

ROB PICKETT DESIGN

PROPOSED HUDSON BUILDING VICTORY LUTHERAN COLLEGE

ELECTRICAL SERVICES SPECIFICATION

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**ROB PICKETT DESIGN
PROPOSED STUDENT SERVICES BUILDING
VICTORY LUTHERAN COLLEGE
ELECTRICAL SERVICES SPECIFICATION**

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ELECTRICAL SERVICES

1.0 GENERAL

1.1 General Scope

The extent of this contract includes:

- All work described in this specification and as indicated on the drawings for the supply and installation of electrical services.
- Final design, supply, installation, testing, commissioning and warranty, all without limiting the generality of any other provision of the Specification.
- The supply and installation of minor items, termination of all cables and incidental material not expressly mentioned in this specification but necessary for the satisfactory completion of the work.
- Each tenderer shall visit the site to acquaint themselves with the existing conditions including those of access, safety for employees, building occupants and public, nature of the work and ascertain the full scope of the work.
- Commencement of work shall imply that the contractor is fully satisfied with their knowledge of all conditions of the work. No claim for additional costs due to lack of knowledge of these conditions will be entertained nor shall be deemed to be a reason for extension of time.

These documents have been prepared to comply with National Construction Code Part J7 'Artificial Lighting and Power'. The electrical contractor will be required to certify that the installation has been completed in compliance with Part J7.

Tender submission must include completed Tender Schedules included as Attachment E-2 to this document. This is to enable satisfactory assessment of submissions.

1.2 Work Not Covered by this Specification

The following work will be carried out under separate specifications:

- Installation, connection and wiring of mechanical services plant or equipment.
- Installation of hydraulic equipment.
- Installation and/or configuration of active network equipment.

Co-ordinate all work with the Project Manager and other trades to ensure no interference occurs between various installations. Ensure that other trades have adequate information to meet requirements of the building program.

1.3 Authorities

General:

Liaise with the relevant supply authority and provide all notices in connection with the supply of electricity to this installation. Ensure all supply authority requirements for metering are provided.

Fees and Permits:

Pay all fees, permits, licenses, registrations, approvals, notifications, levies and the like required by statutory authorities and as required for the satisfactory completion of the work.

1.4 Obvious Work Covered by this Specification

The electrical services documentation shows the design intent and general arrangement of equipment. Minor works, or obvious works, and items that are necessary to provide fully functioning systems in full compliance with the design intent and the technical requirements of the documentation are not necessarily shown. It is the contractor's responsibility to provide such obvious work and/or confirm with the appropriate contractor/consultant if unsure. Make all necessary alterations to the general arrangement and system design to accommodate any equipment offered and accepted as an alternative to the specified equipment.

Example of obvious works but not limited to others:

- Liaising with relevant authorities
- Mounting supports for all equipment, including wedges, backing timber etc.
- Coordinating connection of consumer mains to substation

1.5 Standards

All work shall comply with the following standards and codes;

- AS/NZS 2293:2018 Emergency evacuation lighting for buildings (parts as applicable)
- AS/NZS 3000:2018 Wiring Rules
- AS/NZS 3008.1.1:2017 Electrical installations – Selection of cables.
- AS/NZS 3080:2003 Telecommunications installations - Generic cabling
- The latest issue of other relevant Australian Standards and other Standards as applicable.
- The latest issue of the Local Supply Authority Service & Installation Rules.

1.6 Definitions and Details

Client:	Victory Lutheran College
Project Manager:	Rob Pickett Design
Engineer:	ADADRA BSG
Contractor:	Electrical contractor awarded contract to install the specified electrical services.
Site Address:	28 Drage Rd, West Wodonga VIC 3690

1.7 Defects Liability Period

The entire installation shall be warranted for a full 12 month Defect Liability Period. Any equipment replaced during this Defect Liability Period shall be subject to a further 12 months Defect Liability Period from the time of installation.

During the Defect Liability Period the contractor shall carry out all mandatory maintenance required by Australian Standards and the Building Code of Australia. Details of this maintenance shall be recorded in log books, signed off by the Project Manager, and then left with the Project Manager. Contractors shall provide a service schedule detailing all maintenance to be carried out.

2.0 QUALITY

2.1 Materials

All materials and equipment supplied new shall be new and be entirely suitable for the industry.

Materials and equipment supplied new that are unfit for the installation shall be replaced at no cost to the client.

Maintain uniformity of type and manufacture of all individual fittings and accessories throughout the whole installation.

2.2 Clean Up and Making Good

All surfaces and equipment that have been degraded or damaged during the work shall be made good and be brought back to their original surface finish.

All construction debris and packaging shall be removed from the site.

2.3 Witness Points

Give two business days' notice so that inspection may be made of the following:

- Testing of Electrical Installation.
- Testing of Emergency Escape Lighting
- Testing of Data Communications installation

The installation must pass all authority inspections. Each component of the installation must be tested in an approved manner to ensure its correct operational condition.

2.4 Hold Points

Provide a minimum 5 business days' notice so that review may be made of the following:

- Approval of specified light fittings. Provide samples of all specified light fittings for approval by the client. Where the light fitting to be used is exactly as per specification fitting specific PDF datasheets, produced by the supplier, will be acceptable. (Photocopies of catalogue pages with highlighted lines will not be accepted)
Physical samples will be required where alternatives are offered.
- Provide shop drawings of all switchboards, control panels, and communications cabinets. Allow five (5) business days for approval of drawings and sufficient time to not cause delay in delivery of equipment to meet the building program.
- Provide notice for inspection of trenches after laying of conduit.

In the case of equipment that is to be manufactured specifically for this work and which is proposed as an alternative to the specification, supply the design for the equipment. The design shall be in sufficient detail to enable an appraisal without reference to additional material.

Provide samples with sufficient time for evaluation without affecting project timing as no extensions of time will be allowed for delays associated with this requirement.

2.5 Alternatives

Any modification or alternative which Tenderers consider would be in the interest of the Client may be offered in the form of a covering letter to the Tender. The Tender shall clearly indicate the increased or decreased cost, which may be affected by adoption of the equivalent alternative. These cost changes shall consider the effect of the alternatives on all other trades such as mechanical services, hydraulic services, and builder's.

Alternatives will not be considered if a conforming tender is not also submitted. Approval of alternatives is subject to the following requirement:-

- Where brand names or manufacturer names are included in the documents with the annotation 'similar to' OR 'or equal', they are used with the intent of specifying the minimum quality, appearance and/or standard of performance.
- The particular brand or product specified is to be allowed for and described at tender assessment time.

Alternatives will only be considered if nominated in the Tender submission. Tenderers are to submit a comparison table outlining the key items for consideration.

3.0 COMPONENTS

3.1 Power Distribution

Equipment:	Minimum as shown on the drawings and as specified in section 4 of this document
Distribution Boards:	Metal Consumer Switchboards with CL001 keyed lockable door. Indoors: NHP Concept Plus with IP52 seals Outdoors: NHP Concept Premier All power distribution equipment lighting contractors, and emergency evacuation lighting control gear shall be contained within DB's with 20% spare space for additional equipment.
Circuit breakers:	NHP or similar approved. Where fault levels exceed that of the relevant circuit breaker current limiting fuses shall be used to provide back up protection.
Contactors:	NHP or similar approved Rating must be 20% oversized for the known load at the time of installation.

3.2 Luminaires

For luminaire types refer to Electrical Symbols Legend drawing.

Light Switches

As documented.

Emergency escape light test switches & power sensing equipment shall be proprietary assemblies.

3.3 Cables

All power:	Stranded copper conductor, Single phase circuits $\leq 16A$, TPS, 2.5 mm^2 minimum cross section Other circuits, in accordance with AS3008.1.
Lighting:	Stranded copper conductor, TPS, 2.5 mm^2 minimum cross section. TPS with 1.5 mm^2 cross section is permissible with appropriate adjustments to circuit protection and with voltage drop considerations.

All cables must be installed square and parallel to building lines.

4.0 SCOPE OF INSTALLATION

4.1 DEMOLITION & PRE-WORKS

The electrical contractor is responsible for the disconnection and removal of all redundant electrical equipment and wiring installed in the affected sections of the existing facility.

All redundant wiring shall be completely removed from the buildings.

Maintenance staff will retain redundant equipment for storage and re-use elsewhere unless designated for re-use on this project.

4.2 POWER DISTRIBUTION

4.2.1 Existing Main Switchboard

Provide new circuit breakers to the main switchboard as detailed on the drawings.

4.2.2 New Distribution Boards

Supply and install new distribution boards at locations shown on drawings.

Distribution boards are to be constructed to the minimum standard detailed in section 3.1 of this specification. Supply and install new circuit breakers as noted on the drawings. The distribution boards shall include all necessary circuit breakers, lighting controls, and emergency escape lighting test equipment plus additional space.

Maintenance during the Defect Liability Period shall include testing of RCD's at a minimum frequency of three (3) months. Contractors shall provide a service schedule detailing all maintenance to be carried out.

An Emergency Escape Lighting test discharge facility and power sensing shall be installed in all distribution boards as shown on the drawings.

4.2.3 Sub-mains

Install new sub-mains as indicated on the drawings.

All conduits and other items required for the installation of the mains are the responsibility of the electrical contractor.

4.3 POWER

4.3.1 General

Supply, install and connect power outlets and direct wired supplies as shown on drawings.

4.3.2 Mechanical Services & Hydraulic Services

Supply, install and connect power services for mechanical and hydraulic services as detailed on the drawings. This work includes the circuit breakers, cables, isolators and termination.

Co-ordinate with other trades to ensure correct placement of power supplies.

**CONFIRM ALL POWER REQUIREMENTS WITH THE APPROPRIATE CONTRACTOR
PRIOR TO COMMITMENT TO PURCHASE AND NOTIFY THE PROJECT MANAGER
OF ANY DISCREPANCIES.**

4.4 COMMUNICATIONS

4.4.1 Data Communications

4.4.1.1 Communications Cabinets

Supply and install a new communications cabinet at the location shown on the drawing. This cabinet shall house the fibre optic breakout trays, data patch panels, telephone patch panels, and active switches. Active switches will be supplied by others.

Supply and install new equipment to the cabinet as nominated on the drawings.

Supply sufficient patch leads for every new data outlet installed in the building.

The communications cabinets shall be serviced by a dedicated sub-circuit.

4.4.1.2 Tie Cabling

Supply, install and terminate tie cabling between the new and existing communications cabinets coordinate with Schools IT department to determine cable type and amount of cores.

4.4.1.3 Communications & Data Network

The data cabling system shall be suitable for voice and data communications using multi product computer systems.

Provide cabling to suit communications outlets shown on the drawings. Cabling to all outlets shall originate at the new Communications Cabinet and be continuous. Connect all cabling with a 300mm loop of spare length at each end.

Supply, install and connect communications outlets as shown on the drawings. Cables shall be terminated to the 568A format for pair/pin assignment. Label each outlet for identification. Outlet Labelling must include a cabinet identifier and a port number such as example A-2 Where A is the Communications rack - letter and 2 is the Data Outlet – number.

As-Constructed issue drawings shall show the unique outlet identifiers at each outlet.

4.4.1.4 Datacommunications Testing

The data network installation shall be tested to AS/NZS 3080 permanent link with a certified tester. Test results are to be presented in hard copy and as an ASCII text file on CD-ROM. Results shall include Building, Room Name, Location, and Outlet Number. The technician shall sign the hard copy of the test results and the label of the disk.

Where initial test results do not meet relevant telecommunication standards, the Contractor will rectify the problem.

For optical fibre cable testing tests in accordance with the requirements of AS/NZS 3080 shall be carried out in both directions and at both wavelengths.

4.4.2 New Public Address System

Supply and install a fully operational Public Address System. This system shall include;

- Minimum 250W 3 Zone Public Address Amplifier with auxiliary inputs and priority page over ride. The amplifier shall include pre page chimes.
- An evacuation module to override all other functions with the standard evacuation tone.
- AM/FM digital tuner.
- 5 disk multi play CD player.
- MP3 player input.
- Ceiling recessed speakers with white grilles, minimum 5W with multi tap settings to adjust sound levels.
- 3 off desk mount paging microphones plus 1 off paging microphone at the Fire Indicator Panel.
- Emergency Power. The Public Address system shall be capable of operating for two hours under battery power in accordance with Australian Standards. Provide battery charger and batteries to suit.

The entire system shall be rack mounted and located in the staff administration area on the ground floor.

4.5 LIGHTING

Supply, install and connect lighting, including switches and controls, and ceiling fans to the building as detailed on the drawings. Alternatives fittings will only be considered if nominated in the Tender submission.

4.6 EMERGENCY ESCAPE LIGHTING

Supply, install and connect emergency escape lighting as detailed on the drawings. Refer to the Electrical Symbols Legend drawing for specification of emergency evacuation light fittings. The system and all emergency fittings shall be installed to comply with AS/NZS 2293.

All emergency escape light fittings shall be clearly labelled with a unique number that corresponds to what is indicated in the Emergency Escape Lighting Operations & Maintenance Manual. This number shall also be noted beside each fitting on the As-Built Drawings.

Provide an Emergency Escape Operations & Maintenance Manual complete with all details of the new installation and the initial test in compliance with AS/NZS 2293.

4.7 SECURITY SYSTEM

The nominated contractor for work associated with the Security System is the existing school's Security Service Provider.

The extent of detection devices and other equipment required will be determined by the nominated Security Contractor.

Pay all costs associated with this work.

5.0 INSTALLATION DETAILS

5.1 Fixings and Brackets

All fixings, anchors and brackets shall be installed in accordance with the manufacturer's recommendations.

Masonry anchors shall be expansion type or chemically bonded. Explosive powered tools shall not be used.

Install luminaires on proprietary supports by means of battens, trims, noggings, roses and packing material. Provide battens and support for the fittings and do not direct fix into plasterboard.

5.2 Labelling

All labelling shall meet the following requirements;

- All labels shall be permanently fixed.
- Exterior labels shall be mechanically fixed.
- Labels shall be engraved laminated plastic with black lettering. Minimum lettering height 5mm.

Provide labels for every distribution board, control panel and the like. These labels shall show:

- Board number
- Board description
- Source of supply
- Circuit Breaker number at the source of supply
- Size & Construction Details of cable supplying DB

Labels shall be fixed to the front door of the switchboard or to the switchboard front panel where no door exists.

Provide labels to all direct wire equipment. These labels shall show identify circuit breaker number and distribution board at source of supply.

For the following equipment adhesive labels are permissible in domestic and office type environments. Adhesive labels are not permitted for external use, workshops, industrial applications or the like. If in doubt seek approval from the project manager prior to application.

- Provide labels to all socket outlets. These labels shall identify circuit breaker number and distribution board at source of supply. Labels for socket outlets shall be attached to the fixed section of the outlet.
- Provide labels to all data outlets. These labels shall be a unique identification number.
- Provide labels to all light switches. These labels shall identify circuit breaker number and distribution board at source of supply.

5.3 Switchboard Schedules

Provide an A4 sized connection schedule for all DB's affected by these works. Schedules shall be typed and enclosed within a clear plastic jacket. Schedules shall state where the DB is supplied from and the cable size that was used. For Example 'DB-2 Supplied from MSB, CB 6. Cable is 4-1Cx70mm² Cu XLPE/PVC'.

Schedule descriptions shall indicate location of equipment and number of items installed to the circuit (eg number of GPO's or light fittings). For example, 'Classroom 5, Power, 6 x Dbl GPOs'. Include these schedules in the Electrical Services Manual.

5.4 Cabling

Permanent cabling shall be continuous without joints between terminations.

Cables shall be secured and supported within 450 mm of terminations.

LV single core cables installed within the building shall be supported.

LV multicore cables installed within the building shall be supported.

Earthing cables shall be supported on cable ladder, cable tray or in UV resistant non-metallic conduit.

Pulling tension & bending radius shall not exceed manufacturer's recommendations.

Power cables entering enclosures and switchboards shall be sealed using Nylon glands for cables up to 30 mm diameter, and chrome plated brass glands for cables exceeding 30 mm diameter. Cabling to all switchboards shall be installed in such a manner that will permit installation of additional cables and/or removal of existing cabling without disturbing the cabling terminated at the board.

Cable entries to equipment & enclosures shall maintain the same degree of protection as the equipment &/or enclosure.

Penetrations through walls shall be made permanently weatherproof and shall maintain the same degree of protection as the wall.

Cabling shall be concealed within walls, under floors, in ceiling spaces, or blockwork cavities. Wiring installed in ceiling spaces, under floors and in other accessible spaces shall be clipped at a minimum of 750mm intervals. All such wiring shall be supported on trays, in ducts, or clipped to catenary wires fixed directly to the underside of roof purlins. Wiring may not be clipped to ceiling suspension hangers or laid directly on ceiling tiles.

Cabling shall not be embedded in concrete or plaster but shall be enclosed within PVC or galvanised steel conduit.

Where cabling is installed to inaccessible concealed spaces install cable in UPVC conduit.

All conduits shall be permanently sealed at both ends to prevent the ingress of insects and vermin.

All cables shall be identified at both ends as to their origin and destination. This may be carried out using a permanent-marking pen.

Power cables shall be identified by colour or by the code "L1, L2, L3".

5.4 Cabling (continued)

Power, LV and ELV cabling shall not be installed in a common support or on the same cable ladder or tray unless a metallic barrier is installed to separate the different services.

Underground cables shall be installed in a manner that permits replacement by drawing in without disturbing the underground conduits.

Conduits shall be mechanically protected up to 1.2 metre from the floor level.

All underground cables shall be installed in conduit.

5.5 Other Equipment

The electrical contractor shall make all necessary electrical connections to equipment. This includes the supply and fitting of correct plug tops and the shortening of flexible leads to all equipment. (eg hand driers, automatic doors) Plug tops to outdoor equipment shall be waterproof IP56 and match the socket outlets provided specifically for that purpose.

5.6 Access for Maintenance

Provide access for maintenance to ensure that all components perform to their original standard including;

- Motorised shading device;
- Time switches and motion detectors; and
- Reflectors, lenses and diffusers of light fittings.

5.7 Inspections, Testing and Commissioning

Provide ITP's for each test.

These ITP's shall show:

Date of test

Test undertaken

Test equipment used

Name of test personnel

Results of test

Prove or test operation of:

All luminaires.

Communications Installation.

RCD protection.

All GPO's.

All direct wire equipment.

Emergency escape lighting.

Provide schedules of testing to be performed at completion and during the Defect Liability Period with the completed Tender.

5.8 Tools

Any special tools required for the operation and normal on-site maintenance shall be provided.

6.0 DRAWINGS

6.1 Tender Drawings

The following drawings form part of this specification:

Author	Number	Sheet/Scale	Title
BSG	E000	A1 NTS	Legend & Drawing Index
BSG	E001	A1 NTS	Schematics
BSG	E100	A1 1:200	Site Plan
BSG	E200	A1 1:100	Power & Communications
BSG	E300	A1 1:100	Lighting & Associated Services

6.2 Shop Drawings

The electrical contractor shall provide shop drawings of all switchboards, distribution boards, control panels, and metering panels for installation. Drawings shall include elevations, sections, schematic diagrams/ single line diagrams, and equipment lists. Drawings shall be produced using computer aided drafting software.

The electrical drawings shall be coordinated with other building services to ensure that all equipment will fit in the locations nominated.

Approval of the shop drawings does not remove from the electrical contractor the responsibility for the correctness of dimensions, quantities, calculations, construction, fabrication techniques, co-ordination of work with other trades, or supply authorities.

6.3 As Installed Building Services Drawings

CAD drawings are to be in AutoCAD 2015 format by a capable, qualified CAD draftsman.

The installer shall be responsible for the amending, updating, and providing electronic CAD files to 'As Installed' status in PDF & DWG format. Three (3) paper sets of 'As Constructed' drawings are to be provided. Sheet size shall be as shown in section 6.1.

This includes the Project drawings listed in Section 6, shop drawings, and wiring diagrams for all services.

To accurately identify all works completed during the project 'As Installed' Drawings shall be as follows;

- All previous revision lines and revision clouds removed;
- All notes on the drawings shall be clear and legible with the appropriate font to prevent clashing of text;
- Show any approved alternative products that have been used on the project will be added to the legend;
- Show any changes to location of components. Relocated items will only be shown in their new location;
- Power outlet circuit breaker numbers adjacent to outlet symbols;
- Isolator circuit breaker numbers adjacent to isolator symbols;
- Lighting circuit breaker numbers attached to switch circuits;
- Data outlet identification numbers adjacent to outlets;
- Emergency escape light fitting identification numbers adjacent to fittings; and
- Accurate underground cable routes showing the actual path installed with the location of any in-ground cable route markers. Provide dimensions off permanent structures at each change of direction and at in-ground cable route markers.

The project is deemed to be incomplete until the compliance with this section has been achieved. A copy of the 'As Installed' drawings shall be provided prior to final inspection of the works to enable verification.

7.0 OPERATION & MAINTENANCE MANUALS

The Installer is to provide an Electrical Services Operation & Maintenance Manual prior to the final inspection.

The manual is to be submitted in the following format.

Three (3) hard copies of the manual and one (1) scanned copy of all information including 'As Constructed' drawings copied onto a USB memory stick shall be provided.

The data to be provided in the manuals shall include but not be limited to the following. Each section shown below shall be separately divided:

- Contents page.
- Emergency information ie. After hours numbers to applicable sub-contractor and Contractor/sub-contractor list.
- Operating instructions, manufacturer's literature, diagrams and drawings, test reports covering work, site and commissioning tests with an indexed schedule.
- Maintenance tasks and intervals, for all machinery and equipment provided whether fixed or mobile.
- Schedule of equipment installed nominating, make, model, and warranty details.
- Schedule of spares provided.
- Distribution Board schedules.
- Digital photographic records of underground cable routes.
- Test results of commissioning as required by the applicable Australian Standard. A signed statement that all works have been carried out in accordance with the specification and the current required standards.
- Electrical & specialist certificate of compliance.
- One copy of the 'As Constructed' drawings, in the same format/size as the contract documents.
- The manuals shall be A4 size with stiff/hard plastic covers and loose leaf type pages.
- A stiff indented divider with numbering shall separate each section. Each paragraph shall be numbered or otherwise identified.
- Provide the date of practical completion for inclusion on the cover of the manual:

ELECTRICAL SERVICES MANUAL

**HUDSON BUILDING
VICTORY LUTHERAN COLLEGE
{Date of practical completion}**

ROB PICKETT DESIGN

PROPOSED HUDSON BUILDING VICTORY LUTHERAN COLLEGE

ELECTRICAL SERVICES SPECIFICATION

ATTACHMENT E-1

Drawings

ROB PICKETT DESIGN

PROPOSED HUDSON BUILDING VICTORY LUTHERAN COLLEGE

ELECTRICAL SERVICES SPECIFICATION

ATTACHMENT E-2

Tender Schedules

Tender Price Components

Electrical Contractor Name: _____

ITEM	COST
Demolition Works	\$
Alterations to MSB	\$
Sub-mains	\$
New DB's	\$
Interior Lighting excluding Emergency escape lighting	\$
Emergency Escape lighting	\$
Lighting Controls	\$
Exterior Lighting on Building	\$
General Purpose Power Installation	\$
Special Purpose Power Installation for 3-Phase components	\$
New communications cabinet	\$
Communication tie cabling	\$
Data communications cabling and outlets	\$
Security System Installation	\$
Public Address Installation	\$
Electrical Services Operation & Maintenance Manuals and 'As Constructed' issue drawings.	\$
Commissioning	\$
Other work included under contract but not specifically listed in the above schedule. [Specify]	\$
Total (excluding GST)	\$
GST	\$
Total (including GST)	\$

Schedule of Unit Rates

These prices form part of the contract and may be used by the Project Manager for additional work or deletions from the scope of work. No variations will be considered unless formally advised and requested by the Project Manager.

These individual prices will be used for assessment of tenders.

RATES	
All purpose on site rate for work as directed by the Project Manager for an electrician inclusive of all on costs and management fees.	\$ /hour
Other specify	\$

Percentage to be applied to additional material and sub-contract services: %

ITEM	ADDITION	DELETION
<i>Lighting (all fittings complete and installed)</i>		
Type F1 fitting	\$	\$
Type D1 fitting	\$	\$
Type D2 fitting	\$	\$
Type H1 fitting	\$	\$
Ceiling Fan	\$	\$

<i>Emergency Lighting (all fittings complete and installed)</i>		
LED illuminated Exit sign	\$	\$
LED non-maintained recessed emergency light	\$	\$

<i>Power</i>		
16A 1-pole combined RCD circuit breaker installed on DB	\$	\$
Single GPO installed with 15 metres of cable	\$	\$
Double GPO installed with 15 metres of cable	\$	\$
15A single GPO installed with 15 metres of cable	\$	\$
3-Phase Isolator installed with 15 metres of cable	\$	\$

<i>Communications</i>		
Communications outlet installed with up to 20 metres of cable	\$	\$