Wireless Survey Report

Node-4
Palace Theatre

08 AUGUST 2022

Meraki
Surveyor: Rory Wood

Wireless Survey Report

Palace Theatre, Manchester.

Survey requirements

Palace Theatre has multiple floors housing the auditorium, back of house, front of house and concessions areas. The auditorium houses 1955 guests when at full capacity.
The requirement was to survey the following: -

A. Existing wireless coverage
B. Complete coverage using additional access points (APs) except the auditorium.
C. Design a wireless solution within the auditorium.

Client Discovery Conversation

A client discovery conversation was had before the survey to allow all current issues to be raised concerning the Wireless network:

- Full coverage is not currently provided throughout the theatre.
- Sound and lighting engineers often come and set their own network up on a 2.4Ghz and 5Ghz Frequency during shows.

Procedure

Initially we logged onto the current wireless network and performed a first pass survey. This showed us the coverage of the existing wireless network and allowed us to identify areas with zero or weak wireless coverage.
Once complete we resurveyed these areas using a test access point (AP) to give greater coverage. This was done by placing a test AP in various locations and taking numerous readings throughout the building. Prior to the survey we were escorted by an ATG rep who indicated all the areas that were accessible and required coverage and where he would allow AP's to be installed.
Within the auditorium we placed test AP in locations throughout and recorded the coverage.

Data is recorded from the survey and saved to show heatmaps showing signal coverage, SNR etc. To allow adequate resilience in these results areas of coverage is limited to a minimum of -65dB.

Access

Due to the stage being set up for the show 'The Osmond's' access was not granted due to health and safety reasons.
Our software recorded that in the stalls directly in front of the stage, no APs were transmitting monitored withing a useable power level.

Results

From the first pass survey we found 48 existing Meraki AP's.
Currently the theatre uses:

- 48 APs on a Company and Guest network, transmitting on both 2.4 & 5Ghz frequencies.
- One more Meraki AP was found in the ceiling void above the Grand Tier but was not online (Photo provided below)
- Proposed AP8 and AP9 are based on size of the stage, despite not being able to survey.

These do not provide full coverage of the theatre.

In total for full wireless coverage 79 APs are required, breakdown below:
All areas except the auditorium 64 APs were required.
Within the auditorium we propose 15 APs be installed.

These are to be installed as below: -

No. APs	AP Name	Floor	Location
1	AP A1	Stalls	Orchestra Pit – Moved Centre Stage
2	AP A3	Stalls	Corner of Orchestra Pit
3	AP A4	Stalls	Side wall of Auditorium
4	AP A5	Stalls	Side wall of Auditorium
5	AP A8	Stalls	Back wall of Auditorium
6	AP A10	Stalls	Back wall of

			Auditorium
7	APA12	Stalls	Side wall of Auditorium
8	APA13	Stalls	Side wall of Auditorium
9	APA14	Stalls	Corner of Orchestra Pit
10	APA24	Circle	Moved to Rear Wall
11	APA25	Circle	Moved to Rear Wall
12	APA26	Circle	Moved to Rear Wall
13	APA36	Grand Tier	Moved to Rear Wall
14	APA37	Grand Tier	Moved to Rear Wall
15	APA38	Grand Tier	Moved to Rear Wall

Conclusion

To give full coverage throughout the building, 79 APs are required, this includes the auditorium.

Our Recommendations

- Within the auditorium we propose that the 15APs.
- Review the possible number of clients in each concession area to establish AP counts. Concession Locations highlighted in the table below.

- Monitor the concessions and auditorium APs during event times. This will allow a usage profile data to be collected and identify AP's that hit threshold levels. This information is crucial to locate areas requiring more bandwidth.
- Within the auditorium limit the APs transmitting 2.4Ghz to reduce co-channel interference
- Rewire all AP's using a Cat6a system to remove the bottleneck.

The concessions area includes 26 APs to support high volumes using the network. These need to be reviewed by the theatre to see possible amounts of clients for each location.

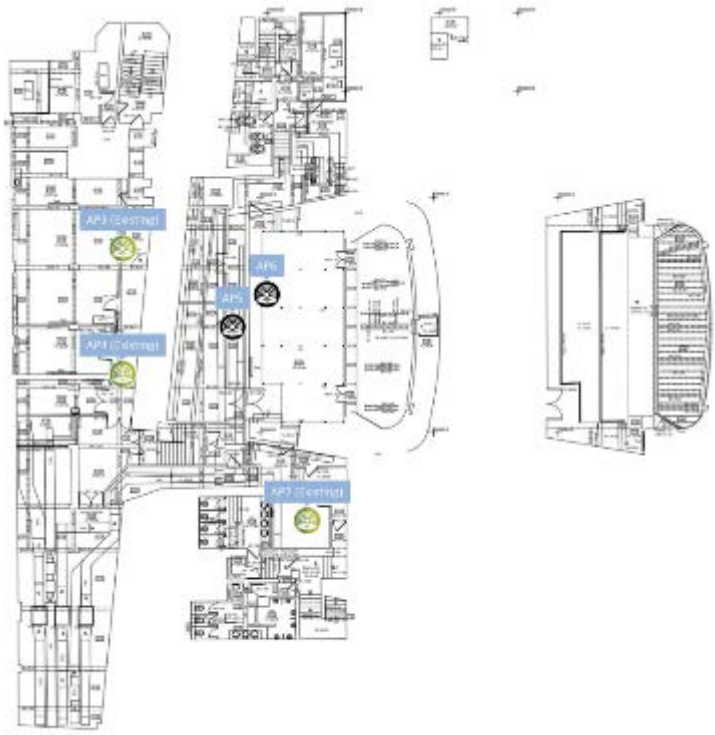
Area No	AP Name	Floor	Location	Possible clientele amount?
1	AP12	Stalls Floor	Stalls Bar	
2	AP13	Stalls Floor	Stalls Lobby	
3	AP14	Stalls Floor	Stalls Lobby	
4	AP15	Stalls Floor	Stalls Bar	
5	AP18	Ground Floor	Circle Boxes	
6	AP19	Ground Floor	Box Office	
7	AP20	Ground Floor	Box Office	
8	AP21	Ground Floor	Main Entrance Foyer	
9	AP22	Ground Floor	Main Entrance Foyer	
10	AP23	Ground Floor	Main Entrance Foyer	
11	AP24	Ground Floor	Main Entrance Foyer	
12	AP25	Ground Floor	Circle Boxes	
13	AP30	Ground Floor	Stage Door Bar	
14	AP31	Ground Floor	Stage Door Bar	
15	AP31	Circle Floor	Upper Circle Boxes	
16	AP38	Circle Floor	Upper Circle Boxes	
17	AP41	Circle Floor Two	Ambassador Lounge	
18	AP43	Circle Floor Two	Circle Bar	
19	AP44	Circle Floor Two	Circle Bar	
20	AP45	Circle Floor Two	Circle Lobby	
21	AP46	Circle Floor Two	Circle Lobby	
22	AP47	Circle Floor Two	Circle Bar	
23	AP48	Circle Floor Two	Circle Bar	
24	AP49	Circle Floor Two	Ambassador Lounge	
25	AP63	Grand Tier Two	Grand Tier Bar	
26	AP64	Grand Tier Two	Grand Tier Lobby	

Existing Sub Stage AP Locations

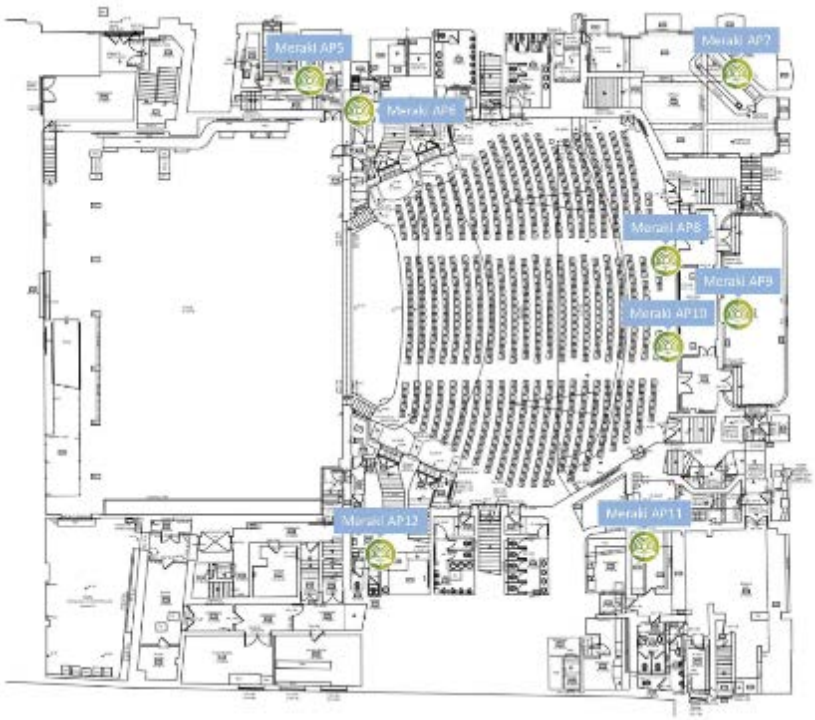
Proposed Sub Stage AP Locations

Existing Basement floor AP Locations

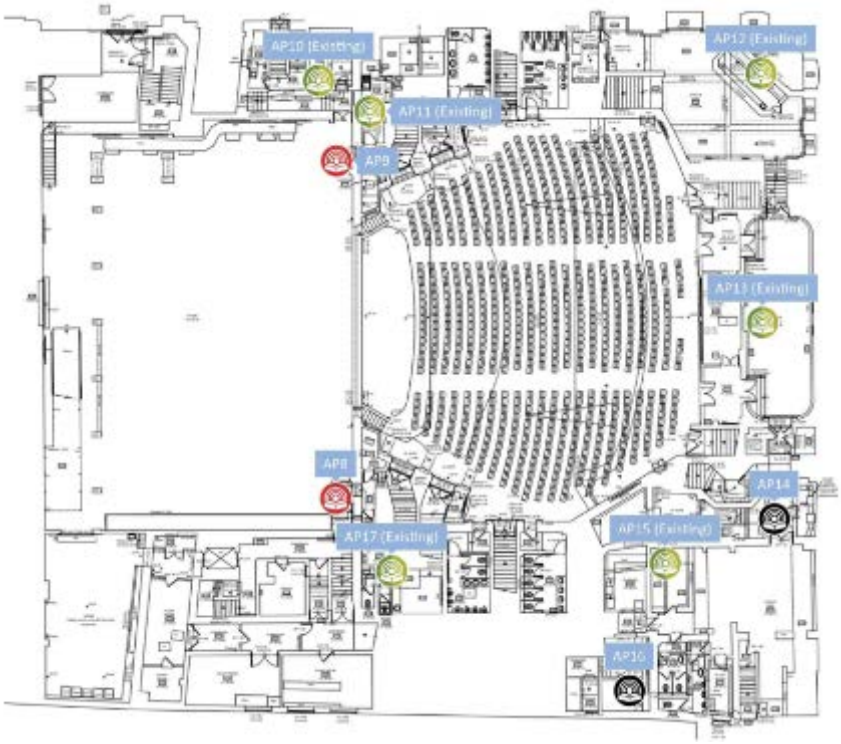
Proposed Basement floor AP Locations



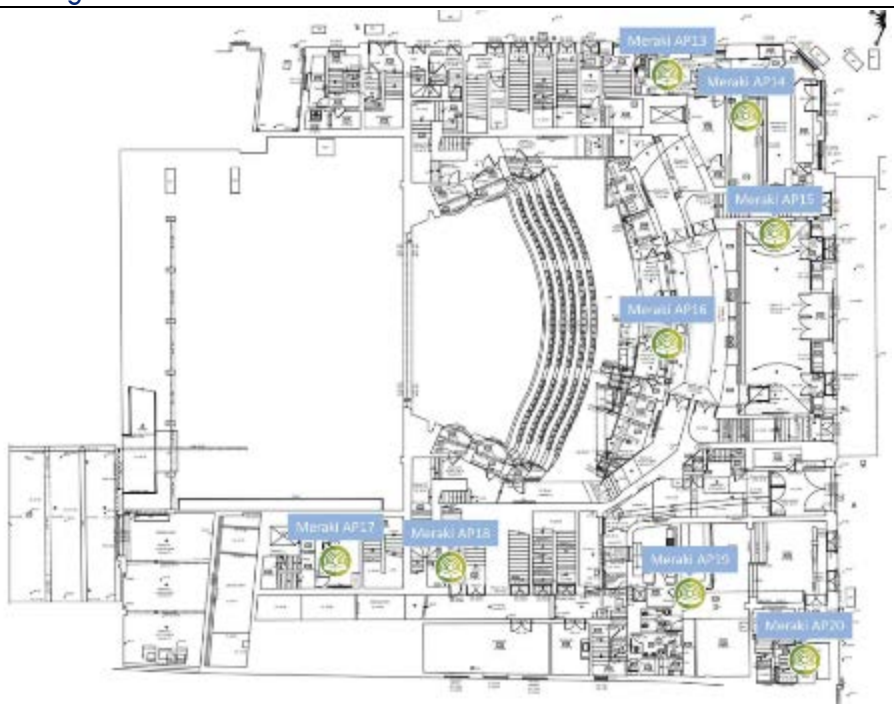
Existing Stalls Floor AP Locations



Proposed Stalls Floor AP Locations

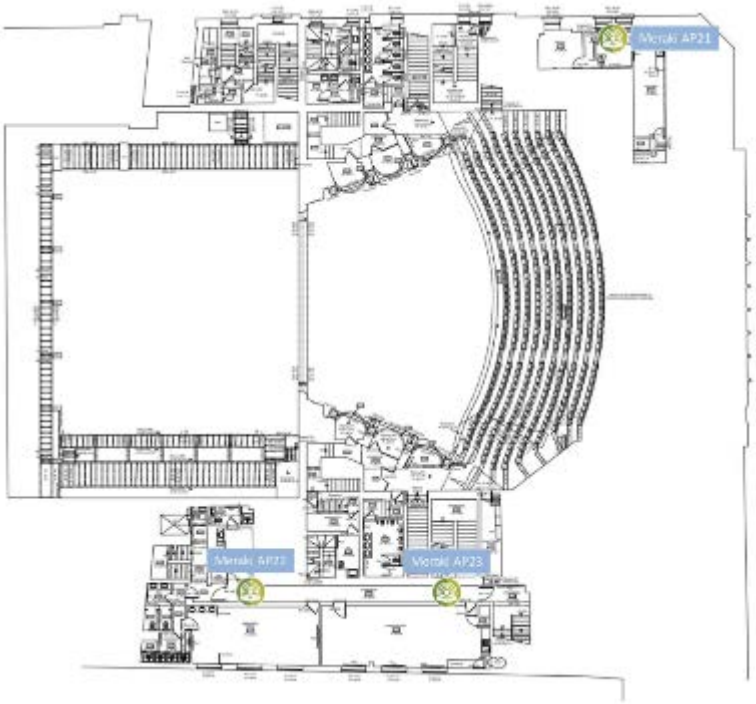


Existing Ground floor AP Locations

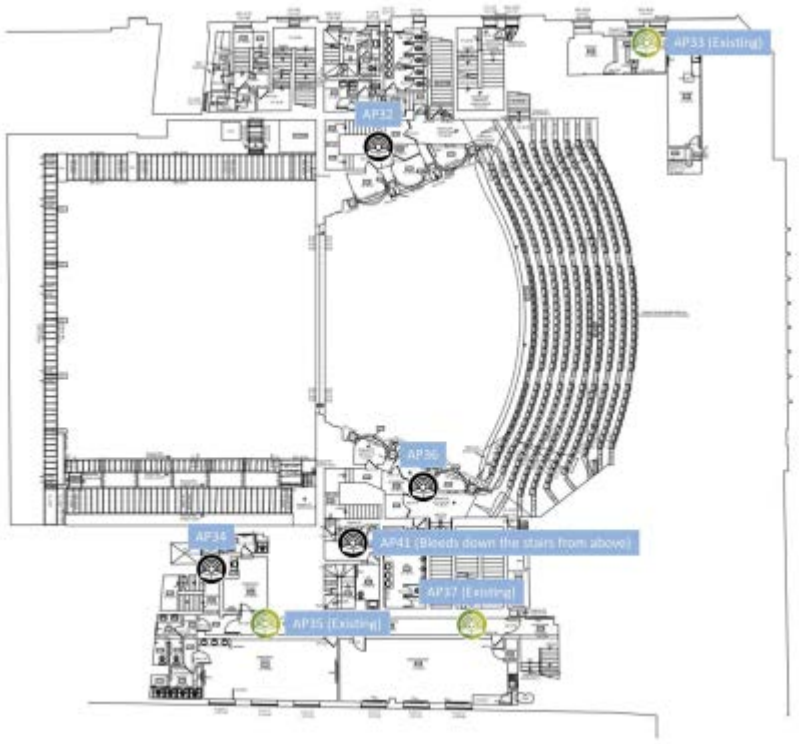


Proposed Ground floor AP Locations

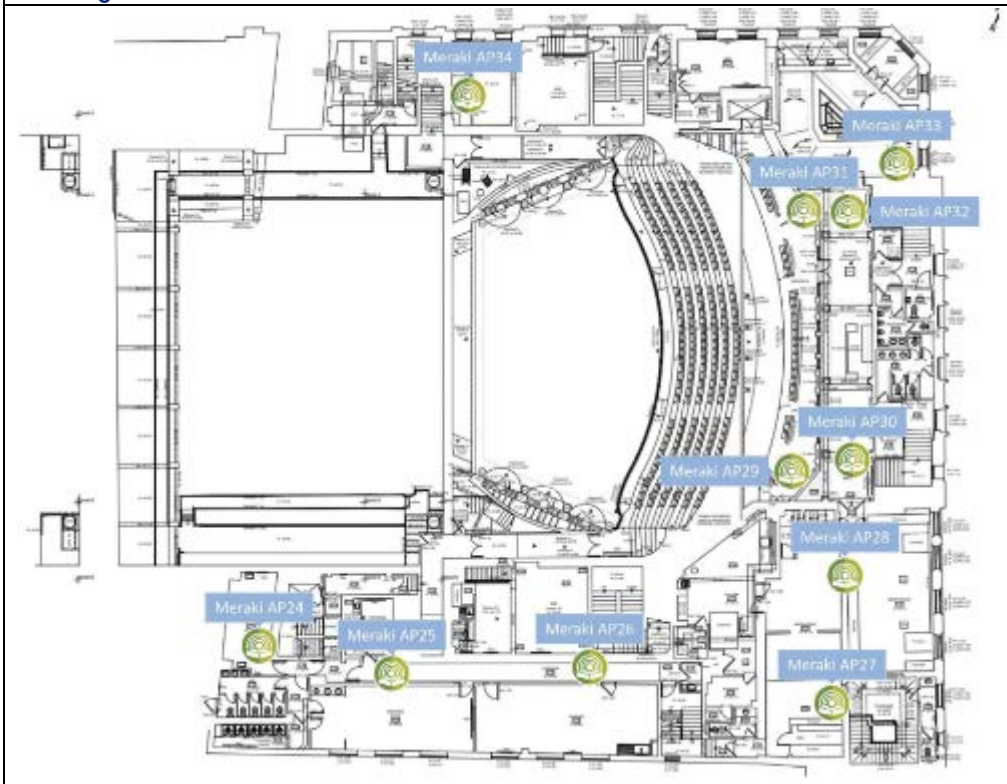
Existing Circle floor One AP Locations



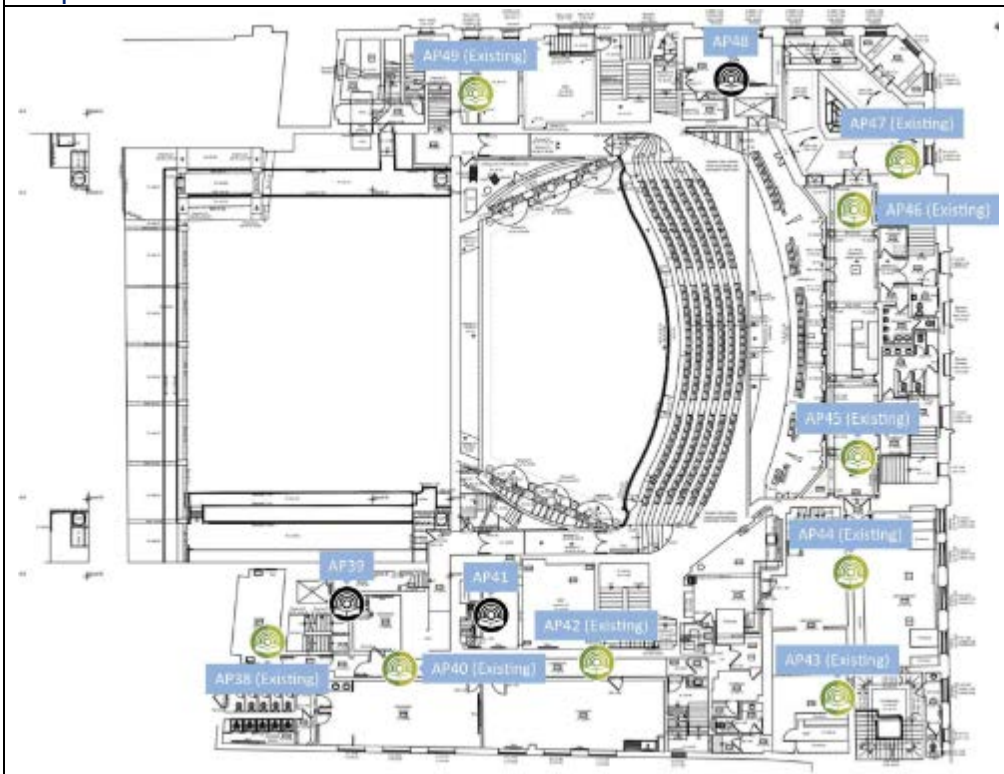
Proposed Circle Floor One AP Locations



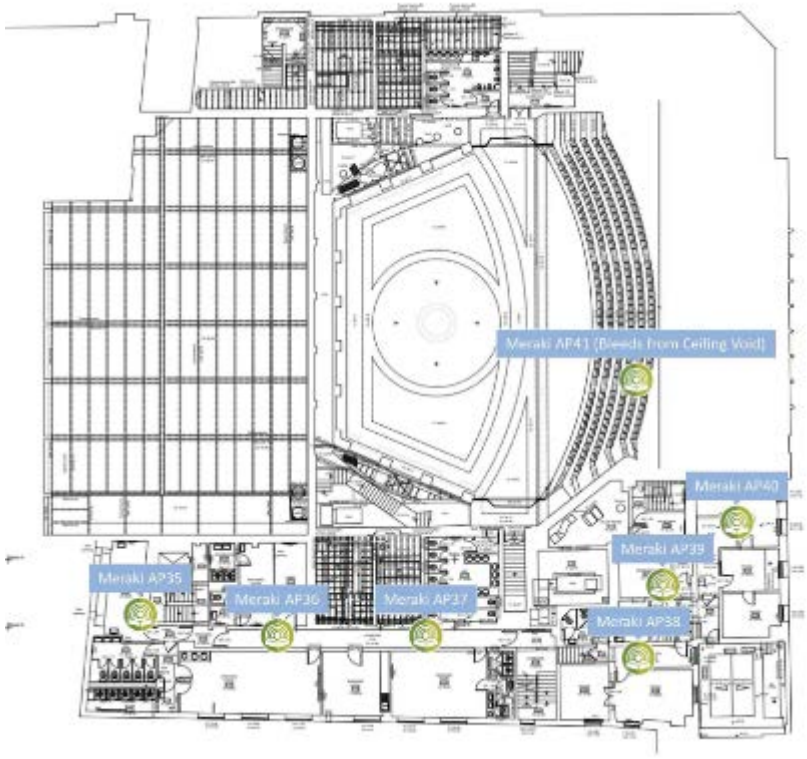
Existing Circle floor Two AP Locations



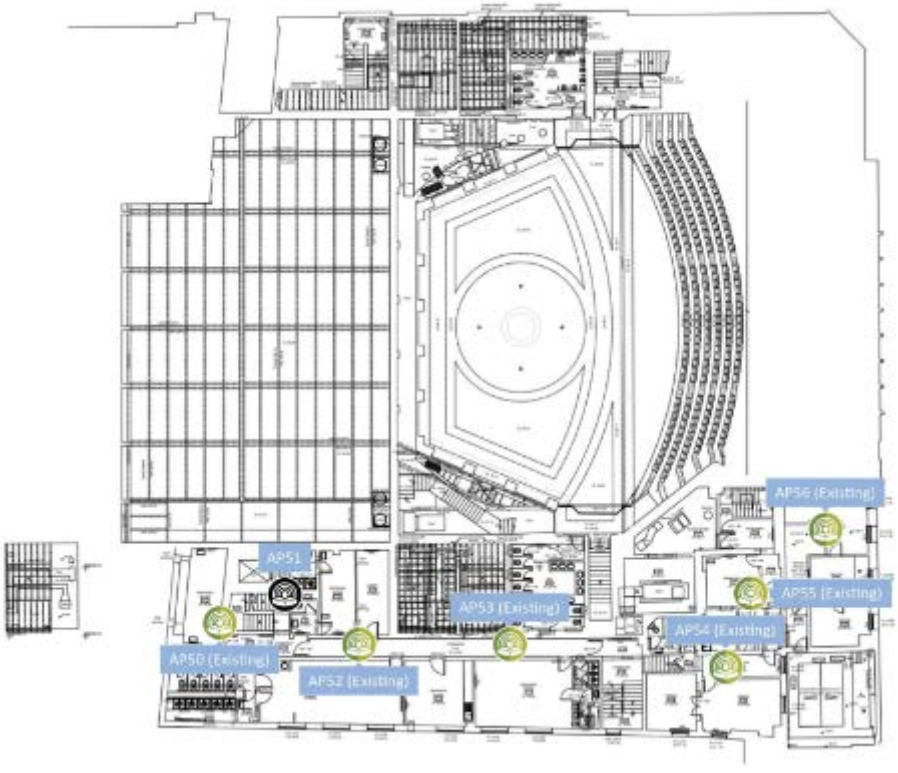
Proposed Circle floor Two AP Locations



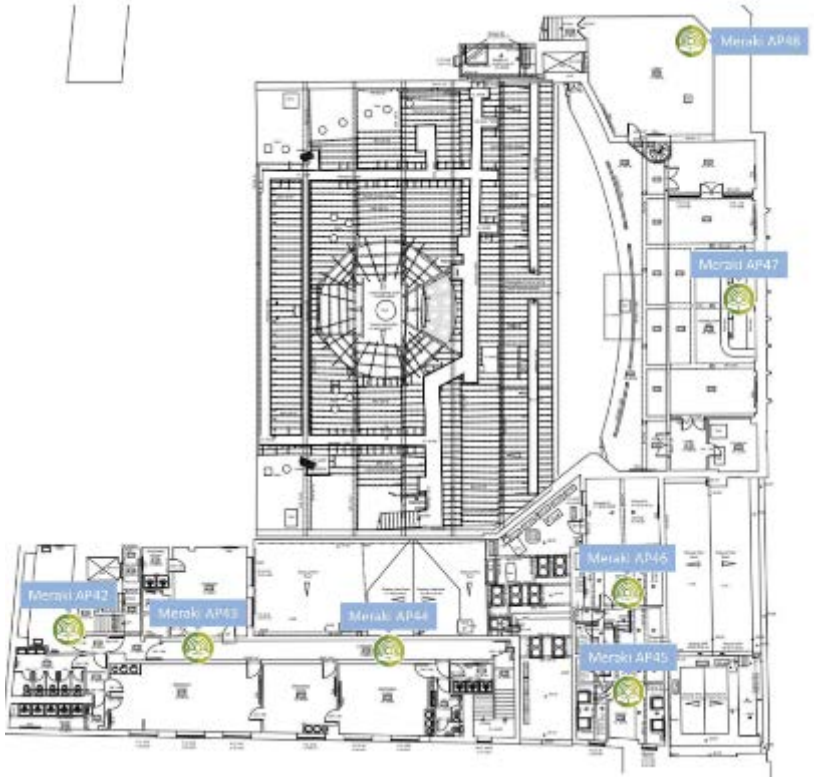
Existing Grand Tier floor One AP Locations



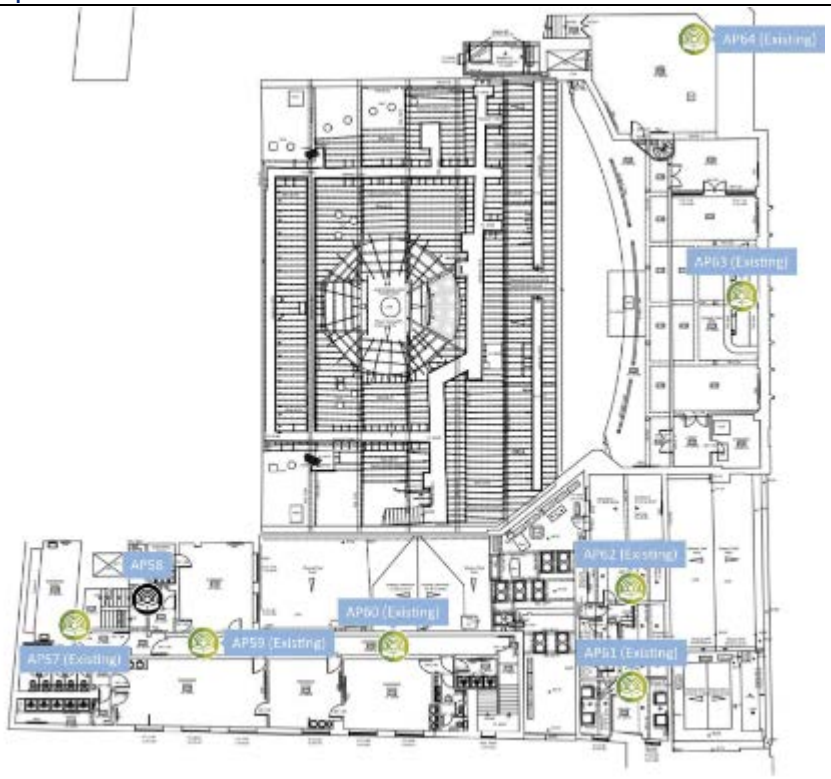
Proposed Grand Tier floor One AP Locations



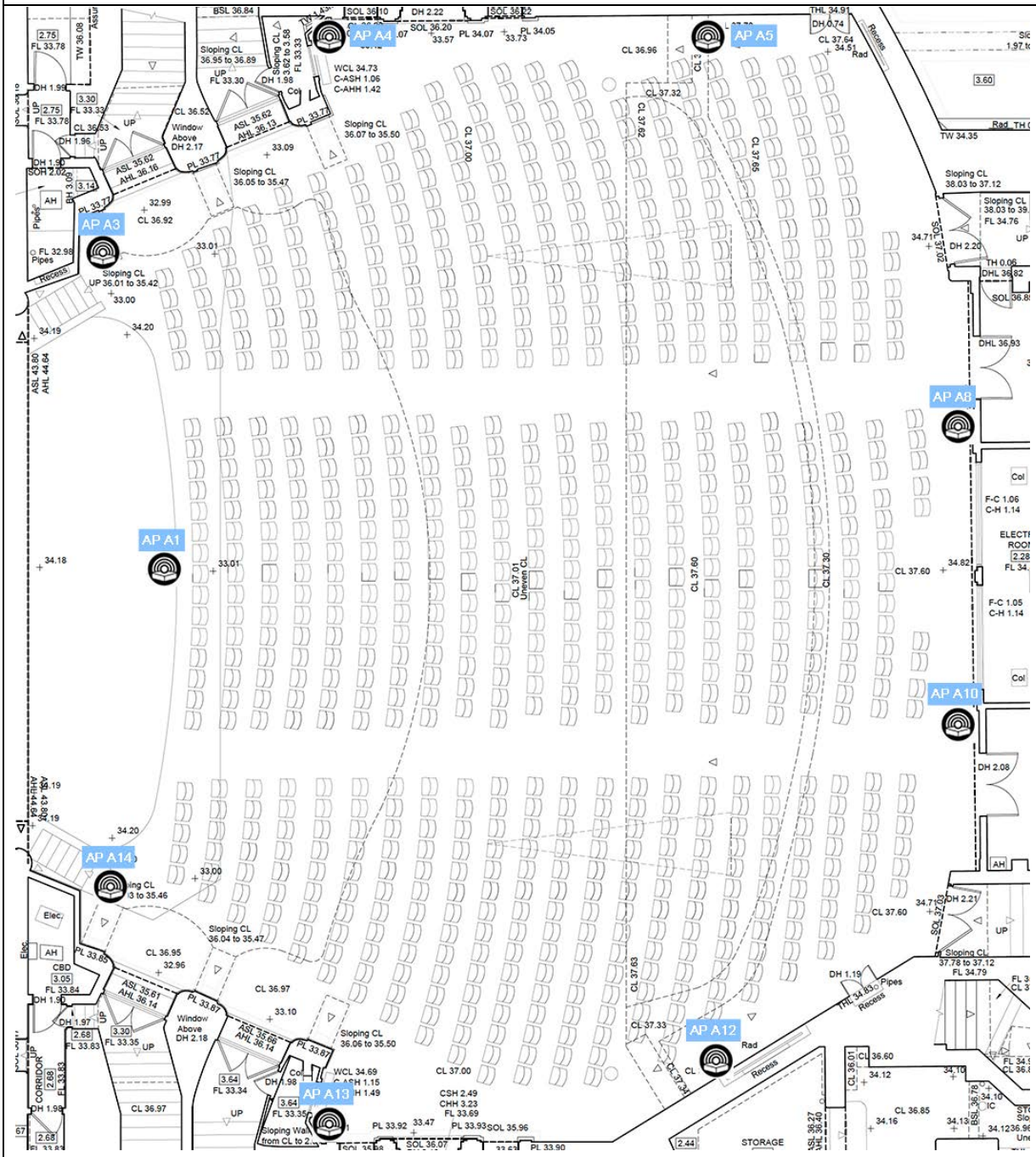
Existing Grand Tier floor Two AP Locations



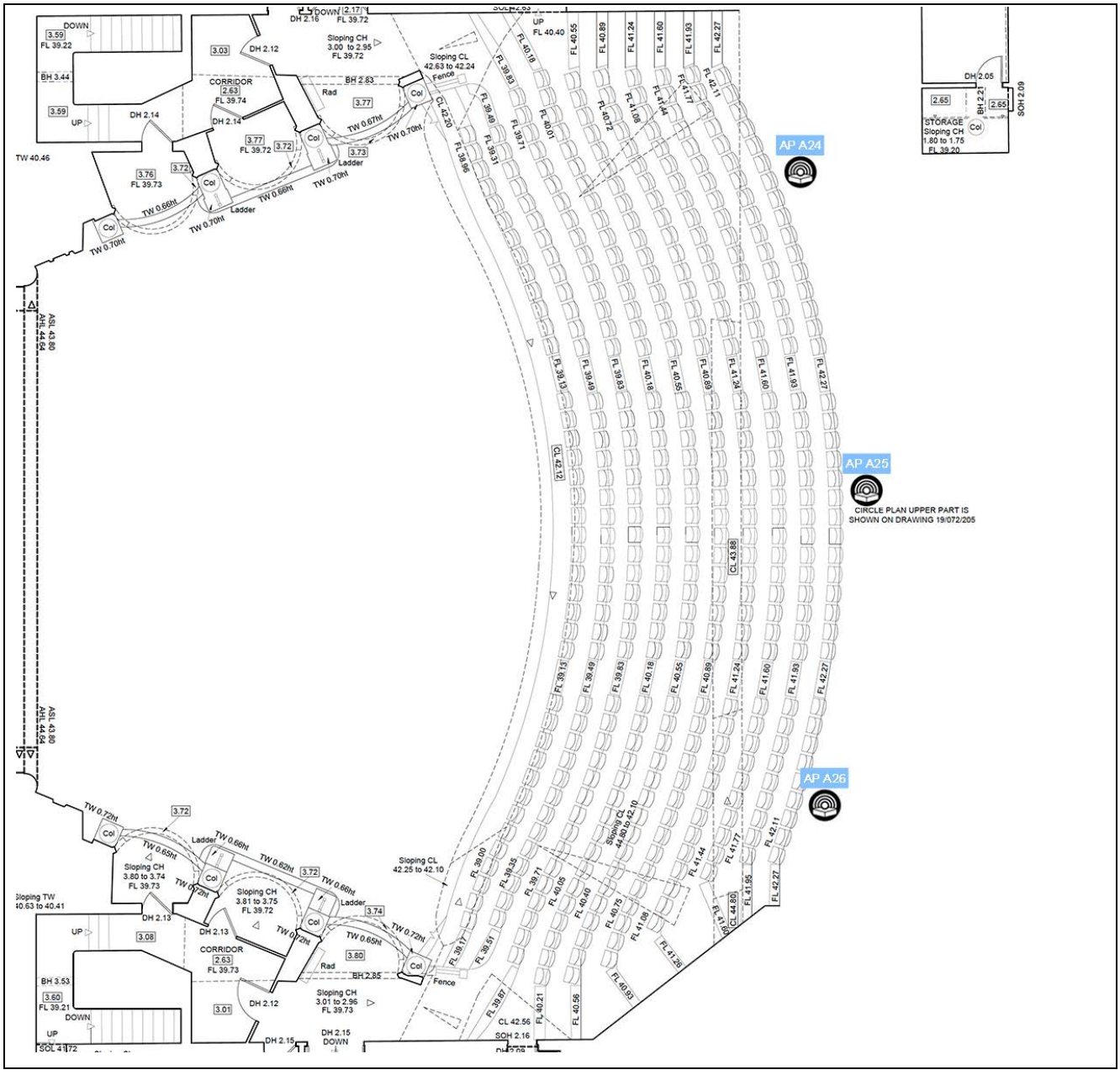
Proposed Grand Tier floor Two AP Locations

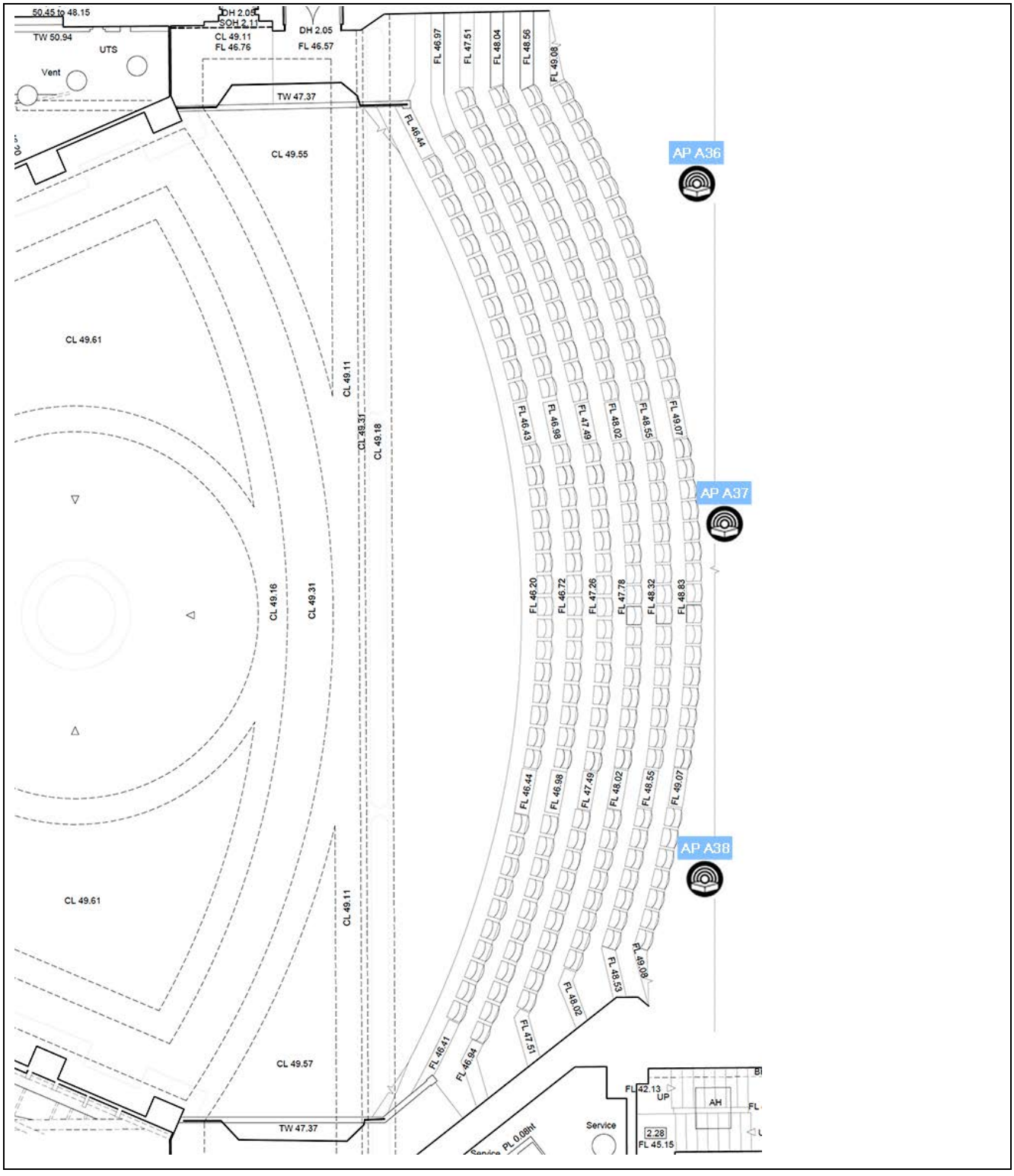


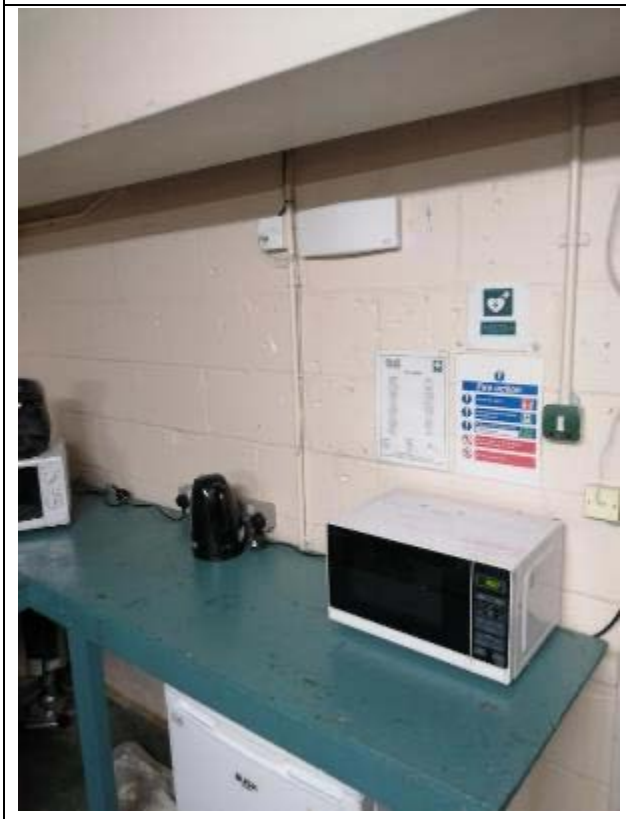
Stalls Auditorium

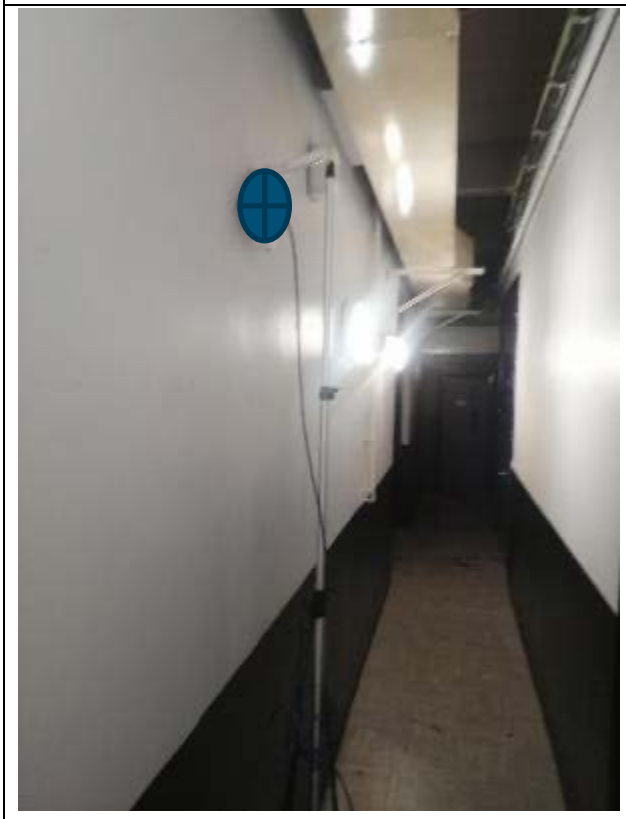
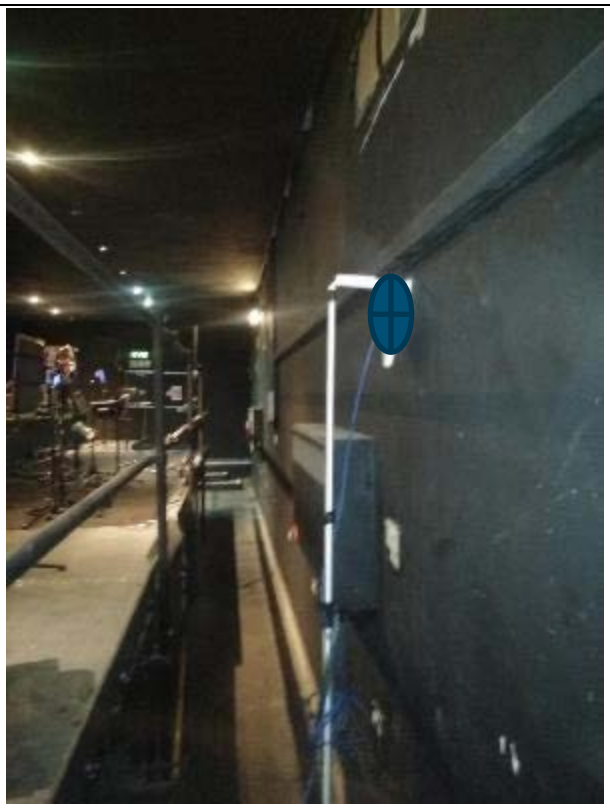
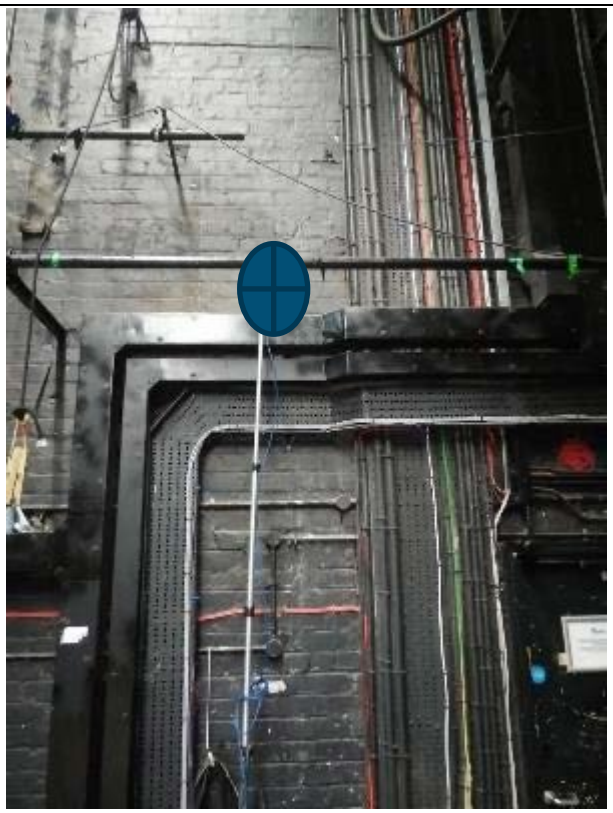


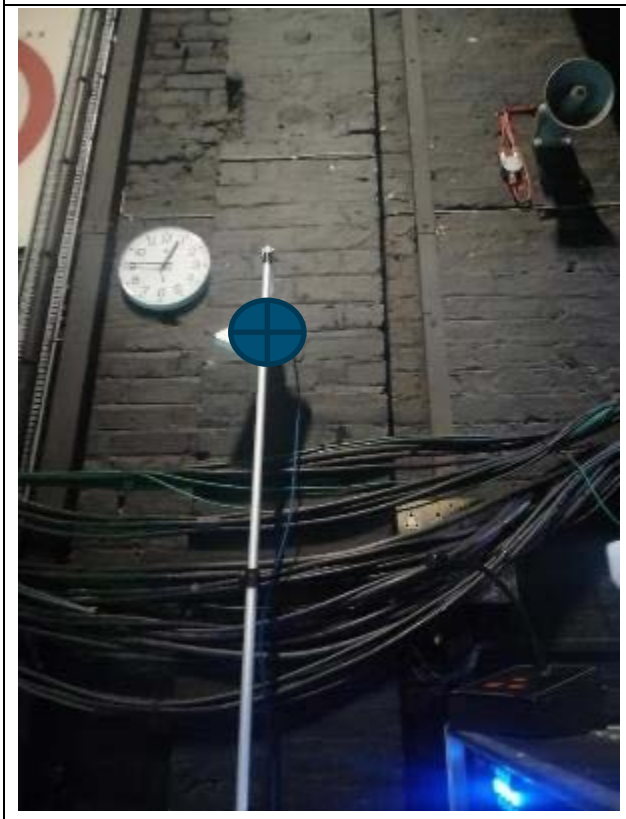
Circle Auditorium


AP A24
AP A25
CIRCLE PLAN UPPER PART IS SHOWN ON DRAWING 19/072/205
AP A26
CORRIDOR
STORAGE
Sloping CH 1.80 to 1.75
FL 39.20
Sloping CH 3.00 to 2.95
FL 39.72
Sloping CL 42.63 to 42.24
Fence
Sloping CL 42.25 to 42.10
Sloping CH 3.80 to 3.74
FL 39.73
Sloping CH 3.81 to 3.75
FL 39.72
Sloping CH 3.01 to 2.96
FL 39.73
Sloping TW 40.63 to 40.41
CL 42.20
CL 42.12
CL 43.88
CL 42.56
SOH 2.16
SOH 2.09
DH 2.05
DH 2.12
DH 2.13
DH 2.14
DH 2.15
Ladder
Fence
Rad
Col
UP
DOWN


50.45 to 48.15
TW 50.94
UTS
Vent
DH 2.08
SOH 2.11
CL 49.11
FL 46.76
DH 2.05
FL 46.57
TW 47.37
CL 49.55
CL 49.61
CL 49.11
CL 49.31
CL 49.18
CL 49.16
CL 49.31
CL 49.61
CL 49.11
CL 49.57
TW 47.37
FL 46.44
FL 46.97
FL 47.51
FL 48.04
FL 48.56
FL 49.08
AP A36
AP A37
AP A38
FL 46.43
FL 46.98
FL 47.49
FL 48.02
FL 48.55
FL 49.07
FL 46.20
FL 46.72
FL 47.26
FL 47.78
FL 48.32
FL 48.83
FL 46.44
FL 46.98
FL 47.49
FL 48.02
FL 48.55
FL 49.07
FL 46.41
FL 46.94
FL 47.51
FL 48.02
FL 48.53
FL 49.08
FL 42.13
UP
AH
Service
2.28
FL 45.15
PL 0.08ht

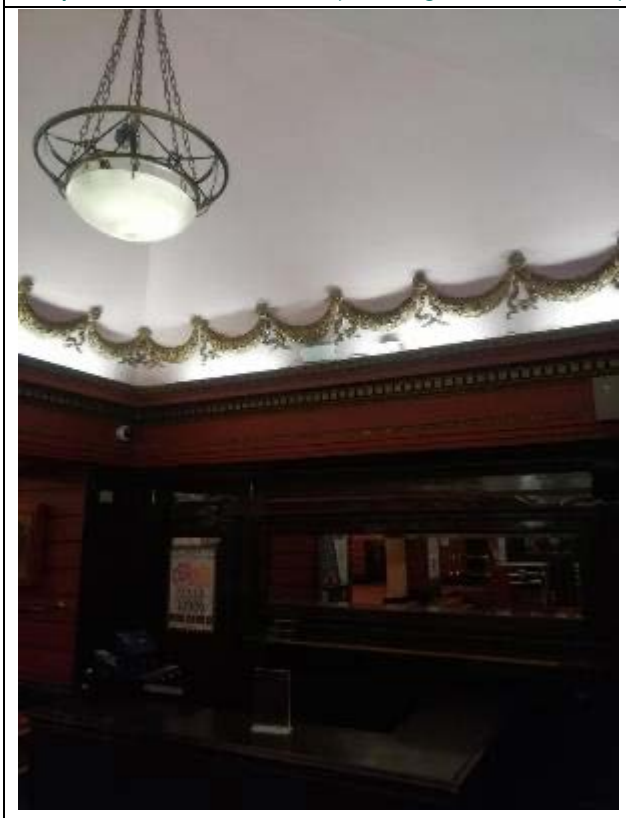
Proposed Location AP1 (Existing Meraki AP1)	Location AP2
	
Proposed location AP3 (Existing Meraki AP2)	Proposed location AP4 (Existing Meraki AP3)

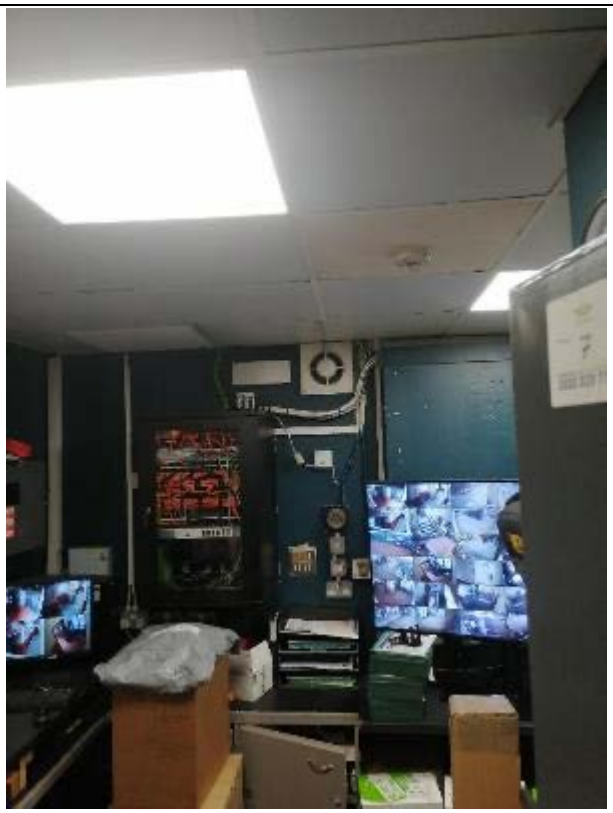
Proposed Location AP5	Location AP6
	
Proposed location AP7 (Existing Meraki AP4)	**Proposed location AP8**
	

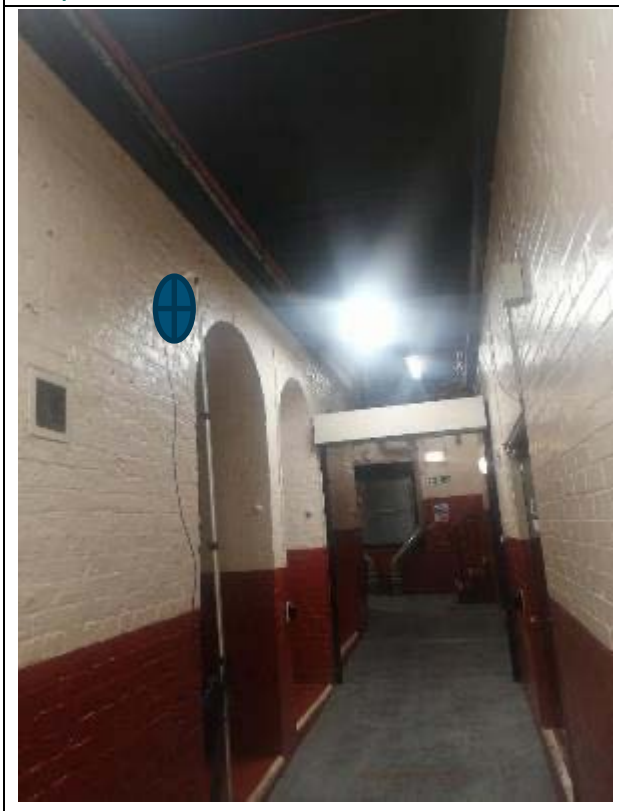
Proposed location AP9	Proposed location AP10 (Existing Meraki AP5)
	
Proposed location AP11 (Existing Meraki AP6)	**Proposed location AP12 (Existing Meraki AP7)**

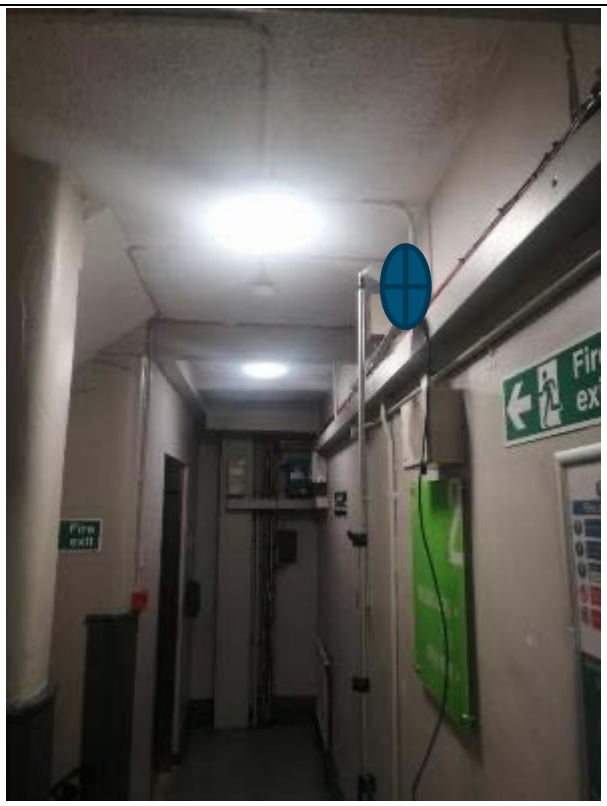
Proposed location AP13 (Existing Meraki AP9)	Proposed location AP14
Proposed location AP15 (Existing Meraki AP11)	**Proposed location AP16**

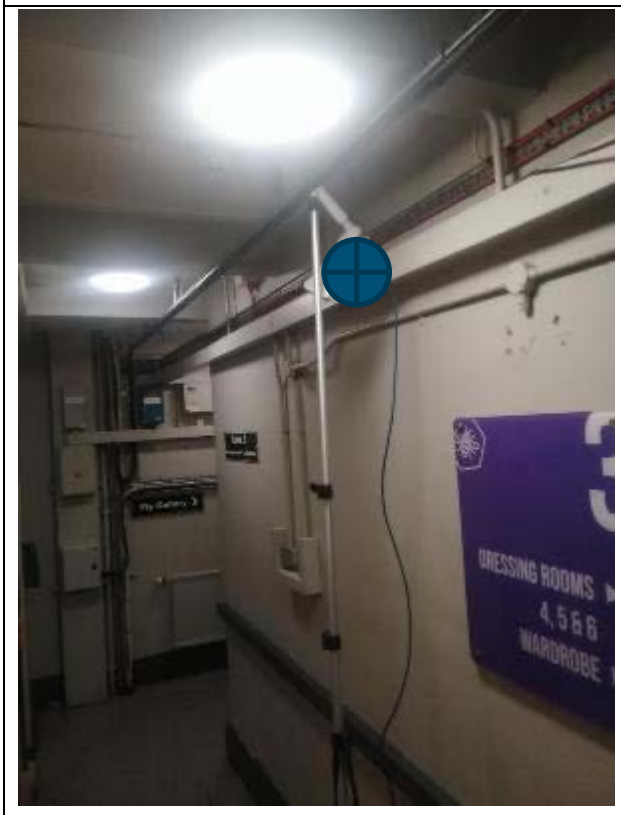
Proposed location AP17 (Existing Meraki AP12)	Proposed location AP18
Proposed location AP19 (Existing Meraki AP13)	**Proposed location AP20 (Existing Meraki AP14)**

Proposed location AP21 (Existing Meraki AP15)	Proposed location AP22
	
Proposed location AP23 (Existing Meraki AP16)	**Proposed location AP24**

Proposed Location AP25	Proposed location AP26
Proposed location AP27 (Existing Meraki AP17)	**Proposed location AP28 (Existing Meraki AP18)**
	

Proposed location AP29	Proposed location AP30 (Existing Meraki AP19)
	
Proposed location AP31 (Existing Meraki AP20)	**Proposed location AP32**

Proposed location AP33 (Existing Meraki AP21)	Proposed location AP34
	
Proposed location AP35 (Existing Meraki AP22)	Proposed location AP36

Proposed location AP37 (Existing Meraki AP23)	Proposed location AP38 (Existing Meraki AP24)
Proposed location AP39	**Proposed location AP40 (Existing Meraki AP25)**
	

Proposed location AP41	Proposed location AP42 (Existing Meraki AP26)
Proposed location AP43 (Existing Meraki AP27)	**Proposed location AP44 (Existing Meraki AP28)**

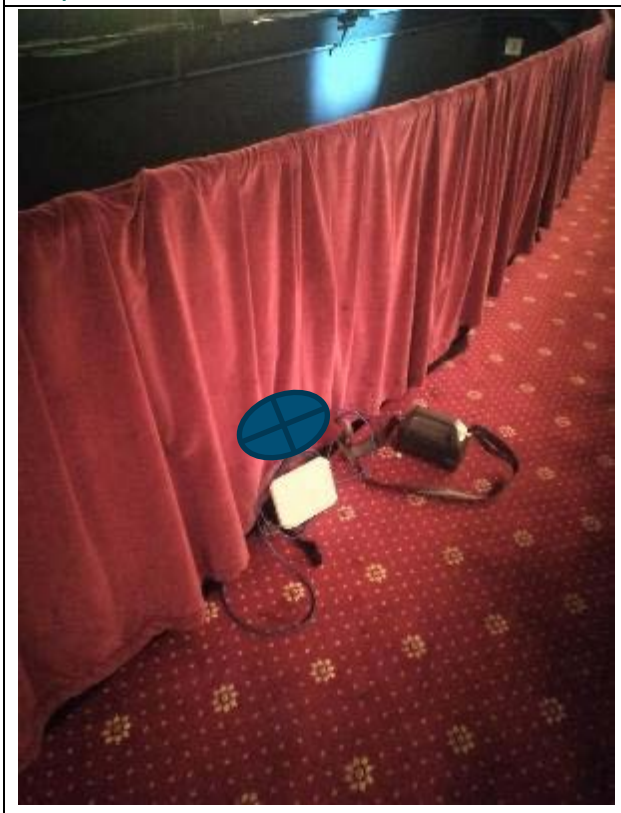
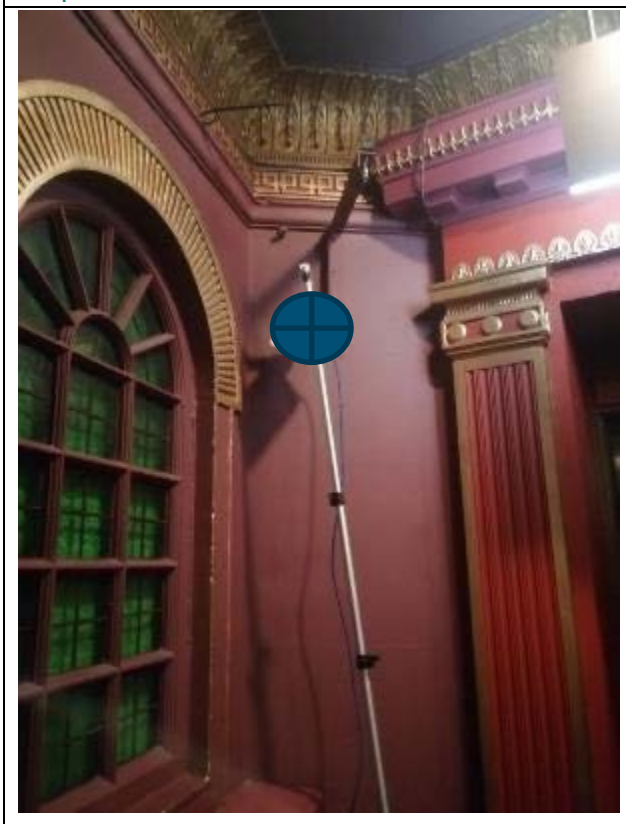
Proposed location AP45 (Existing Meraki AP30)	Proposed location AP46 (Existing Meraki AP32)
Proposed location AP47 (Existing Meraki AP33)	**Proposed location AP48**

Proposed location AP49 (Existing Meraki AP34)	Proposed location AP50 (Existing Meraki AP35)
Proposed location AP51	Proposed location AP52 (Existing Meraki AP36)

Proposed location AP53 (Existing Meraki AP37)	Proposed location AP54 (Existing Meraki AP38)
Proposed location AP55 (Existing Meraki AP39)	Proposed Location AP56 (Existing Meraki AP40)

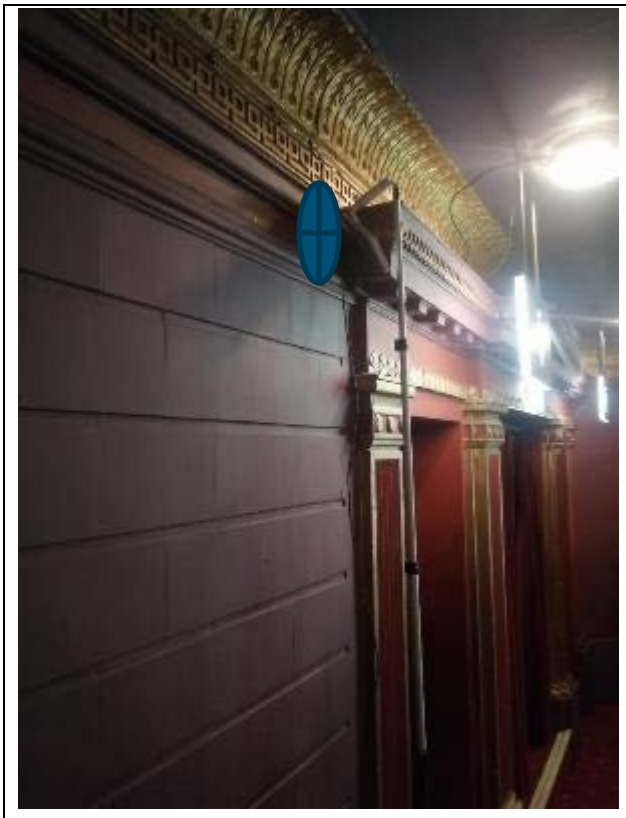
Proposed location AP57(Existing Meraki AP42)	Proposed location AP58
Proposed location AP59 (Existing Meraki AP43)	Proposed Location AP60 (Existing Meraki AP44)

Proposed location AP61 (Existing Meraki AP45)	Proposed location AP62 (Existing Meraki AP46)
Proposed location AP63 (Existing Meraki AP47)	Proposed Location AP64 (Existing Meraki AP48)

Proposed location AP A1	Proposed location AP A3
	
Proposed location AP A4	**Proposed location AP A5**
	

Proposed location AP A8	Proposed location AP A10

Proposed location AP A12	Proposed location AP A13

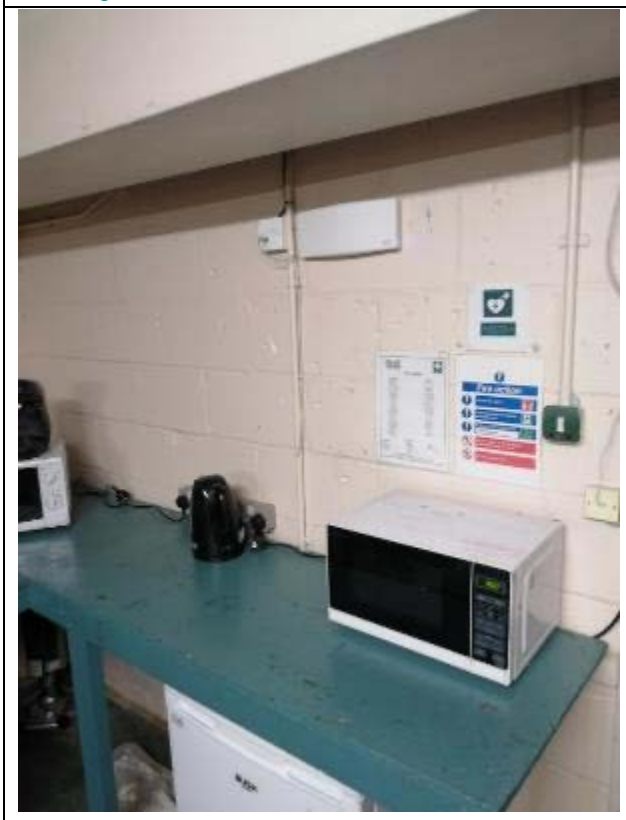


Proposed location AP A14	Proposed location AP A24
	This AP has been relocated to the rear wall. No image currently available.

Proposed location AP A25	Proposed location AP A26
This AP has been relocated to the rear wall. No image currently available.	This AP has been relocated to the rear wall. No image currently available.

Proposed location AP A36	Proposed location AP A37
This AP has been relocated to the rear wall. No image currently available.	This AP has been relocated to the rear wall. No image currently available.

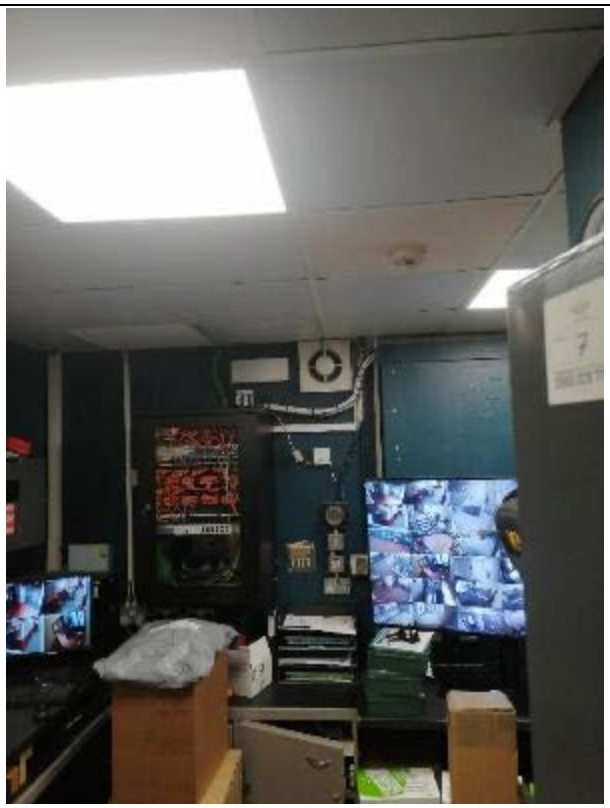
Proposed location AP A38
This AP has been relocated to the rear wall. No image currently available.

Existing Location Meraki AP1	Existing Location Meraki AP2
	
Existing Location Meraki AP3	**Existing Location Meraki AP4**

Existing Location Meraki AP5	Existing Location Meraki AP6
Existing Location Meraki AP7	**Existing Location Meraki AP8**

Existing Location Meraki AP9	Existing Location Meraki AP10
Existing Location Meraki AP11	**Existing Location Meraki AP12**

Existing Location Meraki AP13	Existing Location Meraki AP14
Existing Location Meraki AP15	**Existing Location Meraki AP16**

Existing Location Meraki AP17	Existing Location Meraki AP18
	
Existing Location Meraki AP19	**Existing Location Meraki AP20**

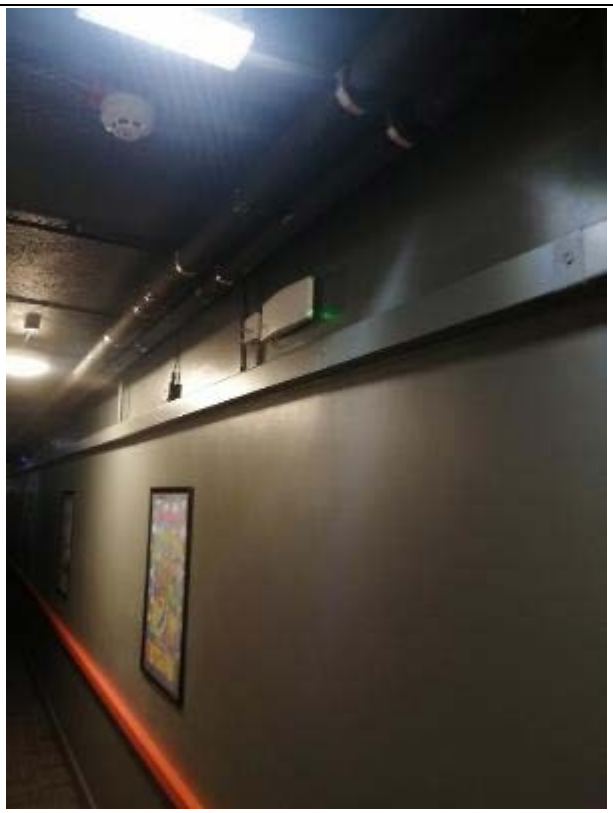
Existing Location Meraki AP21	Existing Location Meraki AP22
Existing Location Meraki AP23	**Existing Location Meraki AP24**

Existing Location Meraki AP25	Existing Location Meraki AP26
Existing Location Meraki AP27	**Existing Location Meraki AP28**

Existing Location Meraki AP29	Existing Location Meraki AP30
Existing Location Meraki AP31	**Existing Location Meraki AP32**

Existing Location Meraki AP33	Existing Location Meraki AP34
Existing Location Meraki AP35	Existing Location Meraki AP36

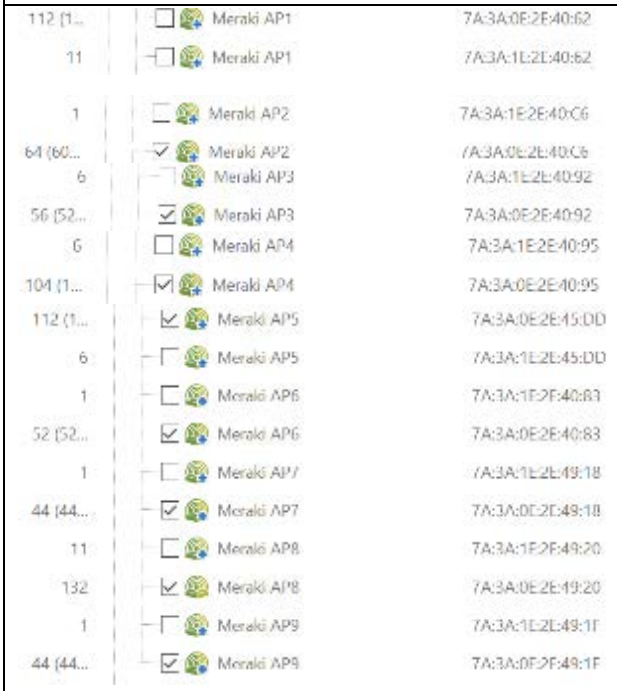
Existing Location Meraki AP37	Existing Location Meraki AP38
Existing Location Meraki AP39	**Existing Location Meraki AP40**

Existing Location Meraki AP41	Existing Location Meraki AP42
Existing Location Meraki AP43	**Existing Location Meraki AP44**
	

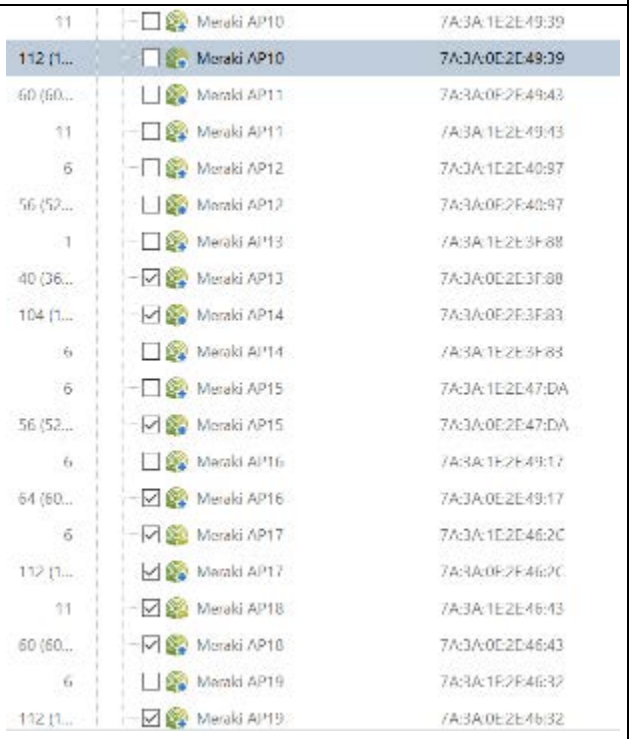
Existing Location Meraki AP45	Existing Location Meraki AP46
Existing Location Meraki AP47	**Existing Location Meraki AP48**

Existing Location Meraki AP Offline	

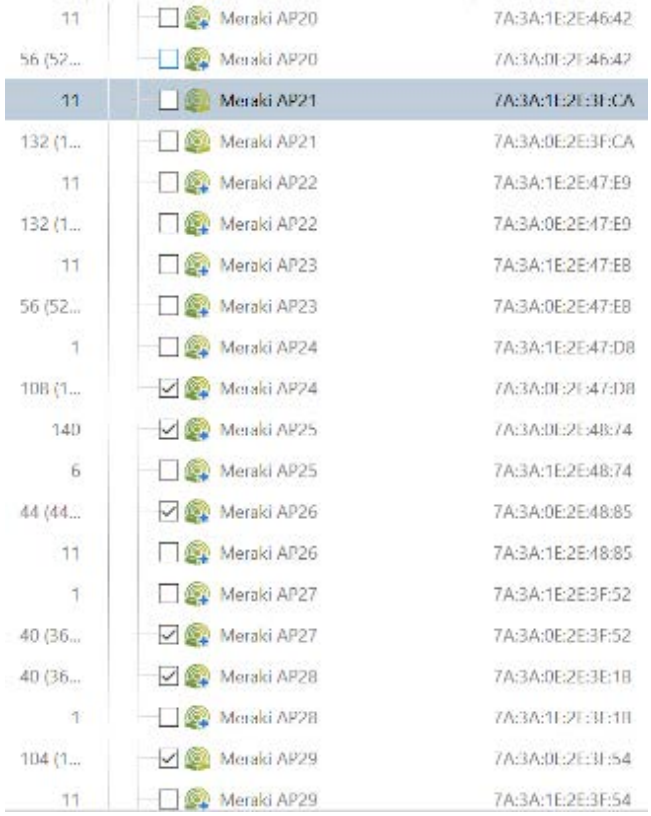
Existing AP 1-9 Mac Addresses



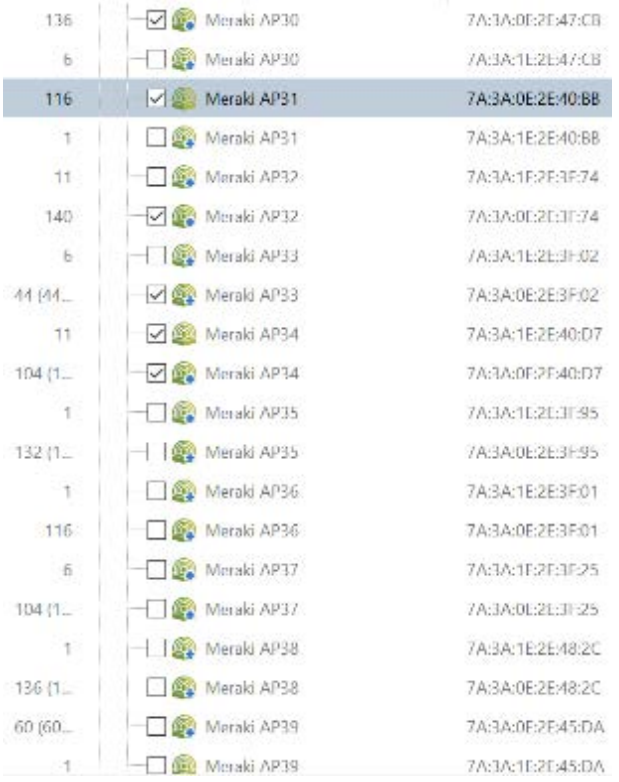
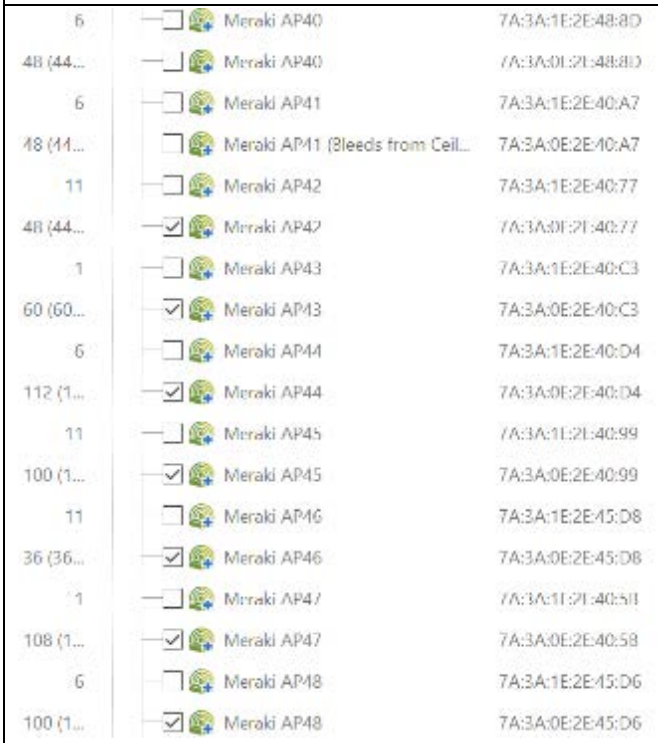
Existing AP10-19 Mac Address



Existing AP 20-29 Mac Addresses



Existing AP 30-39 Mac Addresses



Existing AP 40-48 Mac Addresses