South Coast Correctional Centre Upgrade

Sketch Design Submission for Fire Services

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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

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1 Fire Design Philosophy

1.1 General

The fire protection systems for the new complexes and expansions of existing buildings will generally follow the existing fire strategy and will protected by hydrants and fire alarm system. Fire Extinguishers will be located in conspicuous location as deemed necessary.

1.2 Fire hydrant

The site has an existing hydrant system complete with a booster located at the entrance of the site.

From a preliminary assessment the system appear compliant and capable of further expansion. Commissioning data and latest testing results will be necessary to complete the assessment.

According to the block Plan on site the hydrant system is designed to achieve the following duty point:

- Flow: 20 L/s
- Pressure: 150 kPa

Based on the above data we assume that the hydrant system was designed and certified as a “feed hydrant system”. In such case the Fire Brigades will need access to the on-site hydrants and use their pump appliance to achieve the required pressure.

The existing hydrant ring main will be expanded to supply new required external hydrants. When necessary internal hydrants will integrate the system to achieve full compliance with the reference standard AS 2419.1-2005.

1.3 Fire alarm system

Each new building will be equipped with a fire detection and occupant warning system. We will use existing infrastructures (Panels, networks and sub-panels) for building subject to expansion and some new building in proximity of existing panels. The current fire alarm network will expanded with new nodes (i.e. new fire panels) to cater for new buildings or complex of buildings.

The fire detection design will be compliant to AS 1670.1 – 2015 and integrated with existing fire detection system. Aspirating smoke detection (type Vesda) will be used for large areas or inmate cells. Point type smoke detection will be used along normal occupied spaces and circulation spaces.

Each new major building will be equipped with a sub-Fire panel that will monitor local detectors. Aspirating smoke detectors main units will be networked and communicate with the main FIP.

Where possible a high level interface network will be proposed between the new sub-panel and Vesda Units.

Occupant warning consisting of sounders, speakers and visual warning devices (i.e. strobes) will be used to alert management and occupants of a fire alarm emergency.

In line with current strategy visual warning for each building and sub-panel will be proposed.

2 Building Specific Fire Design – Stage 1

2.1 Management Fire Design – Building G1

2.1.1 Fire hydrant system (Building G1)

The hydrant ring main is shown on the “as built” drawings to run adjacent to the proposed location of building G1. The nearest external hydrant protecting building G does not appear sufficient to cover new building G1 and a new branch will be taken off the existing ring to provide a hydrant in proximity of the building.

2.1.2 Fire detection system (Building G1)

The building will be protected by point type smoke detectors along circulation space and offices. Aspirating smoke detectors sampling point at the return air ducting or single sampling point for each cell will be proposed.

A preliminary assessment based on the as built drawings indicates that sufficient capacity is available on the fire detection loop serving building G. Based on such estimate the existing detection loop will be extended to the new building G1. The aspirating smoke detection (i.e. Vesda) network will also be extended to the new building to interface the new Vesda units.

2.2 Industries Fire Design – Building H1

2.2.1 Fire hydrant system (Building H1)

A branch from the hydrant ring main is terminating at a hydrant on the south side of building H. The current location of the existing hydrant is in proximity to North West corner of the proposed building H1. The existing external hydrant is intended to protect existing building H. It is likely that the existing hydrant branch will be extended to provide hydrant coverage to building H1.

2.2.2 Fire detection system (Building H1)

The building will be protected by point type detectors along circulation space and offices. Aspirating smoke detectors pipework will be installed in the open areas of the building.

The as built drawings available show that the fire detection loop serving the building H is taken from the Sub-FIP 3 located in building J and it only has a 30% spare capacity. It will be necessary to run a new fire loop from the Sub-FIP 3 in building J to connect devices in the new building H1.

2.3 AVL Fire Design – Building I

2.3.1 Fire hydrant system (Building I)

The hydrant ring main as shown on the “as built” drawings runs in proximity of the proposed location of building I (AVL). There are no existing hydrants in proximity and it will be necessary to branch off from the existing ring main. New work will involve excavation and provision of a new branch to provide a new hydrant in proximity of the building I.

2.3.2 Fire detection system (Building I)

The building will be protected by point type smoke detectors along circulation space and offices. Aspirating smoke detectors will be proposed for specific areas within the building.
The new fire detection loop will be powered from building J (i.e. Sub-FIP 3) that is the nearest interface panel. A new fire loop and VESDA network connection to the new building will be necessary.

2.4 Visits Expansion Fire Design – Building N1

2.4.1 Fire hydrant system (Building N1)

The “as built” drawings reviewed show the presence of two external hydrants located on the North side of the existing building N1. It is likely that the position and coverage of the existing hydrants will be compliant and sufficient to protect the new building extension N1.

2.4.2 Fire detection system (Building N1)

The building will be protected by point type smoke detectors along circulation space and offices following the design strategy adopted for building N1. It is recommended to upgrade the current “Intersystem Termination Point Panel” (ISTP) located in building N1 to become a sub fire panel to cater for the additional fire and audio devices necessary for the expansion.

2.5 Reception Alterations Fire Design – Building N2

2.5.1 Fire hydrant system (Building N2)

The “as built” drawings reviewed show the presence of two external hydrants located on the North side of the existing building N2. It is likely that the position and coverage of the existing hydrants will be compliant and sufficient to protect the new building extension N2.

2.5.2 Fire detection system (Building N2)

The building will be protected by point type smoke detectors along circulation space and offices following the design strategy adopted for building N2. Aspirating smoke detection will be provided for holding rooms and other sensitive areas. The existing intersystem termination panel will be upgraded with additional fire detection loop to cater for the additional devices.

2.6 Clinic Expansion Fire Design – Building N3

2.6.1 Fire hydrant system (Building N3)

The “as built” drawings reviewed show the presence of two external hydrants located on the West side of the existing building N3. It is likely that the position and coverage of the existing hydrants will be compliant and sufficient to protect the new building extension N2.

2.6.2 Fire detection system (Building N3)

The building will be protected by point type smoke detectors along circulation space and offices following the design strategy adopted for building N3. Sensitive areas (holding room) will be protected by aspirating smoke detectors (VESDA). The current loops will be expanded to provide coverage to the new areas subject of expansion.

2.7 Maximum Security Accommodation Fire Design – Building Y

2.7.1 Fire hydrant system (Building Y)

The “as built” drawings reviewed show a branch off the ring main running in proximity of new building Y. The branch will be extended to create a new sub-ring. The new sub-main ring will go around the new building Y and join the main ring along the east side of the new proposed building Z. the work will involve branching off the existing nearest branch and underground pipework around the new complex Y.

2.7.2 Fire detection system (Building Y)

The building will be protected by point type smoke detectors along circulation space and offices. Aspirating smoke detectors sampling point at the return air ducting or single sampling point for each cell will be proposed.

A new sub-panel will be proposed for the new complex Y to power the local detectors and monitor Vesda units. The new sub-panel will be networked to the main panel. The occupant warning system will includes speakers, horns and visual alarms internally and externally to the complex in line with current strategy.

2.8 Satellite Clinic & Programs Security Fire Design – Building Z

2.8.1 Fire hydrant system (Building Z)

The “as built” drawings reviewed show the presence of two external hydrants located on the North and east side of the proposed new building Z. It is likely that the position and coverage of the existing hydrants will be compliant and sufficient to protect the new building Z.

2.8.2 Fire detection system (Building Z)

The building will be protected by point type smoke detectors along circulation space and offices following the design strategy adopted in the complex. A new interface panel will be provided to cater for the facility and linked to the new sub-panel proposed for building Y.

3 Building Specific – Stage 2

3.1 Minimum Security Entry & Visits Fire Design – Building O1

3.1.1 Fire hydrant system (Building 01)

The “as built” drawings reviewed show a main supply (150 DN) running underground in proximity of the roundabout on the east side of the new complex. The branch will be extended to create a new sub-ring to cover for all the new proposed buildings. The new sub-main ring will go around the new complex to supply new external hydrants in conspicuous location. The work will involve branching off the existing nearest hydrant main and underground pipework around the new complex buildings O1 to O8.

3.1.2 Fire detection system (Building 01)

The new building will be protected by point type smoke detectors along circulation space and offices.

A new sub-panel will be proposed to be installed in this building and cover buildings No.1 to building No.4 of the new complex to power the detectors and monitor Vesda units. The new sub-panel will be networked to the main panel. The occupant warning system will includes speakers, horns and visual alarms internally and externally to the complex in line with current strategy.

3.2 Minimum Security Clinic and AVL Fire Design - Building O2

3.2.1 Fire hydrant system (Building O2)

The building will be protected by external hydrants part of the new sub-main ring proposed for the new minimum security complex.

3.2.2 Fire detection system (Building O2)

The new building will be protected by point type smoke detectors along circulation space and offices and linked to the main sub-FIP of the new complex in building 01.

3.3 Minimum Security Programs Fire Design - Building O3

3.3.1 Fire hydrant system (Building O3)

The building will be protected by external hydrants part of the new sub-main ring proposed for the new minimum security complex.

3.3.2 Fire detection system (Building O3)

The new building will be protected by point type smoke detectors along circulation space and offices and linked to the main sub-FIP of the new complex in building O1.

3.4 Minimum Security Industries Fire Design – Building O4

3.4.1 Fire hydrant system (Building O4)

The building will be protected by external hydrants part of the new sub-main ring proposed for the new minimum security complex.

3.4.2 Fire detection system (Building O4)

The new building will be protected by point type smoke detectors along circulation space and offices and linked to the main sub-FIP of the new complex in building O1.

3.5 New Minimum Security Accommodation Fire Design – Buildings O5 to O8

3.5.1 Fire hydrant system (Buildings O5 to O8)

The buildings will be protected by external hydrants part of the new sub-main ring proposed for the new minimum security complex.

3.5.2 Fire detection system (Buildings O5 to O8)

The new building will be protected by point type smoke detectors along circulation space and offices. Aspirating smoke detectors sampling point at the return air ducting or single sampling point for each cell will be proposed.

A new sub-panel will be proposed for the new buildings to power the local detectors and monitor Vesda units. The new sub-panel will be networked to the main panel. The occupant warning system will includes speakers, horns and visual alarms internally and externally to the complex in line with current strategy.

A new sub-panel will be proposed to be installed in building No.05 and cover buildings No.5 to building No.8 of the new complex to power the detectors and monitor Vesda units. The new sub-panel will be networked to the main panel. The occupant warning system will includes speakers, horns and visual alarms internally and externally to the complex in line with current strategy.

3.6 Staff Amenities Fire Design – Building R

3.6.1 Fire hydrant system (Building R)

The existing hydrant serving building Q will be extended to supply additional external hydrants in conspicuous location around the carpark and new surrounding amenities. The work will involve branching off the existing nearest hydrant branch and underground pipework around the new complex building.

3.6.2 Fire detection system (Building R)

The new building will be protected by point type smoke detectors along circulation space and offices. A new interface panel could be necessary unless the interface panel in building Q has sufficient spare capability to power the new fire alarm in building R.

3.7 Medium Security Accommodation - Fire Design – Buildings M1 to M4 and M+

3.7.1 Fire hydrant system (Building M1 to M4)

The existing hydrant serving the buildings will be assessed for compliance and capability to provide full coverage to the buildings. Due to the limited areas of expansion no work is expected.

3.7.2 Fire detection system (Building M1 to M4)

The existing fire alarm will be utilized for the planned refurbishment works. Most work will be limited to the removal and reinstatement of equipment.

3.7.3 Fire hydrant system (Building M+)

The nearest existing hydrant serving the building W will be assessed for compliance and capability to provide full coverage to the extended building. Due to the limited areas of expansion no work is expected.

3.7.4 Fire detection system (Building M+)

The new area will be protected by point type smoke detectors. The existing fire loop will be expanded to provide coverage to the new area subject of expansion.

3.8 Medium Security Accommodation Fire Design – Buildings W1, W2, W3 and W+

3.8.1 Fire hydrant system (Buildings W1 to W3)

The existing hydrant serving the buildings will be assessed for compliance and capability to provide full coverage to the buildings. Due to the limited areas of expansion no work is expected.

3.8.2 Fire detection system (Buildings W1 to W3)

The existing fire alarm will be utilized for the planned refurbishment works. Most work will be limited to the removal and reinstatement of equipment.

3.8.3 Fire hydrant system (Building W+)

The nearest existing hydrant serving the building W will be assessed for compliance and capability to provide full coverage to the extended building. Due to the limited areas of expansion no work is expected.

3.8.4 Fire detection system (Building W+)

The new area will be protected by point type smoke detectors. The existing fire loop will be expanded to provide coverage to the new area subject of expansion.

3.9 Recreation Officers Post Fire Design – Building K1

3.9.1 Fire hydrant system (Building W+)

The building will be protected by external hydrants part of the new sub-main ring proposed for the new maximum security complex Y.

3.9.2 Fire detection system (Building O4)

The new building will be protected by point type smoke detectors along circulation space and offices and linked to the new sub-FIP proposed for the new complex Y.

FIRE DESIGN CONCEPT SKETCH - 21.07.2016

EXISTING FIRE HYDRANT BOOSTER
VX
P
Q
Ex
Ex FH
N FH
V
100ø
150ø
VISITOR CAR PARK
SH
R
STAFF CAR PARK
O8
ISTP
O4
O7
O2
O6
O5
ALTERNATIVE O2 OUTLINE
O1
NEW S-FIP
MAIN FIP EX
S
S+
NEW SUBSTATION
W+
W
S-FIP 1 EX
W2
W1
N3+
N3
N2
N2+
N1
N1+
ILC
I
L
M
M+
S-FIP 2 EX
M5
M4
M3
M1
M2
X
H
J
S-FIP 3 EX
E
F
G1
G
H1
ALTERNATIVE H1 OUTLINE
K
D
A
C
B
Z
Y1
Y2
NEW S-FIP
NEW ISTP
NEW FH
T
S-FIP 4 EX
SUBSTATION 2