Electrical Infrastructure Assessment

SS PETER & PAUL ASSYRIAN PRIMARY SCHOOL

ELECTRICAL & L3ASP SERVICES

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EXECUTIVE SUMMARY

JHA has been engaged by PMDL Architects to provide Electrical Services in the assessment of the lead-in power supply arrangements for the proposed Ss Peter & Paul Assyrian Primary School development project.

This report forms part of the State Significant Development Application (SSDA) submission to NSW Department of Planning and Environment for the development of the Ss Peter & Paul Assyrian Primary School located at 17-19 Kosovich Place, Cecil Park NSW 2178 (Lots 2320 & 2321, DP 1223137).

Assessment and summaries contained within this report provide key electrical infrastructure initiatives that have been developed to provide suitable electrical power to the new Primary School site as applicable at an early design stage review. The advice contained herein will also provide opportunity for co-ordination with the Architect and the School Trustees to provide an arrangement to benefit the site into future generations.

The assessment and proposals will include the following:

- Understanding the electrical infrastructure supplies to the existing site proposed to be redeveloped into the primary school;
- Upgrade existing electrical supplies to a single permanent source in the way of a new padmount substation on site;
- Consideration of the impacts to surrounding area items for the installation of a new padmount substation;
- Recommendations for location and installation of a new padmount substation.

The outcome of the proposed arrangements as above will provide the new Ss Peter & Paul Assyrian Primary School with a permanent electrical power arrangement suitable to sustain the requirements of the site.

As project review and staging progresses, the above can be explored in more detail. In addition, new options can be addressed during the appropriate stage with associated information.

PROJECT INFORMATION

The Ss Peter & Paul Assyrian Primary School project consists of development for a new primary school involving the construction of classroom buildings, multi-purpose hall, library, administration, amenities and playground areas in one and two storey permanent buildings and playgrounds at a later stage.

The subject site for the proposed development is currently undeveloped land located at 17-19 Kosovich Place, Cecil Park, NSW 2178 (Lots 2320 & 2321, DP 1223137).

Figure 1 –Site Location (SIX Maps Image)

The school will ultimately be a 3-stream school providing education to students from Kindergarden to Year 6 for approximately 245 students and staff at Stage 1 of the development, with a final provision for 630 students and 35 staff once all stages of the development are complete. Further facilities to be provided on site include a multi-use hall, play court, canteen, library, amenities, and various forecourts with links to student drop off points and an onsite staff car park.

AUTHORITY DESIGN CRITERIA

All works involving the electrical infrastructure and associated surrounding area impacts are to be considered in accordance with the standards and requirements of the following entities:

1.1 ENDEAVOUR ENERGY

All electrical infrastructure works are to be undertaken in accordance with Endeavour Energy (EE) requirements and network standards as the electricity supply authority for the area. All electrical supply arrangements including location of equipment are wholly dependent on Endeavour Energy review and approvals during both the design and construction phases of the project.

The typical Endeavour Energy process involved with the augmentation of existing electrical infrastructure for both the temporary Stage 1 electrical service main supply and permanent padmount substation installation will be comparable to the following:

Process	Description
Endeavour Energy Connection Assessment	EE review and assess their existing network arrangements to determine feasibility of the proposed new connection works.
Application for Connection of New Electrical Infrastructure	Application for Connection issued to EE to begin their assessment and internal administration processes.
Notifications	Notification of the proposed works following EE direction is issued to Council and all affected surrounding customers for comment.
Design	Design Brief is provided by EE to enable the preparation of a Level 3 ASP design package and works.
Contracts	Easements and associated contracts are determined for EE assets within the site boundary. Legal contracts signed by all parties.
Approvals	EE provides certification approval indicating design works are fit for purpose and construction.
Construction	Accredited Level 1 ASP contractor engaged to complete works. Outages required on the existing network for connection cut-over.

1.2 DEPARTMENT OF PLANNING AND ENVIRONMENT

Final location of proposed electrical infrastructure is also subject to review of the Department of Planning and Environment (DOP&E) as part of an SSD DA application. Formal notification will be provided to DOP&E for their review and acceptance of the proposed infrastructure installation. Items of interest for the proposed new permanent padmount substation will include:

- Consideration of the proposed new padmount substation location.
- Understanding of impacts to existing physical items in the vicinity of the installation.

EXISTING ELECTRICAL SERVICES

1.3 SURROUNDING AREA

Endeavour Energy High Voltage and Low Voltage infrastructure is currently located along the southern side of Kosovich Place within public land road reserve as an overhead conductor network arrangement. An existing pole mounted substation (asset number 25488) is currently located on pole 785843 adjacent Lot 2319, providing low voltage supplies to the surrounding lots.

No existing underground Endeavour Energy networks or assets have been indicated along Kosovich Place.

1.4 PROPOSED SITE

The two proposed lots for the proposed Primary School site (Lots 2320 & 2321) are currently undeveloped land and do not have existing authority electrical infrastructure supplies.

It is believed these lots were previously associated with the homestead located at Lot 2318 as a single communal lot, now subdivided to allow the development of the proposed primary school.

PROPOSED ELECTRICAL INFRASTRUCTURE

1.5 GENERAL

The project proposes to develop the existing unoccupied lots 2320 and 2321 into a new primary school with new buildings, open areas and classrooms. The redevelopment of the existing lots will require new electrical infrastructure installed to provide suitable supply for the school's operation.

Construction of the new primary school is to be undertaken as a staged arrangement to provide initial teaching spaces for students while construction continues to complete the masterplan arrangement of the school. As a preliminary staging process, the construction has been indicated to reflect the following:

1. Stage 1 – Earthworks and infrastructure works for site development.
2. Stage 2 – 2 storey learning / administration buildings with associated play areas for up to 210 students
3. Stage 3 (Final Masterplan) – Single and two storey building consisting of classrooms, library, canteen, and multipurpose hall facilities with associated external areas for up to 630 students.

1.6 SITE POWER REQUIREMENTS

In consideration of the new school development and with the knowledge that there is no existing electrical supply to either of the existing lots, a new electrical supply is required to be established. Following deliberations on potential options available to supply the site it has been determined a single consolidated electrical supply arrangement for all stages is to be established.

JHA have carried out preliminary maximum demand calculations for the primary school based on the current master plan and have yielded an electrical load requirement of approximately 700 Amps, 3 phase. The calculated supply demand is greater than that available from the existing Endeavour Energy infrastructure network. To cater for the Stage 1 construction works, the Stage 2 new teaching and administration building, as well as the final Stage 3 masterplan arrangement, a new padmount substation is proposed to be installed on site at the early stages of the project.

The padmount substation will provide suitable power capabilities to supply the proposed site with provision of spare capacity for any future endeavours to be considered by the primary school.

1.7 PADMOUNT SUBSTATION LOCATION & ACCESS

The new padmount substation is proposed to be situated within the development lot directly adjacent the site boundary. This location has been carefully determined with consideration to the following:

- Endeavour Energy direct vehicular and personnel access to the padmount substation from public space without the need of a right-of-way path to enter the site.
- Direct access to new Endeavour Energy high voltage cabling proposed for installation within the Kosovich Place road verge for substation connection, without the need of easements encumbering private land.
- Minimisation of site ground impacts for easement zones over Endeavour Energy assets.

Installation of the new Endeavour Energy padmount substation has been co-ordinated with the final school development masterplan to help avoid the need for relocation during the later stages of development.

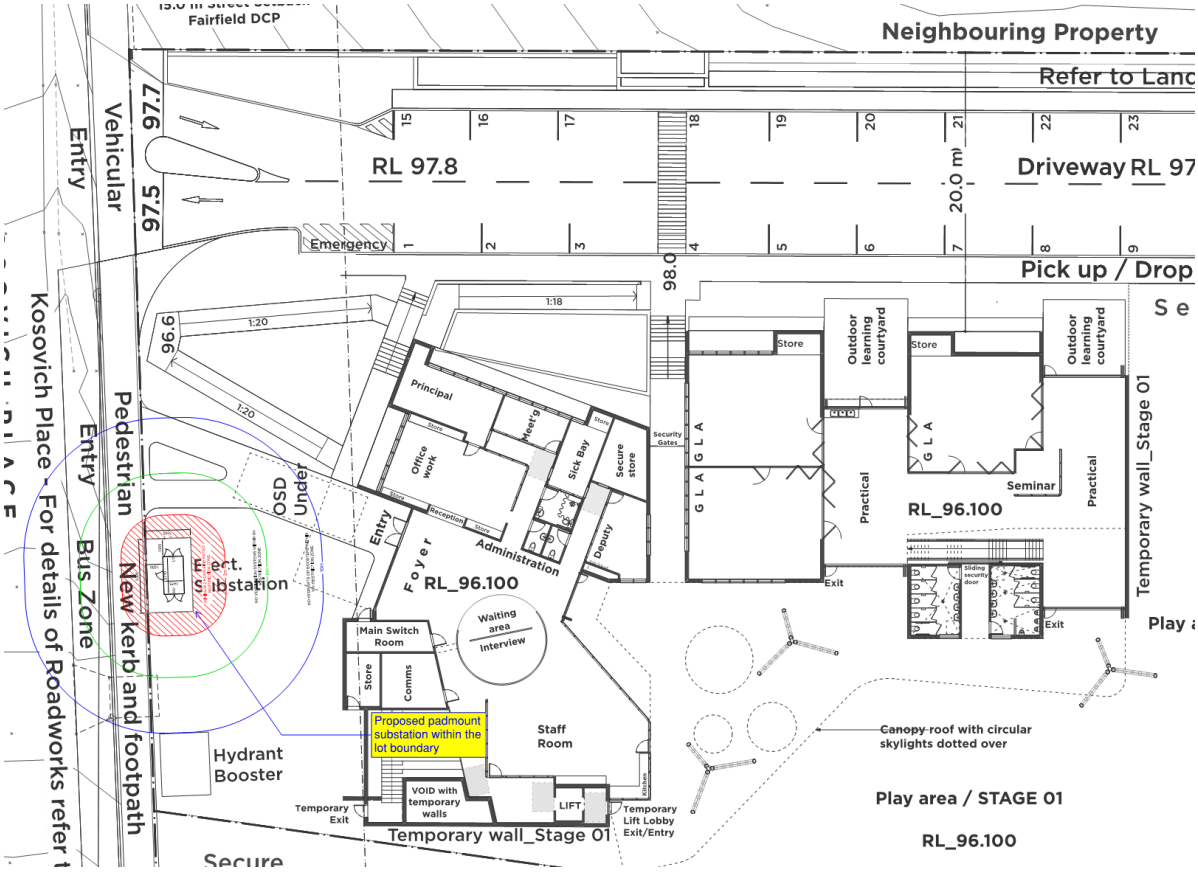

Figure 2 – Proposed New Padmount Substation Location

However the, final location of the proposed padmount substation within the lot boundary will be subject to co-ordination with the final construction plans, School Trustees and Endeavour Energy.

1.8 PADMOUNT SUBSTATION HIGH VOLTAGE RETICULATION

To enable the installation of the proposed padmount substation, it is anticipated the existing high voltage network will need to be supplemented/ extended along Kosovich Place; potentially for the extent back to Wallgrove Road. LV street reticulation to retain existing LV supplies to street lots may also be required should Endeavour Energy determine the existing pole mounted substation is to be decommissioned. Extent of works will include excavation along the Kosovich Place verge for installation of new conduits and cables as per Figure 2 below. The final determination of the connection requirements will be provided by Endeavour Energy upon the receipt of a Design Brief for the proposed padmount substation (Supply Offer received to date).

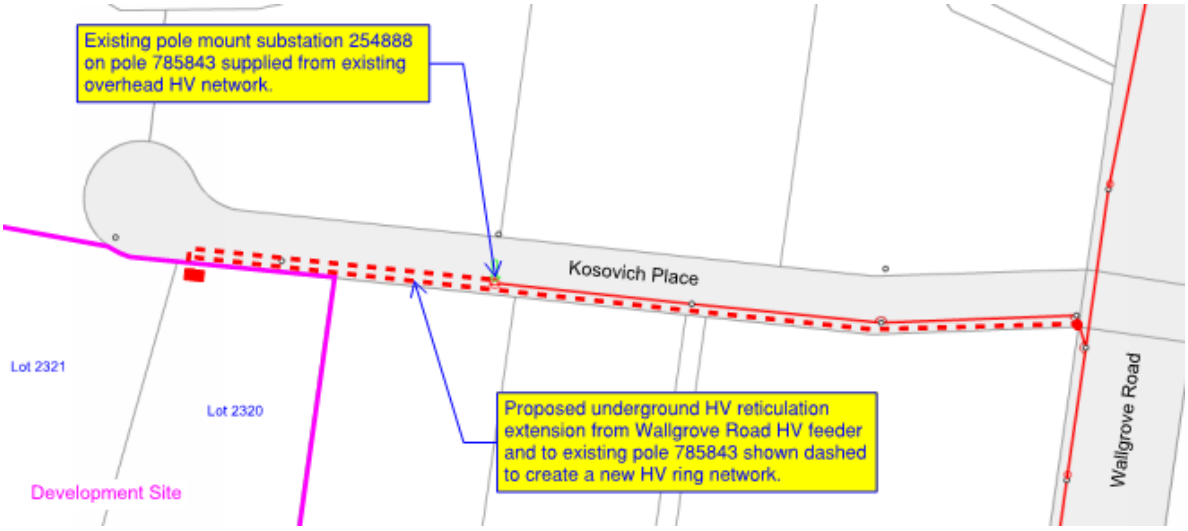

Figure 3 – Proposed HV Installation for New Padmount Substation

ELECTRICAL SERVICES

1.9 MAIN SWITCHROOM

The new main switchroom is proposed to be located to the front of the administration building within 20m of the substation. The main switchroom will accommodate the main switchboard serving safety services equipment, supply authority meter panels, power factor correction equipment and local distribution boards.

The main switchroom shall be constructed to comply with NCC/BCA clause 2.13 including the following elements:

- Structural elements shall be constructed to a FRL of not less than 120/120/120 and a minimum
- Two egress exit self-closing door with a FRL of not less than -/120/30 spaced well apart in accordance with AS/NZS3000.

1.10 DISTRIBUTION BOARDS

The main switchboard will serve all distribution boards located throughout the campus, for supply of general power, lighting, mechanical services and other equipment as required. The distribution boards will be accommodated within lockable distribution board cupboards located within 40m in accordance with EFSG requirements.

Each distribution board will be designed to supply light and general power loads as required plus 20% spare capacity.

The cupboard doors shall be provided with non-combustible coverings and opening suitably smoke sealed when located within egress paths of travel in accordance with NCC/BCA D2.7.

1.11 LIGHTING

It is proposed to use LED type luminaires to all areas due to their high efficiency long life. Lighting levels will be in accordance to AS/NZS 1680 and NCC requirements.

The sporting fields and carpark will be provided with pole mount flood light type luminaires angled to meet obtrusive lighting guidelines.

A proprietary lighting control system will be provided to increase the energy efficiency of the lighting services and allow for control, utilising time clock programmable occupancy detectors and PE cell lighting controls.

Common areas will be provided with occupancy detection lighting controls with manual override switching. Toilets and common corridors will be controlled via occupancy detectors for a pre-set period of time thereafter.

1.12 EMERGENCY AND EXIT LIGHTING

Emergency and Exit lighting will be provided in accordance with the AS2293 and NCC in all areas requiring emergency lighting such as stairs, internal passageways, open spaces and exit from the floor and building.

Emergency lighting local test facility system to be installed within all distribution boards.

Emergency lighting will generally consist of;

- Recessed stand-alone luminaire within corridors and areas where false ceilings exist
- Integrated LED fittings within plantroom areas
- Test facility within each floor distribution board

1.13 PHOTOVOLTAIC SYSTEM

It is JHA's understanding that this site may not be provided with a photovoltaic system at stage 1. At a minimum for stage 1 the Main Switch Room and Board will include capacity for such a system if installed during this or a later stage. This approach will be further investigated with the client.

COMMUNICATION SERVICES

New Telstra/ NBN lead-in communication infrastructure will be incorporated into the design and construction phases of the development as follows:

Communication services infrastructure lead-in conduits shall be provided to pits located along the footpath.

Three (3) x 100mm underground conduits will be provided to each pit located on Kosovich Place to allow provision for up to three carriers to the main communication room serving the entire School.

1.14 COMMUNICATION ROOM

The communication room is proposed to be located within close proximity to the office administration areas to serve the entire school campus.

The proposed communication room will be sized in accordance with the EFSG requirements. This is expected to comprise of three full height school campus distributor, server and IT network equipment communication racks, PABX/VOIP, wall mounted carrier MDF, fibre to the premises network hubs and security cubicles.

The communication equipment UPS will exceed the 10Ah capacity threshold limit serving the communication room equipment thereby requiring the communication room shall be constructed to comply with NCC/BCA clause 2.13 including the following elements:

- Structural elements shall be constructed to a FRL of not less than 120/120/120 and a minimum
- Self-closing door with a FRL of not less than -/120/30

Each building will have its own dedicated communication building distributor rack with a tie link back to the campus distributor in a star like fashion (The Campus distributor being the centre).

1.15 COMMUNICATION CUPBOARDS

The communication cupboards are proposed to be centrally located within each building serving network and security equipment serving all data outlets within a 90m cable route length.

The cupboard doors shall be provided with non-combustible coverings and opening suitably smoke sealed when located within egress paths of travel in accordance with NCC/BCA D2.7.

Wireless access points to be spaced at minimum 10 meter intervals to provide suitable coverage throughout the building. Final location of outlets will be coordinated with architectural room layouts and confirmed as the design progresses.

SECURITY SERVICES

1.16 ACCESS CONTROL

An electronic access control system shall be provided.

Main control panels shall be located in the building main communication room.

The system shall use proximity cards of the HID type and strategically located in the following areas:

- Personnel entrances
- Vehicle entrance
- Administration facilities
- Communications room

The system shall be capable of access by staff and cleaning services. Logging of entry against Key numbers shall be provided.

1.17 SECURITY MONITORED ALARM POINTS

The following doors shall be provided with electronic monitoring (reed switches)

- All Access Controlled Doors
- All External Doors
- External Access door
- Internal doors to the ground floor bathroom facilities (for secure out of hours operation)

1.18 CCTV

A CCTV system is to be provided throughout the external areas only, with an emphasis on building perimeter security only (not internal spaces).

New CCTV cameras and cabling will be linked back to the comms patch panels and switches. Cabling will be carried out as part of the communications data contractor scope, whereby the CCTV contractor would provide patch leads from the data outlet to the camera.

The CCTV system will consist of fixed lens colour cameras and weatherproof and vandal-proof cameras as required. Where wide / long view recording is needed megapixel cameras will be utilised.

CCTV surveillance will be provided to all after-hours access and perimeter points.

FIRE SERVICES

1.19 FIRE DETECTION AND ALARM SYSTEM

An automatic fire detection and alarm system will be provided to satisfy Specification E.2.2a of the Building Code of Australia, AS1670.1 and the local government requirements.

The automatic fire and smoke detection system will have a Fire Indicator Panel located at the main entry and interconnection with Fire Brigade. The FIP will be capable of interfacing with other services such as mechanical services, lift services and security systems.

COMPLIANCE & SUITABILITY

The proposed electrical infrastructure installation, location and connection arrangements as detailed within this report reflect Endeavour Energy's typical requirements as the electrical supply authority. Final determination of the electrical connection works to be provided by Endeavour Energy upon submission of connection applications.

The proposed arrangement of a new padmount substation on site at an early stage will provide suitable electrical supply to the development across all proposed construction and final stages and allows additional provision for any future upgrade endeavours. The space allocation has been determined in consideration of all existing physical items on site to ensure impacts are kept to a minimum.