

An architectural rendering of a modern school building with two main wings. The left wing is a multi-story brick structure with white balconies and large windows. The right wing is a taller, more modern building with a dark brick facade and large glass windows. In the foreground, there is a paved courtyard with a large tree, a brick play area, and several children playing. The sky is blue with some clouds.

# **Upgrades to Chatswood Public School and Chatswood High School**

## **Appendix 18 - Infrastructure Management Plan**

SSD 9483

Prepared by Building Services Engineers (BSE)

For School Infrastructure NSW, Department of Education



# Infrastructure Services Report (SSDA)

Upgrades to Chatswood Public School and Chatswood High School

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## Summary

This report is to provide the information on the existing capacity and any augmentation and easement requirement for the provision of utilities including staging of the infrastructure for the upgrades to Chatswood Public School located at Pacific Highway and Chatswood High School located at Centennial Avenue, Chatswood NSW 2067. This report is to identifies services requirements to redevelop the existing site to accommodate the upgrades.

This report identified the electrical, communication, security, mechanical and lift services infrastructure works that are required to accommodate the proposed works (we have not mentioned items that are not critical to operation).

# 1. Introduction

## 1.1. Purpose and scope

The primary objective of this report is to identify infrastructure services requirement to accommodate the upgrades to Chatswood Public School located at Pacific Highway and Chatswood High School located at Centennial Avenue, Chatswood NSW 2067.

Upgrades to Chatswood Public School and Chatswood High School will deliver:

- more than 150 new and refurbished innovative learning and teaching spaces
- increased quality active play space currently allocated to primary school and high school students
- specialist teaching facilities such as science, art, and music rooms
- dedicated performing arts spaces
- new sports facilities and recreational areas
- new libraries and administration facilities.

Upgrades to Chatswood Public School, including the provision of:

- 53 x homebases (comprising 25 existing and 28 new spaces);
- 4 x special program classrooms (music, language etc);
- 3 x special support unit classrooms;
- Increased quality active play spaces;
- Retaining Heritage buildings A and B
- New hall;
- New car parking facilities; and
- Associated site works and landscaping.

Upgrades to Chatswood High School, including the provision of:

- 123 Classrooms (comprising 21 existing and 102 new spaces)
- New administration and staff facilities;
- New hall; and
- Associated site works and landscaping.

The works within SSDA scope will include:

### **Pacific Highway site (Chatswood Public School):**

- Construction of Building P1, P2 & building G

### **Centennial Ave site (Chatswood High School):**

- Construction of Building S & Building Q
- Construction of Building T

This report will focus on the infrastructure works for SSDA scope only. All enabling works required to be completed prior to the commencement of the SSDA works will be outlined to be carried out under a different planning pathway which will be pursuant to as separate planning approval in this report.

This report contains the findings of investigations into the building services, and covers such things as:

- Brief description of electrical services infrastructure

- Brief description of communications and security services infrastructure
- Brief description of mechanical and lift services infrastructure

## 1.2. Referenced documentation

### 1.2.1. General

<b>AS1530</b>	Fire tests for building materials, components and structures
<b>NCC</b>	National construction code (Building code of Australia)
<b>EFSG</b>	Educational Facilities Standards & Guidelines

### 1.2.2. Electrical services

<b>AS1158</b>	Lighting for outdoor spaces
<b>AS1367</b>	Coaxial cable and optical fibre systems for the RF distribution of analog and digital television and sound signals in single and multiple dwelling installations
<b>AS/NZS1680 set</b>	Interior lighting
<b>AS2293</b>	Emergency escape lighting and exit signs
<b>AS/NZS 3000</b>	Electrical installations (known as the Australian/New Zealand Wiring Rules)
<b>AS3008.1.1</b>	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical Australian installation conditions
<b>AS/NZS3013</b>	Electrical installations - Classification of the fire and mechanical performance of wiring system elements
<b>AS/NZS3080</b>	Information technology - Generic cabling for customer premises
<b>AS3439 set</b>	Low-voltage switchgear and control gear assemblies
<b>AS/CA S009</b>	Installation requirements for customer cabling (Wiring Rules)
<b>NSW SIR</b>	NSW Service and Installation Rules

### 1.2.3. Mechanical services

<b>AS/NZS1668</b>	The use of ventilation and air conditioning in buildings
<b>AS3666</b>	Air handling and water systems of buildings
<b>AS4254</b>	Ductwork for air Handling Systems in Buildings
<b>R2.1248</b>	Refrigeration Engineering HVAC Survey

## 1.3. Definitions & abbreviations

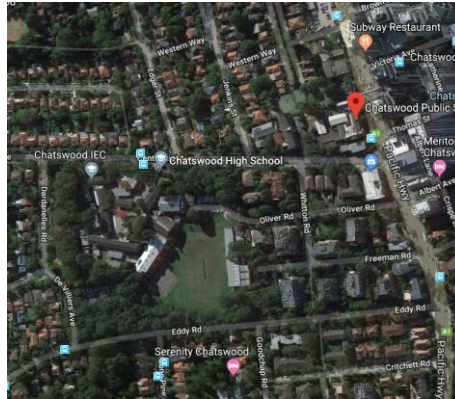
<b>AFFL</b>	Above finished floor level
<b>AFSS</b>	Annual fire safety statement
<b>AHU</b>	Air handling unit
<b>BCA</b>	Building code of Australia
<b>BMS</b>	Building management system
<b>BOH</b>	Back of House

<b>BSE</b>	Building Services Engineers
<b>CCTV</b>	Closed circuit television
<b>DB</b>	Distribution board
<b>EWIS</b>	Emergency Warning and Intercommunication System
<b>FIP</b>	Fire indicator panel
<b>GPO</b>	General power outlet
<b>HLI</b>	High level interface
<b>LMR</b>	Lift Motor Room
<b>MATV</b>	Master antennae television
<b>MDB</b>	Main distribution board
<b>MSB</b>	Main switchboard
<b>MSSB</b>	Mechanical services switchboard
<b>NBN</b>	National Broadband Network
<b>NCC</b>	National construction code
<b>RCD</b>	Residual current device
<b>SMAC</b>	SHAW method of air conditioning
<b>SPD</b>	Services Protection Device
<b>VSD</b>	Variable speed drive

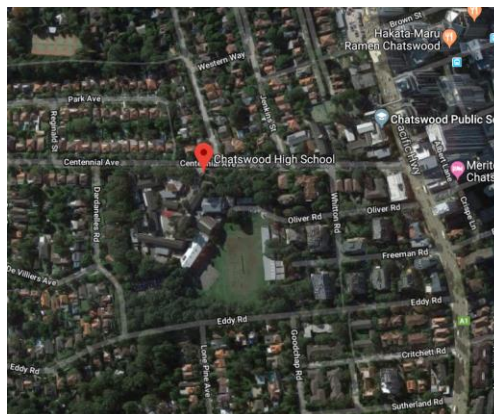


## 2. The Site

The street address for the existing Chatswood public school site is 5 Centennial Ave, Chatswood NSW 2067.



The street address for the existing Chatswood High School site is 24 Centennial Ave, Chatswood NSW 2067.



## 3. Electrical Services Infrastructure

### 3.1. Pacific Highway Site

The site is supplied via a direct feeder from an existing 1000kVA kiosk substation (S.49087) located on the corner of Pacific Highway and Centennial Avenue.

Based on the maximum demand estimate, the proposed development including new and existing buildings will require a 1,000Amp supply. An application for connection form has been submitted to Ausgrid who confirms that the existing substation on site is capable of the proposed load with upgrading the existing LV board to incorporate a 1200Amp distribution panel.

It is anticipated the following electrical infrastructure works will be carried out under SSDA construction program (also refer to Appendix A site reticulation plan for details):

- Alteration works of the existing substation. Existing distributor within substation to be upgraded
- Provision of new site main switchboard and back supply the existing site main switchboard (re-used as main distribution board).
- New consumer mains to be provided from substation to new MSB and existing mains to MDB to be diverted to new MSB.
- New electrical submains from MSB to Building P2 and Building G to be reticulated in the underground conduits (submains to Building P1 to be reticulated within the buildings)

The following enabling works will require to be in place prior to the commencement of the SSDA works:

- Existing link pillar serving demountables to be disconnected and removed (Exempt Development)
- Existing submains to the demountables to be redundant and removed (Exempt Development)

### 3.2. Centennial Avenue Site

The site is supplied from an 600kVA onsite kiosk substation (S.35409) located at the driveway entry of Dardanelles Road. This substation is dedicated to the site with a 600A direct distributor supplying the site. Based on the maximum demand estimate, the proposed development including new and existing buildings, will require a 1800Amp supply/supplies. An application for connection form has been submitted to Ausgrid who confirms that the a new 1000kVA substation will be required parallel to the existing substation with the HV ring main connected to the existing substation. The new substation will be located in a shared easement and right of way of the existing substation. The existing supply will be maintained to avoid interruption to the existing school. Each new building can then be connected to the new site main switchboard or main distribution board whichever is more suitable.

It is anticipated the following electrical infrastructure works will be carried out under SSDA construction program (also refer to Appendix A site reticulation plan for details):

- New electrical submains from MSB to Building S and Building Q to be reticulated in the underground conduits
- New electrical submains from MSB to Building T to be reticulated in the underground conduits

The following enabling works will require to be in place prior to the commencement of the SSDA works:

- Multi-way link pillars to be installed for the electrical supply to the new demountables. Pillars to be supplied from site MSB and reticulated within carpark and sports courts (Exempt Development)

- The new substation and associated main switchboard to be installed prior to the commissioning of Building R (CDC)
- Temporary supply to demountables adjacent to Building D to be provided from MDB. The existing link pillar to remain and electrical submains to the link pillar to be diverted to MDB prior to the demolition of building C & D (REF)
- Temporary supply to Building B to be provided from MDB. Building B is now supplied from Building D which will be demolished during this stage. The existing electrical submains to be diverted and extended to MDB prior to the demolition of Building C & D (REF)
- Existing electrical submains to building B to be extended and re-used as the submains to Building J prior to the demolition of Building B. (REF)

## 4. Communications & Security Infrastructure

### 4.1. Pacific Highway Site

New incoming copper and fibre optic lead-in will be provided from the carrier and connected to the new Building P2 Library campus distributor to accommodate the structured cabling system. The existing campus distributor in Building A will be re-used as building distributor. The existing active equipment will require to be upgraded subject to the review from ICT on compatibility of the proposed new generation equipment used in the new buildings.

It is anticipated the following communication and security infrastructure works will be carried out under SSDA construction program (also refer to Appendix A site reticulation plan for details):

- New incoming copper and fibre optic lead-in to be provided from the carrier and connected to the new Building P2 Library campus distributor
- 12C OS2 + 20 pair UTP Class B backbone cabling from Building P2 campus distributor to be reticulated in the underground conduits to Building G, Building A and Building B (communication backbone cabling to Building P1 to be reticulated within the buildings)
- Security cabling from Building P2 to be reticulated in the underground conduits to Building G, Building A and Building B (security cabling to Building P1 to be reticulated within the buildings)

The following enabling works will require to be in place prior to the commencement of the SSDA works:

- Communication cabling to demountables to be redundant and removed (Exempt Development)

### 4.2. Centennial Avenue Site

The existing campus distributor in Building H Library will remain, however, the existing active equipment will require to be upgraded subject to the review from ICT on compatibility of the proposed new generation equipment used in the new buildings.

It is anticipated that the following communication and security infrastructure works will be required to suit the proposed construction program (also refer to Appendix A site reticulation plan for details):

- 12C OS2 + 20 pair UTP Class B backbone cabling from Building H campus distributor to be reticulated in the underground conduits to Building S and Building Q
- Security cabling from Building H to be reticulated in the underground conduits to Building S and Building Q
- 12C OS2 + 20 pair UTP Class B backbone cabling from Building H campus distributor to be reticulated in the underground conduits to Building T
- Security cabling from Building H to be reticulated in the underground conduits to Building T

The following enabling works will require to be in place prior to the commencement of the SSDA works:

- Installation of new communication cabinets in the demountables with backbone cabling from Building H campus distributor (Exempt Development)
- Existing security headend in Building I to be relocated to Building H prior to demolition of Building I and associated diversion of the security cabling between Building H and other buildings (CDC)
- Diversion of security cabling from B
- 12C OS2 + 20 pair UTP Class B backbone cabling from Building H campus distributor to be reticulated in the underground conduits to building R (CDC)
- Security cabling from Building H campus distributor to be reticulated in the underground conduits to building R (CDC)



## 5. Mechanical Services Infrastructure

### 5.1. Pacific Highway Site and Centennial Avenue Site

The air conditioning system for the new and existing building would be provided with dedicated stand-alone air-conditioning system to serve the respective building. The AC system will be installed during the construction of the building.

A dedicated mechanical services switchboard will be provided to serve each building. The mechanical board will provide electrical power for the air conditioning and ventilation equipment.

#### For New Buildings

BSE are proposing to provide new air conditioning systems and ventilations system to BCA and EFSG requirements. All new buildings consisting of permanent learning spaces and libraries will be provided with an air conditioning and ventilation system to meet EFSG requirements. BSE are not proposing to provide any AC to new temporary demountable buildings.

#### Existing Buildings

The AC system for building A has reached its end of life and is in very poor condition. BSE have proposed for Building A to be provided with a new AC system.

For the remaining existing buildings. Generally, BSE are proposing to provide new air conditioning systems where major upgrades works will be provided.

There are existing areas with minimum refurbishment works that are currently provided with AC. The AC system for these areas are to remain, however the areas are not provided with any outside air systems. New outside supply air system will be provided to meet current EFSG cooling policy requirements.

Building M and H AC system will be replaced with new AC system to cater for the new layout.

### 5.2. Lift Services

In total six (6) new lifts will be provided to serve the entire development. The lift will be installed during the same construction stage of the building.

Pacific Highway site, in total this site will be provided with two (2) new lifts.

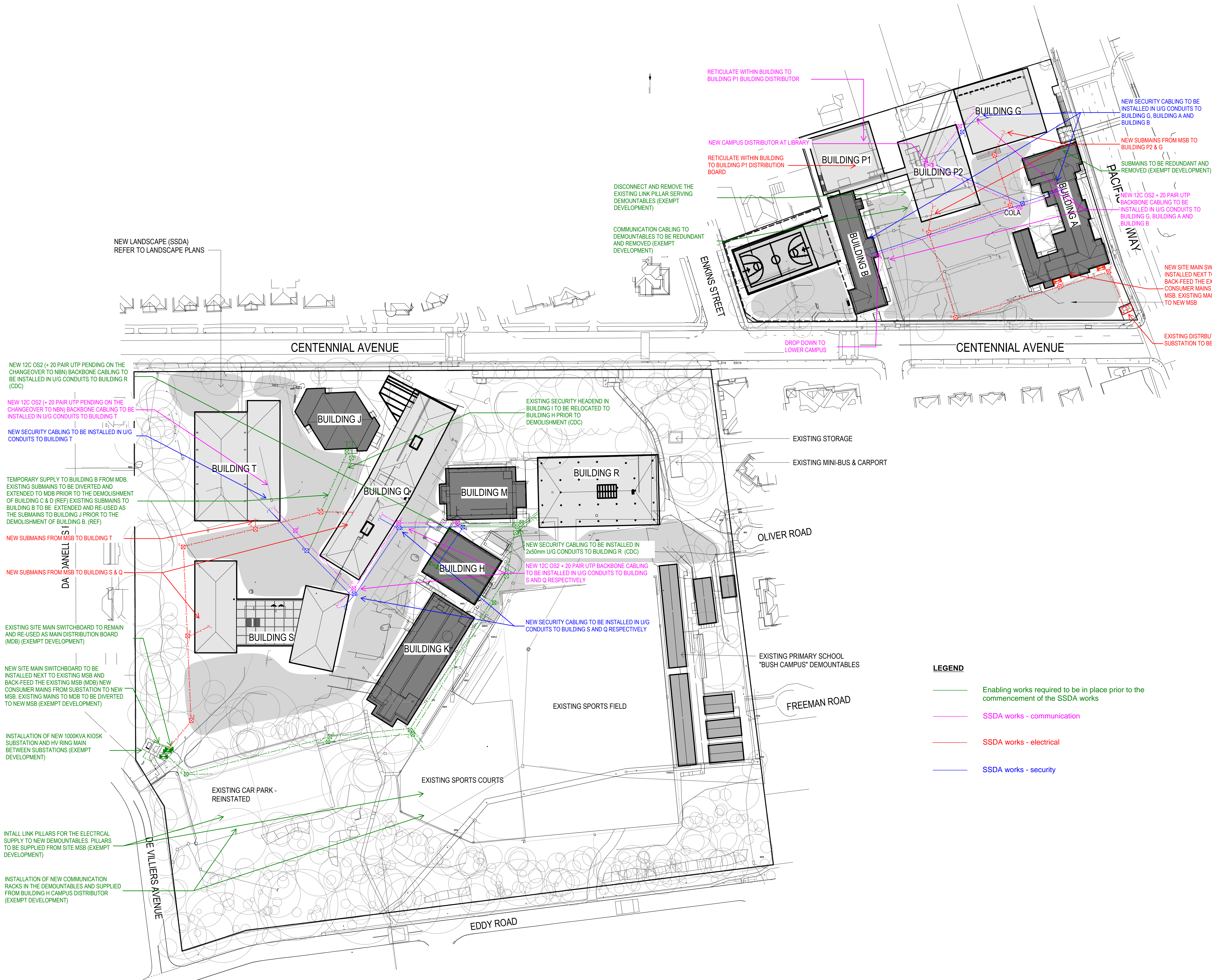
- The new buildings, Buildings P will be provided with a two (2) new lifts.

The Centennial Ave site, in total this site will be provided with four (4) new lifts.

- The new buildings T, Q and S. Each new building will be provided with new lifts, in total four (4) new lifts will be provided for the new buildings.

## Appendix A Site Reticulation Plan





- LEGEND**
- Enabling works required to be in place prior to the commencement of the SSDA works
  - SSDA works - communication
  - SSDA works - electrical
  - SSDA works - security