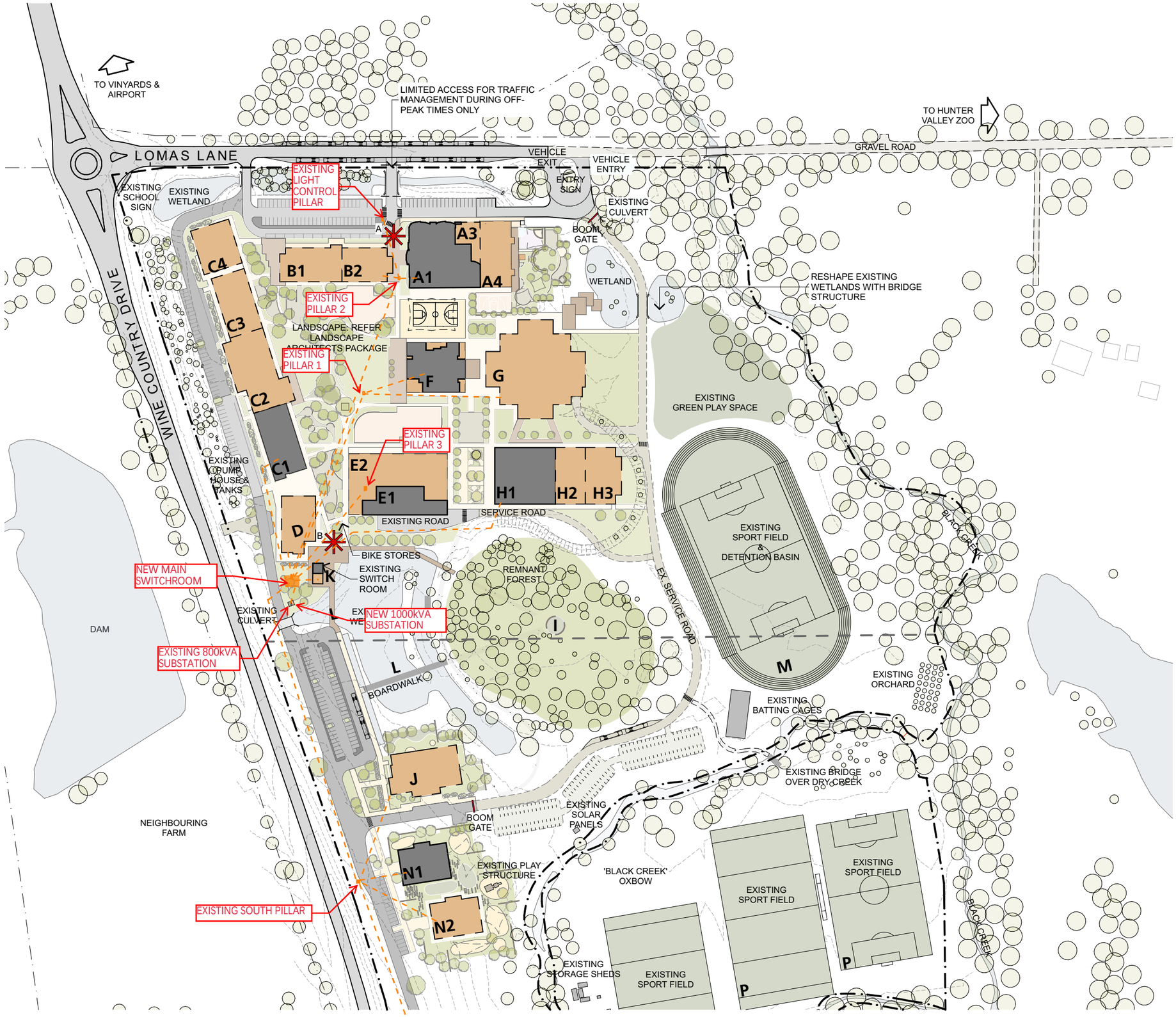
ANNEX A - TABLE 1 – EXPECTED LOAD GROWTH

SPCC Cessnock Staging

2021 enrolments (K-12)	2021 enrolments (Narnia)	2021 enrolments (DALE)	Total Students		Existing Load (A)	Site Power Capacity (A)
1143	73	55	1271		750	1000

Stage #	Nominal timing	Building #	Building description	Existing buildings to be removed	Infrastructure	Student cap (K-12)	Student cap (Narnia)	Student cap (DALE)	Total Students	Additional Load (A)	Expected Load (A)	Site Power Capacity (A)
1a	2022-2024	A3	Junior School	Nil	New southern access off WCD and new internal road/angle parking as far north as Building C2				1471	350	1100	2300
		A4	Junior School		Widening of Lomas Lane for bus bays							
		C2	Senior School		New bus turnaround area and connection to northern carpark (+ 5 spaces)							
		J	Narnia		Minor intersection refurbishment at Lomas Lane and WCD							
		E7	Demountable (TBC)		New 1000kVA Substation							
1b	2025-2027	B1	Middle School	Admin (existing) Narnia (existing)	Reconfiguration of existing northern car park				1471	100	1200	2300
		B2	Middle School									
		S	Waste compund									
2	2027-2031	E2	Trade Training Centre	Nil	Roundabout at intersection of Lomas Lane and WCD				1732	150	1400	2300
3a	2032-2034	C3	Senior School	Demountables E3, E4, E5, E6, E7	Extend internal access road / angle parking adjacent to Building C3				1732	50	1450	2300
3b	2034-2036	D	Welcome and Admin Centre	Nil	Nil	1569	83	80	1732	50	1500	2300
		K	Café									
		N2	DALE									
4a	2038-2040	H2	Sports Hall	Nil	Nil	1569	83	80	1732	50	1550	2300
4b	2040-2041	C4	Library/Chapel	Nil	Extend internal access road to wrap around Building C4 (incl. modify wetland)	1569	83	80	1732	50	1600	2300
5a	2043-2045	H3	Sports Hall	Nil	Nil	1569	83	80	1732	50	1650	2300
5b	2048-2050	F	Canteen/Café Hub	Nil						50	1700	2300
		O	Aquatic Centre	Nil	Nil	1569	83	80	1732	300	2000	2300
5c	2050-2052	G	Performing Arts Centre	Demountable E2	Service access driveway/ramp to PAC	1569	83	80	1732	250	2250	2300

ANNEX B – SITE PLAN SHOWING KEY ELECTRICAL ITEMS



For Information

1. Dimensions are in millimetres unless otherwise shown.
2. Work to given dimensions. Do not scale from drawing.
3. Check all dimensions on site prior to construction and fabrication.
4. Bring any discrepancies to the attention of the proprietor & architect.

LEGEND

- EXISTING BUILDINGS
- PROPOSED BUILDINGS
- Site Boundary
- Lot Boundary
- EXISTING ROAD NETWORK & PARKING
- PROPOSED ROAD NETWORK & PARKING
- GRAVEL ROAD / OVERFLOW CAR PARKING
- FOOTPATHS / BUSH TRACKS
- EXISTING TREES
- BOOM GATE / CONTROLLED ACCESS
- MAIN ENTRY
  A: JUNIOR / MIDDLE SCHOOL
  B: SENIOR SCHOOL

A - Junior School
B - Middle School
C - Senior School + Library
D - Admin & Welcome Centre
E - Trade Training Centre
F - Canteen / Cafe Hub
G - Performing Arts Centre
H - Sports Hall
I - Outdoor Meeting Circle
J - Narnia
K - Cafe
L - Boardwalks
M - Sports Field & Running Track
N - D.A.L.E
O - Aquatic Centre
P - Existing Sports Fields
Q - Waste Management Depot
R - Existing Sheds
S - Existing House

PROJECT SCOPE

The following project stages are within this State Significant Development (SSD) Application:

A3 - Junior School
A4 - Junior School
B1 - Middle School
B2 - Middle School
C2 - Senior School
C3 - Senior School
C4 - Library / Chapel
D - Admin & Welcome Centre
E2 - Trade Training Centre
F - Canteen / Cafe Hub
G - Performing Arts Centre
H2 - Sports Hall
H3 - Sports Hall
J - Narnia
K - Welcome Cafe
L - Boardwalks
N2 - D.A.L.E
O - Aquatic Centre
Q - Waste Management Depot

4347
CD1004
RevB - WIP 03.12.21

Proposed Site Plan (North)

St Philip's Christian College Cessnock
10 Lomas Lane, Nulkaba

0m 25 50 75 100 125 @A3 1:2500

SHAC

Nominated Architect Justin Hamilton (6160) | ABN 32 131 584 846

For Information

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A3 - Junior School
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H3 - Sports Hall
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L - Boardwalks
N2 - D.A.L.E
O - Aquatic Centre
Q - Waste Management Depot

4347
CD1005
RevB - WIP 03.12.21

Proposed Site Plan (South)

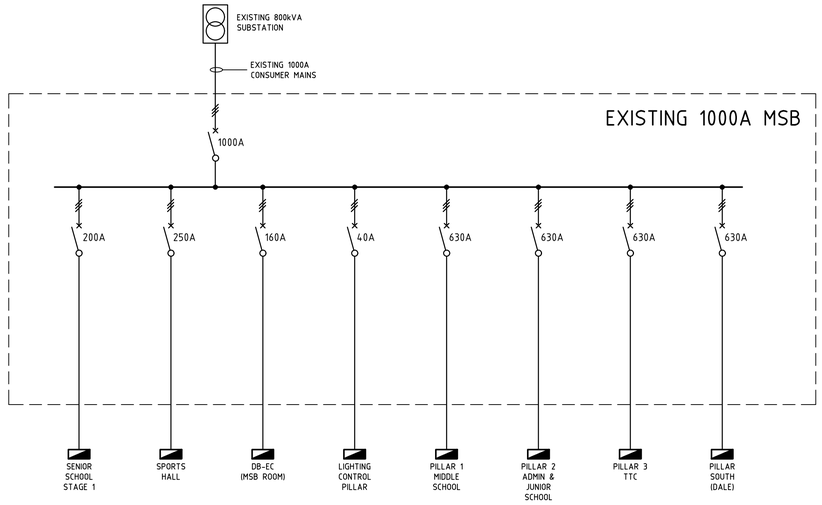
St Philip's Christian College Cessnock
10 Lomas Lane, Nulkaba

0m 25 50 75 100 125 @A3 1:2500

SHAC

Nominated Architect Justin Hamilton (6160) | ABN 32 131 584 846

ANNEX C – SINGLE LINE DIAGRAMS

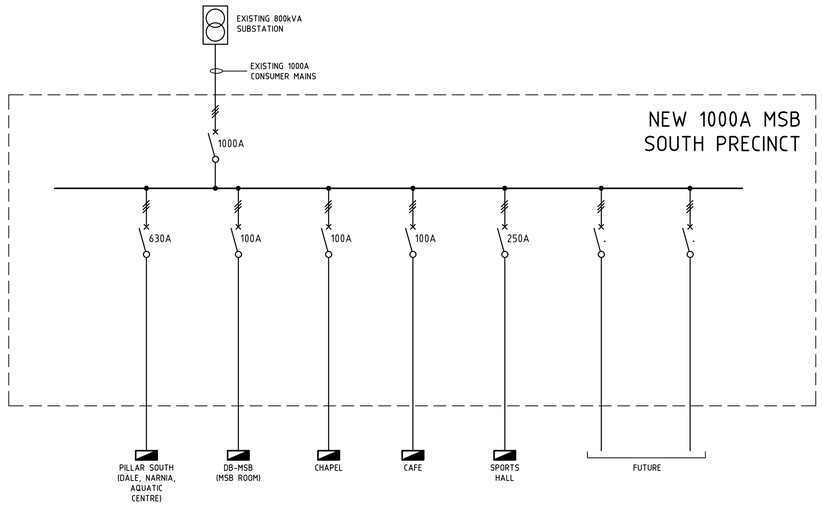


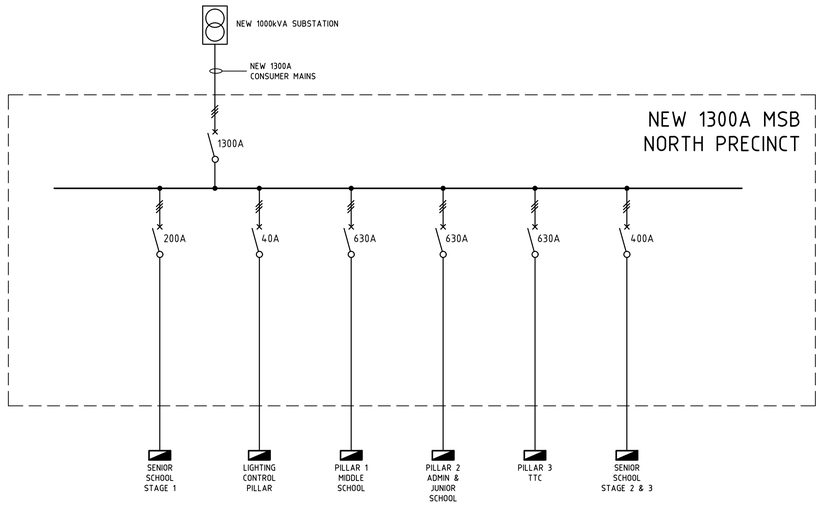
NOTES

1. BASED ON THE EXPECTED LOAD INCREASES THE EXISTING SUPPLY TO SITE WILL NEED TO BE INCREASED PRIOR TO THE SENIOR SCHOOL 2 & JUNIOR SCHOOL STAGES 3 & 4 BEING OCCUPIED.
2. IN ORDER TO LIMIT THE OUTAGE TIME TO THE SCHOOL, THE FOLLOWING SUPPLY UPGRADE SEQUENCE IS RECOMMENDED:
   a. CONSTRUCT A NEW MAIN SWITCHROOM IN THE VICINITY OF THE EXISTING MAIN SWITCHROOM. THIS MAIN SWITCHROOM SHALL BE LARGE ENOUGH TO ACCOMMODATE TWO MAIN SWITCHBOARDS.
   b. INSTALL A NEW 1300A RATED MAIN SWITCHBOARD IN THE NEW MAIN SWITCHROOM AND CONNECT THIS TO A NEW 1000kVA SUBSTATION WHICH IS TO BE INSTALLED ADJACENT TO THE EXISTING 800kVA SUBSTATION.
   c. RELOCATE THE SUPPLIES FROM THE EXISTING 1000A MSB TO NEW 1300A MSB. THIS WILL THEN ALLOW THE EXISTING MSB TO REMOVED AND THE EXISTING MAIN SWITCHROOM TO BE DEMOLISHED.
   d. PROVIDE A NEW 1000A MAIN SWITCHBOARD IN THE NEW MAIN SWITHROOM. THE EXISTING MSB MAY BE SUITABLE FOR RE-USE BUT MAY NEED TO BE ASSESSED IN TERMS OF COMPLIANCE.
   e. CONNECT THIS NEW 1000A MAIN SWITCHBOARD TO EXISTING 800kVA SUBSTATION AND RELOCATE SUPPLIES THAT WERE TEMPORARILY CONNECTED TO THE 1300A MAIN SWITCHBOARD.
3. THE NEW 1300A MSB WILL FEED THE NORTHERN PRECINCT WHICH IS MAINLY THE SCHOOL SITE, AND THE NEW 1000A MSB WILL FEED THE SOUTHERN PRECINCT, WHICH INCLUDES CAFE, CHAPEL, DALE NARNIA, AQUATIC CENTRE ETC. THERE WILL NEED TO BE A CLEAR DEMARCATION LINE/LABELLING ON SITE IN RELATION TO THE TWO SUPPLIES THIS MAY NEED TO BE ADJUSTED TO SUIT ACTUAL LOADS.

EXISTING

PROPSOED





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PROJECT:
ST PHILIP'S CHRISTIAN COLLEGE
ELECTRICAL MASTER PLAN

CLIENT:
ST PHILIP'S CHRISTIAN COLLEGE
CESSNOCK CAMPUS

LOCATION:
10 LOMAS LANE
NULKABA NSW

DRAWING:
SINGLE LINE DIAGRAMS

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SCALE: 1:100@A1 DESIGN: PM
PROJECT No. 21513 DRAWING No: E01 ISSUE: A