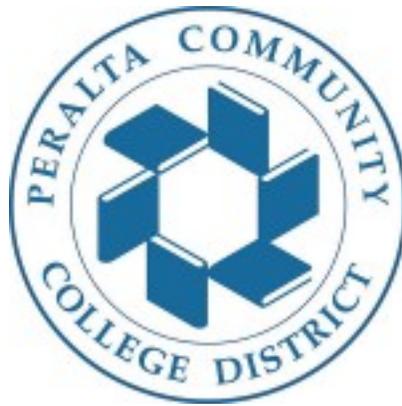


Executive Summary of the Berkeley City College

WLAN Project

Michael Dioquino

Director of Technical Services at:



Submitted by Ed Padilla, NE Systems Incorporated

Wednesday, February 19, 2015

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Executive Summary Berkeley City College Wireless LAN upgrade Project

This executive summary is to provide an understanding of the cost in implementing new core, firewall, and wireless local area network (WLAN) infrastructure at Berkeley City College.

It is the understanding of NE Systems Inc. the project is not to exceed the amounts specified below:

Hardware: \$238,521.54

Services: \$49,964.87

Project Total: \$288,486.41

Annual Maintenance Costs after Year 1: \$15,562.30

Project Cost Summary:

Hardware: \$238,521.54

Hardware included satisfies the requirements:

1. High capacity redundant core router equipment to:
 - a. Accommodate the new high speed WLAN infrastructure
 - b. Ensure Internet and Berkeley City College resources are presented at 99.999 or five nines “up” to both staff and students.
 - c. Support a lower power footprint of the current core router architecture at Berkeley City College.
2. High capacity redundant Unified Threat Management (UTM) security appliances to:
 - a. Ensure both wired and WLAN traffic will have secure access to the Internet by Berkeley City College staff and students.
 - b. Ensure secure access to district resources by Berkeley City College staff.
 - c. Ensure advanced threat protection of the Berkeley City College network traffic.
3. High speed Wireless Local Area Network equipment to:
 - a. Provide complete coverage to Berkeley City College staff and students.
 - b. Provide high-speed wireless connectivity to Berkeley City College staff and students.
 - c. Provide high capacity wireless connectivity to Berkeley City College staff and students.
 - d. Provide wireless differentiated secure access to Berkeley City College staff users.

Services: \$49,964.87

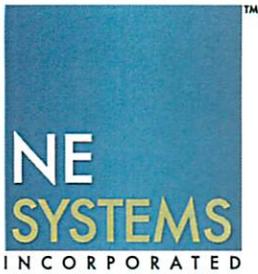
Services included satisfies the requirement of providing Berkeley City College a completely working solution, while providing IT staff a complete understanding and knowledge transfer.

These services included are the:

1. Network core equipment installation and programming services.
2. Firewall equipment installation and programming services.
3. Power over Ethernet edge switch equipment installation and programming services.
4. WLAN equipment installation and programming services.

Closing:

The executive summary provided in this document is provided to Peralta Community College District to provide a summary of costs. NE Systems Inc. looks forward in providing the same level of service other educational institutions have enjoyed for the past 11 years.



Any Network / Any Application

Company Background:

NE Systems Incorporated

Principals:

Neal Rydal, President

Ed Padilla, Chief Executive Officer

Corporate Headquarters:

25106 Barnhill Road, Santa Clarita, CA.

(661) 288-7888

Year Established:

September 2003.

Contracts Held:

California Multiple Award Schedule (CMAS), Western States Contract Alliance (WSCA), General Services Administration (GSA), Pennsylvania Education Purchasing Program for Microcomputers (PEPPM) ** PEPPM is now a national contract.

Certified Small Business.***

Website:

www.ne-systems.com

With over 20 years of combined experience in IT and computer networking technology, NE Systems understands the increasing demands on IT managers, especially in government, education and healthcare, to bring a project home under a tight budget, while also meeting expectations of strict online security and privacy. We have a proven track record of successfully working with educational institutions, healthcare providers, government organizations, and businesses throughout California.

25106 Barnhill Road

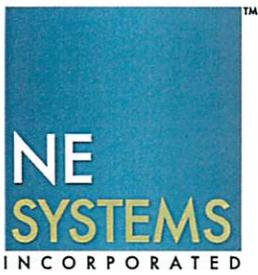
Santa Clarita, CA 91350

Phone: 661.288.7888

Fax: 661.554.7304

info@ne-systems.com

www.ne-systems.com



Any Network / Any Application

Community Colleges References:

Antelope Valley College: Client since 2008.

Rio Hondo College, Client since 2003.

Santa Clarita Community College District, Client since 2003.

Higher Education References

University of Southern California, Client since 2004

University of California, Los Angeles, Client since 2004

Foundations supported:

Santa Clarita Community College District

Peralta Community College District

Pasadena City College

25106 Barnhill Road

Santa Clarita, CA 91350

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Fax: 661.554.7304

info@ne-systems.com

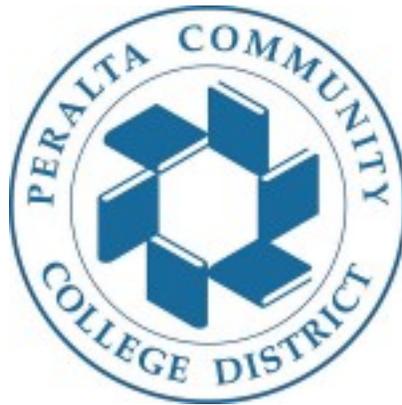
www.ne-systems.com

**Scope of Work for the
Berkeley City College WLAN upgrade project**

Provided to

Michael Dioquino

Director of Technical Services at:



Submitted by Ed Padilla, NE Systems Incorporated

Wednesday, February 19, 2015

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Scope of Work for Berkeley City College Wireless LAN upgrade Project

The below defines Scopes of Work to be performed in implementing new Wireless network infrastructure at Berkeley City College.

Introduction:

The project can be completed successfully based on a model implemented at the Peralta Community College District Office. The project will be identified by six components. These components are:

1. Background Information Provided by Peralta Community College District:
2. Project Coordination
3. Core implementation
4. Power over Ethernet (PoE) Edge Implementation
5. Firewall Implementation
6. WLAN Implementation

The Project:

Background Information:

The background information will allow the project an accurate starting point. This information is key in order to provide a smooth migration from legacy to new infrastructure.

Peralta Community College Districts' responsibilities include:

1. Provide all configuration information of existing core, firewall and edge infrastructure.
2. Provide access as needed to respective closets at all times
3. Provide a staging area in which to hold all the equipment safely on campus
4. Provide hand carts in order to move the equipment to its respective deployment area
5. Provide levels of access for WLAN deployment.
6. Provide levels of access for edge equipment deployment.
7. Documentation from the cabling contractor outline certification and locations of the cable runs from patch panel to building location.
8. Naming convention for equipment to be deployed including switches, routers, edge equipment, and WLAN equipment.
9. Provide configuration information from existing Cisco ASA.

Project Coordination:

The project coordination activities will allow the project a central point for information flow between all parties.

NE Systems Inc. responsibilities include:

1. Coordinate calls with respective vendors to execute their scopes of work.
 - a. These vendors included Arista Networks, Aruba Networks, and Enterasys Networks
2. Staging of the equipment.
 - a. Unboxing the equipment and disposal of the boxes.
 - b. Install the equipment in their respective physical racks.
 - c. Provided asset information to the Peralta CCD staff.
 - d. Upgrade the equipment to the latest stable release
 - e. RMA any non-working equipment
 - f. Licensing the equipment on each manufacturers respective website.
3. Base programming of the equipment.
 - a. Program the equipment into the base architecture.
 - b. Program the equipment to talk to the existing network infrastructure.
4. Advanced programming of the core, firewall, edge and WLAN equipment.
 - a. Develop architecture for deploying the above architecture into the current Berkeley environment.
5. Assist with troubleshooting of the equipment once deployed
 - a. Opening up trouble tickets with respective vendors as needed.
6. Coordinate vendors with their respective scopes of work
 - a. Arista Networks: deploying a completely redundant distribution infrastructure
 - b. Enterasys: deploying a WLAN switches
 - c. Fortinet Incorporated: Migration of the existing firewall into a new redundant UTM architecture.
 - d. Aruba Networks: Deploying a secure high speed 802.11ac WLAN
7. Patching in all connections and documenting as to their respective location

Documentation:

Documentation will include:

1. Vendor contact information
2. Equipment documentation of serial numbers
3. Cut-Sheet in MS Excel format showing patched connections

Core Implementation:

These sets of tasks will implement a redundant distribution infrastructure for this project.

Arista Networks responsibilities include:

Training:

Brief overview of the Extensible Operating System (EOS)
Arista training class at the Arista Networks Training Center.

Configuration:

1. Configuring one instances MLAG for two Arista distribution routers
2. Configure OSPF
3. Configure LACP for edge switch connections.
4. Configure SNMPv3 credentials
5. Make sure Arista is on the latest stable release of firmware.
6. Configure VLANs to interoperate with existing Cisco VTP infrastructure.
7. Configure IP Interfaces
8. Configure syslog and change log to send SYSLOG server
 - a. Including changes, login logout information
 - b. Port status changes
 - c. Configuration changes
 - d. Spanning Tree changes
9. Model Arista equipment using SNMPv3.
10. Configure RADIUS and local failover authentication for Arista switches

Documentation:

Documentation will include:

1. Explanation of configuration files
2. Explanation of VISIO diagrams of architecture implemented for this project.

Power over Ethernet Edge (PoE) Implementation:

These sets of tasks will implement PoE switches for this project.

Enterasys Networks Responsibilities include:

Training:

Brief overview of the Enterasys Operating System.

Configuration:

Implement a completely redundant, secure edge for the Allied Health Building.

1. Model Enterasys equipment using SNMPv3.

2. Configure RADIUS and local failover authentication for Enterasys switches
3. Syslog enabled to management server:
 - a. Including changes, login logout information
 - b. Port status changes
 - c. Configuration changes
 - d. Spanning Tree changes
4. BDPU guard
5. Management to catch duplex mismatch, framing errors, and drops.
6. Policy configured to prevent DHCP services, hijacking of default route, and loop prevention and notification
7. Policy to prevent broadcast storms.
8. Policy for QoS of Voice and Video traffic.

Documentation:

Documentation will include:

1. Explanation of configuration files
2. Explanation of VISIO diagrams of architecture implemented for this project.

Firewall Implementation:

These sets of tasks will implement a redundant Unified Threat Management architecture at Berkeley City College.

Fortinet Incorporated responsibilities will include:

Training:

Training classes will be provided at the Fortinet Training Center for Introductory and Advanced management of the UTM technology.

Configuration:

1. Fortigate Unified Threat Management Appliances:
 - a. Porting over the security architecture from the Cisco ASA
 - b. Porting of the firewall related objects
 - c. Configuration of the routing.
 - d. Configuration of of IPSec Tunnels back to the district office
 - e. Creation of UTM policies to further secure Berkeley City College assets.

Documentation:

Documentation will include:

1. Explanation of configuration files
2. Explanation of VISIO diagrams of architecture implemented for this project.

WLAN Implementation:

These sets of tasks will implement a high speed, secure WLAN at the Berkeley City College

Aruba Networks Responsibilities include:

Training:

Brief overview of the Aruba OS operating system. Training credits providing an in-depth understanding of the Aruba Networks equipment related to this project.

Configuration:

Implement a WLAN throughout the Allied Health Building.

1. Controller
 - a. Program VLANs on the controller
 - b. Program IPs on controllers
 - c. Program captive portal
 - d. Program RADIUS or LDAP authentication for management access to the controller
 - e. Configure syslog and change log to send SYSLOG server
 - i. Including changes, login logout information
 - ii. Port status changes
 - iii. Configuration changes
 - iv. Spanning Tree changes
 - f. Model Aruba equipment using SNMPv3.
2. Program guest SSID
 - a. Guest should have Internet access only
 - b. Program Acceptable Use Policy splash page
3. Program Student SSIDs
 - a. Student access should have Internet
 - b. Student access should be able to print
 - c. Student access should be able to access certain networks
 - d. Program Acceptable Use Policy splash page
4. Program Staff SSIDs
 - a. Authentication should be 802.1X back to the District Office
 - b. Access to all resources

Documentation:

Documentation will include:

1. Explanation of configuration files
2. Explanation of VISIO diagrams of architecture implemented for this project.

Closing:

The Scope of Work provided in this document is taken from a proven model deployed not only at the Peralta Community College District Office, but at several other educational institutions.

Heat Maps and Bill of Materials v1.1

Vista Community College

Jan 21, 2015

RSSI:  -45dB  -55dB  -65dB  -75dB

Campus: Vista Community College

Total APs: 83

Building: Permanent Campus

Address: 2050 Center Street, Berkeley, CA

BOM:

Floor	Total AP	AP215	AP225	T-bar	Flat wall mount	90 wall mount
B	16	13	3	13	0	3
1	12	12	0	12	0	0
2	15	15	0	12	2	3
3	15	15	0	13	0	2
4	13	13	0	10	2	1
5	14	14	0	11	0	3
Total	85	82	3	71	4	12

Wall Mounts:

Flat wall mount (extra)	Aruba AP-220-MNT-W2
90 degree wall mount (extra)	Oberon 1010-00

Legend:

**Unmarked AP's are AP215's with a T-Bar Mount*

AP225 + 90WM = AP225 with a 90 degree wall mount

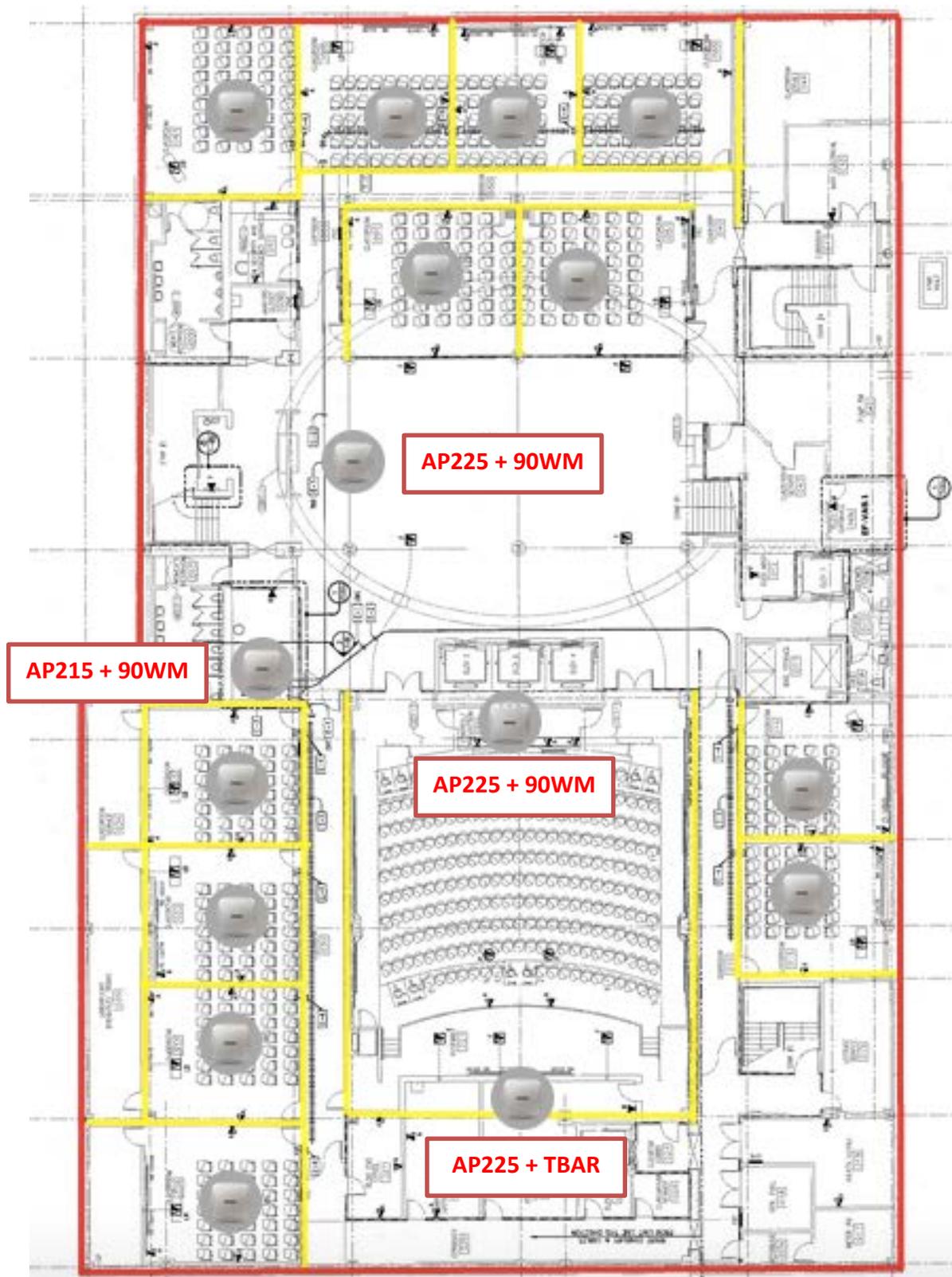
AP225 + TBAR = AP225 with T-bar mount

AP215 + 90WM = AP215 with a 90 degree wall mount

AP215 + WM = AP215 with a flat wall mount

Floor1
Total AP's: 16

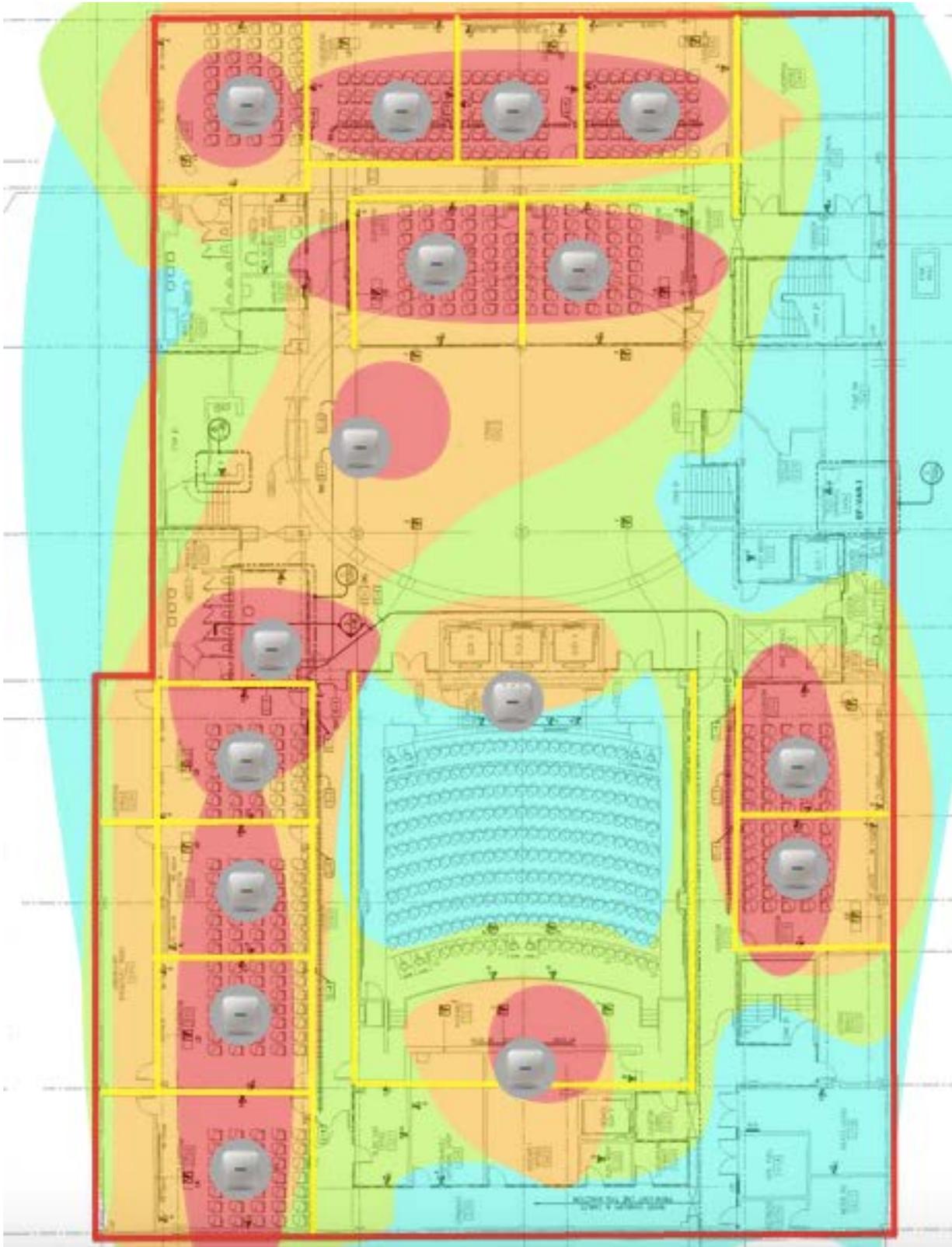
Floor Plan Only View



2.4 GHz Heat Map



5.0 GHz Heat Map

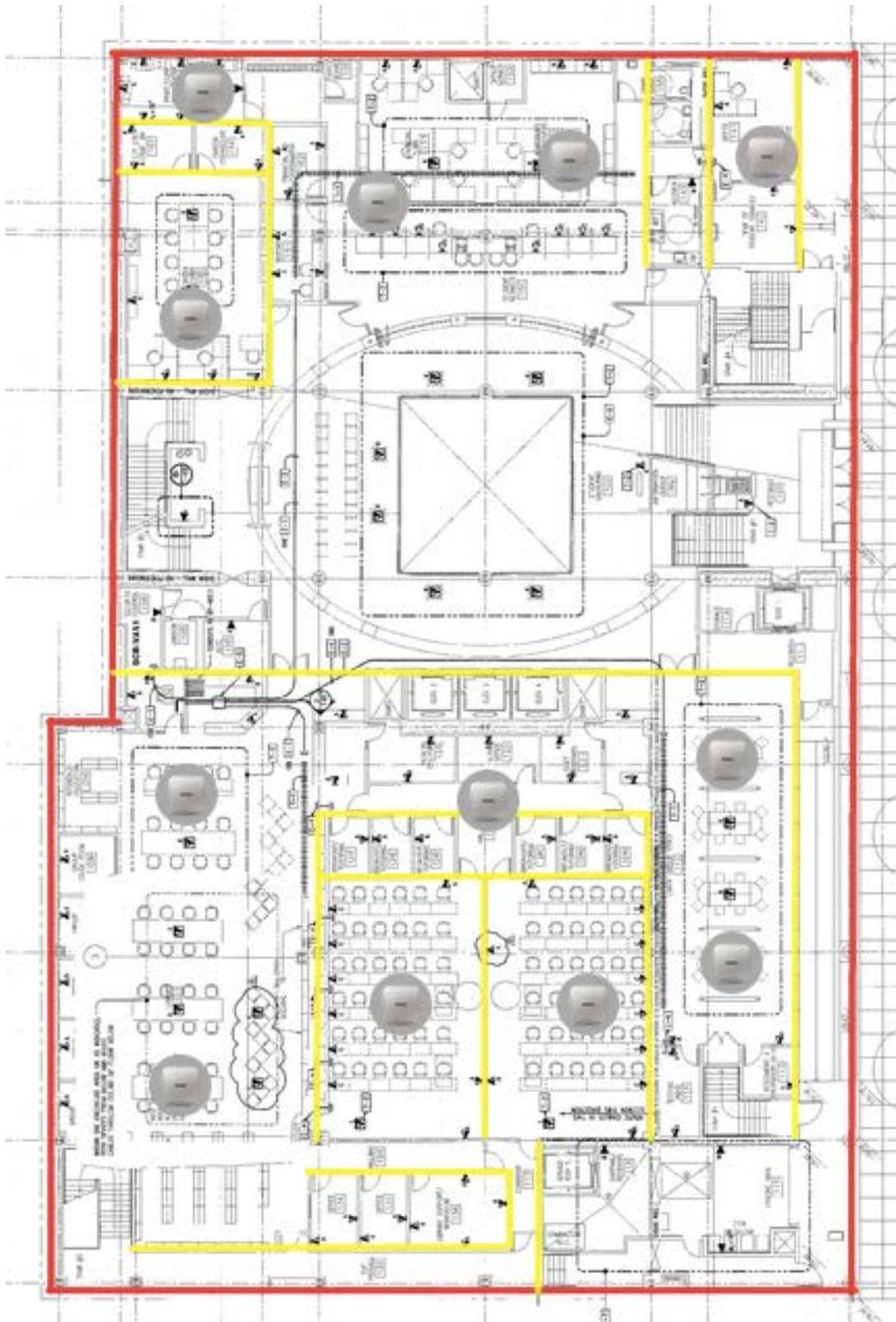


Floor2

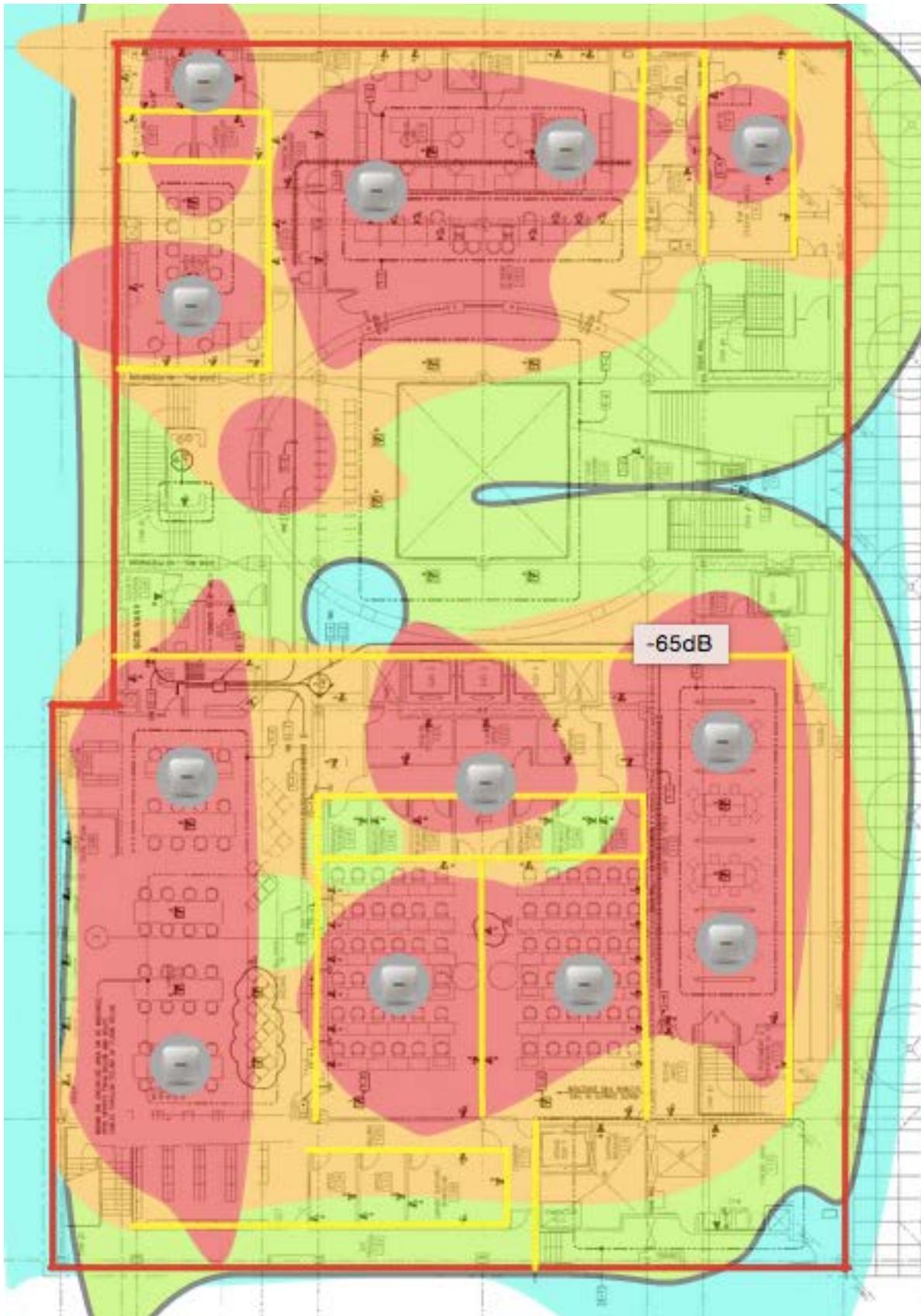
Total APs:

12

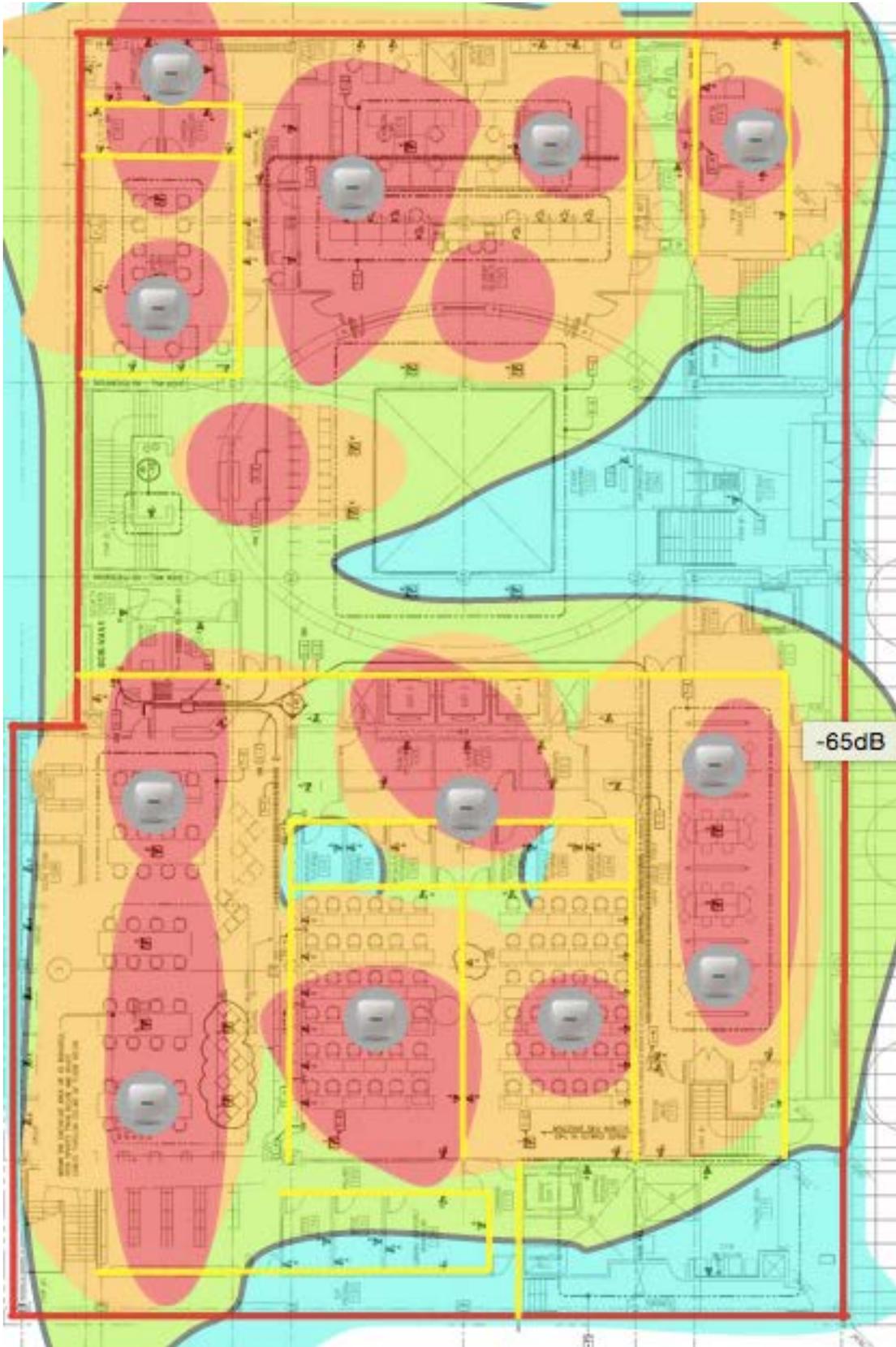
Floor Plan Only View



2.4 GHz Heat Map



5.0 GHz Heat Map

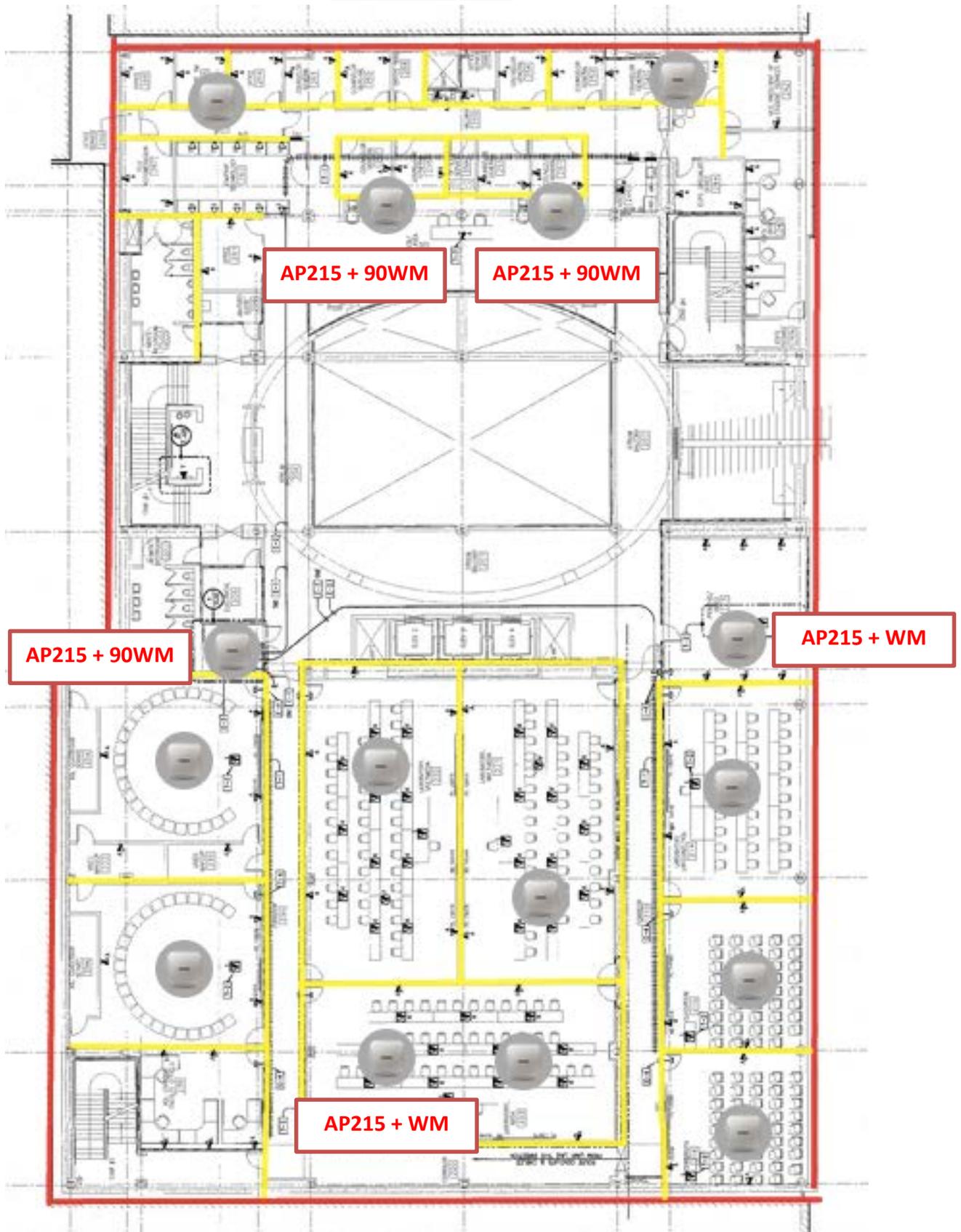


Floor3

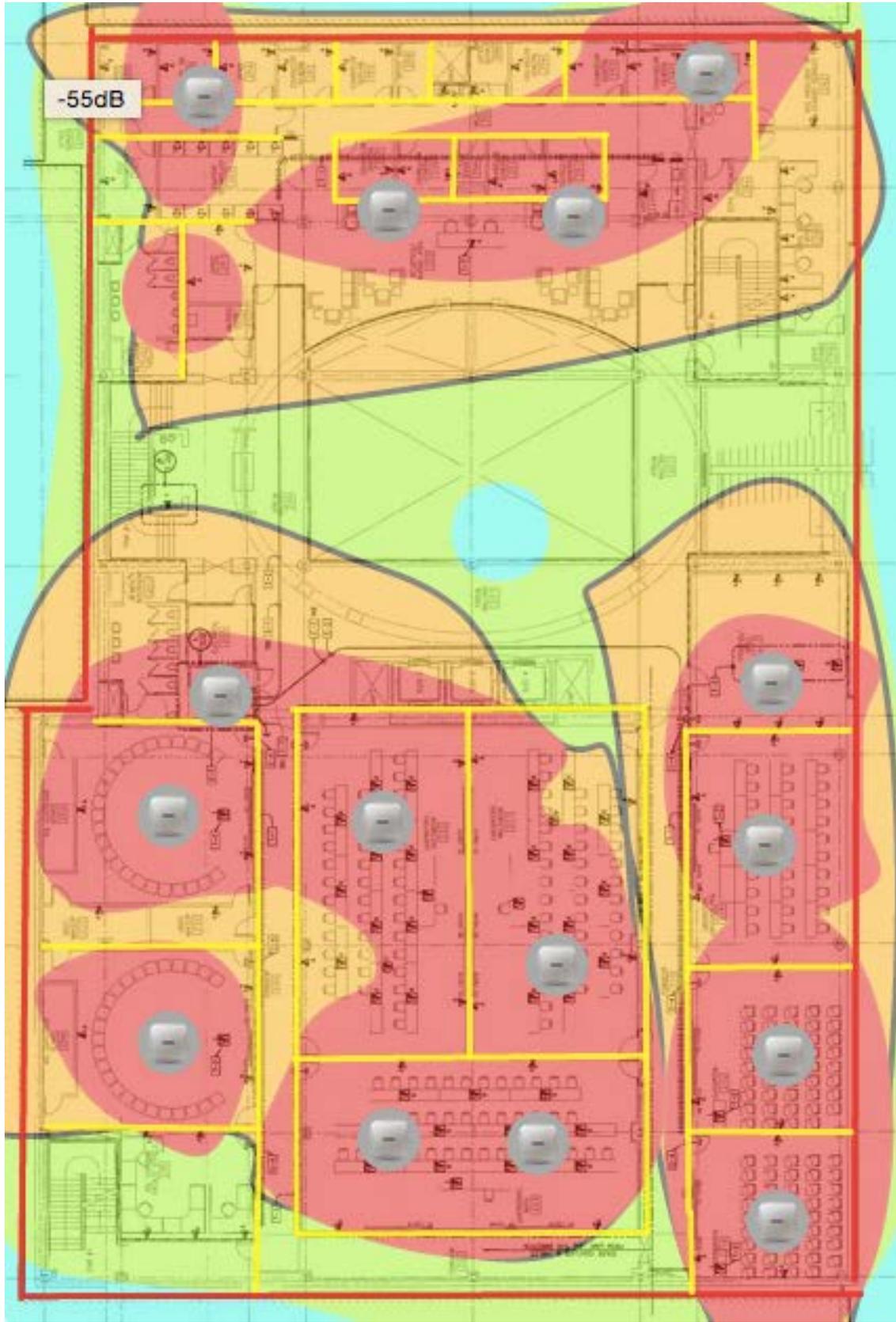
Total APs:

15

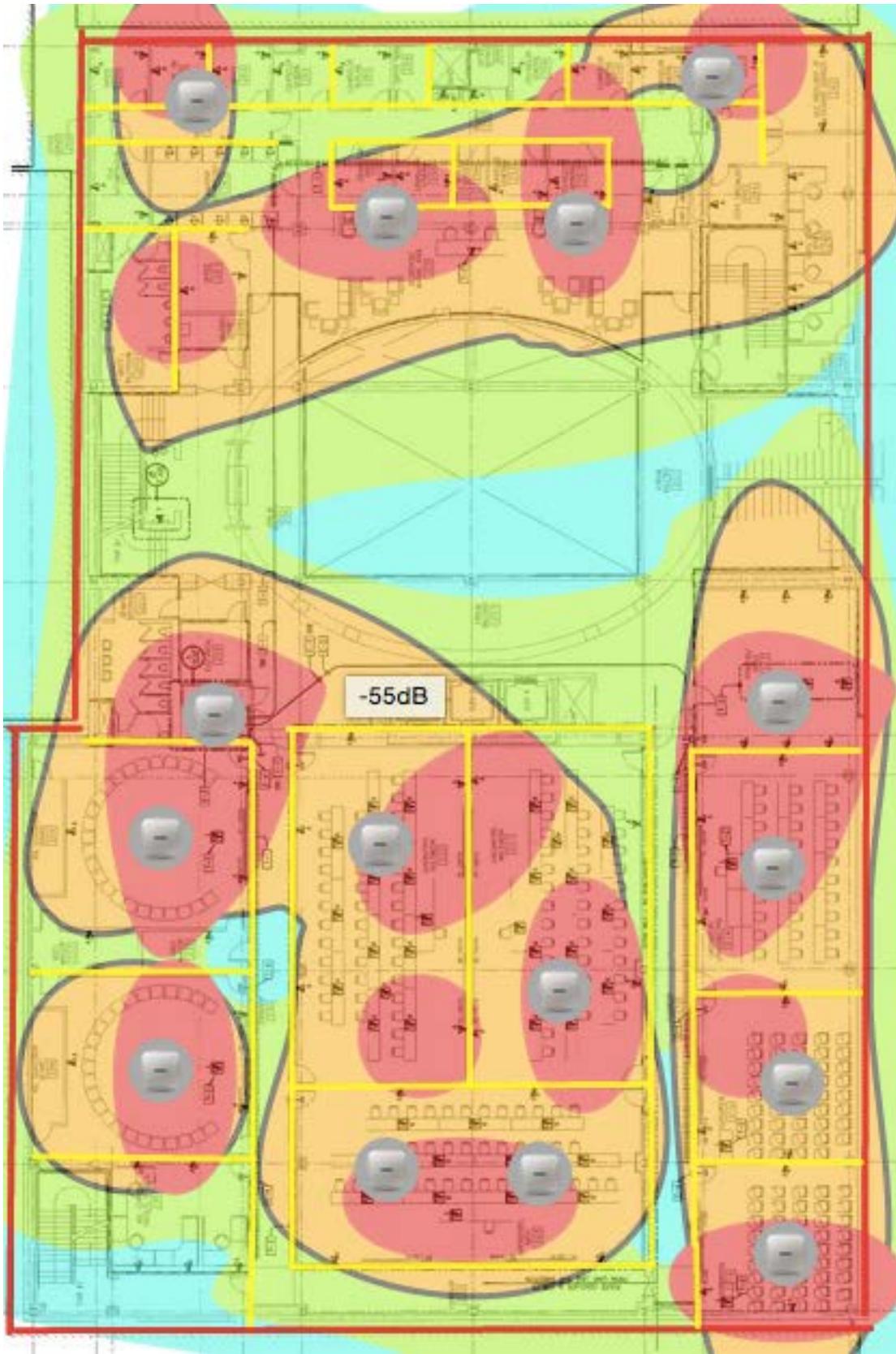
Floor Plan Only View



2.4 GHz Heat Map



5.0 GHz Heat Map

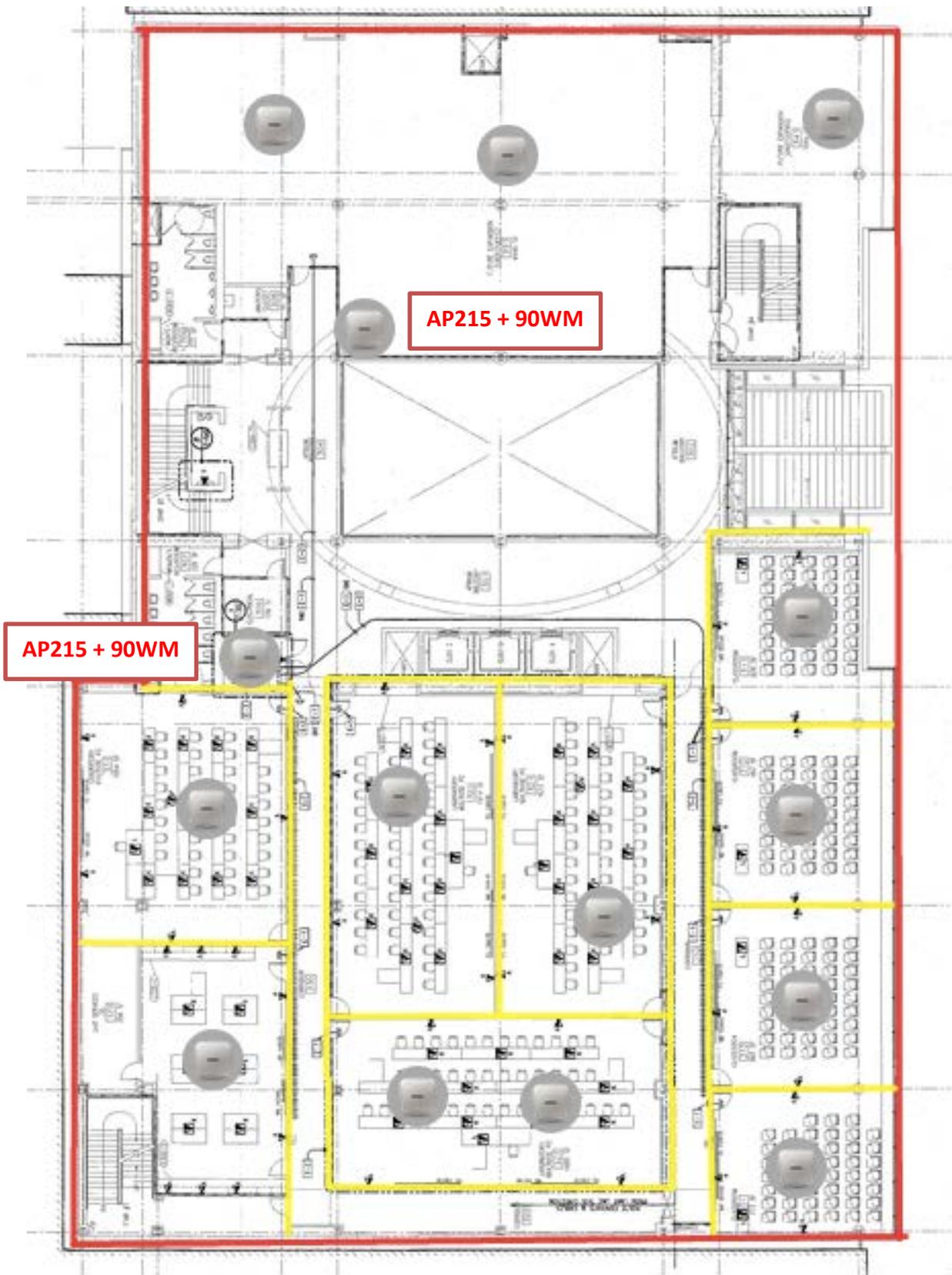


Floor4

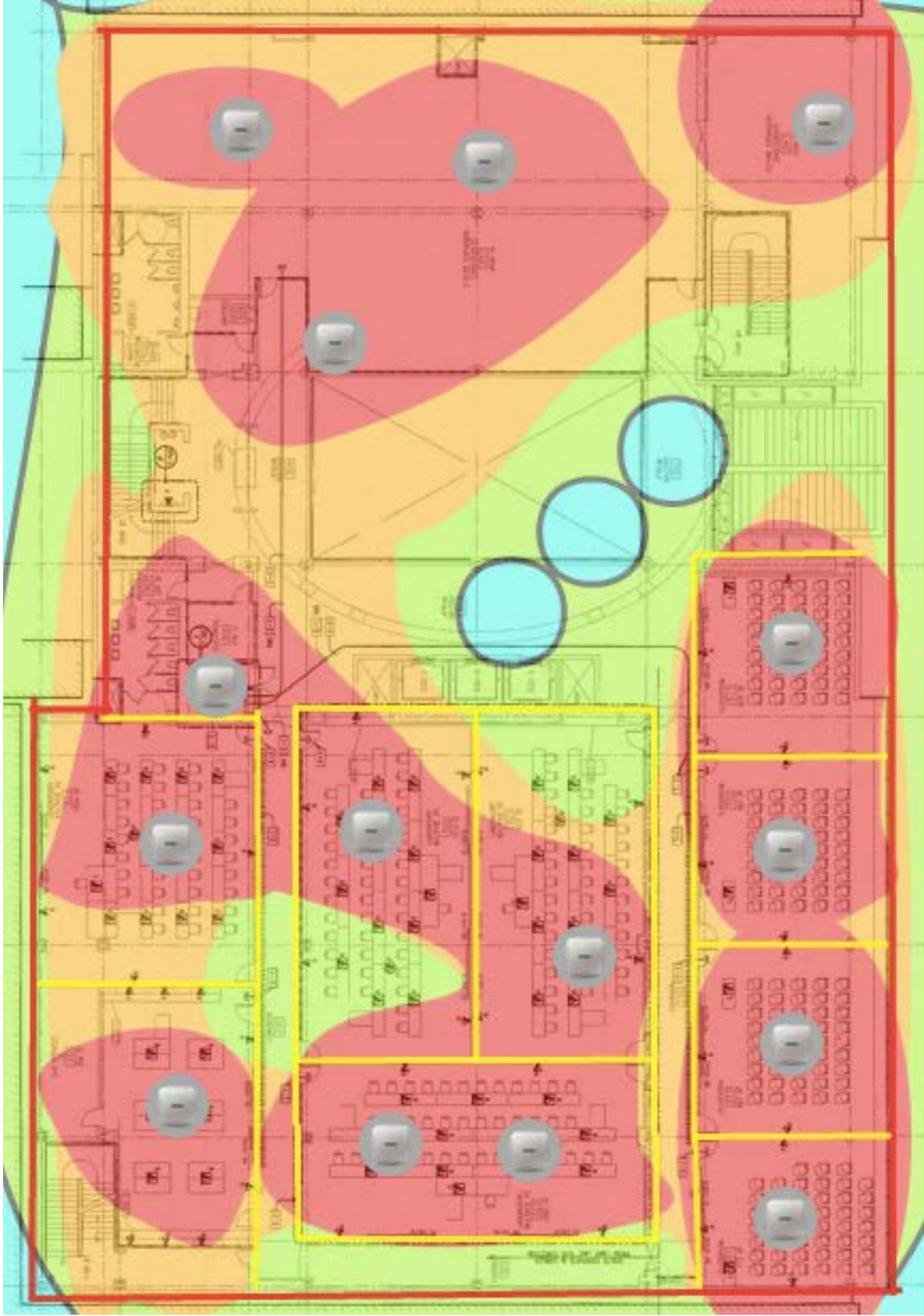
Total APs:

15

Floor Plan Only View



2.4 GHz Heat Map



5.0 GHz Heat Map

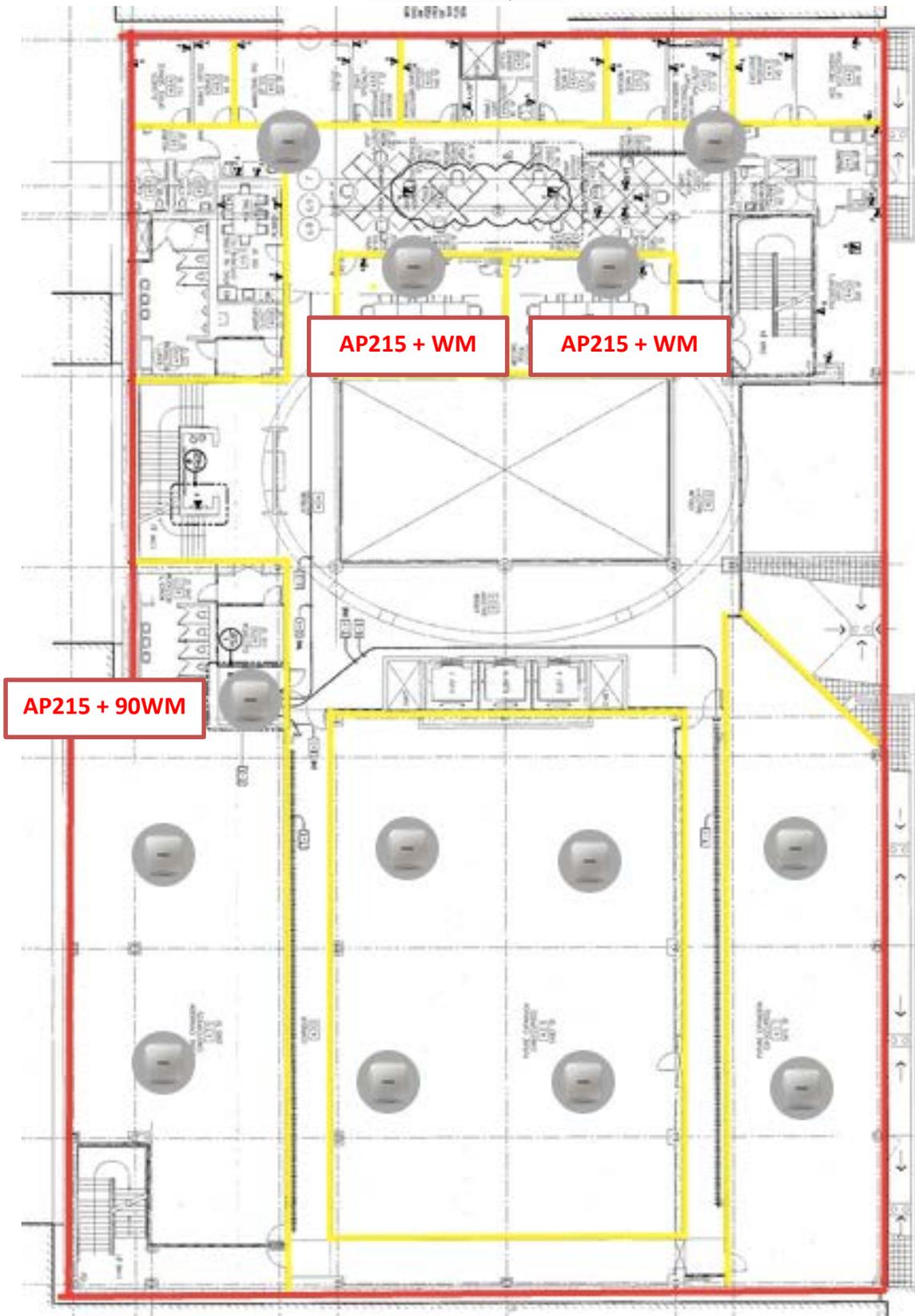


Floor5

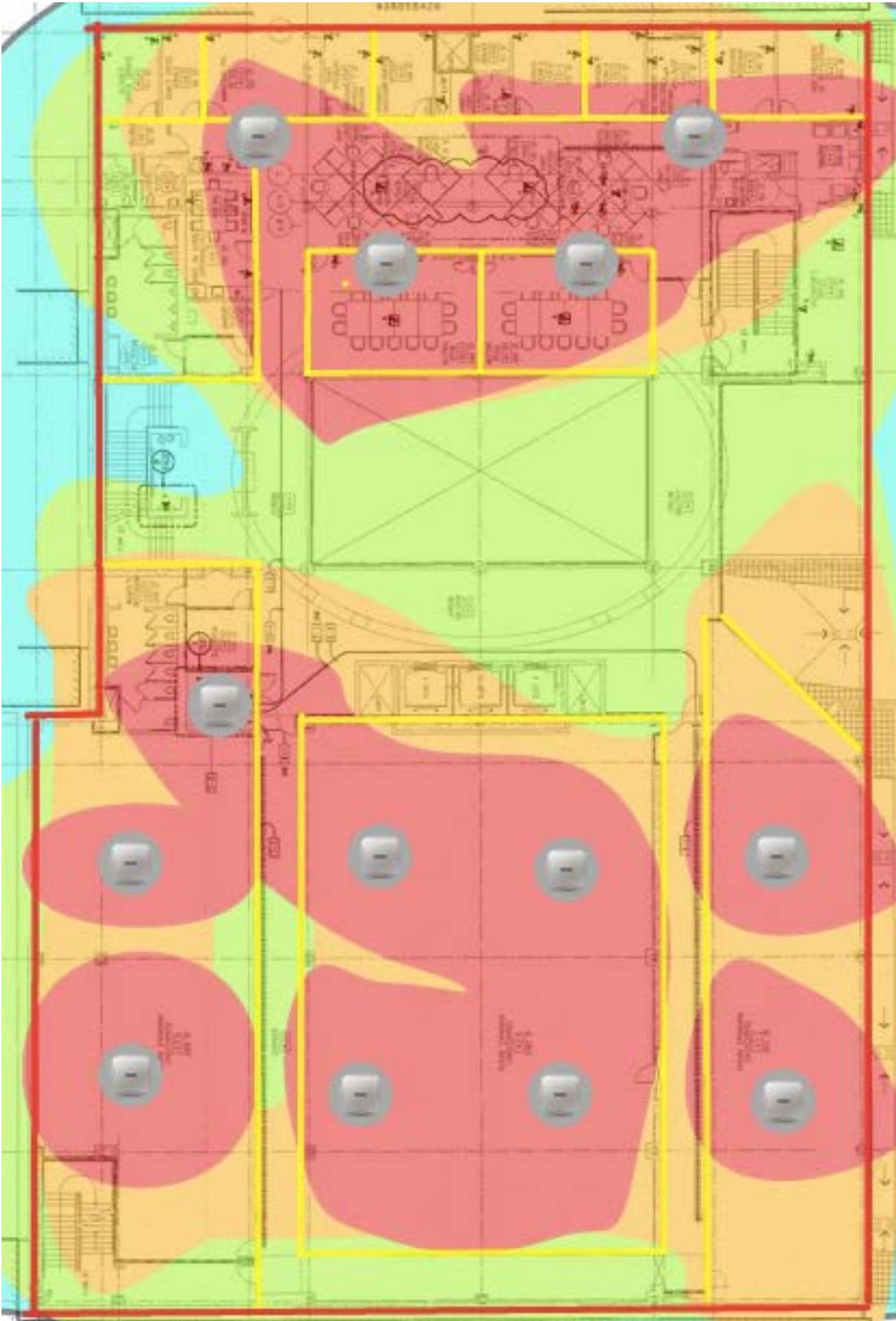
Total APs:

13

Floor Plan Only View



2.4 GHz Heat Map



5.0 GHz Heat Map



Floor5

Total APs:

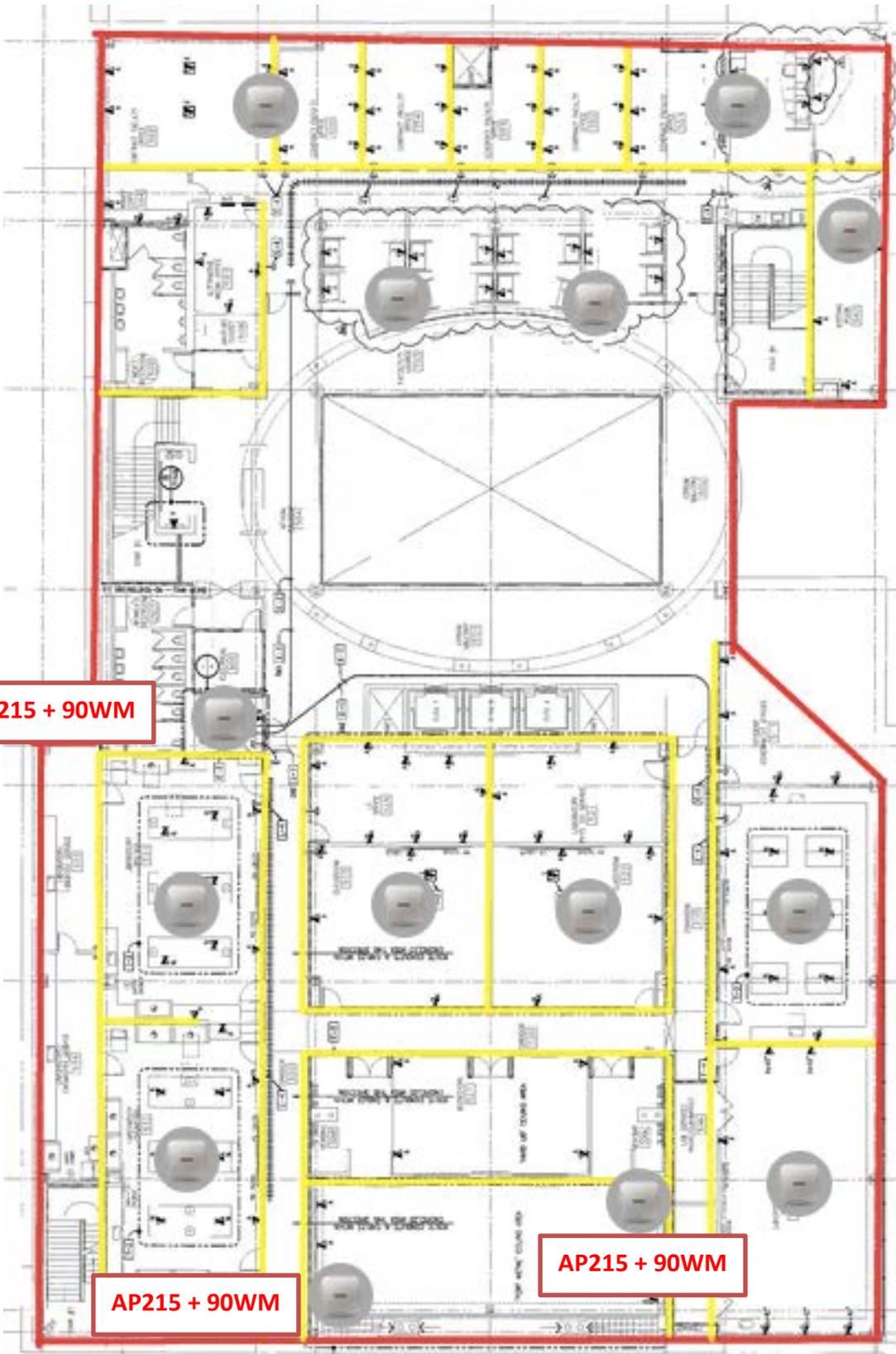
14

Floor Plan Only View

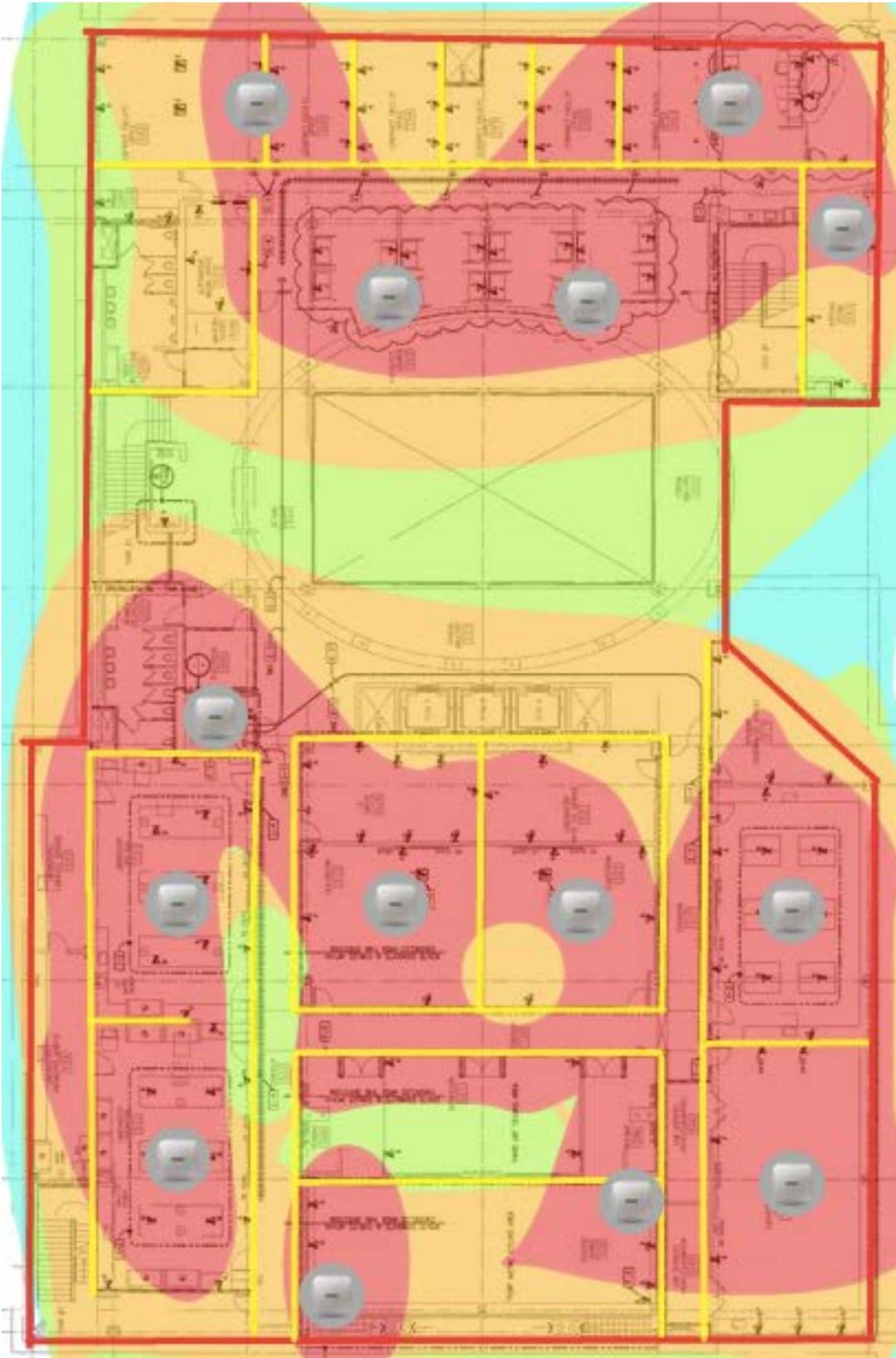
AP215 + 90WM

AP215 + 90WM

AP215 + 90WM



2.4 GHz Heat Map



5.0 GHz Heat Map

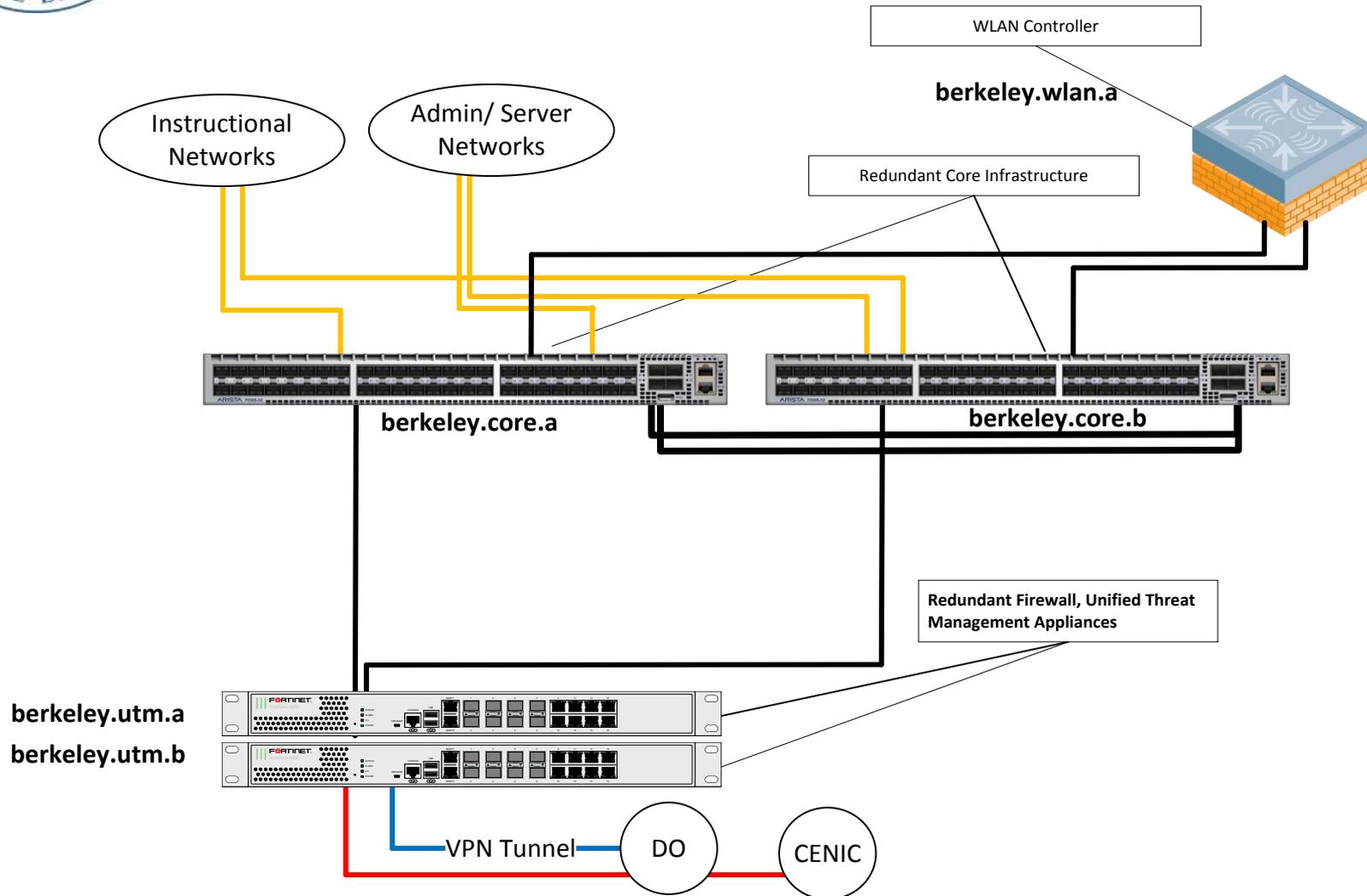




Berkeley City College Core/ Firewall/ WLAN Upgrade Project Core Architecture



ANY NETWORK | ANY APPLICATION



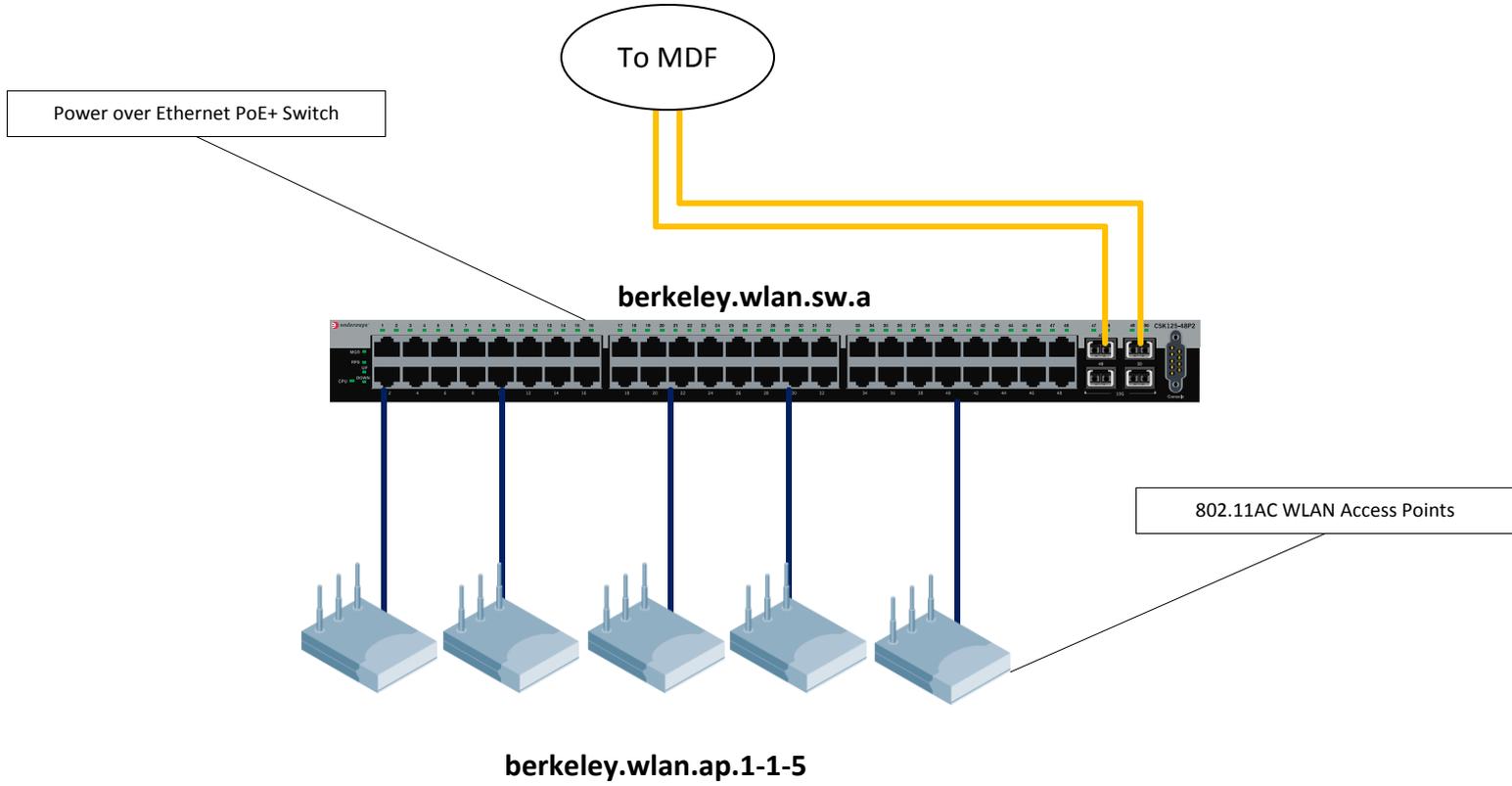
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Berkeley City College Core/ Firewall/ WLAN Upgrade Project Edge Architecture



ANY NETWORK | ANY APPLICATION



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