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Information Technology

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CASE STUDY: physical installation of an arena Wi-Fi system

Rob Snively, RCDD, RTPM – IT Project Manager 2 - University of Florida

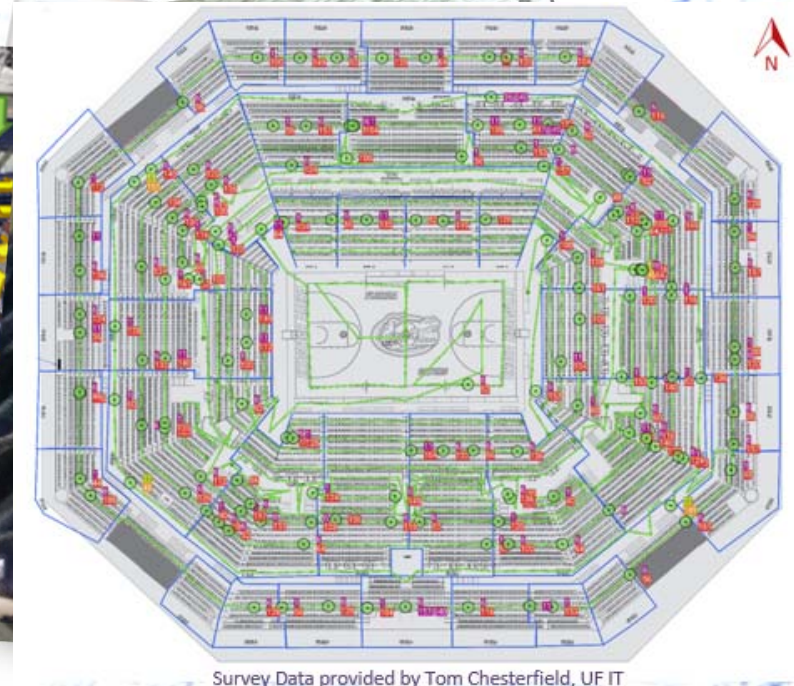
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Topics for this presentation

Agenda

-  About UF
-  O'Dome History
-  O'Dome Renovation
-  Wi-Fi Plan
-  Installation problems
-  Does it work?





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About the University of Florida:

MAIN CAMPUS: Gainesville, FL	ESTABLISHED: 1853
MAIN CAMPUS SIZE: 2,000+ Acres	US NEWS RANKING: 8 th in Public Universities

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Photo credit Allison McGee

About the University of Florida:

ENROLLMENT: >55,000

FACULTY/STAFF: >31,000

CAMPUS SIZE: 2,000+ Acres

MASCOT: GATORS!



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Stephen C. O'Connell Center (aka The O'Dome) ... before the dust

YEAR BUILT: 1980

Wi-Fi: What is Wi-Fi?

ARENA SEATING: 11,548

ROOF: Air Pressure Inflated



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NOW Exactech Arena at the Stephen C. O'Connell Center

YEAR RENOVATED: 2016

WI-FI: YEAH BABY!

ARENA SEATING: 10,500

RENOVATION COST: \$65 MILLION

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Notable Improvements



Grand Main Entrance

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Notable Improvements



-  **Grand Main Entrance**
-  **Corridors with Concessions**

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Notable Improvements



-  **Grand Main Entrance**
-  **Corridors with Concessions**
-  **Club Seating and Lounges**

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Notable Improvements



-  **Grand Main Entrance**
-  **Corridors with Concessions**
-  **Club Seating and Lounges**
-  **Center Hung Scoreboard**
-  **Permanent 2nd Level Seats**

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Notable Improvements



-  **Grand Main Entrance**
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-  **Center Hung Scoreboard**
-  **Permanent 2nd Level Seats**
- And of course...**
-  **WI-FI**

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Notable Improvements



-  **Grand Main Entrance**
 -  **Corridors with Concessions**
 -  **Club Seating and Lounges**
 -  **Center Hung Scoreboard**
 -  **Permanent 2nd Level Seats**
- And of course...
-  **WI-FI everywhere!**

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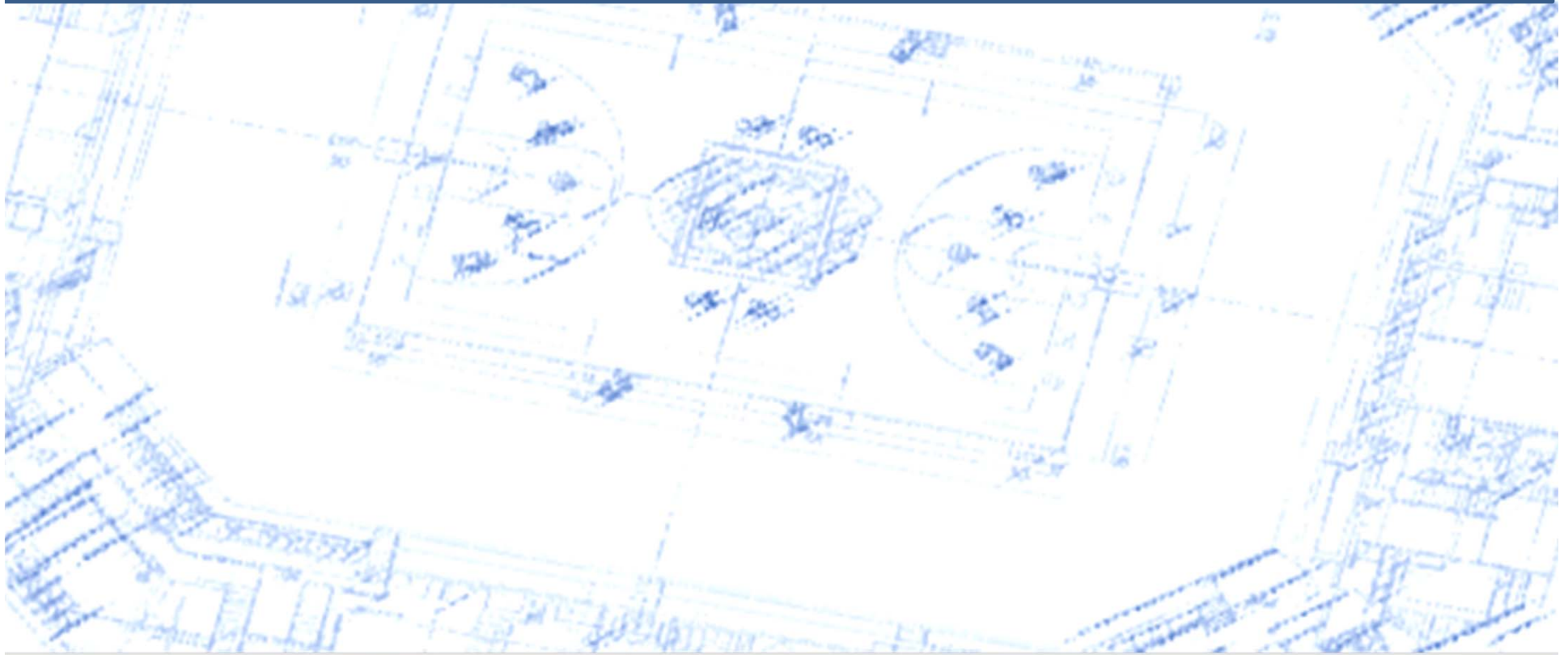
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So, how did we get there?

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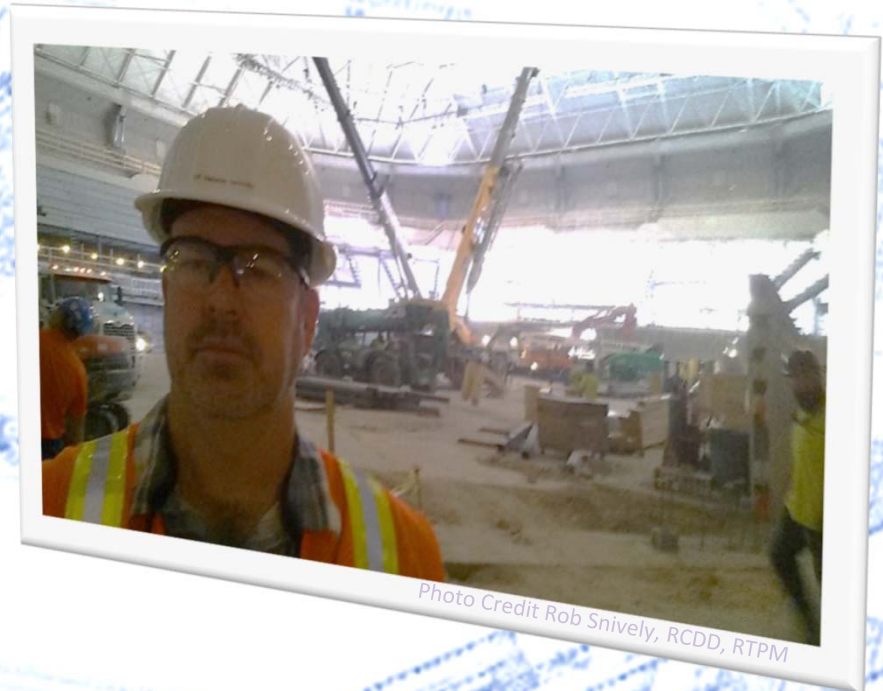
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Access Point Installation Plan

What are we working with?

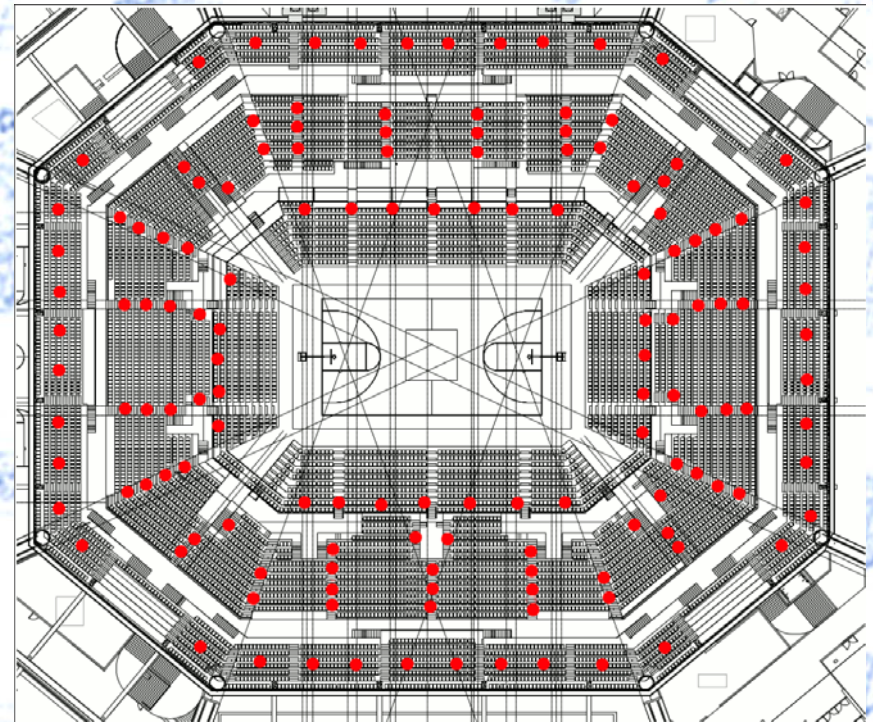
-  Ceiling is too high.
-  Ceiling weight limit will be max'd with new scoreboard.
-  Few mounting options.
-  Can't obstruct fan view or cause a trip hazard.
-  100 meter Ethernet limit.
-  >12,000 client devices possible.



Access Point Installation Plan

In an ideal world...

With the assistance of the UF IT wireless engineer, we submitted these locations to the architects and engineers to incorporate into the plans.



Copyright UF; Location diagram by Matt Grover, UF IT

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Level 1 Antennas & Access Points



**Access Points
mounted to wall
but antennas
TBD.**



Photo Credit Bob Concelmo, RCDD, Complete Network Solutions

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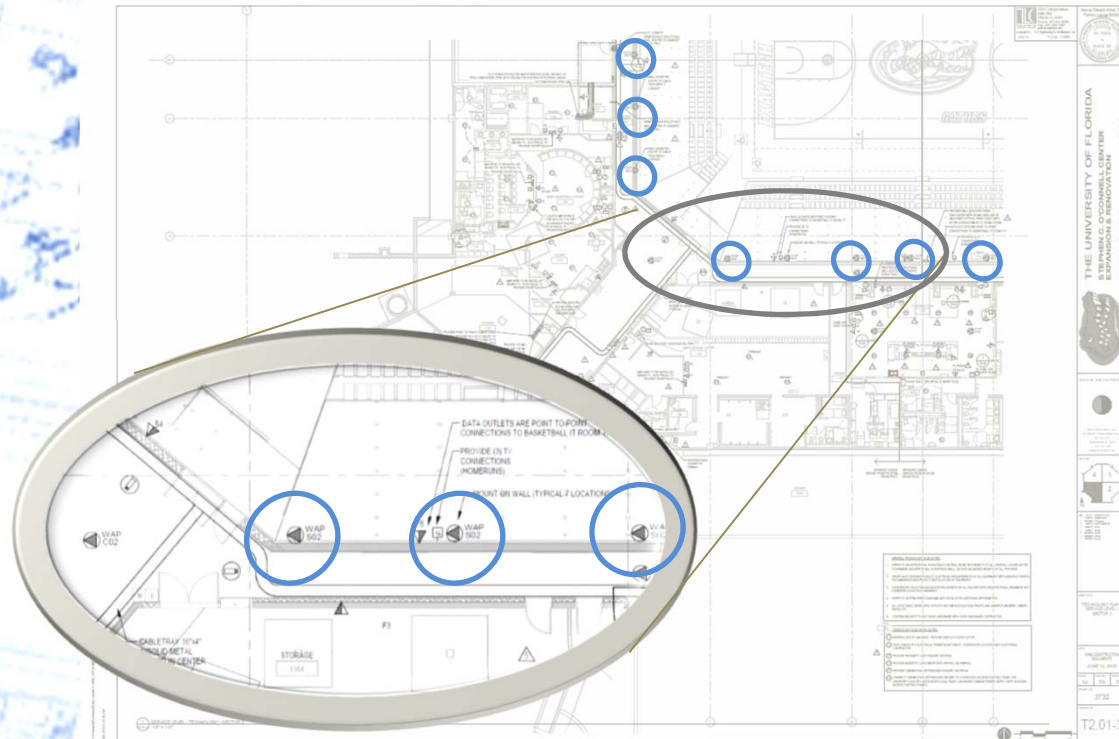
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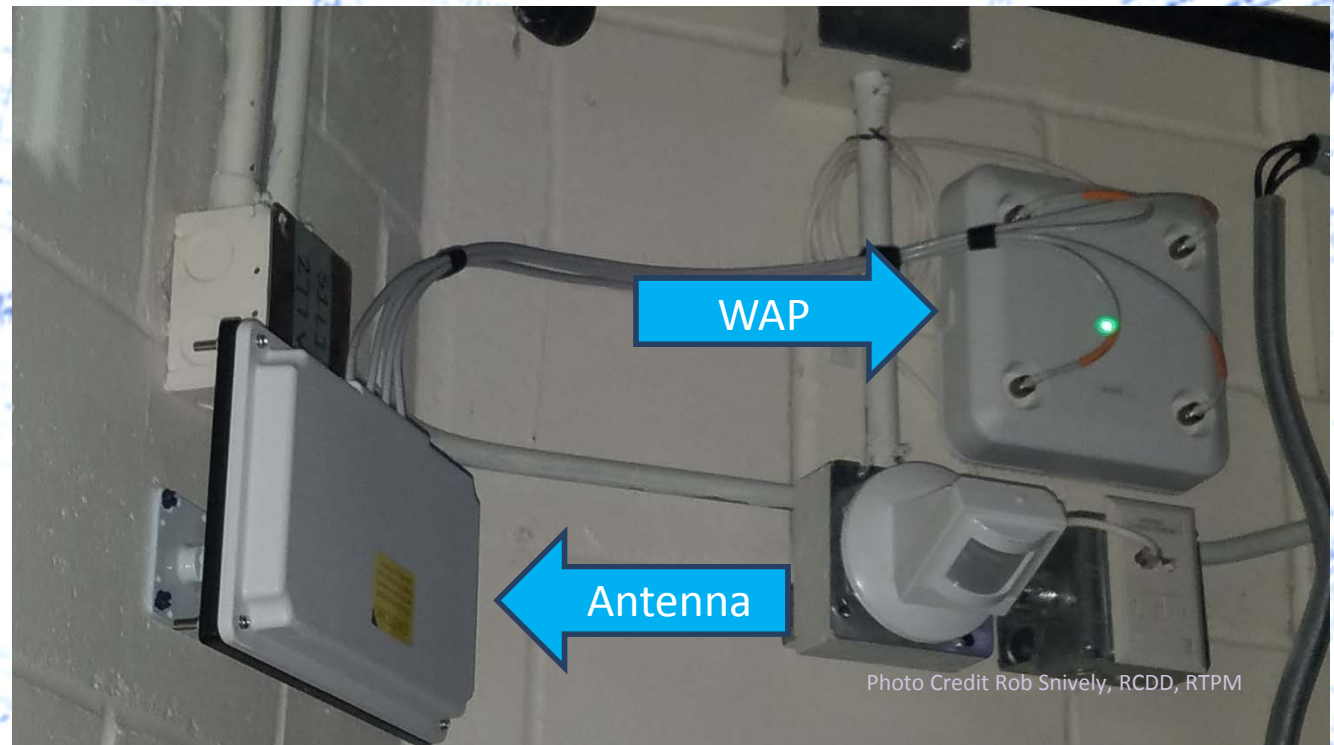
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Level 1 Antennas & Access Points



Access Points mounted to wall and use directional antenna.



Level 3 Antennas & Access Points

Co-located antenna and access point mounted to back wall.



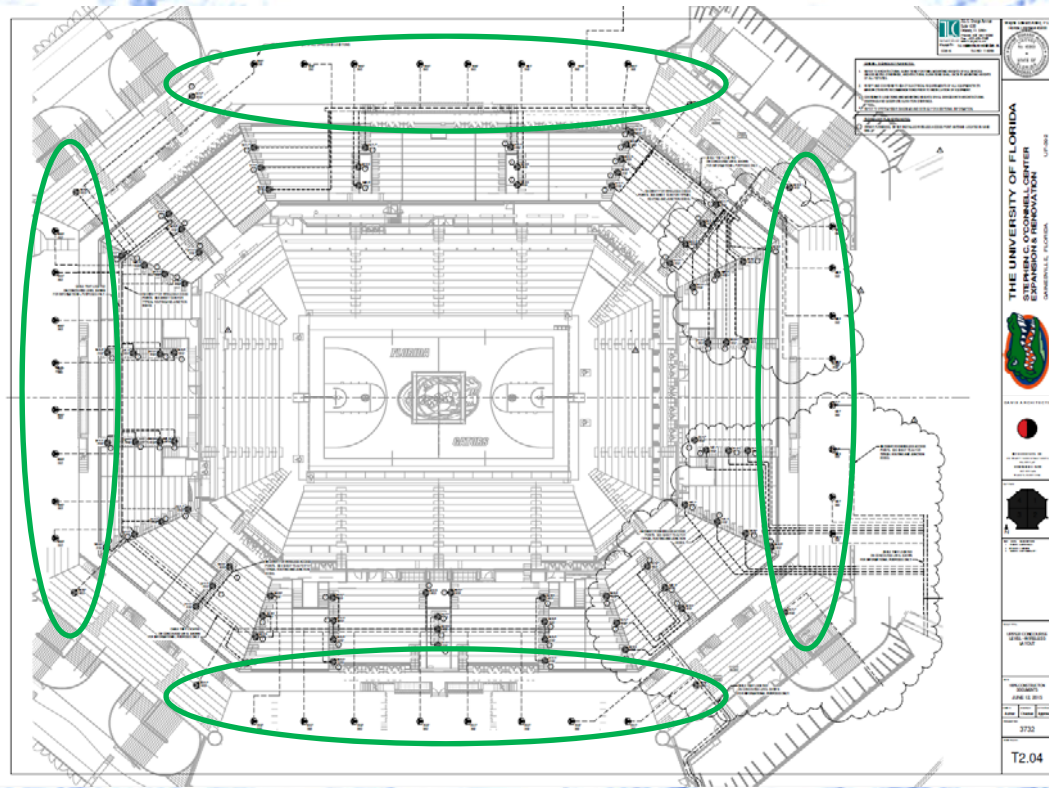
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Level 3 Antennas & Access Points

Co-located
antenna and
access point
mounted to
back wall.



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Level 3 Antennas & Access Points

Co-located
antenna and
access point
mounted to
back wall.



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**What could go wrong?
Later in this presentation.**



Photo Credit Rob Snively, RCDD, RTPM

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Level 2 Antennas & Access Points

Handrail
installed
antennas and
access points
mounted below
deck.



Photo Credit John Madey, RCDD



Photo Credit Bob Concelmo, RCDD, Complete Network Solutions

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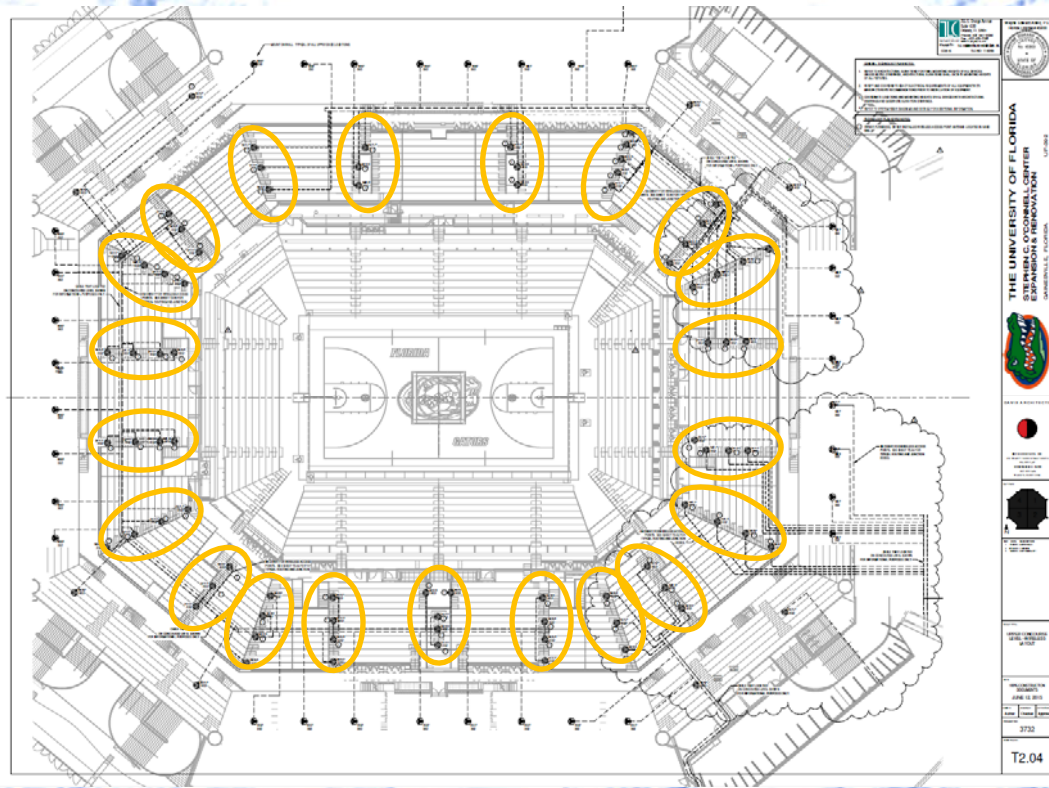


Level 2 Antennas & Access Points

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Photo Credit John Madey, RCDD



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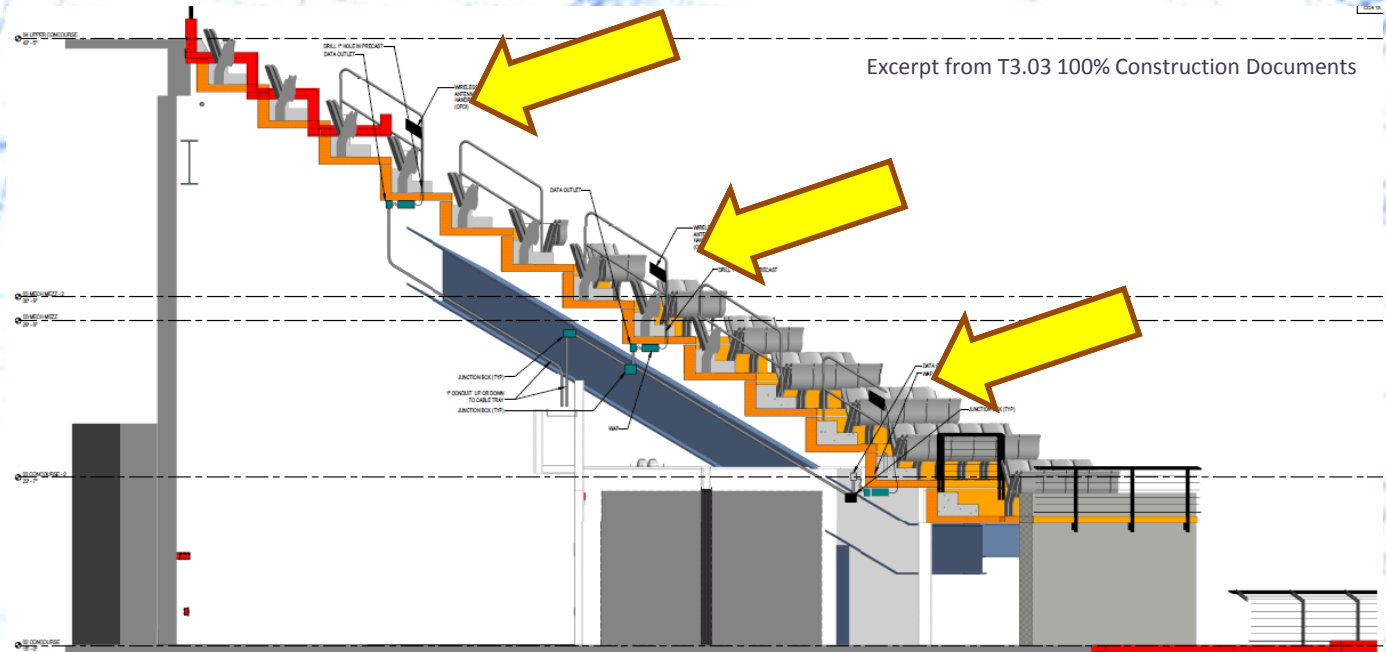
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Level 2 Antennas & Access Points

Handrail installed antennas and access points mounted below deck.



Photo Credit John Madey, RCDD

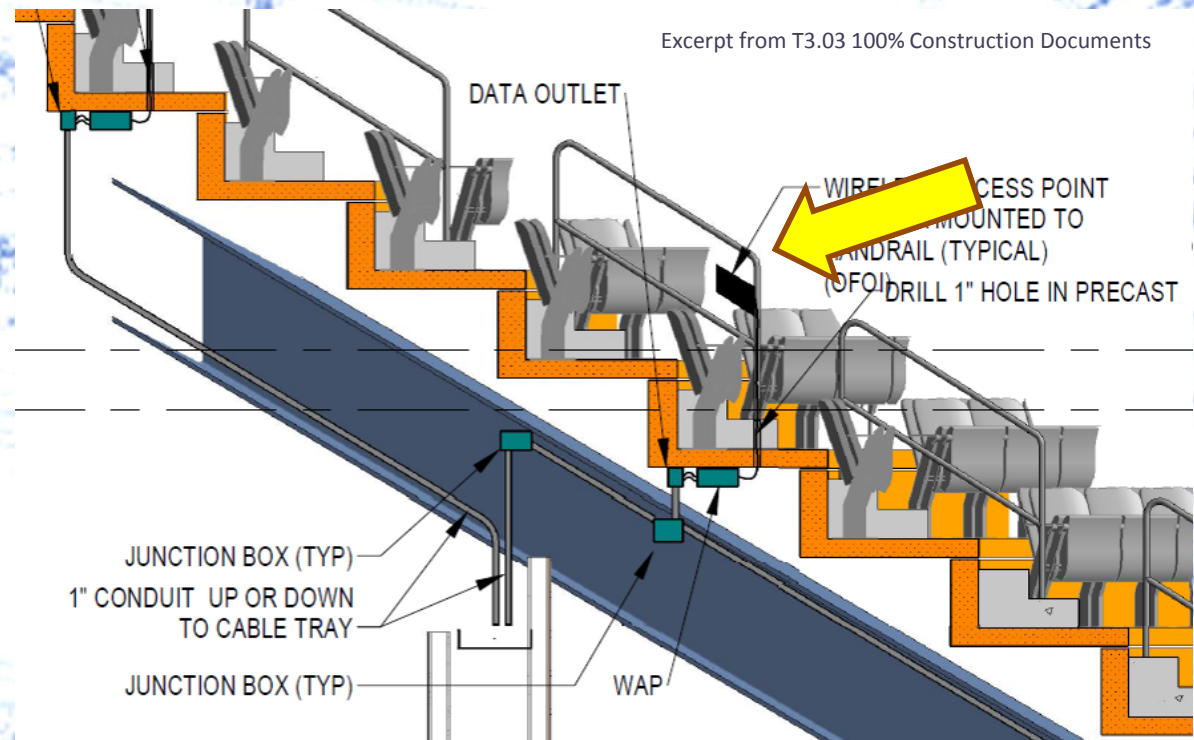


Level 2 Antennas & Access Points

Handrail installed antennas and access points mounted below deck.



Photo Credit John Madey, RCDD



Level 2 Antennas & Access Points

From Above...



Photo Credit John Madey, RCDD

...and below!

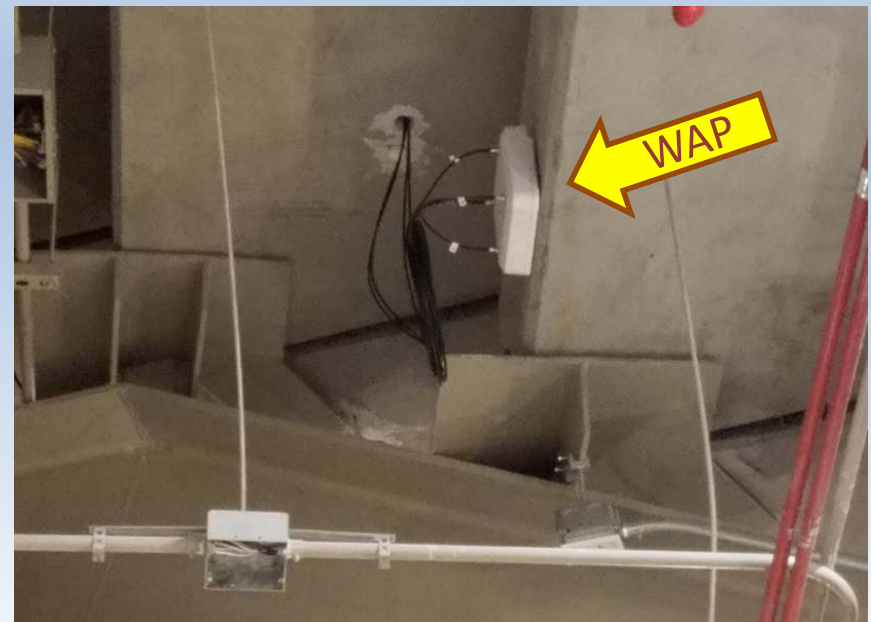


Photo Credit Rob Snively, RCDD, RTPM



Level 2 Antennas & Access Points

Handrail installed antennas and access points mounted below deck.

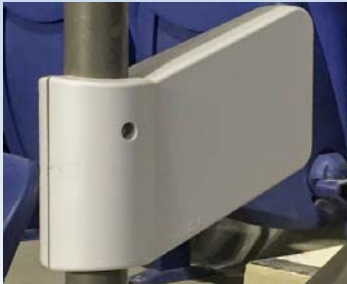


Photo Credit John Madey, RCDD



Photo Credit Rob Snively, RCDD, RTPM

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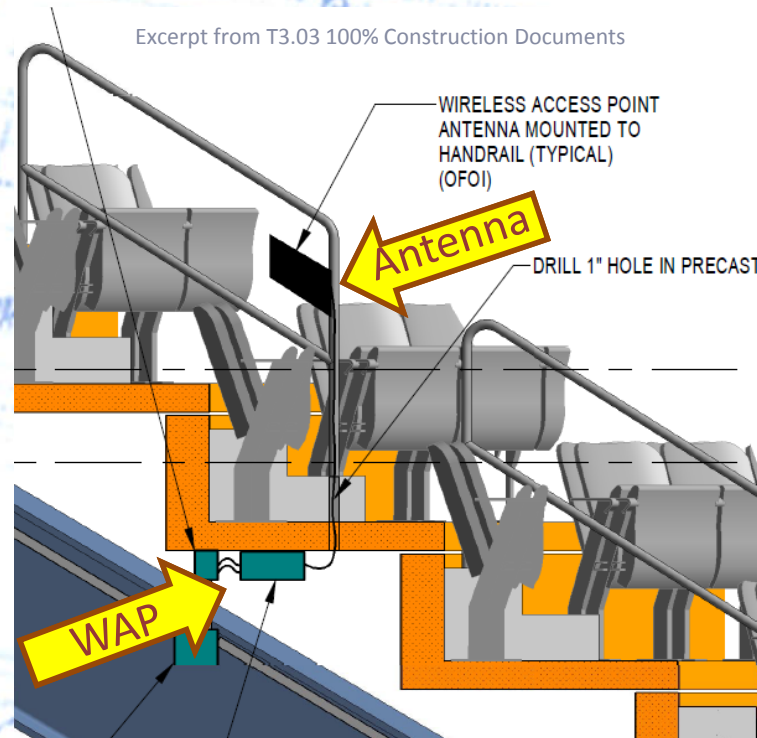


Level 2 Antennas & Access Points

Handrail installed antennas and access points mounted below deck.



Photo Credit John Madey, RCDD



1" Hole in handrail



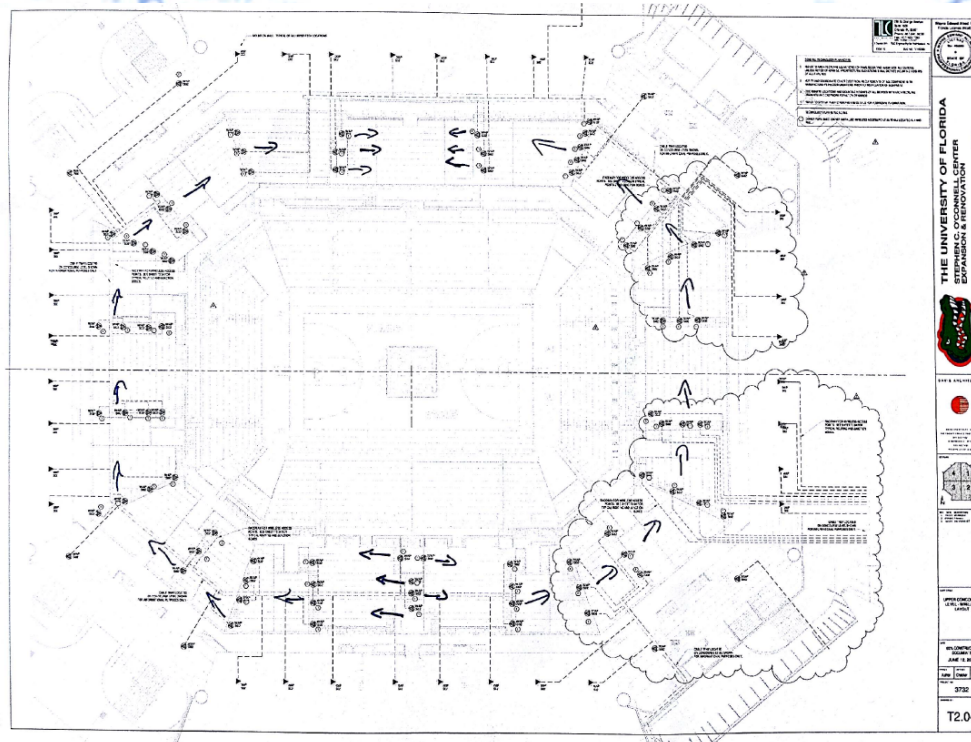
Photo Credit John Madey, RCDD

Level 2 Antennas & Access Points

Handrail
installed
antennas and
access points
mounted below
deck.



Photo Credit John Madey, RCDD



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Level 2 Antennas & Access Points

Handrail
installed
antennas and
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Photo Credit John Madey, RCDD

**What could go wrong?
Next!**



Photo Credit Rob Snively, RCDD, RTPM

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If you've got a problem...

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Photo Credit Bob Concealmo, RCDD, Complete Network Solutions, Inc



These guys can solve it! L-R: Rob Snively, RCDD, RTPM, UFIT ; Chris Clark, RCDD, CNS Inc ; Jon Lowell, RTPM, OSP, CNS Inc



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What could go wrong?

**Handrail
installed
antennas and
access points
mounted below
deck.**



Photo Credit John Madey, RCDD



Photo Credits Rob Snively, RCDD, RTPM and Bob Concelmo, RCDD



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What could go wrong?

Handrail installed antennas and access points mounted below deck.



Photo Credit John Madey, RCDD

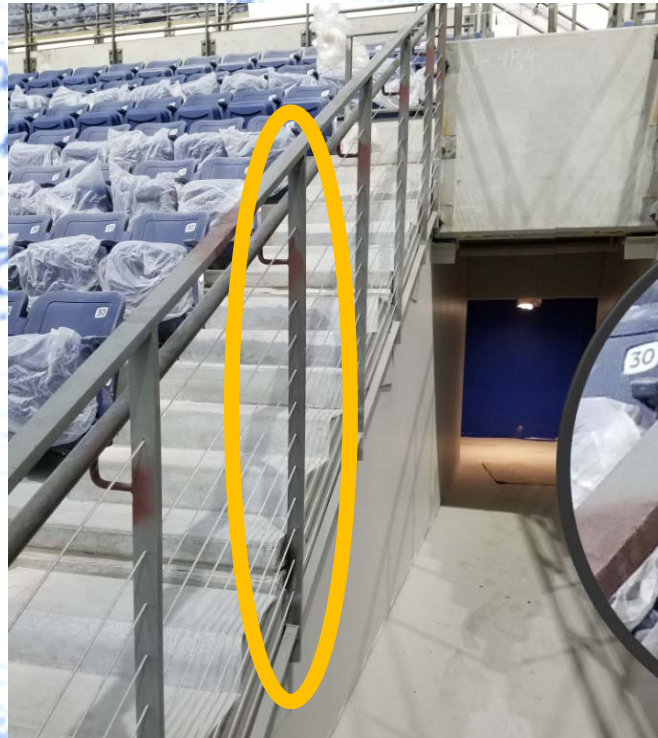


Photo Credit Rob Snively, RCDD, RTPM

A guardrail is not a handrail!



What could go wrong?

Handrail installed antennas and access points mounted below deck.



Photo Credit John Madey, RCDD



A guardrail is not a handrail!

Photo Credit Rob Smiley

What could go wrong?

Co-located antenna and access point mounted to back wall.



Gonna need friends in high places

Photo Credit Rob Snively, RCDD, RTPM

What could go wrong?

Co-located antenna and access point mounted to ~~back wall~~.



Gonna need friends in high places

Photo Credit John Madey, RCDD

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What could go wrong?

Antenna and access point now mounted to upper ring.



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You can't get there from here.



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Final antenna placement showing antenna signal orientation

Upper Ring Access Points: 40

Access Points Behind Retractable Seats: 24

Hand Rail Access Points: 75

Access Points in Rest of O'Dome: 75



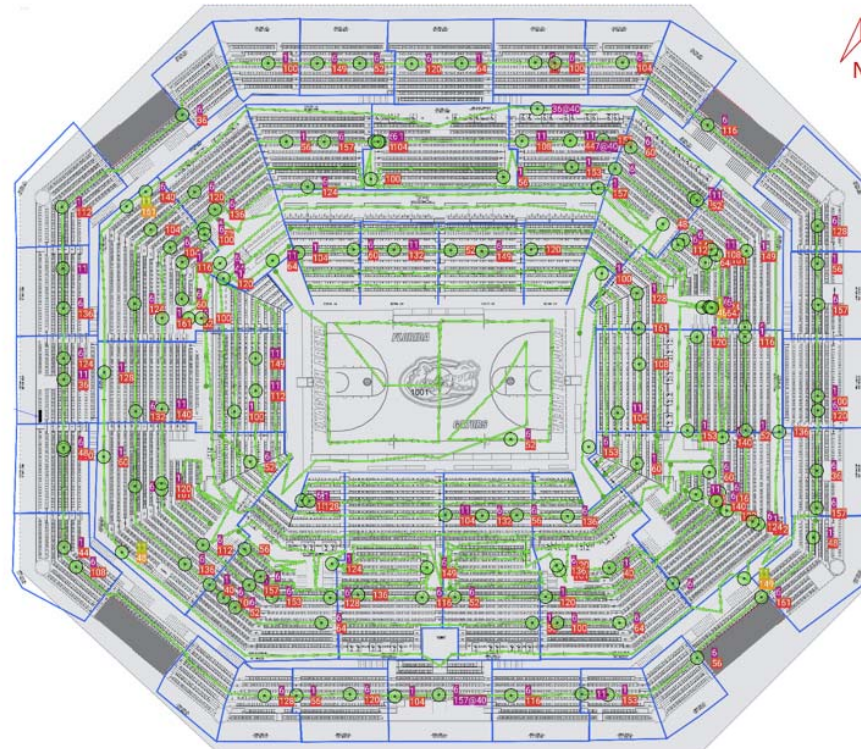
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Turn it over to the network engineers

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Survey Data provided by Tom Chesterfield, UF IT

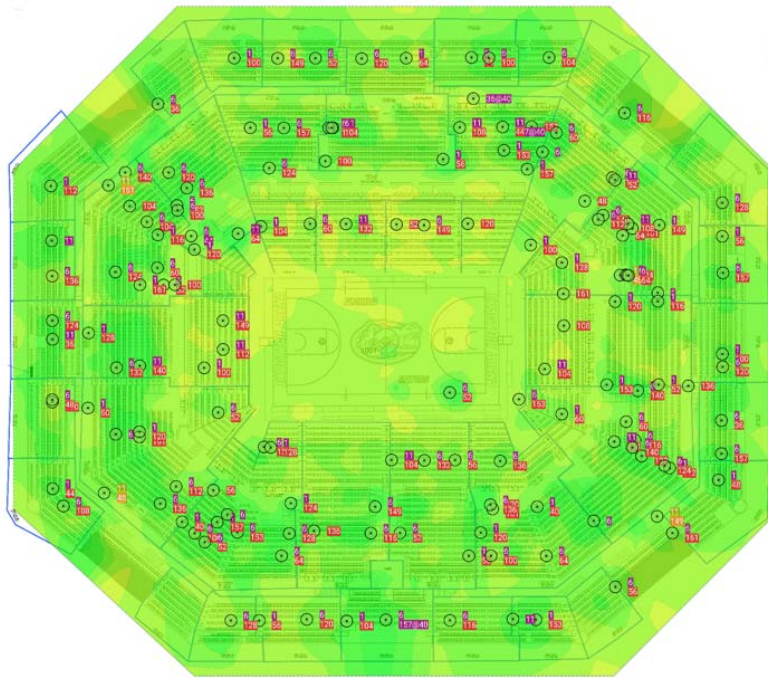
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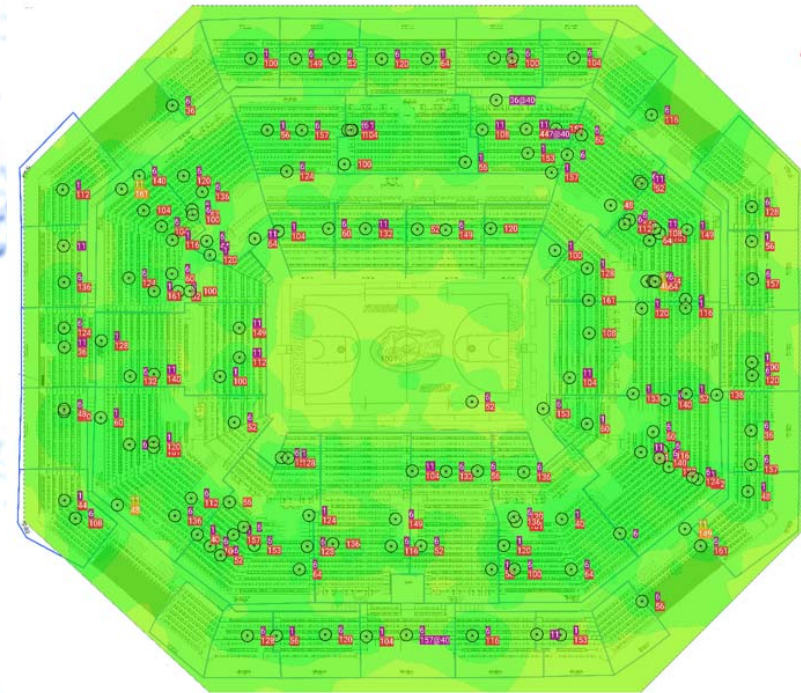
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Turn it over to the network engineers

2.4 GHz



5 GHz

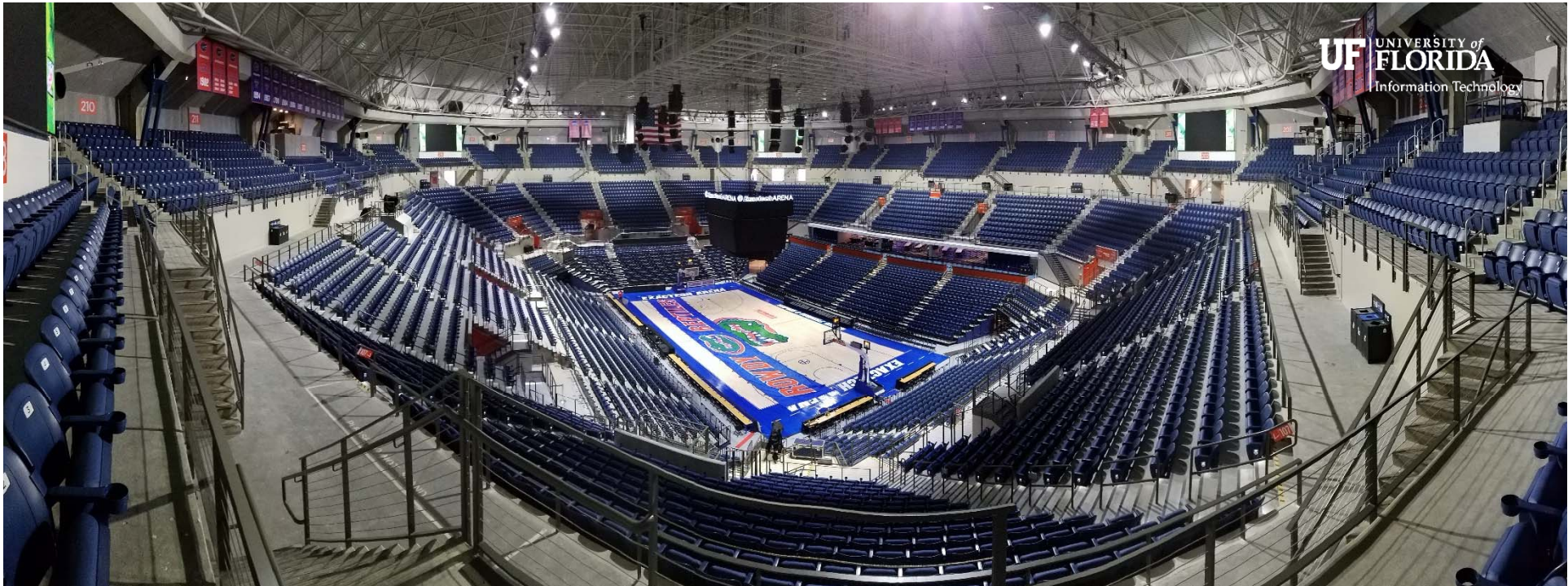


Survey Data provided by Tom Chesterfield, UF IT

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Finally, the Cost

Total O'Dome Network Install. Cost: >\$1 Million

Arena WiFi Wire and Labor: >\$75,000

Total Arena WiFi Cost: ~\$300,000

BICSI Certified Experts: Priceless

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The End...Questions?

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