

TECHNICAL SPECIFICATIONS

Delta Hall

Updated: 11/15/2021









TABLE OF CONTENTS

Technical & Operations Staff Contacts	2
Seating Compacity	2
Location	2
Loading and Unloading	3
Stage Specifications	
House Rigging	
Soft Goods	
Lighting	
Stage Drawing	10
Light Plot	
Section View	12
Lighting Standard House Zero Plot	13
House Zero Line set Schedule	14
Audio	
Dressing Rooms	18
Support Space	
Building Map	
Data Connection Services	
Theater Cleaning Procedures	
HVAC SARS-CoV2 Mitigation	_
$\mathbf{\varepsilon}$	







TECHNICAL & OPERATIONS STAFF CONTACTS

TECHNICAL DIRECTORS

Cliff Wallgren Office: 385-468-2513 On duty cell: 385-272-0763 Email: <u>CWallgren@slco.org</u>

Josh Martin Office: 385-468-2511 On duty cell: 385-272-0763 Email: JJMartin@slco.org

Chris Zaccone Office: 385-468-2512 On duty cell: 385-272-0763 Email: CZaccone@slco.org

PRODUCTION MANAGER

Ernesto Flores Office: 385-468-2510 Cell: 385-272-4521 Email: EAFlores@slco.org

HOUSE CREW

IATSE Local 99. Please Contact venue technical director for calls

PROTECTIVE SERVICES

Salt Lake County Sheriff Cell: 385-272-4679

GENERAL MANAGER

Angela Vanderwell Office: 385-468-2524 Email: AVanderwell@slco.org

EVENT MANAGERS

Stepanie Charles Office: 385-468-2504 Email: scharles@slco.org

Andrew Kopf

Office: 385-468-2503 Email: <u>AKopf@slco.org</u>

TICKETING

Ryan Holyoak Office:385-468-2540 Email: <u>RHolyoak@slco.org</u>

Meghan McCauley Office: 385-468-2530 Email: MMcCauley@slco.org

PHYSICAL/MAILING ADDRESS

Eccles Theater 144 South Main Street Salt Lake City, Utah 84111

DELIVERY/LOADING DOCK ADDRESS

Eccles Theater 144 South Regent Street Salt Lake City, UT 84111

SEATING CAPACITY

Total Capacity	2,501
Pit	64
Orchestra	914
Tier 1	407
Tier 2	435
Tier 3	486
Loge	76
Box	29

LOCATION

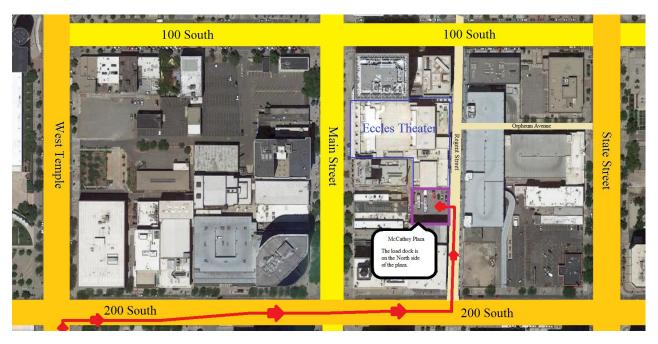
The Eccles Theatre is in the heart of downtown Salt Lake City at 131 S. Main, between City Creek Center & Gallivan Plaza and just a block away from Temple Square. The Theatre has ease of access from interstate 15, half a block from light rail transportation (Green Lines & Blue Lines) and is just a short 15-minute drive away from the Salt Lake City International Airport.





LOADING AND UNLOADING

Access to the theatre loading docks is located on the north side of the McCarthey Plaza off Regent Street and 200 South. All Broadway trucks enter Regent Street from 100 south, so that they can make a right hand turn into the north access gate. Only 3 trucks can unload at a time.



Loading Dock

Truck Parking

Dimensions

Exterior Door to Dock Bumper Overall Width Exterior Door Overhead Clearance Dock Height Interior Dock Doors

Receiving

Forklift

D - - - - - - - -

(3) Docks at stage level

(2) on-site parking docks available, one must remain Unblocked for daily theater deliveries

75'-8" 44'-0"

42'w x 14'-1"'h

20'-0"

4'-0" Outer: 9'w x 10'h

Center: 10'w x 14'h

Dock Edge to SL Loading Door 27'-4"

**No forklift on site

Technical director can assist with arrangements

Additional Details

Truck dock is sloped down, 2.5% grade over 70'

Each bay includes levelers and bumpers

Dock enclosure is climate controlled

There are three shore power outlets located inside the main loading dock and two shore power out lets on the south side of the plaza.

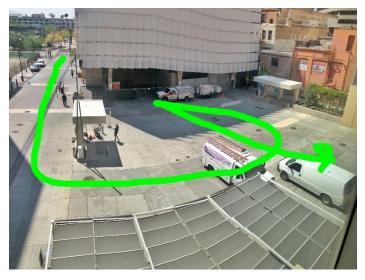




McCarthy Plaza - Controlled Access Upgrades affective August 2021









The Plaza was updated in August 2021 for better controlled access.

The loading dock is assessable 24 hours.

Arrival assistance during the hours of 9:00am – 5:00pm Monday - Friday can be coordinated with a Technical Director at (385) 272-0763

After hour arrival can be assisted by security.

They can be reached at (385) 272-4679

Both traffic barrier gates can be opened at the same time and remain open until all trucks have arrived and parked in the loading dock.

Green line shows suggested truck path for backing into the loading dock area.

If you have any questions or concerns, please reach out to the venue Technical Director at (385) 272-0763

385-468-1030 | 131 South Main Street | Salt Lake City, UT 84111









Elevators

Orchestra pit (1) Gala lift-operated platform for small configuration, large configuration

is removable seating and platforms.

Freight 7'9" W x 11'5" L x 8' H

Service $5^{\circ}5^{\circ}W \times 7^{\circ}11^{\circ}L \times 7^{\circ}3^{\circ}H$

Floor	Directory	Accessed by:
Lower Level (LL)	Dressing Rooms, Green Room, Wardrobe, Laundry, Production Offices	Freight, Service
Orchestra Pit (P)	Orchestra Pit	Service
Lobby (L)	Stage, Dock, Lobby, Star Dressing Rooms	Freight, Service
Tier 1 (T1)	Rehearsal Studio	Freight, Service
Tier 2 (T2)	Pin Rail, Dimmer Room	Service
Tier 3 (T3)	Spot Booth, Cat Walks, Fore Stage Grid, Fly Grid, Loading Gallery	Service

385-468-1030 | 131 South Main Street | Salt Lake City, UT 84111





STAGE SPECIFICATIONS

Proscenium Width (max) With adj Portal Legs (min)	49'-6" 44'-0"	*Maintaining sight lines
Proscenium Height (max) With adj Portal Header (min)	29'-6" 24'-4"	

Zero is defined as DS side of smoke pocket.

*Portal is downstage of Zero within Proscenium thickness of 27 1/4"

Smoke Pocket	10 3/4"
Fire curtain to upstage gallery	46'-6"
Down Stage Edge from Zero	5'
Down stage edge to Main Curtain	6'-6"
Zero to Back Wall	49'-11"
Zero to first line set	1'-6"
Zero to last line set	46"-3"
Stage Width (Loading door to fly rail)	118'-4"
Gridiron height (Bottom of Wells)	74'-10"
Centerline to SL Gallery	45'-5"
Centerline to SR Gallery	53'-6"
Clear Height under SL Gallery	31'-10" (HVAC), 34'-0" (Beam)
Clear Height under SR Galleries	21'-0"
Cross-Over Gallery	35'-9"
SL Loading Door	16'-11" w x 20'-2"h
Orchestra Pit	64' Long x 14' (sides of Curve) 18' (center of curve)

** Attention Shows with Automations

Possible obstruction for automation show deck.

Audio rack SL

The unit is located SL, 35' - 4" from CL cable chase is on deck, 16" from Zero rack bottom to deck is 18" rack front from Zero is 2'-6"



** Please advise if you require lagging into stage floor





HOUSE RIGGING

**All line set have full travel to grid. No permanent electrics, border lights or concert shell.

(87) single-purchased counterweight line sets with ladder truss battens on 6" centers

Capacity 1700lbs

Batten Length 63'-0", 67'-8" w/Extensions

Travel 67'-11"
Trim (in) 3'-11"
Trim (out) 71'-10"

Batten Extensions 3'-o", 2 per batten

Far catwalk 95' Near catwalk 69' Forestage catwalk 42'

Gridiron 74'-10" to stage Well spacing 6 @ 12'-3"

Forestage Gridiron 55' to house floor Depth from Zero +32'-10 3/4" Width 60'-0"

 Width
 60'-0"

 Height
 56'-2"

 Well spacing
 6 @ 10'-0"

Pin Rails Stage left and right

Spot lines available

Chain Motors 200 Amp power available on grid

Please contact venue technical directors for chain motor information.

Lifts Genie electric lift – 30' (Fiberglass) 1

Genie electric lift – 40'

SOFT GOODS

House Curtain (guillotine only)	33' high x 56' wide	1
Black Borders	12' high x 65' wide	6
Black Legs	36'-6" high x 16' wide	12
Black Tabs	35'-6" high x 10' wide	10
Black Out Drapes	35'-6" high x 60' wide	2
Traveler Panels	35'-6" high x40' Wide	2
Bleached White Muslin Cyc.	35'-6" high x 65' wide	1
Black Sharks-tooth Scrim	35'-6" highx65' wide	1
White Sharks-tooth Scrim	35'-6" high x 65' wide	1
Drop Cloths	35'-6" high x 65' wide	4
Plastic Cyc	35'-6" high x 65' wide	1





LIGHTING

Lighting Control Booth House Console Located in right rear of orchestra level

ETC Gio 6k

House Spots 3-Lycian 1295 4k

107' throw to stage, 3° - 7.5°

**Spot booth can accommodate additional lamps

All house incandescent fixtures are ETC Sours 4's and lamped with 750-watt HPL lamps.

Road system:

DMX/Net3 inputs: SL SR, FOH booths, rear orchestra level, mid house, plus additional

portable nodes.

Power: 3 - 400 Amp, 3 phase located USL – cable path has to go up and over the

loading dock door for standard DSL dimmer position 100' runs.

1 - 400 Amp, 3 phase located Pin Rail SL 75' to deck.

1 - 400 Amp, 3 phase located Pin Rail SR with tail downs to deck

Connivance Power and 208 located nearby. 1 - 200 Amp, 3 phase located grid DSL

1 – 100 Amp, 3 phase located forestage grid HR

1 - 100 Amp, 3 phase located USR back wall next to continence power 1 - 400 Amp, 3 phase located USR back wall next to continence power 1 - 100 Amp, 3 phase located USL back wall next to continence power

Connivance Power and 208 volts can be found in all 4 corners of the stage.

Snake Runs from SL or SR to

1) Broadway Position;

Rear of Orchestra level, under balcony Maximum working area is 17' x 9' 6"

Distance to stage: ~100'

Cable Run ~200' to 275' through basement raceway

2) Mid House Position;

*Attention! 28 seats kills to use this position

~Discuses with Technical Director for other options

Orchestra Level, Mid House

Maximum working area is 17' x 9' 6"

Distance to stage: ~80'

Cable Run ~175' to 225' through basement raceway





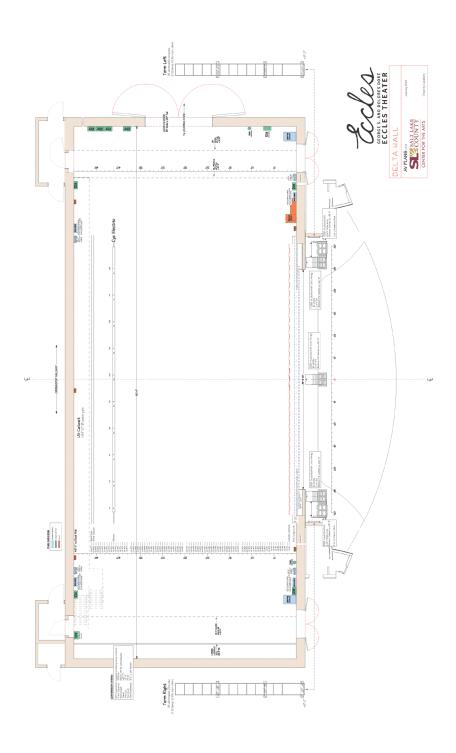
LIGHTING CIRCUITS

Position	Distance	Circuit #'s	Circuits	Notes
Spot booth	107'(PL)			3-Lycian 1295 4k
Spot catwalk	107'(PL)	1-24	24	
Far catwalk	95'(PL)	24-60	36	
Near catwalk	69'(PL)	61-96	36	
Forestage catwalk	42'(PL)	97-120	24	1-100A(cam/lugs)
1st tier rail	80'(PL)	151-168	18	
2nd tier rail	86'(PL)	121-150	30	
Box Booms				
T1 HR		189-192	4	1 – 208v outlet
T1 HL		213-216	4	1 – 208v outlet
T2 HR		181-188	8	1 – 208v outlet
T2 HL		205-212	8	1 – 208v outlet
T3 HR		173-180	8	1 – 208v outlet
T3 HL		197-204	8	1 – 208v outlet
Tech Box HR		169-172	4	1-L620, 1-L630 Outlet
Tech Box HL		193-196	4	1-L620, 1-L630 Outlet
Torm SL	2' (PL)	217-234	18	
Torm SR	2' (PL)	235-252	18	
Grid DSL		253-264	12	1-200A(cam/lugs)
Grid USR		265-276	12	
Pin rail SL		277-420	144	1-400A(cam/tails)
Pin rail SR		421-444	24	1-400A(cam/lugs) with tail downs to deck
Stage				
DSL		445-450	6	1-100A(cam/lugs), 1-200A(cam/lugs)
DSR		451-456	6	1-100A(cam/lugs)
USL		457-468	12	3-400A(cam/lugs), 1-100A(cam/lugs)
USR		469-480	12	1-400A(cam/lugs), 1-100A(cam/lugs)





STAGE DRAWING

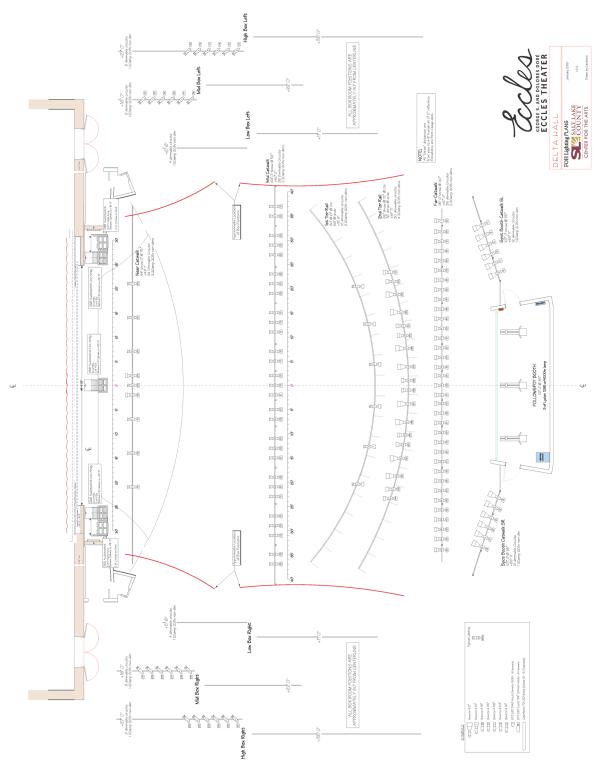


Please contact the TD for other drawings.





FOH Lighting Plot

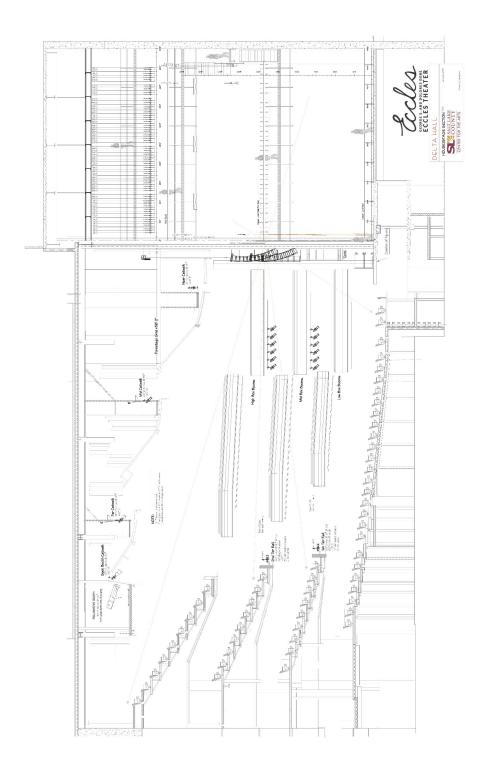


Please contact the TD for other drawings.





Section View



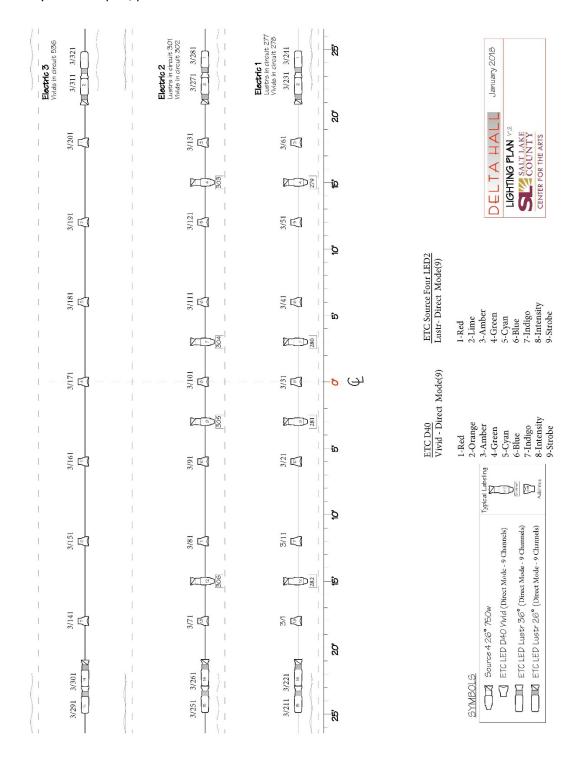
Please contact the TD for other drawings.





Lighting Standard House Zero

The Standard House zero is the house lighting plot that is restored after a show has loaded out. If this plot can be incorporated into your show plot, please let the TD know.







LINE SET SCHEDULE

(House Zero)

Delta Performance Hall – Line Set Schedule

US	LINE#	STUFF	FROM CTR	TRIM	SIZE	WEIGHT	NOTES
- 11"		Hard Portal Border	C/L	Variable	5' x 51'		Wood Grain
- 6"		Hard Portal Legs	Variable	Deck	30'6"x4'6"		Wood Grain
0' 5"		Fire Curtain	C/L				Motorized
1' 6"	1	House Curtain (guillotine only)	C/L	Deck/Out	33'x56'		2 Panels
2' 0"	2	Black Border No. 1	C/L		12'x65'		
2' 6"	3	Black Legs No. 1	22' 0"	Deck	35'6"x16'		
3' 0"	4						
3' 6"	5	Electric #1		32' 0"			24 Circuits
4' 0"	6						
4' 6"	7						
5' 0"	8						
5' 6"	9						
6' 0"	10						
6' 6"	11						
7' 0"	12						
7' 6"	13						
8' 0"	14						
8' 6"	15						
9' 0"	16	Black Border No. 2	C/L		12'x65'		
9' 6"	17	Black Legs No. 2	22' 0"	Deck	35'6"x16'		
10' 0"	18						
10' 6"	19	Electric #2		32' 0"			24 Circuits
11' 0"	20		1				
11' 6"	21						
12' 0"	22						
13' 0"	23						
13' 6"	24						
14' 0"	25						
14' 6"	26						
15' 0"	27						
15' 6"	28						
16' 0"	29	Black Border No. 3	C/L		12'x65'		
16' 6"	30	Black Legs No. 3	22' 0"	Deck	35'6"x16'		
17' 0"	31						
17' 6"	32						
18' 0"	33						
18' 6"	34						
19' 0"	35						
19' 6"	36	Electric #3		32' 0"			24 Circuits
20' 0"	37						
20' 6"	38						
21' 0"	39						
21' 6"	40						
22' 0"	41						
22' 6"	42						
23' 0"	43	Black Border No. 4	C/L		12'x65'		
23' 6"	44	Black Legs No. 4	22' 0"	Deck	35'6"x16'		





Delta Performance Hall – Line Set Schedule

24' 0"	45		Ī				
24' 6"	46		1				
24 0	40			L.			
25' 6"	47						
26' 0"	48						
26' 6"	49	Black Drop	C/L	Deck/Out		2 c	of 35'6"x40' Panels
27' 0"	50						
27' 6"	51						
28' 0"	52						
28' 6"	53						
29' 0"	54		1				
29' 6"	55						
30' 0"	56						
30' 6"	57						
31' 0"	58						
31' 6"	59						
32' 0"	60		1				
32' 6"	61		+				
33' 0"	62		1				
33' 6"	63						
34' 0"	64		+				
34' 6" 35' 0"	65 66		+				
35 0 35' 6"	67		+				
36' 0"	68						
36' 6"	69		1				
37' 0"	70		+				
07 0	7.5						
38' 0"	71						
38' 6"	72						
39' 0"	73	Black Scrim	C/L		35'6"x65'		
39' 6"	74	White Scrim	C/L	di-	35'6"x65'	,	P.
40' 0"	75	Black Drop	C/L		35'6"x65'		
40' 6"	76						
41' 0"	77	Electric #6		36' 0"			LED Strips
41' 6"	78						
42' 0"	79						
42' 6"	80						
43' 0"	81						
43' 6"	82					,	
44' 0"	83						
44' 6"	84						
45' 0"	85	100 14 00 01 00 0	6"		051011 051		
45' 6"	86	White Muslin Seamless Backdrop	C/L		35'6"x65'		106- J D'
46' 0" 46' 6"	87 XX	Blackout Curtain					Wind Break
46' 6" 50' 0"	XX	Catwalk Over Head +38'					
50 U"		Distance to back wall					





AUDIO

Sound Booth Located in center rear of orchestra level

House Console

AVID Venue S6L - Pro Tools Enabled

**Venue has 3 mix positions FOH Booth

Back of seating (in front of FOH booth) "Broadway Position"

Mid House Position (dug in-removeable seats and platforms) Concert

Position "Rock Pit"

Power DSL - 1-100 Amp (cam/lugs)

1-200 Amp (cam/lugs) w/ Isolated ground

DSR - 1-100 Amp (cam lugs)

Playback

Tascam SS-CDR200 Mac Mini with Qlab

House PA (LCR) D&B

LCR - Flown Subs - Ground Subs - Fills					
Mains (LCR)	V8	10	Each		
	V12	2	Each		
Flown Subs	V-Subs	6	Per side	LR/Aux	
Ground Subs	J-Infra	2	Per side	LR/Aux	
Front Fills*	E-5	7		Sum(M)/Aux	
*2 locat	tions, depe	nds o	n pit deployı	ment	
Balcony Delays	E-6	29		Sum(M)/Aux	
Box Delays	E-5	10		Sum(M)/Aux	
Stage Fills		3	Per side	Sum/Aux	
Sec PA	E-12	3		Sum/Aux	

Intercom

4 channel Clearcom system with the ability to tie in road systems.

8 single channel belt packs are available

Mix Position

1) Broadway Position;

Rear of Orchestra level, under balcony Maximum working area is 17' x 9' 6"

Distance to stage: ~100'

Cable Run ~200' to 275' through basement raceway

2) Mid House Position;

*Attention! 28 seats kills to use this position

~Discuses with Technical Director for other options

Orchestra Level, Mid House

Maximum working area is 17' x 9' 6"

Distance to stage: ~80'

Cable Run ~175' to 225' through basement raceway

No floor cable runs allowed in any public space





Stage Manager Panel Located downstage left

Paging to dressing rooms and support spaces

Paging Call system on stage left

Page and God mic stage left

Program and paging available to dressing rooms and

support spaces

Hearing Assist Listen Tech LR-200/LR165-166 Packs

60 - Packs available in lobby

Translator Booth Located in center rear of orchestra level next to Sound Booth

this booth is set up with a monitor feed and microphone for Descriptive audio. This booth will accommodate up to two

narrators.

House Zero Audio includes the left, right, and center line

arrays including flown subs and 2 sets of J-subs setting left and

right on the apron.

5G Wireless Network Our house ticket scanners run on this network and may cause

interference closer to show time.

HOUSE EQUIPMENT

**Some items are subject to additional charges. Ask Event Manager for more details.

Orchestra	Orchestra chairs	60
	Manhasset Music Stand	60
	Music Stand LED Lights	54
	Music Stand Conventional Lights	30

Tobles	0'	16
Tables	Ŏ	16
	6'	10
	4'	10
	6' x 18"	8





DRESSING ROOMS

**All dressing rooms (Except Star dressing rooms) are located in basement, Accessible by stairs and elevators. All Dressing rooms have video and audio feed of stage.

Star Dressing Rooms (10' x 14')

4 rooms, 2 stations each **Located on stage level crossover Lighted mirror stations with sink and counter Private bathroom with shower, sink, and toilet Includes clothes rack and convenience outlets



Chorus Dressing Room (20' x 28')

2 rooms, 16 stations each Lighted mirror stations with counters Includes clothes rack and convenience outlets Bathroom with showers (2), sinks, and toilets



Ensemble Dressing Room (20' x 24')

2 rooms, 12 stations each Lighted mirror stations with counter Includes clothes rack and convenience outlets Bathroom with showers (2), sinks, and toilets







Ensemble Dressing Room (28' x 10')

3 rooms, 6 stations each Lighted mirror stations with counter Includes clothes rack and convenience outlets Bathroom with shower (1), sinks, and toilets



Musicians Lounge (12' x 25')

Restrooms located across hall. Orchestra pit access stairs (1 flight) and elevator



SUPPORT SPACES

**All support spaces (except Rehearsal room, as noted) are located in basement with access to service elevator, orchestra pit, stage left stairs,

Visiting Production Office (12' x 30')

20 Amp circuits - 6 Lockable Cabinets - 5 Accessible/lockable for touring staff with digital number pad







Wardrobe Room (29' x 24')

Commercial steamers

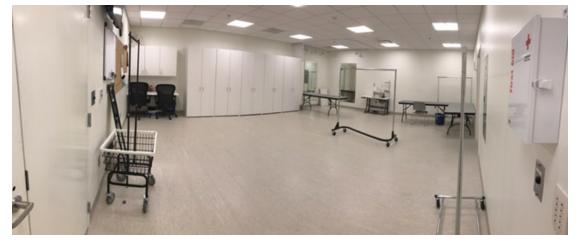
Iron and board

Rolling wardrobe racks

20 Amp circuits

TACEW T-199RB sewing machine

4
3 each
5
TACEW T-199RB sewing machine



Laundry Room (8' x 12')

Washers

Dryers

Large deep basin sink

5

Large deep basin sink



Wig Room (19' x 14')

Lighted mirror stations w/ counter
20 Amp circuits
6
Large deep basin sink
1







Green Room (21' x 27)

Refrigerator (with water & ice dispensers)

Microwave

Sink

20 Amp circuits

4



Rehearsal room on Tier 1 (33' x 42') Harlequin Sprung floor
Large wall with mirrors
Dance Barre (build in on either side of room) 2

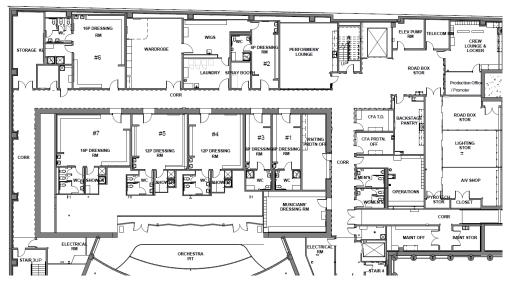




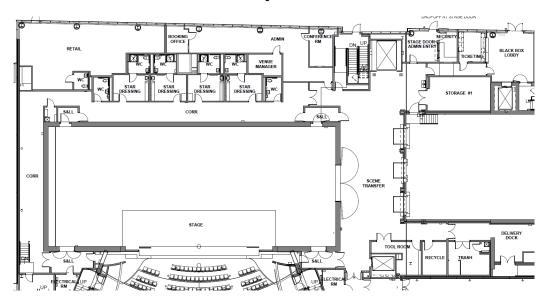


BUILDING MAPS

Lower Level



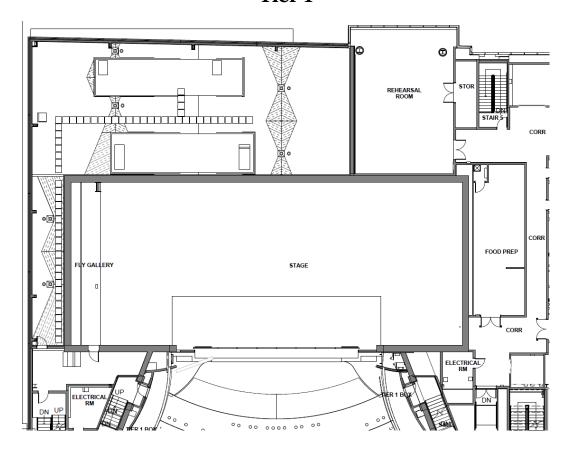
Lobby Level







Tier 1



DATA CONNECTION SERVICES

Wi-Fi Please speak with your Event Manager or Technical Director for latest

information on coverage and/or speed/bandwidth, provider, hot spots, and

access WIP and password.

Wired Connectivity There are 12 wired connections available

Please discuss wired connectivity requirements with your Technical Director.

Cellular Coverage Verizon and Sprint have limited reception to in the lower level.

T-Mobile and AT&T have better reception in the lower level but still have some

areas with no service.

Telephones There are 4 phone connections available

Please discuss Telephone connection requirements with your

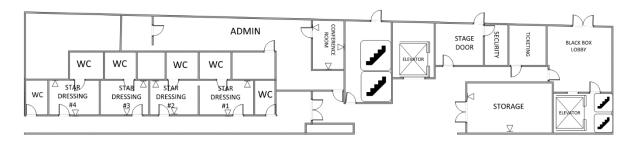
Technical Director.

Please fill out this page for network drops (Mark with "N") and phone lines (Mark with "P") near triangle symbols in each room. Return to Technical director.

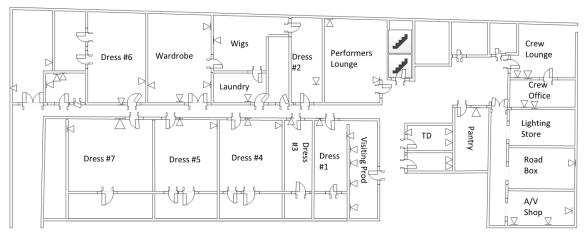




Eccles level 1 drop locations



Eccles level 0 drop locations







The George S. and Dolres Dore Eccles Theater Cleaning Procedures Sars-Cov-2 Sanitization and Mitigation Process

Regarding Sars-Cov-2 (which leads to Covid-19 infections) reaching pandemic levels in 2020 we have added several layers of disinfections and cleaning procedures to mitigate the risk of further transmission within Eccles Theater. The following hierarchy is used by Operations staff to determine what level of sanitization and cleaning is required.

If less than 24 hours have passed since the person who is sick or diagnosed with COVID-19 has been in the space, clean and disinfect the space.

If more than 24 hours have passed since the person who is sick or diagnosed with COVID-19 has been in the space, cleaning is enough. You may choose to also disinfect depending on <u>certain conditions</u> or everyday practices required by your facility.

If more than 3 days have passed since the person who is sick or diagnosed with COVID-19 has been in the space, no additional cleaning (beyond regular cleaning practices) is needed.

If no known infections were reported from any patron or performance staff the janitorial staff (RBM) will commence cleaning of the whole Eccles Theater as per contract. Following each performance RBM staff wearing appropriate PPE will perform the standard post-performance cleaning service. After each area has been cleaned RBM staff will utilize a full surface sanitization procedure known as electrolysis disinfection. This process ensures that soft and hard surfaces are safe for use after the disinfection product has dried.

Between matinee performances RBM performs a selective cleaning service focusing on Delta Hall, all lobby areas, all public used restrooms and limited back of house areas. This service will be followed by an electrostatic disinfection treatment of the above areas.





The George S. and Dolres Dore Eccles Theater HVAC SARS-CoV2 Mitigation

Eccles Theater Facility Management team is committed to providing a safe, clean, and healthy environment for patrons, performers, and staff. The following is a brief overview of the Eccles Theater's HVAC system regarding SARS-CoV2 mitigation.

The heating ventilation and air-conditioning system in Eccles Theater are state of the art Temtrol factory fabricated custom air-handling units. Having been constructed to a LEED Gold standard Eccles Theater HVAC system is a primarily outside air-based system. This means the system prioritizes the use of outside filtered air for most of the building climate needs. Also, of note any recirculated interior air is once again passed through the filtration system before reentering the building. The Eccles Theater HVAC system incorporates 2-stage filtration. Stage one is a prefilter rated at MERV 10, stage two filtration is a high-capacity filter rated at MERV 15.

Eccles Theater HVAC system was designed to move large masses of air continually utilizing high CFM's. Eccles Theater Delta Hall and Delta Stage together total to roughly 800,000 cubic feet of space. The CFM capabilities of the air handler units servicing the Delta Hall and Delta Stage provide an air change per hour (ACH) of 6.87 Every hour the entire volume of air where patrons sit, the performance stage, and orchestra pit area is replaced 6 times. For our star dressing rooms the ACH is 3.3. The ensemble dressing rooms have an ACH of 3.5. Eccles Theater Grand Lobby's ACH is 2.6. Additional HEPA portable air filtration units are available in each dressing room, orchestra pit and cross hallways.







Eccles Theatre ACH Testing

Derek Shupe TBE 801.647.9316 dshupe@unvc.net

Eccles Theater ACH Testing

10.6.2021

Objective: Test the air flow from the 3 air handling systems serving the stage and seating areas of the venue and calculate the Air Exchange Rates (ACH) in both minimum and maximum outside air (OSA) settings.

Conditions: The filters had been recently changed with MERV 8 Pre-filters, but it is unclear as to the condition and rating of the final filters. The control system was manipulated manually to gain the settings for minimum and maximum OSA on all 3 units. Each handler has 100% economy cooling (100% OSA). The supply air for the level 1 and all 3 tiers in the seating areas is supplied from the floor diffusers and the air is returned to the ceiling. The stage is supplied from the 18' level above the stage floor and returned to the ceiling as well.

The minimum OSA set points for the air handlers are as follows:

AHU-4 1,500 CFM

AHU-3 6,600 CFM

AHU-10 6,660 CFM

There are flow stations on each OSA inlet to monitor and report the amount of OSA entering each air handler.

Ratings:

AHU-4 (Stage)
10,000 CFM of total air flow
AHU-3 (Seating Areas)
35,000 CFM of total air flow
AHU-10 (Seating Areas)
40,000 CFM of total air flow
Total for the stage and seating areas combined= 85,000 CFM

Test Data:

AHU-4= 10,741 CFM total air flow at maximum OSA Minimum OSA measured = 1,828 CFM Maximum OSA measured = 10,741 CFM

AHU-3= 35,303 CFM total air flow at maximum OSA Minimum OSA measured = 6,646 CFM Maximum OSA measured = 35,303 CFM

AHU-10= 45,566 CFM total air flow at maximum OSA Minimum OSA measured = 7,108 CFM Maximum OSA measured = 45,566 CFM

Calculations:

The actual cubic volume of the combined spaces (Stage and Seating Areas) = approximately 800,000 ft³.

Total CFM of OSA at **Maximum** OSA damper positions from all 3 air handlers = 91,610 CFM 91,610 CFM/800,000 ft³ = 0.114X60 = **6.87** OSA Air Changes per hour (ACH)

Total CFM of OSA at **Minimum** OSA damper positions from all 3 air handlers = 15,582 CFM 15,582/800,000 ft³ = 0.0194X60 = 1.17 Air changes per hour (ACH)





UNVC | UHS BECx Proposal

PAGE | 2 OF 2

Observations:

During our site visit it was noted that the air handlers AHU-3 and AHU-10 were operating on an input to ramp the fan speed based on a static pressure input that may be located in the plenums for the main floor and the 3 tiers. Perhaps the system may function better if the input to the VFD's was based on room temperature by averaging the several sensors in the space. Also, it may be a good idea to incorporate CO sensors in the return air to increase the air quality even though OSA may be commanded to minimum position and could open to reduce the CO levels.

AHU-3; during our testing we noticed a noise from the supply fan wall that sounds like a dry motor bearing. You may want to get this on your maintenance schedule to avoid any down time for this air handler.

The above data was compiled with some overrides to get the systems into the mode of operation to run the tests. When the system is in fully automatic mode, it may perform differently.

END.

Derek R. Shupe TBE