Electrical Services Overview Report

For

Blacktown Workers Sports Club – ILU's Development – BWC0230

This report, dated 04 September 2019 has been prepared by Haron Robson Australia Pty Ltd for Paynter Dixon Constructions Pty Ltd.

Please direct enquires regarding this document to Greg Reardon at this office quoting our document reference no:
H:\1 - Projects\14400\14478 Blacktown Club Site B Seniors Living - DA\A Briefing-Checklists\Electrical Services Overview Report V3.docx.

HARON ROBSON - The Light. The Power. The Technology.
For over 30 years the trusted source of advice on Lighting, Electrical & Technology for buildings, places & spaces

Haron Robson Australia Pty Ltd ABN 66 002 781 580
Haron Robson Pty Ltd ABN 54 050 140 531
Haron Robson Energy Pty Ltd ABN 68 151 296 347

info@haronrobson.com.au
www.haronrobson.com.au

Level 5, 37 Pitt Street Sydney NSW 2000
PO Box R773 Royal Exchange NSW 1225
T +61 2 7903 4567

BWC ILU DA1 MASTERPLAN – BWC0230
ELECTRICAL SERVICES OVERVIEW REPORT V3
DATED: 04 SEPTEMBER 2019

TABLE OF CONTENTS

BWC ILU DA1 MASTERPLAN – BWC0230
ELECTRICAL SERVICES OVERVIEW REPORT V3
DATED: 04 SEPTEMBER 2019

1 INTRODUCTION

The development for Blacktown Workers Sports Club at 170 Reservoir Road, Arndell Park NSW, is part of the implementation of a Masterplan for the redevelopment of the adjacent sporting fields to a new seniors independent living multi-residential apartment complex which incorporates the following:

- 480 Residential Independent Living Units (ILUs)
- Community Centre
- A future 160 Bed Residential Aged Care Facility (RACF)
- Pedestrian Link to the adjacent Club
- Interconnecting public footpaths & roads

Haron Robson Australia Pty Ltd has been engaged as Electrical Engineering Consultants to advise on the electrical services and overall master planning of the site services for the ILUs and associated spaces.

This overview document is a general statement of the aims and inclusions of the electrical services installation.

2 ELECTRICAL SERVICES

The electrical services component of this project comprises many electrical/electronic systems. The briefing stage of this project will involve the collection of detailed information about the areas and the equipment to be installed so that there can be appropriately detailed allowances for each space. There will be a need to further address the electrical requirements of the other active systems in the building such as air conditioning and hydraulic services during the detailed design process.

This detailed design will address the functional requirements of the users of the building by locating power outlets for general use, and connections for installed electrical equipment. Also, the design of the electrical reticulation system so that it has sufficient capacity to provide reliable and safe power to the development. All systems will be designed to exceed the requirements of the relevant Australian Standards.

3 OUTLINE OF PROVISIONS

3.1 General

Electrical services will be provided to comply with all relevant mandatory Australian Standards and the requirements of Statutory Authorities having jurisdiction in the matter including the National Construction Code 2019 Volume 1.

3.2 Electricity and Telecommunications Authorities

All relevant Electrical Distribution and Telecommunications Carrier authorities shall be consulted with respect to the provision of the required services to the development and the street reticulation to service the development.

All involved authorities will be notified of the details of the development in an orderly time to allow service arrangements and local network augmentation to be carried out without incurring delays in the development's construction schedule.

3.3 Stratum

A Strata Title will be established for the development which will consist of multiple Stratum types.
The Stratum types are:

- House Services (Communal areas such as External Private Roadway and other External areas plus right of way access over conduit links between buildings & site-wide communications assets)
- House Services (Common areas such as Carpark & Residential Lobbies)
- Residential Independent Living Units
- Community Centre

3.4 Electricity Supply

Electricity Supply to the development shall be via the establishment of a number of kiosk type pad-mount substations comprising of one or two transformers to be constructed at the nominated location as indicated on the attached sketch plans. Applications for Connections for the Masterplan and for each stage shall be submitted to Endeavour Energy to further develop a scope of works.

It is proposed that the High Voltage Cabling shall run within deep soil garden areas where possible, otherwise, the High Voltage shall run within conduits cast into the Concrete Slab to the approval of Endeavour Energy.

A new Low Voltage Electrical Supply (Service/Consumers Mains) from the Designated Substations to the various stages of the development shall be installed underground conduits and then via cable ladders at high level within the basement car parking areas to the Main Switchboards located within 50m of the connecting substation or via unmetered link boxes in the case where Main Switchboards are located further than 50m from the connecting substation. The installation of the Low Voltage Electrical Supply cables and their associated cable ladders shall achieve a 2-Hour Fire Rated capacity to maintain Electrical Supply Provisions for the Emergency and Essential Services Equipment.

3.5 Public Domain Lighting

The Public Domain lighting across the site will be developed as an integrated and coherent system, which comprehensively addresses the lighting requirements in terms of effective functional, aesthetic and energy solutions. The main street lighting along the site will be developed as a continuation from each stage of the development. Our detailed solutions will:

- Provide an appropriate level of lighting for pedestrian areas to a category P4 level which for the footpaths means “Local Roads or streets used primarily for access to abutting properties” with “Mixed vehicle and pedestrian traffic” and “low pedestrian/cycle activity” and “Low risk of crime” and “No requirement to enhance prestige” as per Australian Standards for pedestrian lighting AS/NZS 1158.3.1:2005.
- Provide lighting to the entry of the Residential Independent Living Unit Buildings
- Provide lighting to the communal Plazas and podium areas
- Provide lighting to the building perimeters

Generally, our approach will be to use low wattage high-efficiency light sources throughout the development. These light sources will be housed in fittings with good light control to minimise light spill to residents and generally directed downward avoid “cloud staining”. The form/style of all light fittings will be matching throughout to unify the development to the site.

3.6 Telecommunications Provisions

As the development will cater for more than One-Hundred (100) Living Units, the site must be serviced by a ‘Fibre to the Home’ solution. Therefore, the incoming Telecommunications Cable Entry Provisions will be provided for National Broadband Network Fibre Optic Network Cabling to meet this requirement.

NBN Distribution Network (Distribution Equipment and Cabling) within the development will be supplied and installed by NBN provider’s Contractors with a developer’s contribution cost. The “pit and pipe” plus cable pathways conduit and cable trays for the network cabling within the site will be supplied and installed as part of the Electrical Services Scope Of Works.

All work shall be carried out to comply with the Australian Communications and Media Authority’s requirements and regulations. Spatial provisions shall be provided within the allocated telecommunications rooms/riser cupboards throughout the development to accommodate the NBN Active and Distribution Equipment.

4 BUILDING SERVICES

The Electrical Services installation within the development shall be designed and installed to comply with all relevant standards/statutory authority requirements, which have jurisdiction over the development. These include, but are not limited to:-

- National Construction Code (NCC)
- Australian Standard AS/NZS 3000 (Wiring Rules)
- Australian Standard AS/NZS 3008 (Electrical Installations – Selection Of Cables)
- Australian Standard AS/NZS 2293 (Emergency Escape Lighting and Exit Signs For Building)
- Australian Standard AS 1670 (Fire Detection, Warning, Control and Intercom Systems)
- Australian Communications and Media Authority (ACMA) Regulations

- Service and Installation Rules of New South Wales (SIRNSW)

Electrical Supplies to Emergency/Safety and Essential Equipment shall be 2 Hour Fire Rated and segregated, as required by the National Construction Code and Australian Standard AS/NZS 3000.

An Automatic Smoke Detection System shall be provided in the residential areas and in all other areas (Excluding the Car Park) in accordance with the National Construction Code and Australian Standards AS 1670.1.

Where required a Sound System & Intercom System for Emergency Purposes (EWIS) shall be provided in the common areas in the residential towers and Community Centre plus all parts of the Car Park including ancillary storage/plant areas in accordance with the National Construction Code and Australian Standards AS 1670.4.

Emergency and Exit Lighting shall be provided throughout the non-residential areas of the development, complying with the National Construction Code and Australian Standard AS 2293.

4.1 Regulations and Authorities

The whole of the work will be carried out strictly in accordance with:

• Australian Standard AS/NZS 1158	Road Lighting
• Australian Standard AS 1428.1	General Requirements for access - Buildings
• Australian Standard AS/NZS 1680	Interior Lighting
• Australian Standard AS/NZS 2293	Emergency Evacuation Lighting in Buildings
• Australian Standard AS/NZS 3000	Wiring Rules
• Australian Standard AS/NZS 3008	Electrical Installations - Selection of Cables
• Australian Standard AS/NZS 3012	Electrical Installations - Demolition and Construction Sites
• Australian Standard AS/NZS 3013	Electrical Installations - Wiring Systems for Specific Applications
• Australian Standard AS/NZS 3017	Electrical Installations - Testing and Inspection Guidelines
• Australian Standard AS/NZS 3080 for Commercial Premises	Telecommunications Installations - Integrated Tele Cabling Systems
• Australian Standard AS/NZS 3100	Approval and Test Specification - General requirements for electrical equipment (Parent specification for essential safety requirements)
• Australian Standard AS/NZS 3131	Plugs and Socket Outlets for use in Installation Wiring Systems
• Australian Standard AS 3137	Approval and Test Specification - Luminaires
• Australian Standard AS/NZS 3760	In-service Safety Inspection and Testing of Electrical Equipment
• Australian Standard AS/NZS 3947	Low Voltage Switchgear and Control gear
• Australian Standard AS/NZS 4251.1	EMC - Generic Emission - Residential, Commercial, Light Industrial
• Australian Standard AS/NZS 4252.1	EMC - Generic Immunity - Residential, Commercial, Light Industrial
• Australian Standard AS 4282	Control of Obtrusive Effects of Outdoor Lighting
• Australian Standard AS/NZS 4778:2001	Electromagnetic Compatibility for Radio Communications Equipment
• Australian Standard AS/NZS 61000.3.2	Limits for harmonic current emissions (equipment input current less than or equal to 16A per phase)
• Australian Standard AS/NZS 61000.3.3	Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current less than or equal to 16A
• Australian Standard AS/NZS 61000.3.5	Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current greater than 16A
• BS EN 50081.2	EMC
• BS EN 50082.2	EMC
• Local Government Authority	

- Department of Industrial Relations
- Sydney Water
- Insurance Council of Australia
- New South Wales Fire Brigade
- Australian Communication Authority
- NBN Requirements
- Environmental Protection Agency
- SAA Lift Code
- National Construction Code 2019 Volume 1
- Electricity Distributor's Requirements
- Electricity Retailer's Requirements
- Occupational Health and Safety Act
- Disability and Discrimination Act
- WorkCover Authority Requirements
- Electricity Service and Installation Rules of New South Wales.
- The Requirements of all other Authorities having jurisdiction over the work

4.2 Extent of Work

The following items will be arranged to be supplied and installed by the relevant Third Parties and Authorities:-

- High Voltage Network Mains to the New Substations & the augmentation of the Existing High Voltage Network Mains
- Kiosk type pad-mount substations
- Electricity Distribution Authority / Electricity Retailer Tariff Meters and Associated Equipment
- Incoming Lead-In NBN Telecommunications Cable
- NBN Active Distribution Equipment and Cabling

The following items will be arranged to be supplied and installed by the Engaged Electrical Contractor:-

- Service/Consumer Mains from the Point of Supply to the New Main Switchboards
- New Main Switchboards including Protective and Control Devices as required
- Energy Monitoring Equipment in accordance with the National Construction Code - Section J8 requirements
- Electrical Submains to House Services Distribution Boards, Residential & Community Centre Meter Panels and Distribution Boards, Apartment Distribution Boards and other Building Services Control Panels
- House Services Distribution Boards
- Apartment Distribution Boards
- Community Centre Distribution Boards
- Residential, Community Centre & House Services Meter Panels
- Electrical Final Sub-circuit Cabling and Circuit Protection
- General Power Services in accordance with National Construction Code - Section J6 and the nominated Basix requirements
- General Lighting Services in accordance with National Construction Code - Section J6 and the nominated Basix requirements
- Emergency Lighting and Illuminated Exit Sign Services in accordance with National Construction Code and Australian Standard AS 2293
- Pathways for NBN Backbone (Vertical) Cabling

- Pathways for NBN Distribution (Horizontal) Cabling
- QAM / TDT Television Distribution System for Pay TV (if required) and Free-to-Air Television Services
- Automatic Smoke Detection, BOWS and EWIS in accordance with National Construction Code and Australian Standard AS 1670 requirements
- Smoke Alarms within the residential Apartments in accordance with National Construction Code and Australian Standard AS 3786
- Security, Access Control & Intercom Systems Services
- Lightning & Surge Protection
- ESD Design Principles
- Smart Home Services

These items are listed in further detail below.

4.2.1 High Voltage Network Mains

The High Voltage Mains will be required to run to the New Substations in the nominated location of the development via underground ducts and/or ducts within the suspended concrete slab.

(Please find attached layout sketch for further information)

A nominated Level 3 Accredited Service Provider will be engaged to carry out the electrical design works for the High Voltage Mains.

A nominated Level 1 Accredited Service Provider will be engaged to carry out the electrical installation works for the High Voltage Mains and Network augmentation.

4.2.2 Kiosk Substations

The development will require the supply and installation of a five new Kiosk type pad-mount substations (1000kVA transformers for each) in the nominated location of the development.

The Substations shall have a 400V Three (3) Phase, 4 Wire, 50 Hertz, Low Voltage Output capacity of approximately 1,400 Amps per phase each.

The anticipated Electrical Maximum Demand for the development is approximately 3,500 Amps/Phase.
This assessment of the diversified electrical load is based upon the installation of Gas Cooktops, Electric Wall Ovens and Reverse Cycle Air Conditioning within each Apartment, along with a Central Gas Hot Water Systems for each building.

A nominated Level 3 Accredited Service Provider shall be engaged to carry out this portion of the electrical design works for the New Substations.

A nominated Level 1 Accredited Service Provider shall be engaged to carry out the electrical installation works for the New Substations. The Main Contractor shall carry out the Substation site preparation and civil/structural works, in accordance with Endeavour Energy requirements and approved Level 3 ASP design drawings.

4.2.3 Service/Consumer Mains

New Service/Consumer Mains shall be reticulated from each of the New Substations to New Main Switchboards or unmetered link boxes as required. New Service/Consumer Mains shall be installed with a methodology for achieving a 2 Hour Fire Rated in accordance with the National Construction Code and Australian Standard AS/NZS 3000 for the sustained operation of the Emergency and Essential Services Equipment within the development.

The Engaged Electrical Contractor shall carry out the New Service/Consumer Mains installation works, in accordance with Ausgrid requirements, Service and Installation Rules of New South Wales (SIRNSW), National Construction Code (NCC) and Australian Standard AS/NZS 3000.

Service/Consumer Mains Cables shall be calculated and sized in accordance with AS/NZS 3008.

4.2.4 Electrical Switch Rooms

It is proposed that Electrical Switch Rooms be provided on Basement Levels where accessible from a direct entry from the street or Ground Floor Levels within an entry to the building. House Distribution Boards, Unmetered Distribution Boards, Meter Panels and Lighting Control equipment (as required) shall be located within these Electrical Switch Rooms.

4.2.5 Main Switchboards

The development will require the installation of five (5) New Main Switchboards which will be located within the Main Switch Rooms located in either the Basement levels or Ground Floor Levels.

(Please find attached sketches for further information)

The New Main Switchboards will incorporate the following requirements:-

- Dead Front
- Free-Standing with Front Access (Rear where applicable)
- Ingress Protection Rating of IP42 (minimum)
- Form 3b Construction in accordance with Australian Standard AS/NZS 3000 (Wiring Rules) and AS/NZS 3439.1 (Low Voltage Switchgear and Control gear Assemblies) requirements
- Service Protection Device on the Incoming Electrical Supply within the Main Switchboard Assembles in accordance with Service and Installation Rules of New South Wales (SIRNSW).
- Surge Protection Devices
- Power Analysing & Monitoring Devices in accordance with National Construction Code – Section J8
- Sealed Compartments for Electrical Supply Authority Tariff Metering in accordance with the Service and Installation Rules of New South Wales (SIRNSW), Electrical Distribution Authority and Electricity Retailer requirements
- Non-Essential, Essential and Emergency /Safety Services Sections in accordance with National Construction Code and Australian Standard AS/NZS 3000 requirements
- Outgoing Circuit Breakers for House Distribution Boards, Meter Panels, Building Services Control Panels and Equipment.

Main Switchboard dimensions will vary and further detailed design will be required to determine an approximate size.

4.2.6 Electricity Supply Authority Tariff Metering

The New Main Switchboards shall have sealable compartments for the installation of current transformers to facilitate the Tariff Metering of the House Services. The sealable compartments for current transformers shall be in accordance with the Service and Installation Rules of New South Wales (SIRNSW) and the relevant Electrical Distribution Authority's requirements. The House Services Tariff Metering equipment shall be installed within the Main Switch room provided.

4.2.7 Submain Cabling

Submain Cables will be reticulated from the New Main Switchboard via cable ladders, conduits, vertical risers and service cupboards to each Tariff Meter Panel, Distribution Board, Building Services Control Panel and Associated Equipment.

Submain Cabling shall be 2 Hour Fire Rated, where they are supplying nominated Emergency and Essential Services Equipment within the development.

Submain Cables shall be calculated and sized in accordance with AS/NZS 3008 with each submain to generally have 20% spare capacity over and above the designed final maximum demand for the normal usage of that section of installation being supplied by the respective submain cable.

4.2.8 House Distribution Boards

New House Services Distribution Boards shall be supplied and installed within the development for the distribution of electricity for General Lighting, Emergency Lighting and Illuminated Exit Sign Services, General Power Services & Building Services Equipment as required.

New House Services Distribution Boards shall be a Split Chassis Arrangement (Separate Light Chassis and Power Chassis) for compliance with National Construction Code - Section J8 requirements. New House Services Distribution Boards shall incorporate Main Isolating Switch, Miniature Circuit Breakers (MCBs) and Energy Monitoring Facilities.

The House Distribution Boards will incorporate the following requirements:-

- Dead Front
- Free-Standing with Front Access
- Ingress Protection Rating of IP42 (minimum)
- Surge Protection Devices
- Main Switch/Circuit Breaker to isolate power
- Contactors for General Lighting & Emergency/Exit Lighting
- Emergency Lighting Test Switch
- Time Clocks
- Fuses
- Power Analysing & Monitoring Devices in accordance with National Construction Code – Section J8
- Outgoing Circuit Breakers complete with RCD Protection for final sub-circuits as required by AS/NZS 3000:2007.

4.2.9 Apartment Distribution Boards

Apartment Distribution Boards (Loadcentres) shall be supplied and installed within each Apartment for the distribution of Lighting and Power Services within the Apartment. New Apartment Distribution Boards shall be installed in a location as nominated by the Main Contractor.

New Apartment Distribution Boards shall be a White/Grey Polycarbonate DIN Rail Load Centre. Circuit Breakers shall be provided with RCD Protection in accordance with AS/NZS 3000:2007.

The Apartment Distribution Boards will incorporate the following requirements:-

- Surface Mount
- Ingress Protection Rating of IP42 (minimum)
- Surge Protection Devices
- Main Switch/Circuit Breaker to isolate power
- Outgoing Circuit Breakers complete with RCD Protection for final sub-circuits as required by AS/NZS 3000:2007.

4.2.10 Residential & Community Centre Meter Panels

Residential and Community Centre Meter Panels shall be supplied and installed within the Electrical Switch Rooms or riser cupboards located on the Car Park Level, Ground Floor Level & each Residential Level. The Electricity Supply Authority shall supply and install their Tariff Meters and associated equipment on the nominated Meter Panels.

Combined Meter Panels will contain active links to allow for multiple supply authority tariff meters to be installed with meter combinations of 6, 9, 12 or 16 meters. Individual protection fuses for each meter and Single Phase Circuit Breakers or Switches will be also be provided as per the requirements of the Electricity Service and Installation Rules of New South Wales.

4.2.11 Final Sub-circuits

Generally, all cabling for general lighting and power sub-circuits will be run in Thermoplastic (PVC) Sheathed Cable concealed in the false ceilings, wall cavities or wiring installation accessories (i.e. conduits, ducting). Conduits will be provided where necessary for the protection of cables installed within structural slabs and walls.

All final sub-circuits shall be installed utilizing Residual Current Circuit Breakers with Over-Current Protection (RCBOs) on all sub-circuits in accordance with Australian Standard AS/NZS 3000:2007, Clause 2.6 requirements.

4.2.12 General Power Services

The General Power Services installation will be provided in common areas for maintenance and servicing purposes (i.e. cleaning), and as nominated for ancillary equipment and building services equipment.

General Power Services within each Apartment shall be in accordance with the Principal's requirements & the nominated BASIX Requirements.

4.2.13 General Lighting Services

The General Lighting Services installation involves both Interiors and Exteriors and will be designed to coordinate and enhance the architecture, interiors and landscape, whilst providing lighting for the safe movement of occupants throughout the development. Also, ESD principles shall be applied.

The General Lighting Services shall be designed in accordance with National Construction Code - Section J6, AS 1680 requirements and the nominated BASIX requirements.

Lighting within each Apartment shall be in accordance with the nominated BASIX requirements.

4.2.14 Emergency Lighting and Illuminated Exit Sign Services

Emergency Lighting and Illuminated Exit Signs shall be installed throughout the development to comply with the National Construction Code and Australian Standard AS 2293 (Emergency Escape Lighting & Exit Signs for Buildings) requirements.

Emergency Lighting Test Switches shall be supplied and installed in accordance with Australian Standard AS 2293 on all Distribution Boards supplying circuits with Emergency and Exit Sign Lighting incorporated.

4.2.15 Fire Control Centre

If recommended by the fire engineering report the development may be required to incorporate a Fire Control room / Fire Control Centre, in accordance with the National Construction Code requirements E1.8.

If required, the Fire Control Centre / Fire Control Room shall be located within an easily accessible location for the attending New South Wales Fire and Rescue (NSWFR) personnel. The proposed location of the Fire Control Centre / Fire Control Room shall be within the Building C Community Centre Building.

The Fire Control Centre shall house the essential equipment for the Smoke Detection, BOWS, EWIS and Fire Fighting Equipment including the Main Fire Indicator Panel (FIP) and the EWIS Indicator Panel (IP)

Electrical Equipment installed within the Fire Control Centre shall be electrically supplied via a dedicated Emergency Services Distribution Board installed within the Fire Control Centre. The Emergency Services Distribution Board shall be supplied via a 2hr Fire Rated Sub-main source from the Emergency Electrical Supply section of the House Services Main Switchboard.

4.2.16 Automatic Smoke Detection & Alarm System

An Automatic Smoke Detection & Building Occupant Warning System and/or Sound System and Intercom System for Emergency Purposes (EWIS) shall be installed as required.

The systems shall be designed and installed in accordance with the National Construction Code, the Fire Engineered Report, New South Wales Fire and Rescue Requirements, Australian Standards AS 1670.1, AS 1670.4 and all relevant statutory authority regulations and requirements.

The Automatic Smoke Detection & Alarm System, Emergency Warning and Intercommunication System (EWIS) shall be integrated into other Smoke Detection and Fire Control measures for the development, including Australian Standard AS 1668 for Mechanical Ventilation Systems and Hydraulic Fire Suppression Equipment (i.e. Fire Hydrants, Fire Hose Reels, and Fire Sprinklers).

Mimic Panels shall be provided within the Entry Lobby of each building, linked back to the Main Fire Indicator Panel within the Fire Control Centre.

Smoke Alarms shall be installed within each Apartment in accordance with the NCC & Australian Standard AS 3786 requirements.

4.2.17 Telecommunication Rooms

It is proposed that a Telecommunication Rooms within each Basement Level to allow for NBN Distribution Equipment which will be provided by NBN, QAM/TV Racks & Security/Access/Intercom Racks will also be located within these rooms.

(Please find attached sketches for further information)

4.2.18 Telecommunications Fibre Optic Lead-In Cabling

The Engaged Electrical Contractor shall provide the Building Entry/Lead-In Cabling Conduits and accessories from the site boundary to the nominated Telecommunications Rooms. All works shall be in accordance with NBN Network Standards and requirements.

An NBN provider shall provide all the Fibre Optic cabling and equipment to development as necessary to deliver Fibre Optic connectivity to each individual Apartment/Unit within the development in accordance with the NBN Network Standards, Australian Standards, Australian Communication and Media Authority requirements.

An application to an NBN provider will be required to undertake these works and to further establish a detailed scope of works for the entire development.

4.2.19 Telecommunications Fibre Optic Distribution Equipment

Spatial Provisions shall be provided within the allocated Telecommunications Rooms within the development for the installation of all necessary NBN Distribution Equipment.

Premises Distribution Hubs (PDH) shall be provided by the NBN provider. The Engaged Electrical Contractor shall provide all necessary installation accessories (conduits, cable ladders, ducts etc) to ensure the NBN Installing Contractor can install the required cabling and equipment.

4.2.20 Telecommunications Fibre Optic Vertical (Backbone/Trunk) Cabling

Spatial Provisions shall be provided for the installation of Fibre Distribution Terminals (FDT within the Telecommunications Rooms. The Engaged Electrical Contractor shall provide all necessary installation accessories (conduits, cable ladders, ducts etc) to ensure the NBN Installing Contractor can install the required cabling and equipment on each level as required.

Spatial Provisions shall be provided for the installation of Fibre Distribution Terminals (FDT within the Telecommunications Cupboard/Risers on each apartment floor level. The Engaged Electrical Contractor shall provide all necessary installation accessories (conduits, cable ladders, ducts etc) to ensure the NBN Installing Contractor can install the required cabling and equipment on each level as required.

4.2.21 Telecommunications Apartment Provisions

The Engaged Electrical Contractor shall provide a Communications Hub to provide connectivity between the Apartment Telecommunications Outlets and the NBN Network. The connectivity of the Television System for the Apartment will also be within the Communications Hub.

The “Communications Hub” shall comprise a flush mounted communications panel complete with:

- One (1) double GPO (10 Amp switched socket outlets)
- Ethernet Data switcher
- Outgoing Data Cabling patch panels
- Splitter for TV Distribution
- Power supply unit (By NBN provider)
- Network Termination Device (By NBN provider)
- Fibre Wall Outlet (By NBN provider)

Communications Hub Enclosure and associated equipment shall be installed to the Manufacturer’s specifications.

The Engaged Electrical Contractor shall provide RJ45 Telecommunications Outlets within the Apartment. Locations and quantities shall be in accordance with the Principal’s requirements.

The Engaged Electrical Contractor shall provide a Cat.6 (Copper) Cabling to the Telecommunication Outlets within the Apartments. Cabling shall be installed within concealed conduits, ceiling spaces and wall cavities.

The cabling shall be installed in accordance with AS/ACIF S009, Australian Standards AS 3080 and AS 3085 and any other statutory authorities’ requirements.

4.2.22 Essential & Emergency House Services Communications Distribution Network

The Engaged Electrical Contractor shall provide a Cat.6 (Copper) Cabling between each Emergency and Essential Services Equipment and/or Panel to individual NBN fibre Network Termination Devices (NTD) located in the Main Telecommunications Rooms to provide telecommunications connectivity for the Emergency and Essential Services Equipment.

4.2.23 QAM/TDT Television Distribution System

It is proposed that a site-wide Quadrature Amplitude Modulation (QAM) / Transparent Digital Transmodulator (TDT) Television Distribution System be installed within the first stage of the development & extended to the future stages of the development via underground conduit links between building basements. The system shall include Head-End Equipment, Fibre to Co-Axial Media Converters, Amplifiers, Splitters, and Television Outlets and associated cabling. The system shall all be installed in accordance with all relevant Australian Standards and Foxtel Installation requirements.

Engaged Electrical Contractor shall provide all necessary Television Signal Distribution Equipment to ensure the broadcast signal is conveyed through the development.

4.2.24 Cold Water, Gas & Hot Water Metering

The Engaged Contractor shall provide Electrical & Telecommunications provisions for the Cold Water Metering in accordance with Sydney Water Multi-level Individual Metering policy. Cabling shall also be provided between shared water metered facilities and the Body Corporate data collection facility for distribution of shared facility water usage costs in accordance with the site specific Strata Plan & Body Corporate rules & regulations.

The Engaged Contractor shall provide Electrical provisions for Gas and Hot Water Metering in accordance with Jemena Document (FR.RS.002673 – Meter Data Logger Installation Instructions).

4.2.25 Security, Access Control and Intercom Systems

An Intruder Security System will be provided for the monitoring of the communal areas, common areas and fire isolated stairway exits.

An Access Control and Intercom System will be provided for the external entry points to provided access for residents and visitors to the development.

Resident and Visitor Car Parking Facilities shall be incorporated into the Access Control and Intercom System to control vehicle access to the facilities, by the means of Roller Shutters or Boom Gates, Induction Loops and Air (Radio Frequency) Keys.

A Secure Telephone Point (Mode 3) will be provided within each Apartment to facilitate Third Party Security System Providers to install their services and monitor within the Apartment in the future, by the resident.

The Lift Card Key Controls shall be incorporated within the Security/Access & Intercom System to provide control so that lift travel can only be authorised by the approved occupants of the building.

4.2.26 Lightning and Surge Protection

A lightning protection system shall be installed to comply with AS 1768.

The system shall be installed comprising an air termination roof conductors connected to earth electrodes by down conductors. Other Premises components shall be bonded to the system, these include:

- Electrical earth - Main Switchboard MEN
- Communications earth - MDF earth
- Incoming water pipes
- Incoming gas pipes
- Curtain wall - facade metalwork
- Steel reinforcement and structure
- External metal handrails.

All bond connections shall use the appropriate bimetallic connection to eliminate any corrosion caused by contact between dissimilar metals.

Down conductors shall be installed in conduits cast into the concrete columns indicated on the drawings.

Surge protection shall be provided for the Main Switchboards and Distribution Boards as detailed earlier in this report.

4.2.27 ESD - Design Principles

The aim of our detailed design solutions will be to minimise the greenhouse gas emissions associated with building materials (embedded energy) and building operations as well as to minimise running and maintenance costs.

All design solutions shall be in accordance with the minimum requirements of the Building Code of Australia – Section J and the associated BASIX Requirements.

4.2.28 Smart Home Services

The following is a list of proposed smart home services that are to be implemented or optioned into each living unit:

- Intelligent Lighting control systems to allow the resident to switch/dim the lighting in each room via wall plates (touch screen or push button) and optional WI-FI/app interface.
- Motorised blinds with controls integrated into the lighting control system for automation of blinds to adjust the shading from the sun or allow user override
- Tuneable white light sources to provide the user with colour temperature control throughout the day.
- Integration of controlled power outlets to enable control over large energy devices to only operate during off-peak energy rate periods.
- Integration of thermostats for remote control of air conditioning units
- Remote front door video Surveillance/intercom voice connectivity
- Music library management / distributed speaker systems
- News/weather information displayed on the intercom unit
- Community information displayed on the intercom unit
- Mail system to Building Manager on the intercom system
- Display of energy consumption metering
- USB charger outlets incorporated into GPO’s in kitchen & bedroom areas

5 OPTIONS

The following are other electrical services options that may interest the Club for implementation within the development:

- Photovoltaic Solar Panels and or wind turbines to help offset house services electricity costs.
- Battery banks connected to the solar array and or turbines to further assist with house services electricity costs.
- Peer to Peer solar trading scheme to even further assist with house services electricity costs.
- Public WiFi network
- Electric car charging
- Licence Plate Recognition for control of carpark access & visitor spaces all managed by the users via the intercom system
- Embedded Energy Network owned & operated by the Club to enable the on-sell of electricity to the residents.

6 ANNEXURES

- **Electrical Preliminary Reticulation Plans (Total of 2 Pages)**

HARON ROBSON
lightmatters wattmatters avmatters
Reviewed 04/09/2019

Option to continue new high voltage cabling to future sports centre
SPORTFIELD PARKING
BOWLING GREEN
PROPOSED CONNECTION TO HOLBECHE ROAD
EXISTING BLACKTOWN WORKERS SPORTS CLUB
EXISTING BLACKTOWN WORKERS SPORTS CLUB MULTI-LEVEL PARKING
EXISTING CONNECTION TO HOLBECHE ROAD
PEDESTRIAN LINK TO SPORTING FIELDS
EXISTING STORMWATER EASEMENT LINE SHOWN DOTTED
ROAD 6
ROAD 4
SITE BOUNDARY
PEDESTRIAN LINK TO CLUB
BUILDING E1
3 STOREYS
Future ILU Building Main distribution board fed from Building D MSB
BUILDING E3
7 STOREYS
DB
BUILDING E2
4 STOREYS
Future Stage electrical Main Switchboard
MSB
BUILDING D
5 STOREYS
Future ILU Building Main distribution board fed from Building A/B MSB
BUILDING C 4 STOREYS
DB
ROAD 3
Building A/B electrical Main Switchboard in basement
BUILDING B
5 STOREYS
MSB
BUILDING A
3 STOREYS
EXISTING STORMWATER EASEMENT LINE SHOWN DOTTED
Cables reticulate in the basement
Cables reticulate in the basement
Cables reticulate in the basement
Cables reticulate in the basement
Substation 1 to supply Buildings A, B and future ILU Building C
NEIGHBOURING INDUSTRIAL
SITE BOUNDARY
New high voltage cabling run in future landscaped area to new substation(s)
ROAD 2
Substation 4 to supply future ILU Buildings D & E
PEDESTRIAN LINK FROM BUS STOP
Divert high voltage cabling to new substation
Future Stage electrical Main Switchboard
Future ILU Building Main distribution board fed from Building H MSB
Substation 2 to supply future ILU Buildings H and G
ROAD 1
RACF
4 STOREYS
MSB
BULDING F3
4 STOREYS
MSB
BULDING F2
5 STOREYS
BULDING G3
5 STOREYS
BULDING G2
4 STOREYS
ROAD 5
BULDING H3
3 STOREYS
MSB
BULDING H2
4 STOREYS
RESERVOIR ROAD
NEIGHBOURING RESIDENTIAL
Future RACF Main Switchboard
BULDING F1
3 STOREYS
DB
BULDING G1
3 STOREYS
Cables reticulate in the basement
Cables reticulate in the basement
BULDING H1
3 STOREYS
Cables reticulate in the basement
Divert high voltage cabling down Penny Place to new substations
SITE BOUNDARY
RACF ENTRY
PENNY PLACE
Plan to leave space for future RACF substation 5
Substation 3 to supply future ILU Building F
New high voltage cabling within Penny Place to new substations
NEIGHBOURING INDUSTRIAL

0 1 2 4 8 m

N

17002 BLACKTOWN WORKERS SENIORS LIVING - Site Compatibility Certificate

SCC 1003 - Roof Plan

AJ+C Allen Jack+Cottier

HARON ROBSON
lightmatters wattmatters avmatters
Reviewed 04/09/2019

Option to continue new NBNCo conduits & cabling to future sports centre
SPORTFIELD PARKING
BOWLING GREEN
PROPOSED CONNECTION TO HOLBECHE ROAD
EXISTING BLACKTOWN WORKERS SPORTS CLUB
EXISTING BLACKTOWN WORKERS SPORTS CLUB MULTI-LEVEL PARKING
EXISTING CONNECTION TO HOLBECHE ROAD
PEDESTRIAN LINK TO SPORTING FIELDS
EXISTING STORMWATER EASEMENT LINE SHOWN DOTTED
ROAD 6
ROAD 4
SITE BOUNDARY
PEDESTRIAN LINK TO CLUB
BUILDING E1
3 STOREYS
Future Building E Main Comms Room
BUILDING E3
7 STOREYS
BUILDING E2
4 STOREYS
Future Building D Main Comms Room
BUILDING D
5 STOREYS
Comms Room in Building C
BUILDING C 4 STOREYS
ROAD 3
Building A/B Main Comms Room in basement
BUILDING B
5 STOREYS
BUILDING A
3 STOREYS
EXISTING STORMWATER EASEMENT LINE SHOWN DOTTED
NBNCo Conduits & cabling
NEIGHBOURING INDUSTRIAL
SITE BOUNDARY
CR
ROAD 2
NBN Pit for Future Building E
NBN Pit for Future Building D
Cables reticulate in the basement
NBN Pit for Buildings A,B & C
Cables reticulate in the basement
PEDESTRIAN LINK FROM BUS STOP
New NBNCo conduits & cabling run in future landscaped area to new buildings
Option to connect basements with cable tray in the basement for site wide communications
Option to connect basements with conduits under landscape for site wide communications
Option to connect basements with cable tray in the basement for site wide communications
ROAD 1
RACF
4 STOREYS
BULDING F3
4 STOREYS
BULDING F2
5 STOREYS
BULDING G3
5 STOREYS
BULDING G2
4 STOREYS
ROAD 5
BULDING H3
3 STOREYS
BULDING H2
4 STOREYS
Future RACF Main Comms Room
Future Building F Main Comms Room
BULDING F1
3 STOREYS
Future Building G Main Comms Room
BULDING G1
3 STOREYS
Future Building H Main Comms Room
BULDING H1
3 STOREYS
RESERVOIR ROAD
NEIGHBOURING RESIDENTIAL
SITE BOUNDARY
Plan to divert NBNCo Conduits & Cabling within Penny Place to new ILU buildings
RACF ENTRY
PENNY PLACE
NBN Pit for Future RCAF
NBN Pit for Future Building F
NBN Pit for Future Building G
NBN Pit for Future Building H
NEIGHBOURING INDUSTRIAL

A

0 1 2 4 8 m

N

17002 BLACKTOWN WORKERS SENIORS LIVING - Site Compatibility Certificate

SCC 1003 - Roof Plan

AJ+C Allen Jack+Cottier