South Coast Correctional Centre Upgrade

Sketch Design Submission for Electrical Services

Project Reference No: #115577

July 2016

Prepared For:

Guymer Bailey Architects
1/1025 High Street
Armadale VIC 3143

Meinhardt

Level 4, 66 Clarence Street
Sydney NSW, 2000

P. 02 9699 3088 | F.02 9319 7508
www.meinhardtgroup.com

REV	DATE	WRITTEN BY	REVIEWED BY	APPROVED BY
00	26.05.16	JT	RH	MB
00	22.07.16	JT	RH	MB

TABLE OF CONTENTS

1 Electrical Design Philosophy

1.1 General

The existing 600 bed facility is connected to the authority Substations #26939 and #26940; we intend to use these existing connections to supply the new 160 maximum security facility to the south.

The new 200 bed minimum security facility to the north will largely operate independently. We propose new electricity supply connections of 1500kVA pad mounted substation to serve this facility.

1.2 Fundamental design criteria / considerations

Services to be undertaken but not limited to the following systems.

- Liaise with Local Supply Authority new electricity supply connection.
- Liaise with Telstra / NBN Co for lead-in telecommunication services.
- Level 3 designs associated with new pad mounted Substation and alteration of existing HV reticulation to suit new perimeter security wall.
- Alteration and/or new electrical services to suit refurbishment of existing buildings.
- Provide new substation. It is anticipated a 1000kVA Substation is require to serve Stage 2 development.
- Provide new 750kVA diesel standby generator system. In the event of mains power shutdown / blackout, the following systems should have generator backup, eg: life safety services systems, security systems, 50% of general lighting, security lighting.
- Provide underground services conduits and lockable pits.
- Provide power correction units.
- Provide un-interrupted power supply (UPS) as per client brief (if any).
- Provide main switchboard (MSB) and Supply Authority Metering Facility.
- Provide energy meters to meet BCA requirement.
- Provide electrical distribution boards (DBs)
- Provide cables support system such as cables trays, cable ladder system, and catenary wire.
- Provide consumer mains and submain cablings including power supply for hydraulic, mechanical, fire and mechanical control panel
- Provide interior and exterior luminaries.
- Provide emergency lighting and exit signage.
- Provide general switch sockets outlets and special power to serve other services.
- Provide lighting control system.
- Provide Master Antenna Television System.
- Provide Communication system.

1.3 Site Infrastructure / Utility Supply

Stage 1

Liaise and coordinate with Electrical Supply Authority to obtain that the existing 1000kVA pad mounted substation #26939 has spare capacity to serve stages 1 site development. Preliminary calculated electrical maximum demand load base on VA/m2 has indicated an additional load require is in the order of 480kVA to serve new buildings G1, H1, Y, and Z.

Part of this stage also require new underground HV cables to be installed between two existing pad mounted substations to make way for new precast perimeter security fencing including decommission and provision of new pole mounted security lighting. Scope of work to be discussed further in the design phase.

SCCC Pre-Design report status there is an existing main switchboard in the Workshop and is rated at 1,250amps. The MSB has some spare poles and capacity for the proposed development plus this MSB has

generator backup. No single line as-built drawings were available for review and therefore we will investigate this matter further in the design phase.

Stage 2

Liaise with Electrical Supply Authority for new electricity supply connection. Maximum demand computations indicate a power supply requirement of 700kVA will be required for the site and therefore we proposed a new 1000kVA pad mounted substation to be installed at entry to 200 beds facility. An easement for the new pad mounted substation 2.75m x 5.5m is to be established on the site.

A Main Switch Board (MSB) will be located within to Building 01 and the Switchroom to have minimum two hour fire rated compartment. The MSB shall consist of form 3 type switchboard, 50kA with 1500amps busbar rating. The switchboard will be constructed to serve normal, essential and life safety systems. General lighting and power distribution boards including LV distribution systems will be provided to accommodate stage 2 works. Where require or as instructed certain buildings will be provided will generator backup in the event of black out.

A 750kVA Diesel generator back-up unit will be provided and to be located in a dedicated fire rated room next to the Main Switchroom. We proposed generator backup should be provided to serve life safety services, security system, security lighting, including some general lighting and power to certain facilities.

2 Building Specific Electrical Design – Stage 1

2.1 Management – Building G1

2.1.1 Electrical switchboard

Form 1 electrical switchboard up to 100amps/phase will be supplied from the existing infrastructure complete with minimum 36poles DB. The supply will be fed from non-essential power complete with submain cable reticulation via underground services conduit. Essential switchboard will be provided to serve security and life safety system (where required).

2.1.2 Luminaires

LED interior luminaires (vandal proof) are to be controlled via local light switch and exterior luminaires are to be controlled via PE and timeswitch. All luminaire will be provided with anti-ligature fittings in cells similar to existing.

2.1.3 Emergency lighting and exit sign

Emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293. Emergency lighting design criteria shall consists of the following:

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

2.1.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout. All outlets will be terminated back to new electrical equipment. Communications system shall be of type Cat.6 category.

2.2 Industries – Building H1

2.2.1 Electrical switchboard

Form 1 electrical switchboard with 250amps/phase and have minimum 30poles DB. The supply will be fed from non-essential power complete with new submain cables reticulation via underground services conduit.

2.2.2 Luminaires

LED interior luminaires (vandal proof) is to be controlled via local light switch and exterior luminaires is to be controlled via PE and timeswitch. All luminaires will be provided with vandal proof impact.

2.2.3 Emergency lighting and exit sign

Emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293. Emergency lighting design criteria shall consists of the following:

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

2.2.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout. All outlets will be terminated back to new electrical equipment. Communications system shall be of type Cat.6 category

2.3 AVL – Building I

2.3.1 Electrical switchboard

Form 1 electrical switchboard up to 63amps/phase will be supplied from the existing infrastructure complete with minimum 24poles DB. The supply will be fed from non-essential power complete with new submain cables reticulation via underground services conduit.

2.3.2 Luminaires

LED interior luminaires (vandal proof) is to be controlled via local light switch and exterior luminaires is to be controlled via PE and timeswitch. All luminaires will be provided with vandal proof impact.

2.3.3 Emergency lighting and exit sign

An emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293. Emergency lighting design criteria shall consists of the following:

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

2.3.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout. All outlets will be terminated back to new electrical equipment. Communications system shall be of type Cat.6 category

2.4 Visits Expansion – Building N1

2.4.1 Electrical switchboard

Alteration of existing electrical switchboard and provide additional earth leakage circuit breakers protection.

2.4.2 Luminaires

LED interior luminaires (vandal proof) will be provided to suit floor plan and match existing specification. Light fittings to be controlled via local light switch.

2.4.3 Emergency lighting and exit sign

An emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293.

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Connect emergency luminaires to existing testing facilities.

2.4.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout and connect to existing headend equipment.

2.5 Reception Alterations – Building N2

2.5.1 Electrical switchboard

Alteration of existing electrical switchboard and provide additional earth leakage circuit breakers protection.

2.5.2 Luminaires

LED interior luminaires (vandal proof) will be provided to suit floor plan and anti-ligature type fittings to be used in holding rooms. Light fittings to be controlled via local light switch.

2.5.3 Emergency lighting and exit sign

An emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293. Emergency lighting design criteria shall consists of the following:

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

2.5.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout and connect to existing headend equipment.

2.6 Clinic Expansion – Building N3

2.6.1 Electrical switchboard

Alteration of existing electrical switchboard and provide additional earth leakage circuit breakers protection.

2.6.2 Luminaires

LED interior luminaires (vandal proof) will be provided to suit floor plan and observation cells to be fitted out similar to existing with anti-ligature fittings. Light fittings to be controlled via local light switch.

2.6.3 Emergency lighting and exit sign

An emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293.

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

2.6.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout and connect to existing headend equipment. If required medical room will be provided body protected and cardiac to Australian Standard.

2.7 Maximum Security Accommodation – Building Y

2.7.1 Electrical switchboard

Multiple Form 1 electrical switchboards up to 100amps/phase per DB will be supplied from the existing infrastructure. The supply will be fed from non-essential power complete with new submain cables reticulation via underground services conduit. Essential switchboard will be provided to serve security and lift safety system.

2.7.2 Luminaires

LED interior luminaires (vandal proof) is to be controlled via local light switch and exterior luminaires is to be controlled via PE and timeswitch. All luminaires will be provided with vandal proof impact.

2.7.3 Emergency lighting and exit sign

An emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293. Emergency lighting design criteria shall consists of the following:

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

2.7.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout. All outlets will be terminated back to new electrical equipment. Communications system shall be of type Cat.6 category

2.8 Satellite Clinic & Programs Security – Building Z

2.8.1 Electrical switchboard

Form 1 electrical switchboard up to 63amps/phase will be supplied from the existing infrastructure. The supply will be fed from non-essential power complete with new submain cables reticulation via underground services conduit. Essential switchboard will be provided to serve security and life safety system.

2.8.2 Luminaires

LED interior luminaires (vandal proof) is to be controlled via local light switch and exterior luminaires is to be controlled via PE and timeswitch. All luminaires will be provided to suit.

2.8.3 Emergency lighting and exit sign

An emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293.

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

2.8.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout and connect to existing electrical headed equipment. If required medical room will be provided body protected and cardiac to Australian Standard.

3 Building Specific Electrical Design – Stage 2

3.1 Minimum Security Entry & Visits Electrical Design – Building O1

3.1.1 Electrical switchboard

Form 1 electrical switchboard up to 100amps/phase complete with minimum 42 poles DB and LV distribution will be supplied from new MSB. Essential and non-essential power will be provided. The following essential power should be provided to serve security system and security lighting, life safety system, 50% of general lighting and power.

3.1.2 Luminaires

LED interior luminaires (vandal proof) is to be controlled via local light switch and exterior luminaires is to be controlled via PE and timeswitch.

3.1.3 Emergency lighting and exit sign

An emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293. Emergency lighting design criteria shall consists of the following:

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

3.1.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout. All outlets will be terminated back to new electrical equipment. Communications system shall be of type Cat.6 category.

3.2 Minimum Security Programs Electrical Design Building O3

3.2.1 Electrical switchboard

Form 1 electrical switchboard up to 100amps/phase complete with minimum 42 poles DB and LV distribution will be supplied from new MSB. Essential and non-essential power will be provided. The following essential power should be provided to serve security system and security lighting, life safety system, 50% of general lighting and power.

3.2.2 Luminaires

LED interior luminaires (vandal proof) is to be controlled via local light switch and exterior luminaires is to be controlled via PE and timeswitch.

3.2.3 Emergency lighting and exit sign

An emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293. Emergency lighting design criteria shall consists of the following:

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

3.2.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout. All outlets will be terminated back to new electrical equipment. Communications system shall be of type Cat.6 category. If required medical room will be provided body protected and cardiac to Australian Standard.

3.3 Minimum Security Electrical Design – Building O4

3.3.1 Electrical switchboard

Form 1 electrical switchboard with 250amps/phase and 30poles DB will be provided. LV distribution will be supplied from new MSB. Non-essential power will be provided.

3.3.2 Luminaires

LED interior luminaires (vandal proof) is to be controlled via local light switch and exterior luminaires is to be controlled via PE and timeswitch.

3.3.3 Emergency lighting and exit sign

An emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293. Emergency lighting design criteria shall consists of the following:

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

3.3.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout. All outlets will be terminated back to new electrical equipment. Communications system shall be of type Cat.6 category.

3.4 Minimum Security Accommodation Electrical Design – Buildings O5 & O8

3.4.1 Electrical switchboard

Multiple Form 1 electrical switchboards up to 100amps/phase per DB will be provided complete with LV distribution fed from new MSB. The supply will be fed from essential and non-essential power.

3.4.2 Luminaires

LED interior luminaires (vandal proof) is to be controlled via local light switch and exterior luminaires is to be controlled via PE and timeswitch.

3.4.3 Emergency lighting and exit sign

An emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293. Emergency lighting design criteria shall consists of the following:

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

3.4.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout. All outlets will be terminated back to new electrical equipment. Communications system shall be of type Cat.6 category.

3.5 Carpark Electrical Design

3.5.1 Electrical switchboard

LV distribution will be fed from the nearest switchboard.

3.5.2 Luminaires

Carpark LED luminaires (vandal proof) is to be controlled by existing PLC system.

3.6 Staff Amenities Electrical Design – Building R

3.6.1 Electrical switchboard

Form 1 electrical switchboard up to 100amps/phase complete with 42 poles and LV distribution will be provided and to be fed from new MSB. Non-essential power will provided.

3.6.2 Luminaires

LED interior luminaires (vandal proof) is to be controlled via local light switch and exterior luminaires is to be controlled via PE and timeswitch.

3.6.3 Emergency lighting and exit sign

An emergency lighting system design shall be undertaken for all areas as defined under the design codes and standards applicable, namely the BCA and AS 2293. Emergency lighting design criteria shall consists of the following:

- Long life, low energy, low maintenance, self-contained system
- High performance LED lamps
- Testing facilities installed at distribution boards

3.6.4 Power and communication

Switch socket and permanent power to be incorporated to suit floor layout. All outlets will be terminated back to new electrical equipment. Communications system shall be of type Cat.6 category.

3.7 Medium Security Accommodation Electrical Design – Buildings W1, W2

3.7.1 Electrical switchboard

Alteration of existing switchboard and provided new earth leakage circuit breaker protection.

3.7.2 Luminaires

Existing services to remain except for where disturbed by the architectural works.

3.7.3 Emergency lighting and exit sign

Existing services to remain except for where disturbed by the architectural works.

3.7.4 Power and communication

Existing services to remain except for where disturbed by the architectural works.

3.8 Med Security Accommodation Electrical Design – Buildings M1, M2, M3 & M4.

3.8.1 Electrical switchboard

Alteration of existing switchboard and provided new earth leakage circuit breaker protection.

3.8.2 Luminaires

Existing services to remain except for where disturbed by the architectural works.

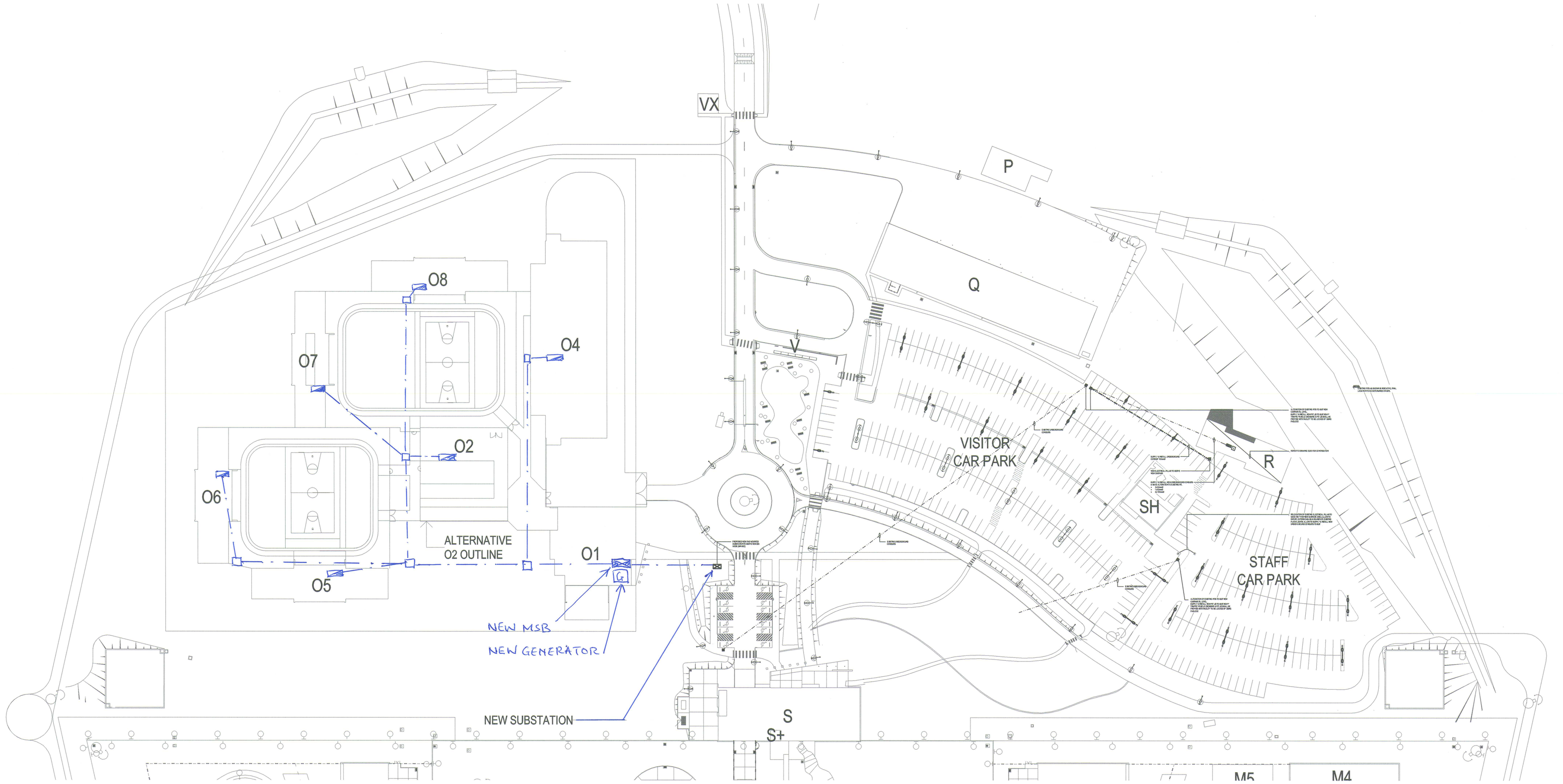
3.8.3 Emergency lighting and exit sign

Existing services to remain except for where disturbed by the architectural works.

3.8.4 Power and communication

Existing services to remain except for where disturbed by the architectural works.

NEW SUBSTATION
S
S+
W+
W
W2
W1
N3+
N3
N2
N2+
N2+
N1
N1+
N1+
M
M+
M5
M4
M3
M1
M2
I
L
ILC
X
H
H1
ALTERNATIVE
H1 OUTLINE
J
K
E
F
G1
G
D
A
C
B
Z
T
Y1
Y2
SUBSTATION 2


VX
P
Q
V
VISITOR
CAR PARK
R
SH
STAFF
CAR PARK
O8
O4
O7
O2
O6
O5
ALTERNATIVE
O2 OUTLET
O1
G
NEW MSB
NEW GENERATOR
NEW SUBSTATION
S
S+
M5
M4