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## **NSW** Department of Education

# Bungendore High School

Electrical and ICT Services Report Reference: EL-BHS-RPT-002

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# 1. Introduction

This Electrical and ICT Services Report has been prepared to support a Review of Environmental Factors (REF) for the NSW Department of Education (DoE) for the construction and operation of the new Bungendore High School (the activity).

The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by *State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP)* as "development permitted without consent" on land carried out by or on behalf of a public authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37 of the T&I SEPP.

This document has been prepared in accordance with the Guidelines for Division 5.1 assessments (the Guidelines) by the Department of Planning, Housing and Infrastructure (DPHI). The purpose of this report is to provide a review of existing ICT and Electrical services around the site and how these will be augmented to support the activity.

# 2. Site Description

The current street address is part of 18 Harp Avenue, Bungendore, NSW, 2621 (the site), and is legally described as part Lot 125 in Deposited Plan 1297613. As shown at Figure 1, the proposed school site forms part of a larger lot which is the subject of a proposed residential subdivision.

The site is located within the North Bungendore Precinct (Elm Grove Estate) in Bungendore. As a result of precinct wide rezonings, the surrounding locality is currently transitioning from a semi-rural residential area to an urbanised area with new low density residential development.

The site is zoned R2 Low Density Residential, with all adjoining land also zoned R2 Low Density Residential.

The site has three frontages:

- Approx 500m southern frontage to Birchfield Drive.
- Approx 500m northern frontage to Bridget Avenue.
- Approx 100m eastern frontage to Winyu Rise.

The site is currently cleared of all vegetation and consists of grassland, having been prepared for the purposes of future low density residential development.

Figure 1 Aerial Photograph of the Site



Source: Urbis, 2024

# 3. Proposed Activity Description

The proposed activity is for the construction and operation of a new high school known as Bungendore High School. The new high school will accommodate 600 students and will involve the construction of three buildings including two learning hubs and a school hall.

The buildings will be three-storey in height and will include teaching spaces, specialist learning hubs, a library, administrative areas and a staff hub. Additional core facilities are also proposed including a standalone school hall with covered outdoor learning area (COLA), a carpark, a pick up and drop off zone along Birchfield Drive, sports courts and a sports field.

Specifically, the project involves the following:

- Building A, which is three storeys accommodating general learning hubs, administration / staff hub and library.
- Building B, which is a part three/part four storeys accommodating general learning hubs and staff areas.
- Building C, which is a standalone school hall with COLA.
- Building D, which is an agricultural block.
- Carpark with 50 spaces.
- Open play space including sports courts and a sports field.
- Associated utilities and services including substation.

The proposed site access arrangements are as follows:

• Main pedestrian entrance to be located off Birchfield Drive.

- Secondary pedestrian access from Bridget Avenue.
- Pick up and drop off zone proposed along Birchfield Drive.
- Onsite parking access via Bridget Avenue.

The design has been masterplanned to allow for an additional future stage.

Figure 2 provides an extract of the proposed site plan.

#### Figure 2 Site Plan



Source: NBRS, 2024

# 4. Existing Services

#### 4.1.1 Existing Utilities – Electrical

A review of the Essential Energy network indicates the following existing electrical services surrounding and within the Bungendore site:

#### **Existing Kiosks**

Two existing kiosk substations are located near the site boundaries.

- The first kiosk substation is located to the south of the site along Birchfield Drive and will be retained for future use.
- The second kiosk substation is positioned to the east of the site along Winyu Rise and will also be retained.

#### High Voltage (HV) Infrastructure

- The site is bordered by an underground HV cable network.
- The HV cabling is marked as a dashed blue line, indicating underground HV circuits traversing the area.

#### Low Voltage (LV) Infrastructure

- A network of underground LV cables in plastic conduits, denoted by solid blue lines below, provides connectivity to the residential lots within the surrounding area.
- LV cabling within plastic conduits connects to electrical cubicles and feeder pillars positioned strategically to supply power to residential developments.

#### **Other Critical Infrastructure**

- The western boundary of the site includes a drainage reserve, with the electrical infrastructure appearing to avoid encroachment into this area.
- The northern boundary, along Bridget Avenue, contains feeder pillars and underground cable connections to support the nearby lots.

#### **Retained Services**

All existing Essential Energy assets, including kiosks, feeder pillars, and underground cabling, will be retained as part of the proposed works.

• Modifications or additions to the network will be required to integrate the electrical supply needs of the site while maintaining existing infrastructure performance.

#### **Proposed Network Enhancements**

Essential Energy may require adjustments to the existing infrastructure to accommodate the proposed development.

• This includes ensuring adequate capacity and redundancy within the LV and HV network for both current and future load requirements.



Figure 3 BYDA utility existing electrical services

### 4.1.2 Existing Utilities – Communications

A desktop Before You Dig Australia (BYDA) study was conducted for the proposed Bungendore High School site and the surrounding area. The following outlines the existing communications services around the site, providing context for the proposed development's servicing strategy.

The communications infrastructure for the site includes conduits from NBN, which are available around the perimeter of the site. However, no Telstra conduits or services are currently identified directly within or adjacent to the site boundary. These services may need to be extended to meet the school's requirements.

There are no required diversions based on the existing layout.

Key details of the existing communications infrastructure:

- NBN Conduits (P100): NBN conduits are located around the site perimeter, with pits positioned at key intervals. These conduits form part of the fibre optic network, providing high-capacity communications services.
- Pit Locations: The perimeter of the site includes multiple pits linked to the NBN network. These pits can be utilised to facilitate connections to the school buildings and support its communication needs.

The servicing strategy will involve coordinating with NBN and Telstra to finalise connection points and ensuring all works are compliant with regulatory and utility provider requirements. The contractor will need to engage with Telstra to identify how a Telstra fibre connection can be provided.



Figure 4 Existing NBN assets

Utility applications for connection will be completed at the next stage of design to provide confidence in the proposed connection strategies.

# 5. Description of Proposed Services

### 5.1 Proposed Electrical Infrastructure

- **Substation**: A new 1000kVA kiosk substation located adjacent to Block A, supplying power to all facilities except agriculture building. LV supply from local feeder pillar to support small agriculture building.
- Main Switchroom: Positioned in Block A to minimise cable reticulation.
- **LV Distribution**: Underground reticulation for electrical cabling to various buildings and key infrastructure.
- **Photovoltaic System**: A 70kW solar PV system on Block A's rooftop, expandable to 100kW in future phases.
- Underground cables: To mitigate the risk of electrolysis corrosion from the nearby railway infrastructure, all underground low-voltage (LV) electrical cabling and ICT cabling will be installed within plastic conduits. The presence of rail-induced stray currents can accelerate metallic conductor degradation, leading to potential service failures and safety risks. Using non-conductive plastic conduits effectively insulates the cabling from external electrical interference, ensuring long-term reliability, compliance with relevant standards, and minimisation of maintenance requirements. This approach aligns with best practices for rail-adjacent infrastructure and mitigates the risk of premature asset deterioration.



Figure 5 Proposed Electrical and ICT Infrastructure

#### 5.2 Proposed ICT Infrastructure

- Main Communications Room (MCR): Located on the ground floor of Block A, housing the Campus Distributor.
- **Building Communications Rooms (BCRs)**: Strategically located to maintain the required 75m cabling radius.
- Wireless Access Points (WAPs): Distributed across classrooms, corridors, and communal spaces, with external WAPs for covered outdoor learning areas.
- **NBN and Telstra Connectivity:** Both services will be integrated, ensuring redundancy and comprehensive ICT support for the school.

#### 5.3 Site Context and Environmental Considerations

• **Existing Utilities:** The site is bordered by HV and LV networks, with NBN conduits and pits at the perimeter. Telstra services currently do not extend directly to the site and will require new conduits and connections.

#### • Environmental Impact:

- Trenching for underground cabling could disturb soil and vegetation.
- Noise from construction activities may temporarily affect surrounding areas.
- Visual impact from above-ground installations like the substation.

#### 5.4 Electrical Infrastructure Impacts

- Impact: Ground disturbance during trenching and substation installation.
- Mitigation: Erosion and sediment control measures, along with re-vegetation post-construction.

#### 5.5 ICT Infrastructure Impacts

• Impact: Minimal as ICT works are primarily underground or within buildings.

• **Mitigation**: Ensure all trenching avoids sensitive areas and complies with environmental management plans.

### 5.6 Compliance with Standards and Regulations

- The design aligns with:
- NCC 2022 and relevant Australian Standards, including AS3000:2018, AS1768 (Lightning Protection), and AS2293.1 (Emergency Lighting).
- NSW Department of Education's EFSG 2.0 and Structured Cabling Systems Specifications.
- Australian standards
- Utility standards

### 5.7 Stakeholder Consultation

- DBYD for Telstra, NBN and Essential Energy complete
- Coordination with Essential Energy for electrical connections and approvals will commence at the next stage of design.
- Engagement with NBN for ICT infrastructure integration will commence at the next stage of design.

## 5.8 Mitigation Method Table

Project Stage	Mitigation Measures	Relevant Section of Report
D/C	Trenching for underground cabling will include erosion control measures to minimise soil disturbance and protect vegetation.	5.3
D	To mitigate the risk of electrolysis corrosion from the nearby railway infrastructure, all underground low-voltage (LV) electrical cabling and ICT cabling will be installed within plastic conduits.	5.1
С	Noise management plans, including temporary noise barriers, will be implemented during construction to reduce noise impact on surrounding areas.	5.3
0	Above-ground installations, such as the substation, will be designed to minimise visual impacts and blend with the surrounding environment.	5.3
D/C	Ground disturbance during trenching, substation installation, and generator placement will be mitigated through erosion control and re-vegetation measures.	5.4
C / O	Noise from the emergency generator operation will be mitigated using an acoustic canopy designed as per the acoustic consultant's specification.	5.4
D/C	ICT trenching works will avoid sensitive areas and comply with environmental management plans to ensure minimal impact.	5.5
D	The design aligns with NCC 2022 and relevant Australian Standards, including AS3000:2018, AS1768 (Lightning Protection), and AS2293.1 (Emergency Lighting).	5.6

Project Stage	Mitigation Measures	Relevant Section of Report
D	Compliance with the NSW Department of Education's EFSG 2.0, Structured Cabling Systems Specifications, and Arup Acoustic specifications will be ensured.	6.6
D / C	DBYD investigations for Telstra, NBN, and Essential Energy have been completed. Coordination with Essential Energy for electrical connections and NBN for ICT infrastructure integration will commence at the next stage of design.	6.7
D / C	Early engagement with utility providers will confirm connection points and design approvals to avoid delays.	6.7
С	Implementation of detailed erosion, sediment control, and noise management plans during construction will mitigate environmental impacts.	6.3, 6.4
D/C	Close coordination with the design team will integrate sustainability measures, including ICT infrastructure and acoustic management, while minimising environmental impacts.	6.6

## 5.9 Conclusion

This assessment has evaluated the potential environmental impacts associated with the proposed electrical and ICT services for the New High School for Bungendore. The identified impacts include ground disturbance during trenching, substation installation, and generator placement, as well as temporary noise from construction activities and potential ongoing noise from generator operation. Additionally, visual effects from above-ground installations, such as the substation, have been considered. Electrolysis has also been addressed.

Mitigation measures, including erosion and sediment control plans, noise management strategies, revegetation measures, and the use of an acoustic canopy for the emergency generator, have been incorporated into the project. These measures will ensure that all potential environmental impacts are effectively managed and mitigated.

Furthermore, the proposed electrical and ICT services have been designed in compliance with all relevant standards, including NCC 2022, AS3000:2018, AS1768, AS2293.1, the NSW Department of Education's EFSG 2.0, and the Arup Acoustic Specification. This ensures that the project aligns with industry best practices, environmental considerations, and regulatory requirements.

Subject to the implementation of the recommendations and mitigation measures detailed in this report, it is concluded that the proposed electrical and ICT services will not result in any likely significant environmental effects and can be implemented with minimal impact on the surrounding environment.