Fire Safety Engineering Design Review for DA Submission

Sutherland Entertainment Centre

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1. General

Scientific Fire Services has undertaken a preliminary review and assessment of the architectural drawings and design concepts proposed for the alteration, additional and refurbishment works associated with the existing Sutherland Entertainment Centre building located at 30 Eton Street, Sutherland NSW. The following provides a summary of the fire safety risk engineering aspects and 'in-principle' support of the proposed design.

2. The Project

The subject site is located at 30 Eton Street, Sutherland and comprises the existing Council owned Sutherland Entertainment Centre. The subject building was constructed circa 1970's and is a unique multi-purpose venue designed as a civic/concert hall to accommodate large events and is understood to be of state heritage significance. The site is bound by Eton Street along the western elevation which also forms the principal site entrance and Merton Street along the eastern elevation. A satellite image of the site is provided in Figure 2.1.

Figure 2.1: Satellite image of site (courtesy of www.google.com/maps)

The current proposal relates to converting the Sutherland Entertainment Centre from a civic/concert hall into a theatre with associated common areas, backstage facilities, a fly tower etc. Alterations/additional works generally include introduction of the fly tower over the stage area, new glulam column/beam structure over new/refurbished foyer area and expansion of tiered seating arrangements. Figure 2.2 depicts a 3D rendering of the proposed building configuration.

Figure 2.2: Sectional perspective of Sutherland Entertainment Centre

Table 2.1 provides a description of the general building layout and configuration (refer to for Appendix B architectural drawings).

Table 2.1: Building layout

Level	Layout/Configuration
Basement	Ancillary & storage rooms (e.g. switch room, plant, garbage, hydraulic pump room), technical supervisor office, musician warm up room, stage door, reception area. Egress provided directly to Merton Street via stair 06, stair 07 & perimeter exit doors. Single flight rising stairs provide access into the ground level forestage & stage areas.
Ground Level	Entrance & public domain consisting of: • Foyer/meeting room; • Foyer, box office, front-of-house (FOH) office; • Public amenities; Stage & performance sections containing: • Tiered seating consisting of lower portion (279 seats) and upper portion (167 seats); • Forestage & stage areas; • Backstage rooms/enclosures including dress rooms, amenities, manager office, sound lock, kitchen, storage, loading dock & scenery assembly).
Level 1	• Tiered seating consisting of dress circle portion (239 seats); • Control, sound mixing & parents/cry rooms situated behind dress circle seating; • Foyer corridor, external function terrace & associated amenities; • Backstage rooms/enclosures including dress rooms, amenities, ensuite, green room, meeting, office, central store/rack; • Egress from public portions served by stair 01, 02 & 03; • Egress from backstage portions served by stair 06 & 07.
Level 2	• Continued tiered seating (dress circle portion, 239 seats); • Backstage rooms/enclosures including dress rooms, wardrobe & plant; • Foyer corridor & portable bar; • Egress from public portions served by stair 03; • Egress from backstage portions served by stair 06 & 07.
Level 3	• Continued tiered seating (dress circle portion, 239 seats); • Cooling tower, plant rooms, external open plant; • Egress from public portions served by stair 03; • Egress from backstage portions served by stair 06 & 07.
Fly Tower	Void space extending approximately 21.9m above the stage and containing loading gallery, cross walkway, catwalk, grid floor and counterweights. Access/egress shall be provided by steel grate stairway & AS1657 access ladder connecting BOH L3 to the grid floor situated at the top of the fly tower.

The building description based on the BCA classification system is provided in Table 2.2.

Table 2.2: BCA building description

Summary of Building	
Building Classification(s)	Class 9b (Public Assembly)
Number of Storeys Contained	Five (5)
Rise in Storeys	Five (5)
Effective Height	Less than 25m
Type of Construction Required	Type A fire-resisting construction

3. Purpose

The preliminary fire safety engineering review was undertaken to determine 'in-principle' whether the design will achieve compliance with the Performance Requirements of the Building Code of Australia (BCA) (ABCB, 2019). The design review relates to the fire-resisting construction, egress provisions and fire protection services for the proposed alteration/additional and refurbishment works.

The design issues as identified by the BCA consultant (refer to Appendix A) specific to the subject building will be formally assessed through the application of fire safety risk engineering process in accordance with the International Fire Engineering Guidelines (IFEG) (ABCB, 2005). It is the expectation that a suitable Performance Solution will be developed and supported through robust fire engineering methodologies of the current design proposal.

In the context of fire resistance and compartmentation the design is proposed to adopt mass timber elements (glulam) above/around the main entrance foyer which are proposed to achieve an inherent resistance. There are also existing structural columns encased within single skin brickwork which are proposed to achieve a rationalised Fire Resistance Level (FRL) of 60 minutes. Furthermore, mass timber (glulam) with timber lattice infill shall be situated within close proximity to foyer exit locations. Finally, non-protected openings are to be situated with minimum setback (3m) to the adjacent title boundaries at various locations. These items have been further reviewed in Section 3.1.

From an egress perspective, the design is identified to contain increased exit travel distances (to an exit and between alternative exits). In addition, the egress configuration (in-part) requires occupants to discharge into a covered area prior to reaching road/open space and within 6m of an opening(s). Furthermore, egress from the top of the fly tower is provided by AS1657 access ladder & steel grate stairway and technically only provided with a single exit. Finally, selected egress doors are proposed to be sliding without the provision of single device operating a latch/bolt from a panic bar. These items have been further reviewed in Section 3.2.

With respect to fire services & equipment, the building shall be provided with a suite of standard fire safety measures which are appropriate to the size and nature of the building (e.g. fire detection, sprinkler protection, occupant warning, fire hydrant system, portable fire extinguishers, exit signage & fire indicator panel etc). The existing AS2419.1:2005 fire hydrant system is proposed to be maintained whereby the hydrant booster assembly is situated along Merton Street and not within sight of the principal entrance along Eton Street. In addition, smoke extraction capacities are proposed to be reviewed with a view to rationalise the requirement for excessive extraction rates to the auditorium/stage portions. These items have been further reviewed in Section 3.3.

The abovementioned design issues shall be addressed through a combination of qualitative & quantitative assessment methodologies. The methodologies will rely upon a combination of enhanced passive and active fire safety measures specific to each design issue which is to be rationalised or through a holistic approach.

3.1 Fire Resistance

3.1.1 Inherent Resistance of Mass Timber (Glulam)

A new mass timber structure comprised of glued laminated timber (glulam) columns & beams shall be constructed above the refurbished entrance foyer. The design proposal is to permit the mass timber structure to achieve an inherent Fire Resistance Level (FRL) in lieu the required FRL of 120 minutes. The inherent fire resistance shall be assessed using a quantitative 'deterministic' assessment. AS1720.4:2006 timber charring calculations along with direct input from the Structural Engineer shall be utilised to determine the time at which the residual glulam cross sections become compromised. The overall analysis shall be to demonstrate that the inherent resistance of the mass timber glulam

structure in combination with automatic fire detection and sprinkler protection facilitates safe evacuation and fire-fighter intervention with appropriate safety factors.

The preliminary assessment conducted by Scientific Fire Services suggests that the identified design issue relating to the inherent Fire Resistance Level's (FRL's) of mass timber (glulam) structure can satisfy the relevant BCA Performance Requirements, namely CP1 & CP2.

3.1.2 Rationalisation of FRL's to Structural Steel Columns

At the entrance foyer, the existing base building design incorporates structural steel columns which are encased in single skin brickwork providing a Fire Resistance Level (FRL) of 60 minutes. The design proposal is to permit the protective brickwork to be maintained to achieve an FRL of 60 minutes in lieu of the required FRL of 120 minutes. Protection to the steel columns shall be assessed by means of a qualitative 'risk' assessment with consideration of the enclosure environment (i.e. foyer entrance) containing the columns, potential for fire ignition, fuel loads and benefit of sprinkler protection. The assessment shall also rely on direct input form the Structural Engineer to determine the structural consequence should a column become compromised under fire conditions. The overall analysis shall be to demonstrate that the steel column protection strategy facilitates safe evacuation and fire-fighter intervention with appropriate safety factors.

The preliminary assessment conducted by Scientific Fire Services suggests that the identified design issue relating to the rationalisation of Fire Resistance Level's (FRL's) can satisfy the relevant BCA Performance Requirements, namely CP1 & CP2.

3.1.3 Timber Elements Adjacent Exit Locations

As part of the architectural design exposed timber elements consisting of glulam columns with lattice infill/attachment shall be situated within/around the entrance foyer. The design proposal is to permit the combustible timber elements to be located near and/or above exit locations. The combustible timber elements shall be assessed using qualitative 'risk' assessment based on the foyer function/use, occupant characteristics and fire hazard. The design shall rely on the availability of multiple exits/egress paths, automatic fire detection & sprinkler protection.

The preliminary assessment conducted by Scientific Fire Services suggests that the identified design issue relating to the combustible timber elements located near/above exits can satisfy the relevant BCA Performance Requirements, namely CP1 & CP2.

3.1.4 Protection of External Openings

Due to the building configuration and footprint there are instances where external openings are located within minimum setback distances to adjacent title boundaries without the required protective measures. The design proposal is to review the non-protected openings to determine if a level of protection is required to mitigate fire spread to/from adjacent building allotments. The openings shall be assessed using a quantitative 'deterministic' assessment. The assessment shall adopt the BCA CV1(a) and CV1(b) verification method to determine the level of radiant heat flux emitted to and received from the adjacent title boundaries. Should excessive radiant heat flux levels be calculated, a protective strategy shall be incorporated into the design (e.g. external wall-wetting sprinkler protection, radiant heat attenuation screen) to mitigate the overall potential for fire spread to occur.

The preliminary assessment conducted by Scientific Fire Services suggests that the identified design issue relating to protection of external openings can satisfy the relevant BCA Performance Requirements, namely CP2.

3.2 Occupant Egress Provisions

3.2.1 Travel Distance between Alternative Exits

Occupant egress from the main theatre/auditorium shall involve an additional distance of up to 73m in lieu of 60m between alternative exits. Egress performance shall be assessed using a quantitative 'deterministic' & 'absolute' assessment based on an ASET/RSET timeline analysis. 3D fire/smoke movement utilising Computational Fluid Dynamics (CFD) and human movement software shall be adopted as modelling tools in the analysis. The design shall rely on a combination of automatic fire detection, sprinkler protection, rationalised smoke extraction system and smoke reservoir volume to provide occupants with early warning, limit/restrict fire growth and facilitate safe evacuation & fire-fighter intervention prior to the onset of untenable conditions.

The preliminary assessment conducted by Scientific Fire Services suggests that the identified design issue relating to exit distance between alternative exits can satisfy the relevant BCA Performance Requirements, namely DP4 & EP2.2.

3.2.2 Discharge of into Covered Area and Path of Travel within 6m of Openings

As part of the egress design the Sutherland Entertainment Centre shall be served by a number of fire stairs which provide egress directly to road/open space. Stair 06 is identified to discharge into an alcove area which is not strictly open for at least 1/3 of its perimeter and furthermore requires occupants to pass within 6m of unprotected openings. The discharge of stair 06 shall be assessed using a qualitative 'risk' assessment with consideration of the discharge environment and its overall potential to become compromised by smoke/heat. The design shall rely on the natural ventilation provided to the discharge location and of alternative egress paths available to occupants upon discharging.

The preliminary assessment conducted by Scientific Fire Services suggests that the identified design issue relating to discharge into covered area can satisfy the relevant Performance Requirement, namely CP2, DP5 & EP2.2.

3.2.3 Single Exit & Travel Distance from Fly Tower

A new fly tower is proposed to be introduced above the stage area and shall contain a loading gallery, cross walk, catwalk and grid floor. The grid floor/catwalk etc. at the top of the fly tower shall be accessed from L3 by way of new steel grate stair & AS1657 access ladder. As the AS1657 access ladder does not strictly constitute an exit, the fly tower portions are noted to be served by a single exit whereby exit travel distance to the single exit is up to 21m in lieu of 20m. The egress provisions from the fly tower shall be assessed using a qualitative 'risk' assessment based on the fly tower function/use, occupant characteristics and potential fire hazard. The design shall rely on the presence of trained staff/personnel, automatic detection system & enhanced audible & visual cues provided by sounder/strobes at strategic locations.

The preliminary assessment conducted by Scientific Fire Services suggests that the identified design issue relating to single exit & travel distance from the fly tower can satisfy the relevant BCA Performance Requirements, namely DP4 & EP2.2.

3.2.4 Sliding Exit Doors

The new/refurbished entrance foyer shall incorporate glazed bounding construction with a number of automatic sliding glazed door assemblies. The automatic sliding doors provide access/egress to/from the entrance foyer. The design proposal is to allow the automatic sliding doors to provide egress whilst not strictly incorporating a single device operating a latch/bolt from a panic bar. The sliding doors shall be assessed using a qualitative 'comparative' assessment. The design shall rely on the auto-open function of the sliding doors upon General Fire Alarm (GFA) and provision of manual push button device with battery back-up which shall allow occupants to operate the sliding doors with single hand motion and provide the design with a level of redundancy.

The preliminary assessment conducted by Scientific Fire Services suggests that the identified design issue relating to the sliding exit doors can satisfy the relevant BCA Performance Requirements, namely DP2.

3.3 Fire Services & Equipment

3.3.1 Fire Hydrant Booster Location

As part of the fire services design, the existing fire hydrant system is proposed to be upgraded in accordance with AS2419.1:2005 with the current hydrant booster assembly location being maintained. In this regard, the hydrant booster shall be situated along Merton Street and not within sight of the principal building entrance along Eton Street. The hydrant booster location shall be assessed using qualitative assessment. The design shall rely on the provision of additional block plans denoting the key building features (e.g. entrances, fire-fighting equipment & paths of travel) and the introduction of a red strobe lights at the booster and entry locations to assist fire crews in identifying both locations.

The preliminary assessment conducted by Scientific Fire Services suggests that the identifies design issue relating to the location of the fire hydrant booster assembly can satisfy the relevant BCA Performance Requirements, namely EP1.3.

3.3.2 Smoke Hazard Management Performance

A smoke hazard management system is to serve the stage and theatre/auditorium areas within the Sutherland Entertainment Centre. The design proposal is to determine the optimum smoke extraction capacities whilst maintaining an appropriate level of occupant life safety. Smoke extraction capacities shall be assessed using a quantitative 'deterministic' & 'absolute' assessment based on an ASET/RSET timeline analysis. 3D fire/smoke movement utilising Computational Fluid Dynamics (CFD) and human movement software shall be adopted as modelling tools in the analysis. The design shall rely on a combination of automatic fire detection, sprinkler protection, rationalised smoke extraction system and smoke reservoir volume to provide occupants with early warning, limit/restrict fire growth and facilitate safe evacuation & fire-fighter intervention prior to the onset of untenable conditions.

The preliminary assessment conducted by Scientific Fire Services suggests that the identifies design issue relating to the rationalisation of smoke extraction capacities can satisfy the relevant BCA Performance Requirements, namely EP2.2.

4. Statement of Endorsement

The fire and life safety related design issue(s) will be addressed through the performance-based path of compliance. Scientific Fire Services (SFS) can confirm that the proposed design will achieve fire safety design compliance to the relevant Performance Requirements of the Building Code of Australia (BCA) (ABCB, 2019).

The formulation of the Fire Engineering Brief (FEB), Fire Engineering Brief Questionnaire (FEBQ) and Fire Safety Engineering Report (FSER) represent the next stages in the approvals process. The FEB/FEBQ shall detail the proposed methodologies, approaches and fire safety requirements which shall also be presented to the relevant Fire Authority for their review and comment. Subsequent to this, the FSER shall detail the quantitative & qualitative analysis required to substantiate the design. Finally, in order to ensure the client can obtain a Construction Certificate for the proposed works, the FSER shall incorporate stakeholder conditions, comments and advice to the satisfaction of the Principal Certifying Authority (PCA).

On the basis of the review of the proposed design issues identified herein, Scientific Fire Services can confirm that the documentation in relation to the subject works will achieve fire safety design compliance with the relevant Performance Requirements of the National Construction Code Series – Volume 1, Building Code of Australia (BCA, 2019).

I trust the above is satisfactory for your current purposes. Should you have any queries, please do not hesitate to contact me on (03) 9686 4730 or email to russell.kilmartin@scifire.com.au

Russell Kilmartin
Director, Principal

Scientific Fire Services

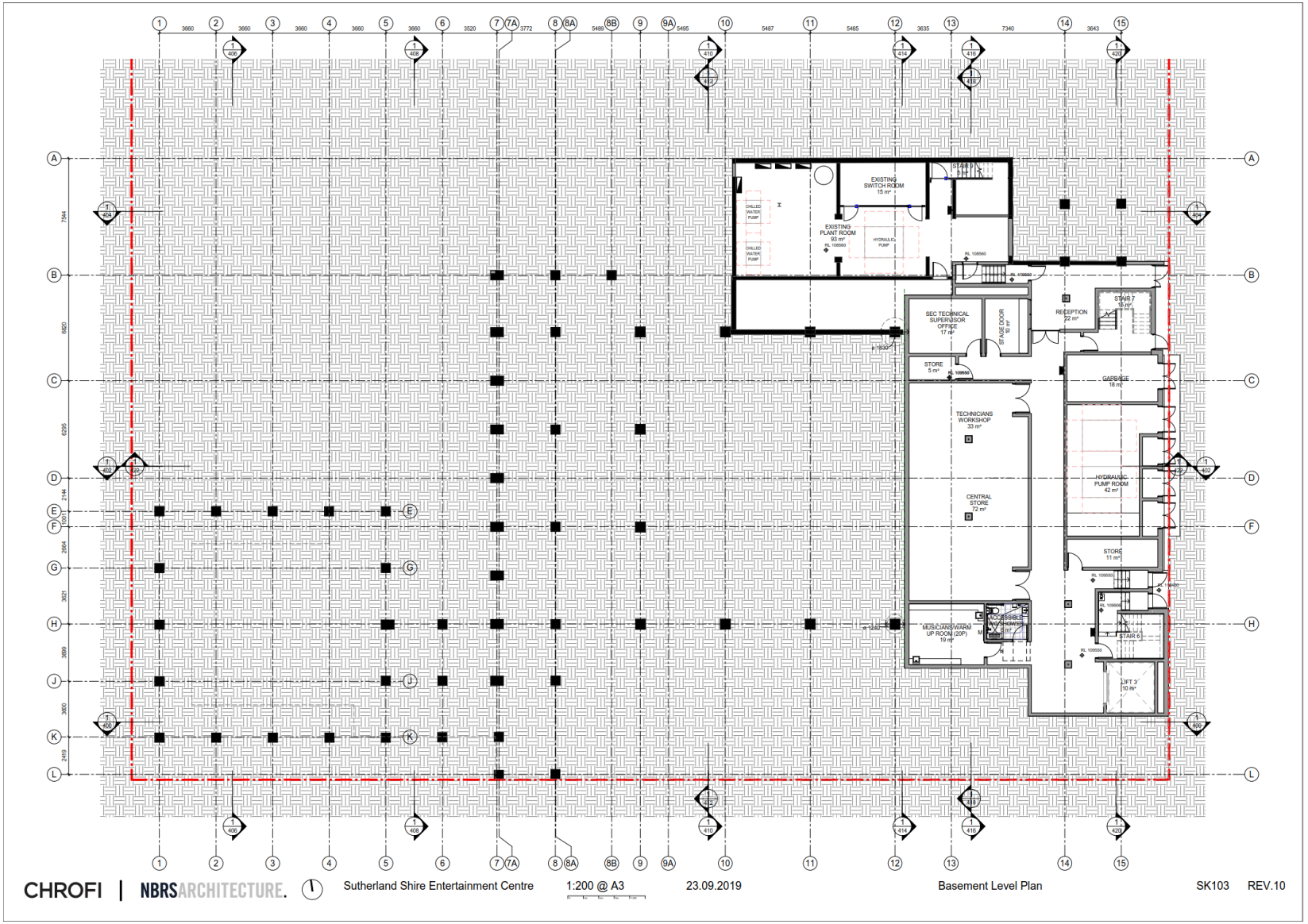
BPB 0210 – C10 – Accredited Certifier – Fire Safety Engineering Compliance

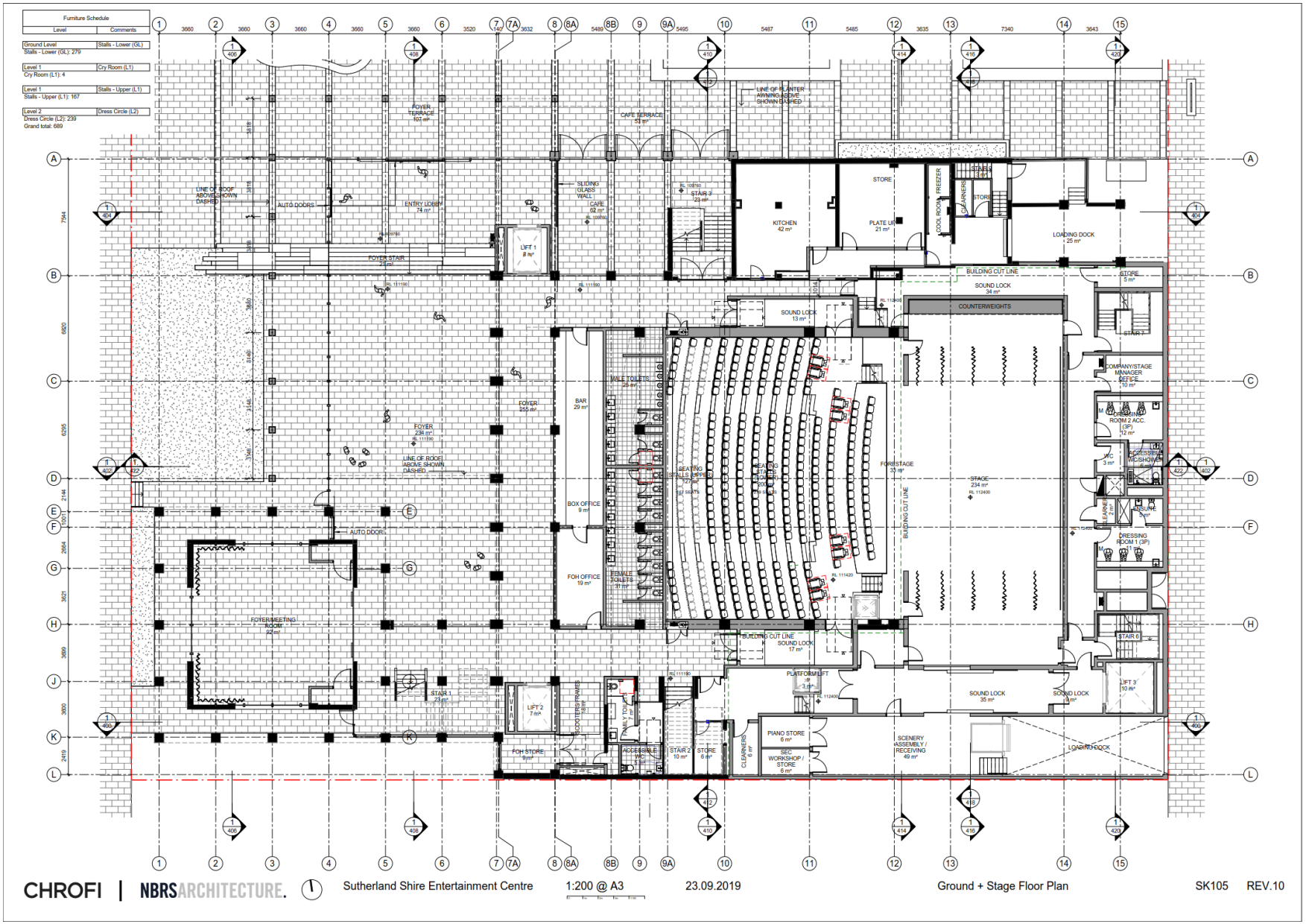
Appendix A. Preliminary BCA/Regulatory Information

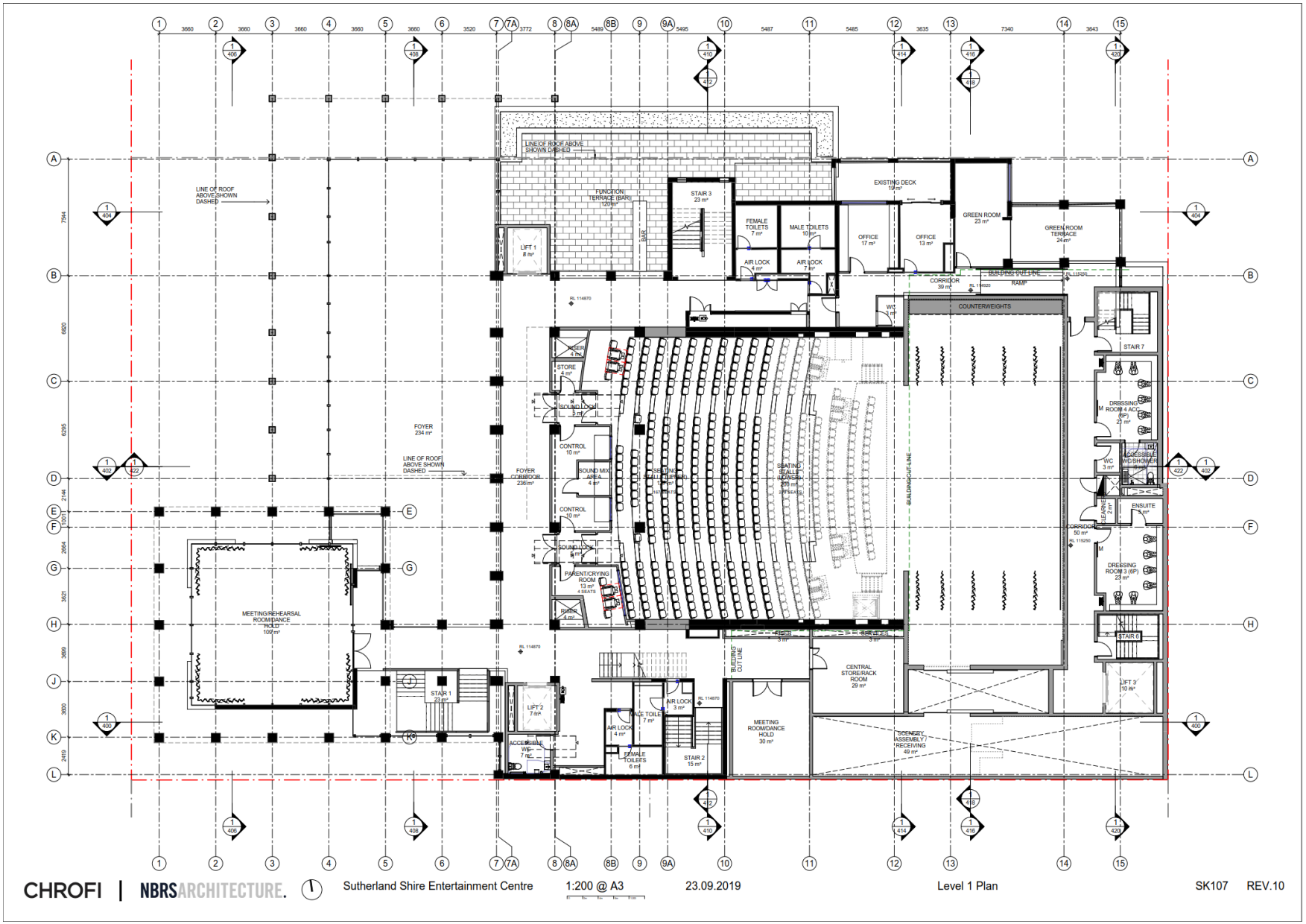
Table A.1: Preliminary list of identified BCA-DtS departures & project design issues

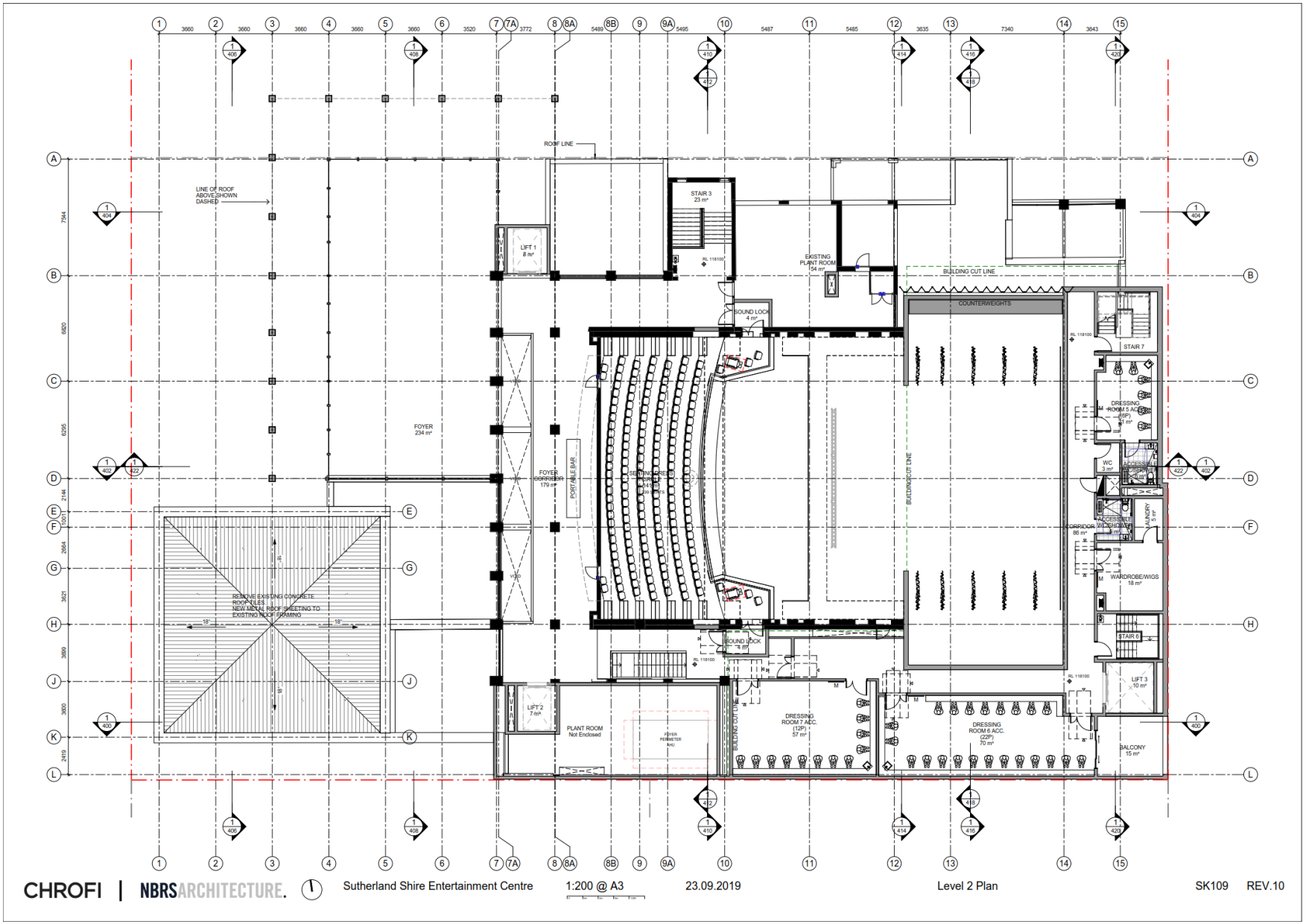
No.	Design Issue	BCA-DtS Departure	Performance Requirement
1.	It is proposed to review the use of mass timber (glulam) structural elements (beams/columns) supporting the foyer structure which are proposed to achieve an inherent fire resistance level in lieu of the required minimum FRL of 120 minutes.	Clause C1.1 & Specification C1.1	CP1 & CP2
2.	It is proposed to permit the existing structural steel columns which are encased in single skin masonry to achieve a rationalised FRL of no less than 60 minutes in lieu of the required minimum FRL of 120 minutes.	Clause C1.1 & Specification C1.1	CP1 & CP2
3.	It is proposed to review the presence of mass timber (glulam) structural elements (columns beams) with timber lattice infill between beams which are proposed to be situated along the path of travel to an exit.	Clause C1.1, Clause 2.4 of Specification C1.1	CP1 & CP2
4.	It has been identified that there are a number of openings that are situated within 3.0m of the adjacent title boundary and are not protected in accordance with Clause C3.4 of the BCA.	Clause C3.2 inter alia Clause C3.4	CP2
5.	It is proposed to review exit travel distances to exceed the maximum distances prescribed by the prescriptive provisions of the BCA as per the following: • Distance between alternative exits of up to 73m in lieu of 60m.	Clause D1.5	DP4 & EP2.2
6.	It has been identified that occupants discharge into a covered area that is not open for at least 1/3 of its perimeter and requires occupants to travel in excess of 6m prior to reaching road or open space.	Clause D1.7	CP2, DP5 & EP2.2
7.	It has been identified that the grid loading floor within the fly tower is technically served by a single exit in lieu of the required two (2). More specifically, the loading floor shall be served by an open stairway and AS1657 access ladder. In addition, the exit travel distance to the single exit serving the fly tower is identified to be up to 21m in lieu of 20m.	Clause D1.4 & Clause D1.16	DP4 & EP2.2
8.	It is proposed to provide exit doors with sliding doors in lieu of single device operating the latch/bolts from a panic bar.	Clause D2.19 & D2.20	DP2
9.	It has been identified that the fire hydrant booster assembly is situated along Merton Street and is not within sight of the main/principle building entrance along Eton Street.	Clause E1.3 & AS2419.1:2005	EP1.3
10.	It is proposed to rationalise the smoke extraction capacities required within the auditorium and stage areas.	Clause E2.2, Table E2.2b, Specification E2.2b & AS1668.1	EP2.2

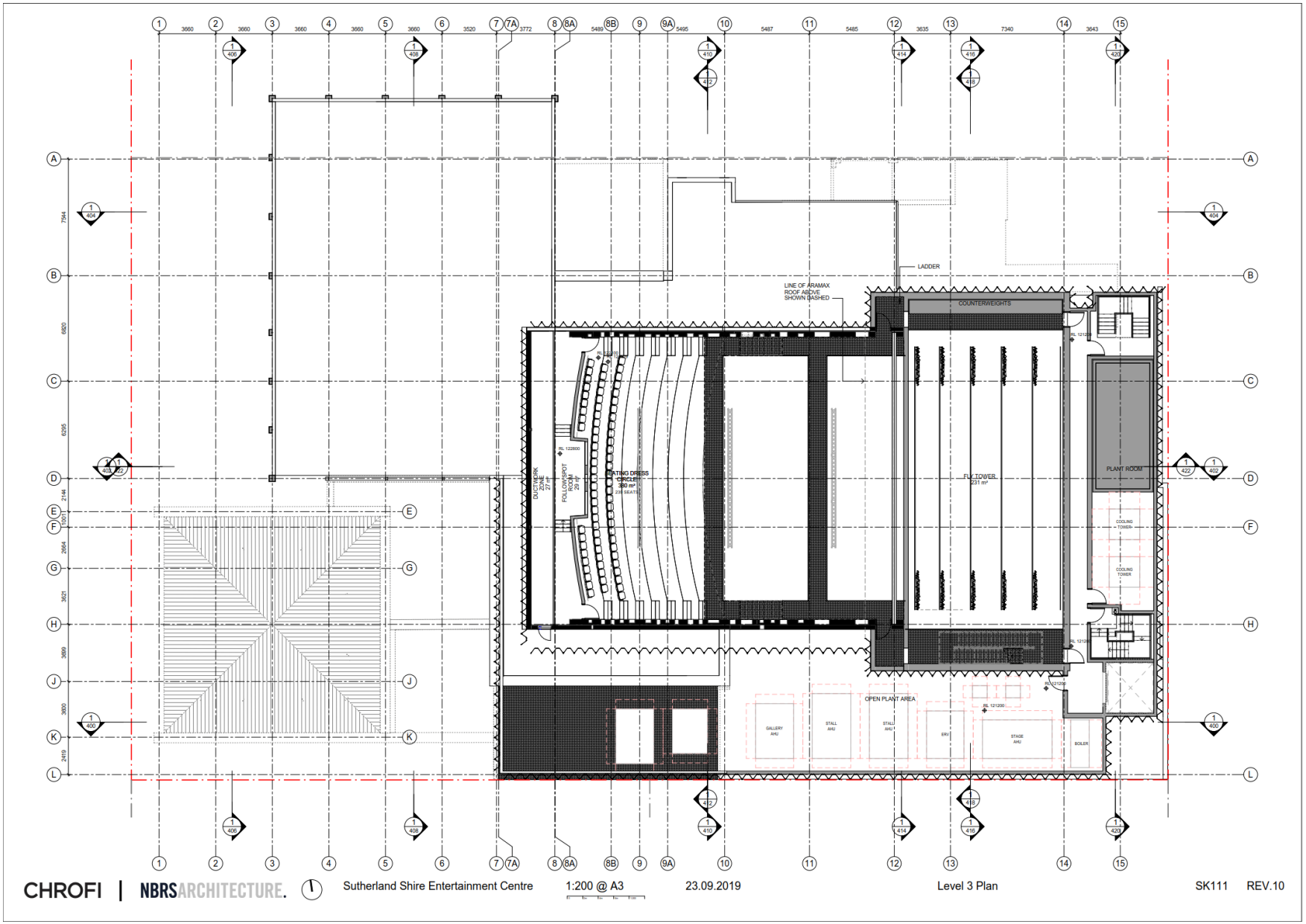
Appendix B. Architectural Drawings

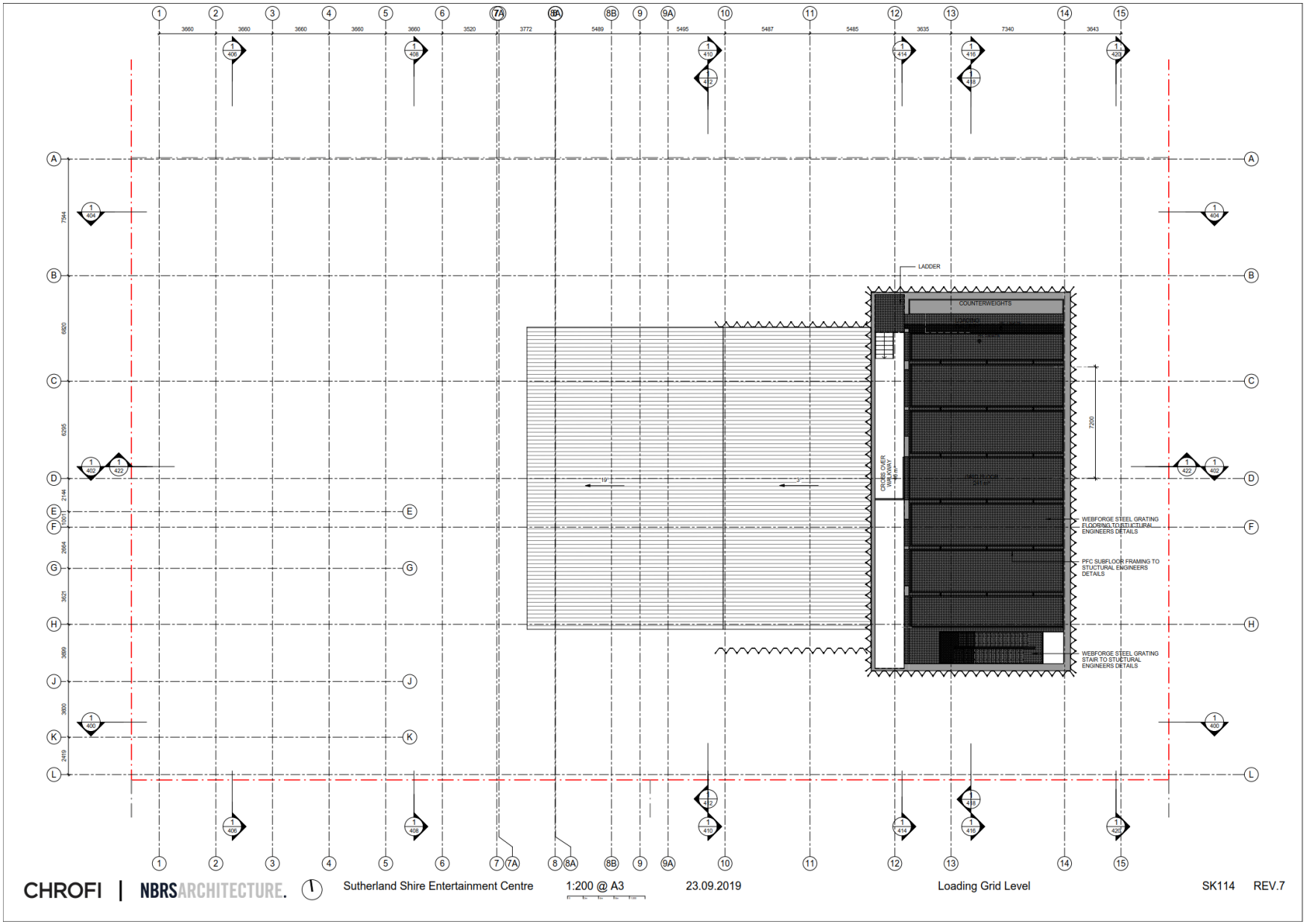


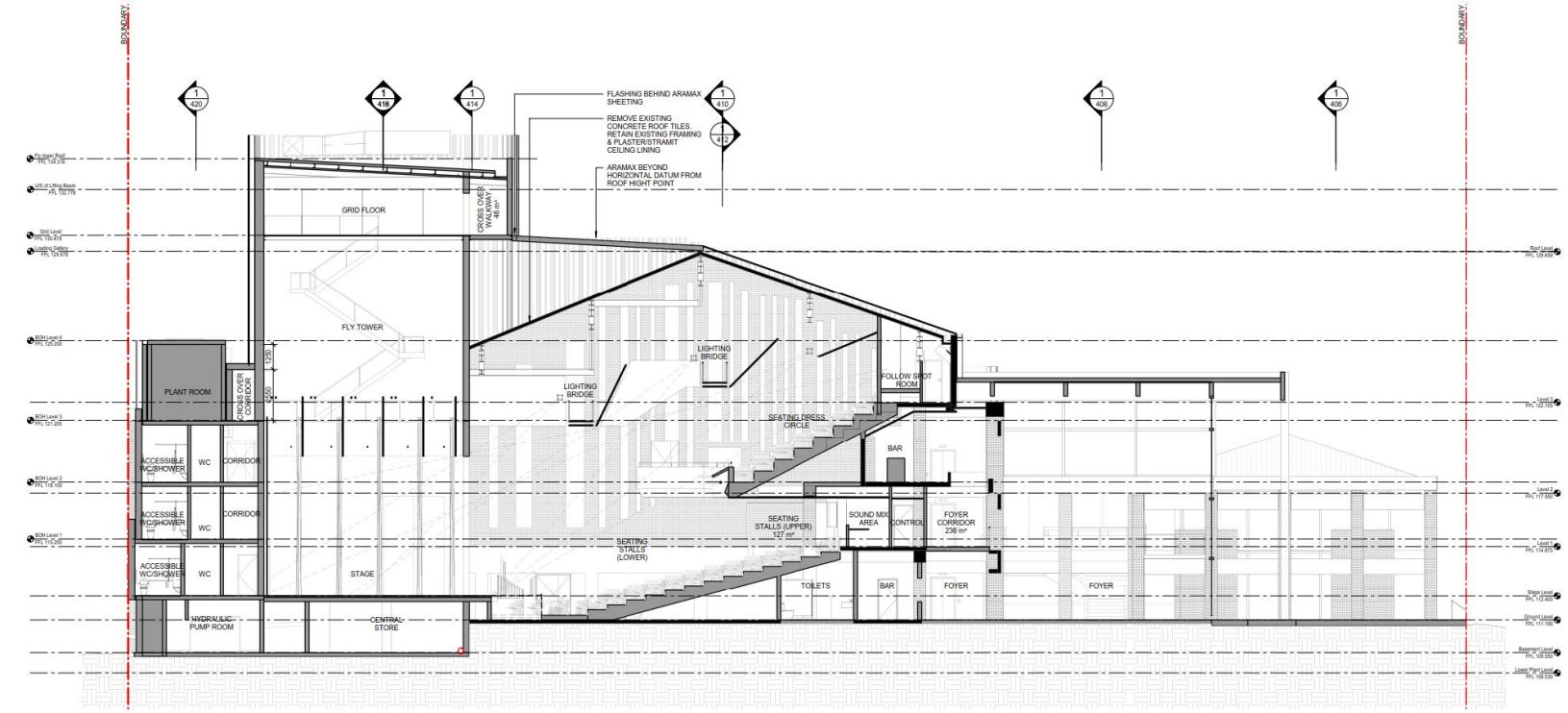

Furniture Schedule
Level
Comments
Ground Level
Stalls - Lower (GL)
Stalls - Lower (GL): 279
Level 1
Cry Room (L1)
Cry Room (L1): 4
Level 1
Stalls - Upper (L1)
Stalls - Upper (L1): 167
Level 2
Dress Circle (L2)
Dress Circle (L2): 239
Grand total: 689
FOYER TERRACE 162 m²
CAFE TERRACE 53 m²
LINE OF PLANTER AWNING ABOVE SHOWN DASHED
LINE OF ROOF ABOVE SHOWN DASHED
AUTO DOORS
ENTRY LOBBY 74 m²
FOYER STAIR 31 m²
LIFT 1 8 m²
SLIDING GLASS WALL
CAFE 62 m²
STAIR 3 23 m²
KITCHEN 42 m²
PLATE UP 21 m²
STORE
COOL ROOM
FREEZER
CLEANERS
STAIRS
LOADING DOCK 25 m²
BUILDING CUT LINE
SOUND LOCK 34 m²
SOUND LOCK 13 m²
COUNTERWEIGHTS
STORE 5 m²
STAIR 7
COMPANY/STAGE MANAGER OFFICE 10 m²
DRESSING ROOM 2 ACC. (3P) 12 m²
WC 3 m²
ACCESSIBLE WC/SHOWER
SUSUNG
DRESSING ROOM 1 (3P)
STAIR 6
LIFT 3 10 m²
FOYER 235 m²
FOYER 235 m²
MALE TOILETS 26 m²
BAR 29 m²
BOX OFFICE 9 m²
FOH OFFICE 19 m²
FEMALE TOILETS 31 m²
SEATING STALLS UPPER 177 m² 167 SEATS
SEATING STALLS LOWER 279 SEATS
FORESTAGE 33 m²
STAGE 234 m²
FOYER/MEETING ROOM 62 m²
STAIR 1 23 m²
LIFT 2 7 m²
FOH STORE 9 m²
ACCESSIBLE WC 5 m²
STAIR 2 10 m²
STORE 6 m²
PIANO STORE 6 m²
SEC WORKSHOP / STORE 6 m²
SCENERY ASSEMBLY / RECEIVING 49 m²
PLATFORM LIFT 3 m²
SOUND LOCK 17 m²
SOUND LOCK 35 m²
SOUND LOCK 19 m²
LOADING DOCK
CHROFI | NBRSARCHITECTURE.
Sutherland Shire Entertainment Centre
1:200 @ A3
23.09.2019
Ground + Stage Floor Plan
SK105
REV.10


CHROFI | NBRSARCHITECTURE.
Sutherland Shire Entertainment Centre
1:200 @ A3
23.09.2019
Level 1 Plan
SK107 REV.10
LINE OF ROOF ABOVE SHOWN DASHED
FUNCTION/ TERRACE (BAR) 120 m²
STAIR 3 23 m²
FEMALE TOILETS 7 m²
MALE TOILETS 10 m²
OFFICE 17 m²
OFFICE 13 m²
EXISTING DECK 19 m²
GREEN ROOM 23 m²
GREEN ROOM TERRACE 24m²
LIFT 1 8 m²
BAR
AIR LOCK 4 m²
AIR LOCK 7 m²
CORRIDOR 39 m²
BUILDING OUT LINE
RAMP
COUNTERWEIGHTS
STAIR 7
STORE 4 m²
SOUND LOCK 5 m²
CONTROL 10 m²
SOUND MIX AREA 4 m²
FOYER 234 m²
FOYER CORRIDOR 236m²
SEATING STALLS (LOWER) 220 m² 275 SEATS
SEATING STALLS (UPPER) 187 m² 234 SEATS
BUILDING OUT LINE
DRESSING ROOM 4 ACC. (6P) 27 m²
ACCESSIBLE WC/SHOWER
WC 3 m²
ENSUITE 5 m²
CORRIDOR 50 m²
CLEARANCE
DRESSING ROOM 3 (6P) 23 m²
PARENT/CRYING ROOM 13 m² 4 SEATS
RISER 4 m²
RISER 4 m²
SERVICES 9 m²
STAIR 6
LIFT 3 10 m²
MEETING/REHEARSAL ROOM/DANCE HOLD 109 m²
STAIR 1 23 m²
LIFT 2 7 m²
AIR LOCK 3 m²
MALE TOILETS 7 m²
AIR LOCK 4 m²
FEMALE TOILETS 6 m²
ACCESSIBLE WC 7 m²
STAIR 2 15 m²
MEETING ROOM/DANCE HOLD 30 m²
CENTRAL STORE/RACK ROOM 29 m²
SCENERY (ASSEMBLY) RECEIVING 49 m²


ROOF LINE
LINE OF ROOF ABOVE SHOWN DASHED
STAIR 3 23 m²
LIFT 1 8 m²
EXISTING PLANT ROOM 54 m²
BUILDING CUT LINE
COUNTERWEIGHTS
SOUND LOCK 4 m²
STAIR 7
FOYER 234 m²
FOYER CORRIDOR 179 m²
PORTABLE BAR
SEATING AREA
DRESSING ROOM 5 ACC. (6P) 41 m²
WC 3 m²
ACCESSIBLE WC
LAUNDRY 5 m²
CORRIDOR 86 m²
WARDROBE/WIGS 18 m²
STAIR 6
LIFT 3 10 m²
REMOVE EXISTING CONCRETE ROOF TILES
NEW METAL ROOF SHEETING TO EXISTING ROOF FRAMING
18°
LIFT 2 7 m²
PLANT ROOM Not Enclosed
FOYER PERIMETER RAIL
DRESSING ROOM 7 ACC. (12P) 57 m²
DRESSING ROOM 6 ACC. (22P) 70 m²
BALCONY 15 m²
CHROFI | NBRSARCHITECTURE.
Sutherland Shire Entertainment Centre
1:200 @ A3
23.09.2019
Level 2 Plan
SK109
REV.10


LADDER
LINE OF ARAMAX ROOF ABOVE SHOWN DASHED
COUNTERWEIGHTS
PLANT ROOM
OPEN PLANT AREA
CHROFI | NBRSARCHITECTURE.
Sutherland Shire Entertainment Centre
1:200 @ A3
23.09.2019
Level 3 Plan
SK111
REV.10


LADDER
COUNTERWEIGHTS
WEBFORGE STEEL GRATING FLOORING TO STUCTURAL ENGINEERS DETAILS
PFC SUBFLOOR FRAMING TO STUCTURAL ENGINEERS DETAILS
WEBFORGE STEEL GRATING STAIR TO STUCTURAL ENGINEERS DETAILS
CHROFI | NBRSARCHITECTURE.
Sutherland Shire Entertainment Centre
1:200 @ A3
23.09.2019
Loading Grid Level
SK114
REV.7



1 Section B-B
1 : 100

CHROFI | NBRSARCHITECTURE.

Sutherland Shire Entertainment Centre | 1:200 @ A3 | 23.09.2019 | Building Sections B-B | SK402 | REV.9