HARON ROBSON
lightmatters wattmatters avmatters

Electrical Services Infrastructure Masterplan Report

BWC 2/25

Blacktown Workers Sports Club

Site A: Outdoor Sports Facilities – 221 Walters Road, Arndell Park

Site B: Seniors Living Village - 170 Reservoir Road, Arndell Park

Client:	**Paynter Dixon Constructions Pty Limited** **Level 2, @ Richardson Place** **NORTH RYDE NSW 2113**
Date:	15th **January 2018**
Version:	4
File Reference:	Electrical Services Overview Report.docx
Prepared by:	**Greg Reardon**

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

WE UNDERSTAND AUDIO VISUAL, LIGHTING, ENERGY, ELECTRICAL AND BUILDING SERVICES SYSTEMS AND ADVISE ON THESE ISSUES WORLDWIDE

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

bsi. ISO 9001 Quality Management
FS 603988

BLACKTOWN WORKERS SPORTS CLUB
ELECTRICAL SERVICES INFRASTRUCTURE MASTERPLAN REPORT
DATED: 15 JANUARY 2018

TABLE OF CONTENTS

1 Executive summary....3
1.1 Introduction....3
2 ELECTRICAL SERVICES....4
3 OUTLINE OF PROVISIONS....4
3.1 General....4
3.2 Electricity and Telecommunications Authorities....4
3.3 Electricity Supply....4
3.4 Public Domain Lighting....4
3.5 Sports Field Lighting....5
3.6 Telecommunications Provisions....5
4 BUILDING SERVICES....5
4.1 Essential Services....5
4.2 Regulations and Authorities....6
4.3 Extent of Work....7
4.2.1 High Voltage Network Mains....8
4.2.2 Kiosk Substations....9
4.2.3 Service/Consumer Mains....9
4.2.4 Electrical Switch Rooms....9
4.2.5 Main Switchboards....9
4.2.6 Electricity Supply Authority Tariff Metering....10
4.2.7 Submain Cabling....10
4.2.8 Common Area Distribution Boards....10
4.2.9 Living Unit Distribution Boards....10
4.2.10 Residential & Tenancy Meter Panels....11
4.2.11 Final Sub-circuits....11
4.2.12 General Power Services....11
4.2.13 General Lighting Services....11
4.2.14 Emergency Lighting and Illuminated Exit Sign Services....11
4.2.15 Tenancy Spaces....11
4.2.16 Fire Control Centre....11
4.2.17 Automatic Smoke Detection & Alarm System....12
4.2.18 Telecommunication Rooms....12
4.2.19 Telecommunications Fibre Optic Lead-In Cabling....12
4.2.20 Telecommunications Fibre Optic Distribution Equipment....12
4.2.21 Telecommunications Fibre Optic Vertical (Backbone/Trunk) Cabling....12
4.2.22 Telecommunications Living Unit Provisions....13
4.2.23 Essential & Emergency House Services Communications Distribution Network....13
4.2.24 Television Distribution System....13
4.2.25 Gas & Hot Metering....13
4.2.26 Security, Access Control and Intercom Systems....13
4.2.27 Lightning and Surge Protection....14
4.2.28 ESD - Design Principles....14
5 ANNEXURES....14

BLACKTOWN WORKERS SPORTS CLUB
ELECTRICAL SERVICES INFRASTRUCTURE MASTERPLAN REPORT
DATED: 15 JANUARY 2018

1 EXECUTIVE SUMMARY

Haron Robson Australia Pty Ltd have been commissioned by Paynter Dixon Constructions Pty Ltd to prepare this Electrical Services Infrastructure Masterplan Report for the proposed development at 170 Reservoir Road, Arndell Park NSW 2148.

The site's real property description is Lot 14 on DP6796, Lot 10 and 11 on DP818679, Lot 14, 16 and 17 on DP 809530 and Lot 200 & 201 on DP880404.

Given the integrated nature of the masterplan this report has been prepared for all three components needed to facilitate the development:

- Planning Proposal to include 'recreation facility (outdoor)' on Lot 14 Sec 4 DP6796 and Lot 10 DP818679.
- Development Application for the outdoor sports facilities on Lot 14 Sec 4 DP6796 and Lot 10 DP818679.
- Site Compatibility Certificate for a Seniors Living Village on Lot 201 DP880404

1.1 Introduction

The proposed Blacktown Workers Group Development at Blacktown Workers Sports Club is part of the implementation of a Masterplan for the redevelopment of the former sports fields surrounding the club which incorporates the following:

Site A:

Site A of the redevelopment is the relocation and upgrade of the existing outdoor sporting facilities on the site. It is proposed that the existing playing fields located south of the sites main access road will be relocated to the existing open spaces within the site adjacent to Walters Road and next to the existing baseball field on the site.

The works are currently underway and will include the development of four new full-sized playing fields including field lighting. In addition to the playing fields two new grandstands with associated vehicle parking are being constructed.

Site B:

The development of Site B will include the construction of a new senior living precinct on the existing sports fields. The new senior living precinct will include for up to 800 Residential Apartments intended for "Resort Living" Independent Living Units (ILU) and a 160 room Residential Aged Care Facility (RACF). The seniors living precinct will include a basement level under a podium accessed from the main entrance of the site.

Refer to Figure 1.1 below for key plan of areas.

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

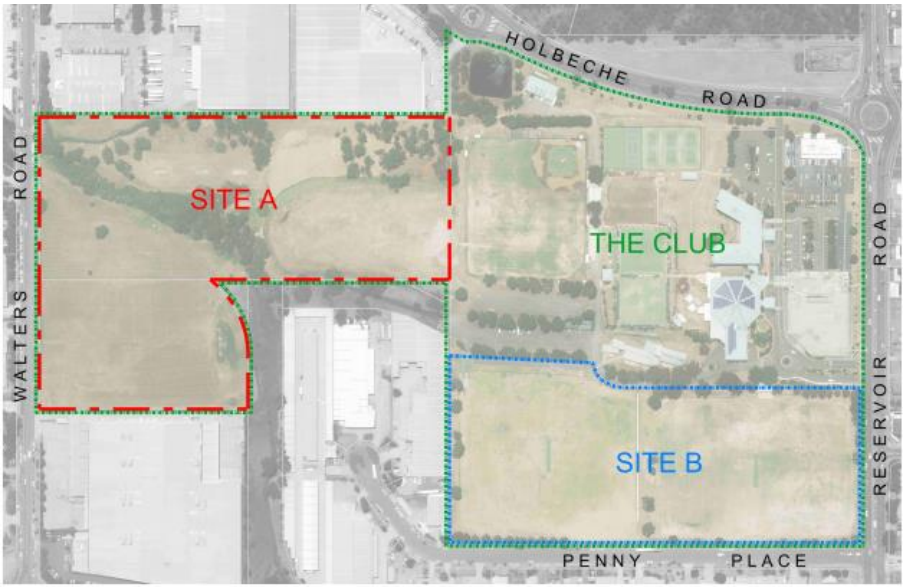

Figure 1.1 Proposed Site layout showing breakdown

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 appropriate detailed allowances for each space. There will be a need to further address the electrical requirements of the other active systems in the proposed buildings such as air conditioning and hydraulic services during the future detailed design process.

This detail design will address the functional requirements of the users of the buildings by locating power outlets for general use, and connections for installed electrical equipment. Also the design of the electrical reticulation system so that is 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 2016 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 Electricity Supply

Electricity Supply to the development shall be via the establishment of six (6) kiosk type electrical substations each servicing various sections of the development to be constructed at nominated locations throughout the development. An Application for Connection will be required to be submitted to Endeavour Energy to further develop a scope of works.

For Site A, it is proposed that the Sports Fields upgrade along Walters Road would be supplied from the existing High Voltage network in Walters Road suppling one (1) new kiosk, adjacent to the grandstand area along Walters Road.

For Site B, it is proposed that a new High Voltage ring main feeder originating from the nearest Endeavour Energy Zone Substation would be required along Reservoir Road then along Penny Place the supply five (5) new proposed kiosks for the ILU's & RACF.

High Voltage cabling shall run within deep soil areas where possible, otherwise the High Voltage shall run within conduits cast in to the Concrete Slab to the approval of Endeavour Energy.

Low Voltage Electrical Supplies (Service/Consumers Mains) from each of the Designated Substations to the various parts of the development shall be installed via underground conduits or via cable ladder at high level within the underground car parking area of the ILU development to the nominated Main Switchboard locations.

Electrical Supply cables shall achieve a 2-Hour Fire Rated capacity to maintain Electrical Supply Provisions for the Emergency and Essential Services Equipment.

3.4 Public Domain Lighting

The Public Domain lighting across both Site A & Site B 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 Public Domain lighting 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 buildings
- Provide lighting to the communal courtyards and podium

- Provide lighting to the buildings perimeter

Generally, the 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.

External lighting within the development will be designed in accordance with Australian Standard AS 4282:1997 "Control of the obtrusive effects of outdoor lighting"

3.5 Sports Field Lighting

The Site A new sports field lighting has been provided via installation of a combination of new 25m - 33m lighting columns complete with multi head LED flood lights to provide illumination for amateur level club competition and match practice (ie 100 lux) for all football codes, in accordance with Australian Standard AS 2560.2.3:2007.

The associated Site A outdoor car parking areas lighting shall provide an appropriate level of lighting to a category P4 level which 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.

External lighting within the development will be designed in accordance with Australian Standard AS 4282:1997 "Control of the obtrusive effects of outdoor lighting"

Areas of the sporting fields are located within the Flood Zone so therefore all distribution boards, including the boards at the base of the lighting columns, if required, will be located outside/above the Flood Zone.

3.6 Telecommunications Provisions

As the Site B residential 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 at their 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.

Traditional Telstra copper lines shall be sort to supply the two new grandstands proposed within the sports field areas.

4 BUILDING SERVICES

4.1 Essential Services

The Electrical Services installation within both Site A & Site B 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.

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

Also for Site B, a Building Occupant Warning System (BOWS) or Sound System & Intercom System for Emergency Purposes (EWIS) shall be provided in the common areas in the residential and commercial buildings including all parts of the underground Car Park including ancillary storage/plant areas in accordance with the National Construction Code, Australian Standards AS 1670.1 and AS 4428 and the relevant Fire Engineering Report.

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

4.2 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 2014 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

4.3 Extent of Work

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

Site A:

- High Voltage Network Mains to the kiosk type substation & the augmentation of the Existing High Voltage Network Mains
- One (1) kiosk type electrical substation
- Electricity Distribution Authority / Electricity Retailer Tariff Meters and Associated Equipment
- Incoming Lead-in Telstra Copper Telecommunications Cables

Site B:

- High Voltage Network Mains to the kiosk type substations & the augmentation of the Existing High Voltage Network Mains
- Five (5) kiosk type electrical substation
- Electricity Distribution Authority / Electricity Retailer Tariff Meters and Associated Equipment
- Incoming Lead-In NBN Telecommunications Cables
- Incoming Lead-in Telstra Copper Telecommunications Cables
- NBN Active Distribution Equipment and Cabling

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

Site A:

- 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 Common Area Distribution Boards and other Services Control Panels
- Common Area Distribution Boards
- Tariff 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

- Field Lighting & General Lighting Services in accordance with National Construction Code - Section J6 and the nominated Australian Standards
- Emergency Lighting and Illuminated Exit Sign Services in accordance with National Construction Code and Australian Standard AS 2293
- Lightning & Surge Protection
- ESD Design Principles

Site B:

- Service/Consumer Mains from the multiple Points 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 Common Area Distribution Boards, Residential & Tenant Meter Panels, Apartment Distribution Boards and other Building Services Control Panels
- Common Area Distribution Boards
- Living Unit Distribution Boards
- Residential & Tenancy 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
- A Television Distribution System for Pay TV and Free-to-Air Television Services
- Automatic Smoke Detection, BOWS and or 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

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 kiosk type Substations in the nominated locations 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 six (6) New 1000kVA transformer kiosk type Substations in the nominated locations around the development.

Each Substation shall have a 400V Three (3) Phase, 4 Wire, 50 Hertz, Low Voltage Output capacity of approximately 1,440 Amps per phase (rated for service protection device).

The anticipated Electrical Maximum Demand for the Site A - Sports Fields development is approximately 1,100 Amps/phase. The anticipated Electrical Maximum Demand for the Site B residential development is approximately 5,595 Amps/Phase.

This assessment of the diversified electrical load is based upon the installation of Induction Cooktops, Electric Wall Ovens and Reverse Cycle Air Conditioning within each Residential Apartment, along with a Centralized Gas Hot Water System.

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

A nominated Level 1 Accredited Service Provider shall be engaged to carry out the electrical installation works for the New kiosk type 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 a New Main Switchboards. 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 Endeavour Energy 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 either on Ground Floor Levels of the buildings / Grandstands or the underground Carpark levels for the residential buildings. Common area 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 six (6) New Main Switchboards which will be located within the Main Switch Rooms located throughout.

(Please find attached sketch for further information)

Each new Main Switchboard 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 Distribution Boards, Meter Panels, Building Services Control Panels and Equipment.

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

4.2.6 Electricity Supply Authority Tariff Metering

Each new Main Switchboard shall have sealable compartments for the installation of current transformers to facilitate the Tariff Metering of the Common Area 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 Common Area Services Tariff Metering equipment shall be installed within the Main Switchrooms.

4.2.7 Submain Cabling

Submain Cables will be reticulated from the new Main Switchboards via underground conduits, 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 Common Area Distribution Boards

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

New Common Area 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 Common Area 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 Living Unit Distribution Boards

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

New Living Unit 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 Living Unit 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 & Tenancy Meter Panels

Residential and Tenancy Metering Panels shall be supplied and installed within the Electrical Switch Rooms located either on the ground floor or on the underground car park level as described above. 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 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 Client's project 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 co-ordinate 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 Living Unit 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 installation in accordance with Australian Standard AS 2293 on all Distribution Boards supplying circuits with Emergency and Exit Sign Lighting incorporated.

4.2.15 Tenancy Spaces

Tenancy Spaces shall be of a "Cold Shell" base building fit-out. This includes the supply and installation of a Distribution Board, Communications Hub, General Power and General Lighting or as required by the Client's project requirements & the nominated BASIX requirements.

4.2.16 Fire Control Centre

The Site B development may be required to incorporate a Fire Control Centre within the residential portion of the development, in accordance with the National Construction Code requirements E1.8.

If required, the Fire Control Centre shall be located within an easily accessible location for the attending New South Wales Fire and Rescue (NSWFR) personnel. 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.

4.2.17 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, any Fire Engineered Report, New South Wales Fire and Rescue Requirements, Australian Standards AS 1670.1, AS 1670.4, AS 44283 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 individual building entry Lobbies, linked back to the Main Fire Indicator Panel within the Fire Control Centre.

Smoke Alarms shall be installed within each Living Unit in accordance with Australian Standard AS 3786 requirements.

4.2.18 Telecommunication Rooms

It is proposed that a Telecommunication Room would be required within the Residential portion of the development along Penny Place to allow for NBN Distribution Equipment which will be provided by NBN, distributed MATV/PAYTV Racks & Security/Access/Intercom Racks will also be located within this room.

4.2.19 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 Room. All works shall be in accordance with NBN Network Standards and requirements.

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

4.2.20 Telecommunications Fibre Optic Distribution Equipment

Spatial Provisions shall be provided within the allocated Telecommunications Room 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.

4.2.21 Telecommunications Fibre Optic Vertical (Backbone/Trunk) Cabling

Spatial Provisions shall be provided for the installation of Fibre Distribution Terminals (FDT within the Telecommunications Room. 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.

4.2.22 Telecommunications Living Unit 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
- Multiswitch for TV Distribution (Splitter)
- 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.

4.2.23 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 Room to provide telecommunications connectivity for the Emergency and Essential Services Equipment.

4.2.24 Television Distribution System

The site shall be provided with a Quadrature Amplitude Modulation (QAM) / Transparent Digital Transmodulator (TDT) Television Distribution System to be extended throughout the development to provide free to air MATV & PayTV signals troughout the system shall include a single satellite receiver dish, 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 broadcast signal is conveyed through the development.

4.2.25 Gas & Hot Metering

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) throughout the multi-residential portion of the development.

4.2.26 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 Carparking 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 Living Unit 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.

4.2.27 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 conductors mounted on the roof of the individual buildings or top of the sports field lighting columns 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.

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

4.2.28 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 BASIX Requirements.

5 ANNEXURES

- **Electrical Services Infrastructure Concept Plan (14279 – SKE01 [3])**

HARON ROBSON

lightmatters wattmatters avmatters

Kiosk Substation no.6
For Soccer Fields

HV connection to
existing network

Kiosk Substation no.5
For Stage 5
Residential Buildings

Kiosk Substation no.4
For Stage 6
Residential Buildings

Kiosk Substation no.3
For Stage 3 & 4
Residential Buildings

Kiosk
Substation no.1
For Stage 1 & 2
Residential
Buildings &
Community
Facility

Kiosk
Substation no.2
For Residential
Aged Care
Facility

New High Voltage ring main
separate feeder from Zone Sub

PROPOSED
RUGBY LEAGUE
GRANDSTAND

30m Lighting
Columns

2 x NEW RUGBY
LEAGUE FIELDS +
1 x SYNTHETIC
CRICKET PITCH

PROPOSED
SOCCER
GRANDSTAND

33m Lighting
Columns

2 x PROPOSED
FULL-SIZED SOCCER
FIELDS, 2 x U9
SOCCER FIELDS +
1 x SYNTHETIC
CRICKET PITCH

2 x CRICKET
NETS + STORE

EXISTING
CAUSEWAY

EXISTING
DAM

HOLBECHE ROAD

WALTERS ROAD

EXISTING TENNIS COURTS

EXISTING
PRACTICE
NETS

EXISTING
SHED

EXISTING
BASEBALL
PITCH

EXISTING
BOWLING
GREEN 3

EXISTING
BOWLING
GREEN 2

EXISTING
BOWLING
GREEN 1

OUTDOOR
GAMING
EXTENSION

EXISTING
MOTEL
(LOT NOT
INCL. AS
PART OF DA)

EXISTING
CAR PARKING
(73 SPACES)

EXISTING
OUTDOOR
AREA

BLACKTOWN
WORKERS
SPORTS
CLUB

EXISTING
MULTI-LEVEL
CARPARK

PEDESTRIAN
OVERPASS

EXISTING
CARPARK

STREET RISES
AT APPROX
1:55 TO HIGH
POINT

RESERVOIR

PENNY PLACE

RACE

LEGEND

- E — Proposed High Voltage Cabling Route
- Proposed Kiosk Substation
- Proposed Low Voltage Cabling Route
- Indicative Electrical Main Switchboard
- DB Indicative Electrical Distribution Board
- Indicative Sports Field Lighting Column

Revisions				
No	Date	Description	Ver	App'd
1	8-12-15	Preliminary issue for review and discussion	1	GR
2	16-03-17	Preliminary issue for review and discussion	2	GR

Nominated Architects Michael Heenan 5264, Peter Ireland 6661

Site Location Plan

Client

PAYNTER DIXON

Paynter Dixon Constructions Pty Limited
Level 2, 2 Richardson Place
Riverside Corporate Park
North Ryde SYDNEY NSW 2113

Architect

AJ+C
Allen Jack+Cottier

79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

Project

BLACKTOWN WORKERS SPORTS CLUB - PROPOSED SPORTING FACILITIES AND CHILDCARE CENTRE

Site A: Outdoor Sports Facilities - 221 Walters Road, Arndell Park.

Proj No. BWC 2/25

Drawing Title
Electrical Services Infrastructure Concept Plan

Drawing Status
NOT FOR CONSTRUCTION

Scale 1:1000

Drawing No 14279 - SKE01

Issue 3

A1

PLOT DATE & TIME: 2/12/2016 12:38:33 PM PLOTTED & CHECKED BY: wrothall

1000_Issue to Surveyor 28112016.dgn

BlacktownSportsClubMaster.p...