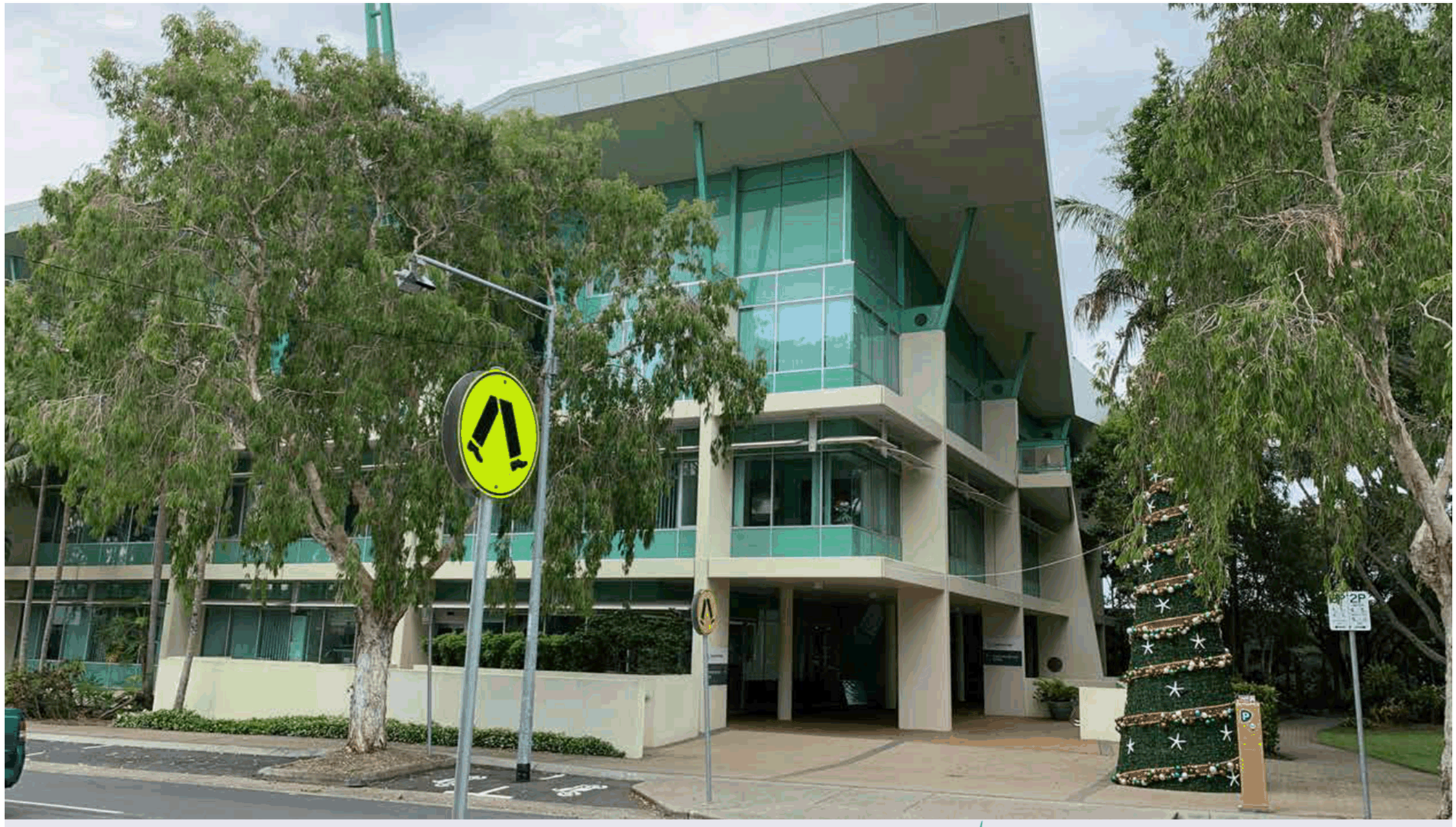


Caloundra Administration Building Repurposing Project

Q1939 STAGE 3 - Due Diligence Report

DATE 25th February 2021 Issue A

Sunshine Coast COUNCIL

WilsonArchitects

Contents

Introduction

Wilson Architects and associated Consultant Team were appointed in December 2019 to provide a Preliminary Design for the proposed re-purposing of the Caloundra Administration Building (CAB). The project involves the conversion of an existing Class 5 Office Building constructed in 1994 into a modern library and community facility, Customer Service Centre and Council Administration Offices (Class 9b Public building with Class 5 Office).

This report is to examine the existing building and report on the constraints and design opportunities involved in re-purposing the building. This report should be read in conjunction with the CAB RP Preliminary Design Report.

Document Search

In addition to the drawings provided by Sunshine Coast Council, Wilson Architects have sourced additional existing electrical and hydraulic drawings from SPP Group and Wiley. The current set of existing drawings are included in Appendix 1.

We note advice from SCC that there is no known Asbestos Register for the building.

executive summary

The re-purposing of the existing Caloundra Administration Building is considered feasible.

In order to satisfy the current National Building Code NCC 2019 there are some required works. Other works are recommended in order to improve the performance of the building.

Building Certification

The existing building is reasonably capable of being brought up to meet the National Building Code NCC 2019 with required alterations to the existing building and Alternative Solutions where necessary.

Refer to the Building Certification Report for more detail.

Structural Engineering

The existing building is required to be strengthened to support proposed increased loading requirements of a Library on all three floors. The strengthening work above is reasonably able to be carried out and will not compromise the use of the building as a Library and will not unduly prevent the use of the Basement as a car park.

The existing building has sufficient capacity to accommodate earthquake loading when assessed against the requirements of AS3826 (Strengthening of Existing Buildings for Earthquake), whilst taking in to account the loading requirements of AS1170.4 R2018 with an Importance Level of 2.

The existing building is not reasonably capable of being strengthened to resist a catastrophic event. SCC have confirmed that use as a Disaster Recovery Centre is not required of the building as this function is provided at other locations such as Nambour and Maroochydore. Instead the building might be used as a space to manage a disaster if such an event was to occur elsewhere.

Civil Engineering Flood assessment

The Basement carpark is below the Flood Hazard Level (FHL). We do not recommend the basement be used for any other purpose.

The Basement contains the Pump Room, housing the Hydrant Pump and Sprinkler valves. These are to be relocated to Level 1 above the FHL.

Level 1 including the Building Substation and Main Switchboard are above the Flood Hazard Level.

Mechanical Engineering

The mechanical systems have reached the end of economic life. It is recommended that the existing Mechanical conditioning systems be replaced to improve the energy efficiency of the building.

It is a requirement to modify the existing ventilation system to the basement to suit the proposed structural strengthening works.

A smoke exhaust system is required to be provided. It is proposed to replace the existing smoke exhaust system in the building.

Electrical Engineering

It is a requirement that the building infrastructure electrical systems be replaced in the proposed refurbishment of the building. This includes the Energex Transformer located in the building substation and the Main Switchboard. For more information refer to the Electrical Services Report.

It is a requirement that new Communications risers are constructed in the building.

It is recommended that general building electrical fitout works be replaced in the proposed refurbishment of the building for energy efficient fixtures.

Hydraulic Engineering

It is proposed to demolish and replace existing sanitary facilities in order to provide compliant accessible facilities and to improve the floor planning.

The existing building hydrants have been tested recently and passed.

The fire hydrants are required to be relocated into the fire stairs. It is recommended to replace the copper hydrant pipework with medium duty galvanised pipework. The hydrant pumps are to be relocated to Level 1.

It is proposed to retain existing stormwater systems with some modifications.

Sprinkler assessment

It is proposed to provide sprinkler protection to Level 1 ,2 and 3 and to replace the sprinklers to the Basement to enable 3 floors to be connected and to improve the fire safety of the building.

The existing street hydrant system has been tested and has been assessed as having sufficient flow to support sprinkler protection to the whole building.

Lift

It is a requirement to replace the existing Lift to comply with NCC 2019. The recommended Lift is a Schindler type with a typical car size of 1600mm wide x 2000mm deep and accommodates 21 persons.

It is also proposed to remove the internal fire stairs and install a second lift within the existing shaft. The second lift will also be a Schindler type, size to match above.

Sustainability

It is a requirement to replace certain building elements in order to comply with the Energy Efficiency requirements of NCC 2019 including:

- glazing envelope to exterior of building
- additional insulation to roof and basement carpark.

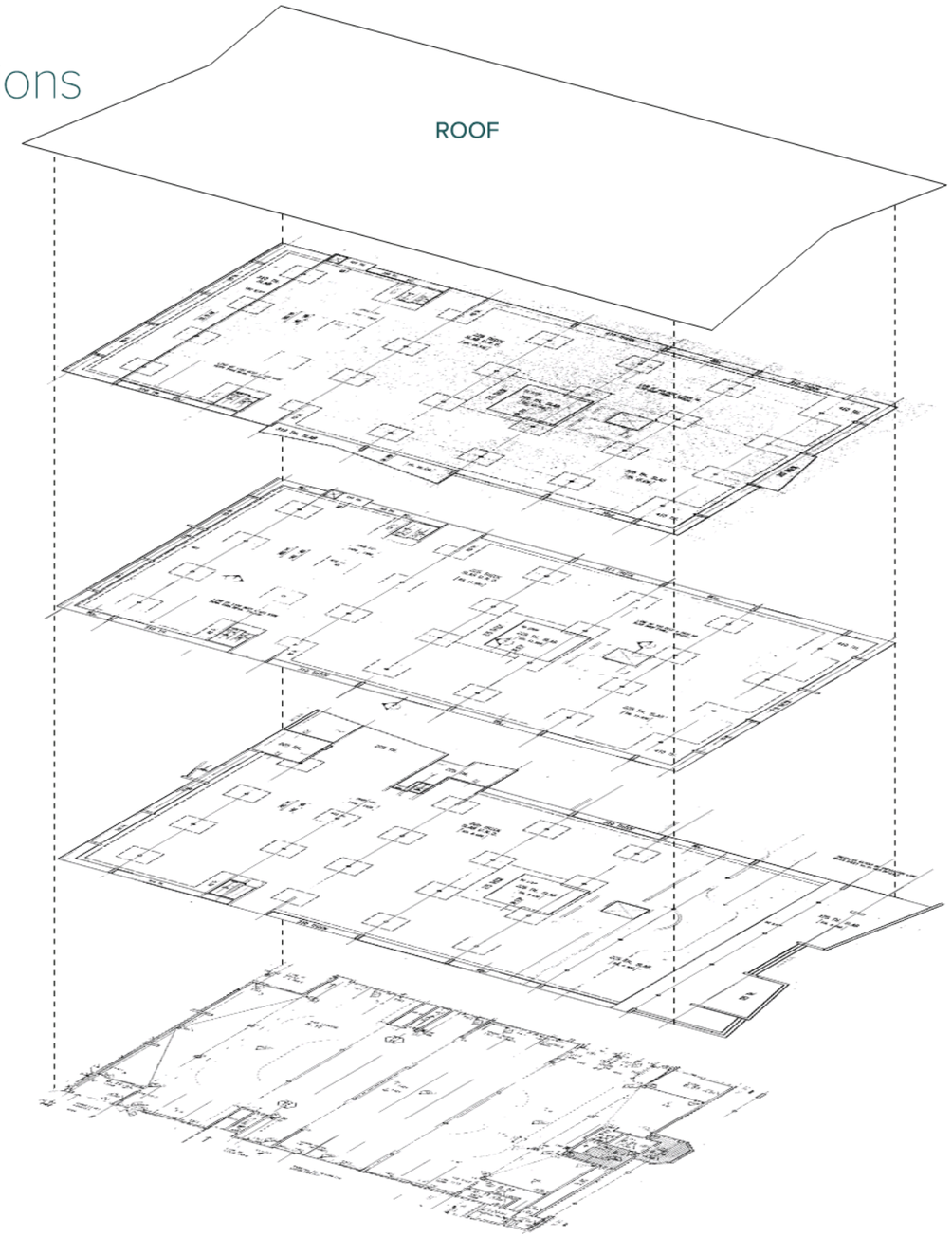
Greenstar

It is recommended to undertake the process to achieve a 5 star Green Star rating for the building refurbishment.

Architectural Implications of Investigations

Below is a list of associated architectural works required as a result of the site investigation. This does not include additional works that will arise as the Concept design progresses to incorporate Library, SCC Customer Service and Community Facilities.

- New external facade to comply with Section J, NCC 2019
- New tiling and balustrades to stairs to comply with NCC 2019.
- New amenities to levels 1, 2 and 3
- New insulation to roof, soffit of basement
- Upgrade of transformer room to allow new MSB to be located within space
- Relocate hydrant pump to Level 1
- Provide new external pad mount location for transformer
- New communications room to levels 1, 2 and 3
- New communications risers to levels 1, 2 and 3
- New data room to level 3



Building Certification Report

Attached is an assessment of the building certification implications of refurbishing the existing building to meet current standards. This review indicates that the building is reasonably able to be converted. Refer to the Preliminary Design Report for the Building Certification Concept Design Report for Design resolutions to the issues raised.

Notable issues include:

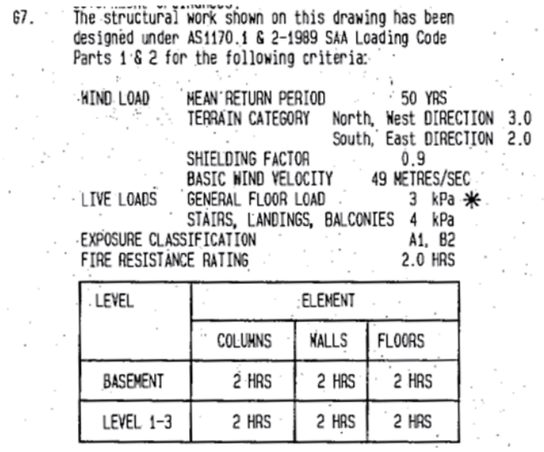
Item 2 - Structural capacity of the existing building and the current earthquake loading requirements of BCA 2019 for new buildings.

The Structural Engineer assigns a Building Importance Level as part of their assessment under AS 3826 Strengthening Existing Buildings for Earthquake. The CAB was given an Importance Level of 2. SCC have reviewed the decision and concur with a Building Importance Level of 2.

Item 5 - Fire Resistance Levels. Original structural drawings nominate a 2hr fire resistance. However Certification requires assessment against the current fire resistance levels in the BCA 2019 requiring Structural Engineering advice and certification. This will involve a process of destructive testing in strategic locations to confirm reinforcement steel, cover and slab thicknesses match the existing drawings. We recommend that this be carried out during a later stage once the proposed design has been approved.

Item 11 - Stairwells will need to be re-tiled and provided with new balustrades to resolve the inconsistencies in the risers and goings.

Item 13 -Access for People with Disabilities. The main issues of concern includes compliant access to existing sanitary facilities as the existing corridor is too narrow. It is proposed to demolish and build new amenities that will comply with accessibility requirements.



G7. The structural work shown on this drawing has been designed under AS1170.1 & 2-1989 SAA Loading Code Parts 1 & 2 for the following criteria:

WIND LOAD	MEAN RETURN PERIOD		50 YRS
	TERRAIN CATEGORY	North, West DIRECTION	3.0
		South, East DIRECTION	2.0
	SHIELDING FACTOR		0.9
	BASIC WIND VELOCITY		49 METRES/SEC
LIVE LOADS	GENERAL FLOOR LOAD		3 kPa *
	STAIRS, LANDINGS, BALCONIES		4 kPa
EXPOSURE CLASSIFICATION			A1, B2
FIRE RESISTANCE RATING			2.0 HRS

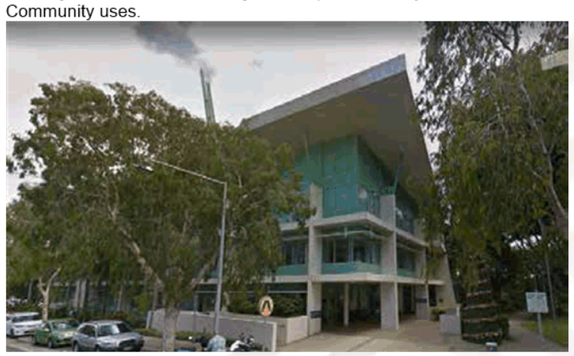
LEVEL	ELEMENT		
	COLUMNS	WALLS	FLOORS
BASEMENT	2 HRS	2 HRS	2 HRS
LEVEL 1-3	2 HRS	2 HRS	2 HRS

Excerpt from Drawing 28039-S2 Issue H identifying 2 hour fire rating of structural elements.

BUILDING CERTIFIERS AUSTRALIA

BUILDING CERTIFICATION REV A
STAGE 2A - PRELIMINARY DESIGN REPORT
PROPOSED CHANGE OF CLASSIFICATION AND MAJOR REFURBISHMENT

Date:	9 September 2020
Our File Reference No:	20190264
Client:	Wilson Architects Att: Phillip Lukin 564 Boundary Street SPRING HILL QLD 4000
Site Address:	1 Omrah Avenue CALOUNDRA QLD 4551
Property Description:	RPD: L1,27 RP159516 & L2 RP69517 & L22 RP883293
Development Proposal:	Proposed Change of Classification and Major Refurbishment of the Existing Administration Building to a Proposed Library Use and other Community uses.
Local Government Area:	Sunshine Coast Regional Council
Referral Agencies:	Queensland Fire & Emergency Service (QFES)
Building Certifier:	Name: David Mansell Accreditation #: A1026006 Signature: Signed for and on behalf of Building Certifiers Australia Pty Ltd Date: 9 September 2020



SUNSHINE COAST OFFICE
Suite 1, 23 Queen of Colonies Parade, Moffat Beach QLD, 4551
PO Box 911, Caloundra QLD, 4551
Phone: 07 5491 4066
Email: info@buildingcertifiersaustralia.com

OTHER OFFICES – BRISBANE

www.buildingcertifiersaustralia.com
ABN 83 832 469 268

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BCA High Level BCA Compliance Items

Structural

1. The structural engineer has advised that the existing building does not comply with the current structural requirements of the Building Code of Australia 2019 (BCA). The Structural Engineer has raised concerns that the building has not been designed or built to comply with the required floor loadings applicable to the existing use (class 5 office) nor for the proposed use of a class 9b library. It is understood that structural upgrade works are proposed via a series of steel beams and columns. The beams and columns will require fire resistance levels in accordance with BCA specification C1.1, or alternatively a Fire Engineered solution can be explored. Sprinkler protecting the building throughout will assist a fire engineered solution that seeks to reduce the fire resistance levels to less than that required by BCA Specification C1.1.

2. The structural engineer has raised concerns regarding the difficultly to alter the existing structure to comply with the current earthquake loading requirements of BCA 2019. If the Structural Engineer is satisfied that the building will be made '*structural sound*', we're of the opinion that the Building Act allows for the Structural Engineer's proposal which we understand is to ensure that the existing structure will have sufficient capacity to accommodate earthquake loading when assessed against the requirements of AS3826, whilst taking in to account the loading requirements of AS1170.4 R2018.

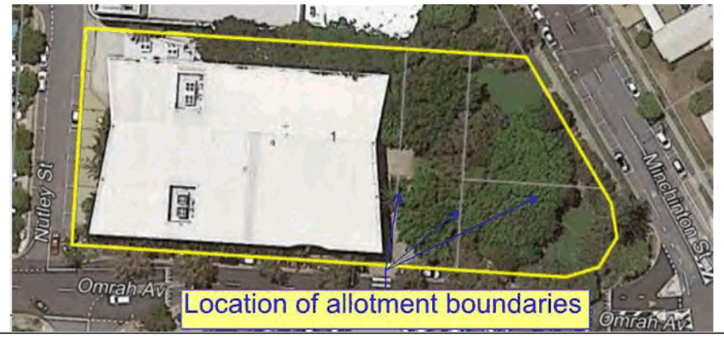
   'Structurally sound' is the term used by Section 80 of the Building Act.
   http://classic.austlii.edu.au/au/legis/qld/consol_act/ba197591/s80.html

   There are other provisions in the Act (such as S110 & S111) that trigger a Building Certifier to have regard to the current building assessment provisions (current BCA) for a change of classification, however in this instance we're of the opinion that the Structural Engineer's proposal is acceptable.

   As this is a discretionary public safety matter, it would be appropriate to refer this discretionary decision to the Council (particularly Ben Wallis and the relevant assigned Council Building Officer) for their concurrence of this decision.

Fire Resistance Levels

3. The existing Park to the east of the building appears to be over 3 separate allotments. The location of the building in relation to the allotment boundaries needs to be confirmed to enable assessment against Section C of the BCA. If the allotment boundaries are within proximity of the building i.e. fail the BCA deemed-to-satisfy fire separation requirements, this item can potentially be referred to the Fire Engineer for consideration.



4. The proposed change in classification results in the required type of construction changing from Type B to Type A. BCA Clause C2.6 requires spandrels to serve a building of BCA Type A construction. However BCA Clause C2.6 does not require spandrels if the building is sprinkler protected throughout in accordance with BCA Specification E1.5. The Design Team have now advised that the Building is proposed to be sprinkler protected throughout.

5. The required fire resistance levels for the existing uses (carpark & office) and the proposed use (carpark, office, library and community uses) are generally the same. However the existing building needs to be considered against the current requirements of the BCA and therefore information will be required from the Structural Engineer certifying that the existing structural elements comply with the fire resistance levels prescribed by BCA2019. The structural elements generally require a 2 hour fire resistance level. There are some concessions for a sprinkler protected carpark. A more detailed list of the required fire resistance levels for each building element can be found in Appendix A of this report.

   The SCRC provided a comment in relation to this item as follows;-
   Does the proposal to sprinkle the building change this? If not, then destructive testing is required as I understand due to potential issues with slab construction (i.e. not built to plan).

   BCA Response to SCRC query - Except for carparks and roofs, the proposal to sprinkler protect an existing building does not typically reduce the required fire resistance levels when assessed against the BCA deemed-to-satisfy (DTS) requirements. However when assessed by a Fire Engineer against the BCA Performance Provisions, sprinklers do typically help to reduce fire resistance levels that would otherwise be required by the BCA DTS provisions. The issue that remains unresolved as far as we're aware is that the Fire Engineer needs baseline data from the Structural Engineer to work with, which is not currently available. For example a structural engineer needs to provide some advice on the fire resistance level of the existing structure so that the Fire Engineer can use that information with his wholistic assessment that includes the benefit of sprinkler protection not contemplated by the BCA DTS provisions. If the Structural Engineer advises that the existing structure achieves a 90/90/90 FRL and the BCA DTS provisions advise that a 120/120/120 FRL is required, the Fire Engineer may be able to justify that the sprinklers offsets the difference.

6. The roof does not require a fire resistance level as the building is proposed to sprinkler protected throughout. Refer to the concession afforded by Clause 3.5 of Specification C1.1.

7. The Preliminary Design proposes a void to connect levels 1 to 3. This proposal does not cause a non-compliance with the BCA maximum fire compartment size provisions under Clause C2.2. Sprinkler protection of the building throughout avoids the relatively onerous BCA Part G3 Atrium provisions.

8. Further information is required in relation to the fire separation of the existing basement carpark from the Event Centre's basement carpark. It is understood that a fire shutter exists between the 2 buildings to separate the basement carparks. It is likely that the fire shutter will not comply with the BCA Clause C3.5 requirement for an insulation level of at least 30. Therefore the separation of the existing Caloundra Administration Building basement carpark from the Event Centre's basement carpark may need to be addressed as a Fire Engineered performance solution. The existing sprinkler system within the carpark will assist.

Egress

9. The proposed new entry foyer stairway is not required to be fire isolated under BCA Clause D1.3 on the basis that the building is sprinkler protected throughout. The other 2 main exit stairways are proposed to be maintained as fire isolated stairways (alternatively they would need to comply with AS1428.1-2009).

10. Some minor exit travel distance issues have been identified in the attached marked-up plans.

11. From a quick preliminary inspection of the fire isolated stairways on 13/12/2019 we noted;-

- Inconsistent riser and going dimensions within some areas of the fire isolated stairways, and-
- riser dimensions exceeding 190mm in various areas of the fire isolated stairways.

The fire isolated stairways will need to be altered to comply with the current building assessment provisions.

12. The basement requires not less than 2 exits. Clarification is required regarding whether the existing swing doorways adjacent to the roller shutter act for egress in both directions. Please note that the QFES do not typically permit a horizontal exit unless the exit is within a single building (not between 2 separate buildings). The reason for this is based on the BCA horizontal exit definition which states;-
    '*Horizontal exit means a required doorway between 2 parts of a building separated from each other by a fire wall.*'

Access for People with Disabilities

13. Access to the existing Building's central sanitary facilities for people with disabilities located on levels 1, 2 & 3 does not comply with AS1428.1-2009. The proposed design seeks to remedy this existing non-compliance. Detailed information to assess the proposed new sanitary facilities is not yet available.

14. New lifts for people with disabilities are now proposed.

Existing Fire Services

15. From a quick preliminary inspection on 13/12/2019, the existing building was noted to be served by;-
    - Fire Hydrant system. The Council advised at our meeting on 13/12/2019 that the existing fire hydrant system is being upgraded to comply with the current requirements of the BCA. This project is being undertaken by an independent consultant team engaged by the Council. It was noted that the fire hydrant risers were copper, whereas the current requirements of the BCA/AS2419.1 require the exposed fire hydrant system pipe work to be galvanised steel where not in a building served by a sprinkler system throughout.
      SCRC query - Fire pump located below flood level? New location to be determined?
      BCA Response – QDC MP3.5 (Construction of Buildings in Flood Hazard Areas) requires sprinkler valve rooms and any associated pumps to be built above the flood hazard level. It is noted that the Architect proposes the sprinkler pump room to be located at ground level (level 1) adjacent to the covered outdoor activity space on the northern side of the building.
      SCRC query - Does the proposed sprinkler system negate the requirement for fire pipework to be changed?
      BCA Response – It would be appropriate for the Consultant responsible for designing and certifying the hydrant system to respond to this query. However our understanding is that the sprinkler system will mean that the hydrant pipework can remain copper in accordance with Clause 8.5.3 of AS2419.1.

8.5.3 Internal pipework

Where internal above-ground pipework is installed, it shall be protected from the effects of fire by one of the following methods:

(a) An automatic fire sprinkler system which shall comply with AS 2118.1.

(b) Fire rating the pipe supports in accordance with Clause 8.7.4.

(c) Installing in a fire-isolated stair or fire-resisting shaft.

(d) Protecting with barriers capable of resisting the effects of fire for a period not less than 60 min.

Where the pipework is of copper and may be exposed to fire in a building that is not protected by sprinklers, the pipework shall be protected using materials that will provide a FRL of not less than –/60/60/; or installed in a fire isolated-stair or fire-resisting shaft; or located above a ceiling system that achieves a resistance to the incipient spread of fire for a period of not less than 60 min.

Where appropriate, exposed internal pipework shall also be protected from mechanical damage.

- Fire Hose Reel system
- Portable fire extinguishers
- Fire Detection System (BCA Table E2.2a requires the proposed Library to be served by a fire detection system)
- The BCA requires the Class 7a basement carpark to be provided with a mechanical ventilation system in accordance with AS 1668.2 and comply with clause 5.5 of AS 1668.1 except that—
  (a) fans with metal blades suitable for operation at normal temperature may be used; and
  (b) the electrical power and control cabling need not be fire rated.
  We have not ascertained whether the existing carpark complies with this BCA requirement.
  SCRC - how do we close this out?
  BCA Response – The Mechanical Engineer or other competent person needs to provide advice in relation to whether the existing carpark complies with this BCA requirement.
- Exit and emergency lighting system.
- In addition the Mechanical Engineering Consultant – JHA has advised in their report dated 17/7/2019 that the building is served by;-
  - Centralised fire fans (F-6 and F-7) initiate as smoke extraction system during general fire alarm (GFA) to provide smoke spill to fire affected floor.
  - Mechanical systems implement zone pressurisation as part of the fire/smoke management strategy with actuation of return air, outside air, and spill air dampers. Air handling units operate to pressurise non fire affected floors.
  - Shutdown systems are adopted for general mechanical systems that are not required to operate in fire mode.

Smoke Hazard Management – BCA Table E2.2b

Exhibition Hall

16. In accordance with BCA Table E2.2b, the building is not permitted to be used as an Exhibition Hall unless the building is served by a sprinkler system complying with BCA Specification E1.5 and an automatic smoke exhaust system.

Public Hall or Lecture Theatre

17. If the building is proposed to be used as a Public Hall or Lecture Theatre, BCA Table E2.2b requires the building or part of the building to be provided with automatic shutdown of any air-handling system (other than miscellaneous exhaust air systems installed in accordance with Sections 5 and 6 of AS 1668.1) which does not form part of the smoke hazard management system, on the activation of—
    (i) smoke detectors installed complying with Specification E2.2a; and
    (ii) any other installed fire detection and alarm system, including a sprinkler system complying with Specification E1.5; and where the floor area of the fire compartment is more than 2000m^2—
    (iii) an automatic smoke exhaust system complying with Specification E2.2b.

Other Assembly Buildings

18. The Levels 1 to 3 fire compartment is now proposed to exceed 2000m^2 and therefore must be provided with an automatic smoke exhaust system complying with Specification E2.2b.

    As an alternative to complying with the BCA Table E2.2b requirements above, the building's required smoke hazard management provisions can be considered under a Fire Engineered performance solution.

Health and Amenity

19. Further information is required to confirm the proposed maximum number of staff and public occupants within the building for the proposed new use so that the required number of sanitary facilities can be assessed.

Energy Efficiency

20. The Energy consultant will need to assess the existing building against the current energy efficiency requirements of the BCA.

Flooding

21. Council's advice was noted in the meeting on 13/12/2019 that the Building is located in a flood prone area, however the site does not appear to be designated as a flood prone area via Council's online mapping system. The Council have advised that the building was constructed over a creek or natural overland flow path which can cause the basement area to flood in a major storm event. Further clarification is required from Council whether the site should be treated as being within a 'flood hazard area' for the purposes of Queensland Development Code MP3.5.

    Further information is contained within the Civil Engineering flood assessment.

Sewer Main

22. Council's mapping system indicates a sewer main that runs through or beneath the building that will need to be considered. Refer to the attached Council Site Report.

Basis of Assessment

Project Scope:

1. The scope of the proposed development involves the conversion of the existing Council Class 5 Office Building constructed in 1994 into a modern library and community facility (Class 9b Public building).

   This Report relates to the compliance of the proposed development with building assessment provisions listed below. This Report does not have regard to any Planning Act matters nor compliance with any other matters beyond the scope of building assessment provisions listed below.

Legislation:

2. The following legislation is applicable to the building certification process –
   - Building Act 1975,-
   - Building Regulations 2006,-
   - Queensland Development Code, and the,-
   - National Construction Code (NCC) 2019 - Building Code of Australia Volume 1 (BCA).

Building Code of Australia Existing Classifications

Level	Use	Classification
Basement	Carpark	Class 7a
Level 1 (Ground Floor)	Offices	Class 5
Level 2	Offices	Class 5
Level 3	Offices	Class 5
Level 4	Plant Room	Ancillary

Building Code of Australia Proposed Classifications

Level	Use	Classification
Basement	Carpark	Class 7a
Level 1 (Ground Floor)	Library	Class 9b
Level 2	Library	Class 9b
Level 3	Meeting and Event Spaces Offices - Administration Workplace	Class 9b Class 5
Level 4	Plant Room	Ancillary

Existing Building - BCA Number of Storeys & Required Type of Construction

3. BCA Storeys 5
4. BCA Rise in Storeys 3 (the basement carpark and plant room are not counted in the rise-in-storeys). After collaboration with the Architect, it is understood that the basement satisfies the following extract from BCA Clause C1.2.

> (b) A *storey* is not counted if—
>
> (i) it is situated at the top of the building and contains only heating, ventilating or lift equipment, water tanks, or similar service units or equipment; or
>
> (ii) it is situated partly below the finished ground and the underside of the ceiling is not more than 1 m above the average finished level of the ground at the *external wall*, or if the *external wall* is more than 12 m long, the average for the 12 m part where the ground is lowest.

5. BCA required type of construction - Type B Construction.
6. BCA Effective Height = 7.2m (Level 3 to Level 1 – refer to the elevations)

Proposed Repurposed Building - BCA Number of Storeys & Required Type of Construction

7. BCA Storeys 5
8. BCA Rise in Storeys 3 (the basement carpark and plant room are not counted in the rise-in-storeys).
9. BCA required type of construction - Type A Construction.
10. BCA Effective Height = 7.2m (Level 3 to Level 1 – refer to the elevations)

The proposed change of classification to Class 9b, results in the building needing to be of BCA **Type A** construction.

BCA Approximate Fire Compartment Floor Area

Level	Approximate Fire Compartment Area	BCA Type A Max permitted fire compartment size
Basement carpark	1524m^2	Does not apply to a carpark served by a sprinkler system.
Level 1 (Ground), Level 2 & Level 3	2165m^2 + 1720m^2 + 2038m^2 + = 5923m^2	8000m^2 for Class 5 & 9b
Level 4 Plantroom	88 m^2	

BCA Maximum Fire Compartment Size

11. BCA Maximum Permitted Fire Compartment Size (refer BCA extract below)

Table C2.2 MAXIMUM SIZE OF FIRE COMPARTMENTS OR ATRIA

Classification		Type of construction of building		
		Type A	Type B	Type C
5, 9b or 9c *aged care building*	max *floor area*—	8 000 m^2	5 500 m^2	3 000 m^2
	max volume—	48 000 m^3	33 000 m^3	18 000 m^3
6, 7, 8 or 9a (except for *patient care areas*)	max *floor area*—	5 000 m^2	3 500 m^2	2 000 m^2
	max volume—	30 000 m^3	21 000 m^3	12 000 m^3

Note: See C2.5 for maximum size of compartments in *patient care areas* in Class 9a *health care buildings*

12. Therefore the proposed refurbished building complies with the maximum fire compartment sizes permitted for the proposed new class 5 and class 9b library and community uses. The proposed void to connect levels 1 to 3 does not cause a non-compliance with the BCA maximum fire compartment size provisions. As the void is proposed to connect 3 storeys, a sprinkler system is now proposed to help avoid the relatively onerous BCA Part G3 Atrium provisions.

Maximum number of people deemed to be accommodated

13. For Libraries, the number of people per m^2 prescribed by BCA Table D1.13 is 2m^2/person for reading spaces and 30m^2/person for storage areas. For Offices, the number of people per m^2 prescribed by BCA Table D1.13 is 10m^2/person. Refer to the attached marked-up plans for further information in relation to how preliminary occupant numbers have been determined. These numbers should be considered a Building Certifier's high level guestimate. More accurate numbers should be determined via collaboration with the Architect, Client and end-users.

Building Level	No of Occupants
Basement Carpark	47 (transient)
Level 1 (Ground)	534
Level 2	354
Level 3	445
Level 4 (Plant Room)	10

Required Exit Width

Building Level	No of Occupants	Required Exit Width	Proposed Exit Width
Basement Carpark	47 (transient)	1m – complies (2 exits are required from a basement, so technically 2m is required.	2m
Level 1 (Ground)	534	5m - refer to the plans, there is a concern with the number of people that can be accommodated in the Foyer & event space and the associated proposed exit width.	6m
Level 2	354	3.5m - complies	4m
Level 3	445	4.5m – does not comply based on the assumed number of proposed occupants	4m
Level 4	10	1m - complies	1m

Building Fire Services

14. We understand that the existing building is served by the following fire safety installations

A. Structural features
- penetrations through fire-rated construction
- fire dampers
- fire shutters (basement carpark) and fire doors
- structural fire protection
- systems required to have a fire-resistance level

B. Fire protection systems
- sprinklers (basement carpark)
- fire detection and alarm system
- carpark exhaust system
- In addition the Mechanical Engineering Consultant – JHA has advised in their report dated 17/7/2019 that the building is served by;-
  - Centralised fire fans (F-6 and F-7) initiate as smoke extraction system during general fire alarm (GFA) to provide smoke spill to fire affected floor.
  - Mechanical systems implement zone pressurisation as part of the fire/smoke management strategy with actuation of return air, outside air, and spill air dampers. Air handling units operate to pressurise non fire affected floors.
  - Shutdown systems are adopted for general mechanical systems that are not required to operate in fire mode.

C. Fire fighting equipment
- fire hydrant system (including hydrant booster)
- fire hose reels
- fire extinguishers (portable)

D. Occupant safety features
- exit door hardware
- emergency lighting
- exit signs
- fire doors

E. Other features
- nil

Number of Required Sanitary Facilities

15. The required number of sanitary facilities is based on the number of occupants proposed to be accommodated by the building. For the purpose of calculating sanitary facilities, we would not include occupants from the carpark nor the plant room.

We are unable to determine the number of required sanitary facilities until we are able to quantify the number of staff and the number of public.

Relevant Queensland Building Act 1975 Provisions

When certifying a proposed change of classification and an associated major refurbishment there are several Building Act 1975 provisions which require prioritised attention.

In this case, the relevant Building Act provisions essentially require the existing building to be assessed against the current building assessment provisions (e.g. current BCA and Queensland Development Code) as if it was a new building. However Section 61 of the Act does provide an opportunity to assess against the earlier building assessments provisions if considered reasonable to the Building Certifier.

There is an opportunity to assess proposed alterations under earlier building code requirements if it is considered reasonable to do so.

61 Alterations to safe existing work may be approved on basis of earlier building assessment provisions

(1) This section applies for a building development application if—
(a) the building work is alterations to an existing building or structure; and
(b) the building certifier is satisfied the general safety and structural standards of the building or structure would not be at risk if the alterations were to be carried out under earlier building assessment provisions.
(2) The building certifier may carry out building assessment work for the application on the basis that the building work is to be carried out under the earlier building assessment provisions.
(3) Subsection (4) applies if the building's BCA classification as shown on the certificate of classification for the building has changed only because of an amendment to building classifications under the BCA made after the certificate was given.
(4) Without limiting subsection (2) , the building certifier may carry out building assessment work for the application on the basis that the building work is to be carried out under the building assessment provisions applying for the BCA classification shown on the certificate of classification.
(5) In this section—

***"building assessment provisions"** includes the former Standard Building By-laws and Standard Building Law under this Act and the repealed Standard Building Regulation 1993 .*

***"earlier building assessment provisions"** means the building assessment provisions as they were in force at a particular time before the application was made.*

S68 of the Act basically requires that the proposed alterations do not unduly reduce the existing level of safety.

68 Particular alterations not permissible

(1) This section applies to a building development application for alterations to an existing building or structure.
(2) However, this section does not apply if—
(a) the alterations are for a budget accommodation building to which chapter 7 , part 3 applies; and
(b) the purpose of the alterations is to ensure the building or structure complies with the fire safety standard.
(3) The assessment manager must not approve the application unless the building certifier has decided the alterations do not unduly reduce the following—
(a) the existing level of fire protection for persons accommodated in, or using, the building or structure;
(b) the existing level of resistance to fire of the building or structure;
(c) the existing safeguards against spread of fire to adjoining buildings or structures;
(d) the existing level of emergency egress from the building or structure.

S80 of the Act requires that the existing building is made safe and structurally sound if it is not already safe and structurally sound.

80 Alterations to unsafe existing work

(1) This section applies to a building development approval if—
(a) the building work is alterations to an existing building or structure; and
(b) the building certifier decides the building or structure is unsafe or structurally unsound.
(2) The building development approval may include a condition that all, or a stated part, of the building or structure must comply with the building assessment provisions in force—
(a) when the approval was granted; or
(b) at another stated time that the building certifier considers will ensure the building or structure is made safe and structurally sound.

S81 of the Act is intended to be triggered when a proposed major refurbishment is proposed to more than 50% of the existing building. S81 is intended to require the Building Certifier to assess the existing building against the current Building Code of Australia and to require the existing building to be upgraded to comply with the current BCA where reasonable and practical.

81 Building development approval for particular alterations may require existing building or structure to comply with building assessment provisions

(1) This section applies to a building development approval for alterations to an existing building or structure if—
(a) the total of the following represents more than half the total volume of the existing building or structure, measured over its roof and external walls—
(i) the alterations;
(ii) any previous structural alterations to it approved or completed in the previous 3 years; or
(b) the building certifier has decided the alterations pose a risk—
(i) to the safety of persons accommodated in or using the building or structure; or
(ii) of spreading fire to adjoining buildings or structures.
(2) However, this section does not apply if—
(a) the alterations are for—
(i) a budget accommodation building to which chapter 7 , part 3 applies; or
(ii) a residential care building to which chapter 7A , part 4 applies; and
(b) the purpose of the alterations is to ensure the building complies with—
(i) for a budget accommodation building—the fire safety standard; or
(ii) for a residential care building—the fire safety standard (RCB).
(3) The building development approval may include a condition that all, or a stated part, of the existing building or structure must comply with all or a stated part of the building assessment provisions as if it were a new building or structure.
(4) This section does not limit chapter 5 , part 3 .

S110 & 111 of the Act effectively require that when a building changes classification, the building is required to comply with the current requirements of the BCA applicable to the new classification.

110 Restriction on making BCA classification or use change

The owner of a building must ensure a BCA classification or use change is not made to the building unless—
(a) a building certifier who is either of the following has approved the change and the building as changed complies with the building assessment provisions—
(i) a local government building certifier;
(ii) a private certifier (class A); or
(b) the change has been approved under section 112 .
Penalty—
Maximum penalty—165 penalty units.

111 Provision for applying to local government to obtain approval for BCA classification or use change

(1) The owner of a building may apply to the local government for an approval mentioned in section 110 (a) .
(2) The application must—
(a) be in the approved form; and
(b) include enough information about the proposed change to allow a local government building certifier to comply with the certificate requirements.
(3) The local government building certifier must decide to grant or refuse the approval.
(4) This section does not prevent a private certifier (class A) engaged by the owner from granting an approval mentioned in section 110 (a) .
(5) Subject to section 112 , a local government building certifier or private certifier (class A) must not approve a BCA classification or use change to a building unless the building as changed complies with the building assessment provisions.
(6) Despite subsections (3) and (4) , if the building assessment provisions or a condition of a building development approval provide for a referral agency inspection of the building about the BCA classification or use change, the approval must not be granted until the requirement has been complied with or it has ceased to apply.

S112 Does provide a concession for buildings in existence before 14 December 1993. However it is understood that the building was not in existence until after 14 December 1993.

112 Concessional approval for particular existing buildings

(1) This section applies only to a building in existence before 14 December 1993.
(2) A building certifier who is either of the following may approve a BCA classification or use change for the building or part of the building without the building or part as changed having to comply with the building assessment provisions, other than the BCA, parts E1 and E4—
(a) a local government building certifier;
(b) a private certifier (class A).
(3) However, the change may be approved only if the building certifier considers that the building or part—
(a) will be structurally sound and capable of withstanding the loadings likely to arise from its use under any new BCA classification or use; and
(b) will reasonably provide for—
(i) the safety of persons in the building if there is a fire, including, for example, means of egress; and
(ii) the prevention and suppression of fire; and
(iii) the prevention of the spread of fire.
(4) Also, if the building contains a special fire service the building certifier must not approve the change unless the certifier has first received from QFES a report on the suitability of the service.
(5) The approval may impose the conditions the building certifier considers necessary about any of the matters mentioned in—
(a) the BCA, part E1 or E4; or
(b) subsection (3) .

A More Detailed List of Applicable BCA Requirements

Structural

1. Because of the proposed major refurbishment and change of classification, the existing building and proposed building works are required to be assessed against the current requirements of the BCA.

   The structural engineer has raised concerns regarding the difficultly to alter the existing structure to comply with the current earthquake loading requirements of BCA 2019. If the Structural Engineer is satisfied that the building will be made 'structural sound', we're of the opinion that the Building Act allows for the Structural Engineer's proposal which we understand is to ensure that the existing structure will have sufficient capacity to accommodate earthquake loading when assessed against the requirements of AS3826, whilst taking in to account the loading requirements of AS1170.4 R2018.

   'Structurally sound' is the term used by Section 80 of the Building Act.
   http://classic.austlii.edu.au/au/legis/qld/consol_act/ba197591/s80.html

   There are other provisions in the Act (such as S110 & S111) that trigger a Building Certifier to have regard to the current building assessment provisions (current BCA) for a change of classification, however in this instance we're of the opinion that the Structural Engineer's proposal is acceptable.

   As this is a discretionary public safety matter, it would be appropriate to refer this discretionary decision to the Council (particularly Ben Wallis and the relevant assigned Council Building Officer) for their concurrence of this decision. Note.

2. Non-structural components of the building and their fastenings must be designed and built for earthquake forces as required by AS1170.4. Note.

Fire Resistance

3. External walls and common walls including all components incorporated in them including the façade covering, framing and insulation must be of non-combustible construction. No combustible external wall claddings are permitted. All attachments to the external walls must be non-combustible. Load bearing internal walls and load bearing fire walls must be of concrete or masonry. Further information is required in relation to the existing external wall systems to verify compliance with this requirement.

   The proposed 'local species timber cladding' does not comply with the BCA DTS provisions and will need to be referred to the Fire Engineer for consideration as performance solution.

4. An ancillary element must not be fixed, installed or attached to the internal parts or external face of an external wall that is required to be non-combustible unless it complies with BCA Clause C1.14. Note.

5. A non-load bearing-
   a) internal wall required to be fire resisting; and
   b) lift, ventilating, pipe, garbage or similar shaft that is not for the discharge of hot products of combustion,
   must be of non-combustible construction. Note.

6. The building must comply with the required fire resistance levels as prescribed by BCA Clause C1.1. Refer to the BCA Specification C1.1 Table 3 extract attached to this Report for a detailed list of the required fire resistance levels for each building element. It is understood that structural upgrade works are proposed via a series of steel beams and columns. The beams and columns will require fire resistance levels in accordance with BCA specification C1.1. A Fire Engineered solution can be explored. Sprinkler protecting the building throughout will assist a fire engineered solution that seeks to reduce the fire resistance levels otherwise required by BCA Specification C1.1. Fire Engineering.

   The tiered seating area is required to be fire separated from the area below.

7. The fire hazard properties of linings (including carpets, vinyls, laminates etc), materials and assemblies must comply with BCA Clause C1.10 and the associated specification. Fire hazard property details for the proposed linings, materials and assemblies must be submitted to and approved by the Building Certifier prior to installation. Note.

8. The fire isolated stairway shaft/s must be provided with a fire resistant lid that has the same fire resistance level as is required for the shaft walls. The fire resistance level must be in both directions (i.e from above or and below) which is often most simply achieved with a concrete fire rated lid (Clause 2.7 of spec. C1.1 of the BCA). Note.

9. The size of any fire compartment in the building must comply with BCA Table C2.2. Note.

Table C2.2 MAXIMUM SIZE OF FIRE COMPARTMENTS OR ATRIA

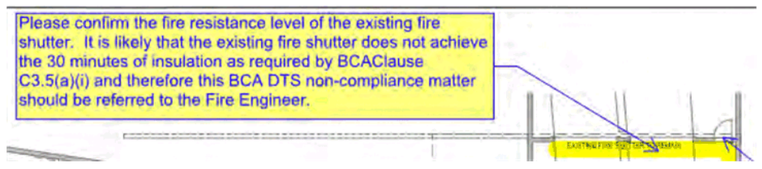
Classification		Type of construction of building		
		Type A	Type B	Type C
5, 9b or 9c *aged care building*	max *floor area*—	8 000 m^2	5 500 m^2	3 000 m^2
	max volume—	48 000 m^3	33 000 m^3	18 000 m^3
6, 7, 8 or 9a (except for *patient care areas*)	max *floor area*—	5 000 m^2	3 500 m^2	2 000 m^2
	max volume—	30 000 m^3	21 000 m^3	12 000 m^3
Note: See C2.5 for maximum size of compartments in *patient care areas* in Class 9a *health care buildings*.				

10. Spandrels are not required to serve the building in accordance with BCA Clause C2.6 as the building is now proposed to be sprinkler protected throughout. Note.

11. Electrical supplies to emergency equipment must be fire separated from the building in accordance with Clause C2.13 of the BCA. The substation (if still proposed) must be fire separated from the remainder of the building by 120/120/120 fire resistant construction with the doorway protected by a self-closing fire door having a fire resistance level not less than -/120/30. Electrical conductors within the building that supply the main switchboard must be fire protected in accordance with Clause C2.13. Note.

12. A battery system installed in the building that has a total voltage of 12 volts or more and a storage capacity of 200 kWh or more must be fire separated from the remainder of the building in accordance with BCA Clause C2.12 by construction with a fire resistance level (FRL) not less than 120/120/120 and any doorway protected with a self-closing fire door having an FRL not less than -/120/30. The ESD Report advises;- *'A 232kWhr Battery storage area has been allowed for in the central plant area to allow connection to the main switchboard to further reduce energy consumption or move towards net zero energy. Sunshine Coast Council is a zero-net emissions organisation and the community is low carbon by 2041.'* Note.

13. Further information is required in relation to the fire separation of the existing basement carpark from the Event Centre's basement carpark. It is understood that a fire shutter exists between the 2 buildings to separate the basement carparks. It is likely that the fire shutter will not comply with the BCA Clause C3.5 requirement for an insulation level of at least 30. Therefore the separation of the existing basement carpark from the Event Centre's basement carpark may need to be addressed as a Fire Engineered performance solution. The existing sprinkler system within the carpark will assist if addressed as a Fire Engineered solution. Fire Engineering.



14. Every doorway that opens onto the fire isolated stairways or fire isolated passageways must be protected by -/60/30 fire doors that are self-closing or automatic closing in accordance with BCA Clause C3.8a(ii) & (iii). Note.

15. As per clause C3.9 of the BCA, the fire isolated exits must not be penetrated by any service other than electrical wiring associated with BCA clause D2.7(e) or water supply pipes for fire services. Note.

16. The lifts must be served by -/60/- fire doors complying with AS1735.11 that are set to remain in the closed position. The lift shaft must be fire separated from the remainder of the building in accordance with BCA specification C1.1. Note.

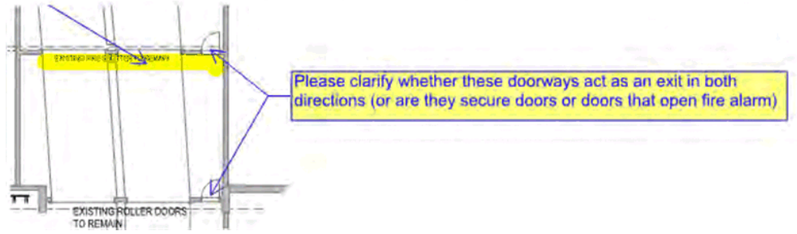
17. All penetrations through fire rated members must be fire protected in accordance with a tested proto-type to maintain the fire resistance of the element being penetrated in accordance with BCA Clauses C3.12 to C3.15. Note.

18. Any awnings above the paths connecting the fire isolated stair discharge points to the public roads must be of non-combustible construction. Note.

Access & Egress

19. The basement and all class 9b areas must have access to not less than 2 exits. Please note that the QFES do not typically permit a horizontal exit unless the exit is within a single building (not between 2 separate buildings). The reason for this is based on the BCA horizontal exit definition which states;- *'Horizontal exit means a required doorway between 2 parts of a building separated from each other by a fire wall.'* Further information required.

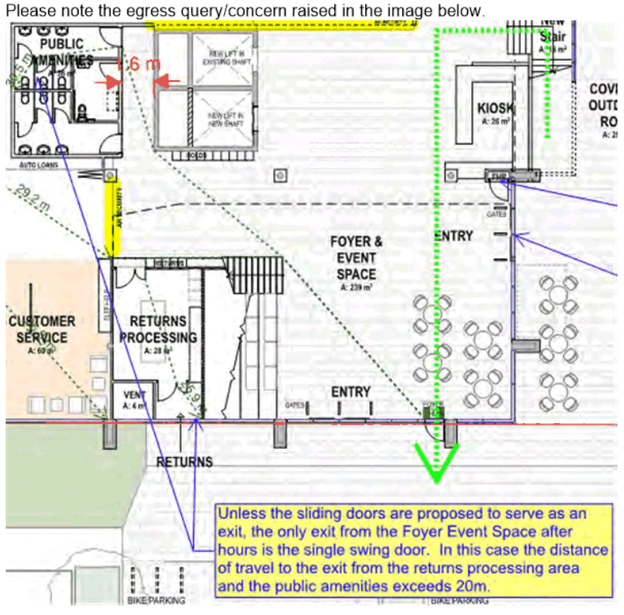
Please clarify if the basement swing doors depicted in the image below exist as exits in both directions.



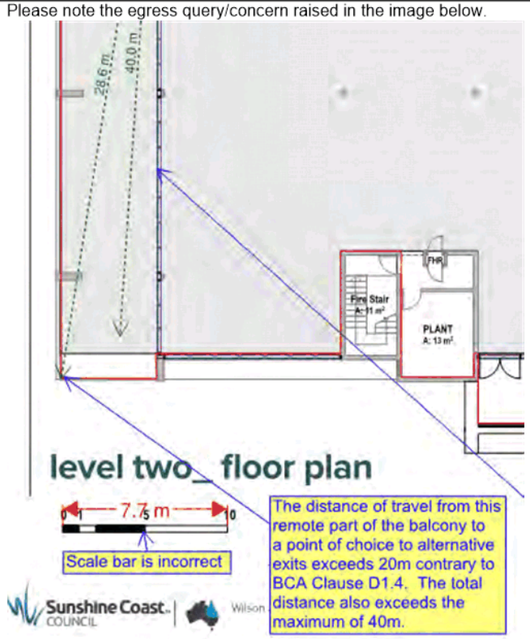
20. The main foyer exit stairway is not required to be fire isolated in accordance with BCA Clause D1.3 as the building is proposed to be sprinkler protected throughout. The other 2 main exit stairways serving the upper levels are proposed to be maintained as fire isolated stairways and therefore are not required to comply with all provisions of AS1428.1-2009. Note.

21. No point on a floor is permitted to be more than 20m from an exit, or a point from which travel in different directions to 2 exits is available, in which case the maximum distance to one of those exits must not exceed 40m. Fire Engineering.

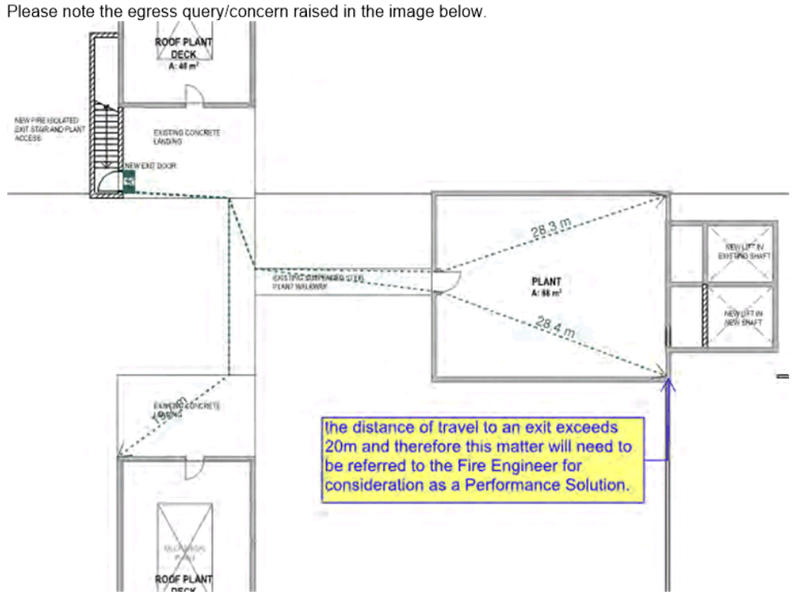
Please note the egress query/concern raised in the image below.



Please note the egress query/concern raised in the image below.



Please note the egress query/concern raised in the image below.



22. The distance between alternative exits must be not greater than 60m.

23. The stairways must be not less than 1000mm in clear width.

24. The upper level appears capable of accommodating 445 people which triggers the need for a minimum exit width of 4.5m. Only 4m is proposed. Refer to the attached plan mark-ups. Fire Engineering, plan amendment or clarification on the number of occupants is required.

25. A doorway must not open directly into the fire isolated stairways or passageways unless it is from-
    a) a public corridor lobby or the like
    b) a sole-occupancy unit occupying all of a store or
    c) sanitary compartment, airlock or the like.

    No areas of non-compliance were identified.

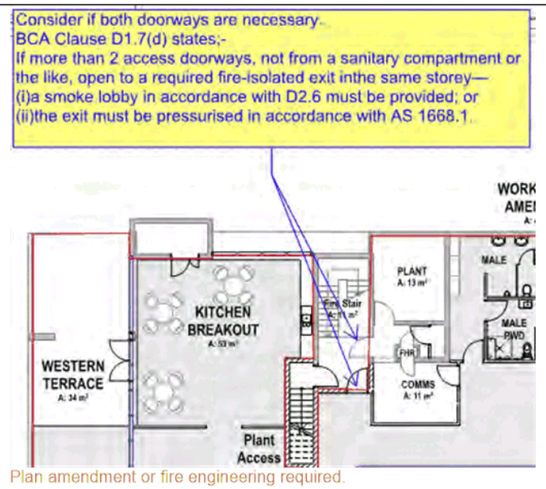
26. Each fire isolated stairway must provide independent egress from each storey served and discharge directly, or by way of its own fire isolated passageway-
    a) To a road or open space; or
    b) To a point-
        i. in a storey or space within the confines of the building that is used for pedestrian movement car parking or the like and is open for at least 2/3 of its perimeter;
        ii. from which an unimpeded path of travel, not further than 20m, is available to a road or open space; or
    c) Into a covered area that-
        i. adjoins a road or open space; and
        ii. is open for at least 1/3 of its perimeter; and
        iii. Has an unobstructed clear height throughout, including the perimeter openings, of not less than 3m, and
        iv. Provides an unimpeded path of travel from the point of discharge to the road or open space of not more than 6m.

    No areas of non-compliance were identified.

27. Where a path of travel from the point of discharge of a fire-isolated exit necessitates passing within 6m of any part of an external wall of the same building, measured horizontally at right angles to the path of travel, that part of the wall must have an FRL of not less than 60/60/60; and
    a) Any openings protected internally in accordance with BCA Clause C3.4,
    b) For a distance of 3m above or below, as appropriate, the level of the path of travel, or for the height of the wall, whichever is the lessor.

    No areas of non-compliance were identified.

28. BCA Clause D1.7(d) states;-
    If more than 2 access doorways, not from a sanitary compartment or the like, open to a required fire-isolated exit in the same storey—
    (i)a smoke lobby in accordance with D2.6 must be provided; or
    (ii)the exit must be pressurised in accordance with AS 1668.1.



Plan amendment or fire engineering required.

29. The non-fire isolated stairway (main foyer new stairway) must comply with BCA Clause D1.9(c). The distance from any point on a floor to a point of egress to open space by the non-fire isolated stairway must not exceed 80m. No items of non-compliance were identified.

30. The paths connecting the exits to the public roads must comply with BCA Clause D1.10. Where exit doorways can be obstructed, bollards or an equivalently effective method must be used to ensure exits are not blocked by vehicles, bins etc. Note.

31. Plant rooms with a floor area less than 100sq.m must be provided with access or in accordance with Part D2 of the BCA or AS1657. Note.

32. Access to lift pits must comply with BCA Clause D1.17. Access to lift pits may be through the lowest landing doors where the pit is not more than 3m deep otherwise compliance with BCA Clause D1.17b is required. Note.

33. The fire isolated stairways must be of non-combustible materials and so that if there is a local failure it will not cause structural damage to, or impair the fire resistance of, the shaft in accordance with BCA Clause D2.2. Note.

34. For the fire isolated exit stairways, there must be no direct connection between a flight rising from a storey below the lowest level of access to a road or open space and a flight descending from a storey above that level. Any construction that separates or is common to the rising and descending flights must be non-combustible and smoke proof in accordance with Clause 2 of Specification C2.5. Note.

35. Electrical installations in the path of travel to an exit must be in a non-combustible enclosure with any openings suitably sealed against smoke spreading from the enclosure in accordance with BCA Clause D2.7. Note.

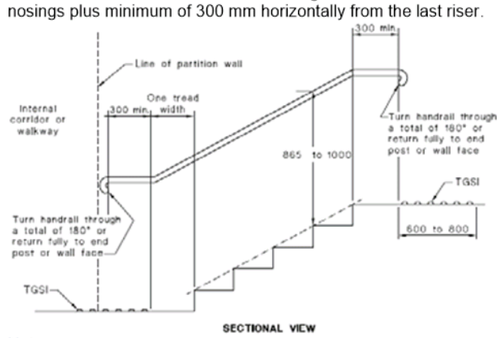
36. The space below the stairs must not be enclosed to form a cupboard or similar enclosed space. Note.

37. Landings, stairway treads and ramps must have a surface with a slip-resistance classification not less than that listed in BCA Table D2.14 when tested in accordance with AS4586. Note.

BCA Table D2.14 Slip-Resistance Classification

Application	***Surface conditions***	
	Dry	***Wet***
Ramp steeper than 1:14	*P4 or R11*	*P5 or R12*
Ramp steeper than 1:20 but not steeper than 1:14	*P3 or R10*	*P4 or R11*
Tread or landing surface	*P3 or R10*	*P4 or R11*
Nosing or landing edge strip	*P3*	*P4*

38. Excluding the fire isolated stairways, any other stairways (including hand rails to both sides) must be in accordance with clause 11 of AS1428.1.
    a) Stairs shall have opaque risers
    b) Stair nosings shall not project beyond the face of the riser and the riser may be vertical or have a splay backwards up to a maximum 25 mm, as shown in Figures 27(A) and 27(B) of AS1428.1.
    c) Stair nosing profiles shall—
       (i) have a sharp intersection;
       (ii) be rounded up to 5 mm radius; or
       (iii) be chamfered up to 5 mm × 5 mm.
    d) At the nosing, each tread shall have a strip not less than 50 mm and not more than 75 mm deep across the full width of the path of travel. The strip may be set back a maximum of 15 mm from the front of the nosing. The strip shall have a minimum luminance contrast of 30% to the background. Where the luminous contrasting strip is affixed to the surface of the tread, any change in level shall comply with Clause 7.2 and Clause 7.3. Where the luminance contrasting strip is not set back from the front of the nosing, then any area of luminance contrast shall not extend down the riser more than 10mm.
    e) The handrails at the bottom of the stair flights must extend at least one tread depth parallel to the line of nosings plus minimum of 300 mm horizontally from the last riser.



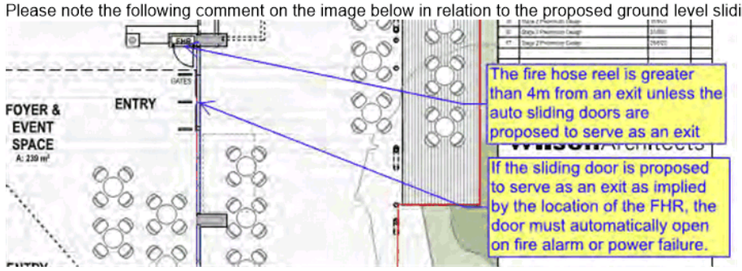
Note.

39. The fire isolated stairways must comply with clause 11.1(f) and (g) of AS1428.1-2009 (contrasting nosings). The fire isolated stairway handrails must comply with clause 12 of AS1428.1-2009. Note.

40. Stairways must have constant riser dimensions not greater than 190mm and constant going dimensions not less than 250mm. Not more than 18 risers are permitted within a single flight. Stair treads must have a non-slip finish and a contrasting nosing. Where it is possible to fall greater than 1000mm to an adjacent surface, balustrading must be provided in accordance with Clause D2.16 of the BCA with balustrades extending not less than 1000mm above floor level or 865mm above the nosing of a stair. Balustrades must not have any gaps that would permit a 125mm sphere to penetrate. Where it is possible to fall greater than 4m to an adjacent surface, balustrades must have no climbable elements between 150mm and 760mm above floor level (including hose cocks, A/C condensers on balconies). Where it is possible to fall greater than 4m out of a window balustrades must extend to a height not less than 865mm above floor level to protect that window. Note.

41. Any automatic sliding doors must open automatically if there is a power failure to the door or on the activation of a fire or smoke alarm anywhere in the fire compartment in accordance with Clause D2.19 of the BCA.

Please note the following comment on the image below in relation to the proposed ground level sliding doors.



42. Exit doors must swing in the direction of egress in accordance with Clause D2.20 of the BCA. Note.

43. Exit doors and doors in the path of travel to an exit must be openable from within, without a key by a single handed downward action on a device between 900 & 1100 above floor level in accordance with Clause D2.21 of the BCA. Otherwise any secure doors (including gates from secure areas) must be fitted with a fail-safe device which automatically unlocks the doors upon the activation of the fire detection or sprinkler systems. Note.

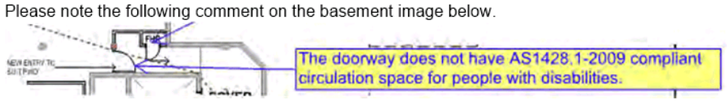
44. Signs must be provided on the fire isolated stair doors on the side of a person seeking egress (external of the stair) stating in 20mm contrasting capital letters 'FIRE SAFETY DOOR, DO NOT OBSTRUCT, DO NOT KEEP OPEN'. The door discharging people to open space from the stairway must have the sign on both sides of the doorway. Note.

Access & Facilities for People with Disabilities (PWD)

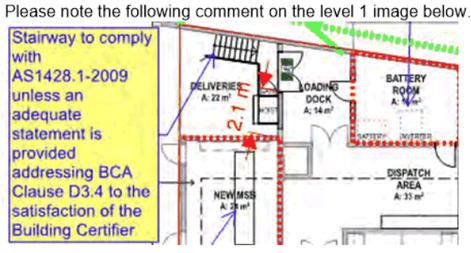
45. An AS1428.1 compliant accessway must be provided to the building-
    a) from the main points of a pedestrian entry at the allotment boundary; and
    b) from another accessible building connected by a pedestrian link; and
    c) from any required accessible carparking space on the allotment.
    An AS1428.1 compliant accessway must be provided through the principal pedestrian entrance and through not less than 50% of all pedestrian entrances including the principal pedestrian entrance. In a building with a total floor area more than 500m², a pedestrian entrance which is not accessible must not be located more than 50 m from an accessible pedestrian entrance (except for pedestrian entrances serving only areas not required to be accessible). Note.

46. Access for people with disabilities must be provided throughout the parts of the building required to be accessible in accordance with the BCA and AS1428.1. Plan amendment required.

    Please note the following comment on the basement image below.



    Please note the following comment on the level 1 image below.



47. The accessways (corridors) must have a turning space complying with AS1428.1 within 2m of the end of accessways where it is not possible to continue travelling along the accessway and at maximum 20m intervals along the accessway. Passing spaces complying with AS1428.1 must be provided at 20m maximum intervals on those parts of an accessway where a direct line of sight is not available. Note.

48. The maximum threshold of all doorways required to be accessible must not be greater than 3mm to satisfy AS1428.1 for people with disabilities. Note.

49. All doorways must have a 30% luminance contrast to their adjacent surfaces in accordance with Clause 13.1 of AS1428.1. Note.

50. All doorways required to be accessible must be not less than 850mm clear and comply with the circulation space requirements of AS1428.1. For double doorways the 850mm required clearance is measured when only 1 door leaf is fully open. Note.

51. The toilets for people with disabilities (PWD) must comply with AS1428.1. A clothes-hanging device must be installed 1200 mm to 1350 mm above the plane of the finished floor. Such devices shall not be less than 500 mm out from any internal corner. A shelf must also be provided in the unisex sanitary facility. Note.

52. The PWD toilet doors must be provided with an in-use indicator and a bolt or catch. Where a snib catch is used, the snib handle shall have a minimum length of 45 mm from the centre of the spindle. In an emergency, the latch mechanism shall be openable from the outside. Note.

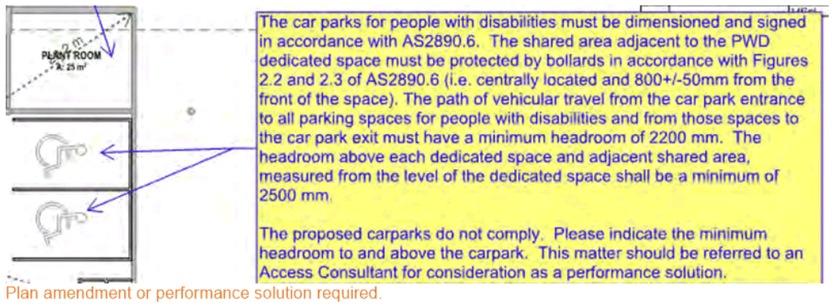
53. Where required to be operated by people with disabilities, door hardware must be located between 900 & 1100 above finished floor level in accordance with AS1428.1. Note.

54. In accordance with AS1428.1 all switches required to be accessible, other than general purpose outlets, must be horizontally aligned with door handles and other controls located between 900mm and 1100mm above the finished floor and be not less than 500mm from internal corners (the preferred height of all switches and GPOs is 1000mm). Note.

55. Braille and tactile signage complying with Specification D3.6 of the BCA and incorporating the international symbol of access (where applicable) must be provided to each sanitary facility. Braille and tactile signage complying with Specification D3.6 must also identify each door required by BCA Clause E4.5 to be provided with an exit sign and state 'Exit' and 'Level' followed by the floor level number. Note.

    Signage including the international symbol for deafness in accordance with AS1428.1 must be provided within a room containing a hearing augmentation system identifying-
    a) The type of hearing augmentation; and
    b) The area covered within the room; and
    c) If receivers are eing used and where the receivers can be obtained.
    Note.

56. A minimum of 1 carparking space for people with a disability is required for every 100 carparking spaces or part thereof. The car parks for people with disabilities must be dimensioned and signed in accordance with AS2890.6. The shared area adjacent to the PWD dedicated space must be protected by bollards in accordance with Figures 2.2 and 2.3 of AS2890.6 (i.e. centrally located and 800+/-50mm from the front of the space). The path of vehicular travel from the car park entrance to all parking spaces for people with disabilities and from those spaces to the car park exit must have a minimum headroom of 2200 mm. The headroom above each dedicated space and adjacent shared area, measured from the level of the dedicated space shall be a minimum of 2500 mm.



Plan amendment or performance solution required.

57. If an inbuilt amplification system (other than one used only for emergency purposes) is proposed a hearing augmentation system complying with BCA Clause D3.7 and AS1428.1 must be provided. Note.

58. Tactile ground surface indicators must be provided in accordance with sections 1 and 2 of AS/NZS1428.4.1 to warn people with a vision impairment that they are approaching a stairway (other than a fire isolated stairway) or a ramp (steeper than 1:20) and where an accessway meets a vehicular way adjacent to any pedestrian entrance to the building if there is no kerb or kerb ramp at that point. Note.

59. On an accessway, where there is no chair rail, handrail, or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a door or opening, must be clearly marked in accordance with AS1428.1. Note.

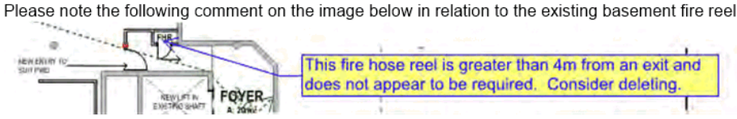
    Where fixed seating is provided, wheelchair seating spaces complying with AS1428.1-2009 must be provided in accordance with BCA clause D3.9. Not less than 3 spaces for PWD must be provided. 1 single space and 1 group of 2 spaces. Plan amendment required.

Services & Equipment

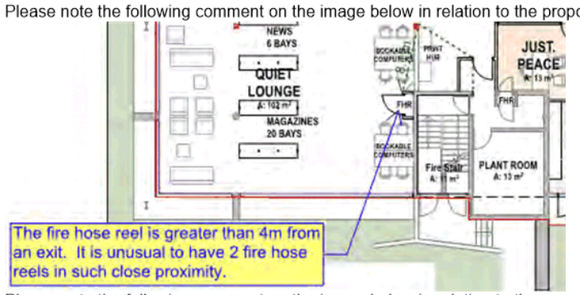
60. A fire hydrant system must serve the development in accordance with AS2419.1. Provision must be made for the disposing of fire hydrant test water to a suitable drain for the purpose of flow testing. It is understood that the building's existing fire hydrant system is being upgraded as part of a separate project to comply with the current building assessment provisions. Please provide a fire hydrant coverage plan to verify compliant coverage. Note.

61. A fire hose reel system must serve the development in accordance with BCA Clause E1.4 and AS2441. Fire hose reels must be located within 4m of an exit. Any system valve which can isolate flow in the fire hose reel water supply main must be secured in the open position by a padlocked metal strap and labelled with an engraved non-ferrous tag with 8mm upper case wording 'FIRE SERVICE VALVE- CLOSE ONLY TO SERVICE FIRE HOSE REELS'. Fire hose reel cabinet signage must have 50mm high capital contrasting letters 'FIRE HOSE REEL'. Please provide a fire hose reel coverage plan to verify compliant coverage.

Please note the following comment on the image below in relation to the existing basement fire reel.



Please note the following comment on the image below in relation to the proposed ground level fire reel.



Please note the following comment on the image below in relation to the proposed ground level fire reel.

Plan amendment required.

62. A sprinkler system must be provided to serve the class 7a basement carpark in accordance with BCA Clause E1.5 and AS2118.1 if the carpark accommodates in excess of 40 vehicles.

Sprinkler alarm valves must be located in a secure room or enclosure which has direct egress to a road or open space. The location of the proposed sprinkler valve room satisfies this requirement.
Note.

63. Portable fire extinguishers must serve the building in accordance with BCA Clause E1.6 and AS2444. Note.

64. In a building under construction not less than one fire extinguisher to suit Class A, B and C fires and electrical fires must be provided at all times on each storey adjacent to each required exit or temporary stairway or exit. After the building has reached an effective height of 12 m the required fire hydrants and fire hose reels must be operational in at least every storey that is covered by the roof or the floor structure above, except the 2 uppermost storeys and any required booster connections must be installed. Note.

65. This building is not approved to accommodate any materials that could cause special problems for fighting a fire because of the nature or quantity of materials to be stored, displayed or used in the building or on the allotment (BCA Clause E1.10). Note.

66. The car park exhaust system must comply with Clause 5.5 of AS1668.1. Note.

67. An automatic smoke detection and alarm system must serve the development in accordance with specification E2.2a of the BCA. Note.

68. An air-handling system which does not form part of a smoke hazard management system and which recycles air from one fire compartment to another fire compartment or operates in a manner that may unduly contribute to the spread of smoke from one fire compartment to another fire compartment must-
    a) be designed and installed to operate as a smoke control system in accordance with AS1668.1; or
    b) incorporate smoke dampers where the air-handling ducts penetrate any elements separating the fire compartments served; and be arranged such that the air-handling system is shut down and the smoke dampers are activated to close automatically by smoke detectors complying with clause 7.5 of AS1670.1..

- Note – JHA - Mechanical Engineering Consultant has advised in their report dated 17/7/2019 that the building is served by;-
  - *Centralised fire fans (F-6 and F-7) initiate as smoke extraction system during general fire alarm (GFA) to provide smoke spill to fire affected floor.*
  - *Mechanical systems implement zone pressurisation as part of the fire/smoke management strategy with actuation of return air, outside air, and spill air dampers. Air handling units operate to pressurise non fire affected floors.*
  - *Shutdown systems are adopted for general mechanical systems that are not required to operate in fire mode.*

Note.

69. In accordance with BCA Table E2.2b, the building is not permitted to be used as an Exhibition Hall unless the building is served by a sprinkler system complying with BCA Specification E1.5 and an automatic smoke exhaust system. Note.

70. If the building is proposed to be used as a Public Hall or Lecture Theatre, BCA Table E2.2b requires the building or part of the building to be provided with automatic shutdown of any air-handling system (other than miscellaneous exhaust air systems installed in accordance with Sections 5 and 6 of AS 1668.1) which does not form part of the smoke hazard management system, on the activation of—
    (i) smoke detectors installed complying with Specification E2.2a; and
    (ii) any other installed fire detection and alarm system, including a sprinkler system complying with Specification E1.5; and where the floor area of the fire compartment is more than 2000m²—
    (iii) an automatic smoke exhaust system complying with Specification E2.2b.
Note.

71. The Levels 1 to 3 fire compartment is now proposed to exceed 2000m² and therefore must be provided with an automatic smoke exhaust system complying with Specification E2.2b.

As an alternative to complying with the BCA Table E2.2b requirements above, the building's required smoke hazard management provisions can be considered under a Fire Engineered performance solution.
Fire Engineered Solution, or maintain the existing smoke hazard management system?

72. A stretcher facility must be provided to serve the lift if the building has an effective height exceeding 12m and be able to accommodate a raised stretcher with a patient lying on it horizontally by providing a clear space not less than 600mm wide x 2000mm long and 1400mm high above the floor level. Note.

73. A warning sign against the use of the lift in a fire must be provided in accordance with Clause E3.3 of the BCA. Note.

74. The lift must be provided with facilities for people with disabilities in accordance with Clause E3.6 of the BCA. Note.

75. If the effective height of the upper most storey exceeds 12m, fire service controls must be provided to serve the proposed lift in accordance with BCA Clause E3.7, E3.9 and E3.10. Note.

76. Emergency and exit lighting is required throughout the building in accordance with the BCA & AS2293.1. Note.

Health & Amenity

77. Toilet doorways within 1200mm of the pan must have lift off hinges, slide or swing outwards. Note.

78. A storm water drainage management system in accordance with AS/NZS 3500.3 must be provided. Any cutting or filling of the site, or construction of retaining walls or other structure on site, shall not jeopardize any existing overland flow drainage system or cause ponding or nuisance storm water. The existing stormwater management system (especially existing box gutters) must be investigated to verify compliance with the current building assessment provisions. Further information required.

79. Hot water, warm water & cooling water systems in a building must be installed in accordance with AS/NZS3666.1. Note.

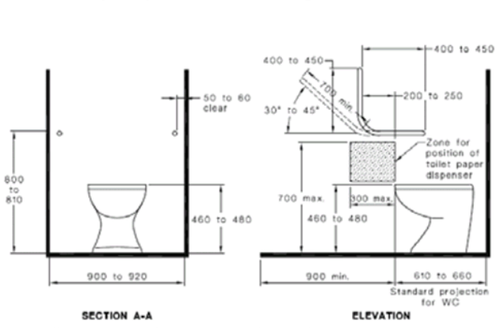
80. Roof coverings must comply with Clause F1.5 of the BCA. Note.

81. Waterproofing membranes for external above ground use (e.g. balconies and roof decks) must comply with BCA Clause F1.4 and AS4654 Parts 1 and 2. All wet areas must be waterproofed in accordance with BCA clause F1.7 and AS3740. The BCA requires the floor of rooms containing urinals to be waterproofed and graded to a floor waste. Note.

82. Separate sanitary facilities for males and females must be provided in accordance with BCA Table F2.3. Note.

83. Accessible unisex sanitary compartments in accordance with AS1428.1-2009 must be provided on every storey containing sanitary compartments and where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks. Note.

84. At each bank of toilets where there is one or more toilets in addition to an accessible unisex sanitary compartment, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS1428.1 must be provided for use by males and females. Doors to sanitary compartments for people with ambulant disabilities shall have openings with a minimum clear width of 700 mm. Doors must be provided with an in-use indicator and a bolt or catch. Where a snib catch is used, the snib handle must have a minimum length of 45 mm from the centre of the spindle. In an emergency, the latch mechanism must be openable from the outside. Signage must be provided to identify the facility in accordance with Clause 8 of AS1428.1. A coat hook shall be provided within the sanitary compartment and at a height between 1350mm to 1500mm from the floor. Note.



85. In accordance with clause F2.4(g), where two or more of each type of accessible unisex sanitary facility are provided, the number of left and right handed mirror image facilities must be provided as evenly as possible. The plans require amendment to satisfy this requirement.

86. The height of rooms must comply with BCA Clause F3.1. Note.

87. Artificial lighting must comply with the BCA (including the energy efficiency provisions) and AS/NZS1680.0. Note.

88. All areas of the building must be either naturally ventilated in accordance with BCA Part F4 or have a mechanical ventilation or air conditioning system complying with AS1668.2 and AS/NZS3666.1. All toilets/wet areas not provided with adequate natural ventilation must be exhausted to outside in accordance with AS1668.2. Any toilet opening to a kitchen or pantry must be provided with mechanical exhaust ventilation. Note.

Occupiable Outdoor Areas

The following requirements apply to an 'occupiable outdoor area' and take precedence where there is a difference to the other BCA DTS provisions. The BCA definition of an 'occupiable outdoor area' is as follows;-

Occupiable outdoor area means a space on a roof, balcony or similar part of a building—
- (a) that is open to the sky; and
- (b) to which access is provided, other than access only for maintenance; and
- (c) that is not *open space* or directly connected with *open space*.

89. Subject to BCA Clause G6.2(b), a lining, material or assembly in an occupiable outdoor area must comply with C1.10 as for an internal element. Note.

90. Egress from the occupiable outdoor areas must comply with BCA Parts D1 & D2. Note.

91. The occupiable outdoor areas must be served by fire fighting equipment in accordance with BCA Clause G6.6. Note.

92. The occupiable outdoor areas must have visibility in an emergency, exit signs and warning systems in accordance with BCA Clause G6.8. Note.

93. Light and ventilation must be provided to the occupiable outdoor area in accordance with BCA Clause G6.9. Note.

Part H1 Class 9b Buildings

94. The proposed seating area must comply with the requirements of BCA Clause H1.4. The gradient of the floor surface must be not steeper than 1 in 8, or the floor must be stepped so that a line joining the nosings of consecutive steps does not exceed an angle of 30 degrees to the horizontal. In addition the height of each step in the stepped floor must be not greater than 600mm. Additional requirements exist within BCA Clause H1.4. Note.

95. Where the general lighting can be dimmed or extinguished during public occupation and the floor is stepped or is inclined at a slope steeper than 1 in 12, aisle lights must be provided to illuminate the full length of the aisle and tread of each step. Refer BCA Clause H1.7. Note.

Energy Efficiency

96. The building must comply with the energy efficiency provisions of Section J of the BCA. Note.

97. In accordance with BCA Clause J8.3(a), the building must have the facility to record the consumption of gas and electricity. Note.

98. In accordance with BCA Clause J8.3(b), the building must have the facility to record individually the energy consumption of-
    a) Air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and
    b) Artificial lighting; and
    c) Appliance power; and
    d) Central hot water supply; and
    e) Internal transport devices including lifts, and
    f) Other ancillary equipment.

    Note.

Queensland Development Code MP3.5 (Construction of Buildings in Flood Hazard Areas)

99. Council's advice was noted in the meeting on 13/12/2019 that the Building is located in a flood prone area, however the site does not appear to be designated as a flood prone area via Council's online mapping system. The Council have advised that the building was constructed over a creek or natural overland flow path which can cause the basement area to flood in a major storm event. Further clarification is required from Council whether the site should be treated as being within a 'flood hazard area' for the purposes of Queensland Development Code MP3.5. If QDC MP3.5 is applicable, the following QDC MP3.5 requirements will apply. Response required.

100. Utilities associated with a building must be located above the flood hazard level. 'Utilities' means any of the following:
    a) lift motors and lift motor rooms for emergency lifts;
    b) electrical switchboards and meters;

c) back-up power supplies and generators for *essential services*;
d) sprinkler valve rooms and any associated pumps;
e) fire indicator panels;
f) controls for stairwell pressurisation and air-handling systems used for
g) smoke control;
h) hot water systems.

'Flood hazard level', for a flood hazard area, means the DFL plus the freeboard
For 'defined flood level' (DFL) see the Building Regulation 2006, sections 5B and 13and schedule 4.
A response is required to the item above to determine the applicability of this requirement.

101. The building with a sanitary drain must be protected from backflow by a reflux valve fitted between the building and the connection point. A reflux valve must be accessible for maintenance in accordance with AS3500.2:2003, section 4.5. A response is required to the item above to determine the applicability of this requirement.

102. A customer dedicated substation located in a building must be located above the DFL. A response is required to the item above to determine the applicability of this requirement.

Miscellaneous

103. Glazing must be designed, fabricated and installed to comply with AS1170, AS1288 & AS2047. Where glazed windows and doors are to be installed by the Builder, the Builder takes the responsibility to ensure those glazed elements are installed in accordance with the suppliers specifications, AS1170.1 & 2, AS2047 and AS1288. Note.

104. Floor surfaces must be suitable to prevent slips (Standards Australia Handbook 197 & AS/NZS 4586), trips and falls. Floor surfaces must be slip-resistant in accordance with the BCA (Clause D2.14) and AS1428.1-2009 (Clause 7.1) which requires all accessible floor surfaces to be slip-resistant. Note.

105. Council's mapping system indicates a sewer main that runs through or beneath the building that will need to be considered. Refer to the attached Council Site Report. Note.

Disability (Access to Premises – buildings) Standards 2010 (Premises Standards)

The Disability (Access to Premises – Buildings) Standards 2010 (Premises Standards) set performance requirements and provide references to technical specifications to ensure dignified access to, and use of, buildings for people with a disability. They clarify the general non-discrimination provisions of the Disability Discrimination Act 1992 in relation to the design construction and management of buildings.

Complying with the Premises Standards satisfies the Disability Discrimination Act non-discrimination requirement for the matters covered by the Standards. If a person acts in accordance with the requirements of the Premises Standards, a successful complaint cannot be made in relation to that action under the Disability Discrimination Act.

The Disability (Access to Premises — Buildings) Standards 2010 (Premises Standards) commenced on 1 May 2011. Any application for a building approval on or after that date triggers the application of the Premises Standards.

The matters relevant to the Premises Standards have been addressed in the section of the Report immediately above and under the following headings.

Access & Egress

Access & Facilities for People with Disabilities (PWD)

Health & Amenity

Appendix A - BCA Required Fire Resistance Levels

Building Code of Australia Specification C1.1 – Table 3 Extract

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS Building element	Class of building— FRL: (in minutes)
	Structural adequacy/Integrity/Insulation
	5, 7a, 9b
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any *fire-source feature* to which it is exposed is—	
For *loadbearing* parts—	
less than 1.5m	120/120/120
1.5 to less than 3 m	120/ 90/ 90
3 or more	120/ 60/ 30
For non-*loadbearing* parts—	
less than 1.5 m	- /120/120
1.5 to less than 3 m	- / 90/ 90
3 m or more	- / - / -
EXTERNAL COLUMN not incorporated in an *external wall*, where the distance from any *fire-source feature* to which it is exposed is—	
For loadbearing columns -	120/ - / -
For non-loadbearing columns -	- / - / -
COMMON WALLS and FIRE WALLS—	120/120/120
INTERNAL WALLS-	
Fire-resisting lift and stair *shafts*—	
Loadbearing	120/120/120
Non-*loadbearing*	- /120/120
Bounding *public corridors*, public lobbies and the like—	
Loadbearing	120/ - / -
Non-*loadbearing*	- / - / -
Between or bounding *sole-occupancy units*—	
Loadbearing	120/ - / -
Non-*loadbearing*	- / - / -
Ventilating, pipe, garbage, and like *shafts* not used for the discharge of hot products of combustion—	
Loadbearing	120/ 90/ 90
Non-*loadbearing*	- / 90/ 90
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS—	120/ - / -
FLOORS	120/120/120
ROOFS	120/ 60/ 30

Clause 3.3 of BCA Specification C1.1
If a floor in a Class 5 or 9b building is designed for a live load not exceeding 3 kPa—
(a) the floor next above (including floor beams) may have an FRL of 90/90/90; or
(b) the roof, if that is next above (including roof beams) may have an FRL of 90/60/30.

Clause 3.5 of BCA Specification C1.1
A roof need not comply with Table 3 if its covering is non-combustible and the building has a sprinkler system complying with Specification E1.5 installed throughout.

Clause 3.9 of BCA Specification C1.1
As the class 7a car park is proposed to be sprinklered, the carpark is only required to comply with the following fire resistance levels (if the carpark is fire separated from the remainder of the building and the sprinkler system complies with clause 11 of BCA Specification E1.5).

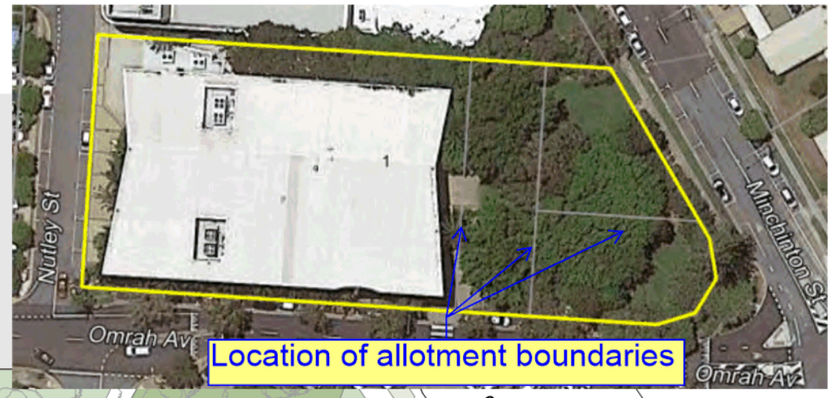
Table 3.9 REQUIREMENTS FOR CARPARKS Building element			FRL (not less than) Structural adequacy/Integrity/Insulation
			ESA/M (not greater than)
Wall			
(a)	*external wall*		
	(i)	less than 3 m from a *fire-source feature* to which it is exposed:	
		Loadbearing	60/60/60
		Non-*loadbearing*	-/60/60
	(ii)	3 m or more from a fire-source feature to which it is exposed	- / - / -
(b)	*internal wall*		
	(i)	loadbearing, other than one supporting only the roof (not used for carparking)	60/ - / -
	(ii)	supporting only the roof (not used for carparking)	- / - / -
	(iii)	non-*loadbearing*	- / - / -
(c)	*fire wall*		
	(i)	from the direction used as a carpark	60/60/60
	(ii)	from the direction not used as a carpark	as *required* by Table 3
Column			
(a)	supporting only the roof (not used for carparking) and 3 m or more from a *fire-source feature* to which it is exposed		- / - / -
(b)	steel column, other than one covered by (a) and one that does not support a part of a building that is not used as a carpark		60/ - / - or 26 m²/tonne
(c)	any other column not covered by (a) or (b)		60/ - / -
Beam			
(a)	steel floor beam in continuous contact with a concrete floor slab		60/ - / - or 30 m²/tonne
(b)	any other beam		60/ - / -
Fire-resisting lift and stair shaft (within the *carpark* only)			60/60/60
Floor slab and vehicle ramp			60/60/60
Roof (not used for carparking)			- / - / -
Notes:		1. ESA/M means the ratio of exposed surface area to mass per unit length 2. Refer to Specification E1.5 for special requirements for a sprinkler system in a *carpark* complying with Table 3.9 and located within a multi-classified building.	

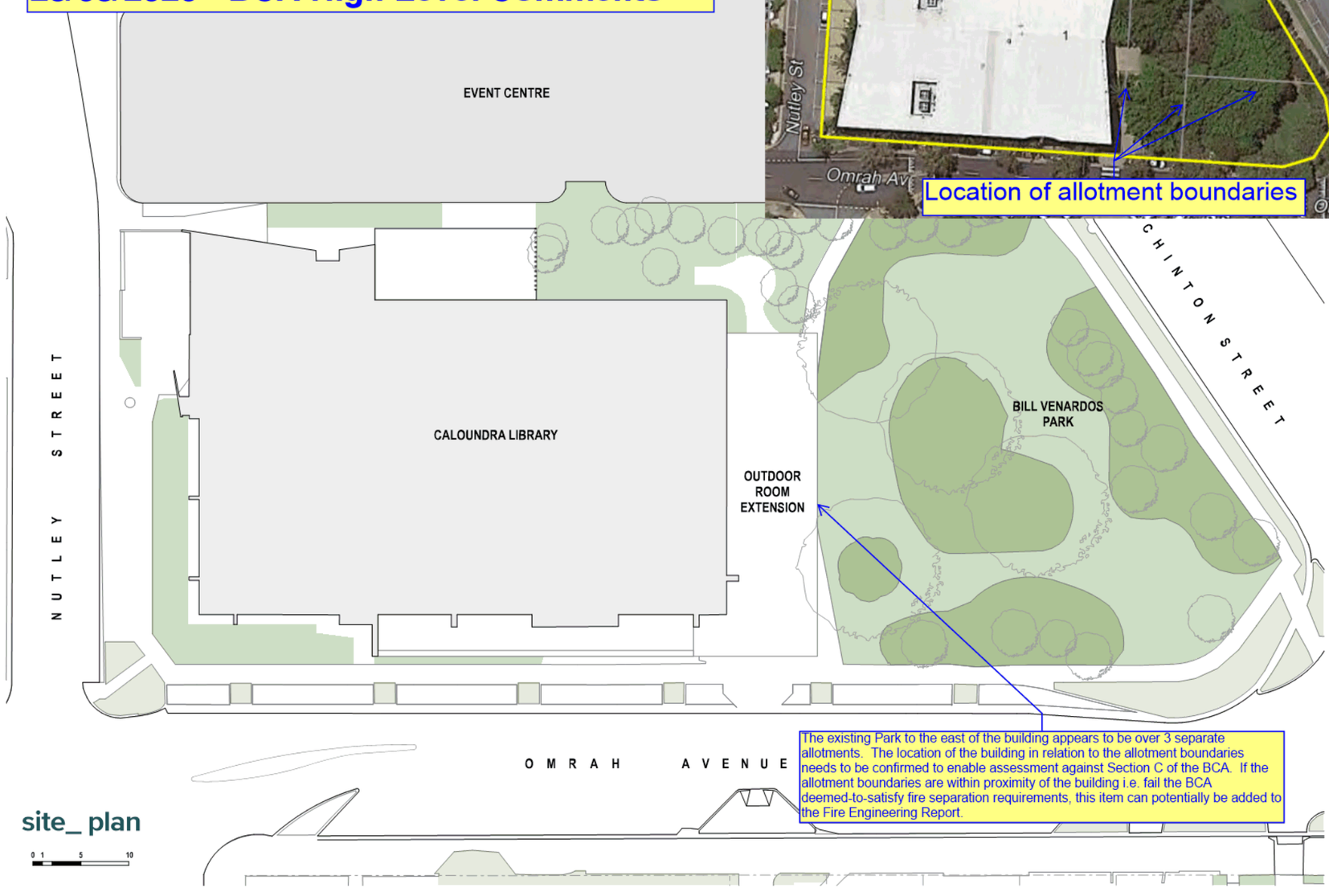
Appendix B - BCA High Level Comments on Preliminary Design Floor Plans

BCA Preliminary Design Report - Page 33 of 34

concept plans

28/08/2020 - BCA High Level Comments





site_ plan

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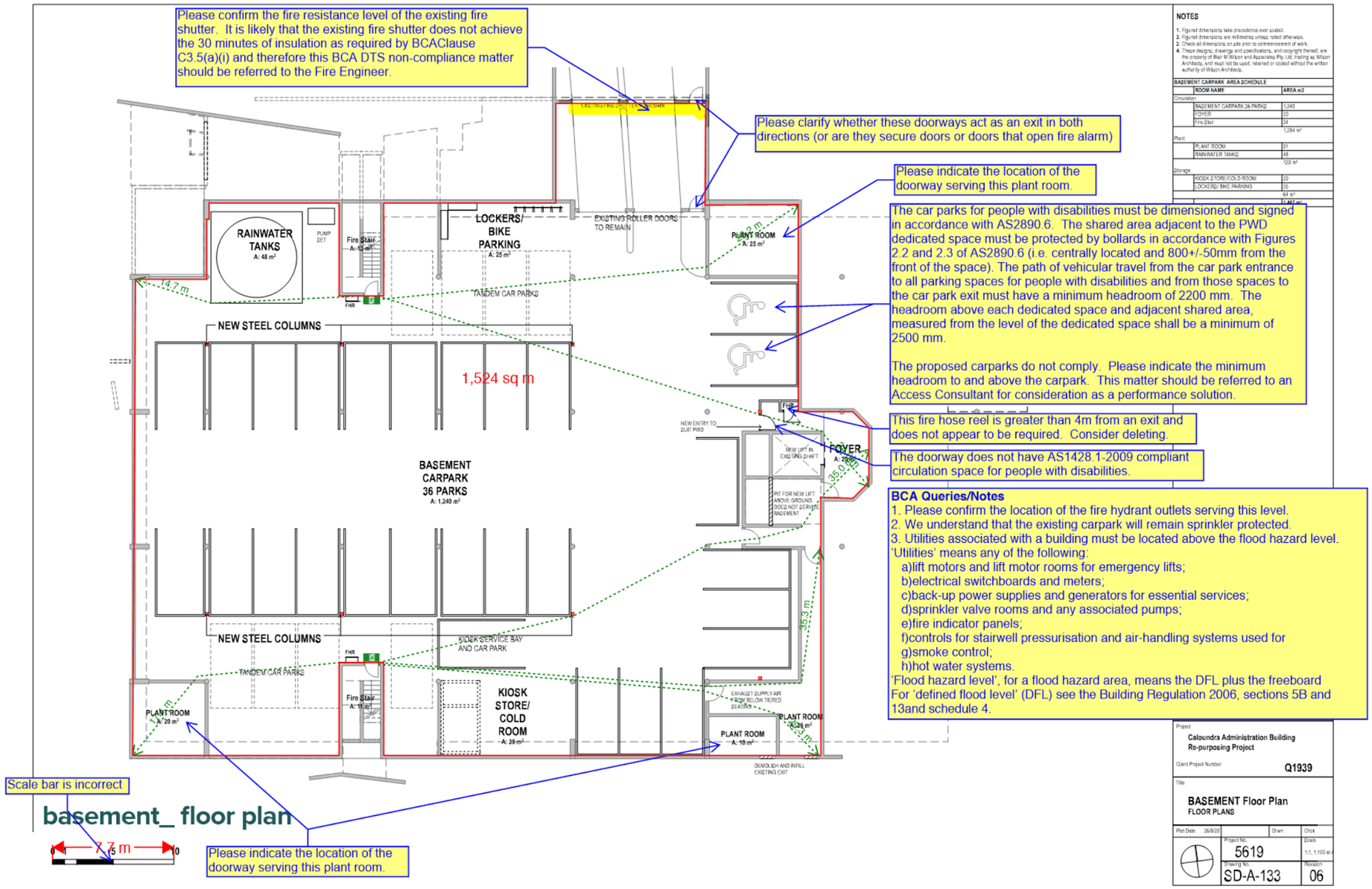
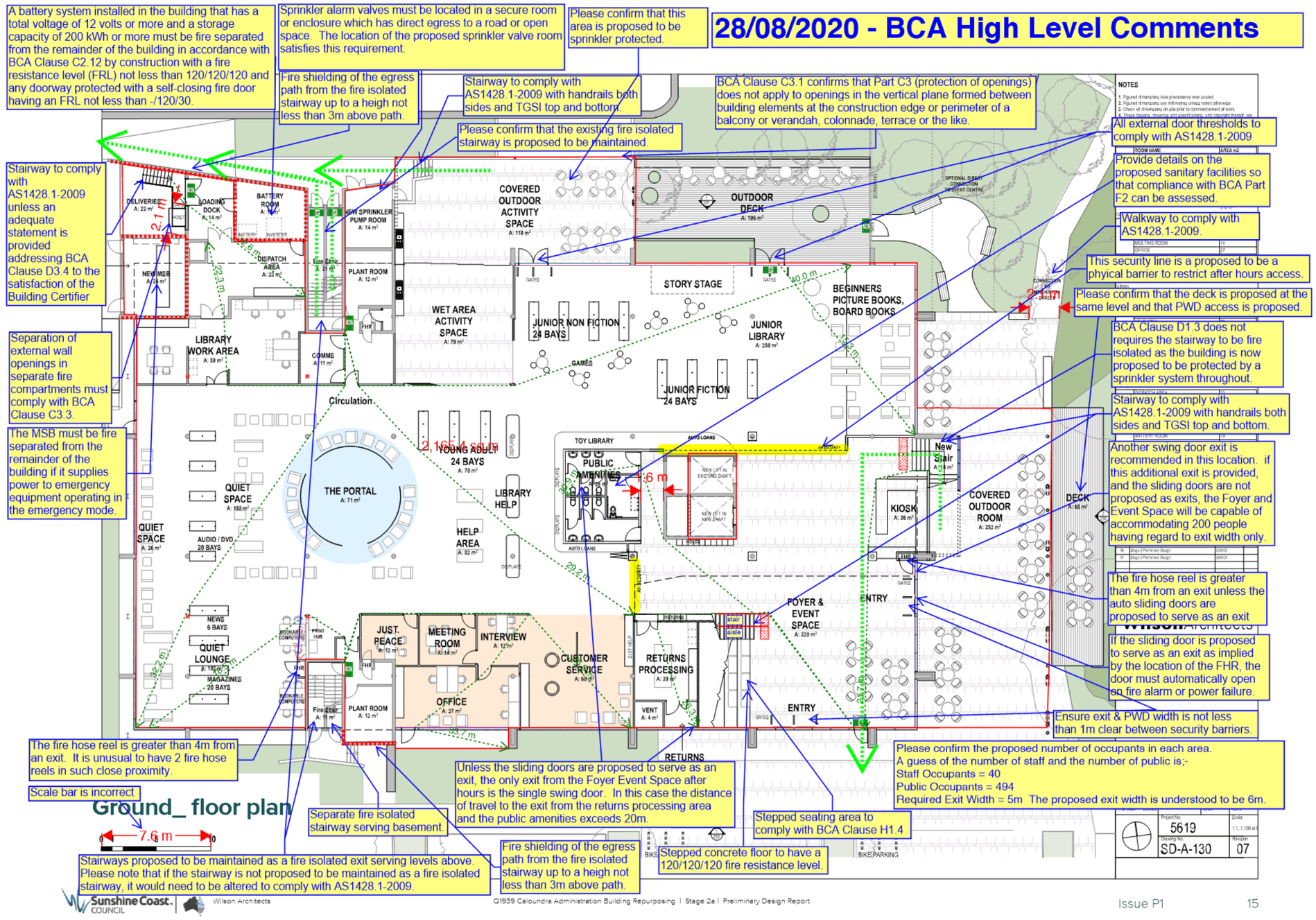
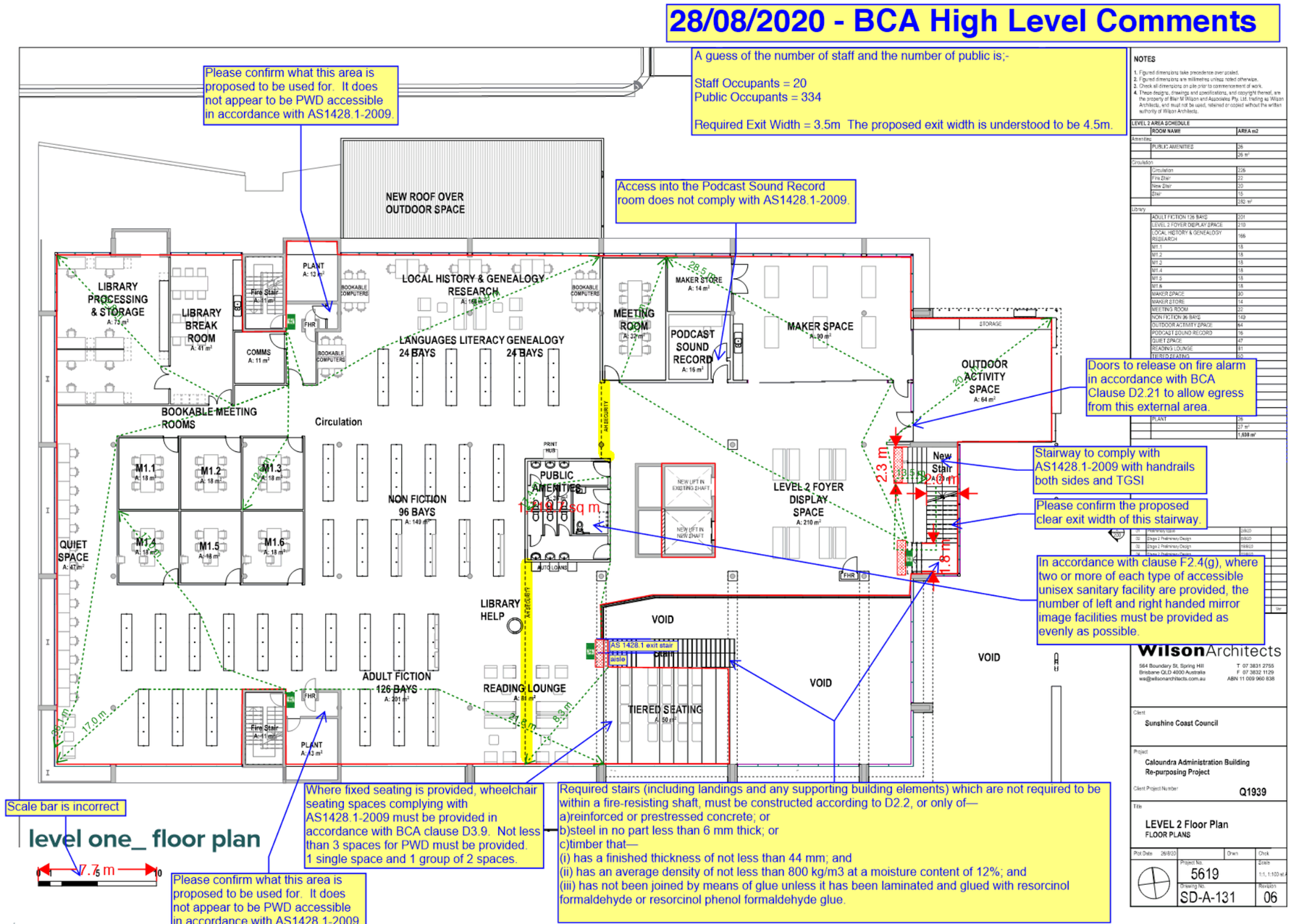
28/08/2020 - BCA High Level Comments

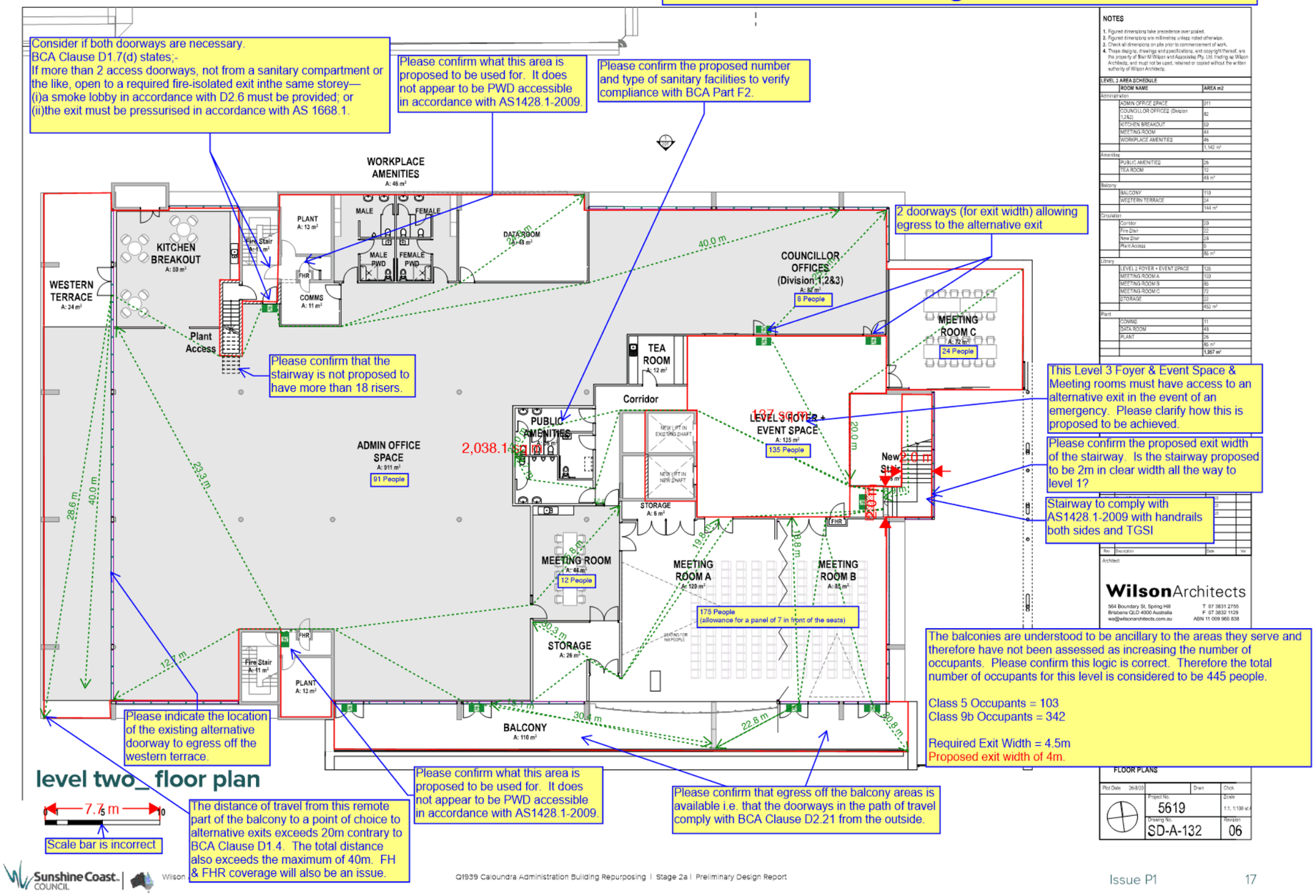



28/08/2020 - BCA High Level Comments
A battery system installed in the building that has a total voltage of 12 volts or more and a storage capacity of 200 kWh or more must be fire separated from the remainder of the building in accordance with BCA Clause C2.12 by construction with a fire resistance level (FRL) not less than 120/120/120 and any doorway protected with a self-closing fire door having an FRL not less than -/120/30.
Sprinkler alarm valves must be located in a secure room or enclosure which has direct egress to a road or open space. The location of the proposed sprinkler valve room satisfies this requirement.
Please confirm that this area is proposed to be sprinkler protected.
Fire shielding of the egress path from the fire isolated stairway up to a heigh not less than 3m above path.
Stairway to comply with AS1428.1-2009 with handrails both sides and TGSI top and bottom.
Please confirm that the existing fire isolated stairway is proposed to be maintained.
BCA Clause C3.1 confirms that Part C3 (protection of openings) does not apply to openings in the vertical plane formed between building elements at the construction edge or perimeter of a balcony or verandah, colonnade, terrace or the like.
Stairway to comply with AS1428.1-2009 unless an adequate statement is provided addressing BCA Clause D3.4 to the satisfaction of the Building Certifier
All external door thresholds to comply with AS1428.1-2009
Provide details on the proposed sanitary facilities so that compliance with BCA Part F2 can be assessed.
Walkway to comply with AS1428.1-2009.
This security line is a proposed to be a phyical barrier to restrict after hours access.
Please confirm that the deck is proposed at the same level and that PWD access is proposed.
Separation of external wall openings in separate fire compartments must comply with BCA Clause C3.3.
BCA Clause D1.3 does not requires the stairway to be fire isolated as the building is now proposed to be protected by a sprinkler system throughout.
Stairway to comply with AS1428.1-2009 with handrails both sides and TGSI top and bottom.
The MSB must be fire separated from the remainder of the building if it supplies power to emergency equipment operating in the emergency mode.
Another swing door exit is recommended in this location. if this additional exit is provided, and the sliding doors are not proposed as exits, the Foyer and Event Space will be capable of accommodating 200 people having regard to exit width only.
The fire hose reel is greater than 4m from an exit unless the auto sliding doors are proposed to serve as an exit
If the sliding door is proposed to serve as an exit as implied by the location of the FHR, the door must automatically open on fire alarm or power failure.
Ensure exit & PWD width is not less than 1m clear between security barriers.
Please confirm the proposed number of occupants in each area.
A guess of the number of staff and the number of public is;-
Staff Occupants = 40
Public Occupants = 494
Required Exit Width = 5m The proposed exit width is understood to be 6m.
The fire hose reel is greater than 4m from an exit. It is unusual to have 2 fire hose reels in such close proximity.
Unless the sliding doors are proposed to serve as an exit, the only exit from the Foyer Event Space after hours is the single swing door. In this case the distance of travel to the exit from the returns processing area and the public amenities exceeds 20m.
Scale bar is incorrect
Ground_ floor plan
7.6 m
Separate fire isolated stairway serving basement.
Stepped seating area to comply with BCA Clause H1.4
Fire shielding of the egress path from the fire isolated stairway up to a heigh not less than 3m above path.
Stepped concrete floor to have a 120/120/120 fire resistance level.
Stairways proposed to be maintained as a fire isolated exit serving levels above. Please note that if the stairway is not proposed to be maintained as a fire isolated stairway, it would need to be altered to comply with AS1428.1-2009.
COVERED OUTDOOR ACTIVITY SPACE
OUTDOOR DECK
STORY STAGE
BEGINNERS PICTURE BOOKS, BOARD BOOKS
JUNIOR LIBRARY
JUNIOR NON FICTION 24 BAYS
JUNIOR FICTION 24 BAYS
WET AREA ACTIVITY SPACE
LIBRARY WORK AREA
YOUNG ADULT 24 BAYS
THE PORTAL
QUIET SPACE
AUDIO / DVD 20 BAYS
NEWS 6 BAYS
QUIET LOUNGE
MAGAZINES 20 BAYS
LIBRARY HELP
HELP AREA
PUBLIC AMENITIES
TOY LIBRARY
AUTO LOANS
KIOSK
COVERED OUTDOOR ROOM
DECK
FOYER & EVENT SPACE
ENTRY
RETURNS PROCESSING
CUSTOMER SERVICE
JUST. PEACE
MEETING ROOM
INTERVIEW
OFFICE
PLANT ROOM
DISPATCH AREA
LOADING DOCK
BATTERY ROOM
NEW MSB
NEW SPRINKLER PUMP ROOM
COMMS
Circulation
BIKE PARKING
Project No. 5619
Drawing No. SD-A-130
Revision 07
Issue P1
15

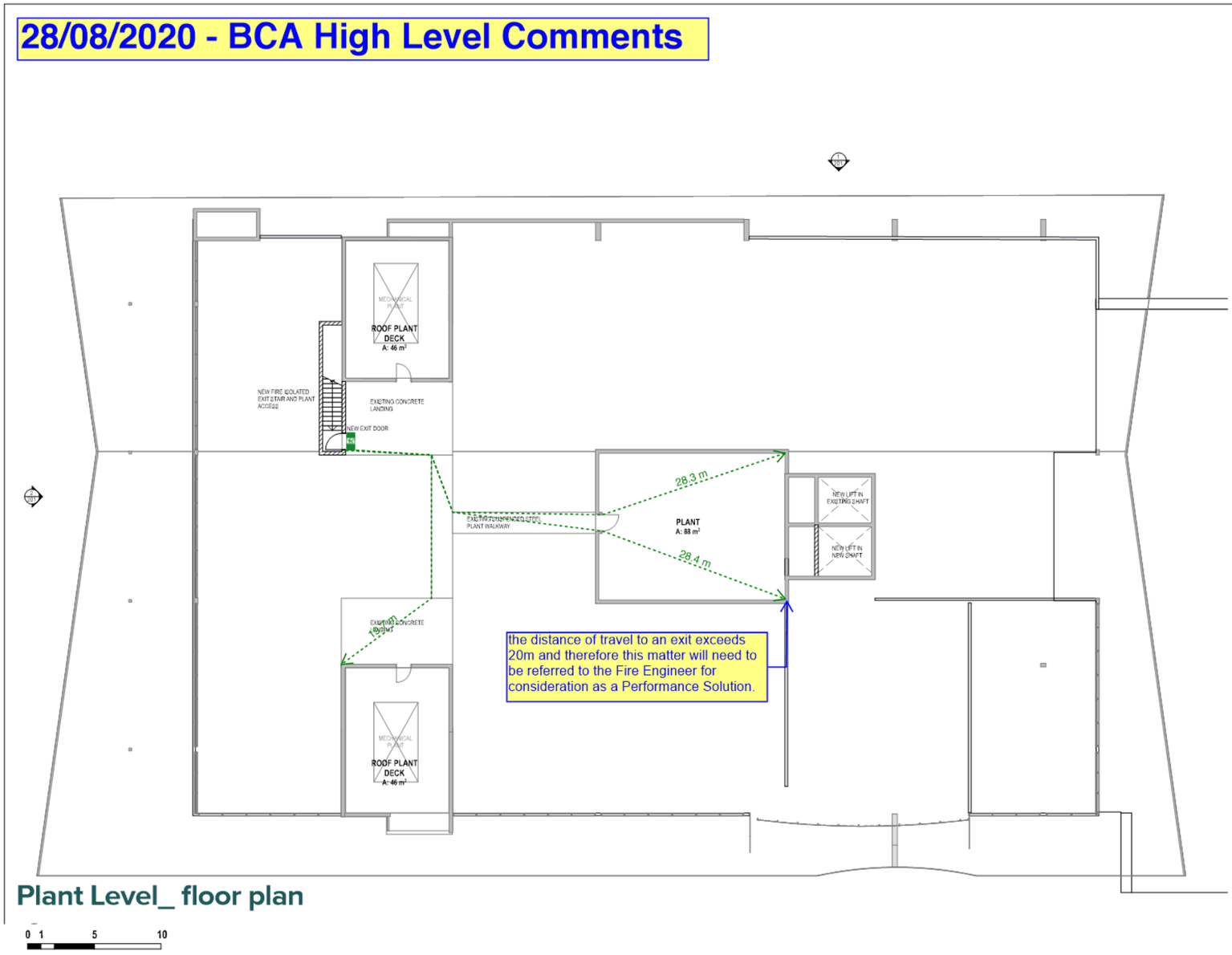
28/08/2020 - BCA High Level Comments



28/08/2020 - BCA High Level Comments



28/08/2020 - BCA High Level Comments



NOTES

1. Figured dimensions take precedence over scaled.
2. Figured dimensions are mill metres unless noted otherwise.
3. Check all dimensions on site prior to commencement of work.
4. These designs, drawings and specifications, and copyright thereof, are the property of Blair M Wilson and Associates Pty. Ltd. trading as Wilson Architects, and must not be used, retained or copied without the written authority of Wilson Architects.

Rev	Description	Date	Ver
01	Stage 2 Preliminary Design	19/8/20	
02	Stage 2 Preliminary Design	19/8/20	
03	Stage 2 Preliminary Design	20/8/20	
04	Stage 2 Preliminary Design	26/8/20	

Architect
WilsonArchitects
564 Boundary St, Spring Hill
Brisbane QLD 4000 Australia
wa@wilsonarchitects.com.au
T 07 3831 2755
F 07 3832 1129
ABN 11 009 960 838

Client
Sunshine Coast Council

Project
Caloundra Administration Building Re-purposing Project

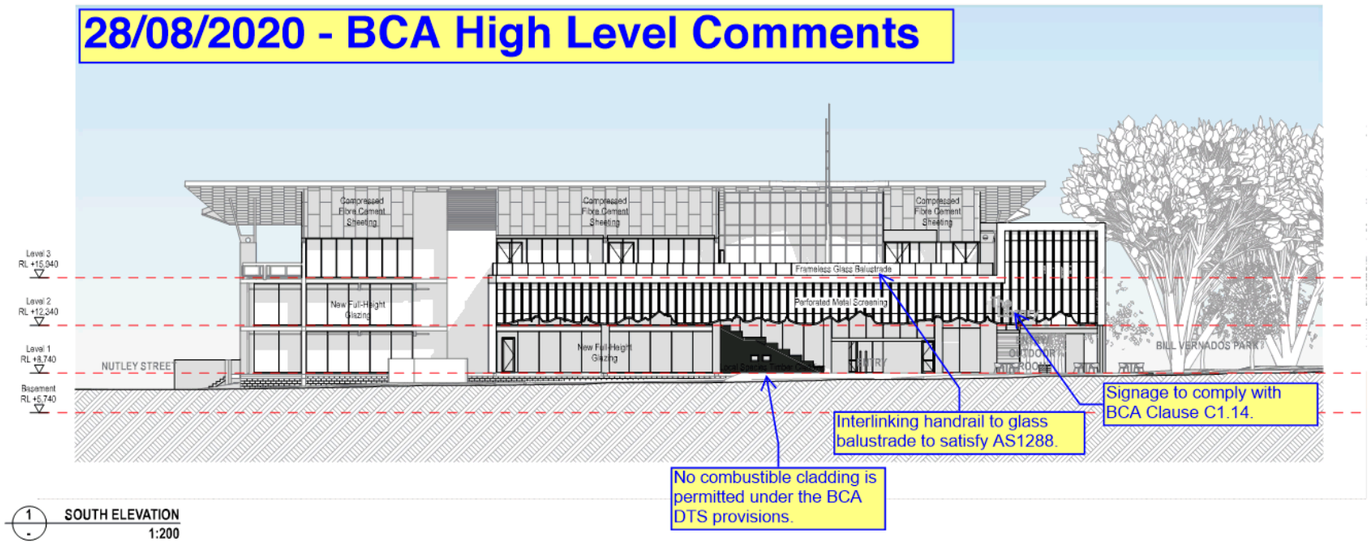
Client Project Number
Q1939

Title
PLANT ROOM Level
FLOOR PLANS

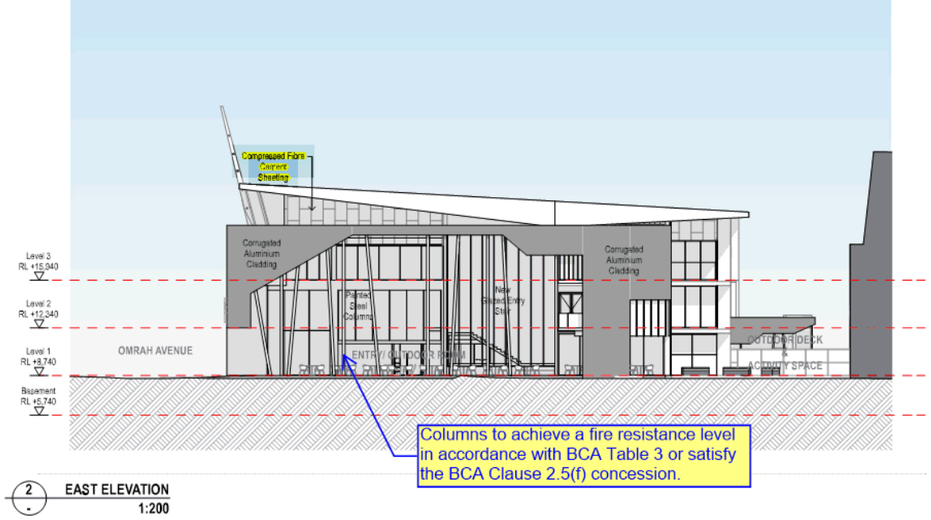
Plot Date	Drawn	Check
26/8/20		

Project No. 5619
Scale 1:1, 1:100 at A1
Drawing No. SD-A-134
Revision 04

28/08/2020 - BCA High Level Comments

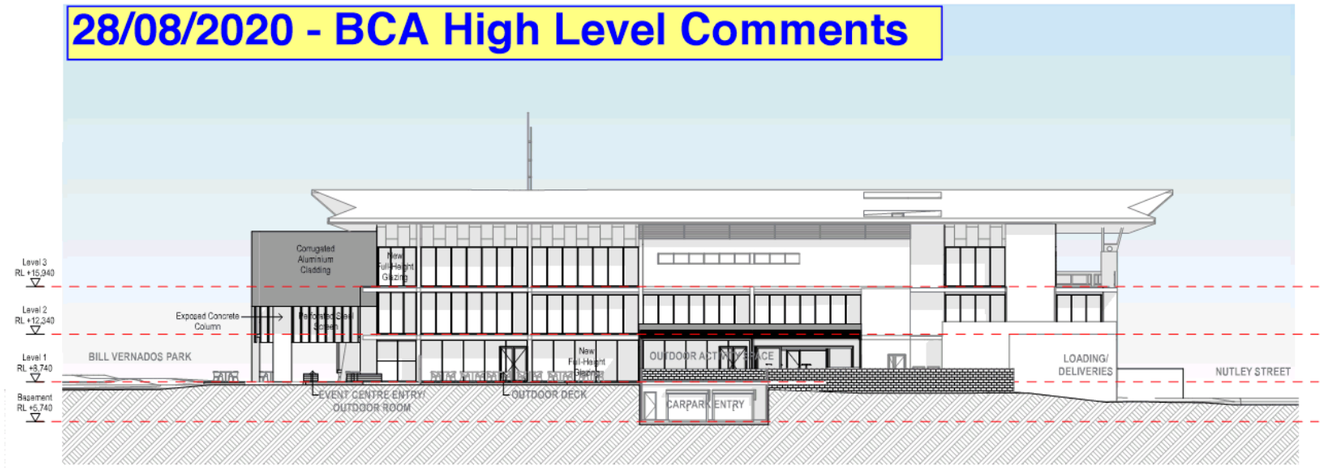


1 - SOUTH ELEVATION 1:200

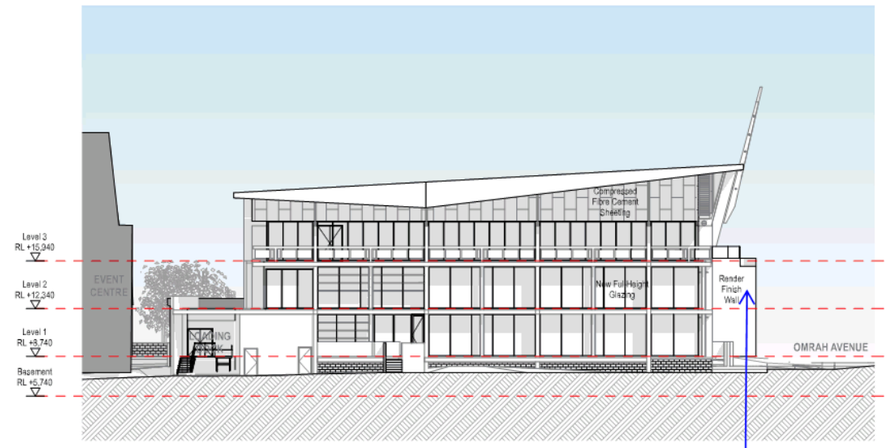


2 - EAST ELEVATION 1:200

28/08/2020 - BCA High Level Comments



1 / - NORTH ELEVATION
1:200



Render to be non-combustible. This is currently a matter of concern for some Brisbane projects where render with some combustible parts may have been used.

2 / - WEST ELEVATION
1:200

Appendix C – Sunshine Coast Regional Council Site Report

Sites Contact Council

Sunshine Coast Council | DEVELOPMENT.i

Site Report©

The following report has been automatically generated to provide an indication (only) of development related information applying to the site.

For more information and to determine if the mapping overlays are applicable, refer to the Sunshine Coast Planning Scheme 2014. This report is not intended to replace the requirement to carry out a detailed assessment of Council and State controls. You are advised to seek your own professional advice on town planning laws and other controls that may impact on the existing or intended use of the subject site.

If you are undertaking conveyancing, development or building certification, it is recommended that Council property searches are sought. These may include (but not limited to) building information searches, planning and development certificates and flood information searches.

Site Information

Change location

Property Address	Council Chambers 1 Omrah Ave CALOUNDRA QLD 4551
Lot Plan	22RP883293
Land Area	3326 SQ METRES
More Information	›View in MyMaps. ›View in Development.i. ›View in SARA Mapping (External Site). ›View in Google Street View (External Site).

Location Map

Land Details - SCC

Contour Map

Land Details - SCC

Water & Sewer Infrastructure Map

The following information has been provided and maintained by Unitywater. Please contact Unitywater directly for any errors or omissions. Limited layers have been displayed for the purpose of this report. Go to Unitywater's Web Mapping Application for more information. Usage in agreement with © Unitywater 2017 terms and conditions.

- Sewer Manhole - Flume Pit
- Sewer Manhole - Maintenance Shaft
- Sewer Manhole - Manhole
- Sewer Manhole - Vacuum Collection Pit
- Water Hydrant - Bulk Supply Point
- Water Hydrant - Hydrant
- Sewer Gravity Main - Trunk Main
- Sewer Gravity Main - Reticulation Main
- Sewer Gravity Main - Overflow Main
- Sewer Gravity Main - Siphon Main
- Sewer Pressure Main - Pressure Sewer
- Sewer Pressure Main - Rising Main
- Sewer Pressure Main - Vacuum Main
- Water Network Meter - Network Meter
- Water Main - Raw Water Main
- Water Main - Trunk Main
- Water Main - Reticulation Main
- Land Details - SCC

Applications Associated with Site

Development & Building applications lodged to Sunshine Coast Council since 2007 and searchable on Development.i.

Note: This list does not include applications lodged under the provisions of the *Economic Development Act 2012* with respect to the Caloundra South Priority Development Area (Aura) and Maroochydore City Centre Priority Development Area. Visit the web links to get an overview of the approval process for these areas and how to get further information.

Lodged over current land parcel (In Progress):	❯PC17/3586 - REFURBISHMENT - Council Chambers 1 Omrah Ave CALOUNDRA - McKenzie Group Consulting Qld Pty Ltd, Received: Mon Jun 19 2017

Other Approval Information

- Key residential and industrial approvals varying the effect of a Planning Scheme; or
- Master Plan details for land within Development Control Plan 1 – Kawana Waters

Sunshine Coast Planning Scheme 2014

Growth Management Area	❯Land within the Urban Growth Management Boundary
Zones: View Tables of Assessment View Zone Codes	❯Major Centre Zone
Local Plan Area: View Tables of Assessment View Local Plan Codes	❯Caloundra Local Plan Area
Local Plan Precincts: View Tables of Assessment View Local Plan Codes	❯CAL LPSP-1b, Community and Creative Hub ❯Gateway Precinct
Land Subject to Acid Sulfate Soils Overlay: View Tables of Assessment View Overlay Code	❯Area 2 : land above 5m AHD and below 20m AHD
Land Subject to Airport Environs Overlay: View Tables of Assessment View Overlay Code	❯Obstacle Limitation Surface (OLS)
Height of Buildings and Structures Overlay: View Tables of Assessment View Overlay Code	❯30 metres
Priority Infrastructure Plan: View Priority Infrastructure Plan View Priority Infrastructure Plan Maps	❯Priority Infrastructure Area

Growth Management Area

Urban Growth Management Boundary
Rural Residential Growth Management Boundary

Zones:

View Tables of Assessment

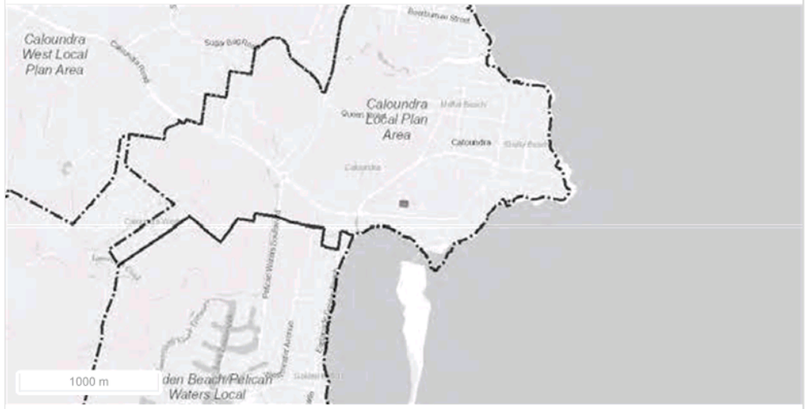
View Zone Codes

Low Density Residential Zone
Medium Density Residential Zone
High Density Residential Zone
Tourist Accommodation Zone
Principal Centre Zone
Major Centre Zone
District Centre Zone
Local Centre Zone
Sport and Recreation Zone
Open Space Zone
Environmental Management and Conservation Zone
Low Impact Industry Zone
Medium Impact Industry Zone
High Impact Industry Zone
Waterfront and Marine Industry Zone
Community Facilities Zone
Emerging Community Zone
Limited Development (Landscape Residential) Zone
Rural Zone
Rural Residential Zone
Specialised Centre Zone
Tourism Zone

Local Plan Area:

View Tables of Assessment

View Local Plan Codes

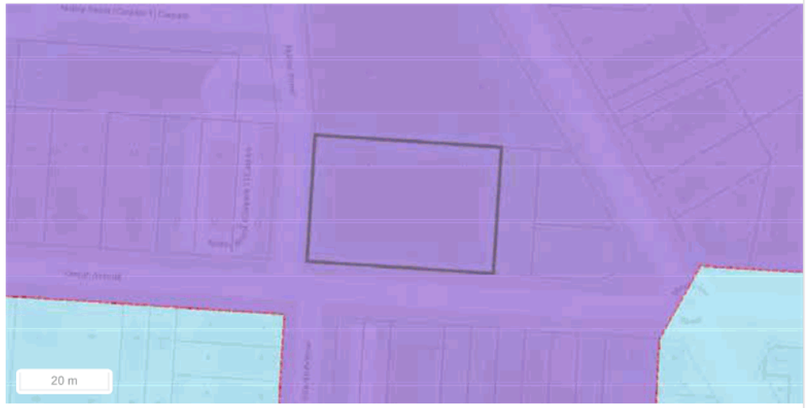


Local Plan Area Boundary

Local Plan Precincts:

View Tables of Assessment

View Local Plan Codes



CAL LPSP-1a, Destination Centre
CAL LPSP-1b, Community and Creative Hub
CAL LPSP-1c, Gateway
CAL LPSP-1d, Central Park Urban Village
CAL LPSP-1e, Caloundra Hospitality Area
KAW LPSP-4a, Urban Village Residential
KAW LPSP-4b, Bermagui Crescent/Iluka Avenue
KAW LPSP-4c, Pacific Boulevard
MAR LPSP-1, Ocean Street Food and Music Sub-Precinct
SID LPSP-1a, Sippy Downs Town Centre Core
SID LPSP-1b, Sippy Downs Business and Technology Sub-precinct
SID LPSP-1c, Sippy Downs West Neighbourhood

Local Plan Precincts:

View Tables of Assessment

View Local Plan Codes

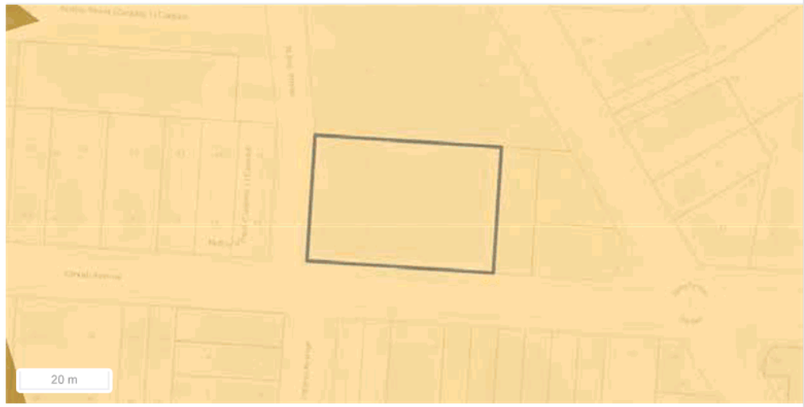
- BUD LPP-1, Gloucester Road South
- Gateway Precinct
- CAL LPP-2, Moffat Beach/Shelly Beach/Dicky Beach
- CAL LPP-3, Caloundra Aerodrome
- CAW LPP-1, Homestead Drive
- COL LPP-1, Palmer Coolum Resort and The Coolum Residences
- EUM LPP-1, Eumundi Butter Factory
- KAW LPP-1, South of Point Cartwright Drive
- KAW LPP-2, North of Point Cartwright Drive
- KAW LPP-3, Nicklin Way North Minyama
- KAW LPP-4, Buddina Urban Village
- KAW LPP-5, Nicklin Way Warana
- KAW LPP-6, Regatta Boulevard Wurtulla
- LAN LPP-1, Landsborough Town West
- LAN LPP-2, Landsborough Town East
- MAH LPP-1, Mooloolaba Spit Government Uses
- MAH LPP-2, Mooloolaba Heart Street Activation
- MAR LPP-1, City Core
- MAR LPP-2, Aerodrome Road
- MAR LPP-3, Maroochy Boulevard/Dalton Drive
- MAR LPP-4, Wharf Street
- MAR LPP-5, Maud Street/Sugar Road
- MAL LPP-1, Maleny Community Precinct
- MAL LPP-2, Maleny West
- MAL LPP-3, Walkers Creek
- MAL LPP-4, Maleny North
- MNS LPP-1, Sunshine Coast Airport

- MNS LPP-2, Town of Seaside
- MNS LPP-3, Marcoola Tourist Accommodation
- NAM LPP-1, Nambour Special Entertainment Precinct
- NAM LPP-2, Former Mill Site
- NAM LPP-3, Town Centre Frame
- NAM LPP-4, Nambour Health Hub
- SID LPP-1, Sippy Downs Town Centre

Land Subject to Acid Sulfate Soils Overlay:

View Tables of Assessment

View Overlay Code



- Area 1 : land at or below 5m AHD
- Area 2 : land above 5m AHD and below 20m AHD

Land Subject to Airport Environs Overlay:

View Tables of Assessment

View Overlay Code

Obstacle Limitation Surface (OLS)

Height of Buildings and Structures Overlay:

View Tables of Assessment

View Overlay Code

8.5 metres
10 metres
12 metres
15 metres
18 metres
21 metres
25 metres
30 metres
37.5 metres
40 metres
45 metres
Unspecified maximum height

Priority Infrastructure Plan:

View Priority Infrastructure Plan

View Priority Infrastructure Plan Maps

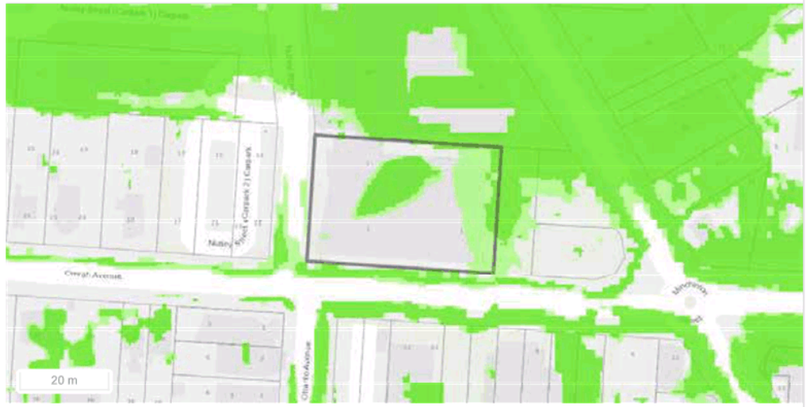
Priority Infrastructure Area

Additional Site Information

Flood Hazard Area/Defined Flood Extent

This map contains the most recent flooding information mapped by Sunshine Coast Council and differs from the Sunshine Coast Planning Scheme 2014, Flood Hazard Overlay. The information presented on this map is relevant to most general flood mapping enquiries, including those relating to flood insurance. Click here for more information.
If you are undertaking conveyancing, development or building certification, it is recommended that you make application to Council for a flood information search. A Council flood information search provides detailed flood information that considers different mechanisms of flooding and specifies the freeboard required for determining a finished floor level. Flood mapping alone cannot provide all the information that is given on a flood information search.

Flood Hazard Area/Defined Flood Extent



Current Climate Riverine Flooding (Flood Modelling)
Future Climate Riverine Flooding (Flood Modelling)
Current Climate Local Flooding (Flood Modelling)
Future Climate Local Flooding (Flood Modelling)
Possible Flooding Beyond Model Boundaries
Modified Flood Extent (Recent Development)

Contact council

Council offices
General contacts
Councillor contacts
Development contacts

Site help & accessibility

Website support
Accessibility
A to Z listing

Stay connected

Structural Engineering Report

The Structural Engineer has reviewed the TOD group reports including the most recent report on the 28th May 2019 (refer following page). They have also made a site visit on the 13th December to inspect the buildings structure. Below is a summary of comments from the minutes of the meeting on the day.

Building Design Load for a building of this type is 3kPa. This is also nominated on the existing structural drawings. TOD Group advice is that building only has the capacity to support what is currently on the floor ie 1.5 - 2kPa only. Library design requires 4KPa capacity for reading rooms with book storage. For book stacking areas a loading of 5.9kPa may apply (3.3kN/m of stacked height assumed to be 1.8m). In our experience this requirement may not generally be necessary, as currently, Library shelving is designed to be lower and more accessible for people with disabilities.

Strengthening of the structure will be required to re-purpose the building. How much strengthening is required depends on the actual capacity of the existing slab. TOD report notes that scans conducted of the existing structure indicate the built reinforcement may not be as per the working drawings. In order to verify the current capacity of the slab it would require xray scanning and destructive testing. Xray scanning is limited in its capacity, as it can only indicate bar locations, not gauge. Further work is required to ascertain the bar gauge. This is achieved by opening up areas of the concrete to sample bar locations to confirm the gauge of reinforcement. Slab thickness scanning is accurate but requires calibration by drilling holes to confirm slab thickness. Concrete strength testing is relatively straightforward.

An assessment on the existing footings and columns has been undertaken on the assumption of a live load of 4.3 kPa general load applied to each level; 4 kPa being the typical live load given in AS1170.2 for reading rooms with book storage such as libraries. The additional 0.3 kPa is to make allowance for lightweight partition walls. The current columns and foundations appear to have suitable capacity to accommodate these increased loads when accounting for some slight reductions in load as is permissible in AS1170.

Following this assessment some options for strengthening the slab to support a anticipated loading of 4kPa have been proposed, illustrated on the following pages.

Earthquake Loading

The Structural Engineer has undertaken a review of the existing structure with regards to capabilities to resist earthquake loadings. Within the requirements of the current earthquake code AS1170.4 R2018 and concrete structures code AS3600-2018 there are a number of detailing provisions that are required to satisfy earthquake loading requirements. Given the age of the building, these detailing provisions would not have been allowed for during construction, and as such are non-compliant with current earthquake codes in that respect.

The Structural Engineer has also undertaken a review of the structure against AS3826 (strengthening of existing buildings for earthquake). The analysis has indicated that the existing structure will have sufficient capacity to accommodate earthquake loading when assessed against the requirements of AS3826, whilst taking in to account the loading requirements of AS1170.4 R2018 with a level of importance of 2.

Refer to the Building Certification report for further advice on Earthquake Loading.

Capacity to resist a catastrophic event

The existing building is not reasonably capable of being strengthened to resist a catastrophic event. SCC have confirmed that use as a Disaster Recovery Centre is not required of the building as this function is provided at other locations such as Nambour and Maroochydore. Instead, the building might be used as a space to manage a disaster, if such an event was to occur elsewhere.

G7. The structural work shown on this drawing has been designed under AS1170.1 & 2-1989 SAA Loading Code Parts 1 & 2 for the following criteria:

WIND LOAD	MEAN RETURN PERIOD		50 YRS
	TERRAIN CATEGORY	North, West DIRECTION	3.0
		South, East DIRECTION	2.0
	SHIELDING FACTOR		0.9
	BASIC WIND VELOCITY		49 METRES/SEC
LIVE LOADS	GENERAL FLOOR LOAD		3 kPa *
	STAIRS, LANDINGS, BALCONIES		4 kPa
EXPOSURE CLASSIFICATION			A1, B2
FIRE RESISTANCE RATING			2.0 HRS

LEVEL	ELEMENT		
	COLUMNS	WALLS	FLOORS
BASEMENT	2 HRS	2 HRS	2 HRS
LEVEL 1-3	2 HRS	2 HRS	2 HRS

Excerpt from Drawing 28039-S2 Issue H

TOD Group Report

HG:CN 10661-9
28 May 2019

Sunshine Coast Council
Locked Bag 72
SCMC QLD 4560

ATTENTION: Jeffrey Lamont

Dear Sir,

RE: CALOUNDRA ADMIN BUILDING – FLOOR LEVEL SURVEY

1.0 INTRODUCTION

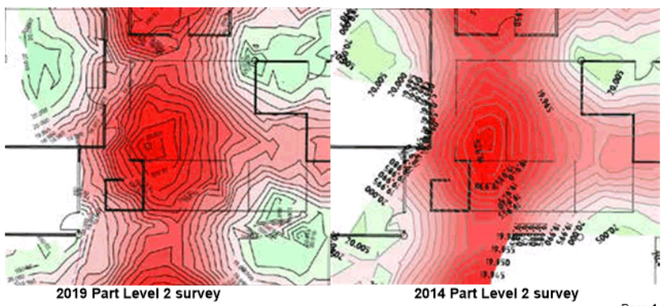
As requested by the Sunshine Coast Council; Tod Consulting Engineers have carried out a review of the Floor Level Surveys provided by Downes Group (dated 8th May 2019) of Level 1, 2, and 3 of the Sunshine Coast Council Caloundra Administration Building.

2.0 SURVEY REVIEW

We have reviewed and compared these recent 2019 floor level surveys to the previous Downes Survey Group from 2011 and 2014 and the maximum deviation in the floor slab levels are as follows:

	2019 survey	2014 survey	2011 survey
Level 1 Floor:	85mm maximum deviation (=10.010 – 9.925)	75mm maximum deviation (=10.010 – 9.935)	77mm maximum deviation (=10.013 – 9.936)
Level 2 Floor	95mm maximum deviation (=20.015 - 19.920)	80mm maximum deviation (=20.005 – 19.925)	83mm maximum deviation (=20.013 – 19.930)
Level 3 Floor:	85mm maximum deviation (=30.020 – 29.935)	85mm maximum deviation (=30.020 – 29.935)	-

When comparing the 2019 survey to the 2014 survey, there appears to be an approximate 10mm increase in the maximum floor level deviation of Level 1. However, it should be noted that one area of slab had 5mm less deviation than 2014 survey. Level 2 has an 10mm increase in the maximum floor deviation from 2014 survey. This may be due to a more detailed 2019 survey – refer below for comparison of the localised area of maximum deviation of the 2019 Level 2 survey to the equivalent area of the 2014 level 2 survey. We also note that the survey drawings states "*Level 2 survey control from previous surveys was not existing at time of this survey with new survey control established*", which may have had an effect on the results.



2019 Part Level 2 survey **2014 Part Level 2 survey**

Noosa: 07 5449 9600
Sunshine Coast: 07 5329 5190
Mackay: 07 4840 2337
PO Box 61, Noosaville, QLD 4566, Australia
www.todconsulting.com

3.0 SUMMARY AND RECOMMENDATIONS

The measured floor slab deflections are, in our opinion, more than double the limits set in the Australian Concrete Code (AS3600).

As there appears to have been an increase in the maximum floor level deviations of Level 1 and Level 2 over the last 5 years, we would recommend the following:

1. The surveyor (Downes Group) be asked by Council to provide comment on the accuracy of the floor survey, and if 10mm difference could be due to more detailed survey or differing control points.
2. That the underside of the Level 1 and 2 slabs be inspected by a Registered Professional Engineer of Queensland (RPEQ) at the locations where the increased deviation has been recorded, to see if there are any physical signs of movement such as cracks in the concrete. They should also inspect the current floor arrangements to confirm if the recommendations of the previous reports have been undertaken:
   - That there are no additional filing / Compactus areas, designated on the suspended slabs of the building, other than those shown on the original design documentation by Glynn Tucker Engineers.
   - The equipment in the proposed Data Room to level 2 shall have a load less than 1.5kPa (150kg per square metre). The proposed loads and location of the "Chillers" for the equipment of the Data Room have been reviewed by Geo Consulting (their reference S5437, dated 22 Feb 2011) – we were not asked to review these loads/locations.
   - Ensure imposed floor loading has not been increased on any of the Level 1, Level 2 or Level 3 floors, and are less than 1.5kPa (150kg per square metre).
   - The Blockwork walls of the Level 3 "Strongroom" have been replaced with light weight stud and plasterboard walls.

The survey contours appear to show a maximum slope/grade of 1:50 (1.14degree or 2%). We are not Ergonomic experts, and therefore are unable to comment if the floor slopes/grades created by the deflections, are acceptable for an office workplace. We would recommend that the Council investigate engaging a suitably qualified Workplace Health and Safety expert to comment/report on if the Caloundra Administration Building floors are within the acceptable limits for an office workplace, as per previous report recommendations. If the floor slopes are deemed excessive by Workplace Health and Safety, then due to the apparent increase in floor deflection of certain areas, we would no longer advise adding extra weight in the form of any type of infill floor framing.

As previously advised, there is little that can be done at this stage to reduce existing deflections or to limit any future on-going increases in slab deflections. In order to permit floor toppings of infill flooring to establish level office floors, we would advise that additional structure would need to be designed and documented. This may involve propping, jacking and/or slab-strengthening procedures, which would be particularly difficult for the Level 1 slab over the existing carpark (vehicle clearances to structure and services).

Pending an inspection by an RPEQ of the floor slabs as noted above; we would also recommend that further floor level surveys of Level 1, 2 and 3 floor slabs should be carried out in 2 years' time (May 2021), to monitor any changes in floor level deflections.

As we have previously advised, responsibility for Structural Adequacy & Certification must remain with the original Engineers who certified the design and inspected the construction.

The information contained in this document produced by Tod Consulting Engineers is solely for the use of Sunshine Coast Council, for the purpose for which it has been prepared. Tod Consulting undertakes no duty to nor accepts any responsibility to any Third Party (including future building owners) who may rely upon this document.

We trust the above advice is helpful. Please do not hesitate to contact us if any clarification is required.

Yours sincerely,

Hamish Gray, Senior Engineer - Structures Group
07 5449 9600 | hg@todconsulting.com
TOD consulting engineers

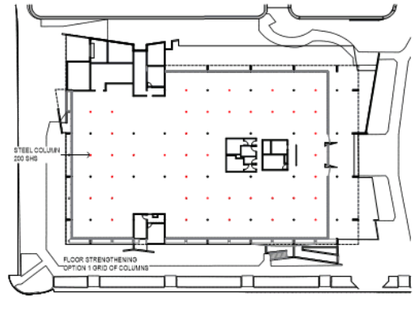
Rectification Options

In selecting a suitable structural rectification approach to the the treatment of the existing slabs to accommodate increased loading requirements a number of structural options and solutions were investigated. The following options are listed along with opportunities and constraints for each individual solution;

OPTION 1 - Grid of Columns

Option 1 was investigated by implementing additional structural columns in the basement to support floor slabs between existing columns to accommodate 4.3 kPa. This option involved the addition of some new footings in the basement, as well as some carbon fibre slab strengthening over the column positions on level 1. This option could have been implemented throughout the building, however would have increased the required footing size. Steel structure is required to be fire rated to 120/-/- however Fire Engineering along with sprinkler protection could see this requirement removed.

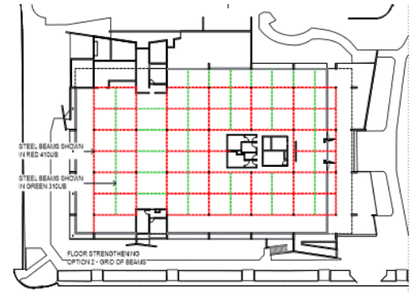
Option 1 reduces the amount of free space for flexible planning, whilst remaining the most suitable where shelving collections are located to permit a grid of columns to work with the planning. This option was assessed to have the greatest impact on the Basement carpark rendering it virtually unusable.



OPTION 2 - Grid of Beams

Option 2 was investigated as a grillage of steel beams between columns, without the use of any additional steel columns or foundations. Due to the relatively large slab spans, these beams would need to be as deep as 460mm in order to support the slab. This option can also be used to strengthen local areas as required. Steel structure is required to be fire rated to 120/-/- however Fire Engineering along with sprinkler protection could see this requirement removed.

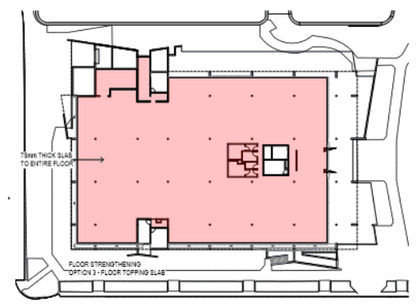
This option was assessed against services requirements. The beam size required would require careful design to accommodate reticulation of mechanical ductwork throughout the floors.



OPTION 3 - Floor Topping

A third was investigated where the existing slab is topped with a bonded topping slab, in order to increase strength. It was estimated that the thickness of this topping slab would need to be 75mm in order to fit in any additional reinforcing steel and maintain cover from a durability perspective.

This option was assessed as only able to be used to top an entire floor , however, not local areas. is anticipated that only one level could be topped to increase strength, as multiple levels would overload the columns and foundations.



RECTIFICATION - Hybrid of structure

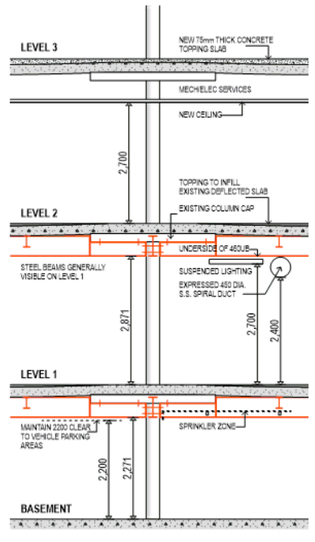
In addressing the loading requirements of the new library program for the existing building, it was deemed that a hybrid structural support solution, which incorporates elements of two structural solutions, would be the most successful;

- Grid of beams solution with additional steel columns where necessary
- Floor topping solution

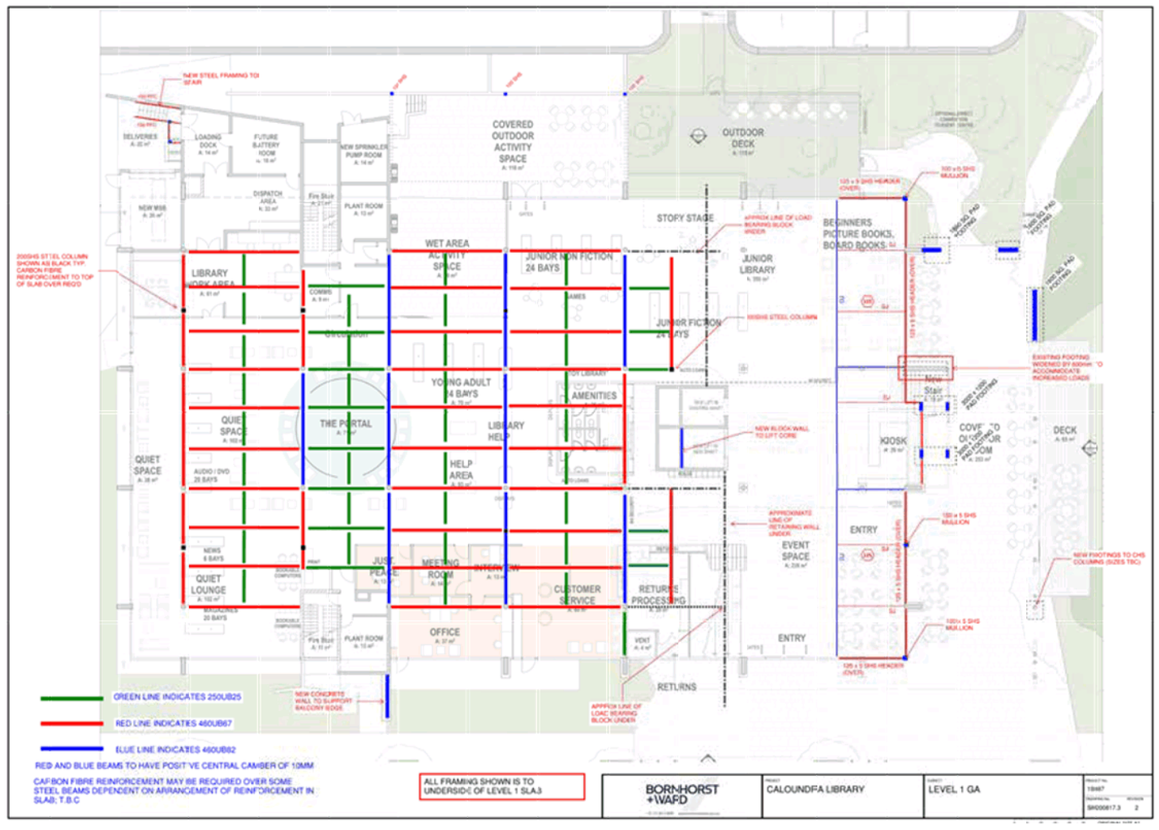
We propose to provide a floor topping solution to Level 3 as it is the topmost floor and has the potential to increase ceiling height.

Level 2 and Level 1 to be supported using a grid of steel beams. Columns will be incorporated supporting floor loads to reduce beam sizes. Careful location will enable extra columns to be incorporated into floor plan design such as collection shelving and to minimise impact on the Basement level car park.

NCC2019 requires that loadbearing internal beams and columns are be required to be fire rated to a minimum of FRL 120/-/-. However the proposed Fire Safety Strategy Report advises that this requirement can be safely excluded.



Typical structural solution section



Proposed Structural design to underside of Level 1

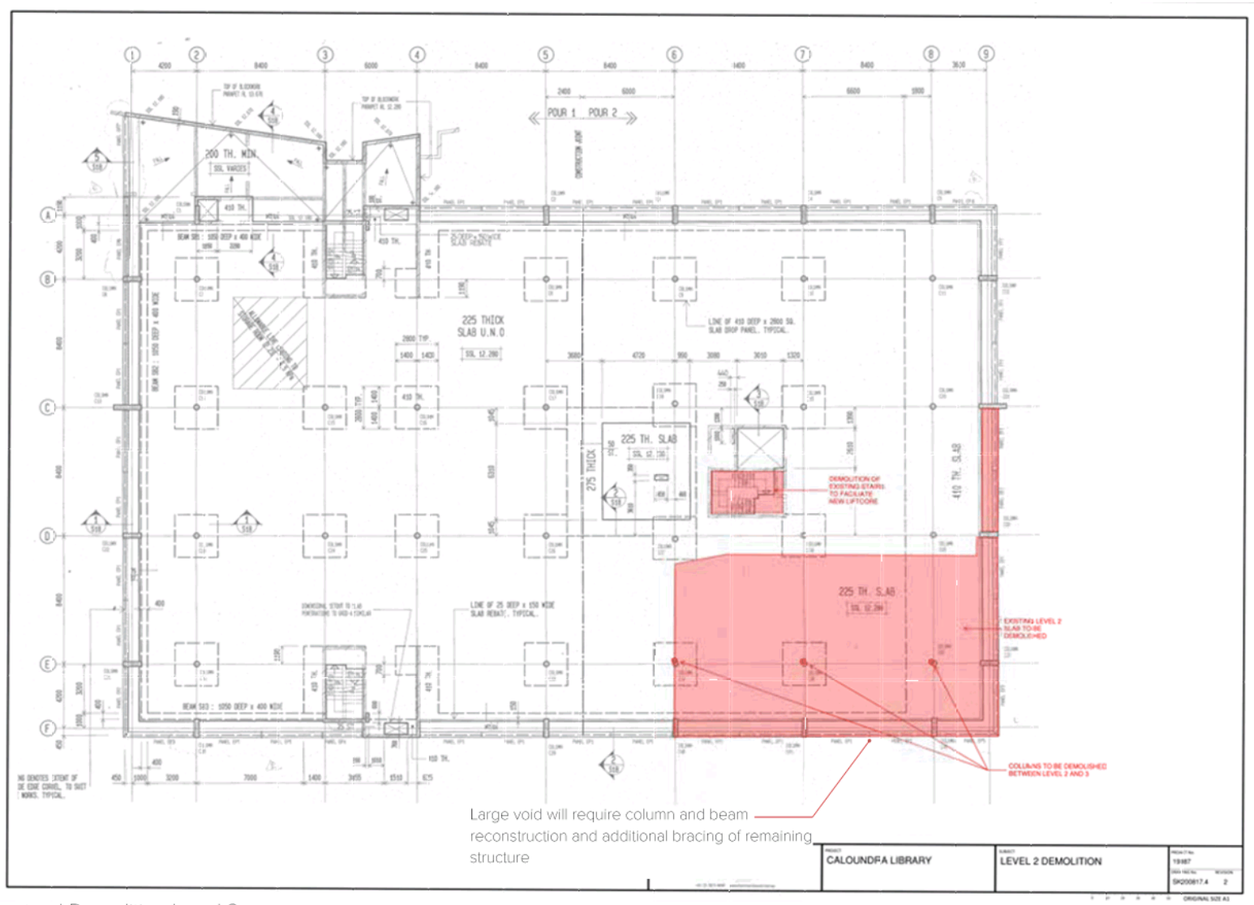
FLOOR VOIDS

Connecting all three levels is desirable in the re-purposing of the building for circulation and intuitive way-finding.

Structural advice is that voids may be cut in the building floor and slab edge thickening. Voids located in these areas, as well as larger voids within the building, will require additional columns and beams to be provided to support remaining structure.

The above-mentioned openings will require more significant structural rectification including reconstruction / reinforcing remaining columns and potentially additional bracing of the remaining structure.

With respect to earthquake performance, while cutting voids will reduce the buildings weight and hence decrease the earthquake loads to a minor degree, it will not overcome the buildings lack of ductility when assessed against the latest concrete codes.



Structural Demolition Level 2

Civil Engineering flood assessment

Refer to Building Certification Report for the requirement under MP3.5 of the Queensland Development Code for utilities associated with the building to be above the flood hazard level.

Utilities include the following:

a) lift motors and lift motor rooms for emergency lifts;

b) electrical switchboards and meters;

c) back-up power supplies and generators for essential services;

d) sprinkler valve rooms and any associated pumps;

e) fire indicator panels;

f) controls for stairwell pressurization and air-handling systems used for smoke control;

h) hot water systems.

In addition any customer dedicated substation located in a building must be above the flood hazard level.

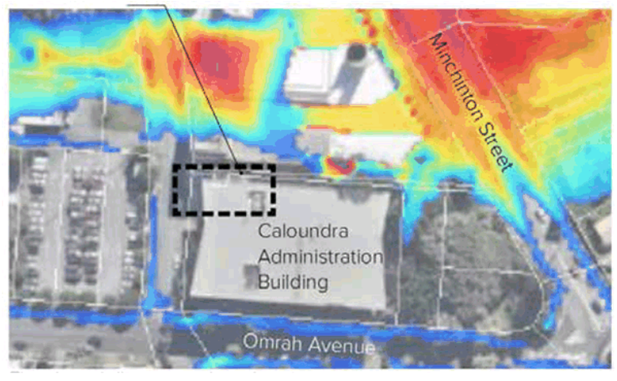
The Basement Carpark Level at RL 5,680 is below the Flood Hazard Level (FHL).

The current sprinkler valve and hydrant pump room is located on the Basement carpark level. As this level sits below the FHL this function is suggested to relocated to Level 1 (Ground), to be housed in the former Switch Room, in order to comply.

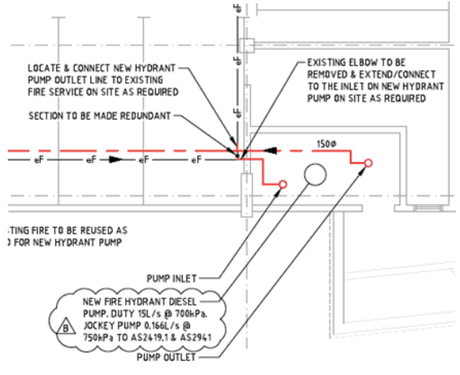
The existing lift is not an emergency lift and so is not affected by this requirement. Refer Lift Services report for more information on the proposed new Lift for the building.

The current Substation Transformer Room at RL 7,380 and the building Switch Room at RL 7,680 are located above the flood hazard level. It is proposed that a new pad mount substation transformer is to be located externally, adjacent to former Substation Transformer Room at RL 7,320, with new MSB located in the former Substation Transformer Room. As previously mentioned above, the new sprinkler valve and hydrant pump room would occupy the former Switch Room which are both located above the flood hazard level.

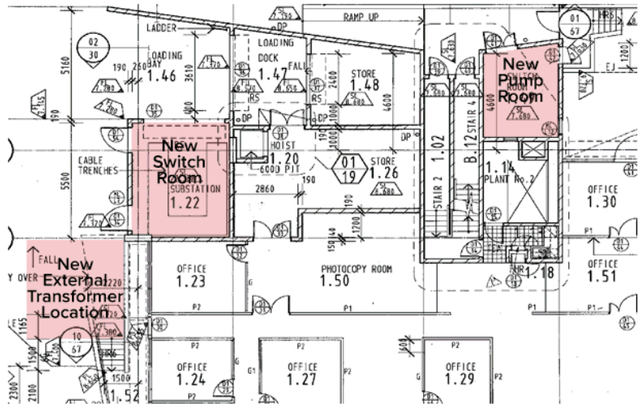
Refer Plan below



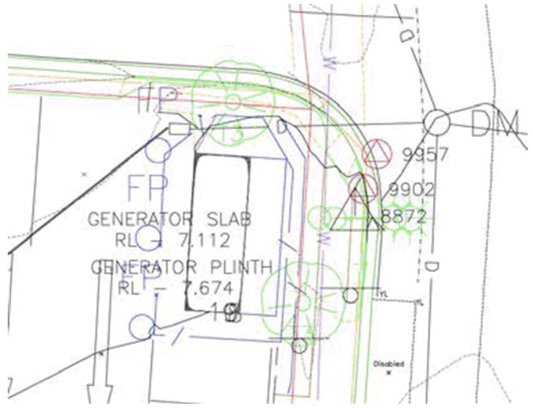
Flood modelling snapshot showing stormwater in a 1% AEP 2100 event



Excerpt from OSKA Consulting Group Drawing 10OH275-00-0100 issue B showing sprinkler valve room and Hydrant pump



Excerpt from original Level 1 floor plan showing New Switch Room at RL 7,380, the New Pump Room at RL 7,680 and the new External Transformer location at RL 7,480 required to be above flood hazard level.



Excerpt from Survey Drawing showing Generator Plinth RL 7.674

Hydraulic and Sustainability Report

Attached is an assessment of the existing hydraulic services systems in the building including:

- Sanitary Plumbing and Drainage.
- Roofwater Drainage
- Domestic Cold Water Services
- Domestic Hot Water Services
- Gas Services
- Wet Fire Services

There are no issues that would prevent the proposed refurbishment from being carried out.

Also attached in the same report is an assessment of sustainability issues in relation to upgrading the building to meet NCC 2019 requirements.

INTEGRAL

Sunshine Coast Council

Caloundra Administration Building Repurposing

REP-CD05

Hydraulics, & Sustainability

Preliminary Design Report

Sunshine Coast COUNCIL

Report No BSCC 0103 PRELIMINARY DESIGN REPORT
Date 23rd February 2021

REPORT AUTHORISATION

PROJECT: **CALOUNDRA ADMINISTRATION BUILDING REPURPOSING PRELIMINARY DESIGN REPORT**

REPORT NO: **BSCC 0103 PRELIMINARY DESIGN REPORT**

Date	Rev	Comment	Prepared by	Checked by	Authorised by
01-05-20	01	Draft	DAT/CRB		
15-05-20	02	Concept Design	DAT/CRB		
26-08-20	03	Preliminary Design Report Draft	DAT/CRB		
15-09-20	04	Preliminary Design Report Draft	DAT/CRB		
23-02-21	05	Preliminary Design Report Final	DAT/CRB		AWJ

Sydney Office
Level 7, 657 Pacific Highway
St Leonards NSW 2065
Tel: +61 2 9431 9431

Level 7, 16 Spring Street
Sydney NSW 2000
Tel: +61 2 9053 6730

E: sydney@integralgroup.com
W: www.integralgroup.com
ABN: 27 618 557 672

Brisbane Office
Level 7, 200 Creek Street
Brisbane QLD 4000
Tel: +61 7 3210 1800

E: brisbane@integralgroup.com
W: www.integralgroup.com
ABN: 91 142 668 773

Melbourne Office (Umow Lai)
Level 4, 10 Yarra Street
South Yarra VIC 3141
Tel: +61 3 9249 0288

E: melbourne@umowlai.com.au
W: www.umowlai.com.au
ABN: 29 143 564 738

EXECUTIVE SUMMARY

This report outlines the Hydraulics and Sustainability proposed for the Sunshine City Council proposed Caloundra Library at Concept (CD) Stage.

The following is a summary of the main points made in this report:

Hydraulic Services

The Hydraulic systems proposed for the Caloundra Library project are as follows:

- The building will retain its existing 150mm sanitary drainage connection and new sanitary plumbing risers will reticulate throughout the building and service all points of demand.
- The building internal waste plumbing installation will be a combination of sanitary plumbing and elevated drainage at high level in the basement carpark complete with stacks, relief vents, vents and end vented horizontal waste branches from the stacks to collect the discharges from fixtures and fittings installed within the building.
- Rainwater from roof areas is captured by an existing box gutter system with external S/S downpipes which fall into a gravity stormwater system. It is proposed to re-route the downpipes to be connected into a new rainwater storage tank complete with a first flush divertor, necessary inlet filtration and outlet filtration to allow for the harvested water to be used for toilet flushing and irrigation systems. Where rainwater cannot be rerouted due to insufficient levels and fall into storage tanks it will remain connected to the existing gravity drainage system connecting into the stormwater infrastructure. The rainwater harvesting system including pumps, filtration equipment, tank level sensors and fault detection are to be controlled by the BMS systems and monitored by the BSIP. No third-party PLCs required
- The buildings domestic water supply is to be extended from the existing mains pressure water supply. It is proposed to use the existing water meter and associated valves located at level one (ground) of the building. The water supplies will be reticulated to all points of demand from the meter system complete with isolation valves, pressure control valves and backflow prevention devices.
- Potable domestic hot water will be generated via localized electric instantaneous hot water units and under sink combined boiling, hot and chilled water units where nominated. The hot water will be reticulated to all points of demand as required complete with all valves and thermostatic mixers to control temperatures at outlets.

Fire Protection Services

The fire protection systems proposed for the Caloundra Library project are as follows:

- The building will retain the existing fire hydrant service which has recently undergone an upgrade completed as part of a separate project where the administration building and event centres fire services have been joined. There are some points which require upgrades and modifications inside the building to meet current standards. The recently installed fire hydrant pump is installed under the declared flood level and is required to be relocated above the basement level.
- Portable fire extinguishers and fire blankets are to be provided to all areas to cover relevant hazards in accordance with Australian Standards and NCC.

The existing buildings fire sprinkler system is proposed to be upgraded as part of the project and the design is to be completed by Omnii.

Sustainability

The Sustainability Initiatives proposed for the Caloundra Library project are as follows:

- The project brief requires the Caloundra Library to achieve a minimum of 5 Star Green Star Design & As Built rating with the potential stretch targets to achieve a 6 star outcome.
- The design will specify all refrigerants within the project to have an Ozone Depletion Potential (ODP) of zero and a Global Warming Potential (GWP) of 10 or less. i.e. R134a or R1234e.
- A 232kWhr Battery storage area has been allowed for in the central plant area to allow connection to the main switchboard to further reduce energy consumption or move towards net zero energy. Peak Demand Management, Battery bank, and PV array Inverters are to be controlled by the BMS and monitored by BSIP. No third-party PLCs are required. Sunshine Coast Council is a zero-net emissions organisation and the community is to be low carbon by 2041.
- Roof treatments (other than PV) will be carefully considered to minimise impacts of the heat island effect. This can be achieved with the use of a Cool roof system with a low Solar Absorptance (SA).
- The building will require the extension of the existing fire hydrant service to the new building. There is to be a new fire booster cabinet installed in accordance with the building certifiers report and to the satisfaction of all relevant Authorities.

CONTENTS

1.0 INTRODUCTION

1.1 SCOPE OF REPORT

This report outlines the Hydraulics and Sustainability proposed for the Sunshine City Council proposed Caloundra Library at Concept (CD) Stage.

This report covers the following disciplines, design topics, and their associated systems–

- Hydraulics
  - Site Infrastructure Connections
  - Sanitary Plumbing & Drainage
  - Rainwater Drainage, Harvesting and Reticulation
  - Domestic Cold Water.
  - Domestic Hot Water.
- Fire Protection
  - Fire Hydrant and Hose Reel System
  - Portable Fire Extinguishers and Fire Blankets
- Environmentally Sustainable Design

1.2 REFERENCE DOCUMENTS

The design of the facility will comply with the following key reference documents:

- NCC 2019 and associated standards
- Green Star Design and As Built v1.3

2.0 HYDRAULICS

2.1 GENERAL

This section of the Report deals with Hydraulic Services, including:

- Site Infrastructure Connections
- Sanitary Plumbing & Drainage
- Rainwater Drainage, Collection and Harvesting Systems
- Domestic Cold Water Systems
- Domestic Hot Water Systems

2.2 SITE INFRASTRUCTURE CONNECTIONS

Primary Hydraulic Services Infrastructure connections includes:

- Connection to internal site property sanitary drainage service
- Connection of rainwater systems to internal site stormwater drainage service
- Connection to internal domestic water service
- Connection to internal fire hydrant service

2.3 DRAINAGE CONNECTIONS

2.3.1 Sanitary Drainage

The site is served by a 150mm sewer connection, connected to the water authority (Unity Water) infrastructure via a manhole located on Nutley Street. The existing 150mm sanitary drainage is shown with an invert level of 6.620 as per the as constructed drawing 95161-H2-AC1 prepared by SP&P.

We propose to re-use this existing property connection located in the basement carpark. It is recommended to provide CCTV footage of the existing connection to determine the condition and suitability. Structure is to confirm if proposed works will interfere with the existing unity water sewer connection. If the manhole is required to be relocated as part of the works a civil engineer will be required to conduct the relocation design and applications.

2.4 DOMESTIC COLD WATER

2.4.1 Cold Water Reticulation

The site is serviced by a 50mm potable water connection which branches off the 150mm connection as per the as constructed drawing 95161-H2-AC1 prepared by SP&P. The cold water connection is located on the southern side of the building external to the building footprint on Omrah Avenue located below ground in a valve box near the existing Fire Booster assembly.

Based on current architectural layouts there does not appear to be an increase in fixtures and therefore the existing 50mm cold water connection should be sufficient to be reused.

We propose to extend new cold water risers throughout the building complete with sub-meters and isolation valves reticulating to all points of demand as required. Sub-meters are to be connected to the buildings BMS system and are to be located at each level and area of demand in accordance with the ESD requirements.

2.5 DOMESTIC HOT WATER SYSTEM

2.5.1 Domestic Hot Water

The base build amenities are currently supplied by a 315L Electric Storage Hot Water Unit located in the L4 Plantroom. The unit was manufactured in 2009 which would be assumed to be nearing the end of its life.

The proposed hot water system for the building will comprise of localized three phase electric instantaneous hot water units, from which hot water reticulation will be extended to serve amenities areas with a shower requiring hot water. Currently it is only proposed to provide hot / warm water to basins in PWD bathrooms where there are showers. The addition of three phase instantaneous units was mentioned to not be an issue due to proposed infrastructure upgrades by the projects electrical engineer. In addition to the instantaneous units we have proposed combined under sink boiling, hot and chilled water units to provide hot water to kitchenettes where these taps are requested by the client. If there is the requirement of a hot water supply to dishwashing machines, we would recommend an additional instantaneous hot water unit to meet the additional demand.

Provision of thermostatic mixing valves will control hot water temperature to maximum of 45˚C to fixtures installed for PWD areas or the like. These are to be installed in in-wall mounted lockable stainless steel boxes in an accessible location.

Hot water units are to be installed complete with isolation valves. All hot water pipe work will be insulated to comply with the requirements set out in Australian Standard AS/NZ 3500.4.

Typical Thermostatic Mixing Valve

2.6 SANITARY DRAINAGE AND SANITARY PLUMBING SYSTEM

2.6.1 Sanitary Plumbing Installation

The sanitary plumbing installation will include a combination of sanitary plumbing and drainage with vertical stacks installed as single stacks, fully vented modified sanitary plumbing system complete with relief vents connected to stacks, group vents, stack vents, air admittance valves, (where appropriate) and waste branches on each floor.

Vertical waste stacks will be located at strategic locations across the floor layouts with riser stacks located in riser ducts generally aligned vertically throughout the building in areas with waste and sanitary fixtures.

Sanitary waste receiving the discharges from fixtures and plumbing outlets will generally drop into the ceiling below the level that the fixture is being served with the result that waste piping will be located in the ceiling space, therefore a spatial allowance for horizontal pipe work in ceilings that could be in the order of 450mm is required to enable piping horizontal piping to connect to vertical stacks.

Acoustic insulation will be provided to sanitary pipe work in when running suspended in ceiling areas to comply with Acoustic Consultants requirements.

Where lifts are to be installed the sumps are to be provided with a dry sump configuration complete clear out to surface located external to the lift shaft with moisture sensors which connect to a control panel with audible and visual alarms. When the alarm senses moisture it shall send a signal to the BMS and Security panel to indicate that water is required to be pumped out by a submersible pump.

2.7 Rainwater Drainage and Harvesting System

2.7.1 Rainwater Drainage Installation

The rainwater from roof areas is captured by an existing box gutter system on the northern side of the building with external S/S downpipes which fall into a gravity stormwater system.

It is proposed to re-route the downpipes at either level one or at high level at level three which are to be to be connected into a new rainwater storage tank complete with necessary inlet filtration and outlet filtration to allow for the harvested water to be used for toilet flushing and irrigation systems.

The tank would ideally be installed in the northern side of the basement carpark to pick up most of the roof water for the building. Where rainwater cannot be rerouted due to insufficient levels into rainwater tanks it will remain connected to the existing gravity drainage system connecting into the existing stormwater infrastructure. It has been noted that the basement has a flood level of FFL of 7.00. Due to this we recommend that the tank is suitably anchored into the basement structure to prevent floatation during a flood event. We would recommend submersible in-tank pumps and the filtration unit to be located on level one.

The new proposed rainwater system, including tank overflows are to be designed for 1 in 100-year storm events.

Acoustic insulation to pipe work in noise sensitive areas will comply with the Acoustic Consultants requirements.

Existing issues have been raised around the flooding of the basement level carpark and a flood level of 7.00 has been proposed. It is recommended that a Civil Engineer is to look further into the issue of overland flow entering the carpark.

2.7.2 Rainwater Harvesting Installation

The rainwater harvesting system will comprise a custom above ground panel tank with a storage capacity to be nominally 50,000 litres approximately.

Harvested rainwater will be treated and pumped to supply toilet flushing of all toilet facilities within the building. Landscape irrigation will be extended directly from the rainwater tank via the pump system that will deliver water to both areas. The pumps will comprise dual constant pressure pump systems which are a submersible in-tank pump and are to be sized to cater for the sites demand. In addition to the pumps a suitable 3 stage rainwater filtration system is to be provided in level 1 due to the basement being located under the defined flood level.

The rainwater system will incorporate first flush diverters, which will divert the first 1mm of rain directly to stormwater and then allow rainwater to be collected into the tanks. Overflow connection from the tanks will be connected to existing external stormwater system.

The rainwater harvesting system will be backed up by town's main water supply, which will automatically change over and provide town's main water when the tanks are near empty, complete with backflow protection and sub-meter connected to buildings BMS in accordance with ESD requirements.

The rainwater harvesting system including pumps, filtration equipment, tank level sensors and fault detection are to be controlled by the BMS systems and monitored by the BSIP. No third-party PLCs required. All treated rainwater areas of use shall be metered and monitored by the BMS.

Final water balance for the site is to be developed so that it considers annual average rainfall data for the project location together with anticipated usage demands.

Typical Rain Water Plant

2.8 Design Criteria

The hydraulic systems design shall be based upon the following design criteria

Item	*Reference*	*Design Criteria*
Sewer Drainage and Sanitary Plumbing	AS/NZ 3500.2 National Construction Code	Sanitary Drainage, Elevated Drainage, Fully vented modified and single stack principles of plumbing with all required venting.

Item	*Reference*	*Design Criteria*
		Gravity drainage systems min. Gradients– • 100 pipes @ 1 in 60 • 150 pipes @ 1 in 100 Material: HDPE with fusion welded joints.
Cold Water Supplies	AS/NZ 3500.1	Water supply velocity to be limited to 2m/s maximum with nominal to be 1.5 m/s. Water pressures to be supplied between 300 and 500 kPa. Backflow prevention to zone areas as well as individual outlets. Material: Type B copper tube
Hot Water Supplies	AS/NZ 3500.4	Generation temperature – 65°C minimum. Supply temperature varies between 45°C to 50°C for sanitary fixtures. Material: Type B copper tube
Rainwater Water Systems	AS/NZ 3500.3	Rainfall intensity of 343 for 1 in 100 year 5 minute storm event. Maximum rainfall to any gutter system to be 16 l/sec. Gravity drainage systems min. gradient for all pipes to be @ 1 in 100. Harvested water systems capacity based upon future water balance for site. Systems include first flush filtration, and post tank 3 stage filtration including UV filtration. Material: Drainage pipework - HDPE with fusion welded joints. Reticulation pipework - Type B copper tube.

3.0 FIRE PROTECTION SERVICES

3.1 GENERAL

The proposed Fire Protection Services for the development will include:

- Site Infrastructure
- Fire hydrant and hose reel system
- Portable fire extinguishers and fire blankets

3.2 DESIGN STANDARDS

The Fire Protection Services for the project will be designed in accordance with the following standards:

- National Construction Code (NCC) / Building Code of Australia (BCA) (2019)
- Project Specific Building Surveyors Report;
- Project Specific Fire Engineering Brief / Report;
- SCC Specific Design Guidelines;
- Australian Standards including:

AS 1221:1997	Fire hose reels
AS 1851-2012	Routine service of fire protection systems and equipment.
AS 2419.1-2005*	Fire Hydrant installations (Part 1: System design, installation and commissioning).
AS 2441-2005	Installation of fire hose reels.
AS 2444-2001	Portable fire extinguishers and fire blankets – selection and location.
AS 2941-2013	Fixed fire protection installations – Pumpset systems
AS/NZS 3500	National Plumbing and Drainage Code

3.3 FIRE HYDRANT & FIRE HOSE REEL SYSTEM

The buildings will be provided with a fire hydrant and hose reel system complying with AS 2419.1 and AS2441 requirements.

3.3.1 Proposed Services

The existing Fire Hydrant & Hose Reel Service is supplied by a 150mm water connection located on the southern side of the building external to the building footprint on Omrah Avenue. This information has been provided from the as constructed drawing 95161-H2-AC1 prepared by SP&P. This is located below ground near the Fire Hydrant Booster assembly. The existing booster located on Omrah Ave has been made redundant due to the Event Centre and Admin Buildings fire hydrant service being joined and the Event Centres booster being maintained.

The building will retain the existing fire hydrant service which has had a new pump added and the two buildings combined. These works where undertaken as part of a separate project. The recently installed pump has been located in the basement which is under the declared flood level. This will need to be relocated to be compliant and would ideally be located inside the newly proposed fire sprinkler pump room located on level one.

The architect and building certifier have confirmed that the largest fire compartment of the Admin Building is under 5000m². This would require two hydrant outlets to discharge simultaneously. The required design parameters are 10l/sec (on-site pumps) and 20L/s (when booster by the brigade) at 700kPa. These duties have recently been increased due to the event centres demands requiring three hydrants to operate simultaneously.

We recommend that new fire hydrant risers are to run external to the fire isolated stair well in a fire rated riser as the building is not currently sprinkler protected. New hydrant landing valves are to be provided inside the fire isolated stairwell at each level with a new fire test drain at the tops of each fire stairwell. It would be recommended to join the three fire services risers located near each of the fire exits at high level in the level three ceiling. This would improve the systems reliability to provide a ring main installation. The new fire test drains are proposed to connect to the basement rainwater tank where falls and clearances permit.

3.3.2 Existing non-compliance issues

- No fire test drains where witnessed in the building during the inspection.
- Recently installed pump set is installed under the defined flood level.
- The building doesn't have a fire ring main installed in accordance with AS2419.1 and currently can't have individual building isolated.

3.4 FIRE EXTINGUISHERS AND BLANKETS

Suitably rated fire extinguishers and fire blankets are to be provided in accordance with AS2444 for coverage to all hazardous areas including switchboards, cafes, plantrooms and kitchenettes. These are to be located in accordance with Australian Standards and the NCC. These are to be positioned, supplied and provided by a qualified Fire Services Company.

Example of portable fire extinguishers and blankets

3.5 FIRE SPRINKLERS

The existing Fire Sprinkler Service is being upgraded by Omnii as is to provide sprinkler coverage to all parts of the building as part of a fire engineered solution.

4.0 ENVIRONMENTALLY SUSTAINABLE DESIGN

4.1 INTRODUCTION

The section provides an overview of the proposed sustainability design features to be incorporated into the concept design for the Caloundra Library. It provides an overview of the Environmentally Sustainable Design (ESD) vision, a summary of the analyses conducted during the Concept Design phase, and an array of recommended initiatives that will be developed in more detail as the design progresses.

The proposed sustainability measures aim to ensure that the development reduces operational energy consumption and corresponding greenhouse gas emissions, reduces potable water use, diverts a significant portion of waste from going to landfill, electrification of services, and provides a healthy and comfortable environment for researchers, staff, and students.

The ESD vision is based on the project requirements, including the sustainability objectives required by Sunshine City Council, the project brief, and regulatory compliance.

This section includes a discussion of recommended passive and active design features, indoor environment quality, water conservation, sustainable materials, sustainable transport, waste management, and appropriate ecology and emissions initiatives to incorporate into the development.

Further analysis will be undertaken to explore the financial, spatial, and related design impacts of the various sustainable design initiatives and options as the project enters the D&C phase.

4.2 PROJECT ESD OBJECTIVES

The project has briefed and regulatory compliance requirements which provide the basis for the sustainability initiatives recommended for inclusion.

4.2.1 Project Brief

The project brief requires the Caloundra Library to achieve a minimum of 5 Star Green Star Design & As Built rating with a stretch target for of achieving a 6-star outcome.

The Green Star suite of rating tools was developed by the Green Building Council of Australia (GBCA) to help the property industry set a standard of measurement for green buildings, promote an integrated design process, recognise environmental leadership, and raise awareness of green building benefits.

The current version of the rating tool is Green Star Design & As Built v1.3. A Green Star Design & As Built v1.3 credit pathway is provided as an appendix to this report. The minimum number of points required to achieve 5 Stars is 60 points.

4.2.2 NCC BCA Section J Energy Efficiency Requirements

The National Construction Code (NCC) Building Code of Australia (BCA) Section J sets forth energy efficiency requirements that buildings must achieve. These requirements apply to the building envelope of conditioned spaces, mechanical services, indoor artificial lighting, and domestic hot water systems.

This project is to comply with the current Section J requirements of NCC 2019. In general, the key requirements which are assessed by ESD include the building fabric, glazing, and building sealing requirements. A Section J assessment is required to demonstrate compliance with NCC 2019.

4.3 ESD DESIGN INITIATIVES

The ESD design approach for the project seeks to deliver a low energy and sustainable building without complicating the design and ongoing operation. The ESD design will seek to deliver an integrated approach where all members of the project team work together to achieve market-leading sustainable design performance.

Key design aspects are discussed in the following sections. A detailed Green Star Design & As Built v1.3 credit pathway can be found in the Appendix.

4.3.1 Management Strategies

It is expected that the project will target most of the Green Star Management credits. Significant emphasis will be placed on commissioning activities, building tuning and the management of the site during construction. Comprehensive metering and monitoring will be investigated to provide facility management with sufficient information to operate the Building efficiently.

4.3.1.1 Commissioning

Comprehensive building pre-commissioning, commissioning and quality monitoring will be required by the appropriate contractors and trades on site.

Transfer of all documentation regarding design intent, as-installed details, commissioning report and training of building management staff to the Building Owner/Manager.

To ensure the optimum energy performance of the building, an Independent Commissioning Agent (ICA) should be engaged to provide advice to the client and to the design team to monitor and verify the commissioning of the HVAC and building control systems. The ICA shall be engaged to provide commissioning and tuning in accordance with the Soft Landings Framework.

The installing Contractors will be committed to a 12-month commissioning building tuning period after handover, including minimum quarterly reviews and final recommissioning after 12 months.

4.3.1.2 Building Users Guide

To enable the building users to achieve the environmental performance envisaged by the design team, a comprehensive Building Users Guide will be prepared for use by the tenants and building management.

4.3.1.3 Construction Management

In order to minimise environmental impact during construction, the Contractor will be required to provide and implement a comprehensive Environmental Management Plan (EMP) during the construction works.

The Contractor will also be required to have ISO 14001 Environmental Management System accreditation applicable to the construction of the building.

4.3.1.4 Metering and Monitoring

Appropriate submetering shall be provided in accordance with Green Star requirements, including a monitoring system. Water, Energy, PV, and Mechanical systems are to be independently metered and monitored by the existing BMS. Where a single item exceed 100 kW it must be independently metered.

4.3.2 Indoor Environment Quality

The design response will provide high levels of indoor environment quality through the provision of beneficial rates of outside air (coupled with heat recovery), access to natural daylight and views, well-designed artificial lighting systems, and consideration of thermal comfort and space acoustics.

Emissions of pollutants from internal finishes and furniture will be reduced through the broad application of low VOC and low formaldehyde products.

4.3.2.1 Indoor Air Quality and Minimising Sources of Air Pollution

High indoor air quality can be achieved by controlling and eliminating sources of indoor air pollution and by providing increased outside air rates.

It is recommended that internal finishes and fittings be selected to minimise the off-gassing of Volatile Organic Compounds (VOCs) and formaldehyde to eliminate a significant source of indoor pollution and improve indoor air quality. The following initiatives are recommended to be included.

- All paints, sealants, and adhesives applied on-site during construction will be low-VOC
- Carpets and resilient flooring will be selected to be low-VOC
- No added formaldehyde in engineered wood products

In addition to controlling sources of indoor pollution, consideration should be given to increasing the minimum outside air rate provided via the HVAC systems at least 50% above the minimum AS1668.2 requirements. More consideration will be required to determine the optimal pathway for the project to demonstrate that high levels of outside air are provided to occupants.

4.3.2.2 Lighting Comfort

The building interior lighting will be carefully designed to optimise occupant comfort. The luminaires will be provided with high frequency ballasts to avoid the low level flicker often associated with fluorescent lighting.

The use of indirect/direct lighting for the office areas will be considered, with the base building office lighting designed for a maintained illuminance level as per AS 1680.2 at the working plane

Independent lighting control shall be provided to over 95% of the area with the ability to turn on/off and dimmed.

4.3.2.3 Acoustics

Detailed design will be performed to ensure that the building services achieves ambient internal noise levels in accordance with AS/NZS 2107:2000, to ensure comfort of the building occupants.

An Acoustic consultant is to be engaged to provide preliminary advice and provide verification measurements post construction.

4.3.2.4 Energy Efficiency

An energy efficiency design approach begins first with a high-performance façade to reduce the space conditioning loads, then by employing low-energy conditioning systems, and finally by incorporating energy recovery and including renewable sources of energy to reduce greenhouse gas emissions.

The current architectural proposal includes significant areas of vision glazing, which will require high performance façade systems to meet the overall project requirements.

The demands minimised through a high-performance façade will be met with mechanical services designed for very efficient performance.

Energy consumption associated with artificial lighting systems will be minimised through high performance (e.g. LED) fittings and effective lighting controls including daylight dimming and localised presence detection.

Finally, an extensive rooftop PV system will offset the building's electricity consumption, reducing greenhouse gas emissions, and assist the Sunshine City Council with its goal of decarbonisation.

Improvement in energy efficiency will form a primary strategy to assist in achieving the 5 Star Green Star rating.

4.3.2.5 Building Fabric and Glazing Performance

In order to reduce the energy consumption associated with active heating and cooling systems, the project will need to incorporate sufficient levels of insulation to provide a high performing building fabric.

The levels of insulation to be incorporated within the building fabric should be selected to meet or exceed the requirements of the NCC Section J. Typically, these are recommended to be as follows:

Table 1 *Building Fabric Insulation Performance*

Building Fabric Component	*Minimum Total System R-value*
Exposed Ceilings/Roof	>R4.6
Window Wall Construction *<80% Wall Area* *>80% Wall Area*	 >R2.2 >R1.5
*Estimated Glazing Performance** *(Double Glazed System, Thermally broken spandrels)*	<U2.8 & <0.3
Floors between conditioned and unconditioned spaces	>R2.2

** To be confirmed upon development of the Section J report. Further analysis required to determine optimal shading/glazing performance*

The building shall be designed in accordance with the Sunshine Coast Buildings Subtropical Sustainable Design.

An alternative method to Deemed to Satisfy DtS approach is using the JV3 methodology. The benefit of this methodology is it can also be used as the basis for Energy and thermal comfort modelling for Green Star submission.

With this performance, the project can achieve compliance with the building fabric provisions of NCC 2019 and will be on track to meet the targeted greenhouse gas reduction for Green Star.

The Existing roof system consists of Metal deck sheeting with a foil blanket on the underside of the roof and additional insulation on the ceiling tiles. To upgrade this system to NCC2019 requirements a bulk insulation system will have to be replaced with a thicker insulation product.

Currently there is no insulation between the carpark and the air-conditioned floors above. To meet NCC2019 Section J requirements a R2.2 insulated soffit board will need to be installed.

4.3.2.6 Energy Efficient Air Conditioning Design

The design for the building considers a range of low energy air conditioning systems specific to each space type, which can reach the desired energy efficiency targets. Electricity consumption is further reduced through the selection of highly efficient plant and equipment, particularly, Fans, Pumps, Chillers,

All HVAC major plant selected shall be high efficiency including:

- All electric motors will be high efficiency. Variable speed fan and pumping motors will be employed that are suitably sized to maintain efficient operation across the full range of energy requirements for each building system. This will ensure efficient operation in all seasons and at all likely occupation densities.
- Outside air pre-treatment to reduce humidity and further improve energy efficiency.
- Highly energy efficient air-cooled chillers will be selected for the main building thermal plant. (Preferably magnetic bearing)
- High efficiency (EC) pumping systems for the chilled water and heating hot water systems.
- Plant energy use will be monitored and optimised using the Existing Building Management System.

4.3.2.7 Electrical Design Initiatives

The lighting design is expected to include LED fixtures with intelligent controls to reduce the overall energy consumption of the electric lighting systems. Occupancy sensors and perimeter daylight dimming controls are recommended for inclusion.

Submetering will be provided for each building use within the building. This will be linked through an energy monitoring system to allow trending of energy uses daily, weekly and annually.

The lighting system design should be configured with controls to minimise the extent of lighting of unoccupied areas. Design measures should include:

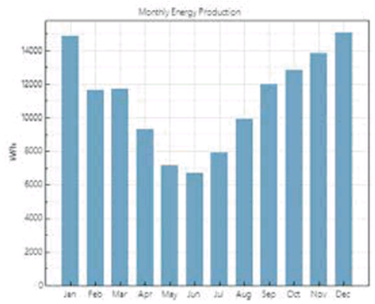
- All individual or enclosed spaces to have individual switches and occupancy sensors
- The size of individually switched lighting zones will not exceed 100m^2 for 95% of NLA
- Switching will be clearly labelled and easily accessible by building occupants

4.3.2.8 Renewable Energy – Rooftop PV and Battery Storage

There is currently no solar on site and there is a large amount of roof area available. The cost of renewable energy systems such as Solar PV have fallen dramatically in recent years while the costs for grid electricity has risen significantly. While trends such as off-site renewable energy Power Purchase Agreements have become popular, this does not avoid the cost of network charges or renewable firming capacity. Therefore on-site renewable energy remains a very attractive proposition and is also strongly rewarded within the Green Star rating.

The use of on-site Solar PV arrays to generate energy is an effective and cost competitive solution to hedge institutions against long term energy costs and fluctuations. It is therefore proposed that a significant portion of roof be utilised for a solar PV system to provide greenhouse gas emissions-free electricity to the building. It is estimated that there is spacial capacity of the roof for a 90 kW to 160 kW PV system.

It is a minimum requirement to reduce peak electricity by 15% for Green Star. It is estimated that a 90 kW PV system can provide this peak electricity reduction and can generate 132,930 kWhr per annum. See the following graph for predicted monthly PV output.



A 232kWhr Battery storage area has been allowed for in the central plant area to allow connection to the main switchboard to further reduce energy consumption or move towards net zero energy. This battery can be used to supply electricity to the building during the night or late evening (low light conditions).

Peak Demand Management, Battery bank, and PV array Inverters are to be controlled by the BMS and monitored by BSIP. No third-party PLCs are required.

Sunshine Coast Council is a zero-net emissions organisation and the community is to be low carbon by 2041.

The cost for Battery storage is declining as this technology is on the uptake and the current estimated cost is approximately $900/kWhr.

4.3.3 **Transport**

To promote the use of active transport facilities it is recommended that the buildings existing end of trip facilities are reviewed.

Minimum number of secure bicycle parking should be provided as follows:

- 7.5% of total office regular occupants
- 5% of peak visitors

Lockers should also be provided calculated at 1.2 lockers per bicycle space.

Showers should be also provided based calculated on the number of regular occupants at 1 per 75 users. Showers are to be provided from Level 1 to Level 3

4.3.4 **Water Efficiency**

Reducing potable water is a two-step process: the first step is to reduce demand through the specification of low flow fittings and fixtures, water efficient appliances (if required). After reducing demand, then the project can look towards fit-for-purpose non-potable water sources to meet the non-potable water demand for toilet flushing, irrigation, and heat rejection.

The following initiatives are recommended:

- Water efficient fittings (toilets, urinals, taps, showers) and appliances (dishwasher) with a target WELS rating as follows:

Fixture of Fitting Type	*Minimum WELS Star Rating*
Toilets	5
Urinals	6 or Waterless
Showerheads	3
Taps	6
Dishwashers	6

- Rainwater harvesting from the roof for toilet flushing, irrigation, and washdown services. The 50kL rainwater tank is being sized to accommodate the expected volume of water that will allow for rainwater to offset a significant proportion of mains water use.
- Native and adaptive plantings for site landscaping to eliminate the need for irrigation; where irrigation must be installed sub-surface drip systems are recommended
- Water submetering for all major water uses, including a connection to the BMS for leak detection monitoring
- Collection or recirculation of all fire protection system test water and maintenance drain-downs for reuse on-site

4.3.5 Responsible Building Materials

Considering the provenance and composition of building materials is an important component of sustainable design.

4.3.5.1 Material Selection

The following initiatives are also proposed for inclusion:

- Low Portland content cement and use of reclaimed water in concrete production.
- Specify that all steel must be sourced from a Responsible Steel Maker and that steel framing or reinforcing is design to reduce the total quantity of steel required
- Minimise the environmental impact of PVC production by avoiding PVC products (can be replaced by HDPE in many applications), and by only selecting Best Practice PVC if PVC is required
- Ensure all timber is from reused or recycled sources, or from a responsible timber chain of custody scheme such as the Forestry Stewardship Council (FSC)
- Specify fit-out materials and loose furniture which carry third party environmental product certifications from schemes such as GECA and Green Tag

4.3.5.2 Construction Waste

Waste from construction and demolition currently comprises a significant portion of landfill volume. The project should aim to divert a significant portion (at least 90%, by mass) of construction and demolition waste from landfill. This requirement should be clearly stipulated within the contract documentation.

4.3.5.3 Operational Recycling

A dedicated storage area will be provided for the separation, collection, and recycling of waste, with access for all building occupants and for collection by recycling companies. The storage area shall be adequately sized to allow for recycling of, as a minimum, paper, glass, plastics, metals, and organic (compost) materials. The size of the recycling facility must be determined by a waste consultant or auditor.

4.3.6 Land Use & Ecology

4.3.6.1 Sustainable Sites

Roof treatments (other than PV) will be carefully considered to minimise impacts of the heat island effect. This can be achieved with the use of a Cool roof system with a low Solar Absorptance (SA).

Stormwater runoff will be mitigated in terms of run-off volumes and quality of the water discharged to the municipal stormwater system.

4.3.6.2 Stormwater Management

The quality and quantity of stormwater released from this site post development is a significant factor for consideration in the sustainability context.

The project design will include measures to mitigate the impact of litter, sediments and pollution entering stormwater systems and downstream waterways. Detailed information on proposed maintenance and site management plans will need to be provided as the design progresses.

4.3.7 Site Emissions

4.3.7.1 Light Pollution

The design will reduce light pollution by designing external luminaires such that no direct beam light will spill beyond the site boundaries or upwards to the night sky. These are currently targeted credits within the Green Star pathway.

4.3.7.2 Refrigerant Impacts

The design will specify all refrigerants within the project to have an Ozone Depletion Potential (ODP) of zero and a Global Warming Potential (GWP) of 10 or less. Some example of refrigerants that could be used to reduce the Total System Direct Environment Impact below 15 are R134a or R1234e.

4.3.8 Innovation

Sunshine City Council has an excellent opportunity to incorporate innovative elements into the building design and delivery. There is a wide range of innovative elements that can be considered in addition to key innovations. Green Star also rewards innovation for specific initiatives as well as for performance that exceeds existing credit benchmarks.

For Green Star, the credit pathway proposed to target all 9 points within the innovation category. A selection of these initiatives include:

- Onsite renewable energy provides a significant proportion of the predicted annual energy consumption
- Zero VOC paints
- Contractor Education
- Community Benefits
- Soft Landings
- Green Star Performance – Green Cleaning

Further initiatives will be investigated as the design develops.

APPENDIX A EXPLANATORY INFORMATION

A.1 EXPLANATORY INFORMATION

A.1.1 EXCLUSIVE USE

This report has been prepared by Integral Group, at the request of Sunshine Coast City Council ("the Client") exclusively for the benefit and reliance of the Client.

This report is an engineering report prepared in accordance with the Client's directions, having due regard to the assumptions that Integral Group may be reasonably expected to make in accordance with sound engineering practice and exercising the obligations and the level of skill, care and attention required of it under the terms of the engagement.

The following section contains important information about this report. This report, in whole or in part, may only be reproduced, or distributed with the prior written permission of Integral Group or the Client, and this permission must accompany every copy of this report.

Integral Group's engagement by the Client is on the basis that Integral Group's liability, whether under the law of contract, tort, statue, equity or otherwise, is limited as set out in the terms of the engagement.

A.1.2 THIRD PARTY RELIANCE

This report is prepared exclusively in accordance with instructions given by or on behalf of our Client. Integral Group therefore excludes any responsibility for the use of, or reliance on, the report by any third party and the use of, or reliance on, the report by any third party is at the risk of that party. Any third party wishing to act upon any material contained in this report should first contact Integral Group for detailed advice which will take into account that party's particular requirements.

It is not possible to make a proper assessment of this report without a clear understanding of the terms of engagement under which the report has been prepared, including the scope and directions given to, and the assumptions made by, Integral Group in the preparation of this report.

A.1.3 SCOPE

The particular scope of Integral Group's brief in this matter, including the scope of investigation requested by the Client, means that the report necessarily concentrates on readily apparent major items.

The review/investigation of the existing engineering services installation involved:

- Visual inspection of the installed plant, distribution system(s), and other building services.
- Perusal of existing design drawing(s).
- Perusal of existing technical specifications.
- Perusal of shop drawing(s).
- Review of Operating and Maintenance Manual(s).
- Review of previous report(s).
- Discussion with SCC Management staff

The investigation did not include:

- An exhaustive examination of all aspects of the existing installation.
- Analyses of original design calculations, specifications and as-installed records for the existing installation.
- Possible latent defects contained in inaccessible sections of the existing installation.
- Verification of plant and system capabilities and operation for the existing installation.
- Measurements of air and water flow rates and temperatures, electrical loadings, switchboard temperatures etc.
- As noted above our review/investigation encompassed a perusal of existing documentation and we have relied on the information obtained from the documents.
- This report is provided strictly on the basis that the information that has been provided can be relied on is accurate, complete and adequate. However, we accept no liability for the accuracy or otherwise of this information, except where Integral Group expressly indicates in the report that it has verified the information to its satisfaction.
- Nothing in this report shall be read or applied so as to purport to exclude, restrict or modify, or have the effect of excluding, restricting or modifying the application of all or any of the provisions of any legislation which by law cannot be excluded, restricted or modified.

A.1.4 HAZARDOUS MATERIALS

Integral Group expressly excludes investigation or advice in relation to the actual or potential presence of pollution, contamination or asbestos, or the actual or potential risk of any incident affecting the safety of operation. Integral Group recommends that the services of a registered occupational hygienist be commissioned to carry out investigations and prepare the necessary report in respect of the presence of asbestos or other hazardous building materials if this has not already been undertaken.

A.1.5 LIMITS ON COST ESTIMATES

Integral Group has no control over the cost of labour, materials, equipment or services furnished by others, contractors' methods of determining prices, or competitive bidding or market conditions. Any cost estimates provided in this report represent our best judgement as an experienced and qualified professional consultant, familiar with the relevant industry. Integral Group cannot guarantee that proposals, bids or actual construction costs will not vary from the cost estimates provided.

A.1.6 COMPLIANCE WITH CURRENT BUILDING CODES, REGULATIONS AND STANDARDS

Building Codes, Regulations and Standards (Regulations), particularly with respect to fire safety systems, may have changed since the original construction. Buildings constructed in accordance with the Regulations in force at the time, may not now comply with current Regulations.

The report may identify areas of non-compliance with current Regulations but it does not purport to provide a comprehensive analysis of compliance with current Regulations. Accordingly Integral Group recommends that the Client should seek specialist regulatory/building code advice to confirm any non-conformances.

A.1.7 ACCURACY

If the reader should become aware of any inaccuracy in or change to any of the facts, findings or assumptions made in this report, the reader is requested to inform Integral Group so that we may assess its significance and review the report's comments and recommendations.

A.1.8 EXCLUSIONS

The following specialist consultancies are outside the scope of this report and are typically included within the design team. For any not currently engaged, it is therefore recommended that specific advice be sought.

- Structural Engineering
- Civil Engineering
- Acoustic / Vibration Engineering
- Dangerous Goods / Hazardous Areas Consultancy
- Bushfire Consultancy
- Design for Disability Advice
- OH & S Measures
- Safety in Design Consultancy
- Building Regulations Advice
- Traffic Consultancy
- Architectural Advice

APPENDIX B GREENSTAR SCORECARD

CALOUNDRA LIBRARY: GREEN STAR PATHWAY

Queensland	Green Star Design & As-Built Credit	v1.3 Available Points	5 Star Target	Additional Stretch Points for 6 Star Target	Compliance Requirements & Comment	Client	Design Team	Contractor	Cost Impact	Integral Group Comment	SCC Comments
MANAGEMENT		**14%**									
1.0	Green Star Accredited Professional	1	1	-	Requires a Green Star Accredited Professional (GSAP) to be engaged for all stages of the project.		Y		Negligible	Integral Group ESD consultant is a GSAP.	
2.0	Environmental Performance Targets	-	Complies	-	Targets for energy and water consumption to be set and documented. E.g. 25% improvement on min DTS Energy Performance. 50% potable water reduction than typical educational building. Provide rainwater reuse on site.	Y			Low < $10k	Water reuse for toilets, wash down facilities, and landscaping. Captured in Owners Project Requirements Document OPR	
2.1	Services and Maintainability Review	1	1	-	ICA to review design during design stage and prior to construction. Considering commissionability, controllability, maintainability, fit for purpose and safety.	Y			Low < $10k	To be performed by ICA	
2.2	Building Commissioning	1	1	-	Pre-commissioning & commissioning must be undertaken to CIBSE, ASHRAE and/or AIRAH standards/guidelines. Now also requires air tightness testing. This is largely standard practice now for upper tier builders, with the exception of airtightness testing. point not targeted due to air tightness requirement		Y	Y	Moderate <$25k	Commissioning activities primarily negligible cost, with exception of airtightness testing.	
2.3	Building Systems Tuning	1	1	-	Requires formal 12month building tuning period with minimum quarterly tuning meetings and recommissioning. Differs from normal DLP activities.	Y	Y	Y	Moderate <$25k	Excellent initiative to ensure building is optimised for energy/water/IEQ performance. Cost associated with additional consultant/contractor time.	
2.4	Independent Commissioning Agent	1	1	-	Requires engagement of ICA to lead/coordinate commissioning & building tuning activities	Y			High >$25k	ICA represents additional consultant and cost to project (e.g. $35k to $50k). Would be required to witness test commissioning and tuning activities.	
3.1	Implementation of a Climate Adaptation Plan	2	2	-		Y	Y	-	Low < $10k	Can be incorporated at low cost with design to size plant for higher ambient temperatures and cyclone proofing on external plant.	
4.0	Building Information	1	1	-	Involves developing package for occupants about building functions, initiatives to enhance energy efficiency, and O&M information package and a Building Log Book. Intent to provide central point of information for those managing the facility.		Y	Y	Negligible	Generally included within Contractor scope as best practice hand-over materials.	
5.1	Environmental Building Performance	1	1	-	Require SCC to commitment to set, measure and report on Environmental Performance targets set through Credit 2.0.	Y			Negligible	No cost to developing targets and monitoring internally based on commissioned energy and water use. This can form the basis of identifying maintenance requirements issues i.e. AC running overnight, water leaks.	
5.2	End of Life Waste Performance	1		-		-	-	-			
6.0	Metering	-	Complies	-	Metering to be provided to monitor building energy and water consumption. Sub-metering must be provided to all major energy/water/gas demands (more extensive than minimum compliance).		Y	Y	Low < $10k	Allowance above base Section J metering	
6.1	Monitoring Systems	1	1	-	Requires strategy for how to monitor and use data from collected from BMS. Cloud based technology platforms can be applied for utility management and benchmarking.		Y	Y	Moderate <$25k	Base functionality already provided by systemax BMS, cloud based system with displays can add additional cost to the project.	
7.0	Environmental Management Plan	-	Complies	-	A comprehensive project-specific Environmental Management Plan (EMP) must be in place for construction. To be included in Head contractor clauses/specification.			Y	Negligible	Good site practice anyway. To be written into head contractor scope to mitigate site risks.	
7.1	Formalised Environmental Management System	1	1	-	Formalised, systematic and methodical approach to planning, implementing and auditing the EMP to ensure conformance to EMP. To be included in Head contractor clauses/specification. Requires ISO14001 certification for the head contractor.			Y	Negligible	Expected of responsible contractor	
7.2	High Quality Staff Support	1	1	-	Contractor required to implement on-site staff wellbeing practices and enhance site workers' knowledge on sustainable practices through educational programs			Y	Negligible	Higher tier contractors likely to have site practices which are consistent with the requirements.	
8B	Operational Waste	1	1	-	Requires on-site waste recycling system which are consistent with best practice requirements.		Y		Negligible	Can be additional costs if there is no internal waste management practices. SCC to confirm is there is an existing waste management policy around recycling and providing a suitable location for waste storage and collection	
	Category Total	14	**13**	**0**							

CALOUNDRA LIBRARY: GREEN STAR PATHWAY

Queensland	Green Star Design & As-Built Credit	v1.3 Available Points	5 Star Target	Additional Stretch Points for 6 Star Target	Compliance Requirements & Comment	Client	Design Team	Contractor	Cost Impact	Integral Group Comment	SCC Comments
INDOOR ENVIRONMENTAL QUALITY		**17%**									
9.1	Ventilation System Attributes	1	1	-	Ventilation system design must meet best practice requirements with regards to intakes and exhaust locations	-	-	-	Negligible	Good design practices.	
9.2	Provision of Outdoor Air	2	1		1 point awarded for increase of 50% on AS 1668 minimum OA requirements or CO2 sensors are installed to prevent CO2 concentrations from exceeding 800ppm. 2 points available for 100% increase or not exceeding 700ppm		Y		Low < $10k	Heat Recovery required on outside air. Good design practice in tropical environments	
9.3	Exhaust or Elimination of Pollutants	1	1	-	Exhausting pollutants from print/photocopy equipment, cooking equipment, and carpark vehicle exhaust through dedicated exhaust systems. Print/photocopy must be isolated in enclosed spaces.		Y		Negligible	Good design practice.	
10.1	Internal Noise Levels	1	1	-	Acoustic Consultant to confirm. Internal ambient noise levels no more than 5dB(A) above the satisfactory levels provided in Table 1 AS/NZS 2107:2000.		Y		Low < $10k	Acoustic Consultant to be engaged to advise acoustic systems beyond minimum requirements.	
10.2	Reverberation	1	1	-	Acoustic Consultant to confirm. Requires mitigation of reverberation in accordance with Australian Standard		Y		Low < $10k	Acoustic Consultant to be engaged to confirm.	
10.3	Acoustic Separation	1	1	-	Acoustic Consultant to confirm. Partition between spaces should achieve a weighted sound reduction index (Rw) of at least 45.		Y		Low < $10k	Acoustic Consultant to be engaged to confirm.	
11.0	Minimum Lighting Comfort	-	Complies	-	Pending lighting design. Lights to be flicker free and address perception of colour in the spaces.		Y		Negligible	Good lighting design and fitting selection	
11.1	General Illuminance and Glare Reduction	1	1	-	Pending lighting design. Lighting levels will comply with best practice guidelines (AS 1680.2.4) and glare is eliminated.		Y		Low	Will require the lighting selection as per design	
11.2	Surface Illuminance	1		-	Surface reflectance of ceiling to be at least 0.75 (matt white) and ceiling area to have at least 30% illuminance of light on the working plane	-	-	-	-	Dependant on finish specification and lighting design	
11.3	Localised Lighting Control	1	1	-	Consideration of lighting control provisions within individual spaces		Y		Moderate <$25K	Additional cost due to the requirement of localised lighting and control.	
12.0	Glare Reduction	-	Complies	-	Requires blinds with a VLT <10%		Y		Low < $10k	Requires user controlled blinds	
12.1	Daylight	2	1	-	Requires space to achieve good levels of daylight. Requires daylight modelling.		Y		Low < $10k	Modelling costs to verify	
12.2	Views	1	1	-	Determine if glazing at high level is prohibited of views		Y		Negligible	No cost	
13.1	Paints, Adhesives, Sealants and Carpets	1	1	-	Internally applied paints, adhesives, sealants and carpets meet stipulated Total VOC Limits. Refer to Green Star Design and As-Built guidelines for limits.		Y	Y	Negligible	Standard industry practice now	
13.2	Engineered Wood Products	1	1	-	All engineered wood products meet stipulated formaldehyde limits or no new engineered wood products are used in the building. Refer to Green Star Design and As-Built guidelines for limits. Includes particleboard, plywood, fibreboard etc.		Y	Y	Negligible	Standard industry practice now	
14.1	Thermal Comfort	1	1	-	Verification of thermal comfort performance required through the application of thermal comfort modelling.		Y		Low < $10k	Requires additional engagement of thermal comfort modelling by ESD consultant. Standard practice design. Required by NCC2019 Section JV3 Report	
14.2	Advanced Thermal Comfort	1		1	90% Occupant satisfaction	-	Y	-			
	Category Total	17	13	1							

CALOUNDRA LIBRARY: GREEN STAR PATHWAY

Queensland	Green Star Design & As-Built Credit	v1.3 Available Points	5 Star Target	Additional Stretch Points for 6 Star Target	Compliance Requirements & Comment	Client	Design Team	Contractor	Cost Impact	Integral Group Comment	SCC Comments
ENERGY		**22%**									
15A.0	Conditional Requirement	NA	Complies	-	Requires minimum Deemed-to-Satisfy (DTS) requirements of Parts J1 (building fabric) and J2 (glazing) of Section J to be exceeded by 5%.		Y				
15A.1	Building Envelope	1	1	-	Nominal increase of 10% over Section J minimum R-Value requirements for building fabric.		Y		Moderate <$25k	Additional cost associated with higher insulation requirement. Beneficial to lower energy costs.	
15A.2	Glazing	1	1	-	Requires 10% improvement on minimum Section J Glazing U-Value and SHGC requirements.		Y		Moderate <$25k	Additional cost associated with higher glazing requirement. Beneficial to lower energy costs	
15A.3	Lighting	1	1		Lighting power density is 10% less than maximum allowed in Section J. Automated lighting control systems (occupant detection, daylight, time switches) provided.		Y		Low < $10k	Occupant sensing and dimming on lighting	
15A.4	Ventilation and Air Conditioning	1	1		The space is naturally ventilated or 10% improvement on Section J efficiency requirements for fan, pump, water heater and air conditioning equipment.		Y		Low < $10k	To be confirmed by Mechanical Consultant	
15A.5	Domestic Hot Water	1	1	-	Domestic Hot Water to be powered by Renewable energy		Y		High >$25k	Requires the PV system to be installed to target and Electric DHW	
15A.7	Accredited Greenpower	5		-	Requires ongoing purchase of green power energy premium.	Y					
15A - New credits	Optional Prescriptive Point: Transition Plan	1		1	Requires to reduce fossil fuel use and develop a transition plan to phase them out. Project teams need to publicly commit to a transition plan and show it has been developed, demonstrating how the building will transition away from the use of fossil fuels.	Y				Potential to use SCC current commitment to Net Zero	
	Optional Prescriptive Point: Fuel Switching	1	1	-	Required to demonstrate that a percentage of energy required by the building annually is generated by on site renewable solutions; OR Other points have been achieved in the pathway		Y		High >$25k	Beneficial to lower energy costs. Requires the installation of the PV system.	
	Optional Prescriptive Point: Onsite Storage	1	-	1	• A renewable energy storage procurement and use strategy has been developed and demonstrates that the storage is sized to match the requirements of the building and that value will be provided to the project; • The stored renewable energy is used to reduce the peak electricity demand; and • The onsite storage must be set up to receive renewable energy (onsite or offsite)		Y		High >$25k	Requires the installation of Battery System, Preliminary space for 232 kWh system	
	Optional Prescriptive Point: Vertical Transport	1	1	-	Required that the energy associated with lift machinery or other vertical transportation meets: • The minimum lift energy efficiency is class B in accordance with ISO 25745-2; and • The minimum lift idle and standby energy performance level is 1 in accordance with ISO 25745-2. • The minimum escalator energy performance is class A+ in accordance with ISO 25745-3. Where projects have both lifts and elevators installed, all three criteria must be met.				Moderate <$25k	Lift is required to be replaced as part of the works	
16A	Peak Electricity Demand Reduction - On-Site Energy Generation	2	1	1	Requires to reduce total peak electricity demand by 15%. Achieved through the application of passive design features, efficient building services and embedded generation.		Y		High >$25k	Requires the installation of the PV system. Achievable with battery storage + high generation potential on site.	
	Category Total	36	**8**	**3**							
TRANSPORT		**10%**									
17B.1	Access by Public Transport	3	2	-	Based on accessibility of the site by public transport. Site achieves a good 'Walk Score'. To be verified		Y		Negligible	Product of site characteristics	
17B.2	Reduced car Parking Provision	1		-	Requires consideration of the reduction of on-site carparking	-	Y	-			
17B.3	Low Emission Vehicle Infrastructure	1	1	-	Requires provision of electric vehicle charging infrastructure and/or dedicated car share spaces. 5% of carparks - Number TBC	-	Y	-	High >$25k	Cost of chargers to be considered	
17B.4	Active Transport Facilities	1	1	-	Requires bicycle parking, access to showers and lockers on site for occupants/visitors.		Y		Moderate <$25k	Number of showers, lockers, and bicycle parking required	
17B.5	Walkable Neighbourhoods	1	1	-	Site achieves a good walk score due to location (minimum required is 80).	-	Y	-		Walkscore of 95 in Caloundra	
	Category Total	7	**5**	**0**							

CALOUNDRA LIBRARY: GREEN STAR PATHWAY

Queensland	Green Star Design & As-Built Credit	v1.3 Available Points	5 Star Target	Additional Stretch Points for 6 Star Target	Compliance Requirements & Comment	Client	Design Team	Contractor	Cost Impact	Integral Group Comment	SCC Comments
WATER		**12%**									
18A	Potable Water - Prescriptive Pathway	12	6	-	Fixtures to meet minimum WELS ratings: taps (6 *), urinals (6 *), toilets (5 *), showers (3 *), rainwater harvesting, avoidance of water-based heat rejection , efficient landscape irrigation system and fire system test water harvesting (TBC fire protection system).		Y		Negligible	Rainwater capture and reuse to toilets and landscaping. 50 kL tank required. No water used for heat rejection (air-cooled chiller). Performance pathway may produce more points.	
	Category Total	12	**6**	**0**							
MATERIALS		**14%**									
19	Life Cycle Impacts	7	3	4		-	-	-	Moderate <$25k	Portland Cement content reduced, 50% reclaimed water in concrete mix. Concrete Aggregates Reduction. Can add additional cost to project materials. QS to confirm. Additional Points to achieve 6 star via LCA modelling	
20.1	Structural and Reinforcing Steel	1		-	Not claimed.	-	-	-			
20.2	Timber Products	1	1	-	Requires timber used in building and construction to be from a reused source or certified by a forest certification scheme. To be confirm if this was included in the specification.			Y	Low < $10k	Generally attainable based on proactive management of sub-contractor material procurement.	
20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	1	1	-	Requires materials to have no PVC and have an Environmental Product Declaration, or PVC to meet bet practice guidelines for PVC.			Y	Low < $10k	Generally attainable based on proactive management of sub-contractor material procurement. Best practice PVC or HDPE.	
21	Product Transparency and Sustainability	3	1	-		-	Y	-	Low < $10k	Environmentally friendly building materials covered in the design brief	
22B	Construction and Demolition Waste	1	1	-	Requires reducing construction waste going to landfill by reusing or recycling 90% of the waste generated during construction.			Y	Low < $10k	Additional costs due to the requirement of weighing waste during construction for recycling.	
	Category Total	14	**7**	**4**							
LAND USE & ECOLOGY		**6%**									
23.0	Endangered, Threatened or Vulnerable Species	-	Complies	-		Y			Negligible	Product of site characteristics	
23.1	Ecological Value	3		-	Points awarded where the ecological value of the site is improved by the project.				Low < $10k	Requires the improvement of site with native vegetation. Requires verification with Ecologist.	
24.0	Sustainable Site	-	Complies	-			Y		Negligible	Product of the site characteristics	
24.1	Reuse of Land	1	1	-	Available where 75% of the site was previously developed.						
24.2	Contamination and Hazardous Materials	1		-	Awarded where the site, or an existing building, was previously contaminated and the site has been remediated in accordance with best practice remediation strategies. To be confirmed by geotechnical engineer.						
25.0	Heat Island Effect Reduction	1	1	-	Generally requires appropriate selection of roof materials, selection of hardscape treatment and extent of landscape/tree coverage. Would require conscious review of site landscape/hardscape.		Y		Low < $10k	Dependant on material selection / landscape design proposals	
	Category Total	6	**2**	**0**							
EMISSIONS		**5%**									
26.1	Stormwater: Reduced Peak Discharge	1	1	-	Civil Engineer to confirm. Post-development peak event discharge from site does not exceed the pre-development peak event discharge.		Y		Moderate <$25k	Can add additional cost to the projects with the addition of rainwater detention tanks.	
26.2	Stormwater: Reduced Pollution Targets	1		-	Civil Engineer to confirm. All stormwater from the site meets specified Pollution Reduction Targets.		Y		Moderate <$25k	Can add additional cost to the projects with the addition of water treatment.	
27.0	Light Pollution to Neighbouring Bodies	-	Complies	-	Pending lighting design. Project to comply with AS 4282:1997 Control of the Obtrusive Effects of Outdoor Lighting		Y		Negligible	Product of good lighting design	
27.1	Light Pollution to Night Sky	1	1	-	Pending lighting design. It can be demonstrated that a specified reduction in light pollution has been achieved.		Y		Negligible	Product of good lighting design	
28.0	Legionella Impacts From Cooling Systems	1	1	-	No water-based heat rejection		Y		Negligible	Air-cooled chillers already on site. Replacement should retain this credit	
29.0	Refrigerants Impacts	1	1	-		-	-	-	Moderate <$25k	Mechanical Consultant to specify	
	Category Total	5	**4**	**0**							

CALOUNDRA LIBRARY: GREEN STAR PATHWAY

Queensland	Green Star Design & As-Built Credit	v1.3 Available Points	5 Star Target	Additional Stretch Points for 6 Star Target	Compliance Requirements & Comment	Client	Design Team	Contractor	Cost Impact	Integral Group Comment	SCC Comments
INNOVATION											
30A	Innovative Technology or Process		1	-	Onsite renewable energy	-	Y	-	High >$25k	Beneficial to lower energy costs. Requires the installation of the PV system.	.
30B	Market Transformation		1	Y	Potentially Soft landings if ICA engaged	-	-	-	Moderate <$25k	There is the cost associated with an ICA with soft landings experience required	.
30C	Exceeding Green Star Benchmarks	10	2	Y	Construction and demo waste reductions to 5Kg/sqm of GFA		Y		Moderate <$25k	Further waste avoidance/management measurement and verification. Ultra low VOC Paints TVOC <5g/L	
30D	Innovation Challenge		5	Y	1) Community benefits - potential benefits of the program to the community 2) Contractor education 3) Financial transparency 4) Global Sustainability - Green Cleaning 5) Reconciliation Action Plan		Y		Low < $10k	Additional cost to write new policies if not currently available. Points awarded based on sustainable initiatives taken which fall outside of available Green Star credits, such as "community engagement".	
30E	Global Sustainability			-		-	-	-	-	Points awarded for targeting credits which are available in alternate sustainability rating schemes such as LEED or WELL. Further work required	
	Category Total	10	9	0							
TOTAL			67.0	75.0							
The following equivalence rating could be achieved			5	6	**Minimum 5 Stars (60 Points), 6 Stars (75 Points)**						

APPENDIX C HYDRAULIC DRAWINGS

Refer Preliminary Design Report

APPENDIX D SECTION J

Refer Preliminary Design Report

APPENDIX E HYDRAULIC CONSTRAINTS

5.0 HYDRAULIC SERVICES

5.1 SITE REVIEW

This existing services report is based on the following information

- Architectural Drawings
- As-Constructed Hydraulic & Fire Sprinkler Services Drawings
- Fire Hydrant System Upgrade Drawings by Oska Consulting Group
- Existing Form 72 (Fire Hydrant Test Form)

5.2 SANITARY PLUMBING AND DRAINAGE

5.2.1 Existing Infrastructure

The site is served by a 150mm sewer connection, connected to the water authority (Unity Water) infrastructure via a manhole located on Nutley Street. The invert level of the existing 150mm sanitary drainage shown with an approximate invert level of 6.620 as per the as constructed drawing 95161-H2-AC1 prepared by SP&P.

Existing Site Manhole

The 150mm PVC sanitary drainage line runs suspended at high level in the carpark which branches off to various 80mm and 100mm sanitary plumbing stacks which rise to supply kitchenettes, tea rooms and base build amenities. The amenities currently consist of the female, male, shower and disabled bathrooms which are consistent throughout the three levels.

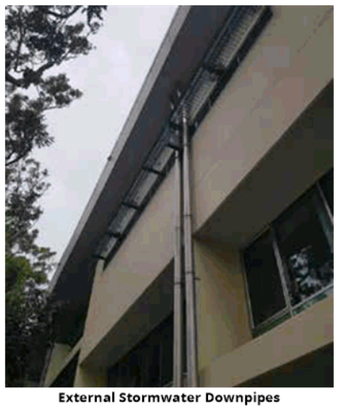
The existing 150mm drainage system shown running at 1:100 has the capacity of 855FU as per AS3500.2.

5.3 ROOF WATER DRAINAGE

5.3.1 Existing Infrastructure

The site is served by two stormwater connections, to the stormwater authority infrastructure. The connection to SCC is directed via a manhole located on the north western corner external to the site on Nutley Street. A 300mm main line running along the northern side of the site connects to the manhole with an invert level of 4.000. A second 150mm PVC service which runs along the western side of the property and connects to the same manhole as per the as constructed drawing 95161-H3-AC1 prepared by SP&P.

The roof is served by multiple box gutters, 150mm stainless steel downpipes and overflow system. No issue were reported about leaks from the existing roof.



External Stormwater Downpipes

Box Gutter

During the site visit it was mentioned that the existing basement has flooding issues due to overland flow. We recommend that a Civil Engineer is engaged to rectify the overland flow issue.

5.4 Domestic Cold Water Services

5.4.1 Existing Infrastructure

The site is serviced by a 50mm potable water connection which branches off the 150mm connection as per the as constructed drawing 95161-H2-AC1 prepared by SP&P. The cold water connection is located on the southern side of the building external to the building footprint on Omrah Avenue located below ground in a valve box near the Fire Booster assembly.

The 50mm potable water service runs suspended at high level in the carpark which branches off to supply kitchenettes, tea rooms and base build amenities.

The existing 50mm potable water service may be re-used depending number of proposed fixtures for the new fit out.

5.5 Domestic Hot Water Services

5.5.1 Existing Infrastructure

The base build amenities are supplied by a 315L Electric Storage Hot Water Unit located in the L4 Plantroom. The unit was manufactured in 2009 which would be assumed to be near the end of its life.

Storage Hot Water Unit

Kitchenettes and tea rooms are supplied by localised Boiling and Chilled Water Units or Electric Instantaneous Units.

Electric Instantaneous & "All in One" Hot Water Units

5.6 Gas Services

5.6.1 Existing Infrastructure

Currently there are no gas services on-site. Various searches indicated that there is no natural gas in the area available.

5.7 WET FIRE SERVICES

5.7.1 Existing Infrastructure

Fire Hydrant Service:

The existing Fire Hydrant & Hose Reel Service is supplied by a 150mm water connection located on the southern side of the building external to the building footprint on Omrah Avenue. This information has been provided from the as constructed drawing 95161-H2-AC1 prepared by SP&P. This is located below ground near the Fire Sprinkler Booster assembly and previous location of the Fire Hydrant Booster Assembly. No check valve or isolation valve was observed at Omrah Ave. Recent works to the Fire Hydrant system has seen the joining of the Event Centre and Administration Buildings fire systems. Please refer to Appendix F for more information.

Existing Combined Site Hydrant Booster

There are a few non-compliance issues that have been observed:

1. It is to be confirmed that each of the fire hydrant service risers are fire rated to be able to maintain the existing copper internal fire service. If it is found that the existing risers are not fire rated the existing building internal pipework should be upgraded to a medium duty galvanized pipe.
2. No fire test drains where witnessed to the most disadvantaged hydrants of the building. These are an operational requirement of QFES.
3. The recently installed fire hydrant pump has been located in the existing fire sprinkler control valve room at basement level off Omrah Ave. The basement is below the DFL and therefore the hydrant pump should be relocated above ground floor level as this is an essential service.

It was witnessed that most of the Fire Hydrants located in cupboards on levels one to three had the pipework size reduced from 100 – 65mm or from 80 – 65mm at a distance over 50mm which is over the maximum allowed as per AS2419.1 Clause 8.5.1. Please see below photo.

Fire Hydrant Cupboard Pipework

The recently provided Form 72 indicates that the system is achieving compliant pressure and flows for the recently combined fire hydrant system. Please note there are no pressure and flows noted for the Hydrant 2 which is located at L3. When testing a fire hydrant system, it is required that the testing in conducted from the most hydraulically disadvantaged hydrant. Please refer to appendix G for the test results.

APPENDIX F SITE FIRE HYDRANT UPGRADE (FOR INFORMATION ONLY)

Queensland Government

Queensland Fire and Emergency Services

Ian Maddigan
Ph: 07 5479 7003
Submission No: S00029690
Our Ref: 20-01490
Your Ref: BA # B200102

15 July 2020

Scott Fixter
Formiga1 Pty Ltd
PO Box 24
ROYAL BRISBANE HOSPITAL QLD 4029

Dear Sir/Madam

Queensland Fire and Emergency Services (QFES) has conducted an inspection and/or test of special fire services for the building work, at the premises listed below, under the *Building Act 1975, s74.* The attached notice identifies whether the referral agency aspects comply or do not comply with the building development approval.

The attached report provides details of the inspection for:

Caloundra Chambers
Sunshine Coast Regional Council Site
1 Omrah Avenue
CALOUNDRA QLD 4551

If you have any questions regarding this report please contact the Building Approval Officer nominated below.

Yours sincerely

Ian Maddigan
Building Approval Officer

Enc.

Deemed To Satisfy/Inspection/Building Approval

Job Details

Job Name: Upgrade hydrant system
Address: 1 Omrah Avenue, CALOUNDRA QLD 4551

Building Details

Class:	5, 9b	Floor Area:	20m²	Effective Height:	6m
Size of Largest Fire Compartment:		1785m²		Rise in Storeys:	3
Legislation:	01-05-19 (BCA2019)				

Deemed To Satisfy Components

Type of Special Fire Service	Inspection
Fire Mains (including booster and/or pumps)	Compliant

- achievement of specified performance
- location and suitability of booster connections and enclosures
- operation of fixed pump-set controls and status indication
- provision of additional hydrant services as mentioned in AS 2419

Comments:
Flow and Pressure achieved - 15 L/s @ 700 kPa (building pump) and 30 L/s @ 700 kPa (boosted).
The static mains pressure was measured at 350 kPa at the time of inspection.

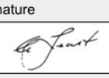
The Hydrant Booster System must be maintained in accordance with the requirements of MP6.1 of the Queensland Development Code (QDC).

North Coast Region - Community Safety Operations
2 Enterprise Street, Kunda Park Queensland 4556
PO Box 6139, Maroochydore Bc Queensland 4558
Website www.qfes.qld.gov.au
Telephone +61 7 5479 7003
Facsimile +61 7 5479 7032
ABN 93 035 163 778

COMPLIANCE SUMMARY

This summary is issued when the works have reached the stage of substantially completed and is dependent upon compliance with the Code (Building Act) Assessment conditions to assist the State satisfy the Crown's obligations under Schedule 7, Part 1, Section 2 of the Planning Regulation 2017 for building work carried out by or for the State or a public sector entity.

Formiga1 Pty Ltd PO Box 24 Royal Brisbane Hospital QLD 4029 P: 07 3253 1200 E: brisbane@formiga1.com

Owner Details	Name (natural person or company): Sunshine Coast Council - Jessica La Roche
Property Description	Street address: 1 Omrah Ave & 20 Minchinton St, Caloundra, QLD 4551 Lot & plan details: Lot 22 on RP883293, Lot 3 on RP159516 Local Government: Sunshine Coast Council
Classification The building or part thereof described is classified as follows in accordance with Part A3 of the Building Code of Australia having regard to the use for which it was designed, built or adapted. If a part of the building is classified differently to another part – state the part to which each classification relates.	Part of Building / Description: Alteration and upgrade to an existing fire hydrant system serving an events building and office building Class of Building / Part: Class 10a (serving Classes 5, 7a & 9b)
Maximum number of people permitted If applicable, state the maximum number of people permitted in the building and the portion it applies to.	Maximum population: N/A Part of Building: N/A
Restriction on the use or occupation of the building If the building work uses a Building Solution within the meaning if the Building Code of Australia or the QDC, restriction use or occupation of the building, state the restriction.	- This work has been approved in accordance with Section 61 and 68 of the Building Act 1975 and is based on acceptance of safe existing work where improvements are made without compromising the existing building. - If there is a change of ownership to either the administration building or events building (or subdivision to separate them as independent buildings), a new assessment against the Building Assessment Provisions will be required.
Performance Solutions If the building work uses an alternative solution, state the applicable materials, systems, methods of building, procedures, specifications and other relevant requirements.	The following systems and procedures form part of the Performance Solution: N/A
Assessment Manager details	Name of building certifier: Formiga1 Pty Ltd - Ashley Trost (for and on behalf of) Licence Number: A1065116 Signature:  Date: 15/07/2020 Code Assessment Ref No.: B200102

CODE (BUILDING ACT) ASSESSMENT FOR BUILDING WORK

Alteration and upgrade to existing fire hydrant system

Formiga1 Pty Ltd PO Box 24 Royal Brisbane Hospital QLD 4029 P: 07 3253 1200 E: brisbane@formiga1.com

This assessment is limited only to a Code Assessment, based on the Building Act 1975 and the Building Code of Australia. This is intended to assist the State satisfy the Crown's obligations under Schedule 7, Part 1, Section 2 of the Planning Regulation 2017 for building work carried out by or for the State or a public sector entity.

Reference Number:	B200102
Street Number and Address:	1 Omrah Ave & 20 Minchinton St, Caloundra, QLD 4551
Lot & Plan Number:	Lot 22 on RP883293, Lot 3 on RP159516
Local Government Area:	Sunshine Coast Council
Applicant:	Sunshine Coast Council - Jessica La Roche
Applicant Address:	1 Omrah Ave, Caloundra, QLD 4551
Applicant Email Address:	jessica.laroche3@sunshinecoast.qld.gov.au

Basis of Review:

Classification:	serves Classes 5, 7 & 9b	**Legislation:**
Type of Construction:	Existing	Building Act 1975 , Building Regulation 2006
Rise in Storeys:	Existing rise in 3 storeys	
Effective Height:	Existing	
Building Area:	approx. 20m2	

This Code Assessment shall be read in conjunction with:

Documents Reviewed:	Part B
Comments Regarding Documents:	Part C
Referral Agencies (Concurrence):	N/A
Referral Agencies (Advice):	**QFES Job No:** 20-01490 **Date:** April 7, 2020 This advice has been considered in the development of this Code Assessment.
Relevant Previous Advice:	N/A

Required Inspections:

Stage:	Inspections:	Inspection Agency:
Final	Final	Formiga1

Building Certifier:	QBCC Licence No:	Date:	Signature:
Formiga1 Pty Ltd - Scott Fixter (for and on behalf of)	A15090276	April 9, 2020	

PART B - DOCUMENTS REVIEWED

Hydraulic Services OSKA Consulting Group	Project Number: 19OH275, Dated: 06/04/2020, Drawing Numbers: 0000, 0001, 0100, 0101, 0102

PART C - COMMENTS REGARDING DOCUMENTS

SECTION B - STRUCTURE

B1) No structural work has been included as part of this approval. Any new structural works will require an amended permit.

SECTION C - FIRE RESISTANCE

C1) Any existing fire rated walls must not be compromised. Any penetrations or openings for services in the existing fire rated walls shall be protected in accordance with BCA Clause C3.15 & Specification C3.15. Installation certification for the various system must be supplied to the Building Certifier prior to the Compliance Summary being issued.

SECTION E - SERVICES AND EQUIPMENT

E1) Alterations to the fire hydrant system must maintain compliance with AS2419.1-2005 as far as practical but must always obtain the objectives of the Code being functionality, safety and maintenance. Water flow and pressure must be compliant for the existing building provisions. Block plans shall be installed to reflect the altered system. Installation and commissioning certification must be submitted to the Building Certifier prior to the Compliance Summary being issued.

E2) The new fire pump installation must comply with AS2941-2013 as far as practical but must always obtain the objectives of the Code being functionality, safety and maintenance. Emergency lighting must be provided to the pump room. The pump duty must be compliant for the water flow and pressure required by the existing building provisions.

E3) Provide suitable fire fighting equipment on site during construction as per BCA Clause E1.9.

GENERAL CONDITIONS

1. We recommend that occupation of the part not occur without a Compliance Summary, similar to the Building Act 1975 Clause 114(2) requirements for work that is not conducted by or on behalf of the State (Certificate of Classification). This summary is issued when the works have reached the stage of substantially completed and is dependent upon certificates supplied to the Building Certifier as noted in Part D.
2. The applicant for this development must ensure that 1 legible set of current drawings for the development is available for inspection on the building site while the building work is in progress.
3. Provide one set of "as constructed" plans prior to or at final inspection, including a list of Fire Safety Installations in accordance with Section 102 of the Building Act for forwarding to the Queensland Fire & Emergency Service.
4. It is acknowledged that alteration and amendments may occur during construction. Applicable revised drawings and certificates shall be provided for assessment and approval. The issuing of a Certificate of Classification will not be considered until documents reflecting these changes have been provided.
5. This Code Assessment has been assessed in accordance with Section 61 & 68 of the Building Act 1975 for safe existing work.
6. Compliance with any endorsements on the approved documentation shown in RED.

INSPECTIONS

7. A final inspection shall be carried out by this practice in conjunction with QFES. This inspection will be arranged directly with QFES by this practice. ***A minimum of 15 business days notice shall be observed.***

ADVISORY NOTES (These are not conditions of approval)

a. This approval does not include plumbing and drainage work. Vehicular access, builders sanitary, and other statutory fees required by local authorities have not been included in the fee proposal and may be invoiced directly from the local government to owner.

b. **OPERATIONAL WORK:** This approval does not include approval of any earthworks (cut or fill) not associated with, or incidental to, the proposed building work. Such work, if proposed by the applicant, may require additional approval from the local authority.

PART D - COMPLIANCE SUMMARY

The following certificates must be provided to the Building Certifier in a single submission with all forms completed in accordance with Clause 48 of the Building Regulation 2006 prior to the issue of a Compliance Summary. Incorrect forms will be returned for re-submission.

We recommend that occupation of the building not occur without a Compliance Summary similar to the Building Act 1975 Clause 114(2) requirements for work that is not conducted by or on behalf of the State (Certificate of Classification). This summary is issued when the works have reached the stage of substantially completed and is dependent upon: -

a. Satisfaction of all conditions nominated in association with the review of this application;

b. Satisfaction of the requirements in regard to inspections;

c. Submission of a copy of the Drainage Clearance Certificate as issued by the relevant local Government;

d. Certificates generally to be provided:-

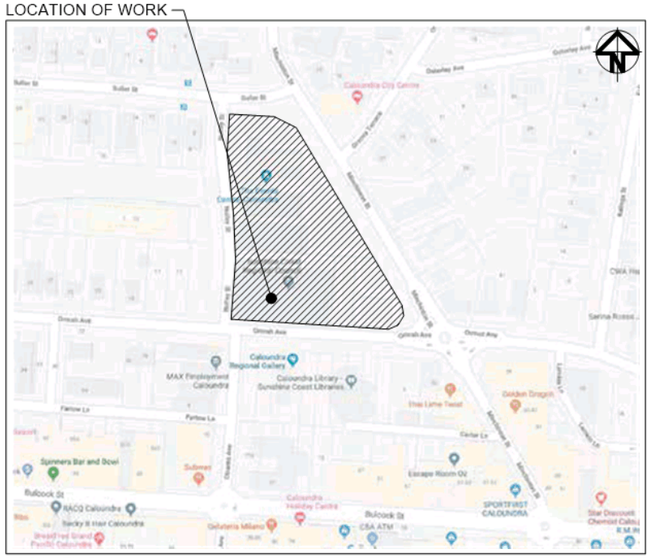
1. Evidence that the Commissioner of the Queensland Fire and Emergency Services has inspected the provision, installation and operation of the Special Fire Services;
2. Provide "As Constructed" plans showing the locations of the all special fire services in the building(s) (Items that are Subject to Referral Advice to the QFES);
3. Install and certify certification for the passive fire penetrations through fire rated elements and compliance with the manufacturer's specification;
4. Installation and commissioning certificates for the alteration to the existing fire hydrant system stating compliance with AS2419.1 and nominating the achieved water flow and pressure.
5. Installation and testing certificate for the emergency lighting and exit signage stating compliance with AS2293.1.
6. Installation and commissioning certificates for the fire pump to AS2941.

FIRE HYDRANT SYSTEM ALTERATION
1 OMRAH AVE & 20 MINCHINTON ST, CALOUNDRA QLD

HYDRAULIC SERVICES
FOR : FIREBOAR

APPROVED WITH CONDITIONS
BY FORMIGA1 PTY LTD
Permit# B200102 Date: 09 APR 2020
This is an approved document accompanying the Code Assessment.

LOCATION OF WORK



LOCALITY PLAN
SCALE: NTS
(SOURCED FROM GOOGLE MAPS)

DRAWING INDEX	
DWG #	DESCRIPTION
0000	COVER SHEET
0001	SITE PLAN
0100	BASEMENT PLAN - ADMINISTRATION BUILDING
0101	BASEMENT PLAN - EVENT CENTRE
0102	DETAIL SHEET

LINE TYPES
- COLD WATER
- COLD WATER - EXISTING
- DISCONNECTED SERVICE
- FIRE
- FIRE - EXISTING
- SPRINKLER
- SPRINKLER - EXISTING

SYMBOLS
- RISER
- DROPPER
- TEE DROPPER
- WATER METER
- CHECK VALVE
- SERVICE VALVE

SYMBOLS
- DIRECTION OF FLOW
- SERVICE DESCRIPTION & NUMBER
- SERVICE SIZE
- DIRECTION OF FLOW
- NORTH ARROW
- REVISION
- DRAWING CONTINUATION
- FALL ARROW
- CAP
- NEW CONNECTION
- SERVICES FLOW ARROW
- CONTINUATION
- UNDOCUMENTED CONTINUATION
- FIRE HOSE REEL
- FIRE HYDRANT VALVE
- DUAL PILLAR HYDRANT
- FIRE HYDRANT BOOSTER
- FIRE BOOSTER ASSEMBLY

LEGEND

AS	AUSTRALIAN STANDARDS
CHV	CHECK VALVE
DPH	DUAL PILLAR HYDRANT
DWG	DRAWING
*	EXISTING
FFL	FINISH FLOOR LEVEL
FHP	FIRE HYDRANT PUMPSET
FHR	FIRE HOSE REEL
FS	FIRE SERVICE
FSL	FINISHED SURFACE LEVEL
FSP	FIRE SERVICE PUMPSET
GAL	GALVANISED
HDGP	HOT DIPPED GALVANISED PIPE
HL	HIGH LEVEL
HV	HYDRANT VALVE
ID	INSIDE DIAMETER
IL	INVERT LEVEL
kPa	KILOPASCAL
L	LITRES
L/s	LITRES PER SECOND
m	METRE
MIN	MINIMUM
mm	MILLIMETRES
NTS	NOT TO SCALE
RL	REDUCED LEVEL
SL	SURFACE LEVEL
SR	SPRINKLER
SV	SERVICE VALVE

GENERAL NOTES:

1. THESE PLANS ARE TO BE READ IN CONJUNCTION WITH ANY APPROVED, SIGNED & STAMPED LOCAL AUTHORITY DRAWINGS & WITH ALL OTHER ASSOCIATED DRAWINGS PRIOR TO COMMENCEMENT. DISCREPANCIES TO BE NOTIFIED TO BUILDER.
2. THESE DRAWINGS ARE DIAGRAMATIC ONLY & ARE INTENDED TO INDICATE DESIGN IN ACCORDANCE WITH THE RELEVANT REGULATIONS & REQUIREMENTS OF THE AUTHORITIES CONCERNED & DO NOT RELIEVE THE CONTRACTOR OR BUILDER FROM ANY RESPONSIBILITY, EVEN IF STAMPED APPROVED BY AUTHORITIES CONCERNED.
3. ALL DIMENSIONS MUST BE TAKEN FROM SITE AND/OR VERIFIED BEFORE COMMENCEMENT OF WORK.
4. THE CONTRACTOR WILL LIAISE AND PAY ALL FEES ASSOCIATED WITH LOCAL AUTHORITY APPROVALS, CONNECTION, CONSTRUCTION COSTS AND REQUIRED INSPECTIONS AND TESTING FOR THIS PROJECT.
5. THE CONTRACTOR SHALL ACCESS AND ADVISE SUPERINTENDENT OF THE CONDITION OF EXISTING PIPEWORK PRIOR TO UNDERTAKING ANY ONSITE WORKS. ALLOW TO REPLACE EXISTING PIPEWORK SHOULD IT BE DEEMED IN POOR OR UNSATISFACTORY CONDITION.
6. ENCLOSED WORK SHALL NOT BE COVERED OR CONCEALED FROM VIEW UNTIL IT HAS BEEN TESTED AND INSPECTED BY THE RESPECTIVE AUTHORITIES INSPECTORS AND HAS BEEN APPROVED FOR CONCEALMENT BY THE SUPERINTENDENT.
7. SEAL OFF & REMOVE ALL REDUNDANT FIXTURES, INCLUDING WATER SUPPLY AND DRAINAGE TO AS3500 AND LOCAL AUTHORITIES APPROVAL.
8. ALL EXISTING SERVICE DETAILS TAKEN FROM LIMITED RECORDS & SURVEY. PLUMBER TO CONFIRM ALL DETAILS ON SITE PRIOR TO CONSTRUCTION & ALLOW FOR NEW OR EXISTING SERVICE REDIRECTION IN TENDER IF NECESSARY.
9. ALL SERVICES PASSING THROUGH A FIRE RATED STRUCTURE SHALL HAVE FIRE COLLARS OR OTHER APPROVED FIRE PROTECTION METHODS RATED TO THE MINIMUM FRL TO THE STRUCTURE IT IS PENETRATING.
10. ALL CONCRETE CUTTING & REFINISHING TO MATCH EXISTING SURFACES WHERE NECESSARY TO ARCHITECTS & STRUCTURAL ENGINEERS APPROVAL PRIOR TO COMMENCING CONSTRUCTION.
11. EXPOSED PIPEWORK SHALL BE PAINTED AND LABELED WITH PIPE MARKERS IN ACCORDANCE WITH AS1345. PIPEWORK INGROUND SHALL BE PROVIDED WITH MARKING TAP IN THE TRENCH INDICATING THE SERVICE AND DIRECTION OF FLOW IN ACCORDANCE WITH AS2648.
12. TEST ALL SYSTEMS AS REQUIRED BY THE LOCAL AUTHORITIES AND RELEVANT AUSTRALIAN STANDARDS.
13. ALL MATERIALS SHALL BE IN ACCORDANCE WITH
    - STANDARD PLUMBING AND DRAINAGE REGULATION.
    - RELEVANT AUSTRALIAN STANDARDS APPROVAL OF THE LOCAL AUTHORITY.
29. THESE DRAWINGS HAVE BEEN DESIGNED TO COMPLY WITH THE LATEST EDITION OF THE AUSTRALIAN STANDARDS:
    - AS2419.1 FIRE HYDRANT INSTALLATIONS PART 1.

FIRE SUPPLY NOTES:

1. ALL SPRINKLER PIPEWORK SHALL BE COORDINATED WITH AIR CONDITIONING DUCT WORK, HYDRAULIC AND ELECTRICAL SERVICES WORKSHOP DRAWINGS.
2. CLASS 20 BLUE BRUTE SHALL BE INSTALLED FOR ALL PIPEWORK RUNS IN GROUND SHALL.
3. ALLOW TO RUN MEDIUM DUTY GALVANISED STEEL PIPEWORK TO SUIT VITAULIC FITTINGS FOR ALL ABOVE GROUND HYDRANT PIPEWORK AND FITTINGS.
4. HYDRANTS TO BE PROTECTED FROM MECHANICAL DAMAGE. I.E. EXTERNAL HYDRANTS IN CAR PARKS ARE TO BE PROTECTED FROM MECHANICAL DAMAGE BY INSTALLING BOLLARDS.

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

FOR BUILDING APPROVAL

REV	DESCRIPTION	DRAWN	DATE
B	REVISED BA	CO	06.04.20
A	BA ISSUE	CO	20.11.19

DISCLAIMER
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ORIGINAL SHEET SIZE: A1

CLIENT: FIREBOAR
FIREBOAR SAFETY | PROTECTION | SURVIVAL

PROJECT: FIRE HYDRANT SYSTEM ALTERATION
1 OMRAH AVE &
20 MINCHINTON ST,
CALOUNDRA QLD

SCALE: N.T.S.

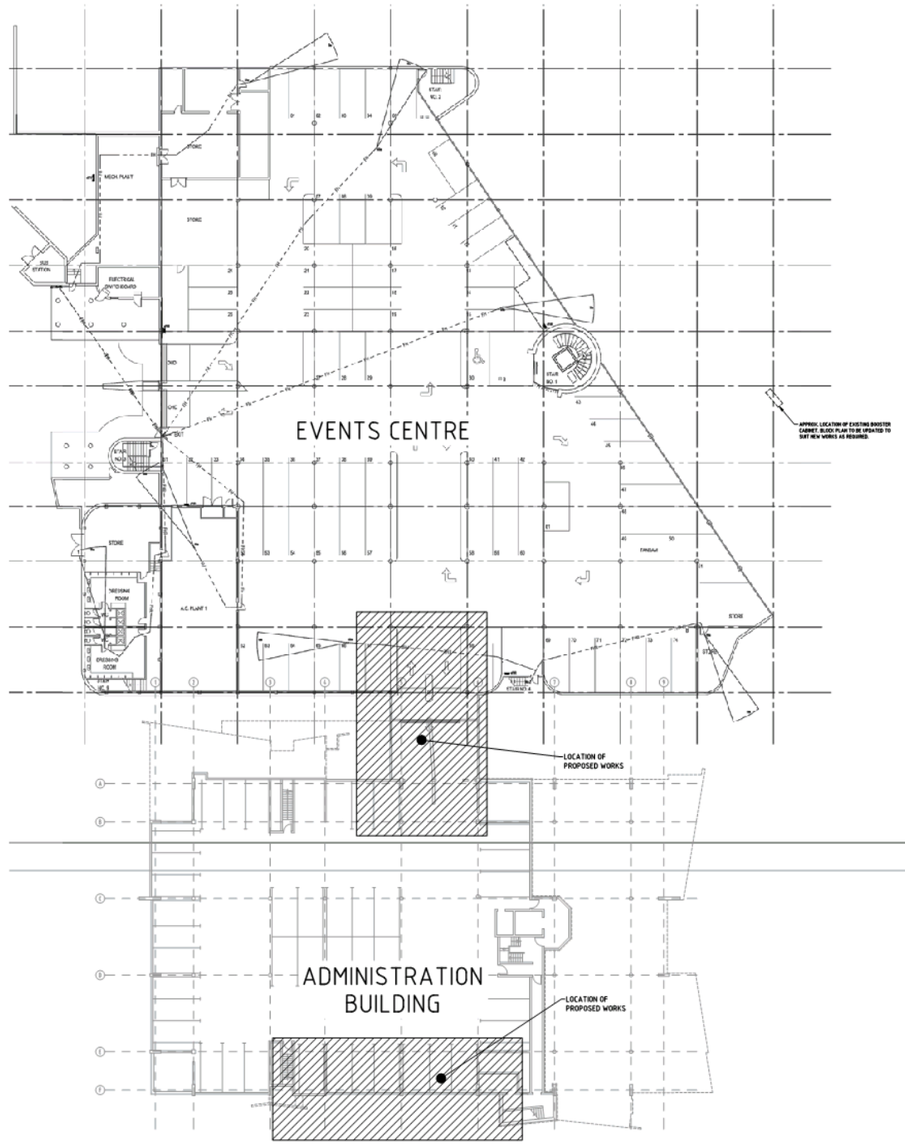
OSKA CONSULTING GROUP
LEVEL 1, 193 FERRY ROAD SOUTHPORT QLD 4215 AUSTRALIA
T 07 5557 0509

TITLE
COVER SHEET
LOCALITY PLAN, DRAWING REGISTER
NOTES, LEGEND, SYMBOLS & LINETYPES

TASK	BY	INITIAL	DATE
REVIEW	CM		
DESIGN	CM		18.11.19
DRAWN	CO		18.11.19

APPROVED CAMERON MAXWELL QBCC No 15142712

PROJECT NUMBER	DRAWING NUMBER	REVISION
19OH275-00-	0000	B



APPROVED WITH CONDITIONS
BY FORMIGA1 PTY LTD
Permit# B200102 Date: 09 APR 2020
This is an approved document accompanying the Code Assessment.

NOTE:
NEW PIPEWORK TO BE TESTED TO 1,700kPa FOR 2 HOURS (AS2419.1-2005 CLAUS 10.2.2

NOTE:
ALL PIPEWORK TO BE VERIFIED ON SITE PRIOR TO COMMENCEMENT OF ANY WORKS.

NOTE:
THESE DRAWINGS HAVE BEEN PRODUCED BY USING HARD COPY PDF'S AND WILL REQUIRE ON SITE SURVEYING TO ACCURATELY DOCUMENT SITE REQUIREMENTS AND EXISTING INVERT LEVELS PRIOR TO COMMENCING ANY WORKS.

EXISTING SERVICES INDICATED IN THESE DOCUMENTS ARE INDICATIVE ONLY. ALLOW TO EXCAVATE & EXPOSE EXISTING SERVICES TO VERIFY EXACT LOCATION & LEVELS OF SERVICES PRIOR TO COMMENCEMENT OF ANY WORKS.

FOR BUILDING APPROVAL

REV	DESCRIPTION	DRAWN	DATE
B	REVISED BA	CO	06.04.20
A	BA ISSUE	CO	20.11.19

COORDINATED REFERENCE DRAWINGS

SERVICE	DRAWING NUMBER	ISSUE	DATE
ARCH			
STRUCT			
CIVIL			
MECH			
ELEC			

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ORIGINAL SHEET SIZE A1

CLIENT
FIREBOAR
SAFETY | PROTECTION | SURVIVAL

PROJECT
FIRE HYDRANT SYSTEM ALTERATION
1 OMRAH AVE &
20 MINCHINTON ST,
CALOUNDRA QLD

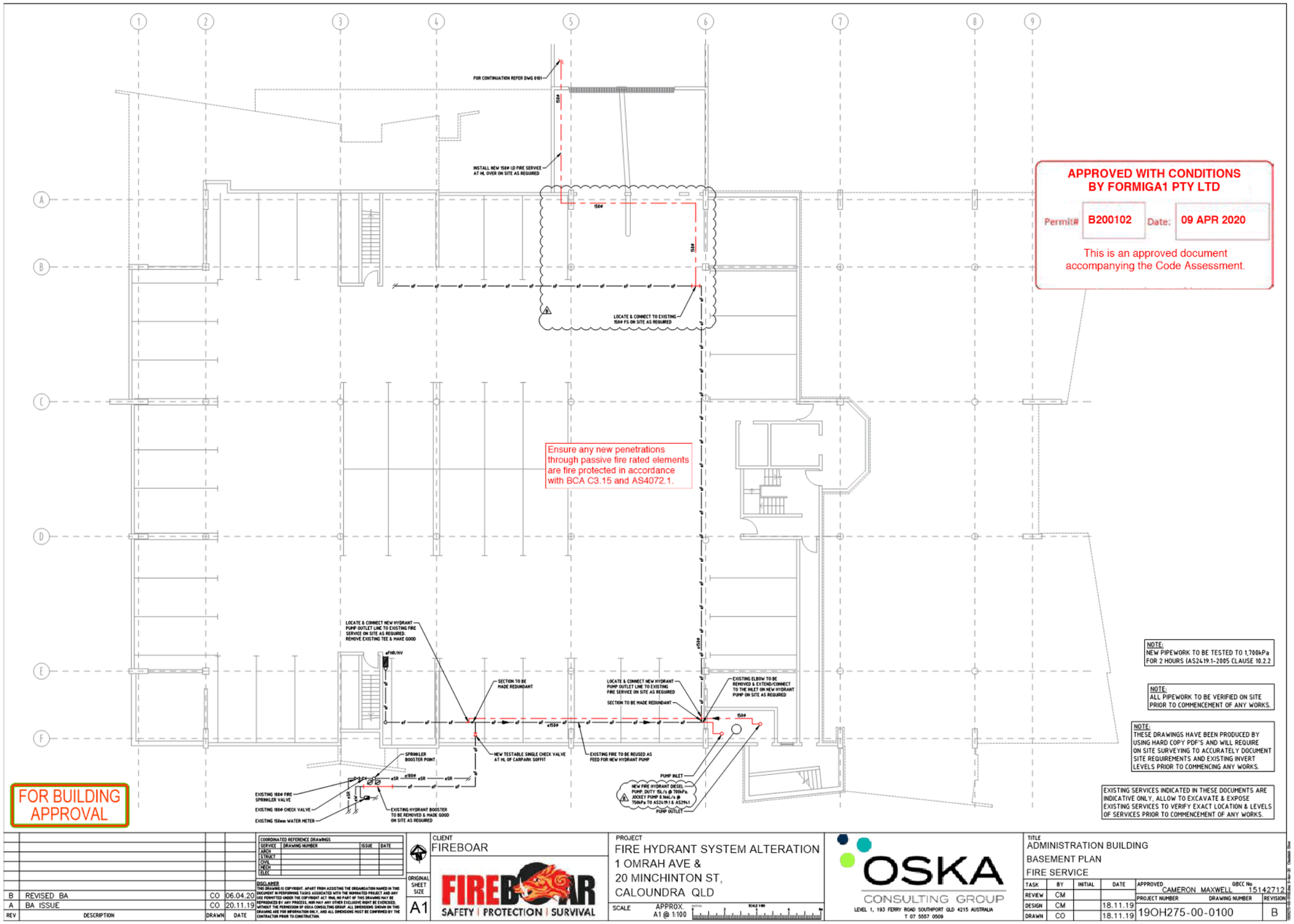
SCALE APPROX. A1 @ 1:250

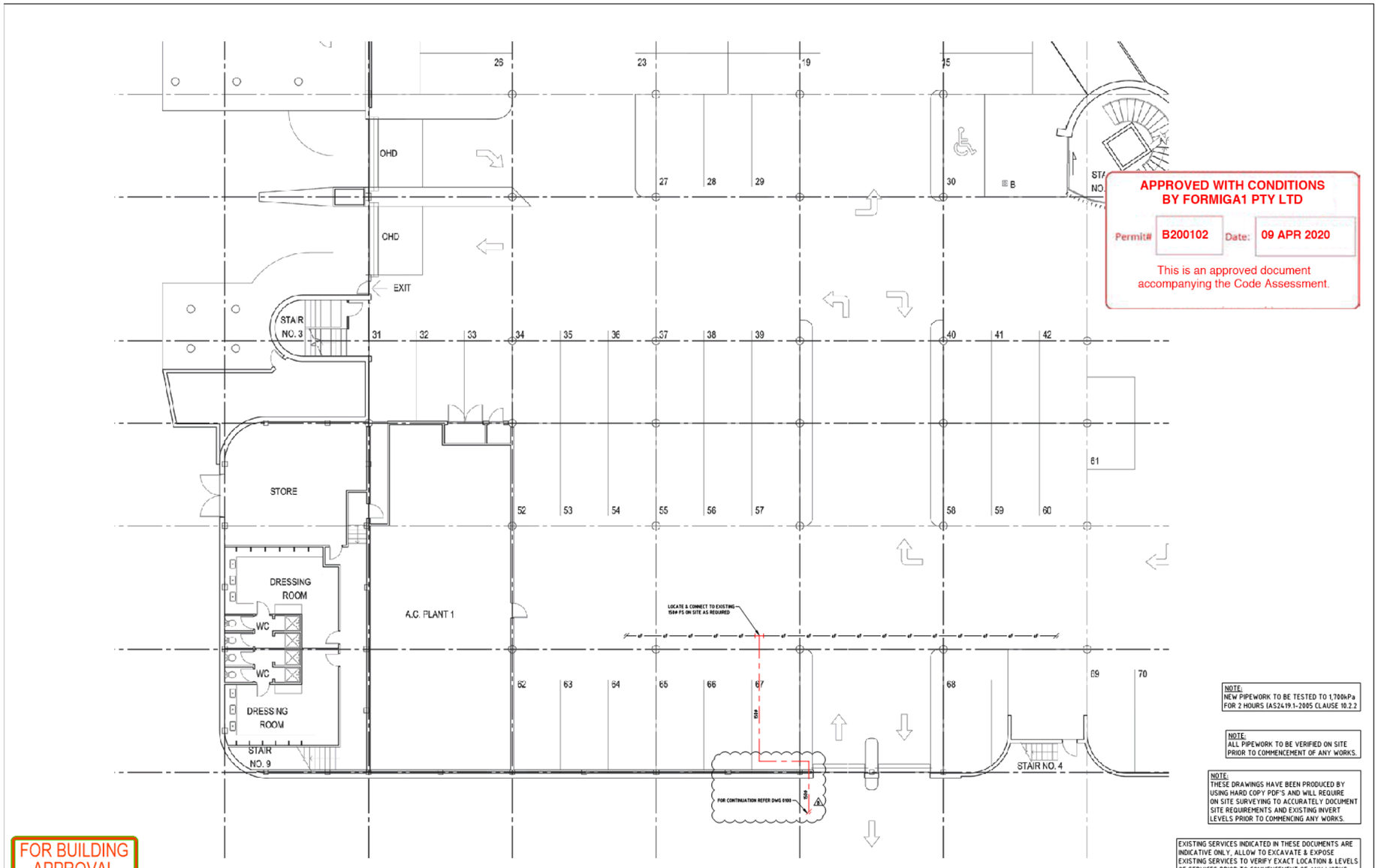
OSKA CONSULTING GROUP
LEVEL 1, 193 FERRY ROAD SOUTHPORT QLD 4215 AUSTRALIA
T 07 5557 0509

TITLE
OVERALL SITE PLAN
BASEMENT LEVEL

TASK	BY	INITIAL	DATE
REVIEW	CM		
DESIGN	CM		18.11.19
DRAWN	CO		18.11.19

APPROVED CAMERON MAXWELL QBCC No 15142712
PROJECT NUMBER 19OH275-00-0001
DRAWING NUMBER
REVISION B


APPROVED WITH CONDITIONS
BY FORMIGA1 PTY LTD
Permit# B200102 Date: 09 APR 2020
This is an approved document accompanying the Code Assessment.
Ensure any new penetrations through passive fire rated elements are fire protected in accordance with BCA C3.15 and AS4072.1.
FOR BUILDING APPROVAL
NOTE: NEW PIPEWORK TO BE TESTED TO 1,700kPa FOR 2 HOURS (AS2419.1-2005 CLAUSE 10.2.2
NOTE: ALL PIPEWORK TO BE VERIFIED ON SITE PRIOR TO COMMENCEMENT OF ANY WORKS.
NOTE: THESE DRAWINGS HAVE BEEN PRODUCED BY USING HARD COPY PDF'S AND WILL REQUIRE ON SITE SURVEYING TO ACCURATELY DOCUMENT SITE REQUIREMENTS AND EXISTING INVERT LEVELS PRIOR TO COMMENCING ANY WORKS.
EXISTING SERVICES INDICATED IN THESE DOCUMENTS ARE INDICATIVE ONLY, ALLOW TO EXCAVATE & EXPOSE EXISTING SERVICES TO VERIFY EXACT LOCATION & LEVELS OF SERVICES PRIOR TO COMMENCEMENT OF ANY WORKS.
CLIENT FIREBOAR
FIREBOAR SAFETY | PROTECTION | SURVIVAL
PROJECT FIRE HYDRANT SYSTEM ALTERATION
1 OMRAH AVE &
20 MINCHINTON ST,
CALOUNDRA QLD
SCALE APPROX A1 @ 1:100
OSKA CONSULTING GROUP
LEVEL 1, 193 FERRY ROAD SOUTHPORT QLD 4215 AUSTRALIA
T 07 5557 0509
TITLE ADMINISTRATION BUILDING
BASEMENT PLAN
FIRE SERVICE
ORIGINAL SHEET SIZE A1
B REVISED BA CO 06.04.20
A BA ISSUE CO 20.11.19
APPROVED CAMERON MAXWELL QBCC No 15142712
PROJECT NUMBER 19OH275-00-0100
DRAWING NUMBER
REVISION B


OHD
OHD
EXIT
STAIR NO. 3
STORE
DRESSING ROOM
WC
WC
DRESSING ROOM
STAIR NO. 9
A.C. PLANT 1
LOCATE & CONNECT TO EXISTING 150ø FS ON SITE AS REQUIRED
FOR CONTINUATION REFER DWG 0100
STAIR NO. 4
APPROVED WITH CONDITIONS
BY FORMIGA1 PTY LTD
Permit# B200102 Date: 09 APR 2020
This is an approved document accompanying the Code Assessment.
NOTE: NEW PIPEWORK TO BE TESTED TO 1,700kPa FOR 2 HOURS (AS2419.1-2005 CLAUSE 10.2.2
NOTE: ALL PIPEWORK TO BE VERIFIED ON SITE PRIOR TO COMMENCEMENT OF ANY WORKS.
NOTE: THESE DRAWINGS HAVE BEEN PRODUCED BY USING HARD COPY PDF'S AND WILL REQUIRE ON SITE SURVEYING TO ACCURATELY DOCUMENT SITE REQUIREMENTS AND EXISTING INVERT LEVELS PRIOR TO COMMENCING ANY WORKS.
EXISTING SERVICES INDICATED IN THESE DOCUMENTS ARE INDICATIVE ONLY, ALLOW TO EXCAVATE & EXPOSE EXISTING SERVICES TO VERIFY EXACT LOCATION & LEVELS OF SERVICES PRIOR TO COMMENCEMENT OF ANY WORKS.
FOR BUILDING APPROVAL
B REVISED BA CO 06.04.20
A BA ISSUE CO 20.11.19
REV DESCRIPTION DRAWN DATE
CLIENT FIREBOAR
SAFETY | PROTECTION | SURVIVAL
ORIGINAL SHEET SIZE A1
PROJECT FIRE HYDRANT SYSTEM ALTERATION
1 OMRAH AVE &
20 MINCHINTON ST,
CALOUNDRA QLD
SCALE APPROX. A1 @ 1:100
OSKA CONSULTING GROUP
LEVEL 1, 193 FERRY ROAD SOUTHPORT QLD 4215 AUSTRALIA
T 07 5557 0509
TITLE EVENTS CENTRE
BASEMENT PLAN
FIRE SERVICE
TASK BY INITIAL DATE
REVIEW CM 18.11.19
DESIGN CM 18.11.19
DRAWN CO 18.11.19
APPROVED CAMERON MAXWELL QBCC No 15142712
PROJECT NUMBER 19OH275-00-0101
DRAWING NUMBER
REVISION B

APPENDIX G FIRE HYDRANT FORM 72 (FOR INFORMATION ONLY)

Version 1 – July 2014

Form 72 - fire hydrant and sprinkler system periodic testing and maintenance

This form is to be used for the purposes of maintenance to water based fire safety installations, as required by the Queensland Development Code – Mandatory Part (MP) 6.1, which is a building assessment provision under the Building Act 1975, section 30. This form is also to be used in accordance with the 'Fire hydrant and sprinkler system commissioning and periodic maintenance procedure', defined in MP 6.1 as the 'Relevant procedure'. Please note that this form does not comprise all maintenance requirements—this form is only for collecting results for maintenance for some sections of the Australian Standards referred to and in each case, further testing is required.

Part A - Test details					
Site name	Caloundra Administration / Events Centre				
Site address	1 Ormah Ave & 22 Minchinton Street Caloundra				
Contractor	Fire Boar				
Testing details	**Test date:** 29-05-2020	Maintenance test:	Annual	5 year	
		fire hydrant	☒	☐	
	Time: 12.30 pm	fire sprinkler	☐	☐	
		combined	☐	☐	

Part B - Hydrant hydrostatic test	PASS ☒	FAIL ☐			
Refer to the required pressure specification for periodic testing (as applicable) as per AS2419.1 or AS1851.					
Boost pressure	900 kPa	**Test pressure**	1700 kPa		
Duration of test	120 min	**End of test pressure**	1700 kPa	**Loss (if any):**	NIL
Comments:					

Part C - Hydrant test equipment/pressure gauges				
If using more devices, provide details in the Notes section below or complete another form. The correction factor must be kPa or a percentage.				
Flow measuring device	Orifice ☐ Part C not required for orifice testing	Mechanical ☒ Calibrated: 19/08/2019	Electro magnetic ☐ Calibrated: / / 2014	
	Device/gauge 1	**Device/gauge 2**	**Device/gauge 3**	**Device/gauge 4**
Serial number	FB 5080	190991-4	FB 1381	FB 10510
Date calibrated	July 2019	July 2019	July 2019	July 2019
Correction certificate	YES	YES	YES	YES
65/100/150 mm face	N/A	100mm	N/A	N/A
Digital reader	N/A	N/A	N/A	N/A
Increments (kPa)	N/A	20 kPa	N/A	N/A

Part D - Hydrant system flow test	PASS ☒	FAIL ☐		
This part relates to tests under Section 4 of AS1851. If pressure/flow rates do not meet the fire system design criteria and there are no on-site problems, contact the relevant water service provider to ascertain if there are any problems with the water system network. In the table below, please record the pressure readings obtained during the hydrant system flow test.				
Hydrant 1 location	Car Park External Hydrants	Hydrant 3 location		
Hydrant 2 location	Level 3 Hydrant	Hydrant 4 location		
System requirements	15 l/s @ 700 kPa	Static pressure	1000 kPa	
On-site pump set installed	Yes ☒		No ☐	

Pressure zone number:	**Size/flow rate**	**Device/gauge no. (Part C)**	**Hydrant 1 only**	**Hydrant 2 only**	**Hydrants 1, 2 and 3**	**Hydrants 1, 2, 3 and 4**
Nozzles	19 mm		kPa	kPa	kPa	kPa
	22 mm		kPa	kPa	kPa	kPa
	25 mm		kPa	kPa	kPa	kPa
Other portable testing devices	5 L/s		kPa	kPa	kPa	kPa
	10 L/s		kPa	kPa	kPa	kPa
	15 L/s	1381/10510	820 kPa	kPa	kPa	kPa
	20 L/s		kPa	kPa	kPa	kPa
	22 L/s		kPa	kPa	kPa	kPa
	System achieved: 15 L/s @ 820 kPa					

Part E - Pump appliance booster test	PASS ☒	FAIL ☐			
This part relates to sections 10.4 and 10.5 of AS2419.1 and for tests under Section 4 of AS1851. If pressure/flow rates do not meet the fire system design criteria and there are no on-site problems, contact the relevant water service provider to ascertain if there are any problems with the water system network. In the table below, please record the pressure readings obtained during the pump appliance booster test.					
Hydrant locations	Car Park External Hydrants		Height of highest hydrant above booster	8M	
System requirements	30 l/s @ 700 kPa	Static pressure	N/A		
Pump inlet pressure	300 kPa	Pump discharge pressure	900kPa		
Boost pressure	900 kPa	Calculated frictional loss	50 kPa		
Comments: N/A					

Part F - Sprinkler hydrostatic test	PASS ☐	FAIL ☐		
Relevant required pressure specification in AS2118.1, AS2118.4 and AS2118.6.				
Pressure	kPa	Time held	mins	
Comments: N/A				

Part G - Sprinkler system flow test

This section is to be used for sections 4.14 of AS2118.1-1999, 4 of AS2118.6-2012 and 6.2 of AS2118.4-2012 and section 2 of AS1851. Notes: (1) For AS2118.1 and AS2118.6 systems, multiple testing points may be required. (2) For AS2118.4, a simulated running test may be required for systems without a flow measuring device, in which the test involves opening a valve to discharge a volume of water that is accepted as being in excess of the design flow. System test points shall be noted for each different system and its location and descriptor.

	System specifications (block plan):		**Test results:**		
Test point 1	Location				
	Required flow rate		Pass ☐	Fail ☐	
	Required pressure		Pass ☐	Fail ☐	
Test point 2	Location				
	Required flow rate		Pass ☐	Fail ☐	
	Required pressure		Pass ☐	Fail ☐	
Running test	Installation gauge pressure:				
Comments: N/A					

Part H - Compliance		
Critical defects identified	Yes ☐	Give owner/occupier a critical defect notice
	No ☒	No action required in relation to critical defects at this time
Repairs/corrective actions taken	Yes ☐	Attach details (including action and date taken) as part of Licensee's report
	No ☒	No action required in relation to repairs/corrective actions at this time
System	Pass ☒	
	Fail ☐	

Part I - Signature

By signing this Form 72, I confirm that the information contained herein is correct to the best of my knowledge given the information available and that this Form 72 has been completed in accordance with the relevant standards, codes and regulations.

Licensee name	Nick Varley	**Licensee signature**	
Licence no. (QBCC/PIC)	745659	**Licensee report no.**	N/A

Note: Building owners/occupiers are responsible for ensuring their buildings continuously meet fire safety standards. Where a building owner/occupier becomes aware that their building does not meet the minimum requirements for water pressure required by any standard applicable under the Queensland Development Code Mandatory Part 6.1 (Maintenance of fire safety installations) the building owner/occupier should contact the Queensland Fire and Emergency Service.
Definitions: "Maintenance test" means a test that is required under a maintenance standard such as AS1851. "Running test" means a two inch waste test installed at the sprinkler control valve on older systems.
Privacy: The information on this form is collected for purposes related to monitoring compliance under the Plumbing and Drainage Act 2002, the Building Act 1975 and the Building Fire Safety Regulation 2008 ("legislation"). This information may be stored in the department's database and may be used for statistical research, information provision and evaluation of Plumbing Industry Council and state government services. Your personal information may be disclosed to other government agencies, local government authorities and third parties for purposes related to this application. Except for these circumstances, personal information will only be disclosed to third parties with your consent or in accordance with the Information Privacy Act 2009.
RTI: The information collected on this form will be retained as required by the Public Records Act 2002 and other relevant Acts and regulations, and is subject to the Right to Information regime established by the Right to Information Act 2009. If you have any further questions regarding your privacy, please email Building Codes Queensland on buildingcodes@qld.gov.au.

Mechanical Services Report

Attached is an assessment of the existing mechanical services systems in the building. In general terms the mechanical systems are in reasonable condition commensurate with the age of the system, however, these systems are at or close to, the end of their economic lifecycle.

Given the scale of refurbishment proposed for the building, it has been decided to undertake to replace the existing plant equipment.


SCHEMATIC DESIGN REPORT
CALOUNDRA ADMINISTRATION BUILDING REPURPOSING
MECHANICAL SERVICES
JHA
JHASERVICES.COM

DOCUMENT CONTROL SHEET

Project Number	Q190072
Project Name	Caloundra Administration Building Repurposing
Description	Electrical Site Inspection Report
Key Contact	Phillip Lukin – Wilson Architects

Prepared By

Company	JHA
Address	130 Commercial Road Teneriffe
Phone	61-7 3257 4890
Email	tian.song@jhaengineers.com.au
Website	www.jhaservices.com
Author (s)	T.Song
Checked	J. Farrah
Authorised	T. Song

Revision History

Issued To	Revision and Date								
Wilson Architects	**REV**	1	2						
	DATE	09.09.20	12.01.21						
	DESCRIPTION	SD Issue	SD Issue						

CONTENTS

1 INTRODUCTION

JHA Consulting Engineers (JHA) have been engaged by Wilson Architects to undertake the feasibility assessment for the refurbishment works associated with the Caloundra Administration building, converting the existing facility into a modern library and administration building with community facilities that integrate with the wider site masterplan.

Figure 1 –Proposed Site Plan

In support of the proposed refurbishment works, we have previously undertaken a Site inspection and provided an associated dilapidation report for Council's review and consideration. A copy is appended to this Schematic Design Report.

1.1 PROJECT SCOPE OF WORKS

The following broad elements of work will be expected for the project

1.1.1 Level 1

Works associated with Level 1 include the provision of public and library services including:

- Training rooms;
- DVD + Audio services;
- Computers;
- Junior Fiction;
- Young Adult;
- Toy Library;
- Story Corner

1.1.2 LEVEL 2

Level 2 is proposed to include the following services:

- Study + Booked Meeting Spaces
- Quiet Reading;
- Adult Fiction
- Non-Fiction
- Literacy

1.1.3 LEVEL 3

Level 3 is proposed to include Staff and Administration areas.

1.2 PURPOSE OF THIS DOCUMENT

The intent of this Schematic Design Report (SDR) is to capture JHA's understanding of the Project's mechanical services design requirements and provide a mechanism through which Sunshine Coast Council can provide feedback on the proposed services.

This SDR will outline the engineering services scope, design criteria, engineering approach, and system strategies proposed for this project, for client sign off and is to be read in conjunction with associated architectural and other engineering reports. This document will be utilised as the basis of future design cost estimates, and as guidance to determine the subsequent design works for the Project.

The intent will be to provide a holistic SDR to ensure services requirements are considered during the construction of the project in its entirety. Broadly, these services encompass those building systems relating to the following:

1.2.1 MECHANICAL:

- Air Conditioning systems (Cooling / Heating)
- Mechanical Outside Air and Exhaust Ventilation systems
- Fire & smoke management systems
- Building control systems

1.3 LIMITATIONS

This SDR is preliminary in nature and represents the outcome of design reviews, and discussions during concept design phase. The information outlined within the SDR is expected to be reviewed, confirmed as part of the review process, and further developed in the next phase of the project.

1.4 APPENDED INFORMATION

The contents of this report are intended to be read in conjunction with the following appendices:

- APPENDIX A: MECHANICAL DILAPIDATION REPORT
- APPENDIX E: MECHANICAL CONCEPT SKETCHES

2 MECHANICAL SERVICES

2.1 OBJECTIVES

The purpose of this section is to define the mechanical services proposed for the project including room requirements, applicable standards, design criteria, system selection and integration with existing services on site where applicable.

2.2 MECHANICAL PROVISIONS

The Caloundra Administration Repurposing project will be provided with the following mechanical services:

- Air Conditioning systems (Cooling / Heating)
- Mechanical Outside Air and Exhaust Ventilation systems
- Extraction Hoods to Café cooking areas
- Smoke and fire management systems
- Building control systems
- Consideration for relocation of air conditioning condensers serving the current data centre

2.3 DESIGN STANDARDS

The mechanical services design will comply with the relevant Australian Standards, codes and practices, including, but not limited to:

Table 1 – Mechanical Reference Standards

REFERENCE	DESCRIPTION
AS 1668.1:2015	The use of ventilation and air conditioning in buildings Part 1: Fire and smoke control in multi-compartment buildings
AS 1668.2:2012	The use of ventilation and air conditioning in buildings Part 2: Mechanical ventilation in buildings
AS 3000:2007	Electrical Installation
AS/NZS 2107-2000	Acoustics: Recommended Design Sound Levels and Reverberation Times for Building Interiors
AS 3666	Air Handling and Water Systems of Buildings
AS 3500	National Plumbing and Drainage Code
AS 5149	Refrigerating Systems
AS 4254	Ductwork for Air Handling systems in buildings
NCC Vol 1 BCA 2019	National Construction Code Volume 1 Building Code of Australia 2019

2.4 DESIGN PARAMETERS

The following design parameters form the basis of the mechanical design for the project.

2.4.1 EXTERNAL DESIGN CONDITIONS

Outdoor design conditions selected are based on the AIRAH Application Manual DA9 Air Conditioning Load Estimation and Psychometrics. The following outline the intended outdoor design conditions for the project:

Table 2 – Climate Zone (Comfort Design Conditions)

Site	Climate Zone	Summer Temperature (°C DB)	Summer Temperature (°C WB)	Winter Temperature (°C DB)	Relative Humidity
Sunshine Coast	Zone 2	29.7	25.8	9.2	AIRAH DA9 Data (Table 1A)

2.4.2 NCC VOL 1 BCA SECTION J REQUIREMENT

The mechanical systems will be designed in accordance with the requirements of NCC Vol 1 BCA 2019, in particular Section J as applicable. The mechanical design will comply with the requirements of Section J5 and J8 of the applicable NCC Vol 1 BCA year.

2.4.3 INTERNAL DESIGN CONDITIONS

Table 3 – Mechanical Design Conditions

Room	Temperature (°C)	Relative Humidity (%RH)
Library Generally	24 + 1.5	Note 1
Library Books / Processing	24 + 1.5	Note 1, 3
Customer Service/ Returns	24 + 1.5	Note 1
Work Areas / Dispatch	24 + 1.5	Note 1
Foyer & Event Space	24 + 1.5	Note 1
Maker Space	24 + 1.5	Note 1
Meeting Rooms	24 + 1.5	Note 1
Administration Office	24 + 1.5	Note 1
Councillor's Offices	24 + 1.5	Note 1
Kitchen Breakout	24 + 1.5	Note 1
Store	Nil	N/A
Communications Rooms	22 + 1	Note 1, 2
Data Room	22 + 1	45-50%RH
Wet Area / Outdoor Activity	Naturally Ventilated	N/A
Fire Pump Room	Mechanical Ventilation	N/A
MSB / Battery Room	Mechanical Ventilation	N/A
Amenities / Cleaner's Cupboards	Mechanical Ventilation	N/A
Mechanical Plant Areas	Nil	N/A
Terraces / Outdoor Spaces	Naturally Ventilated	N/A

[1] No direct humidity control will be provided. The relative humidity range is generally achieved as a result of mechanical based cooling.

[2] Communications rooms will be served by dedicated mechanical air conditioning plant. No duty-standby arrangement is proposed.

[3] Direct humidity control will be provided.

2.4.4 COORDINATION WITH CONCURRENT PROJECTS

A number of concurrent Sunshine Coast Council projects are understood to being undertaken. These are:

- Sunshine Coast Council precinct planning (undertaken by Jacobs)

The precinct masterplan works undertaken by Jacobs is expected to have a direct impact in the design and/or outcome of the Adminstration Building Repurposing works. Due consideration of the proposed works to be undertaken as part of the Sunshine Coast Council precinct planning, is important in refining the scope of works for the Adminstration Building Repurposing, these include:

- Extent of upgrade to the Adminstration Building Repurposing connection to the precinct central energy facility (if applicable);
- Integration of services with consideration for site wide system design approach as part of the Jacobs precinct planning i.e. site wide chilled water or ice storage electrical concepts including infrastructure reconfigurations for co/tri-generation (if applicable)
- Local air cooled chilled water plant strategy given the potential for central energy facility; and
- Integration of building based sustainability initiatives as part of the precinct planning recommendations, to be adopted for the Adminstration Building Repurposing project.

We understand that the Sunshine Coast Council precinct planning is concurrently being progressed, and may be available for review at the next stage of the Adminstration Building Repurposing project.

2.5 MECHANICAL SERVICES METHODOLOGY

2.5.1 AIR CONDITIONING LOAD ALLOWANCES

The following load allowances will be accounted for:

Table 4 - Load Allowances

Item	Allowance	Comments
Lighting Load	10 Watts per m^2	Energy efficient lighting systems will be provided
Equipment Load	20 Watts per m^2	Estimated for each space based on equipment listed in architectural room data sheets for office type facilities. A lower load profile will be considered for the general non equipment library spaces.
Infiltration	0.5 air change 1 air change	On façade zones and areas where standard construction infiltration is expected. Foyer and transient entry façade zones

2.5.2 EQUIPMENT SELECTION CRITERIA

Mechanical equipment will be selected in accordance with the following heating, ventilation and air conditioning (HVAC) selection criteria:

- Plant to have a minimum design life of 15 years, and selected in accordance with the environment in which it is located.
- Plant will adhere to the nominated acoustic criteria for each space (AS/NZS 2107). Refer to the Acoustic section of the report.
- Plant will adhere to the nominated energy efficiency criteria to achieve the nominated Greenstar requirements. Refer to the Greenstar Matrix as part of the ESD report.
- Plant will be selected for the environment in which it is located. Condensation and corrosion issues will be reviewed and addressed as part of corrosion protection measures. Based on the location of the site, additional corrosion protection measures are expected on the condenser fins i.e. Blygold corrosion protection coating.
- General plant capacities will be based on the local climate conditions as outlined above.
- All computer rooms and communications rooms will be provided with stand-alone plant designed for 24hr operation.
- Air conditioning systems will be specified with variable speed inverter-based compressors to maximise low load efficiencies.
- Plant equipment requiring regular maintenance will be located in accessible locations.
- Mechanical equipment and system design will conform to the facility acoustic requirements and will prevent the transmission of noise/vibration from rotating or reciprocating equipment through the building structure. Mechanical condenser and indoor unit plant noise levels will be reviewed by the acoustic consultant.
- Systems will be selected based on proven and reliable operation.
- Equipment and system installation requirements considered to ensure safety measures are incorporated into the design such that requirements of WHS Act and BCA (NCC) Section I1 are met.
- All electric motors shall be high efficiency selections, with suitable planning to ensure the system distribution delivers maximum efficiencies, i.e. via effective plant room locations being adjacent to areas served.
- Plant equipment susceptible to hail damage shall be fitted with hail guards to minimise risk of physical damage. This is to be further considered during the design development phase of the project given location of the mechanical air-cooled chiller plant.

2.5.3 MECHANICAL SYSTEM SITE APPROACH

In discussion with Sunshine Coast Council (SCC) and design team stakeholders, it was advised that there was a desire to pursue a master planned mechanical air conditioning system for the wider precinct as part of the Sunshine Coast precinct renewal including thermal storage and the like. This masterplan is undertaken by a separate design consultancy team.

Consideration was requested by Sunshine Coast Council and design team stakeholders to investigate connections into this potential precinct wide central plant to support wider master planned benefits in terms of system flexibility, energy efficiency, consolidation and future expansion capabilities. The central energy facility is likely to cater for the library building (this project), conference centre, and future developments (gallery etc).

Initiatives investigated by the wider masterplan applicable to mechanical scope provision for the library project include:

- Central energy facility consisting of water-cooled chillers, cooling towers.
- Co/Tri-generation facility consisting of absorption chillers, generators and the like.
- Thermal water or ice storage for peak load management.

Central plant initiatives outlined above, typically improves its return on investment (ROI) with increased system capacity and usage. Its feasibility including whole of life (WOL) net present value (NPV) assessment are undertaken at a site master planning level by the master planning consultant team. It is the understanding of this project that such feasibility would include alternative procurement schemes such as build, own, operate, transfer (BOOT).

Integration of this project to the precinct masterplan central plant is to be further investigated during the design development phase of the project. The following provisions have been made within the current Administration Building Repurposing project:

- Spatial provision for future reticulation of chilled water pipework from precinct wide central energy facility to the mezzanine chilled water plantroom.
- Pipework connections to allow future connection of the central energy facility to the local chilled water system.

2.5.4 EXISTING AIR CONDITIONING SYSTEM CONSIDERATIONS

The existing air conditioning systems that currently serve the Sunshine Coast Administration building precinct was taken into consideration in the selection of the mechanical design for the new Library Repurposing to ensure consistency in design approach and allow for potential for future wider site connection.

The existing administration building is air-conditioned utilising two main design methodologies; air-cooled chilled water (CHW) systems for general air conditioning and specialist air cooled process cooling unit for the existing data centre. Details of the existing air conditioning systems and commentary have been included in APPENDIX A: MECHANICAL DILAPIDATION REPORT.

2.5.5 AIR CONDITIONING SYSTEM CONSIDERATIONS

The mechanical air conditioning systems considered for the Sunshine Coast Administration Repurposing project is Air Cooled Chilled Water Air Conditioning Systems. The following section provides a general description of the system.

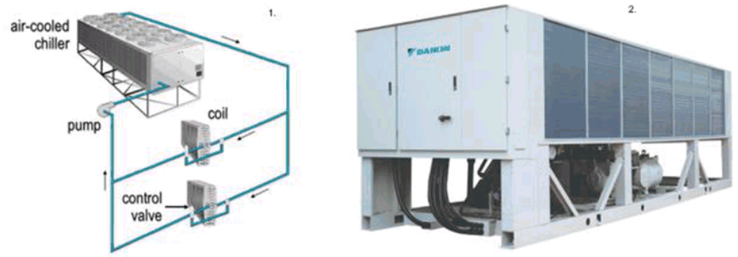
Chilled Water Systems (Air Cooled)

Air cooled chilled water systems consist of a centralised heat rejection air cooled chiller(s), producing chilled water that is distributed via pumps to all associated indoor air conditioning units via insulated chilled water pipework.

The system is generally suitable for medium to large scale installations and is known for their flexibility, customisable controls and chilled water pipework reticulation. It is important to note that the existing facility is based on air cooled chilled water system, of which elements are intended to be re-used as part of the project. The advantage of the system is predominantly in its flexibility when considering medium / large systems served from a central air-cooled heat rejection facility. As such, chilled water systems are often considered for projects or master planned precincts which do not suit localised variable refrigerant systems. Chilled water systems are also known for their relatively higher energy efficiencies, particularly in part load conditions due to centralised heat rejection system and rotary type screw or centrifugal compressor/s.

Providing centralised plant for multiple buildings also offer the added benefit of building based load diversification, allowing a reduction in installed plant capacity when considering precinct diversity between buildings.

As a result of its system characteristics, chilled water systems are beneficial in terms of 'future' redevelopment work, with the 'new' air side system only requiring connection into the existing chilled water-cooling network if infrastructure allowances are made in advance.



1. Typical Air Cooled Chilled Water Schematic
2. Air Cooled Chiller

Figure 2 - Air Cooled Chilled Water System Overview

The following scope of work is proposed for the building:

- Two new air-cooled chillers to replace existing air-cooled plant
- Modify / upgrade existing building primary chilled water pumps as required
- Upgrade and amendment of the existing chilled water infrastructure as required

Some elements of the building chilled water system and pipework will be retained for re-use where possible.

2.5.6 PROPOSED INDOOR SYSTEMS

The indoor air conditioning system is proposed to consist of constant volume indoor in-ceiling fan coil and plantroom air handling units (constant volume and variable volume), with ductwork reticulated to supply conditioned air to the spaces. The air conditioning units are expected to be expressed in various aesthetic strategies including:

- Concealed ducted within ceiling / roof void; and
- Exposed ductwork and diffusers.

The nominated air conditioning systems shall be provided complete with all ductwork, electric duct heater, pipework, filters, sensors, local controls, diffusers, variable air volume terminal units, plenums, supports, insulation, dampers, mounts and all associated electrical and controls wiring.

Figure 3 – System Components

1. Plantroom air handling unit.
2. Local control point for air conditioning system.
3. Circular variable air volume terminal unit.

All existing indoor systems within the scope of works area will be decommissioned, removed and replaced with new.

2.5.7 AIR CONDITIONING DIFFUSION METHOD

Air diffusion design for air conditioning and ventilation systems assure proper combination of temperature and air movement within the occupied space.

The design intent is to provide supply air diffusion layout such that occupant discomfort is avoided, by promoting a uniform condition within the space. The following are considered to improve air diffusion.

- Ceiling mounted supply air diffusers shall be via provision of swirl type registers (Offices and the like).
- Jet diffusion as required for transient spaces where minimal ceiling and/or area for concealing services (Foyer / Atrium areas).
- Duct or side wall mounted supply air diffusers shall be via provision of linear bar or double deflection type registers suitably selected for the required throw distances (where higher ceilings or no ceiling are the architectural preference).

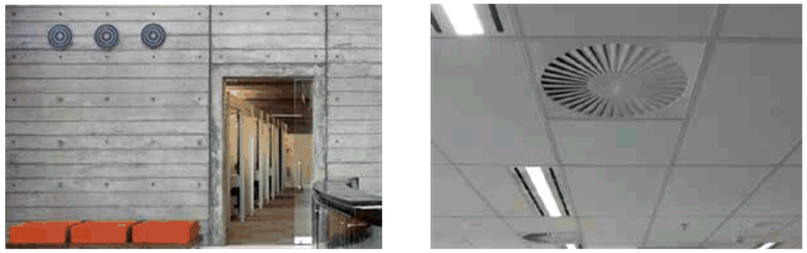


Figure 4 - Jet and Swirl Diffuser Types

2.5.8 HEATING PROVISION

Electric duct heating is generally associated with air handling systems with no direct heating capability, i.e. air handling units with chilled water coil, to provide trim space heating. Heating is not expected to be utilised consistently throughout the year, and limited to winter mornings.

Electric duct heating is not an energy efficient method in providing heating, however is a cost effect method in cooling climate zones which require minimal heating demand. This method of providing heating is cost effective with the chilled water system.

No heating is proposed for spaces where air conditioning is not provided.

2.5.9 HUMIDITY CONTROL

Humidity control is proposed to be provided along with temperature control to sensitive areas – i.e. book spaces. The exact requirements for these areas will be confirmed in consultation with the client, however the general principles are outlined as follows:

Dehumidification is the process in which the relative level of humidity in the air is reduced by condensing and reducing the water moisture content that is associated with air. The lower the relative humidity in a space, the lower the content of water is left remaining in the air. The control of the upper limit of the humidity in air is imperative to spaces such as art galleries, exhibition spaces and often to a lesser extent library, where a high moisture content may damage the displayed artwork and the like. Two of the more common methods of providing dehumidification to a space are:

1. Air handling systems incorporating electric duct heaters. Pre-conditioning units may be used in addition to assist in the process to avoid excessive reheat due to high external ambient humidity scenarios. In general, a pre-conditioning unit is used to strip the latent (moisture) content out of any introduced outside air. This air is then passed through a secondary unit that handles the air distribution to the space, which can further reduce the air's moisture content to achieve the required air delivery moisture content at the required design temperature. Electric re-heat is adopted in such systems to avoid over-cooling of internal space/s.
2. A Single Packaged Unit that implements sensible heat exchange technology to enable precooling and reheating in one packaged design. This is generally not applicable due to the spatial limitation of the project.

Figure 5 - Packaged Unit for Dehumidification

Humidification is the opposite process of dehumidification, where water moisture content is introduced into dry air. In a similar way that air with a high moisture content can damage artwork, very dry air can also have a detrimental effect. To maintain the required spaces within the humidity range, an in-duct spray humidification system is proposed. This system can be installed into the ductwork in either of the dehumidification options presented above.

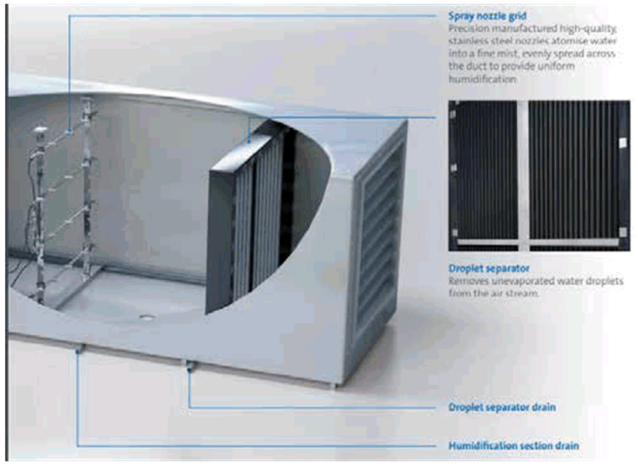


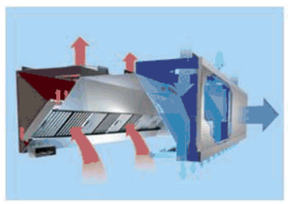
Figure 6 - Humidification System

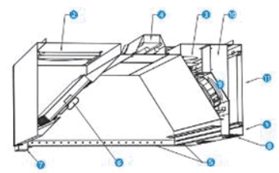
Air handling system incorporate electric duct heaters is proposed for the project for dehumidification control, to be further discussed with stakeholders during design development. Humidification is not expected to be a requirement of the project.

2.5.10 CAFÉ KITCHEN COOKING EXHAUST HOODS

The café kitchen may be provided with a commercial grade mechanical extraction system – to be confirmed following user feedback based on intended cooking processes. A mechanical kitchen exhaust hood can be provided. For the purposes of energy efficiency and air flow reduction, a proprietary Halton KVF Capture Jet Canopy system with makeup air is proposed should commercial café cooking be required. The system is designed as a performance-based solution using ASTM 1704, aimed at improving extraction efficiency while reducing the quantity of exhaust air by 30-40% compared to AS1668.2-2012 deemed to satisfy kitchen exhaust hoods.

KVF DESCRIPTION





CODE	DESCRIPTION
1	Outer casing – visible parts in stainless steel AISI 304
2	Exhaust air connection and adjustment damper
3	Supply air connection and adjustment damper (type MSM)
4	Light fixture with electrical junction box
5	Capture Jet™ nozzles
6	KSA grease filter

CODE	DESCRIPTION
7	Grease collection tray or drain tap
8	Personal supply air nozzles
9	Capture Jet™ fan
10	Capture Jet™ fan air inlet plenum
11	Perforated front face

Figure 7 – Typical Kitchen Hood Details

2.5.11 ROOFTOP PLANT AREA

The mechanical heat rejection plant (condensers) shall be located on the roof of the building on the nominated existing north and south plant areas, with chilled water pipework reticulated via the mezzanine roof void to the primary chilled water pump, and subsequently to the respective indoor air handling systems.

Figure 8 - Roof Plant Area (North Plant – Left, South Plant – Right)

2.5.12 COMMUNICATIONS / DATA ROOMS

Communications rooms shall be designed in accordance with ASHRAE Datacom Series - Best Practices for Datacom Facility Energy Efficiency 2011. The recommended requirements for a Class A facility shall inform the temperature, humidity and filtration quality required as in the figure below:

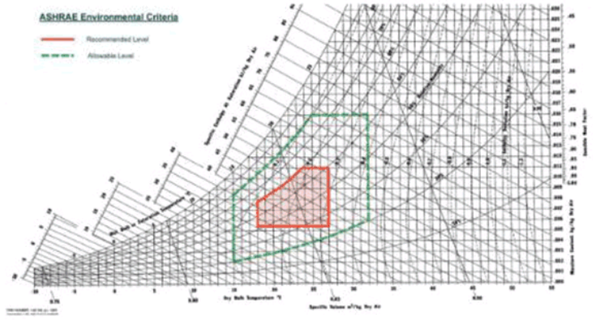


Figure 9 - ASHRAE Best Practices for Datacom Facility Energy Efficiency

The following systems are proposed for the Communication / Data Rooms:

- Communications room shall be provided with dedicated cooling systems, separate to the building cooling system.
- Data rooms cooling system shall be further considered and discussed with SCC ICTS. Systems to be adopted include:
  - Floor mounted close controlled precision cooling units or Computer Room Air Conditioning (CRAC) unit; and
  - In row rack cooling system for hot / cold aisle configurations.

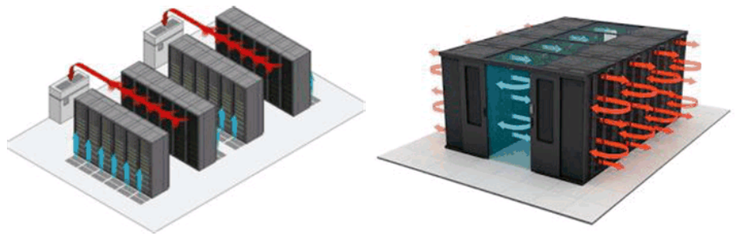


Figure 10 – Data Room Air Conditioning Options

2.5.13 BATTERY ROOM & UPS

Dedicated mechanical extraction system may be provided should the UPS for the communications rack or battery room exceed design requirements as outlined in AS2676, pending battery selection and risk of hydrogen release.

A mechanical extraction system can be provided with an air flow switch interlocked to the power supply to the battery charging circuit, and shall act as a shunt trip should the mechanical ventilation system fail. The system is provided to prevent build-up of hydrogen in the event of over-charging in closed cell batteries (typically lead acid). Hydrogen is highly flammable and without dilution, and without adequate provisions for ventilation, the build-up of hydrogen over time will create an explosive atmosphere at high level within the communications room and lead to a fire and/or explosion.

The extraction system will not be required where the battery provision is not a type or does not exceed the capacity to trigger the mechanical ventilation requirements of AS2676.

2.5.14 VENTILATION SYSTEMS

Ventilation systems shall be provided complete with ductwork, dampers, back-draft dampers (where serving air-conditioned spaces), diffusers, cowls, insulation, sensors, local controls, supports, and all associated electrical and controls cabling.

2.5.15 NATURAL / MIXED MODE VENTILATION

Cross flow / natural ventilation may be desirable in certain areas (such as the Ground Floor Foyer / atrium and Café spaces) the extent of air conditioning can be reduced to provide a mixed mode space allowing the shutdown of local air conditioning systems.

Natural ventilation openings should be located on available external walls at high and low level where possible, to facilitate stack effect of natural ventilation through the occupied space to remove internal heat load. Increasing the extent of openings will increase heat removal, and maximise the times of year where natural ventilation will be effective in delivering comfort conditions.

Mixed mode ventilation design may change the consideration for air conditioning perimeter over and above the requirements of NCC Vol 1 BCA Section J.

A local weather station can be provided on the roof of the building to monitor ambient temperature, humidity, wind speed and rain. When conditions are ideal for natural ventilation, an indicator light can be illuminated within the space to advise the users of the external conditions being ideal for natural ventilation.

Motorised opening of natural ventilation devices i.e. louvre and windows can be considered as optional as part of the project. If adopted, actuation of the motorised devices will be provided with a local control point per room to open and close the motorised devices. For cost reasons, motorised actuation of natural ventilation openings have not been proposed for this project.

2.5.16 CONTROL SYSTEMS

The existing building currently adopt a SCC BMS (BSIP or Automated Logic Corporation BMS) to control and monitor mechanical systems. The SCC BMS control system also provides monitoring of electrical, solar, weather and other ancillary building services. Sunshine Coast

Council advised that the existing SCC BMS control system is of recent installation. It is proposed that the proposed refurbishment works, re-use where possible the existing controllers. New works will extend the capability of the existing building management system. Proposed BMS would be a native BACnet open communications protocol with reference to the existing SCC BMS control system.

2.5.17 BUILDING CONTROL INTEGRATION (BSIP)

The existing SCC BMS (BSIP or Automated Logic Corporation BMS) also provides control and monitoring to the following services directly, without use of other third-party controllers or PLCs:

- Hydraulic services including rainwater systems
- Electrical services including power, lighting, fire and security systems
- Lift services
- General services such as meeting room booking system

Refer to Table 5 for intent of BSIP scope. The exact extent of BSIP will be coordinated with SCC during the design phases of the project.

Table 5 – BSIP Scope

Services	Description	Interface
Hydraulic Services	Rainwater Harvesting	AIAO, DIDO to rainwater harvesting sensors for level sensor, pumps, meters, and the like.
Electrical Services	Peak Demand Management, Battery Bank, PV Array Inverter	HLI to proprietary on-board electrical systems i.e. inverters, battery banks.
Electrical Services	Generator	AIAO, DIDO, HLI to generator PLC systems including associated ATS
Electrical Services	Internal and External Lighting	HLI to proprietary lighting control system i.e., Dali or Dynalite for control and monitoring of lighting groups
Electrical Services	Metering	HLI to electrical smart meters for monitoring
Electrical Services	Motion Sensors	AI, DI to dual output PIR detection sensors
Electrical Services	Security System	HLI to proprietary security control system i.e., Gallagher, Integriti
Electrical Services	Dry Fire System	AI, DI to Fire Indicator Panel for monitoring.
General	Meeting Room	HLI to meeting / function room booking system via outlook to schedule on / off of associated services incl air conditioning, power and the like.
Lift Services	Lift	AI, DI, HLI to proprietary lift control panel for monitoring

2.5.18 FIRE AND SMOKE CONTROL

The existing building is provided with fire and smoke management systems. Refer to APPENDIX A: MECHANICAL DILAPIDATION REPORT. The existing smoke and fire management system are to be retained and upgraded to suit the requirements of the Building Certification Report. The following works are proposed for modification of the existing fire and smoke management system:

- Replacement of the existing centralised fire fans (F-6 and F-7) to suit new compartmentation requirements.
- Provision of new fire essential mechanical services switchboard compliant to AS1668.1
- Re-supply of fire fans from new fire essential MSSB.
- Re-use existing smoke exhaust riser stack within northern and southern plantrooms.

The fire mode strategies are to be determined in accordance with the requirements of the current Australian Standards, and BCA. In general, mechanical services plant and equipment that do not provide fire essential functions, will shut down on receipt of a fire alarm signal from the facility FIP. The exception to this will be where there is no requirement for smoke detection or the plant is required to remain operation due to the type of space (i.e. communications room) which is acceptable under AS1668.1-2015.

2.5.19 MAINTENANCE OF PLANT

Maintenance of plant equipment will be assessed, and is considered as part of the HVAC system selection process. Plant and equipment requiring regular mandatory maintenance are located within plantrooms or within readily accessible ceiling voids accessible by maintenance staff.

Generally, plant enclosures shall be provided with minimum access requirements, and general 900mm minimum width for service zones around serviceable plant areas. Floor markings, instructions, warning notices and safety tape shall be provided to further address risks associated with maintenance access for health and safety purposes where trip hazards are present.

2.5.20 ACOUSTICS

Acoustic requirements will be specified within the acoustic report. The Mechanical design and installation shall reflect the requirements as detailed by the acoustic consultant.

2.5.21 NOISE AND VIBRATION

Mechanical equipment and system design will conform to the facility acoustic requirements and shall prevent the transmission of noise/vibration from rotating or reciprocating equipment through the building structure.

Noise attenuation within the ductwork itself is implemented via internally insulated ductwork. Acoustic attenuators will be provided where required to meet the requirements of AS2107.

2.5.22 AIR INTAKE AND EXHAUST DISCHARGES

Effective locations of the air intake and exhaust discharges will be proposed. Air intake have been generally provided via facade intake cowls or louvres to be coordinated with the architect given impact on the façade and building roof line.

Exhaust discharges shall be via façade louvre local to the area or roof cowl, with minimum separation to any air intake or natural ventilation openings as per AS1668.2-2012.

2.5.23 FUTURE PROOFING AND FLEXIBILITY

Mechanical systems have been selected with spare capacity incorporated. A nominal 5-10% spare capacity factor has been proposed for the mechanical systems as scheduled. Chilled water pipework spigots will be provided within the mezzanine roof chilled water pump room for future connection to the adjacent event centre or future precinct central energy facility. Spatial riser provisions have been made for future reticulation of the chilled water pipework through the building.

No further future proofing or flexibility measures have been adopted in the design.

Additional considerations such as flexibility in the operation of mechanical systems achieved by provision of variable speed driven devices i.e. exhaust systems, has not been provided, and is not anticipated to be required.

2.5.24 REDUNDANCY

There are no spaces which have been directly briefed as requiring fault tolerance or concurrent maintainability of plant. Generally mechanical plant is therefore proposed to be provided at N level of redundancy. No additional redundancy in HVAC systems is understood to be required.

2.5.25 ENERGY EFFICIENCY INITIATIVES

The following sustainable design initiatives to be discussed with the project team at the next phase of the project:

- Condensate recovery for water recycling
- Energy recovery from air conditioning condensers for supplementary heating of the cold-water supply to hot water systems (4 pipe chiller incorporate hot water generation);
- Economy mode operation
- Energy recovery of conditioned exhaust air for preconditioning of outside air;
- High efficiency chilled water plant selection;
- CO2 outside air demand control; and
- Floating set point control strategy based on ambient conditions to reduce energy consumption for non-critical spaces i.e. café and lobby areas etc.

2.6 RELOCATION OF EXISTING MECHANICAL SERVICES

The existing building consists of specialist data centre process cooling heat rejection system, that is of recent manufacture and installation. A review was undertaken to assess the feasibility of re-using the existing plant. While the condition of the plant equipment is suitable for re-use, there does not appear a suitable area of scope within the current project planning to apply the relocated process cooling system.

It is recommended that the existing process cooling system is recovered by Sunshine Coast Council for re-use elsewhere.

APPENDIX A: MECHANICAL DILAPIDATION REPORT


MECHANICAL SITE INSPECTION REPORT
CALOUNDRA ADMINISTRATION BUILDING REPURPOSING
MECHANICAL SERVICES
JHA
JHASERVICES.COM

DOCUMENT CONTROL SHEET

Project Number	Q190072
Project Name	Caloundra Administration Building Repurposing
Description	Mechanical Site Inspection Report
Key Contact	Phillip Lukin – Wilson Architects

Prepared By

Company	JHA
Address	Ground Floor, 130 Commercial Road, Teneriffe, QLD 4005
Phone	61-7 3257 4890
Email	Tian.song@jhaengineers.com.au
Website	www.jhaservices.com
Author	T. Song
Checked	J. Farrah
Authorised	T. Song

Revision History

Issued To	Revision and Date					
Wilson Architects	**REV**	Preliminary	Final Issue	Revised Issue		
	DATE	17.01.20	21.02.20	09.09.20		

CONTENTS

1 INTRODUCTION

JHA Consulting Engineers (JHA) have been engaged by Sunshine Coast Regional Council (SCRC) to undertake the feasibility assessment for the refurbishment works associated with the Caloundra Administration building, converting the existing facility into a modern library and office administration with community facilities that integrate with the wider site masterplan. A visual inspection of the existing air conditioning plant equipment was undertaken to establish the existing condition of the mechanical assets and identify potential rectification works required to facilitate the refurbishment project.

1.1 MECHANICAL PLANT INSPECTION CRITERIA

Site inspection of the existing facilities and associated air conditioning systems were undertaken on the 13th December 2019. The site inspections were visual in nature. The inspections were aimed at identifying the plant and assessing its general condition through eight (8) separate assessment criteria. The assessment criteria have been outlined in Table 1.

Table 1- Inspection criteria

Criteria	Description
Plant General	Inspection of the plant casing, structural framing, fan caging, and securing devices. The plant externals primarily provide protection to the unit, and as a result, its condition is generally commensurate of the age of the unit and its installation location. It also serves as the acoustic housing for the internal equipment.
Structural Supports	Review of the structural elements supporting the plant equipment, including method of vibration isolation. The structural supports for the plant equipment provide stability and rigidity to the equipment, limiting their exposure to vibration and unwanted movements, which otherwise could impose unwanted stress on other elements of plant, i.e. pipework and cable connections. Vibration isolation of the plant to the structure is also important in providing a dampening device to minimise vibrational transfer of the plant to the structure.
Insulation	Inspection of the insulation to the equipment, including insulation to surrounding connections and pipework reticulation of the system. Maintaining adequate insulation to the air conditioning system is critical in maintaining a barrier between the cold piping and ambient conditions, limiting heat losses through the system to maintain the rated capacity and efficiency. Insulation which is damaged, weathered, water-logged and deteriorated do not offer sufficient insulative and vapour barriers, and will result in de-rating of the system capacity and lowering efficiency. It can also cause condensation formation and lead to associated building damage.
Cleanliness	Review of the general cleanliness of the plant equipment, and amount of debris that is visible on the plant. Cleanliness if unattended to, can increase the speed of corrosion to the plant and lead to hygiene / air contamination issues.
Pipework & Supports	Review of the pipework, connections, and supporting brackets associated with the piping system. The condition of the pipework and supports do not influence the condition of the mechanical plant itself, however can lead to additional vibration stress on the pipework and connection to the plant equipment to compromise the performance of the system.
Ductwork & Flex	Review of the ductwork and flexible connections associated with the air conditioning system. The condition of the ductwork does not influence the condition of the unit however does influence the efficiency of the operating system. Ductwork and insulation which is damaged, weathered, water-logged and deteriorated do not offer sufficient insulation and vapour barriers, and will result in de-rating of the system capacity and lowering efficiency.
Associated Components	Review of associated connections to the unit, in particular diffusers etc. The condition of the associated components does not influence the condition of the unit however does influence the efficiency of the operating system.

1.2 INSPECTION & REVIEW FRAMEWORK

A 5-tier grading scheme has been adopted for the conditions review. The 5-tiers are generalised by 'Very Good', 'Good', 'Moderate', 'Poor' and 'Very Poor'. The grading scheme for each of the plant inspection criteria is designated a numerical score.

Table 2- Grading Scheme

Grading	Description
Very Good (5)	Reviewed category has no visible signs of corrosion, damage, and deterioration. The category under review displays no damage and is generally considered to be equal condition to new or near new plant equipment.
Good (4)	Reviewed category has limited visible signs of corrosion, damage, and deterioration. The category under review displays limited indication of damage and is generally considered to be acceptable. While present, the extent of damage does not compromise the system, and is not expected to require any rectification works.
Moderate (3)	Inspected category is showing minor visible signs of corrosion, damage, and deterioration. The visible signs of corrosion, damage and deterioration are isolated, and is not widespread across multiple areas of the plant equipment. Minor rectification works would be expected to restore the isolated damage, corrosion or deterioration on the equipment.
Poor (2)	Inspected category is showing numerous visible signs of corrosion, damage, and deterioration. The visible signs of corrosion, damage and deterioration are across multiple areas and components, and are not isolated, however do not appear to significantly hinder the operation of the plant. Considerable effort in rectification works would be expected to restore the damage, corrosion or deterioration.
Very Poor (1)	Inspected category is showing severe signs of corrosion, damage, and deterioration. The signs of corrosion, damage and deterioration are widespread or severe enough to negatively impact the operation of the plant. The issues identified requires immediate rectification to prevent potential damage to the equipment and other components of the system.

1.3 LIMITATIONS

The conditions assessment is visual in nature and is limited to readily accessible mechanical plant. No intrusive and/or testing of equipment performance was included as part of the audit. The conditions assessment of plant is not conclusive, and may require further inspections including equipment testing and/or review of inaccessible plant.

1.4 EXISTING MECHANICAL SYSTEM COMMENTARY

The following section provide an overview of the existing Caloundra Administration building mechanical air conditioning and ventilation systems.

Air Handling System

- Air conditioning is provided through chilled water ducted plantroom air handling units.
- Two on-floor plantrooms are provided per floor (L1, L2, and L3), located on the northern and southern façade. Each plantroom houses one variable air volume air handling unit, serving on-floor in-ceiling fan assisted variable air volume (VAV) terminal units, and plenumised ceiling return air. Level 3 councillor and meeting rooms are provided with dedicated air handling system located in the mezzanine roof plantroom.
- Heating is provided through electric duct heaters installed downstream of the VAV units.

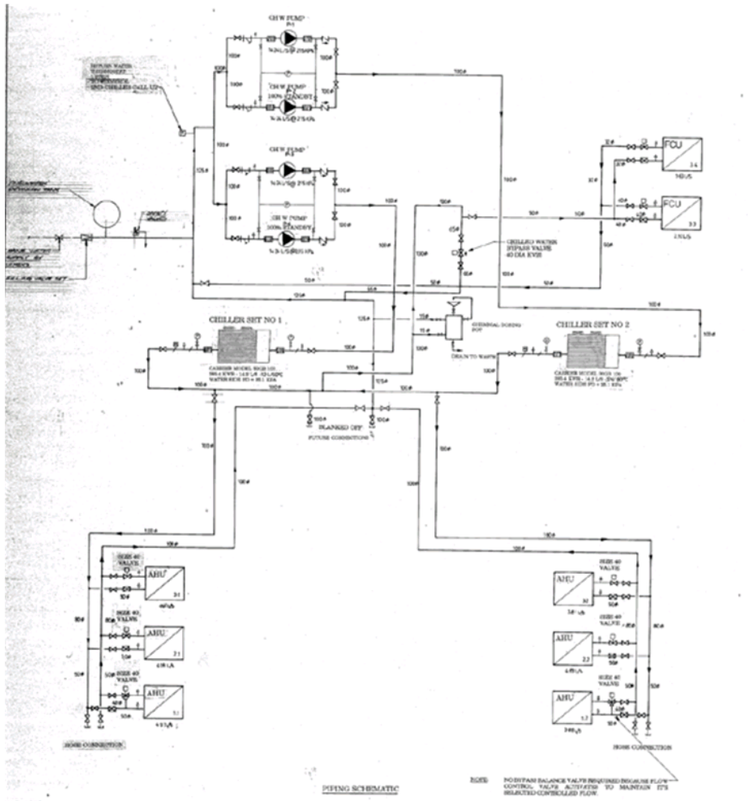
Heat Rejection Plant

- Chilled water is delivered through two air cooled chillers, with dedicated primary chilled water pumps per air cooled chiller.
- Refer to Table 3 for summary of existing heat rejection plant and equipment.
- Refer to Figure 1 for existing plant schematic; note subsequent pump replacement works have removed the duty/standby provision as shown in Figure 1.

Table 3- Existing Mechanical Services

Plant ID	Type	Description	Approximate Installation Year
CH-1 (North)	Air Cooled Chiller	Trane RTAD115 - Approx. 385kWr (14.3L/s)	2006
CH-2 (South)	Air Cooled Chiller	Trane RTAD115 - Approx. 385kWr (14.3L/s)	2006
CHWP-1	Chilled Water Pump	Duty 14.3 L/s @ 215kPa serving CH-1	Recently upgraded / replaced
CHWP-2	Chilled Water Pump	Duty 14.3 L/s @ 215kPa serving CH-2	Recently upgraded / replaced
CH-A	Air Cooled Chiller	Carrier 30RBS-120 – Approx 120kWr	2011
CH-B	Air Cooled Chiller	Carrier 30RBS-120 – Approx 120kWr	2011

Figure 1 Existing Mechanical Services Chilled Water Schematic



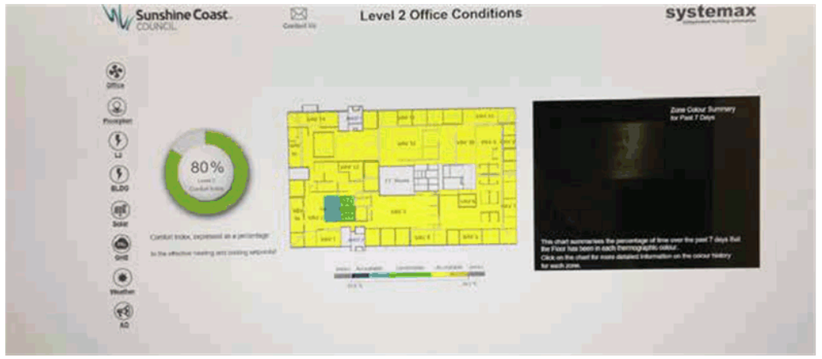
Specialist Systems

- The data centre is provided with 4 no. in-row hot/cold aisle Emerson Liebert process cooling systems (CRV-1, CRV-2, CRV-3, and CRV-4)
- Heat rejection is provided by 2 no. dedicated air-cooled chillers (CH-A and CH-B). Refer to Table 3 for summary of existing heat rejection plant and equipment.

Electrical & Controls

- Power is provided through mechanical services switchboards (MSSB) located within mechanical plantrooms, with fire essential section of the MSSB serving fire essential services.
- Systemax Building Management System (BMS) implemented to monitor and control mechanical plant and equipment and include integration with other building services i.e. electrical, security.

Figure 2 Systemax BMS Display Screens



Fire & Smoke Management

- Centralised fire fans (F-6 and F-7) initiate as smoke extraction system during general fire alarm (GFA) to provide smoke spill to fire affected floor.
- Mechanical systems implement zone pressurisation as part of the fire/smoke management strategy with actuation of return air, outside air, and spill air dampers. Air handling units operate to pressurise non fire affected floors.
- Shutdown systems are adopted for general mechanical systems that are not required to operate in fire mode.

Car Park Ventilation

- Carpark ventilation consists of one ducted extraction system of approximately 11,280 l/s capacity with variable speed drive (VSD). Make-up supply air ventilation system is provided via two outside air ventilation system totally approximately 8,480 l/s capacity with VSD. Carbon monoxide monitoring has been retrofitted to the carpark ventilation for demand-based ventilation control.

General Ventilation Systems

- Amenities throughout the building is provided mechanical extraction via a common centralised exhaust riser.
- The electrical transformer room is provided with dedicated supply air system.

Refer to Section Appendices – As Built Documentation on page 11 for existing as-built documentation of the mechanical installation.

1.5 EXISTING SYSTEM BMS REVIEW

1.5.1 PRECINT COOLING LOAD ASSESSMENT

Coupled with the visual inspection of the mechanical systems, the Systemax BMS data for the Administration Building has been reviewed to assess the mechanical system performance. Available BMS data for months August 2019 through February 2020 (inclusive) has been assessed to analyse the peak cooling demand experienced in summer, and the low lead experienced in winter.

Figure 3 shows a winter (August 2019) maximum cooling demand of 385 kW. This load is served by one chiller running at 100% capacity. During peak load summer periods (January) the maximum cooling demand experienced is 730 kW. This load is served by both chillers operating, and equates to approximately 95% of the installed system capacity (770 kW).

Figure 3 BMS Data Monthly Peaks

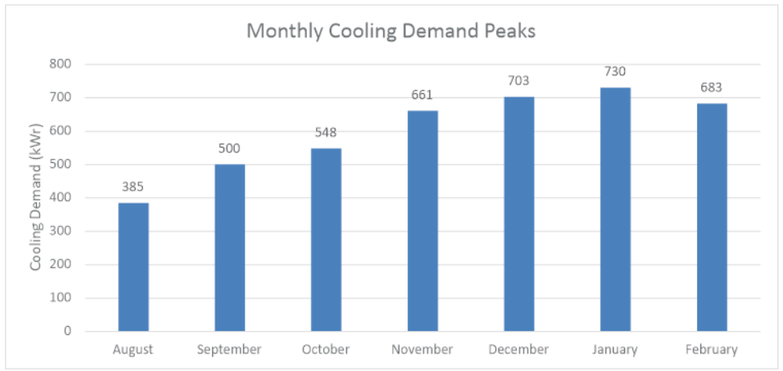


Figure 4 January Peak Day Cooling Demand Profile

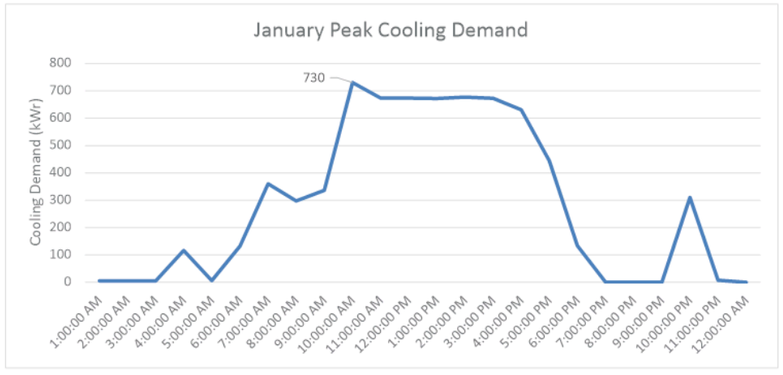
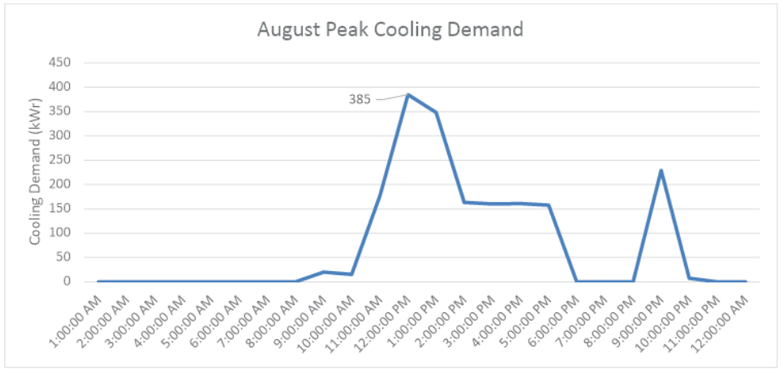


Figure 4 highlights the daily load profile experienced in the building for the maximum design day (January 21st 2020). The load profile follows a typical usage pattern with the cooling demand increasing throughout the day from 6am to the precinct peak at 730 kW, before reducing after 5pm.

Figure 5 highlights the daily load profile for a winter design day (August). The building profile peaks at 385 kW, before reducing in the early afternoon.

Figure 5 August Peak Day Cooling Demand Profile

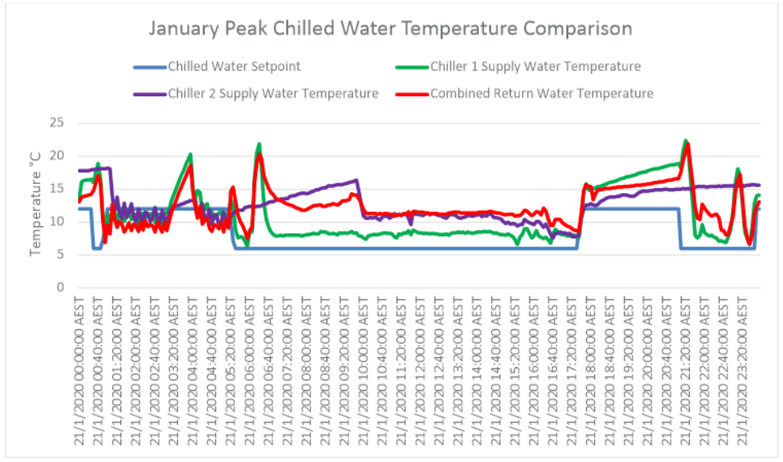


1.5.2 CONTROLS ASSESSMENT

The building mechanical plant operates on time clock schedule, with the air handling units turning on at 6am and turning off at 7pm. After hours activation switches are provided throughout the building to activate the mechanical plant after 7pm.

In addition to the time scheduled plant operation, the building chilled water plant utilises chilled water temperature reset to minimise energy consumption during afterhours periods. The chilled water supply setpoint is allowed to float to 12°C, in lieu of 6°C until an air handling unit is activated and a cooling call is present. When the cooling call is present the chilled water supply setpoint will then reset to 6°C. The chilled water supply temperature of each chiller will adjust based on this setpoint. Figure 6 shows this relationship between the chilled water set point, chilled water supply, and combined return water temperature.

Figure 6 Chilled Water Temperature Comparison



1.6 MECHANICAL SYSTEM REVIEW

The following section provide a condition review of the existing Caloundra Administration building mechanical air conditioning and ventilation systems.

JHA
ABN 50 613 042 809
Sydney | Brisbane | Melbourne
Ground Floor,
130 Commercial Road,
Teneriffe QLD 4005
Ph (07) 3257 4890

JHA Consulting Engineers

PROJECT NAME: **Caloundra Administration Building Repurposing**

REVISION NUMBER: 2
UPDATED: 17.02.19
JHA PROJECT NUMBER: Q190072

KEY CONTACT: P.Lukin
AUTHOR: T.Song
EMAIL: tian.song@jhaenginers.com.au

The following comments and observations are made based on a visual inspection of works to date and do not replace or take precedence over contractual obligations. This report is to summarise our site visit findings. Whilst the report seeks to determine services installed on site and their conditions, this report does not represent an in-depth analysis to identify all latent defects. No testing of elements or the engineering systems has been carried out for the preparation of this report, nor have concealed spaces of plant and motors been opened up for inspection. Work on these aspects has not been done by JHA Consulting Engineers and these matters are expressly not dealt with in this report as they require a more comprehensive study than our scope allows. The opinions expressed in this report are specifically qualified in this way.

Item No.	Category	Average Rating (1-5)	Description	Images
1.	Chillers	2	▪ Chillers appear to have been replaced in 2006 with current Trane units. ▪ Unit external showing widespread signs of corrosion commensurate with age of equipment. ▪ Reactive maintenance to repair corrosion have been noted. ▪ Condenser fins deteriorating and starting to flake, commensurate with age of equipment. ▪ Insulation on refrigerant equipment and circuits are deteriorating and/or deteriorated. ▪ Chilled water pipework connections are sheathed, with valves showing signs of corrosion. ▪ Equipment is approaching the end of its economic life and expected to be replaced in the short-medium term.	  
2.	Data Centre Chillers & PCUs	5	▪ Unit external in good condition with limited signs of corrosion. ▪ No obvious signs of corrosion observed on condenser fans, fins, and supports ▪ Chilled water pipework connections are sheathed, with valves showing signs of corrosion. ▪ No obvious signs of deterioration on internal process cooling units.	  
3.	Pumps	4	▪ At the time of inspection, the existing pumps appear to be undergoing repair works. ▪ Chilled water pump inertia block, vibration isolation mounts, casing, appear to be in good condition. Motor appear to be in the process of being replaced with new.	  
4.	Pipework & Valves	3-4	▪ Pipework sheathed throughout. ▪ External pipework sheathing show limited signs of corrosion. Internal pipework sheathing shows no sign of corrosion. ▪ External valves exposed to weather are observed with corrosion commensurate with age of valve. Internal plantroom based valves show minor signs of corrosion. ▪ Seal and glanding around valves assembly may be compromised in aging valve assemblies.	  

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ABN 50 613 042 809
Sydney | Brisbane | Melbourne
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130 Commercial Road,
Teneriffe QLD 4005
Ph (07) 3257 4890

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REVISION NUMBER:	2	KEY CONTACT:	P.Lukin
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JHA PROJECT NUMBER:	Q190072	EMAIL:	tian.song@jhaenginers.com.au

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5.	Typical On-Floor Air Handling Units	3	▪ Air handling units appear to be original units installed. ▪ Unit external showing signs of corrosion commensurate with age of equipment. ▪ Plantroom circulation access for maintenance is very limited.	
6.	Councillor & Boardroom Air Handling Units	4	▪ Air handling system appear to have recently undergone rectification and/or repair works. ▪ No obvious signs of corrosion and/or deterioration. ▪ Plantroom circulation access for maintenance is good.	
7.	Switchboards	3	▪ Air handling units appear to be original units installed. ▪ A number of switchboard external are showing signs of corrosion commensurate with age of equipment. ▪ Thermographic imaging of the board was not reviewed, and commentary regarding electrical equipment integrity and insulation has not been provided.	
8.	Controls	5	▪ Systemax Building Management System implemented, including integration with other building services. ▪ BMS was recently upgraded to the current Systemax system. ▪ Carpark ventilation system implemented with carbon monoxide detection and variable speed control.	

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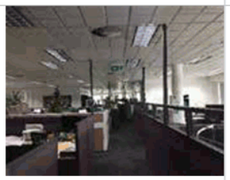
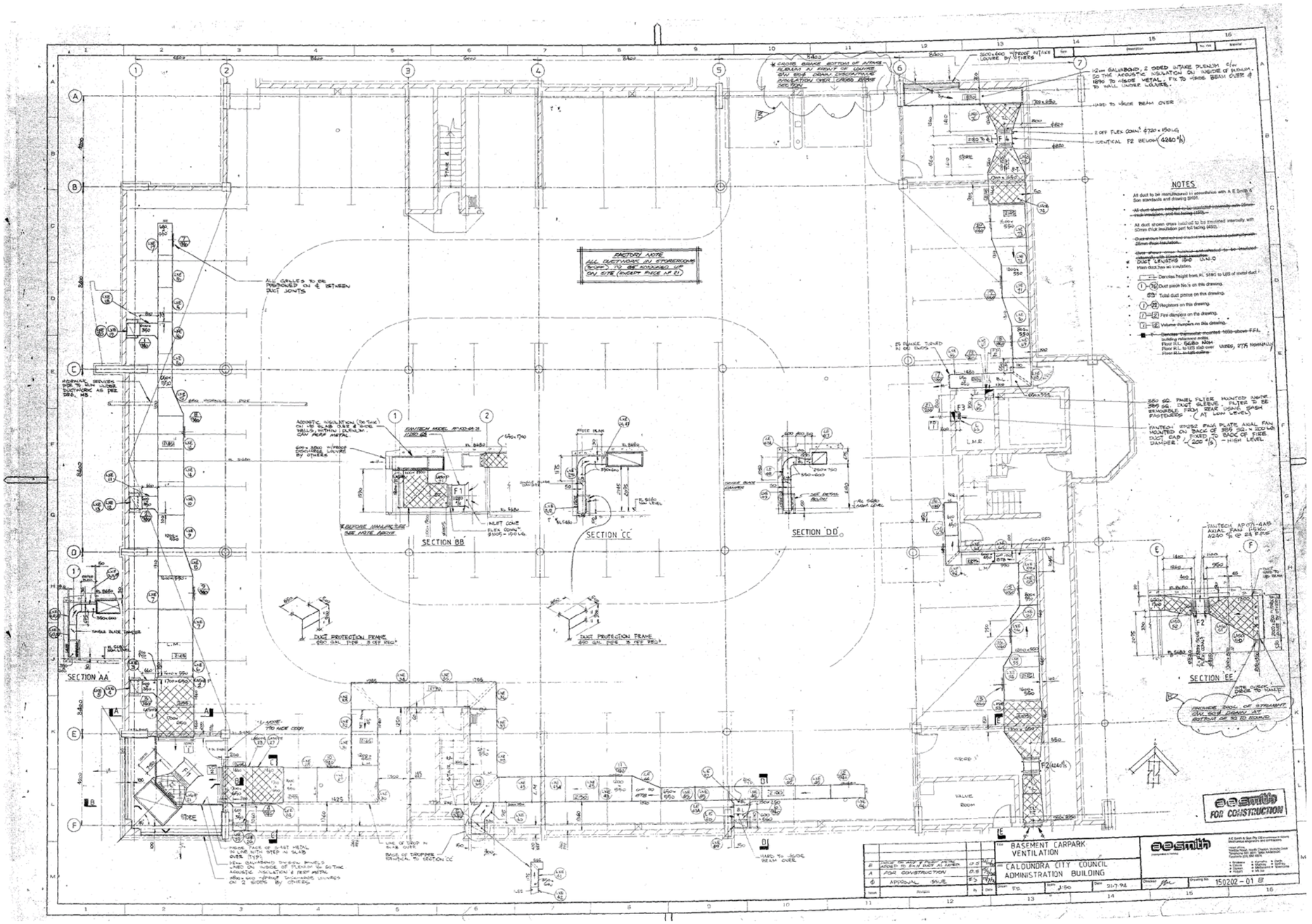
9.	Ductwork	3	▪ Limited visual access available to reticulated ductwork. ▪ Mezzanine roof plantroom ductwork does not show any obvious signs of corrosion or deterioration. ▪ Flexible ductwork does not appear to be adequately supported with saddle supports, and is noted to be reticulated on the ceiling insulation in a number of instances. ▪ Some flexible ductwork appears to have been replaced and/or rectify, whether as part of internal partition refurbishment or general replacement works as part of reactive maintenance. ▪ Facility management feedback suggests internal ductwork corrosion damage is prevalent throughout the ductwork system.	  
10.	Associated Components – Diffusers	4	▪ Generally, diffusers appear to be clean and show no signs of mould or the like. ▪ Sections of existing diffusers show signs of damage. ▪ Return air boots as part of the light fittings shows limited signs of deterioration commensurate with age of equipment. ▪ Select diffusers appear to have been replaced over time.	  

APPENDICES – AS BUILT DOCUMENTATION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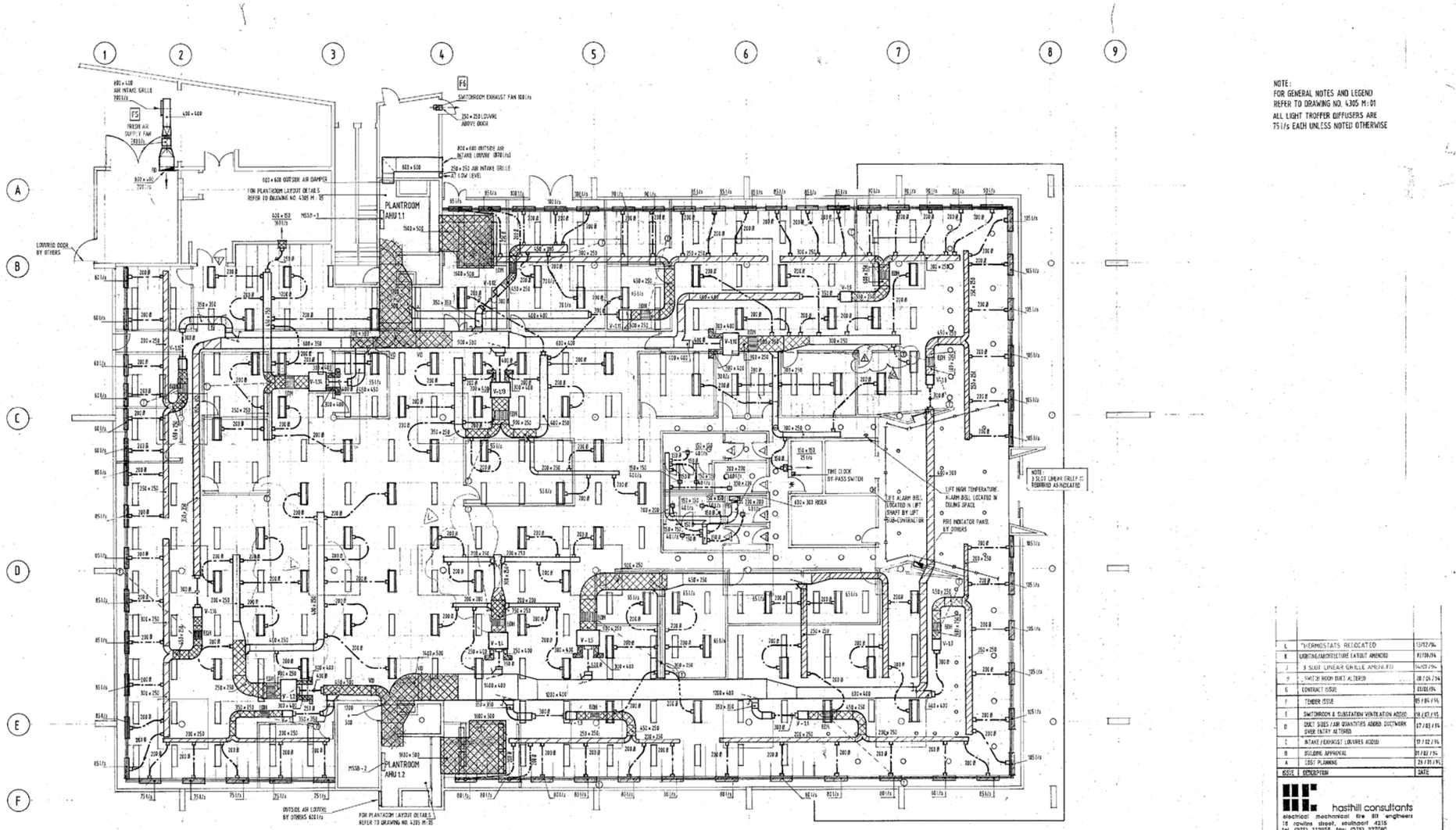
ALL DUCTWORK IN STOREROOM (SHOP) TO BE HOUSING UP ON SITE (EXCEPT PIECE N° 61)
ALL GRILLES TO BE POSITIONED ON ℄ BETWEEN DUCT JOINTS
NOTES
SECTION AA
SECTION BB
SECTION CC
SECTION DD
SECTION EE
DUCT PROTECTION FRAME
FOR CONSTRUCTION
BASEMENT CARPARK VENTILATION
CALOUNDRA CITY COUNCIL ADMINISTRATION BUILDING
aesmith
150202 - 01 E



NOTE:
FOR GENERAL NOTES AND LEGEND
REFER TO DRAWING NO. 4305 M:01
ALL LIGHT TROFFER DIFFUSERS ARE
75 l/s EACH UNLESS NOTED OTHERWISE

ISSUE	DESCRIPTION	DATE
L	THERMOSTATS RELOCATED	13/12/94
K	LIGHTING/ARCHITECTURE LAYOUT AMENDED	9/08/94
J	3 SLOT LINEAR GRILLE AMENDED	14/07/94
H	SWITCH ROOM DUCT ALTERED	28/06/94
G	CONTRACT ISSUE	03/06/94
F	TENDER ISSUE	05/04/94
E	SWITCHROOM & SUBSTATION VENTILATION ADDED	28/03/94
D	DUCT SIZES / AIR QUANTITIES ADDED. DUCTWORK OVER ENTRY ALTERED	07/03/94
C	INTAKE / EXHAUST LOUVRES ADDED	17/02/94
B	BUILDING APPROVAL	01/02/94
A	COST PLANNING	28/01/94

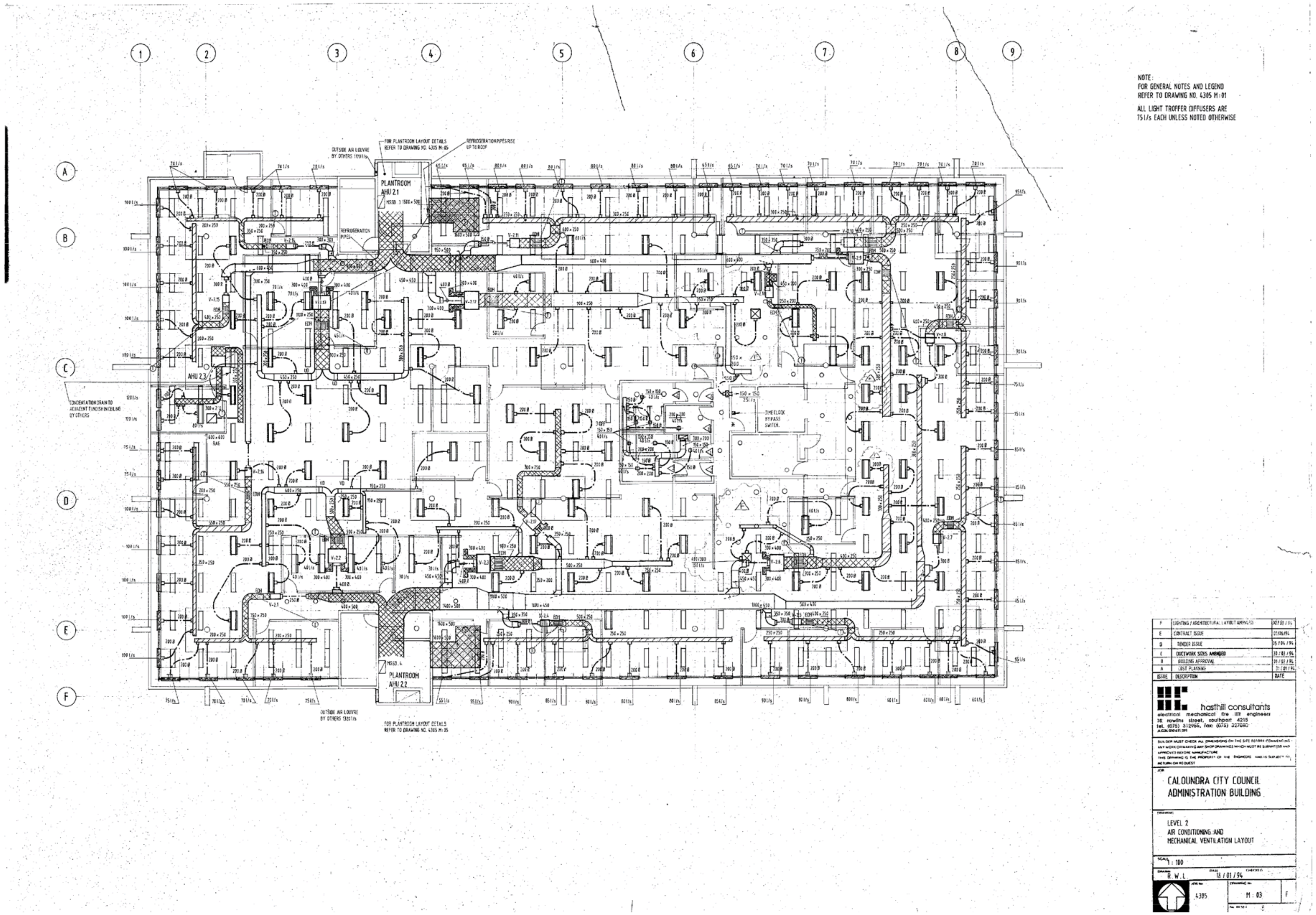
hasthill consultants
electrical mechanical fire lift engineers
16 rowlins street, southport 4215
tel. (075) 312905, fax: (075) 327080
ACN 010 611 391

BUILDER MUST CHECK ALL DIMENSIONS ON THE SITE BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED BEFORE MANUFACTURE
THIS DRAWING IS THE PROPERTY OF THE ENGINEERS AND IS SUBJECT TO RETURN ON REQUEST

JOB
CALOUNDRA CITY COUNCIL
ADMINISTRATION BUILDING

DRAWING
LEVEL 1
AIR CONDITIONING AND
MECHANICAL VENTILATION LAYOUT

SCALE 1 : 100
DRAWN R.W.L. DATE 18/01/94 CHECKED
JOB No. DRAWING No. L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FOR GENERAL NOTES AND LEGEND
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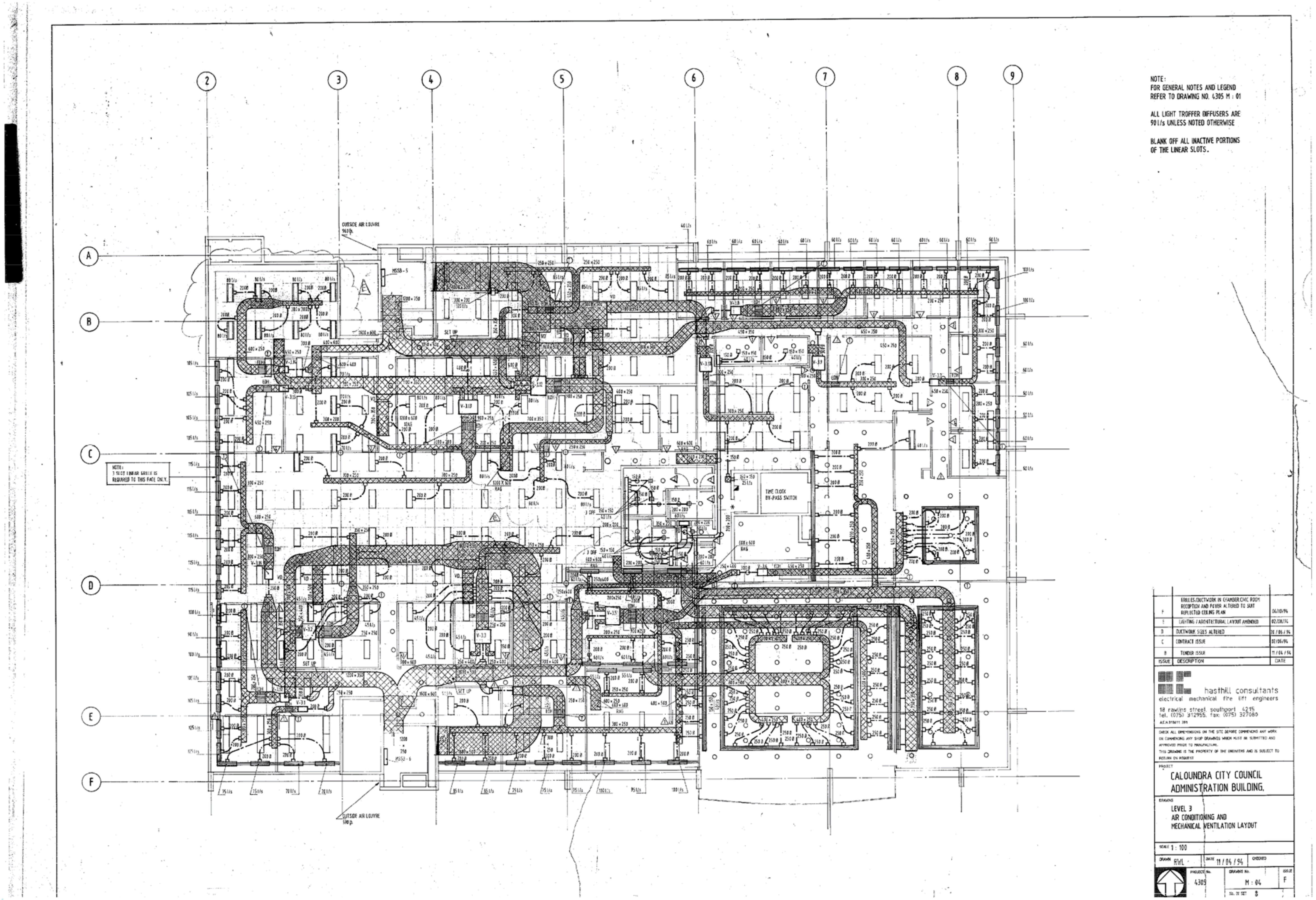
PLANTROOM AHU 2.1
PLANTROOM AHU 2.2
F LIGHTING / ARCHITECTURAL LAYOUT AMENDED
E CONTRACT ISSUE 07/06/94
D TENDER ISSUE 05/04/94
C DUCTWORK SIZES AMENDED 30/03/94
B BUILDING APPROVAL 01/02/94
A COST PLANNING 21/01/94
ISSUE DESCRIPTION DATE
hasthill consultants
electrical mechanical fire lift engineers
16 rawlins street, southport 4215
tel. (075) 312955, fax: (075) 327080
CALOUNDRA CITY COUNCIL
ADMINISTRATION BUILDING
LEVEL 2
AIR CONDITIONING AND
MECHANICAL VENTILATION LAYOUT
SCALE 1:100
R.W.L 18/01/94
4305
M:03
F


NOTE:
FOR GENERAL NOTES AND LEGEND
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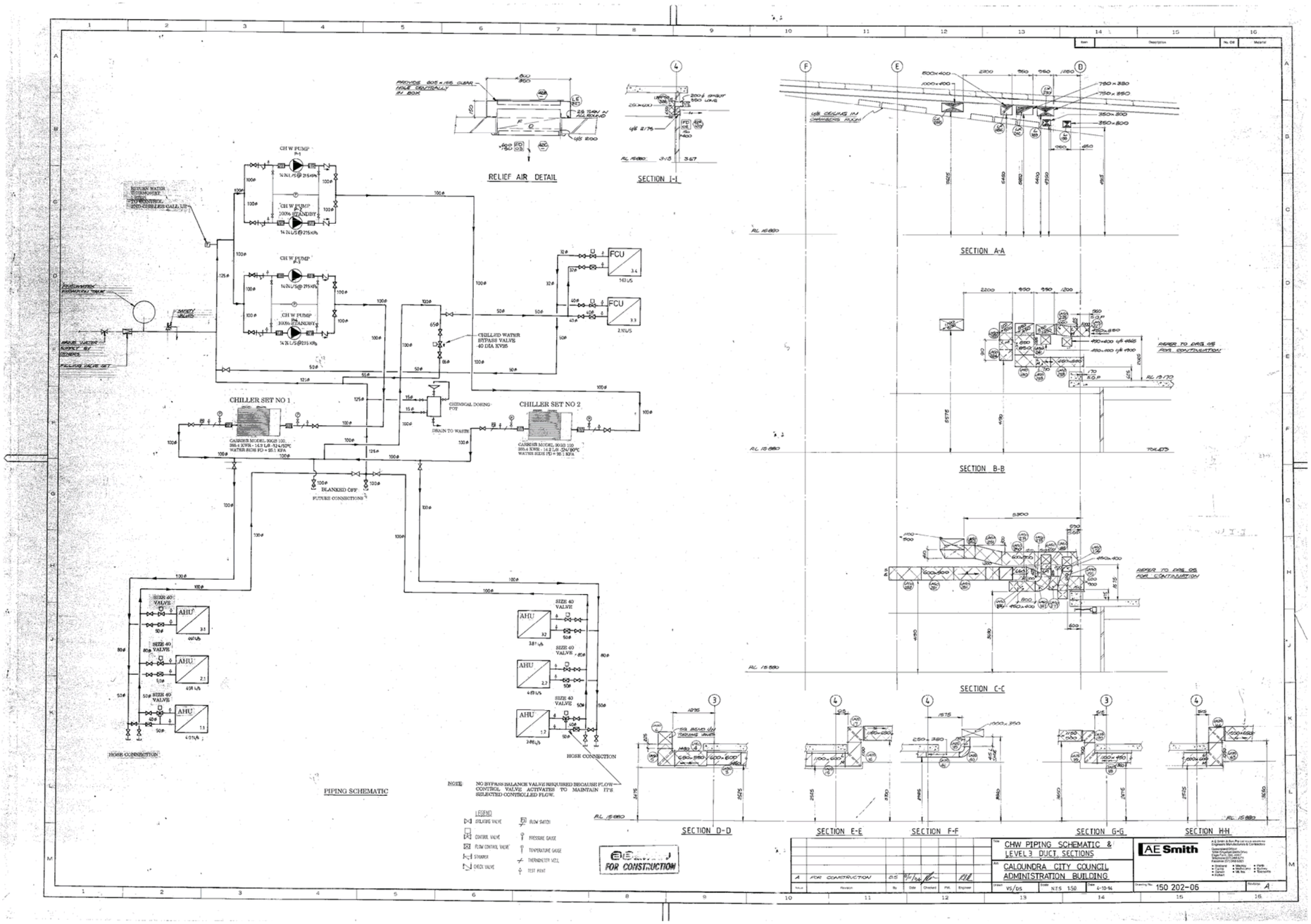
OF THE LINEAR SLOTS.
F GRILLES/DUCTWORK IN CHAMBER CIVIC ROOM RECEPTION AND FOYER ALTERED TO SUIT REFLECTED CEILING PLAN 06/10/94
E LIGHTING / ARCHITECTURAL LAYOUT AMENDED 02/08/94
D DUCTWORK SIZES ALTERED 20/06/94
C CONTRACT ISSUE 02/06/94
B TENDER ISSUE 11/04/94
ISSUE DESCRIPTION DATE
hasthill consultants
electrical mechanical fire lift engineers
18 rawlins street, southport 4215
tel. (075) 312955. fax: (075) 327080
PROJECT
CALOUNDRA CITY COUNCIL
ADMINISTRATION BUILDING.
DRAWING
LEVEL 3
AIR CONDITIONING AND
MECHANICAL VENTILATION LAYOUT
SCALE 1 : 100
DRAWN RWL
DATE 11 / 04 / 94
CHECKED
PROJECT No. 4309
DRAWING No. M : 04
ISSUE F
TIME CLOCK BY-PASS SWITCH
OUTSIDE AIR LOUVRE


RELIEF AIR DETAIL
SECTION 1-1
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
SECTION F-F
SECTION G-G
SECTION HH
CHILLER SET NO 1
CHILLER SET NO 2
CHILLED WATER BYPASS VALVE 40 DIA KV25
CHEMICAL DOSING POT
DRAIN TO WASTE
BLANKED OFF FUTURE CONNECTIONS
HOSE CONNECTION
PIPING SCHEMATIC
NOTE NO BYPASS BALANCE VALVE REQUIRED BECAUSE FLOW CONTROL VALVE ACTIVATES TO MAINTAIN ITS SELECTED CONTROLLED FLOW.
FCU
AHU
FOR CONSTRUCTION
CHW PIPING SCHEMATIC & LEVEL 3 DUCT SECTIONS
CALOUNDRA CITY COUNCIL ADMINISTRATION BUILDING
AE Smith
150 202-06

Electrical Services Report

Attached is an assessment of the existing electrical services in the building. There are a number of significant issues that will have cost implications, however, we anticipate that these changes are reasonably capable of being undertaken.

Issues include:

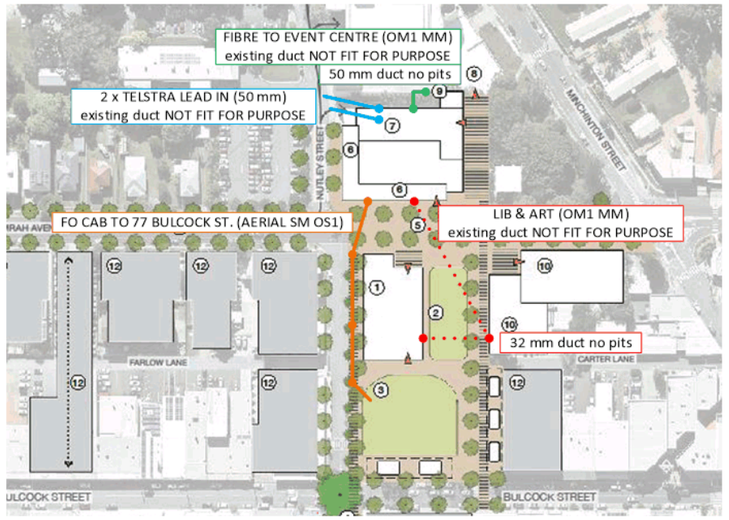
Item 2.1 - Electrical Infrastructure. It is likely that the refurbishment will require upgrading the existing building transformer from 500kVA to 750kVA. This will be determined by Energex once the applicable fees have been paid.

It is proposed that a new pad mounted transformer be externally located, adjacent to the current Transformer Substation Room. It is considered likely that in the event the transformer is upgraded it will not be allowed to remain in the existing room. Implementing a new transformer minimises the risk of trying to maintain the existing infrastructure in the area in which it is currently located.

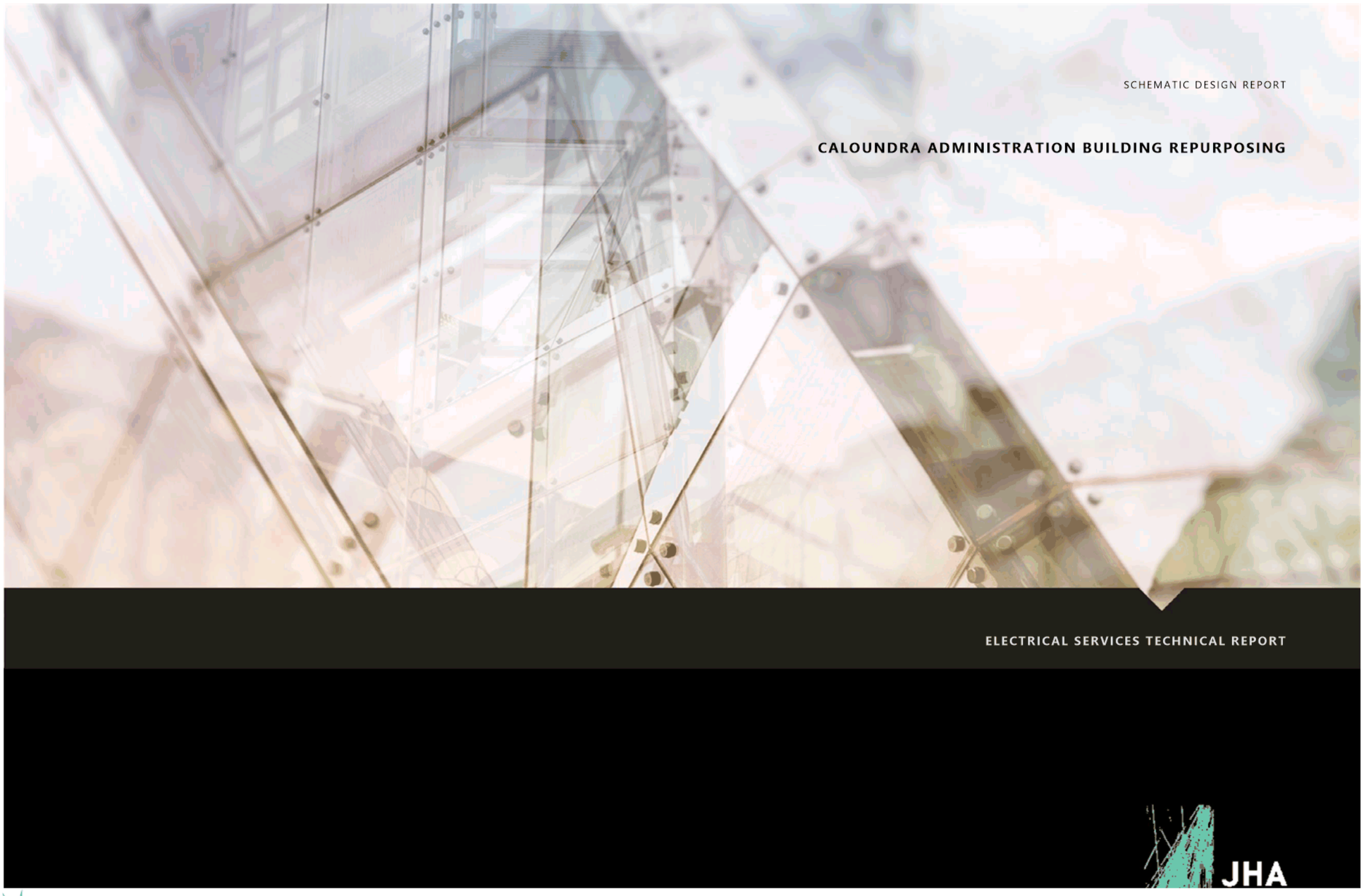
Item 2.1 - Main Switch Board. The existing MSB is to be replaced as part of the upgrade works. The existing room is large enough to accommodate a new MSB, however, is not adequately served by exits from the room. It is suggested that the new MSB be located in the former Substation Room. This space provides adequate space to accommodate the new MSB and complies with current standards in providing sufficient exits as required of a room housing MSB equipment.

Item 2.1 - Intra-Building Reticulation. New Communications risers are required through the building to separate them from the existing electrical services risers.

Item 2.2 - Communication Infrastructure. The existing fibre distribution network services adjacent buildings; including the existing library, Gallery, Event Centre and the public areas within the precinct. There is a risk that works to relocate the Data Centre will adversely affect services to these buildings. Further work will need to be undertaken in future stages to locate the fibre reticulation within the building and protect it during construction.



Excerpt from mark-up provided by SCC showing existing fibre routes in Precinct.


SCHEMATIC DESIGN REPORT
CALOUNDRA ADMINISTRATION BUILDING REPURPOSING
ELECTRICAL SERVICES TECHNICAL REPORT
JHA

DOCUMENT CONTROL SHEET

Project Number	Q190072
Project Name	Caloundra Administration Building Repurposing
Description	Electrical Site Inspection Report
Key Contact	Phillip Lukin – Wilson Architects

Prepared By

Company	JHA
Address	Ground Floor, 130 Commercial Road, Teneriffe, QLD 4005
Phone	61-7 3257 4890
Email	Nathaniel.Siely@jhaengineers.com.au
Website	www.jhaservices.com
Author(s)	N.Siely
Checked	T.Prideaux
Authorised	N.Siely

Revision History

Issued To	Revision and Date					
Wilson Architects	**REV**	1				
	DATE	09.09.20				
	DESCRIPTION	SD Issue				

CONTENTS

CONTENTS

1 INTRODUCTION

1.1 OVERVIEW

JHA Consulting Engineers (JHA) have been engaged by Wilson Architects to undertake the feasibility assessment for the refurbishment works associated with the Caloundra Administration building, converting the existing facility into a modern library and administration building with community facilities that integrate with the wider site masterplan.

Figure 1 –Proposed Site Plan

In support of the proposed refurbishment works, we have previously undertaken a Site inspection and provided an associated dilapidation report for Council's review and consideration. A copy is appended to this Schematic Design Report.

1.2 PROJECT SCOPE OF WORKS

The following broad elements of work will be expected for the project

1.2.1 Level 1

Works associated with Level 1 include the provision of public and library services including:

- Training rooms;
- DVD + Audio services;
- Computers;
- Junior Fiction;
- Young Adult;
- Toy Library;
- Story Corner

1.2.2 LEVEL 2

Level 2 is proposed to include the following services:

- Study + Booked Meeting Spaces
- Quiet Reading;
- Adult Fiction
- Non-Fiction
- Literacy

1.2.3 LEVEL 3

Level 3 is proposed to include Staff and Administration areas.

1.3 PURPOSE OF THIS DOCUMENT

The intent of this Schematic Design Report (SDR) is to capture JHA's understanding of the Project's electrical and communications services design requirements and provide a mechanism through which Sunshine Coast Council can provide feedback on the proposed services.

This SDR will outline the engineering services scope, design criteria, engineering approach, and system strategies proposed for this project, for client sign off and is to be read in conjunction with associated architectural and other engineering reports. This document will be utilised as the basis of future design cost estimates, and as guidance to determine the subsequent design works for the Project.

The intent will be to provide a holistic SDR to ensure services requirements are considered during the construction of the project in its entirety. Broadly, these services encompass those building systems relating to the following:

1.3.1 ELECTRICAL:

- Supply Authority Works, including potential new Energex padmount substation;
- Main Switchboard;
- Utilisation of the existing standby diesel generator;
- Electrical submains and associated distribution philosophy;
- Lightning Protection System;
- Electrical Energy Metering;
- Power Factor Correction

- General power provisions for building services including supplies to other disciplines and Specialist power (e.g. digital signage)
- Internal and external lighting;
- Lighting control systems;
- Emergency and Exit lighting;
- Fire detection and alarm systems.

1.3.2 COMMUNICATIONS:

- Carrier lead-in pathways and telecommunications spaces;
- Base building telecommunications services spaces;
- Optic Fibre and voice grade copper communications cabling pathways;
- Riser space allocations to support both base building and tenant communications cabling pathways;
- Smart building infrastructure including but not limited to energy management system (EMS) inclusive of integration with other disciplines i.e. mechanical and hydraulic metering.
- Communication systems including voice/ data backbone and horizontal cabling reticulation, wireless connectivity (WiFi);
- Security system inclusive of CCTV, intruder detection, alarm, and electronic access control;
- MATV and PayTV distribution;

1.4 LIMITATIONS

This SDR is preliminary in nature and represents the outcome of design reviews, and discussions during concept design phase. The information outlined within the SDR is expected to be reviewed, confirmed as part of the review process, and further developed in the next phase of the project.

2 ELECTRICAL AND COMMUNICATIONS SERVICES DESIGN CRITERIA

2.1 OBJECTIVES

The purpose of this section is to define the electrical services proposed for the project including room requirements, applicable standards, design criteria and system selections.

2.2 DESIGN STANDARDS

The electrical services design will comply with all relevant Australian Standards, codes and practices, including but not limited to:

Table 1 – Electrical Reference Standards

REFERENCE	DESCRIPTION
AS/NZS 3000	▪ Wiring Rules
AS/NZS CISPR 14.1:2003	▪ Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus Emission
AS 1680	▪ Interior Lighting and Visual Environment
AS 1158	▪ Lighting for Roads and Public Spaces
AS 60529	▪ Degrees of Protection provided by Enclosures (IP Code)
AS4282	▪ Control of the obtrusive effects of outdoor lighting;
AS 2293	▪ Emergency Lighting and Exit Signs for Buildings
AS 2648	▪ Underground marking tape, non-detectable.
AS 3008	▪ Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV
AS/NZS 11801.1	▪ Information technology - Generic cabling for customer premises General requirements
AS/NZS 3084	▪ Telecommunications installations - Telecommunications pathways and spaces for commercial buildings
AS 2067	▪ Substations and high voltage installations exceeding kV a.c.
AS/ ACIF S008	▪ Requirements for authorised cabling products
AS/ ACIF S009	▪ Installation requirements for customer cabling (wiring rules)
NCC Vol 1 NCC 2019	▪ National Construction Code Volume 1 Building Code of Australia 2019
AS 3010	▪ Electrical Installations – Generating Sets
AS 1940	▪ The storage and handling of flammable and combustible liquids
AS 1670.1	▪ Fire detection, warning, control and intercom systems – System design, installation and commissioning

2.3 PROJECT-SPECIFIC STANDARDS, REPORTS & GUIDELINES

The following documents shall be considered in the development of the electrical services design:

- Energex Supply and Planning Manual
- QLD Electricity Connection Manual
- Energex design standards
- Identified Sunshine Coast Council Design Standards, including:
  - Access Control/Intruder Detection Design Brief (20191008v1)
  - Access Control/Intruder Detection/CCTV Specification (Installation Standards) (20190726)
  - Security System Installation Standards
  - Communications Infrastructure Standards and Specifications: Copper and Optical Fibre Cabling Specification v1

2.4 DESIGN PARAMETERS

The following design parameters form the basis of the electrical design for the project.

Table 2 – Electrical Design Conditions

CATEGORY	DESIGN CONDITION
Maximum Demand	Per area rates recommended by AS3000, with minor adjustment to consider Energex's Supply and Planning Manual recommendations.
Reticulation	Copper cables as per AS3008.
Sub-mains	Safety services to use WS5X (fire rated) cabling. Non-Safety Services to utilise XLPE/PVC cabling. 25% spare capacity will be provided on top of the calculated maximum demand.
Distribution Boards	25% spare capacity on bus bars over and above the calculated requirement. 25% spare space within over and above the minimum design requirements. Min 6kA fault level for final sub-circuit protection.
Metering	NCC Section J requirements
Containment	Cable tray and conduits for sub-mains. Final sub-circuit via catenary wires. Cable containment to AS3000 capacity. 25% spare capacity over and above calculated minimum requirements.
Lighting	AS1680 and NCC Section J requirements. LED sources Design to apply human-centric lighting concepts where practical
Emergency & Exit Lighting	To AS2293 and NCC requirements.
Communications / Data	As per S008, S009. 50% spare capacity in pathways 30% spare capacity in racks for future growth
Access Control	To SCC Design Brief and Installation Standards
Intruder Detection	To SCC Design Brief and Installation Standards
CCTV	To SCC Design Brief and Installation Standards

3 ELECTRICAL SERVICES

3.1 PROJECT MAXIMUM DEMAND ASSESSMENT

The proposed refurbishment works have been assessed using area rates that are consistent with Energex's Supply and Planning Manual recommendations.

The resultant calculations for the 3 storeys and carpark indicate that:

- The building demand is projected to be in the order of 505 kVA;
- A 25% capacity allowance would incur an additional 125 kVA.
- The total expected electrical demand is therefore projected to be in the order of 630 kVA.

The existing transformer is understood to be 500kVA, with the original design drawings suggesting the substation has physical capacity to house a 750kVA transformer. This has not been confirmed with Energex at this time.

As a result, the project is anticipating that, as a worst case, a new padmount transformer may be required off Nutley Street.

3.2 STANDBY POWER PROVISIONS

The Site is currently served by a 900kVA diesel generator, which appears to be in good condition.

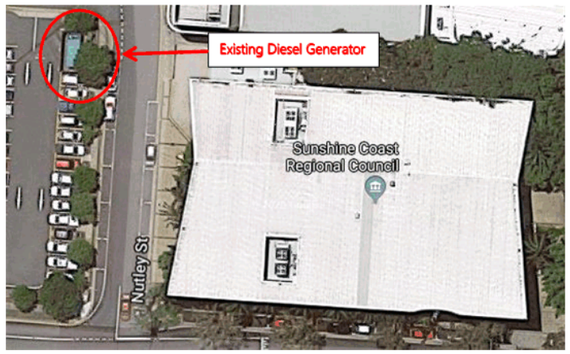


Figure 2 - Diesel Generator Proximity Plan

(Imagery ©2020 Google, Imagery © CNES / Airbus, Maxar Technologies, Map Data © 2020)

No specific requirements for this generator have yet been identified, however we note that it is expected to the capable of providing 100% backup to the refurbished building if required.

As a minimum, the generator must supply any new safety services (as defined by AS3000);

In addition, we recommend that the generator should be loaded to not less than 40% of its name plate capacity to help increase the assets longevity. This load should be in addition to any safety services loads required.

The generator is understood to have an onboard diesel fuel tank, however the capacity is unknown. Additional fuel storage may be required depending on the final connected loading and nominated standby power supply requirements for the project (e.g. 24 hrs).

3.3 ELECTRICAL DISTRIBUTION STRATEGY

3.3.1 OVERVIEW

At this time, we anticipate the design approach to the primary electrical services infrastructure will entail:

- Provision of a new padmount transformer, on the Nutlet Street frontage;
- Provision of a new Site Main Switchboard, to be installed in the existing Energex substation room;
- Provision of new Distribution Boards located in the existing electrical riser cupboards;
- Provision of dedicated switchboards to suit the new Data Centre requirements;

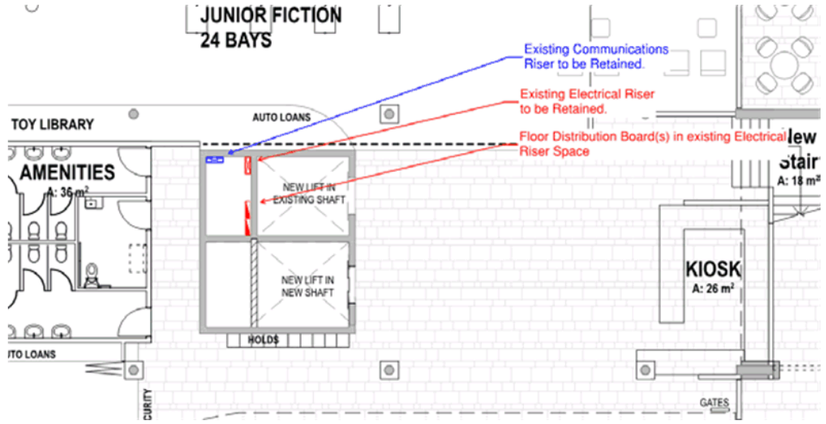


Figure 3 - Proposed Utilisation of Existing Riser Space

3.3.2 METERING

Metering will be provided in accordance with the National Construction Code requirements, and identified additional sub metering requirements.

All meters will be networked together as part of a building Energy Management System.

All works will be undertaken in strict accordance with the Queensland Electricity Connection Manual.

3.3.3 UNINTERRUPTIBLE POWER SUPPLIES

An Uninterruptible Power Supply (UPS) system will be provided to support the new Level 2 Data Centre.

Final design requirements have not been advised to the Project at this time.

We do not anticipate that the battery systems will be sufficient to necessitate the rooms being fire-rated to FRL 120/120/120 under the National Construction Code, but would recommend this being done to increase the reliability of these critical systems.

3.3.4 SOLAR POWER PROVISIONS AND BATTERY STORAGE

Subject to final funding allocations, we anticipate that the refurbished building will be provided with 90kW of solar power via a roof-mounted photovoltaic array.

Any power generated over and above the building's demand is proposed to be stored within a 230 kWh battery storage system located on Level 1.

3.3.5 ELECTRIC VEHICLE CHARING

Subject to final finding allocations, the refurbished building is proposed to be provided with some electric vehicle charging infrastructure, notionally to 5no. carparking bays.

The system proposed is one that can load share a fixed amount of power across multiple charging points. This can be an effective way of utilising spare capacity within the electrical distribution system but without risking overload of the supply infrastructure.

For example, the system could be programmed to distributed not more than 30kW of power at any one time regardless of whether 1 or 5 chargers are in use.

3.4 LIGHTNING PROTECTION

A lightning protection risk assessment has been conducted to assess the proposed repurposing of the Building against the conventional mitigation measures prescribed by AS 1768 *Lightning Protection*.

This risk assessment takes into account a number of factors related to the physical properties and usage properties of a given building, before providing an assessed risk level against four key criteria:

- Loss of Human Life
- Loss of Essential Services
- Loss of Cultural Heritage
- Economic Loss

AS 1768 offers guidance on "acceptable" levels of risk for each of these criteria, which are generally used as a baseline for the specific values calculated on a given building.

Where the calculated risk exceeds the Standards' recommended acceptable risk levels, a number of mitigation steps are available to help lower the calculated risk levels. These measures include:

- Provision of a physical interception system (air terminals, down conductors, earth electrodes and the like)
- Provision of surge protection on services entering the building
- Provision of surge protection on all equipment
- Provision of fire protection measures (to reduce the rate of fire spread)

In order to bring the calculated risk profile for the Building down to within the recommended Acceptable risk range, surge protection will be required at the point of entry for incoming electrical services.

We propose to also include surge protection at each distribution board as an additional protection measure.

3.5 LIGHTING DESIGN

3.5.1 GENERAL

Lighting is a critical element of the design, as it has a bearing on the Architectural quality of the space, its functionality and the wellbeing of occupants. A successful design will maximise the opportunities to reduce energy consumption, while offering high visual comfort and simple, effective means for control and personalisation.

JHA propose that lighting for all spaces should be designed and evaluated within a three-tier framework:

- General lighting: for safety, efficiency, navigability and code compliance requirements;
- Task lighting: for visual efficacy and comfort tailored to the specific usage of each space;
- Accent lighting: to enhance architectural and interior design, creating an appealing environment for occupants and potential tenants.

In our experience, iterative application of this framework can help avoid 'blanket' lighting design responses and therefore:

- Allocate CAPEX in a targeted and effective fashion;
- Reduce energy consumption;
- Identify and prioritise innovation opportunities;
- Avoid visual monotony;

The design will meet NCC 2019 Part J energy density requirements and further achieve the elevated visual comfort and efficiency targets of the GBCA Green Star rating tool.

3.5.2 LIGHT SOURCES & LUMINAIRES

All lighting will use LED sources.

As a minimum, all LED luminaires would meet the following technical standards:

- Colour Rendering Index (CRI) ≥ 90, including R9.
- SDCM ≤ 3 Macadam steps
- Efficacy for general and task lighting:
    - ≥80lm/W at 3000K;
    - ≥90lm/W at 4000K;
- TM-21 lifespan ≥ 50,000hrs L80 B10.

These technical standards ensure a level of quality commensurate with the aspirations of the project, while allowing sufficient latitude in product selection to tailor the lighting CAPEX to the needs of each space.

The lifespan and efficacy criteria will tend to exclude luminaires which are more likely to present ongoing maintenance problems.

3.5.3 LIGHTING STRATEGY

The visual tasks in the majority of base building areas concern safe movement, orientation and navigation. Occupants will range widely, including regular staff, deliveries and members of the general public.

A safe, comfortable and consistent visual environment is key. The table on the next page outlines the proposed general lighting approach and target lux levels. These concepts will be developed and tailored to suit each space during subsequent design stages.

Typical Area	Target Average Illumination (lux)	Proposed Lighting Scheme
Carpark & Bike parking	40	Weatherproof batten and/or lowbay High proportion of vertical illumination
Fire Stairs	80	Robust surface battens with emergency function
Circulation Areas	40 – 160 general 150+ AS1428 DDA access areas	Varied approach, combining downlights, wall lights, direct and indirect illumination. Consider architectural highlights where appropriate.
Lift Lobbies	160	Downlights or linear lighting integral with architecture. High uniformity to minimise distraction when navigating lift system.
Food preparation areas	160-240 240 food prep zone	Curved/angled linear extrusion lighting or to interior design brief. Joinery-integral lighting to kitchen counter.
Meeting Rooms & Reception Areas	320	Low glare, high uniformity, dimmable ceiling troffers & downlights to suit a range of configurations.
Waste, Plant, Services	80-160	Robust batten or lowbay lighting. Supplementary lighting as appropriate, eg vertical light to switchboard panels. Additional lighting where required to meet Authority/Utility standards.
Loading dock	80	Weatherproof impact resistant lowbay lighting. Care required to avoid excessive light spill to street.
Stores	40-160	To suit frequency of handling and nature of items stored
Amenities	80	Recessed downlights, IP44+ Mirror task/feature lighting
PWD Amenities	200	As above, with higher illuminance to AS1428
All other Areas	To AS1680	LED luminaires as appropriate for the task.

Target illumination levels are measured at floor level unless noted otherwise.

3.5.4 LIGHTING CONTROLS

Objectives

The objectives for the building lighting control system are diverse and include:

- Consistency of operation;
- Simplicity of interface at all levels of interaction;
- Scalability, such that a single, unified system can command anything from an individual luminaire to the entire building;
- Interoperability with current and future building services technologies;
- Ability to meet NCC Part J and Green Star efficiency and visual comfort targets;
- Reasonable cost.

3.5.5 EMERGENCY AND EXIT LIGHTING

Emergency egress lighting and exit signage will be provided throughout the facility in accordance with NCC 2019 and AS2293.

The new systems proposed to incorporate new monitored system exit and emergency luminaires and shall use LED light sources. New emergency lighting head end is proposed to be in the main communications room connected to the network for remote management. The proposed head end is proposed to cater for automated required testing and reporting of all emergency and exit lighting (with the exception of the yearly visual check of each emergency and exit luminaire).

JHA propose the use of lithium battery chemistry in all emergency luminaires and exit signs. Lithium battery variants, though more expensive, offer far greater lifespan and lower failure rates than traditional Nickel Cadmium versions.

3.6 FIRE DETECTION AND ALARM REQUIREMENTS

The existing fire detection and alarm system will be replaced with new.

The system will comply with the requirements of the National Construction Code, and AS1670.1.

4 COMMUNICATIONS AND SECURITY SERVICES

4.1 OVERVIEW

The existing carrier lead-in services come into the existing Main Switchroom, which is currently proposed to be repurposed as a sprinkler pump room. As a result, the existing lead-in services including Main Distribution Frame will need to be relocated.

A final location has not yet been determined, however the Level 1 communications room may offer the simplest final solution.

It is important to note that existing Office Building acts as a fibre hub for the local precinct, serving a number of other buildings in the area. These are depicted on the schematic extract in Figure 4 below:

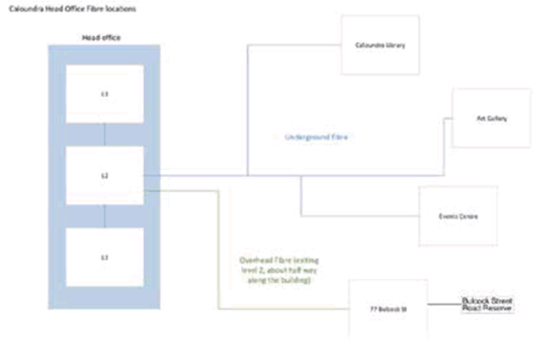


Figure 4 - Site Fibre Topology Diagram

The important features of this diagram include:

- The Level 2 has fibre optic connections to:
  - Caloundra Library;
  - The Art Gallery;
  - The Events Centre;
  - 77 Bulcock Street, noted as *"Overhead Fibre (exiting Level 2, about half way along the building)"*. We understand that there is an additional connection out from 77 Bulcock Street to the Bulcock Street Road Reserve via underground cable pathway;
  - Levels 1 and 3 of the Building.

From this schematic alone it is not clear which fibres emanate from the Level 2 Data Centre and which from the Level 2 communications equipment in the electrical distribution board cupboard/riser space, though we believe the main fibre distribution rack to reside the Level 2 electrical riser space.

The Building will broadly include communications provisions to suit the following broad scope elements:

- Provision of new pathways from the street to facilitate the provision of carrier lead-in services;
- Protection and/or minor diversion of existing precinct optic fibre services;
- Provision of new dedicated communications rooms on each floor of the building;
- Communications risers to connect the various telecommunications rooms;
- A data centre on Level 2, notionally 50m² (final details to be confirmed);
- Provision of hardwired and wireless data outlets to suit final Fitout requirements;
- Public Address Systems;
- Security systems, including base building access control and CCTV;
- Master Antenna Television (MATV) services and IP TV services (if required);

4.2 COMMUNICATIONS INFRASTRUCTURE

Generally, the communications infrastructure will comply with the requirements of SCC Communications Infrastructure Standards and Specifications.

This includes elements such as:

- The provision of OS2 fibre optic backbone cabling;
- The provision of shielded Cat 6A horizontal cabling.

In terms of physical spaces, the project is proposed to include new telecommunications spaces as follows:

- Level 1 Telecommunications Room, to house 2no. racks and (potentially) serve as the Buildings Main Distribution Frame and fibre lead-in termination point. The racks are proposed to support both Level 1 and carpark ICT services;
- Level 2 Telecommunications Room, to house 2no. racks. These racks are proposed to support Level 2 ICT services only;
- Level 3 Telecommunications Room, to house 2no. racks. These racks are proposed to support ICT services on both Level 3 and the roof top/mezzanine plant areas.

4.3 DIVERSION AND PROTECTION OF EXISTING SERVICES

As noted, there are a number of precinct-wide services that appear to be supported by the existing administration building. Specifically, the existing Level 2 electrical cupboard appears to be operating as a fibre distribution hub.

The implications of relocating this hub have not yet been determined, however we envisage that the outcome will be one of two scenarios:

- Retain the existing fibre distribution rack in situ; or
- Relocate the fibre distribution rack to the new Level 2 telecommunications space.

This will be worked through with the SCC ICT team during subsequent design stages.

4.4 SECURITY AND SURVEILLANCE

The building will be provided with electronic security services which confirm to the various design and installation requirements published by SCC.

That is, we anticipate the project will be provided with:

- A CCTV system (we are not yet clear whether this will be the Standard or Enterprise version described in the Access Control/Intruder Detection/CCTV Specification (Installation Standards);
- An electronic access control system utilising the Inner Range Integriti platform;
- Intruder detection capabilities, including Passive Infrared sensors.

4.5 HEARING AUGMENTATION

Hearing Augmentation will be provided in base building areas in accordance with the requirements of the National Construction Code Clause D3.7.

Final requirements will be identified through consultation with the Project's Building Certifier during subsequent design stages. Final system types will be agreed with the Council once minimum requirements have been established.

5 ITEMS FOR FURTHER RESOLUTION IN SUBSEQUENT DESIGN STAGES

The following is a brief listing of major actions to be resolved during schematic design phase:

- Resolution of the proposed substation approach, and corresponding relocation (or not) of the Main Switchboard into the existing substation room;
- Resolution of the need (or not) to divert the existing carrier lead-in services to a new location from (what is proposed to be) the new sprinkler pump room;
- Resolution of the requirements for the relocation (or not) of the existing Level 2 fibre hub, including identification of any precinct impacts;
- Resolution of the Project design requirements for the standby diesel generator;
- Resolution of the final Data Centre size and infrastructure requirements;
- Agreement on infrastructure spare capacity to be provided;

APPENDIX A: Previous Dilapidation Report

ELECTRICAL SITE INSPECTION REPORT

CALOUNDRA ADMINISTRATION BUILDING REPURPOSING

ELECTRICAL SERVICES

JHA

JHASERVICES.COM

DOCUMENT CONTROL SHEET

Project Number	Q190072
Project Name	Caloundra Administration Building Repurposing
Description	Electrical Site Inspection Report
Key Contact	Phillip Lukin – Wilson Architects

Prepared By

Company	JHA
Address	Ground Floor, 130 Commercial Road, Teneriffe, QLD 4005
Phone	61-7 3257 4890
Email	Nathaniel.Siely@jhaengineers.com.au
Website	www.jhaservices.com
Author	N.Siely
Checked	T.Prideaux
Authorised	N.Siely

Revision History

Issued To	Revision and Date								
Wilson Architects	**REV**	Preliminary	Final	Final	Final	Final			
	DATE	29.01.20	21.02.20	09.03.20	13.08.20	09.09.20			

CONTENTS

1 INTRODUCTION

JHA Consulting Engineers (JHA) have been engaged by Wilson to undertake the feasibility assessment for the refurbishment works associated with the Caloundra Administration building, converting the existing facility into a modern library and administration building with community facilities that integrate with the wider site masterplan.

In support of the proposed refurbishment works, we have undertaken a visual inspection and condition assessment of the electrical and communications infrastructure. This report discusses the outcomes of the inspection, and makes recommendations for modification works to suit the proposed refurbishment scope.

1.1 LIMITATIONS

The condition and compliance assessment undertaken was visual in nature and is limited to readily accessible electrical plant only. No intrusive and/or testing of equipment performance was included as part of the audit. The conditions assessment of plant is not conclusive, and may require further inspections including equipment testing and/or review of inaccessible plant.

2 ELECTRICAL AND ELECTRONIC SYSTEMS REVIEW

2.1 ELECTRICAL INFRASTRUCTURE – DESCRIPTION OF EXISTING SYSTEMS

Energex Substation/Transformer

- The existing Energex Substation is located on Level 1, accessible from Nutley Street either via personnel doors or via roller shutter.
- Access could not be provided during the Inspection. As such the commentary below is based on the design drawings provided to the Project team, dated circa mid-1994. We note that the Project team gaining access to the substation would not alter the outcomes of this report: this final assessment of the suitability of the substation for accommodating any upgrades will be determined exclusively by Energex.
- These design drawings identify the transformer as being rated to 500kVA, and "future possibly 750kVA";
- The drawings appear contradictory in so far as the main Schematic Drawing, E08 suggests Consumer's mains cabling was designed as 3x4x1C 240mm² Cu, but plan drawing E05 identifies that only 2no. 100mm diameter conduits were provided (one of which was tagged as spare). That configuration of consumer's mains would not fit within a single 100mm diameter conduit.
- Although the substation could not be accessed, we suspect the actual route does not follow the design documentation, but instead runs on externally mounted cable tray.

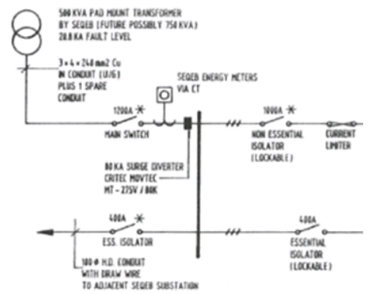


Figure E1

Figure 1 - Extract from Drawing E08 Rev D, dated 21/06/1994.

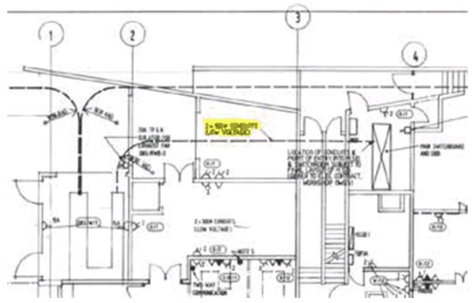


Figure 2 - Extract from Drawing E05 Rev H, dated 07/09/1994

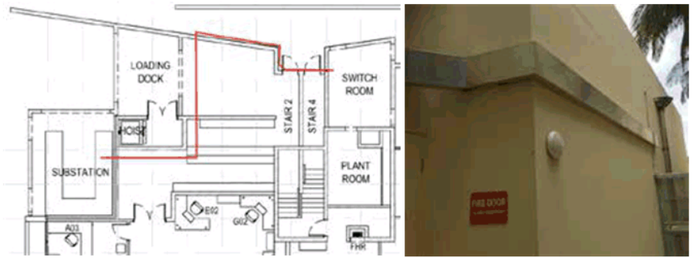


Figure 3 - Suspected Consumer's Mains Route based on Visual Inspection

It has been confirmed to the Project that there is a registered easement covering the substation and associated high voltage cable routes through the northern part of the Site, as highlighted in Figure 4 below:

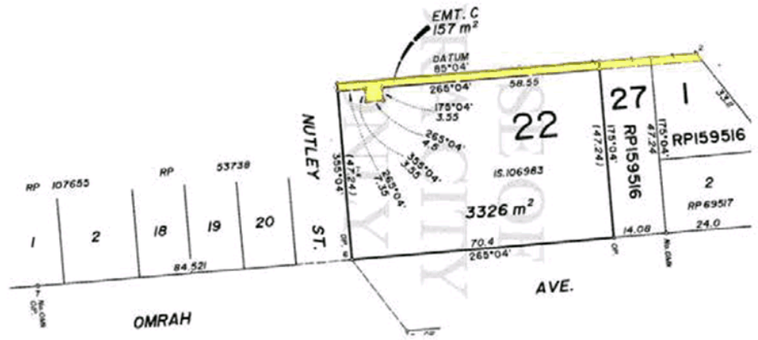


Figure 4 - Existing Registered Easement(s) covering Energex Assets

Site Main Switchboard

- The existing Site Main Switchboard is located in a dedicated room on Level 1;
- The switchboard itself includes a number of key features, some of which are clear departures from the original design documentation and installation works. Although a number of ratings are unconfirmed, it is almost certain this switchboard will need to be replaced as part of the building refurbishment works and therefore the unknown ratings are not considered to be of significant important to the Project moving forward. Nonetheless, the notable attributes are as follows;
    - A free-standing Main Switchboard containing;
        - Incoming Mains Supply Main Switch (1600A frame. Trip rating unknown);
        - Incoming Generator supply (Generator circuit breaker located on the wall, not forming part of the Main Switchboard);
        - Non-essential distribution, including separate non-essential section Main Switch (rating unconfirmed);
        - Essential distribution, including separate essential section Main Switch (rating unconfirmed);
        - A dedicated lift services main switch (rating unconfirmed);
        - A "Fire Services" Distribution Board (MCB) section supplying 9no. services;
    - A wall mounted 630A Main Switch which we believe to be affording protection to the upstream Transformer. This appears to be in addition to the larger Main Switch on the Main Switchboard, presumably due to the smaller transformer size);
    - A wall mounted circuit breaker (1200A frame – trip rating unknown), which appears to serve as the generator isolation point. This device appears to have a physical key interlock with the Main Switchboard, which is consistent with the original design documentation;
    - A separate metering panel which appears to cover all outgoing non-essential supplies;
- Note that validation of the various circuit breaker trip settings would generally require de-energisation of the panel/switchboard section to enable the relevant circuit breaker cubicle to be opened and the circuit breaker inspected;
- The main switchroom room is largely block construction: it's Fire Resistance Level (FRL) requires confirmation;
- The existing Energex NMI number was noted as QB11647558. The Energex CT ratio was identified as 800/5.

Figure 5 - Existing Site Main Switchboard

Intra-Building Reticulation

Electrical reticulation within the Building is broadly arranged as:

1. A single electrical distribution board per floor, located in a dedicated riser/plant space on each floor;
2. These switchrooms are vertically aligned throughout the building, with fire stopping provided to the riser entry/exit points;
3. These rooms are currently shared between communications services and the electrical distribution boards;
4. Lighting and general power circuits reticulate out via in-ceiling cable tray;

Figure 6 - Typical Distribution Board in Riser Space

Site Alternative Power Supply: Standby Diesel Generator

The Site is currently supported (partially) by a diesel generator located off the existing carpark on the other side of Nutley Street:

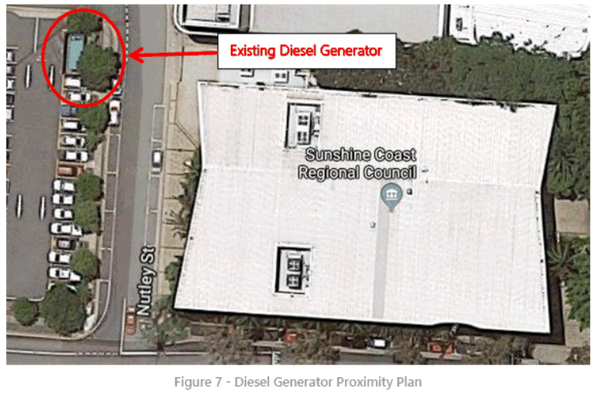


Figure 7 - Diesel Generator Proximity Plan

(Imagery ©2020 Google, Imagery © CNES / Airbus, Maxar Technologies, Map Data © 2020)

Figure 8 - Existing Generator Enclosure

Broadly, the existing Generator appears to be in good condition and had no reported issues. It appears to be currently maintained by CityGenerators.

Based on the mapping extract provided by Geoff Newell to the project we understand the generator to be sitting above ,the Q100 flood level.

The existing generator has the following summary attributes:

- Make/Model: Cummins/C900D5
- Rating: 900 kVA Standby (/820 kVA Prime)
- Year of Manufacture: 2010
- Location: External, surrounded by non-weatherproof enclosure with some traffic protection:
- Cables to Generator Isolator point (circuit breaker) in Main Switchroom: Unconfirmed, but suspected to be 3x4x1c 240mm^2 Cu XLPE/PVC (assumed as 90 deg).
- Onboard fuel storage capacity: Unknown.
- Generator Circuit Breaker Rating: Masterpact NT12 H1 w/ Micrologic 5.0 P Trip unit. Settings unknown.

Details of the generator's starting mechanism were not available at the time of inspection; however we understand it to be a manual start only.

It should be noted that at the time of writing this report, there are no stated requirements for standby power for the refurbished building. As such, we do not see that the lack of detail around the generators fuel storage, circuit breaker rating or starting mechanism are key considerations affecting the progression (or not) of this Project moving forward.

The Generator appears to directly feed into a Generator Switchboard located on Level 1 (accessed externally via a roller shutter only). This switchboard appears to feed:

- Data Centre Switchboard A;
- Data Centre Switchboard B;
- Essential Section of Site Main Switchboard;

Other pertinent details include:

- Manufacturer: Sunline Switchboards;
- Degree of Segregation: Form 4A;
- IP Rating: IP43
- Fault Withstand Capacity: 36kA for 1 second
- Busbar Current Rating: 1250A.
- Manufacturer Reference: "DWG no. Q11D8"

Figure 9 - Level 1 Generator Switchboard Accessed via Roller Shutter

Data Centre Infrastructure

There is significant electrical infrastructure servicing the existing Level 2 Data Centre, including 2no. Data Centre Switchboards, "Data Centre Main Switchboard A" and "Data Centre Main Switchboard B".

This switchboard pair has been installed side-by-side within the Level 2 Data Centre Space per Figure 10 below.

Figure 10 - Data Centre Main Switchboards A (left) and B (right)

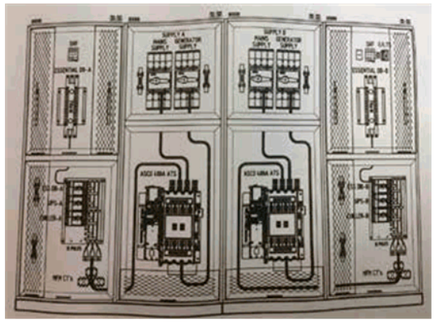


Figure 11 - Data Centre Main Switchboard Internal Layout based on Workshop Drawing

Other pertinent details include (applicable to both "A" and "B" panels):

- Manufacturer: Power Electric Switchboards;
- Date of Manufacture: May 2011
- Degree of Segregation: Form 2;
- IP Rating: IP54
- Fault Withstand Capacity: 25kA for 1 second
- Busbar Current Rating: 400A;
- Manufacturer Reference: "Assembly Ref No. M1521"

The data Centre also contained significant UPS systems, however as the Data Centre is proposed to undergo significant size reduction under this Project, the UPS systems were not reviewed in great detail for this initial feasibility assessment.

Lightning Protection System

The existing building does not appear to be fitted with any form of interception (/physical) lightning protection system, i.e. visible finials, down conductors or the like.

General Fitout Works

The Existing general electrical services fitout elements comprise:

- Power outlets, arranged to suit the open plan office fitout;
- Lighting generally included fluorescent style fittings with glare limiting louvres; and
- Emergency/Exit lighting as single point type with local battery backup;

2.2 COMMUNICATION INFRASTRUCTURE – DESCRIPTION OF EXISTING SYSTEMS

Optic Fibre Infrastructure

The existing Office Building acts as a fibre hub for the local precinct, serving a number of other buildings in the area. These are depicted on the schematic extract in Figure 12 below:

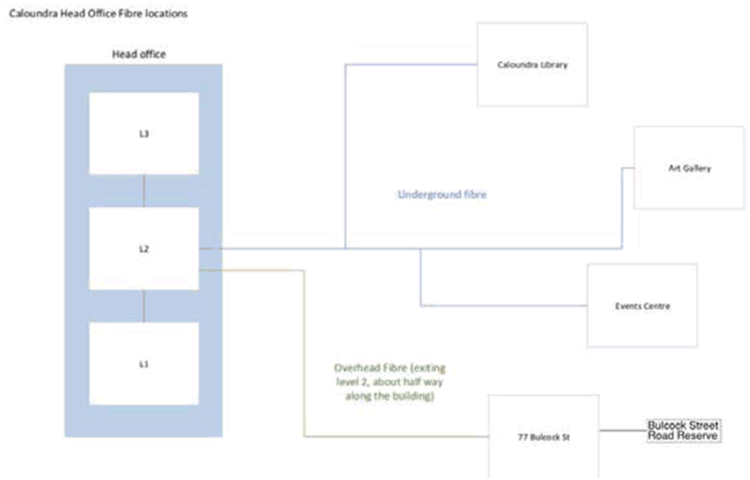


Figure 12 - Site Fibre Topology Diagram

The important features of this diagram include:

- The Level 2 has fibre optic connections to:
  - Caloundra Library;
  - The Art Gallery;
  - The Events Centre;
  - 77 Bulcock Street, noted as *"Overhead Fibre (exiting Level 2, about half way along the building)"*. We understand that there is an additional connection out from 77 Bulcock Street to the Bulcock Street Road Reserve ;
  - Levels 1 and 3 of the Building.
- From this schematic alone it is not clear which fibres emanate from the Level 2 Data Centre and which from the Level 2 communications equipment in the electrical distribution board cupboard/riser space, though we believe the main fibre distribution rack to reside the Level 2 electrical riser space.

Figure 13 - Cable Believed to be the Optic Fibre line connecting through to 77 Bulcock Street

Image Capture: Dec 2018 © 2020 Google

This schematic does not denote the incoming Carrier Fibre Optic connections to the Building. The incoming location(s) and route through the building for these services is unknown however, based on Site inspection it appears that:

- The incoming Telstra Service fibre terminates within the Ground Floor Main Switchroom, which also houses the Main Distribution Frame; and
- The incoming Optus fibre service also terminates within the Main Switchroom.

The incoming Optus service cable ID was identified as QQ47BLS001. The service to the Level 2 Data Centre was labelled with Cable ID QQ4712F.

The Telstra Service appear to comprise 2x 12c links, connecting through from the Ground floor MDF area up to the Level 2 Distribution Board cupboard (not Data Centre). The final core counts and cable references were not ascertained from visual inspection.

Figure 14 - Optus (left) and Telstra Fibre Lead in termination points

Within the Level 2 Communications rack (located within the Level 2 Distribution board riser space), the Telstra service appears to terminate between splitting off to serve other floors as well as additional buildings (i.e. the Telstra Service does not appear to terminate in the Level 2 Data Centre).

The works under this Project will only resolve the physical aspect of any relocation and/or installation of cabling/equipment to suit the refurbishment's ICT needs: what those needs are and whether the existing fibre infrastructure is suitable (including the retention, or not, or links to other buildings in the precinct) will need to be reviewed and confirmed by the SCRC ICT team.

Copper (Voice) Infrastructure

The Building Main Distribution Frame (MDF) is located in the ground floor Main Switchroom.

Figure 15 - Site Main Distribution Frame within Main Switchroom

The MDF connects through to an intermediate distribution frame (IDF) located on each level within the same riser cupboard as the electrical distribution boards.

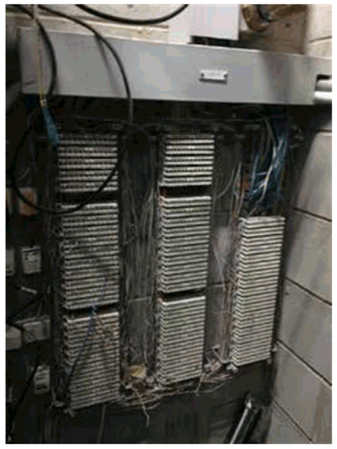


Figure 16 - Site MDF in Main Switchroom

From here the frames appear to connect through to patch panels in the local communications rack(s) before being distributed out onto each floor.

Telecommunications Rooms and Horizontal Distribution

All of the Building related communications equipment appears to be co-located with the corresponding electrical equipment:

- MDF is located within the Main Switchroom room on Ground Floor;
- The Level 1 IDF is located within the Level 1 Electrical Switchroom housing DSB1/EDB1;
- The Level 2 IDF is located within the Level 1 Electrical Switchroom housing DSB2/EDB2;
- The Level 3 IDF is located within the Level 1 Electrical Switchroom housing DSB3/EDB3;

It is clear that when this Building was designed, communications systems and system requirements were not planned and managed in the same way that most modern buildings now are. This is evidenced through the arrangement on the original power and data layout drawings provided (dated circa 1994) per the below extract(s) which only indicate that the IDF was provisioned for.

Figure 17 – Extract(s) from 1994 Design Drawing

As the needs of the building and its occupants has evolved, additional equipment has been installed to these same spaces resulting in a physically challenging installation. Nonetheless, distribution racks have been installed in each of the on-floor electrical switchrooms/communications spaces to distribute communications services out to that floor.

Security and Access Control Systems

The building is fitted with an Electronic Access Control System (EACS). The installed equipment appears to have been recently upgraded to InnerRange's Integriti platform.

Perimeter doors and some internal doors appear to be fitted with proximity card readers and electric strike plates (or other electronic mechanism to suit the door type).

2.3 DRY FIRE SYSTEMS – DESCRIPTION OF EXISTING SYSTEM

The existing Administration Building is protected by an automatic fire detection and alarm system. It appears to include an Emergency Warning and Intercommunication System (EWIS) component as well.

The building's fire indicator panel (FIP) is located within the Level 1 reception area adjacent the main desk.

Figure 18 - Building Fire Indicator Panel

It is a Notifier AFP3030 type and included an Intertia-2000 EWIS component. It is also fitted with Alarm Signalling Equipment (ASE) that has both a phoneline and radio dial-out connectivity.

Figure 19 - Alarm Signalling Equipment indicating both Phone and Radio Connectivity

A sub-FIP is located on Level 2, approximately per the zoning diagram shown in Figure 20:

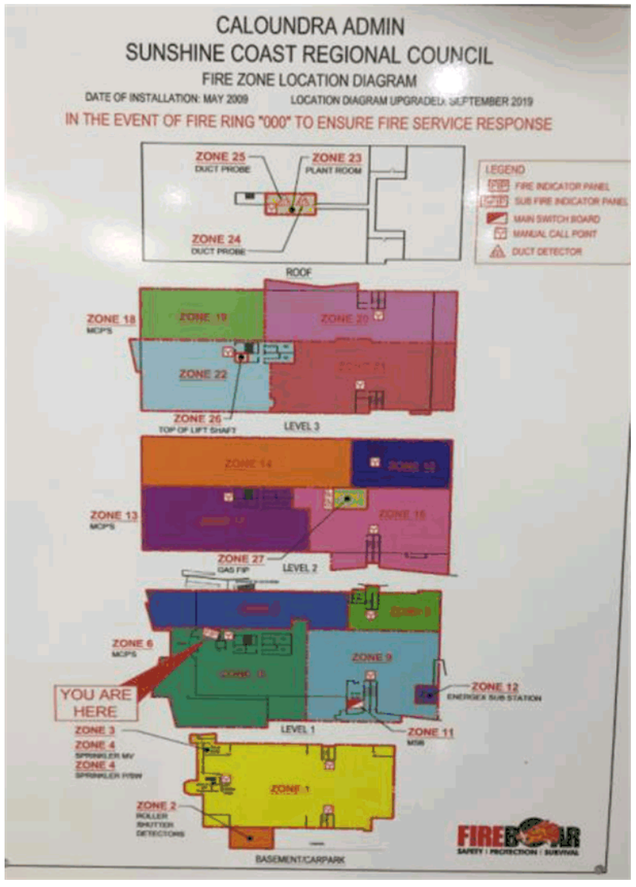


Figure 20 - Administration Building Detection Zone Location Diagram

The system appears to have been installed and maintained by FireBoar.

3 ELECTRICAL AND ELECTRONIC SYSTEMS – CONDITION ASSESSMENT AND SUITABILITY FOR PROPOSED REFURBISHMENT

3.1 ELECTRICAL INFRASTRUCTURE

Energex Substation/Transformer

An Energex Enquiry has been lodged to ascertain the availability of load on the Energex network and the suitability of the existing transformer to handle the projected demand of the proposed Library which is estimated to be in the order of 630 kVA/ 910 Amps per phase.

As a minimum, we anticipate that the transformer will require to be upgraded, likely to a 750kVA transformer. From the original drawings, it appears that the design intention was for the substation to be suitable for such an upgrade however it is not clear whether the room will comply with current Energex Standards.

This will need to be conversation with Energex once a reply from the Connection Enquiry has been obtained.

In order to understand further detail about the existing substation and whether it could be upgraded, an Energex Network Enquiry has been lodged (ref: CX20OMR0581738Q). Energex have responded to this Enquiry and confirmed that further investigation and design works will be required by their team in order to provide formal advice to our Project. The avenue for this is for the Project to lodge a formal Connection Application, and for the Council to pay the applicable Fee of $7,858.40 (ex GST).

We are aware of a concurrent Project underway involving Jacobs, who are looking at the services supporting the wider precinct. Those works may or may not involve the rationalisation of services and utility assets in the area, pending outcomes of that Project's investigations. As such, this Project has elected not to proceed with the Energex Connection Application and associated fees at this time.

Risk Carried Forward: Existing substation is not suitable for upgraded transformer AND the supply arrangement may not be resolved through the concurrent project being worked on by the Jacobs team.

Site Main Switchboard

The existing Site main switchboard is of age, and will not be suitable for re-use under the refurbishment Project works.

The reasons for this statement relate to both:

1. Suitability of the existing connection(s) on the Main Switchboard to suit the likely new connection requirements; and
2. Non-compliance with current Australian Standards, namely AS3000:2018, which would need to be rectified if the switchboard is to be re-purposed.

The main considerations are:

1. If the new Main Switchboard is to support Safety Services (as defined by AS3000:2018), then the room will need to achieve segregation from the remainder of the building by means of Fire Resistance Level (FRL) 120/120/120 per Clause C2.13.
2. If the switchboard has a current rating of 800A per phase or greater (we anticipate it being 1200A), then the switchroom must have 2 paths of egress per the requirements of AS3000:2018.

As such, we anticipate that a new Main Switchboard location will need to be determined early on in the design phase. The final requirements for FRL construction will need to be reviewed once the building services design requirements become clearer.

The new location will need to be cognisant of the appliable flood level.

Intra-Building Reticulation

The existing Riser Spaces are vertically aligned and appear to afford sufficient space to operate as an electrical services cupboard/riser space so long as the existing communications equipment is relocated.

Preliminary advice from the Building Certifier is that the new installation will need to achieve the energy efficiency measures prescribed by the National Construction Code 2019.: the existing distribution boards will require replacement under the fitout in order that the requirements for separate metering of lighting and power circuits (Ref NCC Section J8) can be achieved.

The existing Risers and associated cable penetrations are anticipated to be suitable to accommodate the refurbishment works, subject to final design requirements.

All existing cable tray and cable pathways should be replaced and/or reconfigured to suit the final fitout requirements.

Site Alternative Power Supply: Standby Diesel Generator

No specific generator requirements have been identified for the proposed refurbishment works.

We suggest that the refurbishment project make sure of this generator, albeit in a reconfigured manner, to suit the new Library refurbishment requirements.

As such, the existing Standby Diesel generator is recommended to be retained and connected to the new Site Main Switchboard.

The existing Generator Main Switchboard, despite being in good condition, is likely to be surplus to the Project requirements given that the Data Centre is downsizing significantly and will be able to be adequately supported by the new Site Main Switchboard.

It has been confirmed to the Project team that this generator will not be required to achieve a post-disaster operating availability.

Data Centre Infrastructure

The existing Data Centre Main Switchboard appears to be in good condition and has no reported functional concerns.

Although likely to be oversized for the requirements of the reduced Data Centre proposed for the new Library fitout, we recommend it be retained for re-use if practical (spatially) to do so.

Final UPS requirements will need to be agreed with Users to suit the final Data Centre loading requirements: we suspect it is likely that at least some of the existing UPS equipment could be retained for re-use.

Lightning Protection System

We have undertaken a preliminary Lightning Protection Risk assessment in accordance with the requirements of Australian Standard AS1768. That assessment concluded that only point-of-entry surge protection should be provided to the building's electrical services: no physical protection would be required to meet the acceptable loss criteria defined in the Standard.

General Fitout Works

The existing fitout is expected to be made entirely redundant by the new works, and replaced with new components including new small power elements, new lighting, and new emergency lighting.

3.2 COMMUNICATION INFRASTRUCTURE

Optic Fibre Infrastructure

The Project has not received indication that the existing Telstra and Optus incoming fibre connections require review. Unless the project is advised otherwise, we recommend that these termination devices and associated internal reticulation be left in situ (if possible) to minimise the costs associated with relocating the carrier assets. This is particularly the case if our associated recommendation to relocate the site Main Switchboard is acted upon.

However, we do recommend that the existing fibre distribution hub located in the Level 2 electrical riser/cupboard space should be relocated to a purpose-built communications room under the Refurbishment works.

Risk: Relocation of the existing communications services is likely to affect buildings beyond the existing Administration Building within the Precinct.

Proposed Mitigation: We foresee that some disruption will be unavoidable and therefore will need to be proactively managed by both the Project team and SCRC ICT personnel. We foresee therefore that the mitigation measures will relate to managing the duration of outage rather than trying to alleviate the outage itself.

Copper (Voice) Infrastructure

The project has not been advised that the existing telephony systems, including extensive internal copper distribution network requires modification. We do recommend that the existing building MDF be retained in situ and rationalised, on the condition that our

associated recommendation to move the Site Main Switchboard also be acted upon. This would leave the existing Site Main Switchroom to be left to communications services only.

However, we do foresee an opportunity to rationalise much of this existing copper voice cabling and convert the site to an IP-based telephony system. The design team will need to liaise closely with the SCRC ICT team for these works.

Telecommunications Rooms and Horizontal Distribution

We strongly recommend that the refurbishment works allow to create new, dedicated telecommunications spaces in a relatively central location on each floor (so that no point on the floor exceeds a 90m cable run length).

That is, we do not regard the existing electrical services riser/cupboard locations as suitable for the installation of new communications equipment due to access and service constraints (air conditioning).

Some services, for example the Level 2 fibre distribution rack may require further review to ensure any relocation activities can be managed to minimise disruption to external sites and services.

These spaces will need to be in additional to the proposed new Data Centre.

Security and Access Control Systems

The installed access control system, the Inner Range Integriti platform, is a relatively new system which we recommend be retained where possible.

The final access and intruder detection provisions will need to be aligned to suit the final building fitout and security strategy: this is likely to require some modification and recommissioning of the existing equipment, though we envisage an overall cost saving for the Council compared to total replacement.

3.3 DRY FIRE SYSTEMS

The final requirements for the fire detection and alarm system will be advised to the Project via the Building Certifier. The preliminary advice received has noted that an AS1670.1 (BOWS) system will be required, which is less onerous than the installed AS1670.4 EWIS type system.

Depending on the final design requirements, it may be possible to retain the existing Fire Indicator Panel, including Alarm Signalling Equipment as it appears to be in good working condition, with the panel type still supported by the Manufacturer.

The final location of detectors, speakers, interface units and the like will need to be designed and arranged to suit the final fitout requirements.

There is an existing gas suppression system currently protecting the existing Level 2 data centre. The most recent advice from the SCRC team is that gas suppression will not be required to the new Data Centre being proposed under this Project: at this time, the extent of works associated with the existing gas suppression system will therefore be limited to decommissioning and subsequent demolition of the existing system only.

4 SUMMARY RECOMMENDATIONS

The summary outcomes from our initial visual inspections are summarised in the table below:

Element	Recommendation	Action Recommended
Energex Substation/Transformer	Upgrade Transformer in situ if possible.	Progress to Connection Application and pay applicable Energex fees to confirm whether existing substation can be re-used for new, larger transformer.
Site Main Switchboard	Replace with new	
Intra-Building Reticulation	Retain existing riser spaces. Replace existing distribution boards	
Site Alternative Power Supply: Standby Diesel Generator	Demolish generator switchboard. Connect generator directly to new Main Switchboard.	Generator operational requirements, including required fuel reserves (e.g. run whole building for 48 hrs) should be identified as soon as is practical.
Data Centre Infrastructure	Retain existing Data Centre Main Switchboards A & B if space in the new (smaller) Data Centre permits.	
Lightning Protection System	Surge Protection to the Main Switchboard only.	
General Fitout Works	New, to suit final fitout requirements.	
Optic Fibre Infrastructure	Retain carrier services in situ if possible. Relocate on-floor infrastructure to new telecommunications spaces.	Confirm connectivity for existing fibre optic connections to adjacent facilities, and final ICT requirements for the newly refurbished building.
Copper (Voice) Infrastructure	Retain existing MDF but rationalise. Migrate from distributed copper services to VoIP system if agreed to with SCRC ICT team.	Request SCRC ICT team to confirm if migration to VoIP is acceptable to help rationalise MDF and floor IDFs.
Telecommunications Rooms and Horizontal Distribution	New, dedicated telecommunications spaces to be created in a relatively central location on each floor. New communications cabling to be provided to new data outlets to suit final fitout requirements.	
Security and Access Control Systems	Existing Inner Range Integriti equipment should be retained where practical.	
	Final access control and intruder detection field devices to suit final fitout requirements.	
Dry Fire Systems – Description of Existing System	Existing FIP to be retained in situ if possible. New detectors, speakers and interface units to be provided to suit the final fitout requirements.	

Lift Services Report

Attached is Vertical transportation Report.

The existing lift is to be replaced for the following reasons:

- it is too slow to adequately serve the proposed use of the building as a library and community facility.
- it does not comply with NCC2019 with regards to accessibility requirements for people with a disability.

In addition to replacing the existing lift, it is proposed to install a second lift in the stairwell adjacent to the current lift. This addition would adequately service the proposed use of the building as a library and community facility. This proposal would require the removal of the existing stairwell adjacent to the current lift and re-purposing that space to accommodate a new lift shaft and car. A new circulation stair is proposed to offset the removal of the existing stair.

The recommended lifts are a Schindler type with a typical car size of 1600mm wide x 2000mm deep and accommodates 21 persons.

A representative from Schindler attended the site on the 30th of January 2020 and examined the existing lift and shaft. Our advice from Schindler is that the existing lift shaft dimensions including the pit depth and over-run are sufficient to house an appropriate sized lift for the building. No amendments are required to the existing shaft.

It is proposed to completely remove the existing lift and lift motor. The proposed lift does not require a lift motor room. The lift motor room at the basement becomes redundant.

The lift is to meet accessibility requirements. The new car size recommended provides sufficient space for a person in a wheelchair to enter the lift, turn around and to exit the lift in a forward direction.

The building is not required to incorporate a stretcher facility as the Effective Height of the building is less than 12m. However the proposed lift car sizes are sufficient to permit a stretcher to be used.

HAWKINS JENKINS ROSS Pty Ltd
CONSULTING ENGINEERS
ABN. 16 010 986 240

619 LOGAN ROAD
GREENSLOPES QLD 4120
Telephone. (07) 3324 2977
Fax. (07) 3324 0667
email. mail@hjr.com.au

CALOUNDRA CITY COUNCIL
ADMINISTRATION BUILDING
VERTICAL TRANSPORTATION SERVICES

PREAMBLE

Hawkins Jenkins Ross has been engaged by Wilson Architects to complete initial investigations and review of the existing vertical transportation services and potential installation of a new lift to replace the existing hydraulic lift at the Caloundra Administration Building. The advice provided by Wilson Architects is that the current lift is slow and the intent is to provide a new lift that complies with the current requirements for people with disabilities. A second option allowing two lifts to be installed has also been included for consideration.

EXISTING LIFT

The existing lift is a hydraulic lift that serves the Basement and three upper levels of the existing building and has a lift motor room on the basement level. The existing shaft as per the existing drawings reflect an RL 4080 at the base of the pit up to RL 5680 at the Basement level which equates to a 1600mm pit dimension. The floor of level 3 is RL 15880 and the shaft lid is at RL 21280 which equates to an overrun dimension of 5400mm. The existing shaft is noted as 2610mm wide x 3010mm deep.

PROPOSED LIFT

The proposed option / test lift is based on the Schindler 5500 series lift which has a typical lift car size of 2600D x 1600W. This size lift and car can be accommodated within the existing shaft dimensions. The existing electrical earthing would need to be further confirmed and also the viability of cutting in a new control panel at the top level for the MRL controller which requires a recessed section for the electrical cabinet. The 5500 series lift is a nominal 21 person lift with a standard travel speed of 1m/s. The Schindler 5500 series lift car dimensions are suitable to accommodate a stretcher if required.
An alternative option is for a new shaft to be constructed via removal of existing stairs and allowing a second lift (2 x Schindler 5500 series lifts) to be installed to improve people movement capabilities. The buildability and construction of the shaft is covered within the Architectural scope of this project and this report is limited just to the lift itself.

TIMEFRAMES

The indicative time frames as per feedback from Schindler lifts are that the demolition of the existing hydraulic lift would take approx. 3 weeks with the actual installation of the new lift being in the order of 6 weeks. The lead time on the manufacturing and delivery is typically 18 weeks. This would therefore require a final overall time frame of approximately 27 weeks for the lift removal and replacement.

PROBABLE COST

The probable cost as per indicative figures provided by Schindler indicate the approx. cost to be in the region of $200,000.00 which is inclusive of an allowance for the removal of the existing hydraulic lift and installation of a new MRL lift. The final finishes would need to be confirmed to further clarify.

The probable cost for the option of the two lift installation as noted by Schindler would be approximately $360,000.00 again includes both lifts as well as removal of the existing hydraulic lift. The construction of the new shaft itself is not included in the above figure.

Regards,

Bryce Napper
HAWKINS JENKINS ROSS PTY LTD

Fire Safety Strategy Report

Attached is Fire Safety Strategy Report.

The Report provides a Performance Solution to non-compliances raised in the Building Certifiers Report

Significant issues that are resolved include:

- Fire rating of structural steel used to stiffen the existing floors can be safely deleted.
- Extended travel distances to exits can be safely accommodated.

omnii
Consulting Fire Engineers

Project
Caloundra Library
1 Omrah Avenue, Caloundra Queensland

Principal
Wilson Architects

Certifier
Building Certifiers Australia

Fire Safety Strategy Report

September 2020
Project Number 8230100
Revision B

8230100 FSSR B

omnii
Consulting Fire Engineers

Document Authorisation Issue

Project: Caloundra Library
Project Address: 1 Omrah Avenue, Caloundra Queensland
Project Reference: 8230100

Revision	Date Issued	Status	Prepared By	Reviewed By
A	7th September 2020	**Final**	Pavlo Nikolaienko	Graham Timms
	Comment:	For Project Team Review		
B	22nd September 2020	**Final**	Pavlo Nikolaienko	Graham Timms
	Comment:	Authorised Issue		

Caloundra Library
1 Omrah Avenue, Caloundra Queensland

omnii
Consulting Fire Engineers

Table of Contents

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1. Introduction

This document, prepared for Wilson Architects (Principal), is the Fire Safety Strategy Report (FSSR) for the proposed refurbishment of the Caloundra Library located at 1 Omrah Avenue, Caloundra Queensland.

Compliance with the Performance Requirements of the NCC can be achieved by designing the building to meet the prescriptive Deemed-to-Satisfy (DTS) provisions of the NCC. However, as the DTS provisions are prescriptive they may restrict or hinder the design from meeting functional and operational objectives of the project. In these situations, fire engineered Performance Solutions can be developed to achieve the design objectives of the project.

This Fire Safety Strategy Report (FSSR) has been prepared to outline the likely non-compliance issues that will require fire engineered Performance Solutions, and the fire safety strategy and associated design requirements likely to be required to support the Performance Solutions.

Further, this FSSR identifies a potential fire engineering risk assessment methodology. The methodology recognises that a number of the NCC DTS provisions are generic requirements irrespective of the fire safety systems required, and provides opportunity to develop robust Performance Solutions that can be shown to meet the relevant Performance Requirements of the NCC by considering the benefits provided by smoke detection and sprinkler suppression systems.

This FSSR has been prepared to outline potential design options, that may require fire engineered Performance Solutions, for this project. The options review has examined opportunities to retain existing structure, removal of an existing fire stair, dimensions of horizontal projections and interconnection of levels via non-fire isolated stairs.

After consideration by the Client and design team, a preferred fire safety design approach will be chosen and documented via the typical fire engineering process (e.g. FEB/FER).

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2. Project Description

The project comprises the refurbishment of an existing 3 storey administration building into a Library and Community building (Class 9b). The building will comprise:

- Basement Level - Carpark (Class 7a);
- Level 1 (Ground) - Library (Class 9b);
- Level 2 - Library (Class 9b);
- Level 3 – Office (Class 5), Community Meeting Rooms (Class 9b).

The floor plan layouts of the proposed refurbishment are shown in Figure 2.1 to Figure 2.4 below.

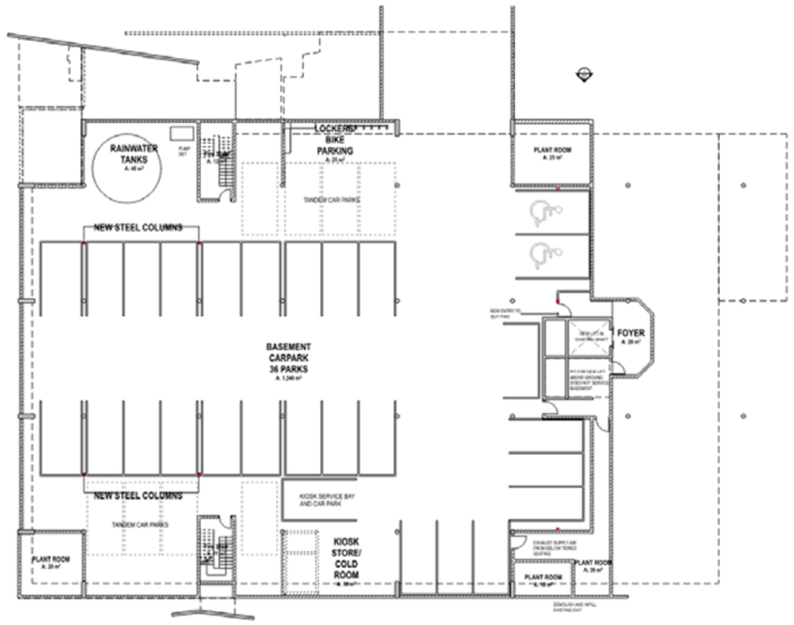


Figure 2.1 –Basement Floor Plan

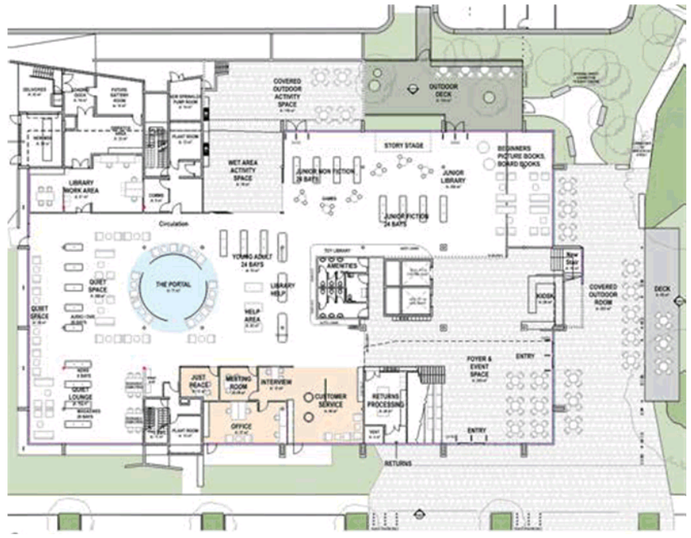


Figure 2.2 – Level 1 (Ground) Floor Plan

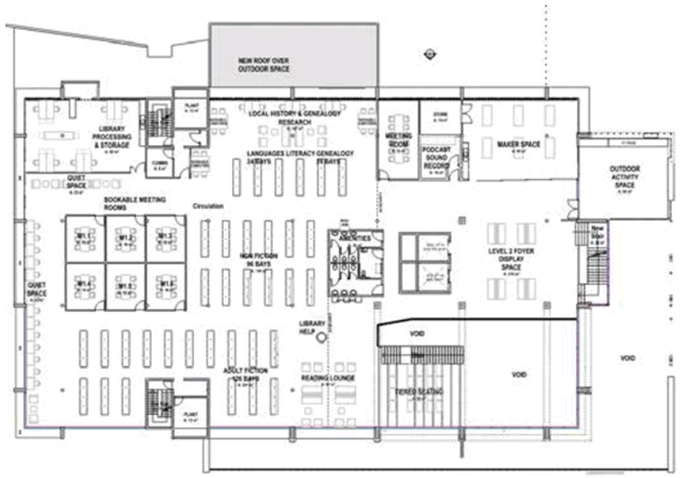


Figure 2.3 – Level 2 Floor Plan

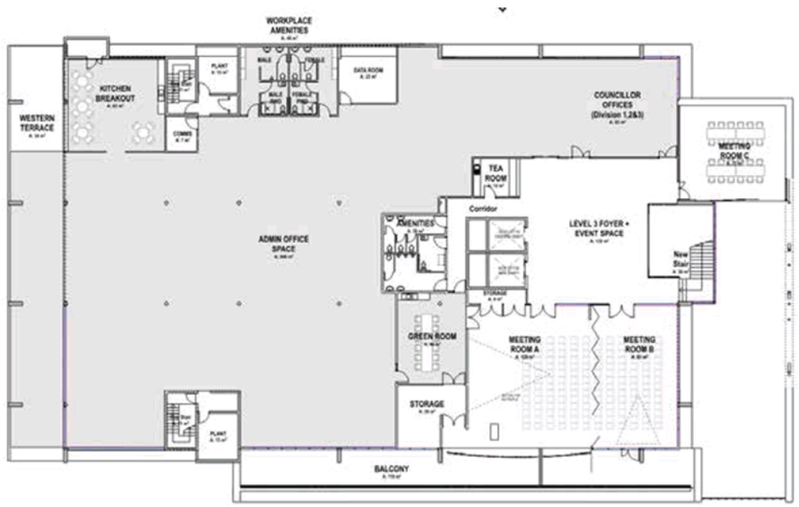


Figure 2.4 – Level 3 Floor Plan

Figure 2.5 – Plant Room Level

3. Fire Safety Strategy

The following Section describes the concept Fire Safety Strategy addressing the aspects of the design identified by the Building Certifier as not complying with the prescriptive DTS provisions of the BCA.

3.1 Unprotected Steel Members

As part of the building alteration works, the existing concrete floors will require to be provided with stiffening using steel beams and columns. We understand the purpose of this new steel structure is to level the existing slabs rather than provide structural support to the building.

However, as part of the floor structure of a Type A construction, the subject steel beams are required to have FRL of not less than 120 minutes as per DTS NCC Specification C1.1 requirements.

The intent of NCC DTS Clause C1.1, as stipulated by the Guide to the NCC (1), is to establish the minimum fire-resisting construction required for Class 2 to Class 9 buildings and Specification C1.1 is used to clarify the requirements for fire-resisting construction of building elements.

By achieving the Fire Resistance Levels (FRLs) and other requirements stipulated in Clause 3.1 and Table 3 of Specification C1.1, it is considered that an acceptable degree of separation and structural stability is provided to reduce the potential for fire spread and structural failure, to the degree necessary.

Relevant Performance Requirements CP1 and CP2, as stipulated by the Guide to the NCC and in the context to the Performance Solution, deal with the structural stability required during a fire and the spread of fire within a building. A building must have elements appropriately fire rated so that:

- structural stability and integrity are uncompromised, to the degree necessary;
- the fire is contained within the fire compartment of origin, to the degree necessary;
- the fire does not endanger the occupants by entering escape routes; and
- firefighters while they undertake search and rescue operations.

It is noted that CP1 and CP2 do not make any reference to a Fire Resistance Level (FRL) and compliance with the relevant performance requirements through a Performance Solution may be achieved by other means, such as the use of active systems.

The hazard associated with reduced fire resistance levels is that the structural stability of the building elements and the avoidance of fire spread may not be maintained during a fire for the required duration.

As a Performance Solution, it is proposed to permit the use of unprotected steel beams and columns in the floor slabs stiffening system, in lieu of 120 minutes FRL as per NCC DTS requirements.

Acceptance will be demonstrated if assessment shows that the proposed steel elements, not achieving DTS fire resistance level, do not unduly impact on the safety of the occupants' evacuation from the building.

As part of the Performance Solution, it is recognised that the building will be provided with:

- fire sprinkler system,
- smoke detection system,
- building occupants warning system (BOWS),
- a fire hydrant system,
- a fire hose reel system,
- fire extinguishers.

Refer to the proposed Fire Engineering Outcomes in Section 4 for detailed fire safety measures which form part of the proposed Performance Solution.

3.2 Distance to Allotment Boundary

As part of the preliminary building NCC compliance review, the Certifier identified that the proposed Library building will be in close proximity of adjacent allotment boundaries, as shown in Figure 3.1 below. Parts of the proposed building will overlap the allotment boundary.

Figure 3.1 – Distance to Allotment Boundaries

It is assumed that the proposed building elements and associated openings located in proximity to fire-source feature will require additional fire protection measures as per NCC Clause C3.4 and Specification C1.1.

The detailed scope of the required protection measures will be defined at the detailed building design stage. As a proposed Performance Solution, the required DTS protection measures will be reviewed and rationalised where it is not expected to unduly impact the fire spread between buildings located on adjacent allotments.

3.3 Extended Travel Distances

As part of the preliminary BCA assessment of the proposed building design documentation, the Certifier identified the following extended travel distances non-compliant to the DTS NCC D1.4 limitations:

- Up to 30m to a point of choice in class 9b building;
- Up to 50m to the nearest exit in class 9b building;
- Up to 30m to a single exit in class 9b building.

The travel distances between alternative exits are considered as compliant to DTS NCC requirements.

The intent of NCC DTS Clause D1.4, as stipulated by the Guide to the NCC, is to maximise the safety of occupants by enabling them to be close enough to an exit to safely evacuate.

By achieving the proximity to the exits as stipulated in Clause D1.4, it is considered that occupants will be able to reach an exit within a sufficient timeframe and before untenable conditions are reached within the egress path.

By achieving the minimum and maximum distances between alternative exits, it is considered that exits required for alternative means of egress will not be blocked by the same obstacle and will be available to occupants within a 'reasonable' distance.

Relevant Performance Requirements DP4 and EP2.2, as stipulated by the Guide to the NCC and in context to the Performance Solution, deal with the time required for occupants to reach an exit and the conditions within this evacuation route(s) during the evacuation period.

To safeguard occupants from illness or injury while evacuating in an emergency, tenable conditions within these evacuation routes must be maintained for the duration required for occupant evacuation (i.e. time to reach an exit).

As a Performance Solution, it is proposed to permit the abovementioned extended travel distances considering fire safety provisions to be provided within a building.

Among other safety features within a building, all subject areas are provided with an automatic smoke detection system which is expected to identify fire and activate BOWS system during the early fire development stage. This is expected to allow staff and visitors to evacuate the building and notify a fire brigade at the early stage of the fire growth.

Also, all subject building areas will be provided with an automatic fire sprinkler system throughout. It is expected that the installed fire sprinkler system would activate while the fire is in the growth stage and not yet fully developed.

Therefore, it is expected that the available safe egress time (ASET) for building occupants will exceed the required safe egress time (RSET) with a considerable safety factor.

An assessment will be developed at the FEB/FER stage to confirm that the proposed Performance Solution does not unduly impact on the safety of the occupants' evacuation from the building.

Acceptance will be demonstrated if proposed extended travel distances to exit do not unduly impact on the safety of the occupants' evacuation from the building.

As part of the Performance Solution, it is recognised that the building will be provided with:

- fire sprinkler system,
- smoke detection system,
- building occupants warning system (BOWS),
- a fire hydrant system,
- a fire hose reel system,
- fire extinguishers.

Refer to the proposed Fire Engineering Outcomes in Section 4 for detailed fire safety measures which form part of the proposed Performance Solution.

4. Proposed Fire Engineering Outcomes

Fire and Smoke Resistance

a. The building must be constructed in accordance with DTS NCC requirements for Type A construction, except:
   i. Steel beams and columns used for the stiffening of the existing floor slabs are permitted to not protected in lieu of having 120/-/- FRL as per DTS NCC requirements.

Provisions for Escape

b. The exit provisions from the building must be provided in accordance with DTS NCC Section D requirements, except
   i. The following increased exit travel distances are permitted:
      – Single exit or POC up to 30m in lieu of DTS 20m
      – Nearest exit up to 50m in lieu of DTS 40m

Fire Hydrants, Hose Reels and Extinguishers

c. The building must be provided with a fire hydrant system in accordance with NCC DTS Provisions and AS2419.1 requirements.

d. The building must be provided with a fire hose reel system in accordance with NCC DTS Provisions and AS2441 requirements.

e. The building must be provided with portable fire extinguishers in accordance with NCC DTS Provisions and AS2444 requirements.

Fire Sprinkler Systems

f. The building must be provided with automatic fire sprinkler protection in accordance with AS2118.1:2017 requirements.

Smoke Detection & Alarm System

g. A smoke detection system must be provided throughout the building in accordance with NCC DTS Specification E2.2a and AS1670.1 requirements.

h. A Building Occupant Warning System (BOWS) must be provided throughout the building in accordance with AS 1670.1.

Emergency Lighting and Exit Signs

i. Emergency lighting and exit signs must be provided in accordance with the NCC DTS requirements.

Commissioning

j. All fire safety equipment or equipment associated with fire safety must be correctly commissioned including integrated testing.

Maintenance

k. Equipment and Safety Installations Special Fire Services and Fire Safety Installations must be maintained in accordance with current and future building maintenance legislation. Failure to do so will render the outcomes of this document invalid, null and void.

l. Evacuation routes must be maintained in an efficient condition and kept readily accessible, functional and clear of obstruction so that egress from the building is maintained as per the requirements of State regulations or any legislation that supersedes it.

m. Up-to-date logbooks must be provided on-site.

Other Provisions

n. A no-smoking policy must be implemented in accordance with State legislation.

o. Fire and evacuation plans must be developed and implemented in accordance with State regulations.

p. All occupants of the building must be given instruction on the fire and evacuation plan in accordance with State regulations.

q. A sign must be provided adjacent to the Fire Detection and Control Indicating Equipment (FDCIE) or in the main entry listing the Performance Solution applicable to the building. The sign must be incised, inlaid or embossed letters on a metal, wood, plastic or similar plate, securely and permanently attached to the wall.

r. A copy of the approved Fire Engineering Report must be provided at building handover and be located at one of the following:
   i. within the FDCIE; or
   ii. in the Essential Safety Measures log book cabinet; or
   iii. Management In Use Plan manual; or
   iv. Maintenance manual for the fire protection systems.

s. No changes to the fire safety strategy without the express written consent of Omnii Pty Ltd.

Sprinkler Design Report

Currently, the basement car park is the only part of the building that is sprinklered. It is proposed to extend sprinkler protection to the entire building.

Attached is a street hydrant Flow and Pressure Test Report by Australian Fire Services Testing dated 15th July 2020.

An assessment was carried out by Omnii Pty Ltd to determine the capacity of the street hydrant system to support a sprinkler protection system throughout the building. Their concluded that there is sufficient pressure to provide a sprinkler system without a sprinkler pump.

Also attached is the Fire Sprinkler Concept Design advice. Refer to the Preliminary Design Report for the Sprinkler drawings.

AFST Australian Fire Services Testing

Fire Hydrant & Booster Testing & Certification

Web: www.firetesting.com.au
Email: admin@firetesting.com.au
PO Box 7244 **Ph** 07 3901 5040
East Brisbane Q 4169

Project No 8910
15 July 2020

Sunshine Coast Council
Locked Bag 72
Sunshine Coast Mail Centre Qld 4560

Attn: Ms Zsuzzie Rossell

STREET HYDRANT FLOW & PRESSURE TEST REPORT

1 General

Location: Caloundra Events Centre - 11 Omrah Avenue - Caloundra

Date & Time of Test: Wednesday, 15 July 2020 @ 9:00am

2 Test Information

HYDRANT FLOW TEST
Tests were undertaken to determine the water flow rate and pressure available from the authority water supply network. The flow rates were measured using spring hydrant standpipe/s fitted with pressure gauges and Omega flow measurement devices.

Fire Hydrant #1 is a Spring Hydrant located at GPS 26°48'10.6"S 153°07'49.2"E.
Fire Hydrant #2 is a Spring Hydrant located adjacent to 35 Minchinton Street on the Eastern footpath.
Fire Hydrant #3 is a Spring Hydrant located five metres East of Otranto Avenue on the Southern footpath of Omrah Avenue.

Test 1: Flowing Fire Hydrants #1 & #2 + Residual Fire Hydrant #3
Test 2: Flowing Fire Hydrants #1, #2 & #3 (Max Flow)
Test 3: Flowing Fire Hydrant #3 + Residual Fire Hydrants #1 & #2

3 Test Results

Test 1: Flowing Fire Hydrants #1 & #2 + Residual Fire Hydrant #3

Flow Rate & Pressure at Fire Hydrant #1		Flow Rate & Pressure at Fire Hydrant #2		Residual Pressure at Fire Hydrant #3	Total Flow
(l/s)	(kPa)	(l/s)	(kPa)	(kPa)	(l/s)
0	430	0	430	430	0
10	390	0	-	425	10
10	360	10	380	420	20
15	320	15	350	415	30
20	260	20	300	405	40
25	170	25	240	390	50
25	170	27	220	385	52

Test 2: Flowing Fire Hydrants #1, #2 & #3 (Max Flow)

Flow Rate & Pressure at Fire Hydrant #1		Flow Rate & Pressure at Fire Hydrant #2		Flow Rate & Pressure at Fire Hydrant #3		Total Max Flow
(l/s)	(kPa)	(l/s)	(kPa)	(l/s)	(kPa)	(l/s)
22	140	26	200	23	170	71

AFST Australian Fire Services Testing

Fire Hydrant & Booster Testing & Certification

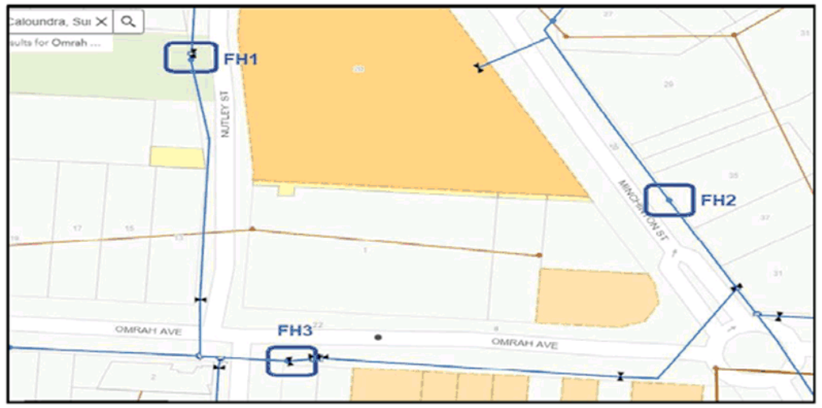
Web: www.firetesting.com.au
Email: admin@firetesting.com.au
PO Box 7244 **Ph** 07 3901 5040
East Brisbane Q 4169

Project No 8910
15 July 2020

Test 3: Flowing Fire Hydrant #3 + Residual Fire Hydrants #1 & #2

Flow Rate & Pressure at Fire Hydrant #3		Residual Pressure at Fire Hydrant #1	Residual Pressure at Fire Hydrant #2
(l/s)	(kPa)	(kPa)	(kPa)
0	430	430	430
5	410	430	430
10	380	425	425
15	340	425	425
20	290	420	420
25	220	415	415
26	210	415	415

4 Hydrant Location Map



5 Important Information

1. *The test results detailed in this report only record the results achieved for the actual tests carried out for this report.*
2. *Persons / entities / authorities using or interpolating this report & results must consider adjustments may be required to allow for seasonal variations and time of demand variations.*
3. *Persons / entities / authorities using or interpolating this report & results must consider the RL [Reduced Levels] at the points of flow & pressure.*
4. *Pressure values detailed in bold font are from a non flowing standpipe or hydrant to indicated pressures in the main or fire service at that point. Pressures at standpipes which are flowing are not shown in bold font and only indicate the pressure directly upstream of the flow meter.*
5. *Flow meters and pressure gauges are checked for accuracy weekly. Calibration certification by a third party accredited agency annually / after servicing of the instruments.*
6. *Flow meters are within ±0.25l/s and pressure gauges are an industrial standard to an accuracy of ±10kPa*
7. *This report does not does not certify materials, workmanship or locations of equipment for the system installed either in construction or design*
8. *The results are recorded from real time testing, not computer based simulated modelling.*

Bruce M Dan

Bruce Dan
M.App.Sc. Fire & Risk Engineering
for and on behalf of Australian Fire Services Testing

*Fire Hydrant Testing *Fire System Design *1 & 5 Year Maintenance Testing *Pressure & Flow Certification
*Block Plans & Pressure Sign *Fire Brigade Booster Testing with Pumper Appliance Fire Hose Reel Testing

Accredited for Flow Testing of Street Hydrants
• Queensland Urban Utilities
• Gold Coast Water
ACN : 134 622 334 ABN : 46 134 622 334

AFFILIATIONS
IFE: 00034671 AHSCA: QF 2061 FPIBQ: 187
QBCC: 1159916 AFST QBCC: 739305 NOMINEE

Consultant's Advice

	Name	Company	Email Address/Fax No.
To	Phillip Lukin	Wilson Architects	phillip@wilsonarchitects.com.au
Cc	Shane Collins	Wilson Architects	shane@wilsonarchitects.com.au
From:	Tom Robson	Date: 1st September 2020	Pages: 4
Project No:	8230101	CA No.: 001	
Project:	Caloundra Library – 1 Omrah Avenue, Caloundra Queensland		
Re:	Fire Sprinkler System Concept Design		

Dear Phillip,

We have prepared the following fire sprinkler system design concept for Caloundra Library based on the architecture drawings prepared by Wilson Architects and dated 5th August 2020.

This proposed concept design should be read in conjunction with the accompanying concept plan drawings:

Table 1 - Drawing Schedule

Drawing Number	Drawing Name
F-0000-001	Cover Sheet, Drawing Schedule, Locality Plan, Legend, Notes and Design Criteria
F-0000-002	Schematics and Details
F-0000-100	Basement Level
F-0000-101	Level 1
F-0000-102	Level 2
F-0000-103	Level 3
F-0000-104	Level 4

1.1 Existing Sprinkler System

An existing fire sprinkler system is installed throughout the Basement carpark level of the existing administration building.

The existing fire sprinkler system is fed by a single ø100 connection to the authority water main in Omrah Avenue, which reticulates from the water supply connection into the Basement carpark, via a dual booster inlet, and into a single ø100 sprinkler control valve assembly which serves the sprinkler network across the Basement level.

As Constructed drawings prepared for FireVac Pty Ltd dated 3/7/1995 indicate the system is connected to the authority main via a single ø100 connection, independent from the sites fire hydrant and domestic water supplies.

Tom Robson (Name) | Signature | 1st September 2020 (Date)

8230101 CA001 A

Brisbane Ground Floor, 159 Coronation Drive, Milton Qld 4064 T +61 7 3223 7370
Melbourne Level 2, 51 Queen Street, Melbourne Vic 3000 T +61 3 9620 4025
Gold Coast 12 West Street, Burleigh Heads Qld 4220 T +61 7 3223 7370
Omnii Pty Ltd | ABN 26 590 358 533 | omnii.com.au

There appears to be some discrepancy with the type of pipework installed as shown on these drawings; the below ground pipework is noted as Class 20 Blue Brute (i.e. PVC) on the site plan and Type B Copper on the Basement level plan. No backflow prevention or water meter is identified on these drawings.

Later drawings prepared for Fire Boar Pty Ltd dated 20/11/2019 indicate the water supply connection has been provided with a single non-testable check valve and a single isolation valve below ground.

We understand the local water authority, UnityWater, require all connections to be provided with a water meter and testable check valve.

As the proposed development consist of a change of use for the building and includes significant alterations to the buildings internal layout we understand UnityWater will likely require the water supply connection comply with their current standards and specifications, therefore necessitating upgrade of the current water supply configuration to meet their requirements.

The existing fire brigade booster consists of a dual booster inlet point, with no feed outlets currently provided.

Current standards require a number of feed outlets corresponding to the number of booster inlets be provided adjacent each set of booster inlets, therefore necessitating upgrade of the booster assembly for compliance.

1.2 Proposed Design Concept

As part of the project fire engineering strategy for the proposed development we understand that a fire sprinkler system complying with AS 2118.1-2017 will be required throughout the entire building, including Basement, Level 1 (Ground), Level and Level 3.

The proposed design incorporates re-use of the existing water supply connection and control valve to service the entire building as summarised below.

Table 2 - Concept Design Summary

Item / Area	Proposed Design
Water Supply Connection	Retain existing ø100 connection. Replace single isolation valve and non-testable check valve with authority approved metering and backflow assembly.
Fire Brigade Booster	Replace existing dual inlets with 'H-pattern' arrangement, consisting of: • Dual Booster inlets. • Dual Feed outlets. • Cross connection with monitored isolation valve and check valve.
Sprinkler Control Valve Assembly	Retain existing ø100 control valve assembly.
Basement Level	The Basement level will be provided with significant new steel structure supporting the levels above, therefore the existing fire sprinkler system on this level is proposed to be decommissioned and removed. Provide a new Ordinary Hazard Group 2 fire sprinkler system complying with AS 2118.1-2017 throughout the Basement level. The new Basement Carpark system shall be provided with a separate monitored isolation valve downstream of the control valve assembly. The Basement Carpark sprinkler system must be able to be isolated separately from the remainder of the building sprinkler systems.
Levels 1, 2 and 3	Provide new Light Hazard fire sprinkler system complying with AS 2118.1-2017 throughout Level 1, Level 2 and Level 3. The feed shall include a monitored isolation valve, separate from that of the Basement level. The feed is proposed to rise from Basement level to each level being sprinkler protected above via a new services riser cupboard.

	Optional Item: Additional monitored isolation valves may be provided within the services riser at each of Level 1, 2 and 3. These additional valves are not a code requirement but will allow for separate isolation of the sprinkler system on each storey, thereby facilitating future fitouts to be undertaken on any given level while maintaining protection through the remainder of the building.

Both the fire sprinkler and fire hydrant system drawing water from the same authority water main and therefore the flow rate demand of the system must be simultaneously available from the water main.

The Estimated performance requirements of the system performance requirements are summarised as follows:

Table 3 - Performance Requirement Summary

System	Performance Requirements
Fire Sprinkler System (AS 2118.1-2017)	Ordinary Hazard Group 2 (Basement Level) – 12 x K_{FM}8.0 sprinklers operating at 60 L/min: - Estimated 850 L/min at 200 kPa Light Hazard (Levels 1, 2 and 3): 6 x K_{FM}8.0 sprinklers operating at 70 kPa: - Estimated 480 L/min at 300 kPa Ordinary Hazard Group 1 (Roof Level) – 6 x K_{FM}8.0 sprinklers operating at 60 L/min: - Estimated 450 L/min at 275 kPa
Fire Hydrant System (Existing AS 2419.1 Pumped system)	2 x 5 L/sec = 10 L/sec (600 L/min) under pumped conditions, and 2 x 10 L/sec = 20 L/sec (1,200 L/min) under boosted conditions
Estimated Simultaneous Minimum Requirements:	34.2 L/sec (2,050 L/min) at 200 kPa, 28 L/sec (1,680 L/min) at 300 kPa, and 27.5 L/sec (1,650 L/min) at 275 kPa
Performance Available from Existing Authority Water Main (based on test report prepared by AFST Pty Ltd dated 15/07/2020)	30 L/sec (1,800 L/min) at 415 kPa, and 40 L/sec (2,400 L/min) at 405 kPa

1.3 Spatial Requirements

The following spatial allowances will be required to cater for the proposal design concept.

Table 4 - Spatial Requirements

Service Item	Spatial Requirements	Comment
Fire Sprinkler System		
Fire Sprinkler Control Valve Assembly	1,000mm wide x 800mm deep x 2,100mm high	A minimum 1m x 1m clearance directly in front of the valve assembly can be provided. Room with direct access from road or open space. No fire separation required between the main building and fire pump room.
Upgraded Water Meter and Backflow Assembly	Approximately 2,500mm long x 1,000mm deep x 1,000mm high	Dimensions noted are indicative only, final size to be confirmed by the water authority and their accredited water supply engineer.
Upgraded Fire Sprinkler Booster	2,000mm wide x 800mm deep x 1,600mm high	Located in place of the existing sprinkler booster. Booster equipment to be housed in metal cabinets supplied by fire contractor.
New Fire Sprinkler Riser	Approximately 250mm wide x 200mm deep	The riser will be required to traverse from the control valve room to all sprinkler protected levels above.
Clearance for range pipework and sprinklers Applicable for Levels 1, 2 and 3	Approximately 200mm deep zone throughout	Clearance zone for sprinklers and pipework will generally be required throughout the levels to be protected. Localised instances of other building services passing through the zone may be permitted, subject to coordination during the Detailed Design phase.

appendix 1 - safety in design and environmental risk register

Safety in Design and Environmental Risk Register
Q1939 - Caloundra Administration Building Repurposing

Wilson Architects Job No. 5619
Revision P1

IDENTIFY HAZARDS A Hazard is a situation or thing with the potential to harm a person.		**ASSESS RISK** A risk is the possibility that harm might occur when exposed to a hazard.	**CONTROL RISK** **Risk Control Measure Hierarchy**		**REVIEW CONTROL MEASURES**	
		HIGH - Potential to kill, disable or cause serious environmental damage MEDIUM - Potential to cause serious injury or illness, to temporarily disable or cause temporary environmental damage	EL - Eliminate Hazard SUB - Substitute the Hazard ISO - Isolate the Hazard ENG - Engineered controls AD - Administrative action		Consider risks types through all stages of the project including design, construction, end user operation and maintenance, demolition	
Ref No.	**List of Hazards - add project specifics as required**	LOW - Potential to cause minor injury or minor environmental damage	PPE - Personal protective equipment	**Action By**	**Action**	**Document / Comment**
1	**PROJECT SITE + LOCATION ISSUES**					
1.01	External demolition	High	AD	Debris during demolition, fence off area to prevent unauthorised access.	Contractor	Open	Site safety plan to be provided
1.02	Noise and vibration impact during demolition and construction on adjacent buildings	Medium	ISO, ENG, AD	Notify occupants of timeframes for high noise and vibration.	Contractor	Open	Review before commencement of construction
1.03	Required egress from existing tenancies that are obstructed or closed off during construction.	High	AD	Temporary hoarding erected around work site is to be such that no impedement to egress from the existing building is created.	Contractor	Open	Review before commencement of construction
1.04	Delivery of materials and equipment	Medium	ENG, AD	Delivery of materials and equipment to be coordinated with SCC.	Contractor	Open	Review before commencement of construction
1.05	Dust creation by construction works	Medium	ISO, ENG, AD	Contain dust within floor enclosure. Protect air intakes with filters. Dust control EPA requirement.	Contractor	Open	Replace filters when required
2	**PEDESTRIAN / PUBLIC INTERFACE**					
2.01	Risk of falls during construction	High	ISO, ENG, AD	Protected by scaffold and screens being installed during construction; signage and/or blockade to prevent walking under gantry whilst lifting.	Contractor	Open	Review before commencement of construction
2.02	Pedestrian protection during construction	High	ISO, ENG, AD	Contractor ground level site enclosures installed prior to demolition. Lifting gantry installed during construction works protected by fencing including overhead delivery zone to protect pedestrians under. Works procedure to be provided.	Contractor	Open	Review before commencement of construction
2.03	Site access + traffic control	High	ISO, ENG, AD	Site Deliveries Management Plan to be submitted to SCC for review prior to commencement.	Contractor	Open	Traffic controller for all deliveries.
2.04	Protection during equipment installation	Medium	ISO, ENG, AD, PPE	Methodologies for equipment installation by trade contractors	Contractor	Open	Ongoing, Trade contractors to ensure safe procedural methodology for safe installation of equipment during the works.
3	**HAZARDOUS MATERIALS**					
3.01	Asbestos containing materials (ACM) and contamination	High	ENG, AD, PPE	Asbestos report to be issued with tender documents, Monitor site for any unforseen hazardous materials	Contractor	Open	- Asbestos monitoring and records - Hazardous procedure for removal
4	**OPERATIONAL PROCEDURES / MAINTENANCE**					
4.01	Waste management	Low	AD, PPE	SCC cleaning procedures in place	SCC	Open	SCC procedures in place
4.02	Maintenance of equipment at ceiling level (eg AV projectors, Light fittings, cameras etc)	Low	AD, PPE	SCC procedures in place	SCC	Open	SCC procedures in place
4.03	Maintenance and access to clean windows	High	ENG, AD, PPE	Façade design to incorporate Fall arrest equipment	Architect	Open	

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		HIGH - Potential to kill, disable or cause serious environmental damage MEDIUM - Potential to cause serious injury or illness, to temporarily disable or cause temporary environmental damage LOW - Potential to cause minor injury or minor environmental damage	EL - Eliminate Hazard SUB - Substitute the Hazard ISO - Isolate the Hazard ENG - Engineered controls AD - Administrative action PPE - Personal protective equipment			Consider risks types through all stages of the project including design, construction, end user operation and maintenance, demolition	
Ref No.	**List of Hazards - add project specifics as required**				**Action By**	**Action**	**Document / Comment**
4.04	Maintenance and access to service VAV's	Medium	AD, PPE	Access panels located to permit service from ladder. SCC precedures in place regarding services access	SCC	Open	
4.05	Noise nuisance to building occupants from mechanical plant and ductwork systems	Medium	ENG, AD	Comply with maximum noise levels as defined by AS 2107	Acoustic Consultant	Open	
5	**AUTHORITIES**						
5.01	BA + QFES Approval	Low	AD	Applications to be lodged	Certifier	Open	
5.02	SCC Plumbing Approvals	Low	AD	Applications to be lodged	Hydraulic Consultant	Open	
6	**BUILDING ENVELOPE**						
6.01	Window cleaning and external maintenance	High	ENG, AD, PPE	Façade design to incorporate Fall arrest equipment.	Architect	Open	
6.02	laminated glass vs heat toughened - glass failure	Low	ENG	Assess nickel sulphide content. Exterior glass to be laminated toughened	Contractor	Open	
7	**STRUCTURE**						
7.01	Existing structure performs poorly and may not be costructed in accordance with drawings	High	ENG	Destructive testing of structure in strategic locations recommended during design phase to assess reinforcing details and slab thicknesses	SCC	Open	
7.02	Existing structure does not support proposed loads	High	ENG	Design by Structural Engineer to incorporate strenthening works to support proposed additional floor loads	Structural Engineer	Open	
7.02	New penetrations through existing slabs	High	ENG, PPE	Penetrations to be checked by Structural Engineer	Structural Engineer	Open	
8	**INTERIOR / FINISHES**						
8.01	Lighting and glare	Low	ENG	Glazing Selection, utilise blinds	Architect	Open	

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		HIGH - Potential to kill, disable or cause serious environmental damage MEDIUM - Potential to cause serious injury or illness, to temporarily disable or cause temporary environmental damage LOW - Potential to cause minor injury or minor environmental damage	EL - Eliminate Hazard SUB - Substitute the Hazard ISO - Isolate the Hazard ENG - Engineered controls AD - Administrative action PPE - Personal protective equipment			Consider risks types through all stages of the project including design, construction, end user operation and maintenance, demolition	
Ref No.	**List of Hazards - add project specifics as required**				**Action By**	**Action**	**Document / Comment**
8.02	Risk of slipping on floor	Medium	ENG	Slip rated finishes compliant with AS to be selected. Test certificates required to be submitted by Contractor	Contractor	Open	
8.03	Fire hazard properties of finishes	Medium	ENG	Fire hazard properties testing compliant with BCA and AS's. Test certificates required to be sent to Certifier prior to installation	Contractor	Open	
9	**GENERAL DESIGN / MISCELLANEOUS**						
9.01	Workplace design for built-in fixtures and joinery.	Medium	ENG	Joinery design to be reviewed for ergonomic work practices	Architect	Open	
9.01	Volatile organic compounds in materials	Medium	ENG, AD, PPE	VOC limits to be placed on materials for construction and on work carried out on site	Contractor	Open	
9.02	Form 16 installation certificates	Medium	AD	All relevant contractors to issue Form 16 certificates, to be submitted to Certifier prior to issue of Certificate of Classification.	Contractor	Open	
10	**CONSTRUCTION**						
10.01	Fire hydrants + FHR's (BCA E1.9 Fire precautions during construction requirements)	High	ENG, AD, PPE	fire hydrants + FHR's to be maintained to floor as building proceeds	Contractor	Open	Ongoing, precaution for fire protection risk during construction
10.02	Window / louvre / film installation - risk of fall	High	ISO, ENG, AD, PPE	Suitable temporary fall protection to be provided.	Contractor	Open	Contractor working methodology working in areas on site where penetrations exist
10.03	Installation of new penetrations in existing structure	High	ISO, ENG, AD, PPE	Suitable temporary protection from fall risk and protection/ risk of structure falling to be provided.	Contractor	Open	Contractor working methodology working in areas on site where penetrations exist
10.04	Lifting gantry - handling of materials	High	ISO, ENG, AD, PPE	Lifting procedures by Contractor .	Contractor	Open	Working at heights, mobile plant - Contained within Contractors WMS
10.05	Cranage of exterior glazing	High	ISO, ENG, AD, PPE	Lifting procedures by Contractor .	Contractor	Open	Contractor working methodology working in areas on site where penetrations and fall risks exist
10.06	Installation of services at high level - risk of fall	High	ISO, ENG, AD, PPE	Access procedures by Contractor to be followed - use of scissor lifts, scaffolds, etc.	Contractor	Open	Working at heights, mobile plant
10.07	On-site welding / oxy	High	EL	Not permitted on site	Contractor	Open	
10.08	Existing services impact on demolition	Medium	EL	Review reticulated services and comment on isolation points. Provide advance notice to SCC of services isolation and shutdown.	Contractor	Open	Ongoing

Safety in Design and Environmental Risk Register
Q1939 - Caloundra Administration Building Repurposing

Wilson Architects Job No. 5619
Revision P1

IDENTIFY HAZARDS A Hazard is a situation or thing with the potential to harm a person.		ASSESS RISK A risk is the possibility that harm might occur when exposed to a hazard.	CONTROL RISK Risk Control Measure Hierarchy			REVIEW CONTROL MEASURES	
		HIGH - Potential to kill, disable or cause serious environmental damage MEDIUM - Potential to cause serious injury or illness, to temporarily disable or cause temporary environmental damage LOW - Potential to cause minor injury or minor environmental damage	EL - Eliminate Hazard SUB - Substitute the Hazard ISO - Isolate the Hazard ENG - Engineered controls AD - Administrative action PPE - Personal protective equipment			Consider risks types through all stages of the project including design, construction, end user operation and maintenance, demolition	
Ref No.	**List of Hazards - add project specifics as required**				**Action By**	**Action**	**Document / Comment**
10.09	Impact of demolition on existing buildings outside air intakes	Low	ENG	review OA locations on adjacent buildings and disuss dust creation ativities with Contractor - see earlier item	Contractor	Open	Ongoing
10.10	Cable tray installation	Medium	AD, PPE	fall protection during installation	Contractor	Open	Access provided when working at heights - WMS inforporated in Safety Plan
10.11	Hazardous materials identified during demolition	High	EL, AD, PPE	Hazardous Substance management plan to be established prior to demolition commencing	Contractor	Open	Contractor to prepare report.
10.12	Removal of demolished material	High	ENG, AD, PPE	Contractor safety processes	Contractor	Open	WMS to be incorporated into safety plan
10.13	Damage to existing building/structure during demolition/new work	Low	AD	Prepare dilapidation record/report	Contractor	Open	Contractor to prepare report.
11	**ELECTRICAL SERVICES**						
11.01	Isolation of services not to impair other floors remaining operational	Low	AD	Coordinate isolation of services with SCC+H85 prior to isolation or shutdown	Contractor	Open	
11.02	Stripping out existing cables - care to be taken to identify and test cables prior to removal	Medium	AD, PPE	Isolate building power before any work is carried out.	Contractor	Open	
12	**MECHANICAL + RETICULATED SERVICES**						
12.01	Existing ductwork removal	Low	ENG, AD, PPE		Mechanical Consultant	Open	
12.02	Chilled water systems - work on live systems	Medium	ENG, AD, PPE		Mechanical Consultant	Open	
13	**HYDRAULIC SERVICES**						
13.01	Existing waste pipework demolition.	High	AD, PPE	Flush pipe first; Ensure appropriate protective clothing during works	Hydraulic Consultant	Open	Consultant to outline procedure
13.02	Removal existing HW units	Medium	AD, PPE	Hydraulic Consultant to confirm	Hydraulic Consultant	Open	
13.03	Work on live Sanitary/Trade waste drainage pipework	High	ENG, AD, PPE		Hydraulic Consultant	Open	Consultant to outline procedure
13.04	Inhalation of sewer/ trade waste gases by end users	High	ENG	Ensure that all vent pipes are terminated 3000mm above pedestrianised areas and all Sanitary drainage traps are charged.	Contractor	Open	
13.05	Falling whilst maintaining or operating control valves at high level in ceiling	Medium	ENG	Reduce number of control valves at high level (if any)	Contractor	Open	
13.06	Burns from hot water supply to fixtures	Medium	ENG	Ensure that all water to ablutions fixtures is tempered to 50 degrees celsius and hot water to disabled fixtures is tempered to 43 degrees celsius.	Contractor	Open	

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13.07	Falling whilst maintaining or operating thermostatic mixing valves at high level in wall	Medium	ENG	Install TMV's in wall at or below 1800mm AFFL where possible	Contractor	Open	
13.08	Insufficent flows and pressures to fire supply water	High	ENG	Ensure council main supply is adequate to get minimum flow and pressure requirements and provide pump assistance to the system if it isn't	Contractor	Open	
13.09	Rupture of pipework/ injury to persons/ service disruption	Medium	ENG	Ensure the water pipework is designed and installed with pipework with an appropriate pressure rating	Contractor	Open	Pressure reduction provided - check location at level 6 to reduce pressure to CBCRC
13.10	Injury to persons trying to maintain or service hydraulics plant, ie hot water units/ pumps.	Low	ENG, AD	Ensure adequate clearances are left to ensure easy access for service, maintenance and possible removal of equipment.	Contractor	Open	
13.11	Injury to un-authorised persons from hydraulics plant	Medium	ENG, AD	Ensure that all hydraulics plant is located in an area only accessed by authorised personnel	Contractor	Open	SCC to maintain
13.12	Injury to persons drinking from non-potable water outlets	Medium	ENG, AD	Ensure all non-potable water outlets are suitably signed	Contractor	Open	
13.13	Hydrant pipework servicing Event Centre is shut off during works to Admin Building	High	ENG, AD	Valves to be installed to allow Admin building to be isolated while work is carried out without affecting Event Centre	SCC	Open	
14	**ENVIRONMENTAL ASPECTS**						
14.1	Sediment runoff from excavation during construction	Medium	ENG, AD	Install environmental barriers around site	Contractor	Open	
14.2	Noise and vibration impact during demolition and construction on adjacent buildings	Low	ENG, AD	Monitor impact of vibration on Event Centre structure through car-park	Contractor	Open	

appendix 2 - list of existing drawings

Appendix 1 - Existing Drawings

Architectural Drawings

WD01 G Site Plan
WD02 D Setout Plan
WD03 K Floor Plan Basement
WD04 D Reflected Ceiling Plan Basement
WD05 Q Floor Plan Level 1
WD06 H Reflected Ceiling Plan Level 1
WD07 L Floor Plan Level 2
WD08 H Reflected Ceiling Plan Level 2
WD09 Q Floor Plan Level 3
WD10 Q Reflected Ceiling Plan Level 3
WD11 F Roof Plan
WD15 F Core Plans Basement - Level 1
WD16 E Core Reflected Ceiling Plans Basement - Level 1
WD17 F Core Plans Level 1, 2 & 3
WD18 E Core Reflected Ceiling Plans Level 1, 2 & 3
WD19 L Amenities Plan
WD25 L Elevations - South and East
WD26 M Elevations - North and West
WD27 J Sections
WD28 F Sections - Facade - Sheet 1
WD29 F Sections - Facade - Sheet 2
WD30 G Sections - Facade - Sheet 3
WD31 C Sections - Facade - Sheet 4
WD35 D Windows Schedule - Sheet 1
WD36 G Windows Schedule - Sheet 2
WD37 E Details - Chamber Glazing
WD38 D Glazing Details
WD40 E Louvre Details
WD41 E Precast Details
WD42 B Details - Main Entry Details
WD43 A Miscellaneous - Window Glazing
WD44 D Metalwork Details - Handrails Type 5 & 6
WD45 D Handrails Details - 1, 2 & 3
WD46 B Handrail Details & Balconies
WD47 A Roof Strut Setout
WD48 G Roof Details
WD49 D Site - Side Entry Canopy
WD51 C Details Foyer - Chamber - Lift Car
WD53 B Details - Water Goods
WD54 D Details - Sunshading 1 & 2
WD55 D Spire - Sunshading 3 & 4
WD56 C Details - Partitions & bulkhead
WD58 C Roof Sump & Spitters
WD59 D Details - Miscellaneous Metalwork
WD60 D Amenities Elevations
WD65 E Sections - Fire Escape Stairs
WD66 B Stain No.1 - Fit Out Details
WD67 F Details - External Works
WD68 A Waterproofing Details
WD69 B Details - Tile, Floor Finishes
WD75 B Kitchen Fit Out- Sheet 1
WD77 B Joinery Level 1 - Entry Foyer
WD78 A Joinery and Layout Setout - Level 1
WD79 B Joinery, Tile Setout - Entry Foyer
WD80 A Level 1 - Detailed Reflected Ceiling Plan
WD81 A Level 1 - Detailed Reflected Ceiling Plan
WD82 A Level 1 - Detailed Reflected Ceiling Plan
WD83 A Entry Foyer Elevations
WD84 A Joinery level 1
WD85 B Joinery Fitout Level 1 - Entry Foyer
WD86 A Joinery level 1
WD90 A Joinery - Typical Details - Main Entry Foyer
WD91 A Joinery - Typical Details - Main Entry
WD92 A Joinery - Typical Details - Main Entry
WD96 B Joinery Level 2 Counters
WD93 A Joinery Reception Desk
WD94 A Joinery Level 1 - Counters
WD95 B Joinery level 2 - Counters
WD96 B Joinery level 2 - Counters
WD97 C Joinery level 3
WD98 A Joinery Level 3
WD99 A Joinery Typical Details
WD100 C Lift Fitout
WD101 B Lift Fitout Details
WD102 A Joinery level 3
WD103 A Joinery Level 1 and 3
WD105 A Miscell Ceiling and Bulkhead Details
WD106 G Level 3 Chamber Layout
WD107 E Level 3 Chamber, Civic Rm RCP
WD108 E Chanber Wall Elevations
WD109 C Chamber Wall Sections
WD110 C Chamber Wall/Floor Details
WD111 A Level 3 Foyer Wall Elevations
WD112 B Level 3 Civic Rm Wall Elevations
WD113 A Level 3 Reception Rm Wall Elevations
WD115 A Joinery Sections and Elevations
WD120 E Chamber Joinery Councillors Table
WD121 C Councillors Table Elev/Sect
WD122 C Councillors Table Details
WD123 A Chamber Joinery Lockers
WD124 A Chamber Joinery Lockers, Details

Window Shop Drawings

3057-01 C Index and Specification
3057-02 B East Elevation L1-L3
3057-03 B West Elevation L1-L3
3057-04 C Part North Elevation L1-L3
3057-05 C Part South Elevation L1-L3
3057-06 B Part Nth & Sth Elevations L1-L3
3057-07 B Main Entry L1
3057-08 B Council Chamber L3
3057-09 B General Glazing Details
3057-10 D High Level Glazing Details
3057-11 E Hinged Door Details
3057-12 B Casement and T.H.I.S Window Details
3057-13 C Miscellaneous Details
3057-14 B West Wall L3 Glazing Details
3057-15 B Window Key Plan L1
3057-16 B Window Key Plan L2
3057-17 B Window Key Plan L3
3057-18 B Main Entry Door Details
3057-19 B Main Entry Portal Cladding
3057-20 A Main Entry Faceted Glazing Details
3057-21 A Main Entry Faceted Glazing Details
3057-22 A Main Entry Faceted Glazing Details
3057-23 A Chamber L3 Faceted Glazing Details
3057-24 A Chamber L3 Faceted Glazing Details

Structural Engineering Drawings

28039 S1 C Bulk Excavation
28039 S2 H Basement Column and Wall Layout
28039 S3 E Foundation Layout
28039 S4 E Level 1 Column and Wall Layout
28039 S5 C Foundation Plan - Level 1
28039 S6 C Foundation and Blockwork Wall Details
28039 S7 A Lift Shaft Base Concrete Outline
28039 S8 C Lift Shaft Over Run Pit Wall Elevations
28039 S9 C Concrete Column Schedule
28039 S10 B Concrete Column Details Sheet 2
28039 S11 E Plan Basement Concrete Outline
28039 S12 G Level 1 Concrete Outline Plan
28039 S13 B Level 1 Concrete Outline Sections
28039 S14 D Level 1 Concrete Outline Sections
28039 S15 C Level 1 Bottom Steel Plan
28039 S16 C Level 1 Top Steel Plan
28039 S17 E Level 2 Concrete Outline Plan
28039 S18 A Concrete Outline Sections
28039 S19 B Level 2 Beams SB1-SB3
28039 S20 B Level 2 Bottom Steel Plan
28039 S21 B Level 2 Top Steel Plan
28039 S22 J Level 3 Concrete Outline Plan
28039 S23 B Level 3 Concrete Outline Details
28039 S24 B Level 3 Bottom Steel Plan
28039 S25 A Level 3 Top Steel Plan
28039 S26 C Core 1 Concrete Outline and Section
28039 S27 D Core 2,3 Concrete Outline and Section
28039 S28 E Plan Courtyard Concrete Outline
28039 S29 C Precast Panel Details and Handrail
28039 S30 C Stair FS1 - Elevations and Details
28039 S31 C Stair FS3 - Elevations and Details
28039 S32 D Stair FS2/FS3 Key Diagrams
28039 S33 D Plan Roof Steel Framing
28039 S34 D Frame Elevations Grids 1-7
28039 S35 D Frame Elevations Grids 8,9,A,F
28039 S36 C Roof Sections Sheet 1
28039 S37 D Roof Sections Sheet 2
28039 S38 B Plan Lower Roof Outline and Fascia

Existing Drawings

Electrical Drawings

4305 E01 H Basement Level Lighting, Power, Security and Fire
4305 E02 G Level 1 Lighting, Security, Fire
4305 E03 G Level 2 Lighting, Security, Fire
4305 E04 H Level 3 Lighting, Security, Fire
4305 E05 H Level 1 Power, Tel, Data
4305 E06 F Level 2 Power, Tel, Data
4305 E07 D Level 3 Power, Tel, Data
4305 E08 D Diagrams, Schedules and Roof Plant room
4305 E09 B Level 3 Chamber Power Layout
4305 E10 B Level 3 Chamber Lighting Layout

Mechanical Drawings

4305 M01 H Basement Ventilation Layout
4305 M02 L Level 1 AC and Ventilation
4305 M03 F Level 2 AC and Ventilation
4305 M04 F Level 3 AC and Ventilation

Mechanical Shop Drawings

150202-01 B Basement Carpark Ventilation
150202-06 A CHW piping Schematic and L3 Duct Sections

Hydraulic Drawings

95161 H1 AC1 Site plan, Notes and Legends
95161 H2 AC1 Hydraulic Services Basement
95161 H3 AC1 Hydraulic Services Level 1
95161 H4 AC1 Hydraulic Services Level 2
95161 H5 AC1 Hydraulic Services Level 3
95161 H6 AC1 Hydraulic Services Roof Plan
95161 H7 AC1 Amenities Details Sheet
95161 H8 AC1 Saintary Plumbing and Fire Services Diagrammatics
95161 H9 AC1 Hot & Cold Water Diagrammatic
95161 H10 AC1 Basement Drainage Detail
95161 F1 AC1 Site plan, Notes and Legends
95161 F2 AC1 Fire Services Basement

Hydrant Upgrade Drawings

19OH275-00-0000 B COVER SHEET
19OH275-00-0001 B OVERALL SITE PLAN
19OH275-00-0100 B ADMINISTRATION BLDG BASEMENT PLAN
19OH275-00-0101 B EVENT CENTRE BASEMENT PLAN
19OH275-00-0102 A FIRE PUMP DETAIL

Phone +61 7 3831 2755
Fax +61 7 3832 1129
Email wa@wilsonarchitects.com.au

564 Boundary Street, Spring Hill
Queensland, Australia 4000
wilsonarchitects.com.au

WilsonArchitects