Hall Street Development, Bondi
DA Electrical Services Report

Toga Group

28 May 2008
Document No.: 60042382elecservreport.DOC

DA Electrical Services Report

Prepared for

Toga Group

Prepared by

Bassett Consulting Engineers
Level 11, 44 Market Street, Sydney NSW 2060, PO Box Q410, QVB Post Office NSW 1230, Australia
T +61 2 8295 7555 F +61 2 8295 7500 E sydney@bassett.com.au www.bassett.com.au

ABN 22 004 873 634

28 May 2008

Quality Information

Document DA Electrical Services Report

Ref 60042382

Date 28 May 2008

Prepared by Harry Papandony

Reviewed by

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	28 May 2008	DA Issue	Harry Papandony/Associate Director	

Table of Contents

1.0	Electrical Services Generally		1
2.0	Electrical Services		2
	2.1	General	2
	2.2	Regulations and Authorities	2
	2.3	Substation	3
	2.4	Electricity Demand	3
	2.5	Consumer Mains	3
	2.6	Main Switchboards	3
	2.7	Electricity Retailer Metering	4
	2.8	Power Factor Correction	4
	2.9	Power Distribution	4
	2.10	Earthing	5
	2.11	Distribution Switchboards	5
	2.12	Artificial Lighting	6
	2.13	Lighting Control System	6
	2.14	Power Outlets	6
	2.15	Emergency Evacuation Lighting	7
	2.16	Lightning Protection and Surge Suppressors	7
	2.17	ESD Initiatives	7
3.0	Communications Systems		8
	3.1	Building Main Distribution Frame (MDF)	8
	3.2	Floor Distribution Frames	8
	3.3	Backbone cabling	8
	3.4	MATV and Pay TV	8
	3.5	Background Music System	8
4.0	Security System		9
	4.1	Access Control System	9
	4.2	Intercom Systems	10
	4.3	CCTV Monitoring System	10

1.0 Electrical Services Generally

This report describes Electrical, Communications and Security services systems to be provided in the proposed building consisting of:

- 3 levels of basement car parking and plant areas;
- 2 levels of retail area comprising of small retails outlets
- 3 levels of services apartments comprising of studio, and one and two types
- 4 levels of residential apartments comprising of one, two three and four bed types.

2.0 Electrical Services

2.1 General

The electrical services for the project comprise of the following:

- Electricity Supply
- Consumers Mains
- Main switchboards
- Earthing
- Power Factor Correction
- House and Tenant metering
- Distribution Switchboards
- Power Distribution
- Artificial lighting including specialist lighting and lighting control system
- Emergency and exit lighting
- Power outlets
- Final subcircuit cabling
- Telecommunications cabling
- Free to air and pay TV system
- Intruder Detection and Access Control System
- CCTV systems
- Background music system
- Lightning and surge protection

2.2 Regulations and Authorities

The buildings electrical services will be designed in accordance with:

- The Building Code of Australia
- Service and Installations Rules of New South Wales
- Energy Australia Rules and Regulations
- AS/NZS 3000 Wiring Rules
- Australian Communications and Media Authority (ACMA).
- Environment Protection Agency
- NSW Fire Brigade

- Local Council
- Telstra/Austel
- Workcover
- Relevant Australian Standards

2.3 Substation

A substation chamber will be established on site to supply the anticipated electricity demand. Energy Australia has provided written advice that a surface chamber is necessary which was contrary to earlier advice permitting the use of a basement chamber.

The Client has advised that this matter will be referred to Council and has instructed that the design proceed with a basement chamber substation

2.4 Electricity Demand

The calculated maximum demand for the site is estimated to be 2500kVA. .

2.5 Consumer Mains

Two hour fire rated conductors will be provided from the substation to the buildings main switchboards.

The consumers mains route length will be greater than 5 meters therefore the main switchboard will be designed to allow for increased route length.

2.6 Main Switchboards

Site main switchboard and stratum main switchboards will be provided. The stratum main switchboards will be supplied from the site main switchboard with 2 hour fire rated supplies if they supply fire essential equipment. It is assumed that there will be 4 separate stratums, namely:

- Retail stratum;
- Hotel Stratum;
- Residential Stratum;
- Site common stratum

The switchboards will be housed in the site main switchroom located adjacent of the substation.

The switchboards will be enclosed assembly type of Form 2 construction and IP42 degree of protection. The switchboards will be floor-mounted, free-standing, front/back connected type.

Instrumentation for Volts, Amps and maximum demand will be provided on the incoming consumers mains as well as major submains. Where required the instrumentation will be interfaced to the building management system for energy reporting (electricity suppliers greater than 120 Amps)

The site main switchboard will be designed to allow for increased consumers mains route length.

2.7 Electricity Retailer Metering

Electricity retailer equipment comprising of whole current and current transformer metering will be provided generally as follows:

- Site Common Stratum (car parking, external lighting etc.);
- Retail Stratum with separate metering for
  - Common area lighting and power and common services
  - Individual retail tenancies located
- Hotel Stratum:
  - Apartments (single meter not individual)
  - "House" services
- Residential Stratum with separate metering for:
  - Common area lighting and power and common services
  - Individual metering to apartments located in corridor common area

The meter panels will be grouped together in locations readily accessible by the retailers.

2.8 Power Factor Correction

Power factor correction equipment will be provided at the main switchboards supplying reactive loads to maintain the power factor at a minimum of 0.95. The equipment will be connected to the busbars of the main switchboard and will incorporate 10 year life capacitors and detuning reactors. Capacitors will be located in a thermally separate compartment to the reactors.

The equipment will be housed within the main switchroom with cable links across to the main switchboard.

2.9 Power Distribution

Submains will be provided to distribute power to major distribution switchboards, final distribution switchboards and control panels for other services (mechanical, lifts, fire, hydraulic). Submains will be XLPE or PVC/PVC copper except when supplying fire essential services loads, which will be the fire rated type.

Submains will be installed on cable trays and arranged in a single path radial format except for typical levels where metered and unmetered rising mains with local tee offs will be used.

Submain capacity and allowance for spare will be as follows:

- Metered and Unmetered lighting and power submains: Maximum Demand to AS 3000 plus 25% spare;
- Commercial/Retail tenancies: 150VA/ m^2 plus 25%
- Mechanical Services: Maximum Demand to AS 3000 plus 25% spare
- Fire services: As required;

- Lift Services Control Panels: As required
- Hydraulic Services Control panels: As required

2.10 Earthing

The installation will be earthed in accordance with the requirements of AS 3000 including protective earth bonding of all cable trays/ducts, equipment, and equipotential bonding to water services incoming mains, lightning protection system earthing etc.

2.11 Distribution Switchboards

Distribution switchboards will be provided to service all areas of the building. The distribution switchboards will be fitted with switchgear, and control and indicating equipment as required (isolators, fault current protection, circuit breakers/RCD's, instrumentation, surge protection, fault current protection, digital power analysers and electricity metering)

The switchboards will be enclosed assembly type of Form 1 construction and generally IP42 degree of protection however a higher IP rating will be utilised if the switchboard is exposed to dust or moisture. The switchboards will be floor or wall mounted type.

Distribution board pole space allowances will typically be as follows:

- Residential/Hotel Room: As required plus 20% spare pole capacity complete with:
  - Main switch
  - Circuit breakers to all final subcircuits
  - RCD protection on all 20 Amp light and power final subcircuits.
  - Emergency Lighting test switches
  - Lighting control equipment
- Common Area Switchboards: As required plus 50% spare pole capacity complete with:
  - Main switch
  - Circuit breakers to all final subcircuits
  - RCD protection on all 20 Amp light and power final subcircuits.
  - Emergency Lighting test switch
  - Lighting control equipment
  - Surge diverter/filter protection if supplying critical equipment
- Retail/Commercial tenancies: To tenant/client requirements

2.12 Artificial Lighting

Lighting will be provided to suit the functional, aesthetic and BCA section J6 energy efficiency requirements. Lighting will generally comprise of the following:

Area	Type
Hotel Rooms	High efficiency luminaires utilising compact or linear fluorescent luminaires
Residential Apartments	High efficiency luminaires to at least bathrooms and laundrys
Corridors	High efficiency luminaires utilising compact or linear fluorescent luminaires connected to programmable lighting control system including motion/daylight sensing.
Main Entrance Lobbies	High efficiency luminaires utilising metal halide or compact/ fluorescent luminaires connected to programmable lighting control system
Retail	To be confirmed – shell provision or tenant requirements
Plant rooms and basement car park	Fluorescent luminaires with prismatic diffusers or wire guards connected to programmable lighting control system
External Lighting	To suit the Architectural/Landscape features. Lighting level will be as uniform as possible and generally comply with AS/NZS 1158. Circuits will be connected to programmable lighting control system
Internally Illuminated Signage	Power supply only connected to lighting control system

2.13 Lighting Control System

A programmable lighting control system utilising perimeter photoelectric cells, occupancy sensors, relay controllers, ballast controllers and dimmers will be provided to control the lighting throughout the building and external areas. Lighting control equipment will be housed in the floor electrical riser cupboards and will be linked together with all other levels to form a lighting control network for the building.

Head end equipment will be located in the building managers office with facilities to programme the system provided on each floor. The system will be interfaced to the building management system via high level interface.

2.14 Power Outlets

Power outlets for general purposes and special purposes will be provided, generally as follows:

- Toilets, lockers, store rooms: As required for specific purposes (hand dryers, hot water units, boiling water unit, urinal flushing devices and 10 Amp outlets (GPO) for general purposes. In toilets double GPO will be provided adjacent to each vanity unit.

- Plant and service areas: As required for specific purposes plus a number of 10 Amp IP rated outlets for general purposes

- Basement Parking areas: 10 Amp IP rated outlets every 20m at high level and as required for specific purposes (e.g. car wash bay)
- Typical Corridor: Double GPO every 12m
- Typical Lift core area: Double GPO's for general purposes and vending machines
- Retail: To be confirmed – shell provision or tenant requirements
- Serviced Apartments: Client room data sheets and specification
- Hotel Service areas (offices, housekeeping rooms etc): Client room data sheets and specification
- Residential Apartments: As agreed with Architect

General purpose outlets will be circuited a maximum of 8 per circuit with RCD protection as required by the Wiring Rules.

2.15 Emergency Evacuation Lighting

Single Point emergency evacuation lighting system comprising of Illuminated exit signs and emergency luminaires will be provided in accordance with BCA and Australian Standard requirements.

The fittings will be dual rate charging system and Nickel Cadmium batteries that provide a 7 year design life.

All base building emergency and exit lights will be monitored by a central monitoring and testing system with the head end control equipment located in the building management office.

Local emergency testing units will be provided at all distribution boards supplying emergency lighting in accordance with AS2293.

2.16 Lightning Protection and Surge Suppressors

A lightning protection in accordance with recommendations contained AS1768 will be provided. The system will utilise the building structure and cladding where possible to avoid additional fixtures and fittings.

Surge diverters will be provided in the main switchboards and incoming telecommunication services, floor tenant distribution boards and distribution switchboards supplying critical equipment.

2.17 ESD Initiatives

The design includes many ESD initiatives, some of which are:

- High efficiency luminaires (light sources, electronic control gear, high light output ratio)
- Programmable intelligent lighting control system utilising photoelectric sensors, occupancy sensors, ballast controls, dimmers and timers
- Light pollution from external lighting is limited by ensuring that no direct beam is directed beyond the site boundaries or upwards without falling directly on a surface with the explicit purpose of illuminating that surface.

3.0 Communications Systems

3.1 Building Main Distribution Frame (MDF)

Main distribution frame (MDF) comprising of KRONE LSA Plus termination modules suitable for terminating Telstra Lead in cables will be provided. The MDF will be will be housed in dedicated room located in the basement.

3.2 Floor Distribution Frames

Floor distributors comprising of KRONE LSA Plus termination modules will be provided to all typical floors, lower ground and basement parking levels. The floor distributors will be housed in a dedicated communications riser or allocated tenancy.

3.3 Backbone cabling

Category 6 and fibre optic backbone cabling will be provided from the Building distributor to each of the floor distribution frames. The cabling will be installed in the dedicated communications risers

A minimum of 100 pairs CAT3 will be provided to each typical office floor distributor and 20 pair to basement level distributors.

3.4 MATV and Pay TV

A dedicated MATV system capable of receiving all free to air commercial channels as well as being able to support future PAY TV services will be provided.

The system will distribute a full range of audio and digital broadcast television signals, FM radio and cable signals which may be available in the local network.

RF/MATV free to air antenna and MATV/CATV Head-end equipment will be provided with backbone cabling distributed down the communications riser. Six way splitters will be provided in the riser for further reticulation to outlets during fitout. Signal levels will be measured at each floor splitter location and shall comply with AS 1367 to provide a minimum level of 80dbm.

The tenant will be required to provide the cables from the splitters to final outlets.

3.5 Background Music System

A background music system covering the hotel lobby and corridors will be provided. Headend equipment comprising of music sources and amplifiers will be housed in a 19 inch cabinet located in the office. The background music system will be interfaced to the fire detection system so it can be isolated in the event of a fire alarm.

4.0 Security System

4.1 Access Control System

A PC based IP addressable access control system will be provided comprising of the following:

- Card readers
- Provision of proximity cards at handover. Numbers required to be confirmed but usually a card is provided for every 10-15m^2 of NLA.
- Electric door locks
- Power supply units
- Reed switches
- Door controllers and input/output panels
- Internal sounders at selected locations
- Movement sensors
- Arming disarming key pads
- Duress alarms at Concierge and security control office
- Direct interface to the main fire control system.
- Direct interface to the car park management system (if provided)
- Direct interface to lift control system
- High level interface to the CCTV DVR system.
- High level interface to the lighting control system
- Facilities to be networked to users or tenants externally via a TCP/IP WAN interface
- Intercom points at car park entry and exit
- An independent separate access management workstation and Photo ID camera that is networked to the main network controller for base building / tenants use shall be located in the Building Manager's office.
- Main head end controller located within the Building Manager's/SecuirtyOffice. The central security system network controller equipment will be a fully functional computer based security system including PC and necessary peripherals, software, specific hardware and interconnecting cabling to local controllers and security system devices generally. The system controller shall offer programmable control, monitoring and event logging by means of a keyboard, mouse, VDU and printer.
- UPS system

Security and Access control to the building will generally be as follows:

- Car park Entry/Exit (roller door, boom gate etc): Card reader and heavy duty reed switch monitoring combined with ticket dispensing machine for general public use.
- Fire Isolated Stair Exit doors: Recessed reed switches and electric locks that automatically unlock n the event of a fire alarm with audio/visual alarm system near the door operated from within the stair -BCA cl D2.22 requirement (conduit provisions will be made for installation of card reader within stairs to allow for inter floor stair access for tenants occupying multiple floor sin the building.
- Main Foyer: Card Reader to enter interfaced to auto door controller with push to exit button. Further discussion required if card reader to exit is also required.
- Lifts: Card reader in lift
- Plant room doors and services riser cupboards: Recessed reed switch minimum with card readers where requested by the client
- Services riser cupboards: Recessed reed switch
- Other ground level doors not indicated above: Recessed reed switches minimum with card readers where requested by the client
- Fire alarm overrides will be provided as required by the BCA

4.2 Intercom Systems

4.3 CCTV Monitoring System

The CCTV Monitoring system will be provided comprising of the following:

- IP addressable cameras in protective housings to suit location at the following locations:
  - Car park entry/exits
  - Loading Dock
  - Throughout car parking levels
  - Hotel reception and lift lobby
  - Lift lobbies to each hotel floor
  - Goods lift
  - Building perimeter and public areas
  - Retail Laneway and Entries
  - All building exits points of the building
- CCTV digital records
- Rack mounted DVMS DVR and monitor with capacity of up to 16 input camera channels and storage capacity of up to 750GB.
- UPS

- The main head end controller and viewing screen will be located at the reception desk.