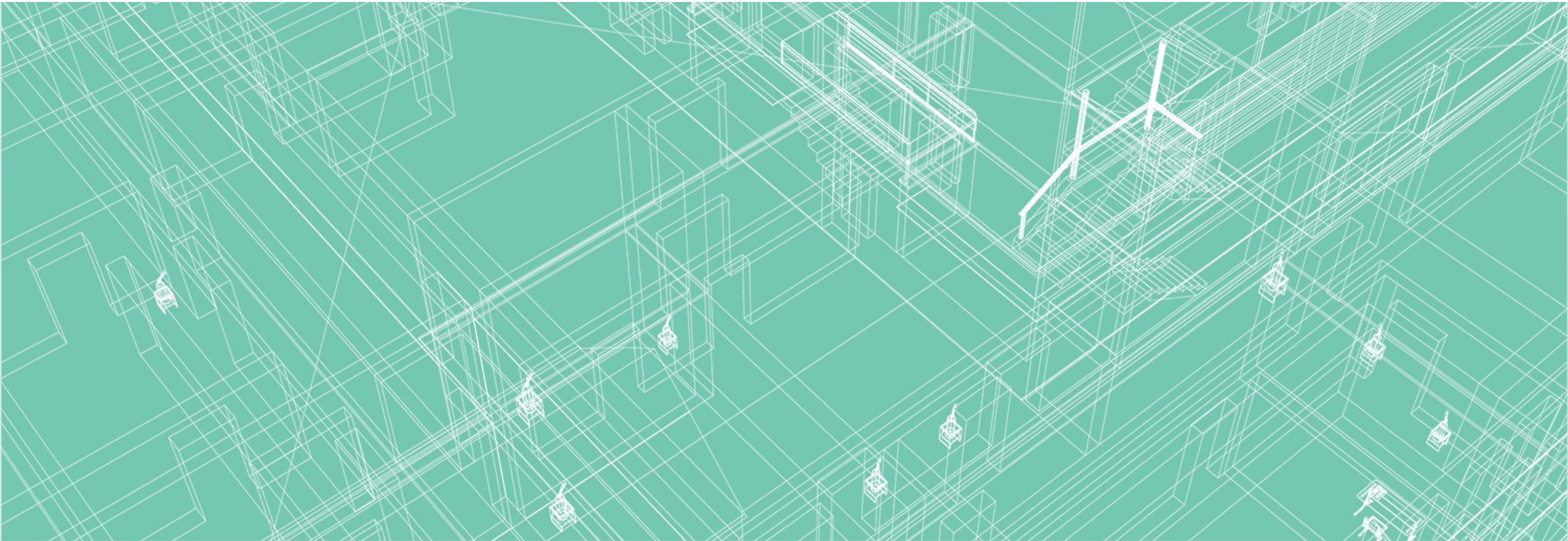




LIGHTING STRATEGY

NEW PRIMARY SCHOOL IN EDMONDSON PARK

ELECTRICAL SERVICES

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1 INTRODUCTION

JHA are the lighting designers for the New Primary School in Edmondson Park and have prepared this report in accordance with the technical requirements of the Secretary’s Environmental Assessment Requirements (SEARs) and the Educational Facilities Standards Guidelines (EFSG) for the development of a New Primary School in Edmondson Park.

Specifically this report addresses the following SEARs:

SEARs	Report Reference
Item 5 - Environmental Amenity	Contents in this Report in particular:
An analysis of proposed lighting that identifies measures to reduce spill into the surrounding sensitive receivers.	Page 5

The document is designed to achieve a summarised, succinct and coherent written description detailing information on the lighting strategy to be implemented to the New Primary School in Edmondson Park. The document will also identify the recommended lighting levels and specific requirements as per Australia Standards and will be used a guide for the detailed design development.

In response to SEARs and the EFSG, the following lighting strategies will be implemented:

- The lighting design will only highlight the building feature elements where applicable while minimising the reflectance to neighbouring buildings, especially residential buildings.
- Special consideration to external luminaire selection will be made in particular the light intensity and distribution.
- Lighting calculation will be carried out to demonstrate the compliance to AS4282.
- Luminaires will be timer/ PE controlled ensure illumination to the surrounding context is managed and controlled. In addition, a local lighting control switch/panel will be installed in the nearest electrical switchboard to override/ control the system.
- Low glare luminaires will be utilised throughout the external lighting.
- Timers and photoelectric sensors will be installed for energy savings.
- Building entrance and external walkways will be well lit to maximise the opportunities for casual surveillance.
- Up-lighting luminaires will be avoided to minimise the sky glow.

The document is not designed as a specification or bill of materials, nor is it intended to provide detail of the equipment, fitting or services selection.

1.1 DESCRIPTION ON SITE

The New Primary School in Edmondson Park is approximately 2 hectares comprises 2 allotments, which described in Table 1.1 below and shown in Figure 1.1(a). It is noted that the new primary school and the proposed works are located on Lots 1 and 2 in DP 1257105 (the Site) (refer to Figure 1.1(b)).

Table 1.1 – New Primary School in Edmondson Park Allotments

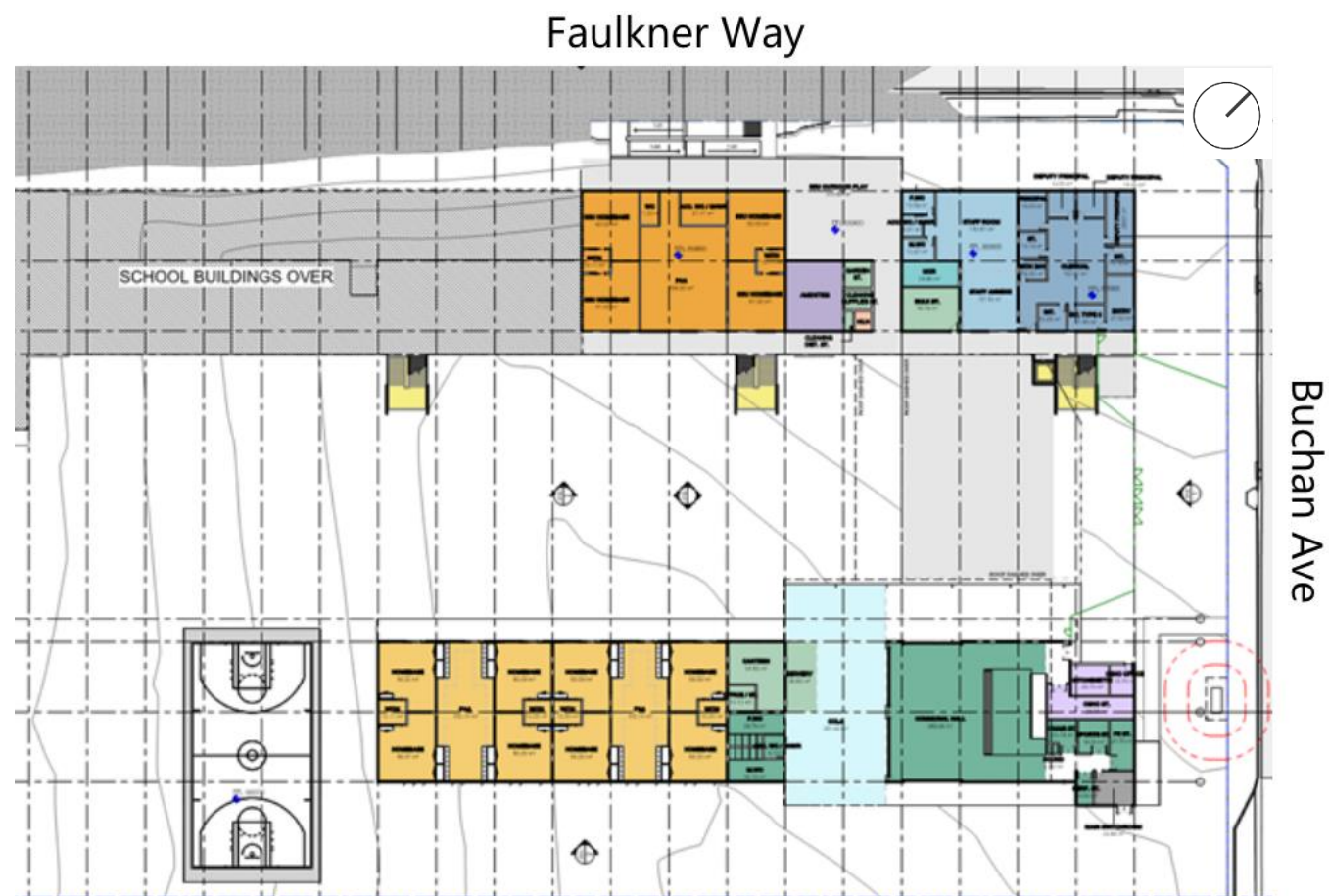
Address	Legal Description
Buchan Avenue	Lots 1 and 2 in DP 1257105

Figure 1.1(a) – New Primary School in Edmondson Park landholdings



Source: Six Maps

Figure 1.1(b) – The Site: Location of New Primary School in Edmondson Park.



Source: TKD Architects

The key school elements within and surrounding the Site include:

- A drop-off and pick-up area and bus zone along Buchan Avenue to the north of the site.
- Staff car park accessed from Faulkner Way to the south west.
- A three-storey courtyard building.
- Multi-purpose sporting facilities and outdoor play spaces.

1.2 NEW PRIMARY SCHOOL AND THE SURROUNDING CONTEXT

The New Primary School in Edmondson Park is located in the Liverpool council local government area (LGA). It is directly to the north west of Edmondson Park Railway Station.

The new primary school location is approximately 9km south east of Liverpool Hospital, 400 metres north west of the Edmondson Park Railway Station. Currently there is proposed works within the vacant land to the north and east of the new primary school. The works is known as the Town Centre North and is proposed to increase the dwellings from 440 to 3,286.

The key land use characteristics surrounding the new primary school are:

- **South:** The South West Rail corridor and vacant land.
- **North:** Low density residential and vacant land earmarked for the development of medium – high density residential dwellings.
- **East:** Vacant land earmarked for the development of medium – high density residential dwellings.
- **West:** Low density residential.

Immediately surrounding the new primary school is best described as:

- **South:** The South West Rail corridor.
- **North** (Buchan Avenue): Clermont Park.
- **East:** Vacant land earmarked for the development of medium – high density residential dwellings.
- **West** (Faulkner Way): Low density residential.

The relationship to site and immediate surrounds i.e. existing building and infrastructure, reduce light spill into surrounding sensitive receivers, in particular to the north , east and western fronts has been assessed and by ensuring compliance with AS4282 coupled with lighting techniques with lighting will be primarily focused/ projected downwards avoiding glare, impacts to these neighbours will be minimal. Lighting will be timer/pe controlled, and therefore will be managed accordingly

1.3 PROJECT DESCRIPTION

The proposed works comprise the following:

- Land use for the purpose of a new primary school and pre-school;
- Construction of new buildings including:
 - A three storey building on the western portion of the site primarily addressing Faulkner Way comprising 36 homebases, 4 special support unit teaching spaces, staff room, administration office at the ground floor and library at the first floor addressing the corner of Buchan Avenue and Faulkner Way, and student amenities;
 - A single storey coldshell preschool building for educational programs for children the year before they commence kindergarten, accommodating 40 places. The pre-school building will be connected at the southern end of the three storey building; and
 - A single storey building on the eastern portion of the site comprising a communal hall, out of school hours care facility, 8 homebases and covered outdoor learning area.
- Landscaping and public domains works including tree planting, a sports court and creation of various assembly, play and learning zones;
- A drop-off and pick-up zone, and bus zone on Buchan Avenue;
- An at-grade staff carpark in the southern part of the site with ingress and egress provided off Faulkner Way at the south-west corner of the site;
- Primary pedestrian entrance from Buchan Avenue and an additional entrance on Faulkner Way for the ground floor support unit; and
- Other ancillary infrastructure and utilities works and digital signage.

2 GLOSSARY

Term	Definition
The Site	Buchan Avenue: 1 and 2 in DP 1257105
The Project	Construction of a New Primary School in Edmondson Park.

3 LIGHTING STRATEGY

3.1 ASPIRATIONAL BRIEF

The lighting design for The Project aims to not only achieve an elegant and discreet solution that will enhance the aesthetic qualities of the New Primary School in Edmondson Park, but also to provide a robust system that will last.

The aspirations of the overall lighting design will be delivered through design solutions that benchmark internationally accepted best practice recommendations to support the functionality of the school's interior and exterior spaces. The design will achieve high visual comfort, and sensitively respond to the building fabric and the immediate environment by considering the following key points:

- Flexibility to accommodate the various functional requirements of the school
- Compliance with the EFSG requirements
- Coordination and integration with architecture, fire strategies, and other engineering services disciplines
- User comfort and experience
- Energy efficiency
- Technology – appropriate, tested and robust;
- Light - efficient and appropriate artificial sources balanced with natural light sources
- Safety
- Controllability
- Reliability
- Adaptability
- Maintainability
- Expandability
- Value for Money



3.2 ENERGY

Supporting the global movement to preserve and use natural resources and monitor energy consumption and costs, the project not only has an opportunity but also a responsibility to achieve a successful sustainable solution with minimal impact on the environment. The design will consider a holistic approach to attain a low energy sustainable solution.

3.3 TECHNOLOGY

Technological advancement is a key consideration within the New Primary School in Edmondson Park. The design will incorporate smart design principles to compliment the building's technical capabilities. Design considerations will assist in enhancing the flexibility and function of the space.

3.4 OBJECTIVES AND GUIDELINES

The design objective is to respond to SEARs and the EFSG whilst adopting best practice recommendations in accordance with Australian code compliance.

3.4.1 EDUCATIONAL FACILITIES STANDARDS & GUIDELINES (EFSG)

The design objective shall respond to the EFSG objectives as stated under Specifications Guide 951 Luminaires. The provisions below shall be designed / allowed to meet / align with the EFSG objectives

OBJECTIVES

- To minimize the impact of artificial illumination on the amenity of residents and pedestrians.
- To provide a safe urban environment without adverse effects on surrounding development or the public domain.
- To minimize the impact of artificial illumination in contributing to sky glow.

PROVISIONS

- Where external artificial illumination is proposed:
 - It should be designed and sited to minimize glare.
 - It must comply with the standards set out in Australian Standard AS4282 – *Control of the Obtrusive Effects of Outdoor Lighting*
- Illumination of sporting facilities to be timer controlled.
- Entrances must be well lit and do not produce shadows or adverse glare.
- Staff entrances which are separated from the main building entrance must be well lit and opportunities for casual surveillance is maximized.

3.4.2 CODES AND COMPLIANCE

Whilst the creation of an appropriate lighting atmosphere is considered the highest priority, the following policies, acts, ordinances, regulations and codes will be considered as part of the design:

- The Standards Association of Australia
- The Building Code of Australia NCC 2019
- AS4282 – Control of the Obtrusive Effects of Outdoor Lighting
- AS1680 – Interior Lighting
- AS1158 – Lighting for roads and public spaces – Pedestrian
- AS2560 – Sports Lighting

3.5 LIGHTING DESIGN OBJECTIVES AND MITIGATION MEASURES

Light is a major part of the project since it has a direct influence on the perception and the definition of this educational project. The important issues to consider are the illuminance levels provided, the selection of luminaires, luminaire colour temperature, luminaire colour rendering, the use of daylight, the control of light, and the location of luminaires to ensure minimal impact to the fabric of the architecture and to avoid negative impact and obtrusive effects to the neighbouring properties/ receivers.

Throughout the support spaces, light should create a comfortable, varied, inviting and interesting atmosphere, in support of the vision, intention and design of the architecture.

The internal lighting scheme should consider façade and exterior connections of the building to provide a cohesive and harmonious solution that connects the interior and exterior where appropriate and enhance the facades connection to the landscape. The design must also connect to the street and immediate exterior environment whilst avoiding impact to neighbours by ensuring design compliance to AS4282.

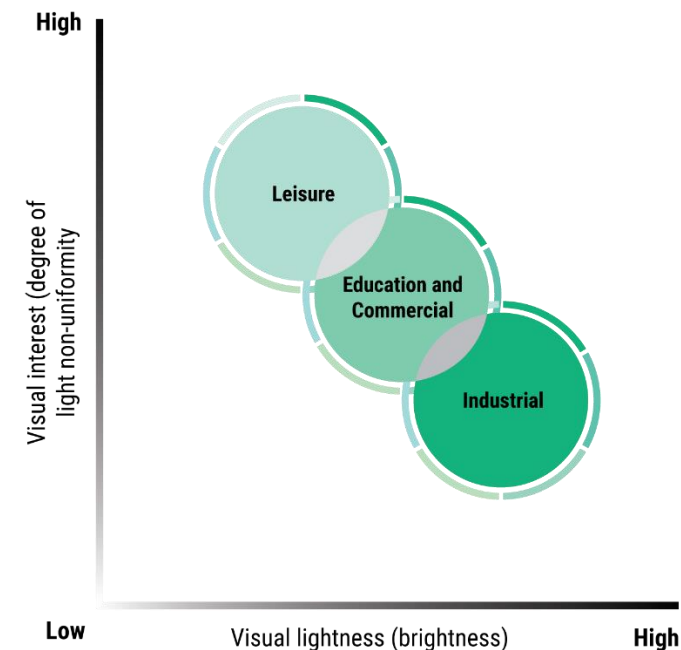


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3.6 LIGHTING DESIGN PARAMETERS



3.6.1 VISUAL QUALITIES OF LIGHT

Correlated colour temperature (CCT) of a light source is a measure of the hue of the white light output of that source. It is denoted in Kelvin (K) degrees that refer to the temperature of a theoretical black body radiator which, when heated up to a certain temperature, emits the same hue equivalent as the light source in question.

Practically, correlated colour temperature gives an indication of how cool or how warm the light output of a light source appears. Colour temperatures of less than 3500 K are commonly named as warm white. The lower the correlated colour temperature of a light source, the warmer the appearance; and the higher the colour temperature, the cooler the appearance of the light source.



(Pinterest and google)

Colour Rendering Properties (CRI) The spectral properties of the light sources have a direct influence on the colour appearance of the surfaces within the spaces. The choice of light sources should be made to create the intended visual atmosphere, being mindful about all the materials and surfaces, their forms and colours. Colour rendering is of particular importance in the enhancing the interior visual quality within various rooms.



(Pinterest and google)

3.6.2 LIGHTING INTENSITY AND UNIFORMITY

Lighting will be designed to achieve the adequate illumination levels addressed by the relevant guiding documents (AS1680, AS1158 and AS2560). Each space within the building would require a certain lighting level depending on its function and will comply with the EFSG. Uniformity of lighting levels throughout the spaces is important for achieving a comfortable visual atmosphere. Brightness differences within the field of view, i.e. high contrast might cause discomfort for tasks such as reading, or viewing a particular surface and should be avoided. Nevertheless, in addition to a uniform general lighting, ambient lighting and accent lighting has the potential to enhance the architectural quality and draw attention to intended focal areas.

3.6.3 INTEGRATED DESIGN

The design will consider opportunities within the site and form of the building. The primary aim is to provide a flexible design that responds to a broad range of operational uses and will be robust in form. The lighting scheme, where possible, should be integrated into the building’s architecture. Where visible the luminaires are to suit the architectural language of the building. This consideration is to be extended to emergency lighting and exterior lighting.

ELECTRIC LIGHTING CONTROL

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 devices should be located away from general public’s access and will be designed in accordance with the EFSG.

3.7 LIGHTING METHODOLOGY AND PROPOSE SCOPE OF WORKS

Propose scope of works included are as listed below.

TEACHING SPACES / LIBRARY / CANTEEN

Lighting to these areas is to be fit for purpose and address its functional requirements. Lighting of vertical surfaces may be beneficial in this space. The lighting design should be cohesive with the surrounds. The lighting design seeks to address the following key issues:

- Designing lighting atmosphere to suit best to the architectural context
- Lighting quality with respect to light distribution and illuminance levels
- The provision of a lighting control system that provides operational lighting to the various functional spaces to fulfil visual task requirements with optimum efficiency.
- Minimisation of maintenance/ lamp replacements by LED lamp technology

OUTDOOR CIRCULATION AREAS

The luminaire selection and mounting height will be reviewed and refined during detailed design development. The spacing, positioning and orientation will be designed in accordance with AS2560, AS1158.1 and AS4282 and the EFSG.

Lighting to these areas will be controlled via a combination of photoelectric cells and lighting timers with a manual override switch located in the nearest electrical cupboard. Lights shall be switched off during daytime and timer controlled in accordance with the EFSG.

MULTIPURPOSE HALL

Illumination methodologies in the hall should aim at providing a uniform lighting solution for visual tasks (use as examination hall). Allow for flexibility through the use of lighting control systems to dim and adjust the surrounds to create various moods within the space.

STAFF ROOMS

Illumination methodologies in the staff rooms should aim at providing a uniform lighting solution to task areas and workstations and designed in accordance with the EFSG.

AMENITIES

Change room 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.



OUTDOOR CARPARK

Illumination methodologies in the carpark should aim at providing a uniform lighting solution to vehicle / pedestrian circulation areas.

The selection and finishes of all external light fittings will be coordinated with the Architect. Luminaire selection shall be low glare fittings.

External lighting will be LED type light sources only. Lighting will be controlled via a combination of photoelectric cells and the lighting control system/timer with a manual override control.

Lighting shall generally be low height, low intensity and discreetly positioned so as to avoid spill lighting and shall be designed in accordance 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. JHA understand the sensitivity of the residential neighbours, and as such will consider obtrusive lighting with care.

STORE

A level of illuminance should be provided to suit specific tasks within the storage areas without over lighting the space. Gradation of light levels between circulation and storage areas should be considered to compliment the function of the space.



Room Type	Quantitative Lighting Levels (AS1680/AS1158) standards or as per the EFSG
Teaching Spaces / Library / Canteen	240-320lux
Multipurpose Hall	240-320lux
Amenities / Stairs	80lux
Staff Rooms	240-320lux
Outdoor Staff Carpark	10lux
Store	40-160lux