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ELECTRICAL • MECHANICAL • FIRE • LIFT • URD

Electrical & Mechanical Services Report

For **Wattle Glen And Tandara Child Care Centres**
At **Penrith, NSW**

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Revision History

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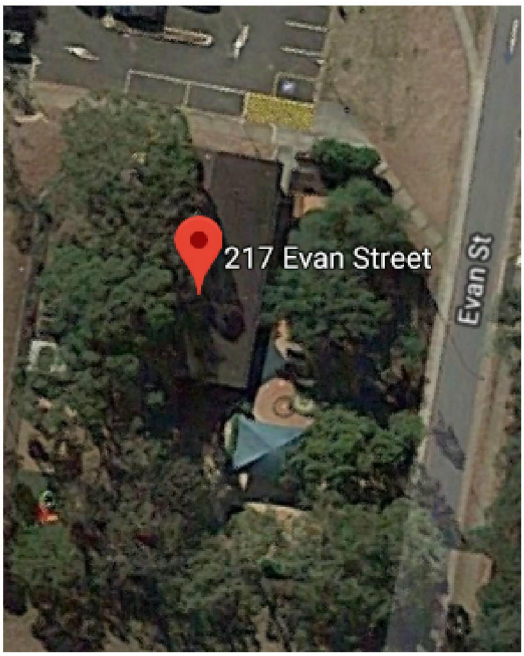
1. EXECUTIVE SUMMARY

This report has been prepared by Peter Eustace and Associates Consulting Engineers for Penrith City Council at the request of Complete Urban as part of the council's child care centre refurbishment project.

The electrical, mechanical, fire and communication services infrastructure was inspected to allow assessment of the existing facility to cater for the proposed upgrades to the Facility.

A site inspection was carried out on 24th August 2018 at both Wattle Glen and Tandara child care centres to gather information on existing building services. This report is based on visual inspection only, no testing of equipment and wiring has been carried out.

Wattle Glen Child Care



Tandara Child Care

2. SOURCES OF INFORMATION

There was no as built drawing available for the site air-condition, ventilation, electrical and communication services including pit and conduit layout and switchboards except some hand drawn sketch inside the switchboard/meter panel.

3. ELECTRICAL & MECHANICAL SERVICES

3.1 General

The following services have been inspected:

- Supply Authority Connection
- Electrical Power Reticulation System
- Main Switchboard, Meter panel
- General lighting and Emergency Lighting System
- General Power and Wiring System
- Fire Detection and Alarm System
- Telecommunication system
- Air-Condition and ducting
- Ventilation System

This report addresses the existing buildings' compliance including proposed alteration in regard to the following:

- National Construction Code of Australia 2016 (NCC)
- Relevant Australian Standards

3.2 Wattle Glen Child Care Centre

Electrical Services

The MSB/meter panel of the site is currently fed via underground conduit from the adjacent child care centre switchboard and is located on the outside wall of the centre. The existing feed is 80A three phase supply which appears to be adequate however being situated on a different lot Wattle Glen child care centre should have a separate power supply from the electrical pillar located on the footpath on Trinity Drive. This will require application to power supply authority, new conduit and trenching and cabling. This work can be done as a separate exercise from the refurbishment project, however the site MSB shall be replaced as this is well passed its service life and does not comply with current regulation.

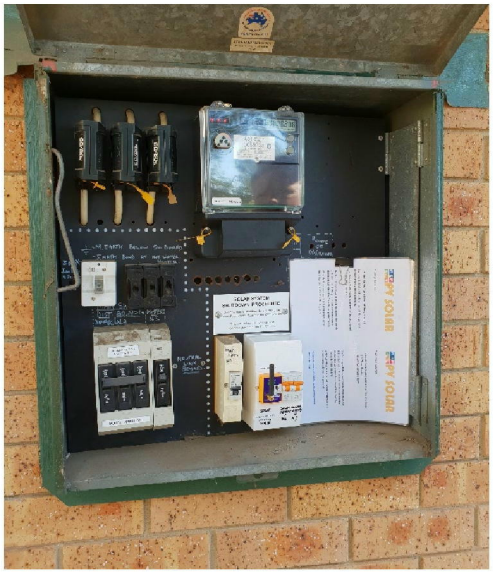


Fig - Site MSB

There are two off distribution switchboards located in the existing office room that feed lighting, power, hot water and air-conditioning system. These switchboards shall also be replaced and relocated as they do not comply with current standards.

Fig - Switchboards

Existing internal and external light fittings use either T8 fluorescent lamps or compact fluorescent lamp which are not energy efficient. Some of existing light switches height do not comply with disable code requirement. No emergency lighting system was found in the facility. All internal and external lighting shall be removed and new energy efficient LED lighting system shall be designed. A proper lighting control scheme shall be employed to comply with NCC section J6. Emergency lighting and exit sign shall also be designed. New ceiling fans can be installed according to client's requirement.

Fig – Lighting and Emergency lighting

Some of general power outlets do not meet the height requirement for child care centre according to legislations. New power outlets shall be installed throughout the building including re-wiring to new switchboard.

The facility has been connected to NBN optical fibre network. A communication rack is located in the store room which provides phone and data network to the outlets located in various rooms. No upgrade work will be required for communication system except new cabling to new data outlets where required.

Existing intruder detection system appears to be functioning and will not require upgrade. We understand some PIRs will need to be installed to match the new layout.

Smoke detectors have been installed in most of the rooms, but it was not understood whether the detectors are connected to the security system. The facility does not need any smoke detection and alarm system according to regulation, however can be installed to protect the property according to client's requirement.

Mechanical Services

The condition of the existing air-conditioning and ventilation systems is poor. The equipment installed is of varying ages and seems to have had very little maintenance completed on it with the smaller spaces now being served by small split systems and the larger ducted systems serving the open spaces. The existing ventilation system in laundry and toilets is not adequate and causing damage to the building element.

Fig – Air-Conditioners

In general, it is suggested, for both quality of air-conditioning and ongoing maintenance and breakdown resilience that all split systems are replaced, however 2 off Actron split ducted units serving the larger spaces can remain as they were manufactured in 2013 and are still operating effectively. The duct used on these units is of poor quality and will not last much longer before completely loosing its insulation properties and is exposed to the risk of rupturing and not only providing poor quality air supply into the rooms but also higher electricity costs. New lightweight rigid duct is to be installed to reduce the waste in energy, increase system performance whilst also being ready for an upgrade in the future should one of the units fail. It is suggested that the grilles mounted on the ceiling are also replaced as an aesthetic choice due to their appearance.

The smaller rooms shall be provided with new split systems. The replacement of the smaller split system will extend the lifespan of the ducted units due to the reduced overall building load placed on the ducted air-conditioning systems. The replacement of these systems will also be more energy efficient than what is currently installed whilst providing better performance.

3.3 Tandara Child Care Centre

Electrical Services

The MSB/distribution switchboard of the site is currently fed via underground conduit from Evan street. The existing feed appears to be 80A three phase supply however an electrician shall check and confirm the cabling and fuse size. The existing site MSB shall be replaced as this is well passed its service life and does not comply with current regulation. The location of MSB also does not comply as it is located on the exit path from the children's room.

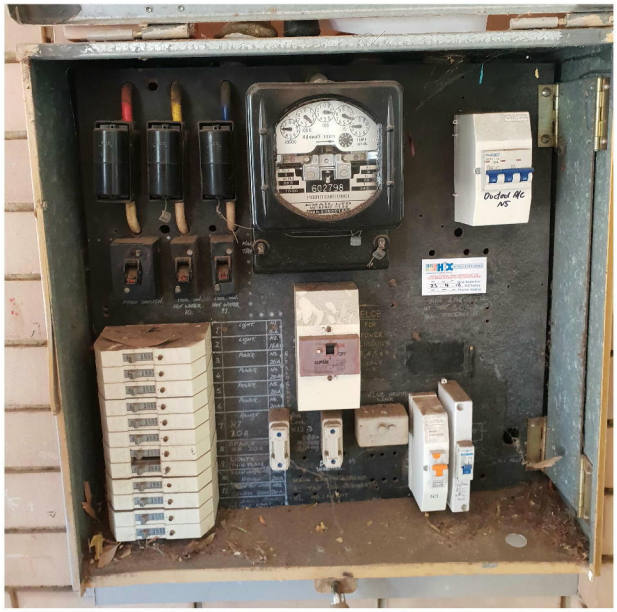


Fig –Site MSB

Existing internal and external light fittings are poor quality fluorescent lamps based. Both recessed and surface mounted lighting found in the facility. Some of existing light switches height do not comply with disable code requirement. No emergency lighting system was found in the facility. All internal and external lighting shall be removed and new energy efficient LED lighting system shall be designed. A proper lighting control scheme shall be employed to comply with NCC section J6. Emergency lighting and exit sign shall also be designed. New ceiling fans should be installed in the children room with new controllers.

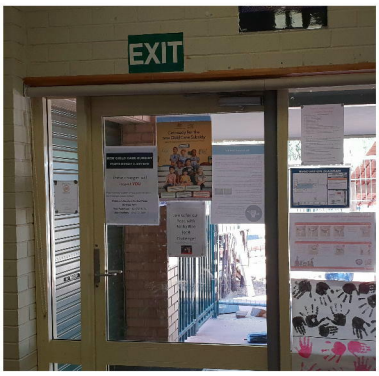


Fig –Emergency Lighting

Power outlets have been installed using surface mounted ducts in many places. Some of general power outlets do not meet the height requirement for child care centre according to legislations. New power outlets shall be installed throughout the building including re-wiring to new switchboard. New wall sheeting shall be provided to run cabling from ceiling space to power and data outlets. Skirting duct for mounting power and data outlets can also be used if walls are not provided with new sheeting.

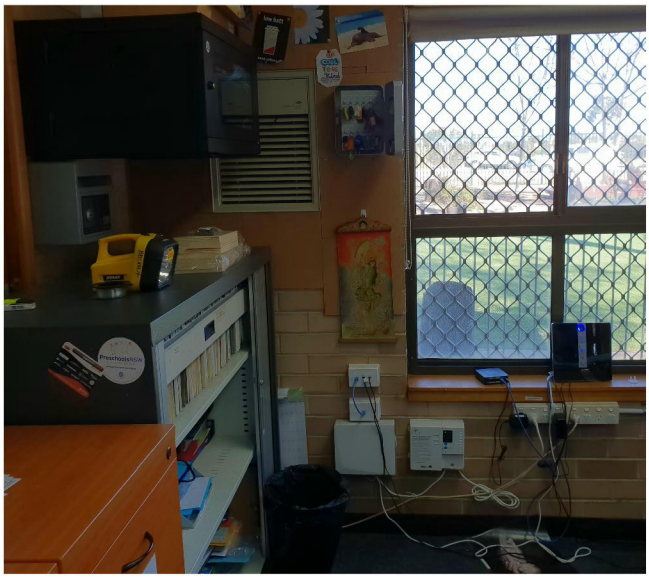


Fig –NBN equipment and power/data outlets

The facility has been connected to NBN optical fibre network. A communication rack is located in the office room which provides phone and data network to the outlets located in various rooms. No upgrade work will be required for communication system except a new 12RU rack to house modems and active devices and new cabling to new data outlets where required.

Existing intruder detection system appears to be functioning and will not require upgrade. We understand some PIRs will need to be installed to match the new layout.

Smoke detectors have been installed in the facility, but it was not understood whether the detectors are connected to the security system. The facility does not need any smoke detection and alarm system according to regulation, however can be installed to protect the property according to client's requirement.

Mechanical Services

The condition of the existing air-conditioning and ventilation systems is poor. The Daikin unit shown below is of 2011 manufacture and would be expected to fail within the next 5 years. If the capital is available for its replacement, then it should be replaced. If this is not possible then the ducting should be replaced in the same fashion as mentioned in the report above for Wattle Glen for future connection to a replacement, should it be required.

Fig – Air-conditioner

The smaller rooms shall be provided with new split systems. The replacement of the smaller split system will extend the lifespan of the ducted units due to the reduced overall building load placed on the ducted air-conditioning systems. The replacement of these systems will also be more energy efficient than what is currently installed whilst providing better performance.

4. CONCLUSION

It appears the inspected existing electrical and mechanical services have been in service for many years, though some of them are still usable however in many locations they do not meet current requirement.

The following are recommended for refurbishment of both sites:

- Install new site main switchboard/meter panel
- New Distribution switchboard
- Redesign new lighting and power system, some of existing wiring may be possible to reuse however we recommend new wiring to all new fittings.
- New wiring to all new data outlets
- Modification to security intruder system to suit new layout
- Re-use existing ducted air-conditioners for child care rooms but install new lightweight rigid duct
- Install new split system air-condition for smaller rooms
- Ventilation to laundry and toilets