

Concert Hall

Sydney Opera House

Technical and Production Information the Concert Hall

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Image by Chris Bennett



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1 Introduction

The Concert Hall, with an audience capacity of up to 2670 in the round, is the largest interior venue at SOH. Home of the Sydney Symphony Orchestra, the venue is regularly used by chamber and symphony orchestras, solo classical performers and choral groups, for which it's acoustics are particularly well suited. The Concert Hall (CH) is also used for contemporary music, jazz, variety shows, dance, films and conferences.

The walls, stage and auditorium floor are finished in Australian brushbox timber with the seats made from Australian white birch timber veneer, upholstered in magenta wool. Overlooking the stage is believed to be the world's largest mechanical action grand organ, itself a distinctive architectural feature of the venue.

The foyers of the CH encircle the venue, offering unsurpassed views across Sydney Harbour and the Harbour Bridge to the north and west, and the city to the south.

In 2022 the CH opened after being closed for two and half years for extensive renovations. A multi-million dollar upgrade was undertaken to improve safety, acoustics and accessibility.

It is intended that this document is read in conjunction with the SOH Event Guide.

1.1 List of Acronyms

BOH	Back of House
CP	Central Passage
CH	Concert Hall
CHSF	Concert Hall South Foyer
EWP	Elevated Work Platform
DS	Down-stage
FOH	Front of House
GR	Green Room
LD	Loading Dock
OP	Opposite Prompt (Stage Right)
PS	Prompt Side (Stage Left)
SM	Stage Manager
SMD	Stage Manager's Desk
SOH	Sydney Opera House
US	Up-stage



2 Risk Management

In NSW, if you conduct a business or undertaking, you are legally obliged to manage certain risks. In particular, you must:

- Identify and eliminate risks to health and safety, or, if that is not practicable, then minimise those risks so far as is reasonably practicable; and
- Ensure the health and safety of your own workers, AS WELL AS ensure that other workers' or persons' safety is not put at risk by work carried out as part of your business or undertaking.

Work health and safety obligations in NSW are non-transferable and concurrent. This means that:

- Each business or person with safety obligations must comply with their WHS requirements; and
- If more than one business or person has a duty under the law, then they must comply to the extent that they can influence or control the safety matter.

Please refer to the SOH Event Guide.



3 Venue Access

Two goods lifts (12 and 22) are available to carry equipment from the main SOH Loading Dock or Central Passage (CP) to the venue. These lifts are shared with The Studio and stop at the following locations:

- B4 (Loading Dock)
- CP (Ground Level)
- GM (Gallery Mezzanine Level)
- L1 (Orchestra Assembly Room)
- L2 (CH Anteroom)

Size and weight limits apply:

Goods Lift Dimensions		Lift 12	Lift 22
Internal Car Dimensions	Height	2.40m	2.39m
	Width	1.65m	1.95m
	Depth	3.36m	3.36m
Clear Door Opening	Height	2.20m	2.20m
	Width	1.60m	1.80m
Load Capacity	Max Capacity	1,800kg	1,800kg
	Point Load	1,080kg	1,080kg
Other	Speed	1.0m/s	1.0m/s
	Doors	3 Panel side opening	3 Panel side opening

Larger items which exceed lift sizes are required to be carried into the building up 72 stairs, either from the Forecourt and the Monumental Steps, or from under the Monumental Steps via the Box Office Foyer and the CH South Foyer (CHSF).

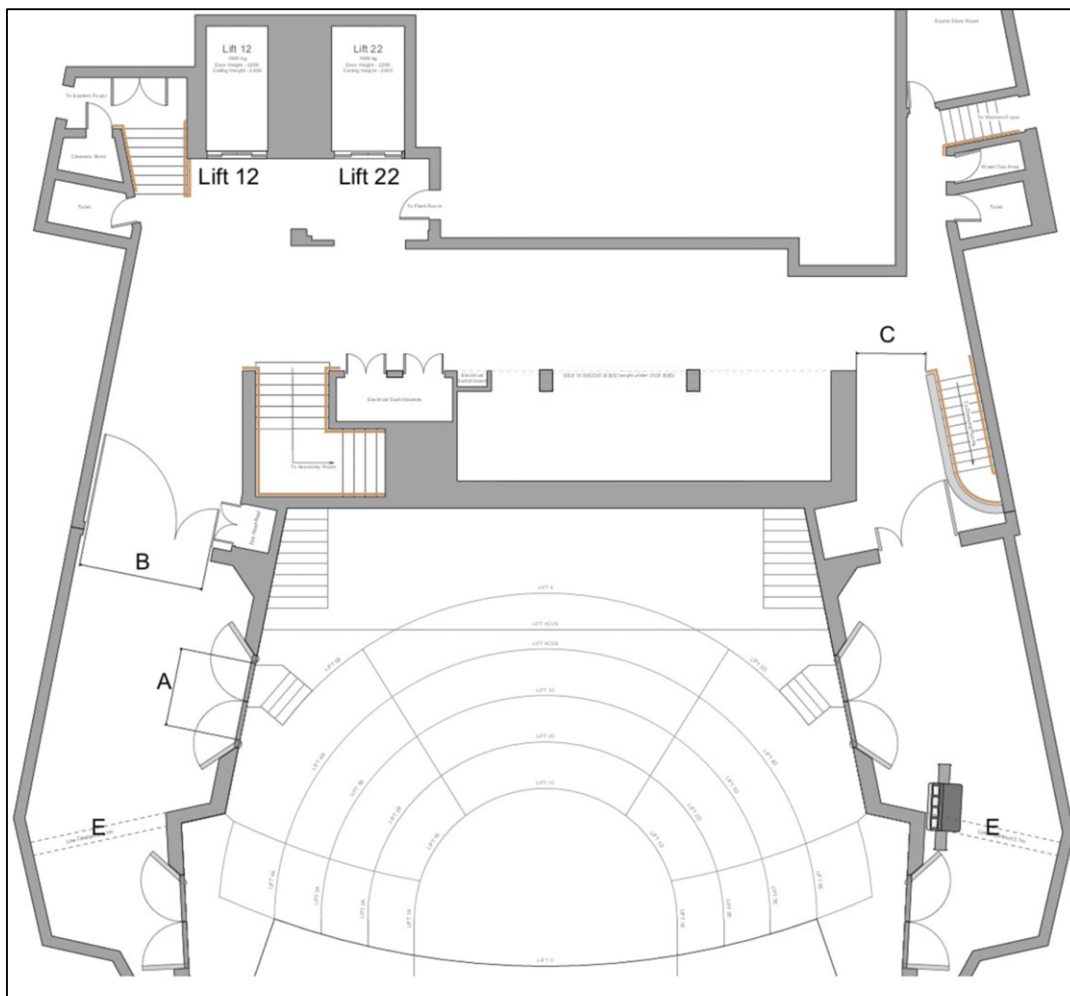
Access to the CHSF and into the CH is via standard double doors, either into the Anteroom or through the CH auditorium via Door 11.



3.1.1 Anteroom to Stage

Access from the anteroom towards stage is via four double doors (two in each wing). Typically, OP side is used as a primary means of access to stage given its proximity to the lifts, larger door and lack of permanent infrastructure within the wing area. PS access is slightly more restrictive with reduced clearance between anteroom and wing.

Key Stage Access Dimensions		Height	Width
A	Doors from wings to stage (all 4)	2.20m	2.00m
B	Minimum clearance from anteroom to OP wing	2.20m	2.80m
C	Minimum clearance from anteroom to PS wing	2.20m	1.70m
D	Anteroom ceiling height	2.25m	-
E	Height clearance to down stage doors	2.08m	-





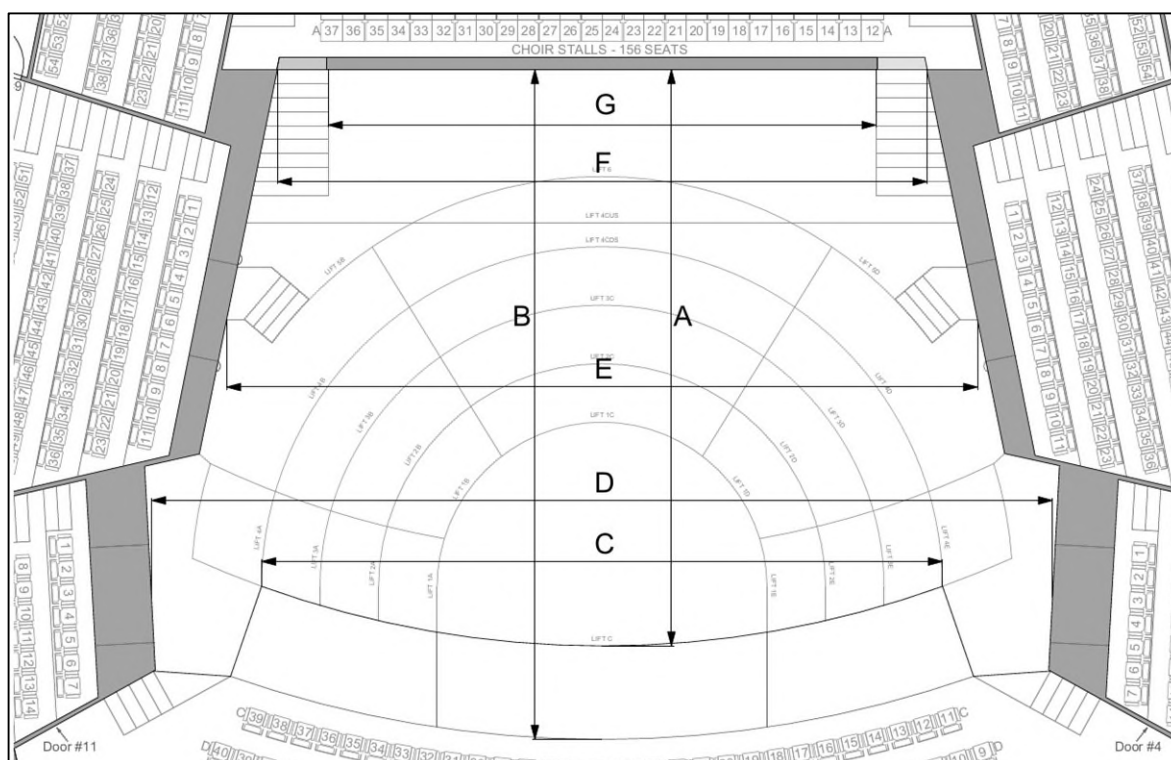
4 Venue Dimensions

4.1 Plan Dimensions

Dimension	Details	Distance
A	Depth of stage at centre line	12.30m
B	Depth of stage at centre line with stage extension	14.30m
C	Width of stage front	14.50m
D	Width between down-stage doors*	19.20m
E	Width between up-stage doors*	16.00m
F	Width at up-stage edge* (stairs not in use)	13.80m
G	Width at up-stage edge (stairs in use)	11.70m

Dimensions are approximate and critical measurements should be confirmed on site.

*Stage walls overhang approx. 100mm at top

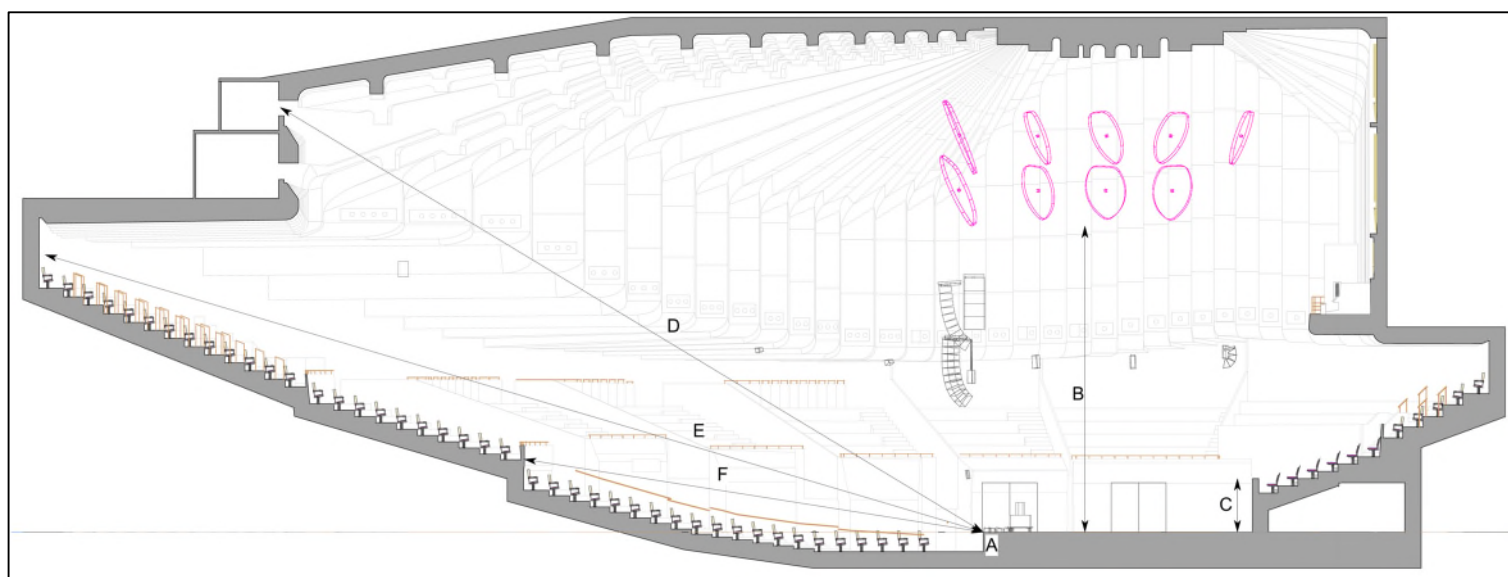




4.2 Section Dimensions

Dimension	Details	Distance
A	Auditorium floor to stage level	0.90m
B	Height of ceiling at centre line (to 'out dead' of acoustic overlay)	15.0m
C	Rear stage wall height	2.40m
D	Follow-spot booth to stage front	37.0m
E	Rear of upper circle to stage front	44.0m
F	Rear of stalls to stage front	20.5m

Dimensions are approximate and critical measurements should be confirmed on site.





4.3 Stage Surface

Surface*	Satin matte clear polyurethane on brushbox over 21mm ply substrate
Rake	Flat – No rake
Max Point Load	500kg (over a 200 x 200mm area)
Total Live Load	US - 700kg/m ²
	DS - 500kg/m ² (Stage extension / Stage lifts 1A, 2A, 3A, 4A, 1B, C, 1D, 1E, 2E, 3E, 4E / Fixed stage areas)

*Anchoring of any equipment or spiking of any instruments into the stage surface is not permitted

4.4 Stage Plans

Stage plans are available at sydneyoperahouse.com

Scaled plans can be requested through SOH Event Operations as PDFs or as Vectorworks files.

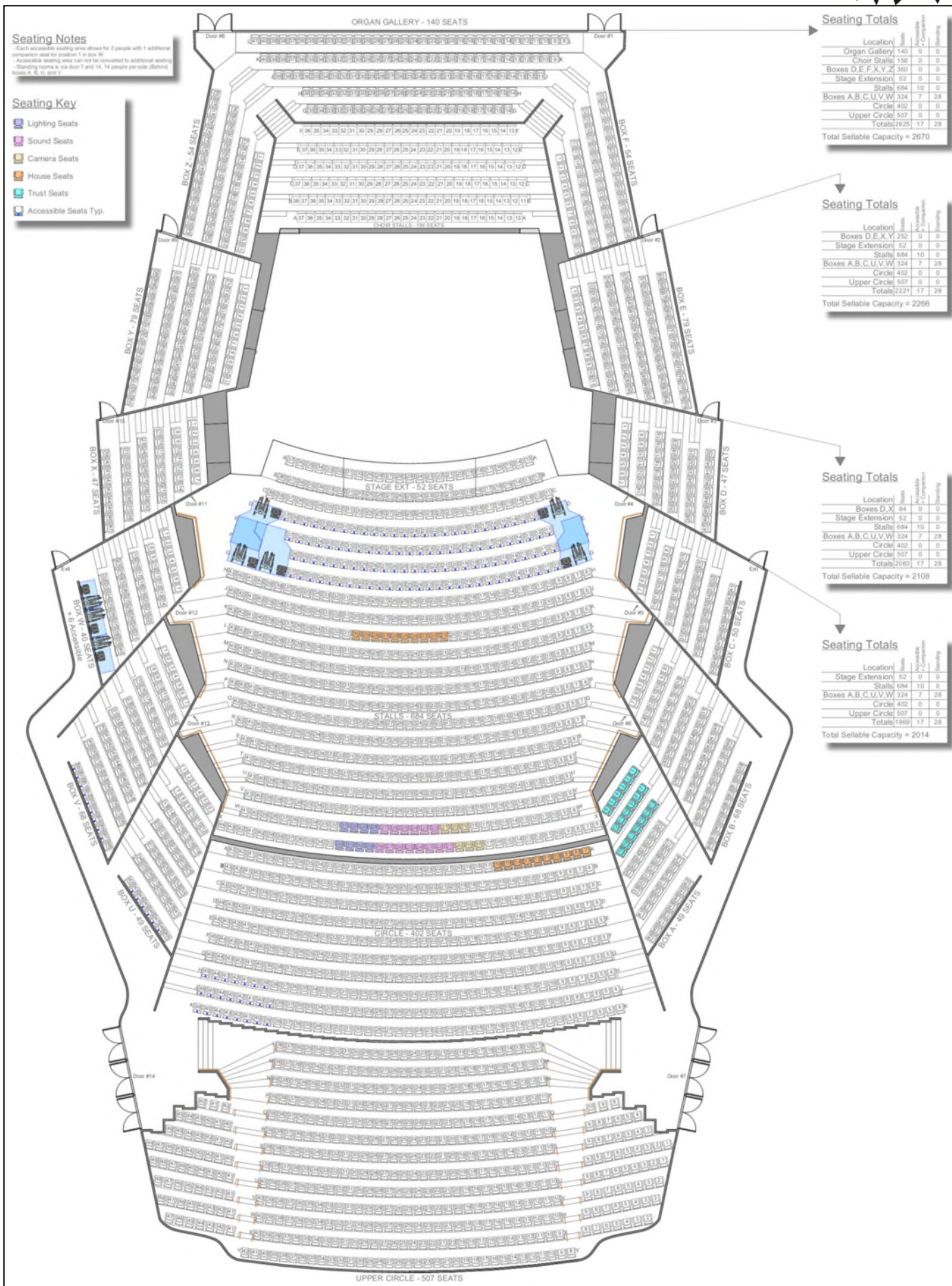
Email techspec@sydneyoperahouse.com or through your SOH Production Manager.

4.5 Auditorium Seating

The standard total physical seating in the CH is 2573 arena style in-the-round, with continental seating in the stalls and dress circle. This total includes the stage extension in the 'deployed' position (stage level), and does not include accessible seating or standing positions.

An additional 52 seats can be added (bringing total venue seating to 2625) by lowering the stage extension and semi-automatically deploying rows A and B. Altering the standard seating layout to include these seats incurs additional labour fees to set and strike.

Total capacity needs to account for potential production holds and sightline requirements for specific events, to be discussed with Event Operations prior to on-sale.



Seating Notes
 - Chair accessible seating area allows for 2 people with 1 additional companion seat for position 1 in box W
 - Accessible seating area can not be converted to additional seating
 - Standing room is in door 7 and 14, 14 people per side (behind boxes A, B, C, and V)

- Seating Key**
- Lighting Seats
 - Sound Seats
 - Camera Seats
 - House Seats
 - Trust Seats
 - Accessible Seats Typ.

Seating Totals

Location	Seating	Access	Companion	Standing
Organ Gallery	140	0	0	0
Chor Stalls	158	0	0	0
Boxes D,E,F,X,Y,Z	380	0	0	0
Stage Extension	52	0	0	0
Stalls	684	10	0	0
Boxes A,B,C,U,V,W	324	7	28	0
Circle	402	0	0	0
Upper Circle	507	0	0	0
Totals	2625	17	28	0

Total Sellable Capacity = 2670

Seating Totals

Location	Seating	Access	Companion	Standing
Boxes D,E,X,Y	252	0	0	0
Stage Extension	52	0	0	0
Stalls	684	10	0	0
Boxes A,B,C,U,V,W	324	7	28	0
Circle	402	0	0	0
Upper Circle	507	0	0	0
Totals	2221	17	28	0

Total Sellable Capacity = 2266

Seating Totals

Location	Seating	Access	Companion	Standing
Boxes D,X	84	0	0	0
Stage Extension	52	0	0	0
Stalls	684	10	0	0
Boxes A,B,C,U,V,W	324	7	28	0
Circle	402	0	0	0
Upper Circle	507	0	0	0
Totals	2053	17	28	0

Total Sellable Capacity = 2108

Seating Totals

Location	Seating	Access	Companion	Standing
Stage Extension	52	0	0	0
Stalls	684	10	0	0
Boxes A,B,C,U,V,W	324	7	28	0
Circle	402	0	0	0
Upper Circle	507	0	0	0
Totals	1969	17	28	0

Total Sellable Capacity = 2014



5 Staging

5.1 Stage Machinery

The CH is equipped with a sophisticated theatre machinery system with over 350 axis of control. The control of all machinery is achieved via a number of touch screen desks and handheld devices with multiple connections points (including wireless) available throughout the venue.

The control system may only be operated by SOH staff.

5.1.1 Under-Stage Machinery

Machinery Type	Quantity	Details
Stage Lift	25	Arranged in a semi-circular formation
Up-stage Stairs	2	Provide access to choir stalls from up-stage lift
Mid-stage Stairs	2	Deploy automatically when required
Stage Extension	3	Can be lowered to reveal stalls rows A & B

Stage Lifts

The primary function of the stage lifts are to provide a stepped semi-circular arrangement for the setting of an orchestra.

A majority of the lifts can travel to 0.8m above the fixed stage level (in 0.2m increments) with the exception of a number of up-stage lifts that travel to 1.0m.

The furthest up-stage two lifts have a travel of 1.7m above stage level with the most up-stage lift providing storage for up to two grand pianos.

5.1.2 Stage Lift Accessories

Depending upon final configuration required of the stage lifts, additional accessories are required to be manually deployed:

- Hand Rails
- Kick Rails
- Removable Fascias
- Temporary Step Units

Stage Stairs

Two up-stage automated stairs form part of the up-stage lift and provide access to the choir stalls. If access to the choir stalls is not required then these stairs store flat within the up-stage lift providing additional stage area.

The two mid-stage stairs are passive and deployed automatically when their adjoining lift travels above stage level.

All automated Stage Stairs are only deployed in 0.2m increments.

For direct access from stage to auditorium, two step units can be deployed manually.



Stage Extension

The stage extension is made up of three independently controlled lifts that travel from stage to auditorium level.

The two normal configurations are with all three lifts level with one another, either at stage level (venue standard layout) or at auditorium level (-0.90m).

Other configurations are available upon consultation, at additional costs.

5.1.3 Over-Head Machinery

The over-head machinery system is comprised of a number of different elements that provide a potential lifting capacity of over 30 tonnes, with multi-line winches capable of working in groups (see venue fly plot).

Machinery Type	Quantity	Location
2.5t Multi-line Winch (5 lines)	11	Over-stage
4.0t Multi-line Chain Motor (5 lines)	4	Over-stage (up-stage area)
1.5t Multi-line Winch (4 lines)	4 (2 per side of stage)	Over-stage (running up / down on side of stage)
1.0t Fixed Position Chain Motor	22	Over stalls and circle

Due to the unique nature of the CH structure, a variety of different restrictions are placed on the over-head machinery system. These restrictions include but are not limited to:

- Limiting the overall capacity of fly system in different zones of the roof
- Limits on moving multiple elements at once
- Reductions in movement speed

5.1.4 Specialist Rigging

The CH has a number of specific rigging locations throughout the venue for the attachment of event specific equipment.

There are five rigging points located above the cannon ports on each side of the stage and five points in the stage walls on each side. Additionally, there are three tie-off points at the back row of each box.

5.2 Acoustic Systems

The CH has various sound reflecting / absorbing systems that optimise the venues acoustics:

5.2.1 Over-Stage Reflectors

There are eighteen curved reflectors over-stage that trim between 8.5-12.0m from stage level depending on the event requirements. For non-acoustic performances the reflectors are flown out and tilted to provide clearance for the deployment of the acoustic banners and over-head machinery.



5.2.2 Wall Reflectors

There are twenty-two wall reflectors (eleven on each side of the venue) that are deployed from the vertical walls near the ceiling. These reflectors extend from the wall approximately 1.4m and provide additional reflection of sound down to the audience.

5.2.3 Acoustic Banners

When the CH is in 'amplified performance' mode there are five different types of banners that are deployed throughout the venue.

Banner Type	Quantity	Details
Crown Banners	15	1.2m - 3.0m in width, deployed from the ceiling above stage, when fully deployed their bottom trim is approximately 10m from stage
Drawer Banners	8	Four each side, deployed from the vertical walls near the ceiling above stage when fully deployed their bottom trim is approximately 10m from stage
Wall Banners	-	Banners deploy to cover the walls behind the last row of seats in organ gallery, upper circle and boxes D/E/F/X/Y/Z
Box-front Banners	6	Banners extend downwards from a roller blind style mechanism in front of boxes A/B/C/U/V/W
Manual Drapes	-	A series of manually deployed drapes cover the surfaces of the walls surrounding the stage and areas at the rear of the venue

5.3 Standard Venue Configuration

The CH has many different possible configurations of its installed machinery and systems.

Time should be allocated in the schedule to adapt the venue to suit event requirements and then return the venue to its standard configuration at the end of the hire period.

The standard configuration of the venue is as follows:

- Stage lifts stowed (flat stage)
- All acoustic banners stowed
- Wall reflectors stowed
- FOH control position in stalls retracted and seats in place
- Flown audio subs removed
- Stage extension deployed (at stage level) with rows A / B retracted
- Acoustic reflectors and lighting pods flown to standard trim height (8.5-12.0m)
- Auditorium access stair units removed



5.4 Standard Staging Equipment

The following equipment is included within the venue hire costs:

Element	Equipment	Allocation	Details
General Furniture	Card Table	3	830 x 830mm Square Top
	Trestle Table	2	1800 x 750 Top
	Vinyl Chair	10	
	Black Screen	4	
Wardrobe	Wardrobe Rack (large)	7	
	Wardrobe Rack (small)	7	
	Desk Unit	2	Portable with mirror/screen

5.5 Additional Staging Equipment

The following sections of equipment can be utilised by your production at an additional cost, subject to the requirements of the other venues.

5.5.1 Masking

The following cloths are allocated to the venue at additional cost:

Element	Equipment	Allocation	Details
Masking	Leg	10prs	Black, 4350 x 7250
		1pr	Black, 3000 x 7500
		1pr	Black, 2000 x 7500
	Border	6	Black, 18000 x 3000
		4	Black, 18000 x 2000
		4	Black, 18000 x 1250
	Border (Side Masking)	1	Black, 7250 x 3000
	Smother	1	Black, 16000 x 7250
		2	Black, 18000 x 5000
		1	Black, 14000 x 7500
	Tabs	3prs	Black, 8800 x 7500
		1pr	Black, 8000 x 7500
	Additional masking may be allocated upon request		



5.5.2 Additional Equipment

The following equipment can be can be utilised by your production at an additional cost:

Element	Equipment	Details
Rostrum	Megadeck 1.2 x 2.4m	Carpeted
	Megadeck 0.4 x 2.4m	Carpeted
	Megadeck 0.8 x 2.4m	Carpeted
	Megadeck 1.0 x 2.0m	
	Megadeck 1.0 x 1.0m	
	Megadeck 'Wedges'	Brushbox Finish, used in conjunction with Stage Risers
	Megadeck Legs	200 / 350 (rolling) / 400 / 600 / 800mm
Floor Covering	Black Carpet	
	Vinyl	Black or White
General Furniture	Card Table	830 x 830mm Square Top
	Trestle Table	1800 x 750 Top, Various Colours
	Cabaret Table	600mm or 900mm Round Top
	Vinyl Interlocking Chair	Black, Padded
Orchestral Furniture	Padded Orchestral Chair	Height Adjustable
	Music Stand	
	Conductors Stand	
	Bass Spike Board	
	Cello Spike Board	
Cloths	Sharkstooth Gauze	Various
	Filled Cloth	Various
	Push-up Drapes on Poles	Black, Various sizes
	2m Book Flat Masking	Black or Grey, Padded
	1.3m Book Flat Masking	Black, Padded
Rigging	1T Chain Block	7m chain
	1/2T Chain Block	



Element	Equipment	Details
	Tail Pipe	20-25mm, various lengths
	Mini Quad Truss	100mm, various lengths
	Tri Truss	Various lengths
	Box Truss	Various lengths



6 Lighting

6.1 Base Lighting Equipment

In addition to venue hire charges, the Base Lighting Equipment package fee includes the following:

6.1.1 Control

Stage lighting is controlled by an ETC Gio console (located in the control room) with an ETC Gio@5 running as a tracking back-up.

Both consoles have 24K channels and use an ETC DMX over Ethernet system for DMX distribution.

An ETC Nomad Puck is available for use with Designer's monitors at the production desk in the auditorium. An ETC Pad (remote control unit) is available for rigging and focussing sessions on-stage.

If lighting console operation is required from the stalls, additional seats (minimum of eight) will need to be removed and must be considered prior to tickets going on sale so seats can be reserved.

External network devices including tour lighting desks or control surfaces must be pre-approved prior to installation onto the local network.

6.1.2 Data

The CH has an ETC DMX over Ethernet system. It utilises sACN to distribute an almost infinite number of DMX universes.

Alternate protocols such as ArtNet are not permitted to run on the House network. If protocols other than sACN are required please discuss with SOH.

Data appears in the control room, the dimmer rooms, on the stage platform, in stage wings and in the stalls at the FOH stalls operating position. Some points have permanently installed Ethernet to DMX nodes. Extra nodes can be installed on request.

6.1.3 Power

All general and dimmed electrical power supplies are 240V AC @ 50Hz.

Two 400A 3-phase power-lock connections are available (one in each stage wing).

These two connections share a 600A breaker. Additional 50A 3-phase Clipsal connections are available throughout the stage, wings, and other strategic locations.

SOH can install additional dimmer racks if required, by prior arrangement. Electrical installations may only be performed by SOH staff and all requirements must be discussed in advance.

6.1.4 Dimmers

The CH has over 618 channels of 3kw dimming / switched dimming and 52 5kw dimming/ switched dimming.

While a number of these dimming channels are dedicated to the fixed lighting positions, there are over 350 channels available for temporary event overlay including 146 channels on-stage level and 216 channels located within the lighting cable reelers.



6.1.5 Lighting Pods

There are sixteen, height variable lighting pods over-stage providing top and front light for orchestral arrangements.

The pods contain ETC Pro Eight-Cell lights that are non-zoomable and fixed colour temperature which emulates tungsten and also provide work light for stage. These lights are fixed focus and cannot be adjusted for other events.

Additionally, each lighting pod also contains one SolaFrame Studio moving head fixture which can provide a colour or gobo stage wash. Each light also contains shutters that can be used for specials as required. Due to the nature of the lighting pods, position changes can only be achieved at very low speed.

6.1.6 Cannon Ports

Above each side of the stage, within the bulkhead above the boxes, are eight MAC encore performance WRMs (four on each side). When not required the fixtures are concealed behind the vertical walls.

6.1.7 Fixed Lighting Positions

There are a number of fixed lighting positions throughout the venue that can be used for performances as required. Some of these positions have a fixed focus (typically for orchestral lighting) while other positions can be adjusted to suit the needs of a particular event. The table below provides a detailed overview of the lighting positions, the equipment and any other notes.

Position	Equipment	Details
FOH Bridge 2	2.5k Fresnels	Orchestra front lighting
FOH Bridge 3	2.5k Profiles	Orchestra front lighting
Back Spots	Source4 Luster+2	10 variable focus per side
Cannon Ports	MAC Encore Performance WRM	4 per side
Lighting Pods	ETC Pro Eight-Cell	Fixed focus
Lighting Pods	SolaFrame Studio	1 per pod
Crown Lighting	LDOH005 INCAND AIR	RGBAW
Follow Spot Booth	High End SolaSpot Pro 1500	2 per side
Organ Lighting	LED strip	Fixed focus

6.1.8 House Lights

The house lights are RGBAW LED fixtures which can emulate tungsten, but if required also provide the ability to change colour and isolate specific areas.

6.1.9 Crown Lights

The crown lights are RGBAW LED fixtures which can emulate tungsten but also provide the ability to change colour. Due to the reflectors and lighting pods permanently hung in the venue these lights do not provide lighting for the stage platform and serve as architectural lighting elements that match the existing house lights.



6.2 Additional Lighting Equipment

The following equipment is dedicated to the venue and can be utilised by your production at an additional cost:

Lamp Type	Allocation
Martin Mac Viper Performance	8
Martin Mac Viper Profile	10
Martin Quantum Profile	18
Martin Quantum Wash	18
Martin Mac 101 CW	8
Additional lamp and effects stock are available upon request	

6.2.1 Followspots

Four Robert Juliat “Cyrano” 2.5kW HMI followspots with manual colour changers are permanently located above the dress circle in a dedicated followspot room.

The angle to the down-stage edge of the stage is approximately 30° and the throw is 36m.

6.2.2 Music Stand Lights

24V LED sconce lights are available to fit music stands at an additional cost.

6.2.3 Smoke and fog machines

Two Unique haze machines are permanently installed in the up-stage cannon port positions – one each side of stage.

Smoke or haze cannot be used in the CH while the grand organ is in use, and special effects of any type are not permitted to be installed in or around the organ loft.

Oil-based machines are not permitted.



7 Sound & Audio Visual

7.1 Base Sound Equipment

In addition to venue hire charges, the Base Sound Equipment package fee includes the following:

7.1.1 Loudspeaker System

The venue has a D&B Audiotechnik loudspeaker system, with some elements requiring to be set-up production dependant:

Component	Equipment	Allocation
Main Flown System	Left: 6 x KSL8 over 4 x KSL12	10
	Centre: 6 x KSL8 over 4 x KSL12	10
	Right: 6 x KSL8 over 4 x KSL12	10
Subs*	Flown: SL Sub Flown behind centre array	4
	Floor: SL Sub or V-sub	2
Delay and Fill	Image fill: V7p or 44s	2
	Circle Delay: V10p	3
	Side Box Fills: Y10p	6
	Side Box Fills: Y7p	2
	Side Box Fills: E8	6
	Side Box Fills*: E4	20
	Front Fill*: 44s or T10	8

*Deployment of these elements incurs additional labour and time

7.1.2 System Processing and Routing

System processing is performed by the installed amplifiers and a D&B DS100 signal engine. Signal distribution to these devices is over a Dante Network.

7.1.3 Technical Panels & Audio Routing

The CH has an extensive installation of cabling infrastructure to send audio and video signals throughout the venue.

The majority of the infrastructure home-runs are to the venue patch room. The patch room, located off the Assembly Room on Level 1, is also home for audio drive equipment, stage management system equipment and patching.

Point to point patching of copper and fibre is also available from FOH mix position in the stalls to side of stage for touring applications:



- 8 Pairs of multi-mode fibre
- 8 Cat6
- 8 75Ohm BNC
- 8 Individual XLR audio tie lines and 96 channels of audio tie lines (via 2x150 pin LK connectors)
- 8 Pairs of multi-mode fibre connect OP to FOH

7.2 Additional A/V Equipment

The following equipment can be utilised by your production at an additional cost:

7.2.1 Mixing Console FOH Stalls

Permanently installed Yamaha Rivage, PM10 surface including the below DSP and I/O

- DSP-RX-EX
- 288 input processing channels
- 72 Mix Busses
- 36 Matrixes
- RPIO 622 with 96 RY-ML-Silk Preamps
- RPIO 622 with 16 RY- ML-Silk Preamps, 16 analogue Out, 16 AES I/O

Outboard FX

- 2 x Bricasti M7's
- Waves Extreme Server running Waves Mercury V12

To accommodate the FOH mix position, 14 seats are required to be removed from the stalls in rows W and X.

Box A / U Position

An operating position is available behind box A or U, and does not require the removal of any seats.

This position is only used for productions with minimal audio requirements and utilises a small mixing desk.

The standard set-up for this position is a Yamaha QL1 desk behind Box U.

7.2.2 Monitor Console

A Yamaha Rivage PM3 console is available in a floating rack to be set up side of stage as required. DSP and IO is permanently installed, including the following equipment:

- DSP R10
- 144 input processing channels
- 72 Mix Busses
- 36 Matrix Busses
- 3 x 3224d2 with 96 Preamps, 48 analogue out and 24 AES Out
- 1 x 1608 with 16 Preamps



The following equipment can be utilised by your production at an additional cost:

Equipment	Model
Mixing Consoles	Midas Pro 2 Midas Pro 1 Yamaha QL1
Stage Monitors	D&B Audiotechnik M4 D&B Audiotechnik Y-SUB D&B Audiotechnik V series line array D&B Audiotechnik V-Sub D&B Audiotechnik V10P D&B Audiotechnik Y10P D&B Audiotechnik Y7P D&B Audiotechnik E8
Radio Microphones – Belt-packs (Shure Axient Wireless System)	<u>AXT 100 Belt Packs:</u> DPA 4066 DPA D:Fine DPA D:Fine 66 DPA 4061 DPA 4080 DPA 6066
Radio Microphones – Handhelds (Shure Axient Wireless System)	<u>AXT 200 Handhelds:</u> Shure KSM9 Shure Beta 58 Shure SM58
Shure In-Ear Monitors	Stereo PT10T dual wireless transmitters P10R wireless body-pack receivers SE425 earpieces
Wired Microphones	SOH have a wide range of microphones from brands such as Sennheiser, Shure, AKG, DPA, Beyer and Neumann and offers a variety of packages to suit
Additional Playback	MacBook Pro running QLab



7.2.3 Video Replay

The Sound & AV department has a range of playback options and switchers. SOH vision equipment is shared between all venues and its use in the CH is subject to availability and will incur additional charges.

Equipment	Model
Switchers	Barco Image Pro Blackmagic Design ATEM 2 M/E Production Studio 4K
Vision Playback	MacBook Pro Sound Devices Pix 270i

7.2.4 Projection and Video Monitors

There are a number of options available for projector placement within the venue, including front and rear projection. Please note that in order to facilitate projection, truss and a screen must be rigged.

Element	Equipment
Projectors	Barco HDX 14k
Screens	Stumpfl 7.3m x 4.1m (24ft x 13.5ft) 16:9 ratio FastFold Stumpfl 6.1m x 3.4m (20ft x 11.3ft) 16:9 ratio FastFold Stumpfl 4.8m x 2.7m (16ft x 9ft) 16:9 ratio FastFold Stumpfl 3.6m x 2.1m (12ft x 7ft) 16:9 ratio FastFold
Video Monitors	LCD 75" LCD 55" OLED 17"



8 Pianos

The following pianos are included within venue hire costs, and are located in the following BOH spaces as standard:

Dressing Room	Piano
DR58	Yamaha Model C5
DR72	Steinway Model A
DR73	Yamaha Upright (S1 Pro)
DR74	Steinway Model B
DR76	Steinway Model O
DR61	Yamaha Upright
DR62	Yamaha Upright

Performance pianos for stage and associated tuning costs are additional to venue hire.

8.1.1 Grand Organ

The grand organ is an exceptionally significant instrument and must be treated with care. In order to protect the instrument from damage, only authorised performers are allowed access to the organ loft area.

There are two colour CCTV monitors, a full stage-view and a conductor-view (which can be mirror-reversed if required).

There is a fold-back speaker from the stage to the organ, and a microphone connection for the organist to communicate with the conductor or the audience.

Communications with the SM is via cue lights and direct communication can be arranged upon request.

SOH require that organists who are not acquainted with the organ attend a familiarisation session with the organ tuner.

Smoke or haze effects cannot be used in the CH when the organ is in use.

For safety reasons, venue technical set-ups cannot continue while the organ is being played, therefore organ pre-setting and rehearsal time needs to be scheduled independently of your technical time.



9 Communications

9.1 Stage Manager's Desk

A Stagetec Stage Manager's Desk (SMD) is located in Prompt Corner. The desk is fully programmable, includes four broadcast-quality show relay screens, a telephone, two integrated Riedel Artist communications panels and dynamically assignable tactile LED buttons.

The SMD controls audio and video relay to both FOH and BOH spaces, and can be used to broadcast live or pre-recorded announcements to back-stage or foyer spaces.

There is an automatic message stacking facility to prevent conflict with other venues when announcements are simultaneously sent from other venues to common areas of the building, such as the Green Room (GR). Features include dynamic allocation of paging, program audio relay, cue lights, and foyer bells.

FOH functions are generally managed by the Theatre Manager from a touch screen in the foyer, however these functions are also accessible at the SMD.

9.2 Show Relay

9.2.1 Longview

A low latency, colour image of the venue stage is distributed to the SMD, stage wings, lighting control, sound control, GR, some dressing rooms, and venue foyers. The SM has pan, tilt, and zoom control of the long-view camera. A low-light camera is also permanently installed and sends vision to the SMD.

9.2.2 Conductor View

An image of the conductor from a low latency camera under the organ loft is distributed to the SMD, stage wings and to two 24" Sony monitors in the TV booths at the rear sides of the stalls.

The SM has pan, tilt, and zoom control of the conductor view camera.

9.2.3 Door Cameras

When stage doors are closed, low latency screens and cameras mounted above each pair of doors provide an on-stage view in order to facilitate exits / entrances.

9.2.4 Temporary Show Relay

Temporary show relay screens can be deployed around the venue, foyers and throughout the wider precinct by prior arrangement and additional cost.

9.3 Headset Communications

A Riedel Artist wired intercom system operates across all venues. Permanent talkback stations are available in lighting and sound control locations, and wired headset tie lines are installed at all regular operating positions.

A Riedel Bolero wireless beltpack system is fully integrated with the Riedel Artist wired intercom system, and is included within venue hire costs as per the below table:

Equipment	Allocation	Details
Wireless Beltpack Comms	19	Riedel Bolero BBP
Additional units may be provided upon request at a per unit charge		



10 Back-stage Facilities

10.1 Dressing Rooms

The venue includes use of eleven associated dressing rooms. The dressing rooms are all located close to the Green Room, one level beneath stage.

Dressing Room	Details	Allocation
Soloist's Rooms	Accommodate two to four artists each Rooms include an en-suite bathroom with shower, toilet, and locker facilities	7
Conductor Suite (DR 72)	Reserved for conductors, soloists, or company management This room has a lounge area with a baby-grand piano, a writing desk, and a television with relay view of the stage Dressing facilities include a dressing table, full-length mirror, wardrobe rack and an en-suite bathroom	1
Other Dressing Rooms	Event Operations to advise	

Lockers in the dressing rooms are fitted with a staple and hasp. In order to lock a locker, a performer or presenter should bring their own padlock/s. Lockers must be cleared at the conclusion of the hiring period, or at the end of each day where other hirers will be using the CH between your sessions.

10.2 Rehearsal Rooms

The CH has two rehearsal rooms (RR 78 / 79) for use by hirers during their booking period. The rooms are located beneath the Assembly Room and have the capacity of up to five people depending on musical equipment requirements.

Due to the acoustic overlay within the rooms the use of the rehearsal rooms are only for singers and musicians and are not to be used as additional dressing or storage rooms.

The rehearsal rooms are also shared by hirers from other SOH venues. Coordination and use of these rooms must be confirmed in advance.

10.3 Laundry Facilities

Venue laundry allocation:

Equipment	Allocation
Electric clothes dryer	1
Top loading clothes washing machine	1



11 Protection of Building Surfaces

Appropriate measures must be taken to ensure the protection of all SOH building fabrics and surfaces, including wood, granite, glass, ceramics, concrete and bronze.

Prior consultation and approval is required for any plans to attach to or penetrate building surfaces.

You must provide suitable rubber pads, plywood sheets or plastic to protect all building surfaces including but not limited to floors, walls, chairs and ceilings.

The use of paints or chemicals on SOH building surfaces or fixtures is prohibited. Similarly, any use of water, soaps or cleaning fluids of any kind must be pre-approved by Building Operations.



12 Appendices

12.1 Venue Plans (Acoustic / Amplified)

