Portland Community College

FACILITIES PLAN TECHNICAL REPORTS

Information Technology

In partnership with:

VANTAGE

PORTLAND COMMUNITY COLLEGE

IT Master Plan

Infrastructure Existing Conditions Report

Date: April 17, 2018

Prepared for:

SRG Partnership

Vantage Technology Consulting Group
201 Continental Blvd. • Suite 120
El Segundo • California 90245
310 536 7676 • fax 310 536 7677 • www.VantageTCG.com

I. Introduction

Portland Community College (PCC) is the largest post-secondary institution in the state of Oregon. PCC fills a unique role by offering high quality education and opportunities for their students, which in turn contributes to the vibrancy of Portland's economic community. Goals for the school include strengthening the region's economy by educating a skilled workforce, preparing students to successfully transfer to four-year colleges and universities, enriching the community through lifelong learning, building a greener workforce while shrinking their carbon footprint, and maintaining responsibility of sound financial stewardship of public dollars. Each year PCC plays host to more than 89,000 students, with more than 100 different programs to choose from in nearly 60 different fields of study. Here are the demographics from the last year of enrollment:

- 57,197 credit students in FY16
- Approx. 46,750 Continuing Education students in FY16
- 1,506 Full-time faculty and staff:
- 1,749 Part-time faculty and staff:

PCC operates four campuses and seven centers in the surrounding area.

- The Cascade Campus, 12 buildings located in the heart of North Portland
- The Rock Creek Campus, 9 buildings located off NW Springville road in the Beaverton-Hillsboro area
- The Southeast Campus, 6 buildings, on the corner of SE Division street and SE 82nd
- The Sylvania Campus, 14 buildings between Tigard and Lake Oswego
- The CLIMB Center for Advancement, 1 building in Central Portland
- The Downtown Center, in the Willamette building in Downtown Portland
- The Newberg Center, 1 building off Highway 99W
- The Swan Islands Trade Center, 1 building near the Cascade campus
- The Hillsboro Center, 1 building satellite facility to the Rock Creek campus
- The Portland Metropolitan Workforce Training Center, 1 building in NE Portland that is part of PCC's Extended Learning Campus
- The Willow Creek Center, 1 building in Beaverton

SRG Partnership has been engaged to develop college-wide facilities master planning services for Portland Community College (PCC) in Portland, Oregon. SRG requested that Vantage address the technology components identified in the RFP. Vantage's scope includes:

A. District-Wide Assessment of:
   1. Fiber and copper cable plant
   2. Technology physical facilities (technology rooms)
   3. Network redundancy
   4. Data center redundancy
   5. Wireless Architecture
   6. Infrastructure support for video surveillance and public safety systems

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B. The intent of the Phase I Facilities Master Plan is:
   1. To document existing systems, provide an assessment of current conditions and areas of deferred maintenance
   2. To provide recommendations for and documentation of a future network architecture based on interactive discussion with the PCC IT Group
   3. To provide recommendations including additions, upgrades or replacements to IT facilities and infrastructure necessary to support the future network architecture
   4. To provide a high-level description of discrete projects to address the recommendations for IT facilities and infrastructure including priorities, preliminary schedules and budgets identifying projects slated for the 2017 Bond measure.

The Phase I work has addressed all areas of the college, including all four campuses and eight centers mentioned above.

II. Methodology

Our process for this assessment comprised of the following:

A. A pre kick-off teleconference with PCC IT Management to:
   1. Review scope and methodology
   2. Gather an overview of IT managements view of current status and issues
   3. Discuss availability and status of existing documentation
   4. Establish candidates for stakeholder interviews
   5. Identify important areas of the campus for visual inspection

B. A review of existing documentation provided by PCC
   1. Vantage requested copies of relevant and available information:
      a. Masterplans and strategic plans, existing or in development
      b. Existing voice/data/video systems information, including network topologies sizing, counts, campus layout, traffic, services, usage etc.
      c. Systems, servers and services provided by or supported by IT.
      d. Present infrastructure information (copper, fiber, conduit, utility tunnels, riser, horizontal, wireless, etc.)
      e. Classroom technology standards
      f. Other information as it presently exists.

C. Attendance on site for:
   1. A kick off meeting with IT management
   2. Initial meetings with stakeholders (IT management, IT steering group, IT operations.) The goals of the meetings with IT personnel helped to establish the current state of the network including:
      a. Physical and logical topology
      b. Electronics (switches and routers)
      c. Wireless Security and access
      d. Inside/outside cable plant
      e. Supporting electrical and mechanical systems
      f. Network Management methods
   3. A survey on each campus/center to inspect and document existing conditions
      a. Vantage performed an IT facilities site survey and analysis to determine to what extent the existing infrastructures and spaces can support present and projected network needs. These inspections provided valuable insight into the current state of technology and the investment that might be required to bring systems and infrastructure up to the required levels. Vantage has coordinating with the MEP FMP team to include information on the environmental systems in the final report, along with recommended remediation for systems found to be deficient. MEP related items are found in PAE's section of the FMP report.
      b. To accomplish the kick off meeting and initial stakeholder discussions, we brought our team to site for two consecutive days in February 2017.
      c. In conjunction with the PCC IT team, Vantage assessed every telecom room (TR) at all campuses and centers during site visits in March and April of 2017.
      d. Vantage assessed examples of classrooms, lecture halls, conference areas, as well as 12 special "one-off" learning spaces across the district at all four campuses in April 2017.

D. Interactive discussions were held via teleconference and web conference and focused on the goals for a network supporting and enabling the institution in line with other elements of the Facilities Master Plan. Subjects included:
   1. Trends in Higher-Ed
      a. Flexible
      b. Easy to manage, seamless management between wired, wireless networks
      c. Highly available
      d. Fault tolerant
      e. Cost effective
      f. Secure and easy to use

      g. Ubiquitous
      h. Adaptable in support of future technologies and innovative uses of technologies
   2. Visioning (what would we design if resources were unlimited?)
   3. Specific technologies available that might make the vision possible
   4. Potential future network design and possible impediments
      a. Challenges and opportunities regarding the opportunities for enhanced collaboration across campuses
      b. Developed and prioritized a list of projects for possible inclusion as capital projects (Bond Measure)

III. Assessment of Existing Conditions

The sections that follow describe Vantage's understanding and findings resulting from our site survey and assessment activities. Keep in mind that the purpose of this report is to ensure that all parties are working with a mutual understanding of the underlying technical condition and agree on the components, systems, and services that are to be reused.

The criteria used in evaluation of conditions and serviceability of the infrastructure and related components are based on current industry standards as provided by ANSI, TIA, EIA, and BICSI, as well as compliance with National, State, and local codes. The primary criteria is compliance with the current version of the PCC Structured Cabling Standards (Version 2.0 dated 12/7/2016).

A. Outside Plant
   1. Vantage requested documentation for the existing outside plant (OSP) duct banks, underground vaults, handholes, and pull boxes for each of the main campuses. No recent or accurate information was available. As this information is primary to planning future communications expansion and upgrades, it was determined that a potential Bond Project would be to initiate a complete survey and audit of all inter-building communications pathways at each of the four principal campuses, utilizing existing engineering drawings and updating them by a physical inventory of all communications pathways, starting at each Campus MDF and tracing the duct banks and conduits connecting the various buildings at each campus. The resultant information is to be placed into PCC's system of record for infrastructure, Mapcom M4.


Figure 1 Example of entry conduits from other buildings.

B. Inside Plant

1. Vertical (Fiber Optic) topology consists of 48 strands of multi-mode fiber, and 12 strands of single mode fiber from the campus Main Distribution Frame (MDF) to each building, terminating in the Building Distribution Frame (BDF). From each BDF, there is only multi-mode fiber in the building risers, linking all Intermediate Distribution Frames (IDF) or Technology Rooms (TR) on other floors. This is limiting the bandwidth available throughout the building to 1 gigabit ethernet, and the district is considering extending single mode fiber to each TR for implementation of 10 gigabit bandwidth, or even 40 gigabit in the future.

2. Horizontal (Copper)
   It is Vantage's understanding that all horizontal inside cabling, whether voice or data, is category 5 or better (5, 5e, 6 or 6a). All cables are terminated at the work area outlet in RJ-45 jacks. The PCC standards call for the use of Category 6 cable for all workstations or work area outlets, while Category 6A is used for all Wireless Access Point connections. Those buildings using Category 5 should be upgraded to Category 6, for Gigabit Ethernet support.

Figure 2 Terminations are well supported and easy to trace

Figure 3 Example of good horizontal cable management

C. Telecommunications Rooms & Spaces (TRs)

1. Ground systems
   The PCC standards require the following components in each technology space:

   - The telecommunications main grounding buss bar (TMGB) is used in the main communications room of the building or campus. It is ¼" thick, 4" High, and has a variable length (usually 12" to 16") made from solid copper, or copper with electro-tin plating. It is pre-drilled to accommodate two-hole crimped lugs, and connected to building steel or the building ground electrode system. The connection to building steel or ground electrode system is 6ga. wire (minimum) for distances less than 13ft. The ground conductor is sized appropriately using engineering calculations, and may be as large as 750 kcmil (slightly less than 1-inch diameter) for longer distances. The connection to the ground system is made using exothermic welding, listed compression two-hole lugs, or two-hole exothermic lugs.
   - The Telecommunications Grounding Busbar (TGB) is slightly smaller - It is ¼" thick, 2" High, and usually 12" long. It is used in secondary communications rooms in a building, and all other characteristics and connection requirements for the TMGB apply to the TGB.

   Several buildings were constructed prior to the updated standards requiring two-hole compression lugs on ground conductors, but individual conductors from the TMGB or TGB to each rack, ladder, and conduits used for pathways were required at the time of most construction or remodel projects. Some of the current PCC spaces conform to the new or previous standards, while others are in non-compliance. Refer to appendix for specific room ratings. Examples follow.

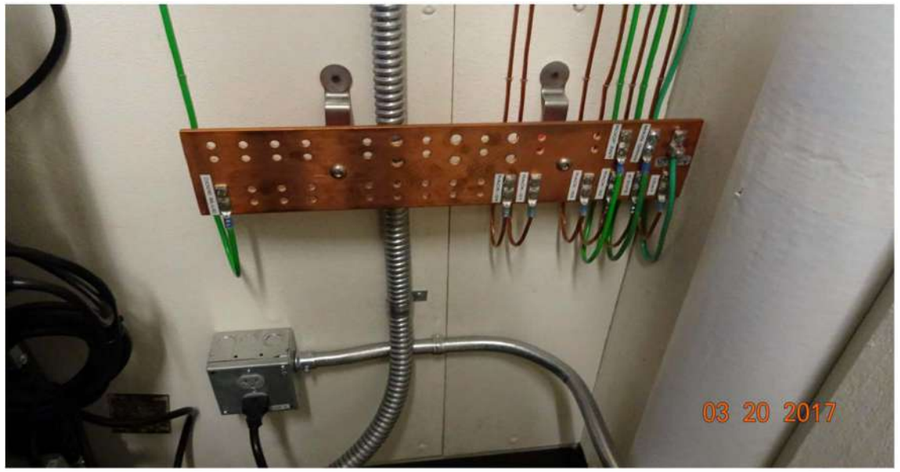

Figure 4 Example of grounding method using two-hole lugs, which comply with current standards.

Figure 5 Example using one-hole lugs, which are no longer compliant.

Figure 6 Ground bar is not an approved type.

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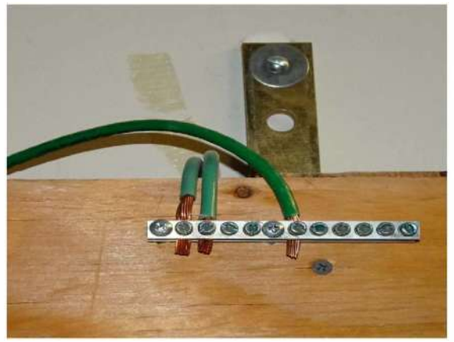

Figure 7 Additional examples of unapproved ground bar. Conductors can easily loosen, compromising ground integrity.

2. Racks and Cabinets

Network equipment located in the Technology Spaces are typically mounted in two-post or four post racks, or in cabinets with sides and lockable doors. The racks and cabinets are bolted to the floor, and ladder tray is installed above the racks to support cables distributed to and from the equipment. Vertical and horizontal cable management is installed to maintain order, making adds, moves, and changes easier for IT staff.

Figure 8 Good wire management, excellent capacity for expansion.

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Figure 9 Example of racks and cabinets with good expansion capacity.

3. Pathways

Pathways between floors consist primarily of conduit sleeves of various sizes to the space above, if the TRs are stacked vertically. In some cases where TRs are not stacked directly above or below, ladder tray or offset conduits are used. Inner duct has been used to segregate the fiber optic cabling from other cables.

The Sylvania campus has an active Utility Tunnel system, where most low voltage copper and fiber cables connect from the campus MDF to most, but not all, individual buildings' BDF. The trays may have been designed and intended for campus communications, and were initially sized for that purpose. Over time, the cable trays in the tunnel system have been used by multiple trades and campus departments, and now contain alarm, HVAC, Building Automation and Control, landscaping, lighting control, security, as well as abandoned copper analog voice cables. In many places they are overloaded and filled beyond intended capacity. Recommend removing all abandoned cables, and installing additional cable trays where possible, adjacent to, or above existing trays.

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Figure 10 Overloaded tray in Sylvania tunnel system.

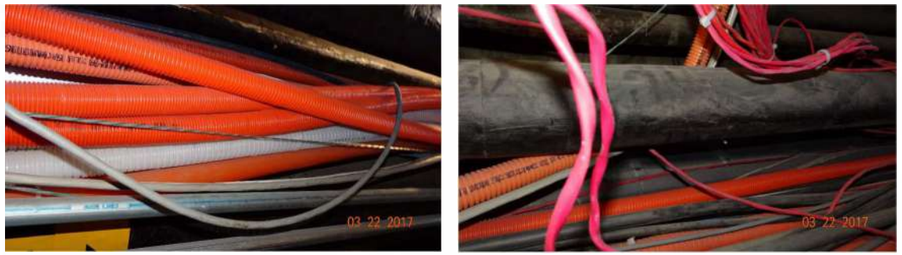

Figure 11 Multiple departments using tray intended for data only.

4. Firestopping is required at all penetrations through fire-rated walls and floors. Conduits, cable tray systems, and other cable pathways shall be sealed with an appropriate firestop system. Both single sided and "through-wall" penetrations require firestop assemblies, if required by the local Authority having jurisdiction. Over 50% of all the buildings in the district are lacking proper firestop systems, or have been installed improperly. These penetrations and conduits should be checked and corrected by a specialist in firestopping methods, and any new cable trays, sleeves, or conduits should be firestopped as required.

Figure 12 Good firestopping methods.

Figure 13 Poor firestopping methods.

5. Fire suppression in the Telecommunications spaces throughout the district was generally very good, with at least one or more wet sprinkler heads present. The effectiveness was not able to be determined. In the Data Center, inert gas systems are installed, in four zones – the plenum above the Server room, the plenum below the raised floor, the server room itself, and the room containing the UPS and battery systems.

Figure 14 Inert gas suppression for data center.

Figure 15 Sprinkler adjacent to open electrical circuits presents a hazard.

6. Access Control to the Telecommunications rooms uses a card-access system with electronic door release, with a back-up mechanical key. During the site survey, several of the spaces were in the completion stages of installing new Access Control systems, and except for a few exceptions, the rooms across the district were secure. Individual exceptions are noted in the appendix.

D. Network Redundancy

1. The existing conduit pathways at campuses with multiple buildings has led to a star topology for ●SP fiber optics. This means that each building connects to the network core at that campus via a single pathway. Each Building has a BDF, each campus or center has a single MDF with active electronic that connect that building with the campus network core and connects to the individual TRs serving the building network endpoints. This means that there is no redundancy in pathway connecting the campus network infrastructure. In some cases, there is redundancy built into the active electronics providing some measure of resiliency

2. The primary limitation on enhancing resiliency is related to the OSP conduit pathways. To add diverse pathways between buildings requires considerable effort and cost digging, trenching and repairing in support of new conduits. Historically, failures that impacted service delivery that would have been mitigated by diverse pathways are rare, making an investment in diverse pathways low on the priority list. Of note, a recent 2-day outage at the Cascade campus was caused by construction efforts. Had diverse pathways been in place at that campus, the event would not have impacted service delivery. However, the Working Group strongly recommends inclusion of diverse pathways and additional resiliency measures when cost-effective opportunities arise. For example, new construction, renovation or roadway work may provide cost-effective opportunities for additional redundancy and resiliency.
3. The trend in higher-education has been to migrate services, including those critical to the teaching and learning mission of the institution, to the "Cloud". PCC is no exception to that trend and continues to migrate services at a rapid pace to Cloud providers. The result is an increasing criticality for Internet connectivity. Should Internet access be unavailable or in any way constrained, PCC's ability to succeed in both the administrative and teaching & learning missions is severely impaired. In addition to the natural rise in bandwidth needs over time from existing services, as services are migrated to the cloud or use patterns changes, sudden substantial demand increases may occur. As the ability to enhance capacity on the WAN and Internet connections is reliant on commercial carriers with lead time for changes typically measured in several months, institutional decisions that could impact that usage must be coordinated with IT or capacity constraints may hamper institutional initiatives with little apparent warning. Additionally, as utilization grows, the impact to border electronics like firewalls, packet shapers, IDS/IPS, and routers can be substantial resulting in rapid replacement cycles closer to 2-3 years.

   Inter-campus connectivity is provided via a dual star topology over metro ethernet (metroE). In this topology all campuses connect to both Cascade and Sylvania over 1Gb metroE connections. Sylvania and Cascade connect to each other over diverse leased fiber with 10Gb optics. Internet connectivity is provided through the Sylvania campus and via a fiber connection from Cascade to the Pittock Internet Exchange hotel. While there may be a need to increase capacity to some of the satellite campuses over time, the topology is robust and has been reliable.
4. Recommendation: Opportunistically add diverse pathways for network connectivity. Closely monitor WAN and Internet utilization and proactively enhance capacity.

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E. Data Center

1. The data center at the Sylvania campus was renovated in 2011. The data center has 1120 sqft of useable raised floor space supporting up to 19 cabinets with less than 19 cabinets currently populated. A non-contained "hot aisle / cold aisle" method of cooling is used. This involves lining up server racks in alternating rows with cold air intakes facing one way and hot air exhausts facing the other. The rows composed of rack fronts are called cold aisles. Typically, cold aisles face air conditioner output ducts. The rows the heated exhausts pour into are called hot aisles. Typically, hot aisles face air conditioner return ducts. Two (N+1) 40-ton CRAC units in addition to an older 10ton CRAC. Cold air distribution is via underfloor areas and perforated floor tiles, and the hot air return uses overhead ducting with no hot aisle containment or other mechanism to separate the return air from the conditioned air.

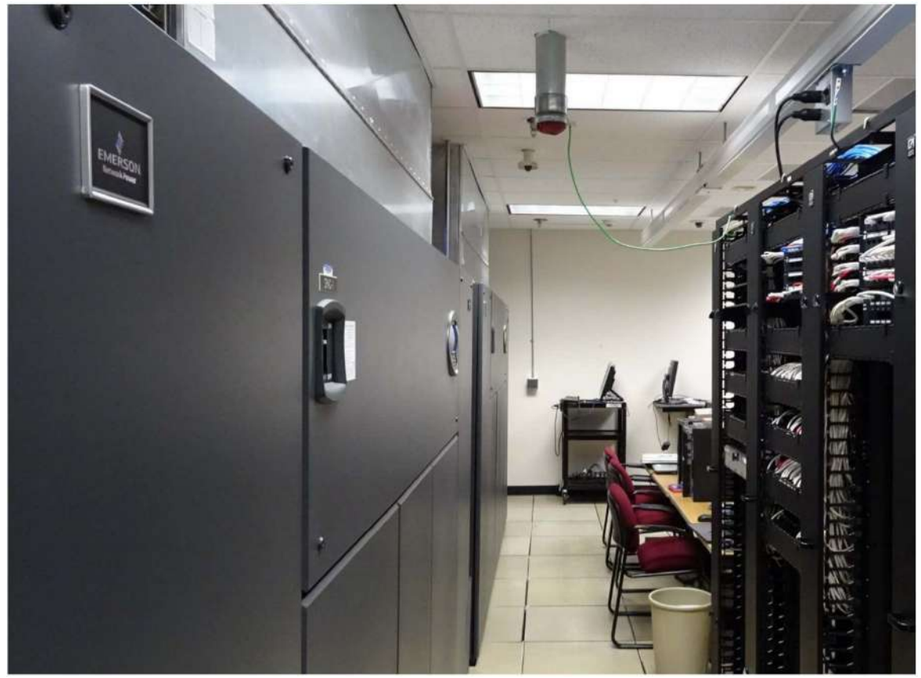

Figure 16 CRAC Units cool the hot air from the plenum above the ceiling tiles.

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Figure 17 Rear of the cabinets face out to the room. Hot air is exhausted, rising to the ceiling return vents

Figure 18 Cold air is directed to the aisle between cabinets, where the equipment air intakes are located.

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A single 250kW UPS provides power through a Starline busway with a steady-state electrical load of approximately 42kW. The current operating load is ~41% of the units' capacity, and will provide a full room run-time of approximately 30 minutes, to allow transition time between main grid power and generator power.

Figure 19 UPS and cabinets of batteries.

Figure 20 Starline bus with redundant circuits.

2. A 350 kW diesel generator provides power to the UPS and HVAC in the event of a commercial power failure. PCC reports that unloaded tests are run weekly but that loaded tests are not regularly performed. Generator monitoring and maintenance was reported anecdotally to be an issue with at least one event where the generator ran dry (out of fuel) with no responsible party monitoring fuel levels. FMS provides maintenance services for HVAC and electrical systems supporting the data center but there does not appear to be effective engagement between IT and FMS to ensure system design, maintenance and monitoring adequately support the systems. No roll-up lug is available to support a temporary generator should one be required.
3. Some of the data center active electronics are nearing or have reached the end of the intended service life and must be replaced.
4. PCC has considerable spare capacity in terms of floor space, cooling and electrical to support future growth of services in the Sylvania data center.
5. Recommendation: Install a lug for a roll-up generator. Improve data center HVAC efficiency with hot aisle containment, chimneys or some other mechanism to separate conditioned from return air. Replace end-of-life active electronics. See PAE's report for additional detail.

F. Business Continuity and Disaster Recovery

1. PCC does not have an institutional business continuity (BC) or disaster recovery (DR) plan or defined set of objectives for IT to support. Without those defined objectives, the Working Group cannot determine if additional data center capacity is needed at other campuses or at commercial facilities in support of DR/BC functions. PCC has heavily invested in virtualization technology and continues to pursue Cloud services where applicable. DR/BC planning may further those investments utilizing Cloud services to provide BC/DR services for PCC infrastructure. As PCC defines institutional BC objectives, there is likely to be a considerable effort required from IT to meet that objective. For example, it may be an institutional objective to be able to move classes at another campus should any one campus become out of service for any reason. The IT effort in support of this could range substantially based on the campus and the specialized needs of disrupted classes, faculty and staff.
2. Recommendation: Create an institutional DR and BC plan including critical IT related functions. Should an institutional plan not be possible at this time, create IT specific DR/BC plans.

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G. Video Surveillance

1. A separate working group is focusing on various physical security measures including video surveillance. In consultation with the sub-consultant responsible for that section, no significant architectural changes are anticipated to the video surveillance system that will impact the data network. The overall approach and data transfer between buildings and campuses will remain as it is with only incremental upgrades in software and hardware. In addition, some cameras may be upgraded from analog to IP but with the localized architecture, the network impact is expected to be minimal.

H. WiFi

1. Indoor WiFi coverage at PCC is generally excellent. The construction materials (e.g., block) at some campuses adds to the already significant technical complexity of managing WiFi at PCC. While WiFi in some cases bleeds through walls, outdoor coverage is essentially non-existent. Vantage reviewed PCC WiFi using heat map data provided by PCC's Aruba Airwave management platform. This system monitors and manages all access points throughout the PCC system. While coverage is excellent, WiFi technology is rapidly changing and demand continues to rise at an exponential pace further exacerbated by the explosion in Internet of Things (IoT) devices. Additional demands on WiFi outside of the traditional classroom experience include life safety systems, mass/emergency notification, security alarms and life safety systems. The result is that the replacement cycle on WiFi system components is rapid and there is a constant need to tweak the system and add or move additional access points. The primary components of the WiFi system are noted below:

Cascade

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Cascade Hall	AP-224	Both	Aruba 6000	27	2/1/2023	No
Jackson Hall	AP-134	N only	Aruba 6000	15	8/1/2020	Yes
Student Center	AP-134	N only	Aruba 6000	15	8/1/2020	Yes
Moriarty Arts and Humanities Building	AP-134	N only	Aruba 6000	18	8/1/2020	Yes
Physical Education Building	AP-134	N only	Aruba 6000	7	8/1/2020	Yes
Public Safety	AP-134	N only	Aruba 6000	1	8/1/2020	Yes
Public Service Education Building	AP-134	N only	Aruba 6000	9	8/1/2020	Yes

Student Services Building	AP-134	N only	Aruba 6000	21	8/1/2020	Yes
Student Services Building Remodel	AP-134	N only	Aruba 6000	18	8/1/2020	Yes
Student Union	AP-224	Both	Aruba 6000	20	2/1/2023	No
Technology Education Building	AP-134	N only	Aruba 6000	22	8/1/2020	Yes
Terrell Hall	AP-134	N only	Aruba 6000	20	8/1/2020	Yes

South East

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Community Hall Annex	AP-105,125	N only	Aruba 6000	7	8/1/2018, 8/1/2020	Yes
Southeast Administration Building	AP-105,134	N only	Aruba 6000	8	8/1/2020	Yes
Learning Commons	AP-134,224	N only, Both	Aruba 6000	31	8/1/2020, 2/1/2023	Yes, No
Mount Scott Hall	AP-105	N only	Aruba 6000	5	8/1/2020	Yes
Mount Tabor Hall	AP-105	N only	Aruba 6000	24	8/1/2020	Yes
Student Commons	AP-224	Both	Aruba 6000	36	2/1/2023	No

Sylvania

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Automotive and Metals	AP-134	N only	Aruba 6000	22	8/1/2020	Yes
Bookstore	AP-134	N only	Aruba 6000	8	8/1/2020	Yes
College Center	AP-134,224	N only, Both	Aruba 6000	50	8/1/2020, 2/1/2023	Yes, No
Campus Services Building	AP-134	N only	Aruba 6000	9	8/1/2020	Yes
Communication Technology	AP-134	N only	Aruba 6000	25	8/1/2020	Yes
Heat Plant	AP-134	N only	Aruba 6000	4	8/1/2020	Yes
Health Technology	AP-134	N only	Aruba 6000	32	8/1/2020	Yes
Library	AP-134	N only	Aruba 6000	22	8/1/2020	Yes
Performing Arts Center	AP-134	N only	Aruba 6000	7	8/1/2020	Yes

Performing Arts Center Outdoor	AP-175P	N only	Aruba 6000	3	8/1/2020	No
Southern Classroom Building	AP-134,175P	N only	Aruba 6000	9	8/1/2020	Yes, No
Social Science and Technology	AP-134,224	N only, Both	Aruba 6000	16	8/1/2020, 2/1/2023	Yes, No
Science Technology	AP-134,224	N only, Both	Aruba 6000	24	8/1/2020, 2/1/2023	Yes, No
Technology Classroom Building	AP-134	N only	Aruba 6000	20	8/1/2020	Yes

Rock Creek

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Building 1	AP-134	N only	Aruba 6000	4	8/1/2020	Yes
Building 2	AP-134	N only	Aruba 6000	46	8/1/2020	Yes
Building 3	AP-134,224	N only, Both	Aruba 6000	24	8/1/2020, 2/1/2023	Yes, No
Building 4	AP-134	N only	Aruba 6000	2	8/1/2020	Yes
Building 5	AP-134,224	N only, Both	Aruba 6000	26	8/1/2020, 2/1/2023	Yes, No
Building 6	AP-134	N only	Aruba 6000	8	8/1/2020	Yes
Building 7	AP-134,224	N only, Both	Aruba 6000	30	8/1/2020, 2/1/2023	Yes, No
Building 7 ADD	AP-134,224	N only, Both	Aruba 6000	24	8/1/2020, 2/1/2023	Yes, No
Building 9	AP-134	N only	Aruba 6000	18	8/1/2020	Yes

Bonita Rd

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Building 1	AP-134	N only	Aruba 6000	5	8/1/2020	Yes

Capital Bond, Capital Park

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Building 1	AP-105	N only	Aruba 6000	1	8/1/2018	Yes

CLIMB

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Building 1	AP-125	N only	Aruba 6000	19	8/1/2020	Yes

Downtown Center

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Building 1	AP-105	N only	Aruba 6000	18	8/1/2018	Yes

Hampton Square

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Building 1	AP-224	Both	Aruba 6000	1	2/1/2023	No

Hillsboro

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Building 1	AP-105	N only	Aruba 6000	6	8/1/2018	Yes

Newberg Center

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Building 1	AP-125	N only	Aruba 6000	9	8/1/2020	Yes

Portland Metro

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Building 1	AP-134	N only	Aruba 6000	9	8/1/2020	Yes
Building 2	AP-134	N only	Aruba 6000	5	8/1/2020	Yes

Swan Island

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Building 1	AP-134	N only	Aruba 6000	11	8/1/2020	Yes

Willow Creek

Building	AP model	802.11n/ac Support	Controller Model	Qty	End of Support	Replace?
Building 1	AP-134,224	N only, Both	Aruba 6000	42	8/1/2020, 2/1/2023	Yes, No

2. Recommendation: Replace older APs and controllers. Deploy WiFi outdoors in highly targeted areas with strong potential value.

IV. Audiovisual & Classroom/Instructional Technologies

Vantage reviewed many typical and A-typical instructional spaces on all four PCC campuses and identified spaces that have general issues that are either being addressed by facilities or have been considered for future facilities efforts and are not listed within this report. There are other spaces/programs that the District needs to address that, based on both professional assessment and stakeholder vision, are suggested for consideration for program enhancement and bond funding:

- Sylvania Maker Lab #101 (Automotive Technology)
- Sylvania Clinical/Nursing Simulation #HT315
- Rock Creek Performing Arts Theater #114
- Rock Creek Event Center #122
- Cascade Auditorium #MAHB 104
- Southeast STEM Lab #229/231
- Conference Spaces (Including Southeast Conference Room)
- Typical Classrooms
- Cascade Fire Training & Simulation Space
- Remote Media Systems Management & Helpdesk

Note that over the duration while this report was being generated in concert with other assessment efforts, identified and needed technology corrections were and are still in process to ensure program continuation.

A. Maker Lab #101 (Automotive Technology)
   1. PCC's Maker Lab is a space that was repurposed from an existing automotive technology space due to the size, layout and support services (power, water, etc. that works well for a multi-discipline creation space. The Maker Lab consists of the large main room that hosts a classroom-style space with individual computers and 3D printers, lounge area, open large item fabrication and assembly, tool and part storage and sturdy work benches for creation and small assembly (including sewing, more 3D printing, etc.). Also in the Maker Lab is a separate room for classroom use with an observation window into the main Maker Lab area. Another area attached to the space is a visioning and modeling room consisting of whiteboard area, small wood fabrication for modeling, sandblasting equipment, etc.
   2. In talking with the key stakeholders and users for this space (including students), some suggestions for better lighting, space layout and additional services including walls plumbed for pneumatic air lines and outlets on the walls and ceilings (retractable reel ceiling lines) were desired. Adding the marking for station zones and safety pathways would be helpful to maintain adequate clearances for critical or dangerous equipment. This may include the addition of physical partitions or curtains as well as the re-zoning of overhead lighting.

3. Adding some monitors around the space that can be used for team use of laptop connection and display, space or station information, lab instructions or general information would be helpful for the space growth and flexibility.
4. Some stakeholder expressed the desire to rotate the classroom space 90-degrees to face the observation window wall and add new 90" interactive monitor in place of existing 70" TV with the goal to gain more student seating. The expense of doing this, however, may be too great based on the need to adjust power and data for the individual workstations and 3D printers. This is being recommended to looked at as part of a larger project to expand the maker program for the District.
5. Recommended changes to this space would include:
    a. Explore the re-orientation of the room for classroom area to see which arrangement will yield the best number of seats compared to the viewability and engagement with the rest of the space.
    b. Plumb wall with pneumatic air connections and add retractable reel ceiling connections for air support throughout space
    c. Add safety marking lines for walkways and stations
    d. Add retractable curtain to divide "classroom" area from main creation space when required
    e. Update overhead lighting to support stations and areas more effectively
    f. Add more retractable power reels in strategic overhead locations for workstations
    g. Remove legacy car lifts to add more space for new stations
    h. Add 40" monitors around space for general information or specific content
    i. Add upgrade projector in model room and add more whiteboarding space
    j. Add computer software (and hardware as needed) for digitally capturing whiteboarding notes
    k. Add new stations / support for virtual reality and augmented reality equipment
    l. Better support for disabled students with access to tools, pull-out monitors, wireless keyboards, etc. – Include Assistive Listening System equipment for the hearing impaired
    m. Install a 3D printer support program for preventative maintenance

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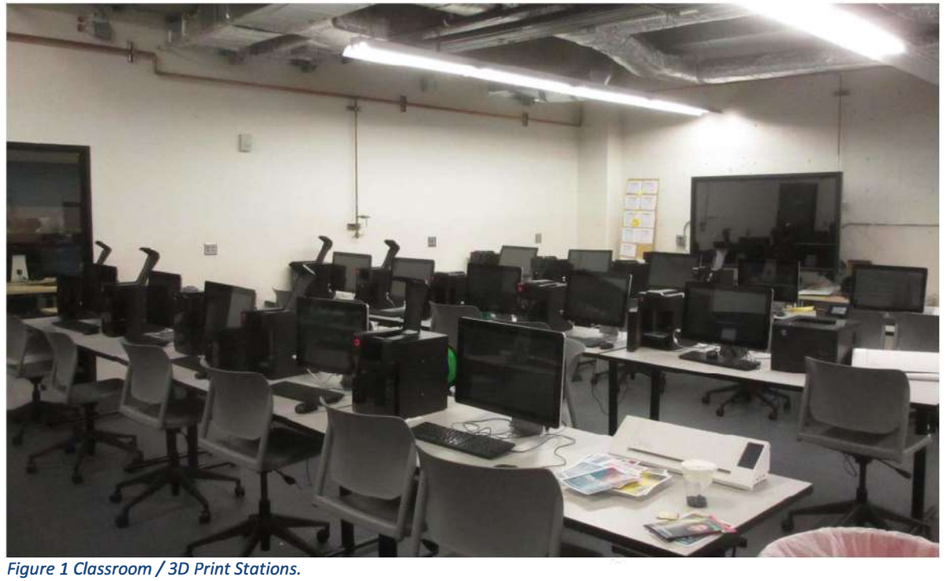

Figure 1 Classroom / 3D Print Stations.

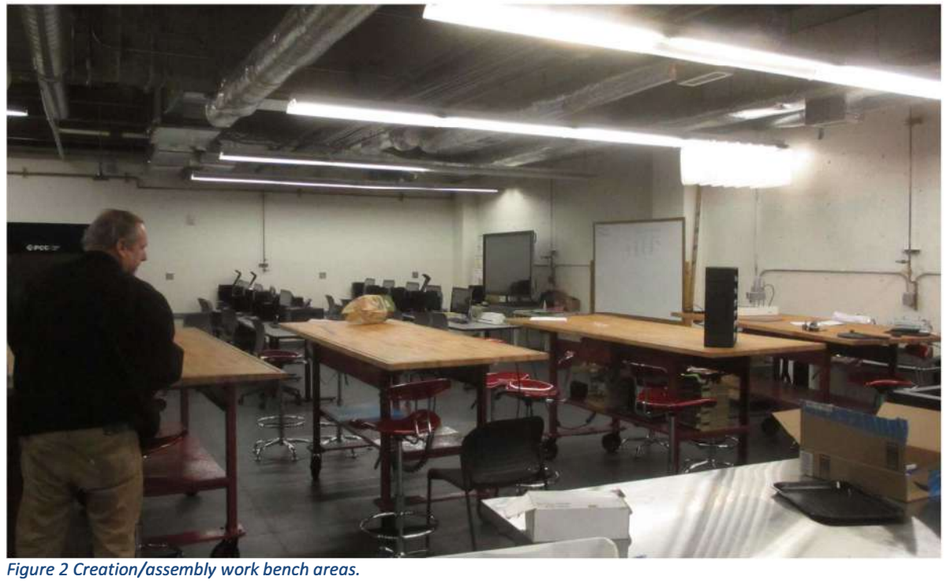

Figure 2 Creation/assembly work bench areas.

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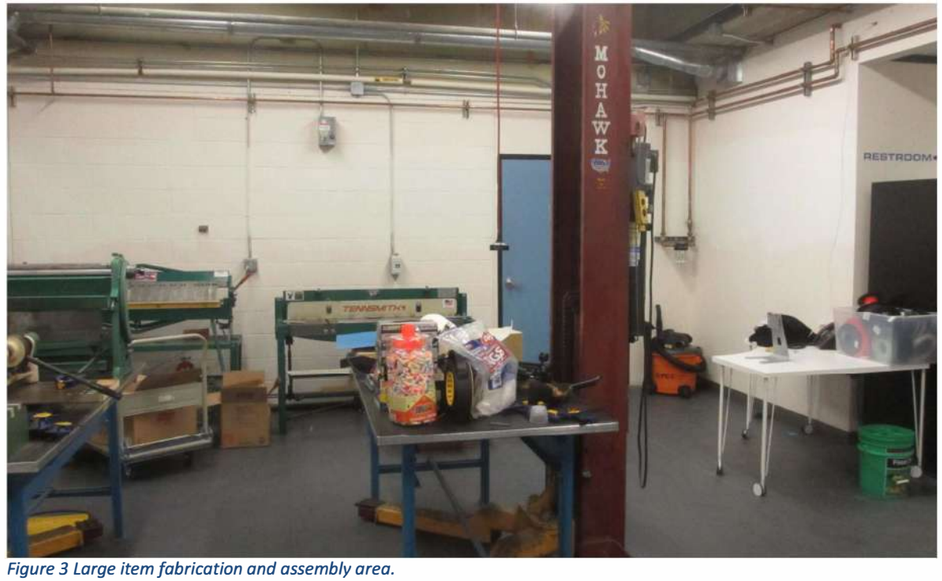

Figure 3 Large item fabrication and assembly area.

Figure 4 Lounge & meeting area.

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Figure 5 Maker Lab separate classroom area.

Figure 6 Maker Lab separate model space.

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Figure 7 Maker Lab separate model space (whiteboard wall).

B. Nursing Simulation Lab #SY

1. The existing Nursing Simulation Lab at the Sylvania campus is functioning but needs new support equipment to get the system back to the desired operating state. The space includes multiple microphones and cameras but only some of which can be utilized for recording in the current system. Look at adding to functionality of space for the replicating of other hospital-style systems such as nurse-call, etc. to enhance the experience. The school does leverage the relationship with the local hospitals for this for offsite exposures but looking at possible enhancements that would provide better on-campus recording and briefing of mock scenarios can be valuable. Look at possible future technology enhancements as well such as augmented reality tools for virtual simulation experiences that are coming available.
2. There are limited stations within the Simulation Lab and growth should be considered for the physical space and layout of the room. The stakeholders expressed the desire to add storage and charging space for mannequins as well as new head wall locations for bed connections. The addition of a dedicated NICU station and a new active infant mannequin is desired.
3. Briefing Room is very small and has limited space for larger group review sessions. This is a physical space concern, so the campus should review the overall space requirements for program growth forecasts for consideration as a much larger scope and bond program addition. Vantage recommends including the capability to send (via live streaming, etc.) simulation room video to the display in the Briefing Room for Observation Room expansion and non-participant viewing.
4. For reference, the building that the Simulation Lab is currently planned for replacement in 2020 so program may expand at that time.
5. It is recommended that a new turn-key system be installed to ensure that all components and functionality are operating together as intended and that the entire system would be under a new warranty.
6. *Note: There were critical issues with the active mannequin system and the interfacing of the proprietary vendor equipment network and the campus network but while this report was in development, the District IT and manufacturer were engaged in the process to reconcile the issues with Vantage acting as mediator. This has now been in process for a few months with promising results and a pathway for support procedures for all similar solutions from this same manufacturer throughout all simulation spaces in the District including the FMS group.
7. Note that the district noted another Simulation space at the Cascade campus but this was not noted to Vantage as a space to be reviewed. Similar requirements may be required but should be reviewed with campus / district stakeholders for evaluation.
8. Recommended changes to this space would include:
    a. New camera control processor that will work with all existing cameras
    b. Additional cameras (a total of 6 is preferred by the staff for the room) and microphones for new stations (including "Nursing Station")
    c. New audio management console
    d. New recording equipment
    e. Better layout of control space to also simulate "Nursing Station"
    f. Expand program to include other technologies found in hospital such as nurse call and "Voceru" style paging units (or similar newer technology)
    g. Updates to Laerdal mannequin system and wireless support
    h. Add storage and charging areas for multiple mannequins
    i. Add additional station & bedding including headwall
    j. Add NICU station and support (have bed but only older non-active infant mannequin)
    k. Expand Briefing Room size and viewing capabilities
    l. Resolve wired/wireless mannequin control and cross-talk issues with manufacturer*
    m. Add permanent sink and plumbing to eliminate noisy portable unit
    n. Lab proximity relocated closer to Skills Lab so both spaces can work with mannequins together when required
    o. Replace entire system with new components and fresh comprehensive warranty

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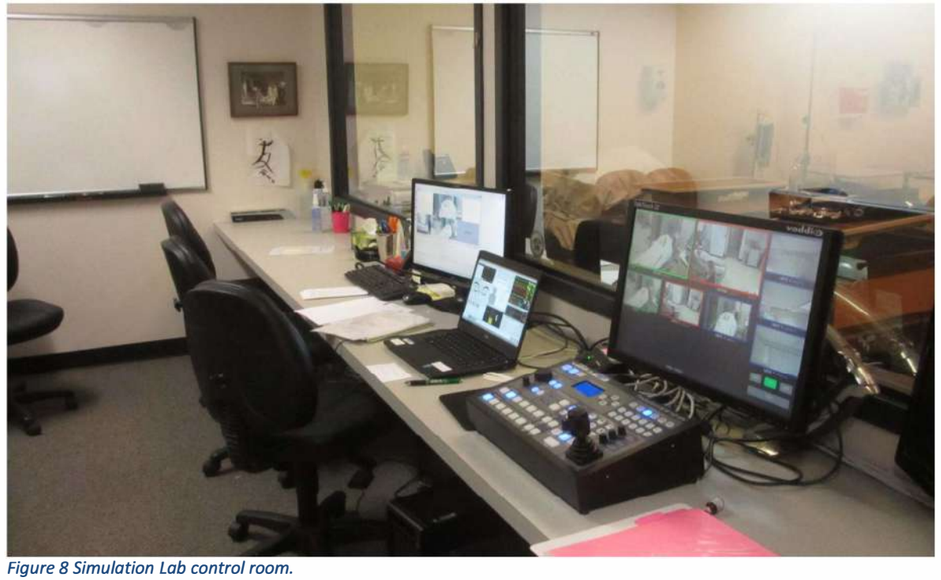

Figure 8 Simulation Lab control room.

Figure 9 Vacant Sim station.

Figure 10 Portable sink and storage units.

Figure 11 Briefing Room.

C. Performing Arts Theater #114, Rock Creek Building 3

1. The Rock Creek campus' Building Three Theater is no longer functioning as a performing arts venue due to many of the theatrical systems being in disrepair. This space is being heavily used now as a larger lecture and classroom space. The theatrical group has moved out of Rock Creek since this space can no longer support them but would like to be able to use this space for more than dance practice areas or small audio performances (with portable equipment).
2. The projector in this space is hard to access and Vantage recommended replacing with a new 20,000 operating hour laser projector to minimize servicing and operating costs (lamp changes, etc.) since there are no consumable components or serviceable filters that need regular support. The projector was replaced at the time this report was in review so was removed from the action list.
3. The audio equipment within the venue is dated and mostly in disrepair for even basic classroom lecture use. There are cabling issues and cable tracing/labeling and general cleanup required to make the system in better use for production support (both on-stage and in rear technical spaces).
4. The control booth gets very hot while in use and the school has stated that the room occasionally reached 90 degrees Fahrenheit.
5. Recommended changes to this space would include:
    a. Curtains need to be replaced (preferably with motorized systems rather than manual) – this may already be in process while this report is issued
    b. Audio system upgrades and repairs (many amplifiers are broken and suggest replacement of one minimum) – audio system should be redesigned and replaced
    c. Clean up bad cabling in rear
    d. Need more storage area (architectural scope)
    e. New stage audio connections and cable snake system
    f. Upgrade control booth to accommodate ventilation and supply and add HVAC system to help control room environment for the booth operators

Note: At the time this report was being created, the campus was in the process of adding a new audio amplifier and replacing two speakers and was also replacing 5 wireless handheld microphones and the general audio cabling to the stage. Wireless microphones were originally requested but have been removed from the list based on later client direction. The projector has now been replaced.

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Figure 12 Theater stage & podium.

Figure 13 Stage floor connections.

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Figure 14 Rear Control Room (new audio & lighting console).

Figure 15 Rear tech station cables.

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D. Event Center #122 (Rock Creek)

1. The Event Center is a large capacity space that can be divided into three separate independent sections. The room(s) are heavily used and need special support as the existing control system is difficult to operate with consistent reliability and will occasionally lock up after 2 hours into usage. The Crestron control hardware is functioning, but the programming needs to be replaced – may look at upgrading Crestron hardware from older 2-series processor to 3-series model that works better in combining applications. Recommend replacing older 8-series control panels with newer versions. The 8-series control panels were a short-lived solution that were soon replaced with a more solid hardware option for both wireless connectivity and battery. These units have been proven to be problematic with control connectivity and reliability.
2. The main equipment rack is a Middle Atlantic 3-bay credenza that is missing the covering panels which help direct proper convection cooling (with the top fans) and keep the equipment cleaner. The rack is very dusty although no issues with equipment overheating have been communicated. This equipment should be relocated to a more appropriate cabinet taking less floor space and improving clearance and access to all equipment in the TR.
3. Recommended changes to this space would include:
   a. Re-program space and test to function reliably and to add new features like locking out in secondary mode, etc.
   b. Replace control processor and control panels
   c. Replace projector lenses with ones more suitable for the projector throw.
   d. Replace fluorescent lighting with newer LED fixtures and connected to AV control system
   e. Install new projectors (have equipment but need labor)
   f. Fix speakers that are not working (two at minimum)
   g. Add more wireless data network support for room
   h. Look at laptop connection issues and compatibility (EDID) with system and display equipment
   i. Clean out and service older equipment that will not be replaced and;
   j. Replace the existing 3-bay equipment credenza with a single (or two as needed) vertical equipment rack to save space within the room.
   k. Conduit infrastructure not compliant with N.E.C. requirements. Replace PVC conduit penetration(s) through ceiling with EMT sleeves with vertical cable ladder to rack or direct EMT conduits for cabling. The existing conduits run through a mechanical space before reaching the telcom room and should be re-run as required for a more direct path.

Figure 16 Event Conference Room Layout.

Figure 17 Equipment Credenza.

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Figure 18 Wall Control Panel.

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E. Auditorium #MAHB 104

1. The Cascade Campus' Moriarty Arts & Humanities Building Auditorium is a large venue performance and lecture space. The stakeholders and primary operators of this space stress the need to simplify the transition between various modes such as presentation to theatrical to classroom in the control system. The classroom presentation system is not well-integrated within the performance audio system so can require a theater technician to setup mode in rear control booth for general lecture use.
2. The theatrical lighting system needs to be reviewed and updated as the school needs to bring in additional stage lighting on stands to supplement during performances and the current lighting controls are not labeled for easy operation. The operators of the room would like to see better installed dedicated side lighting for performance use as well as overhead lighting for presenter and panel discussion illumination. This will help with the video recording of the presentations as well. The side curtain does not completely block out the widow lighting into the room and is a disruption for video presentation and light control for recording.
3. Enhancements to the room for the addition of an opening window in the control room for the operator to hear better during live audio performances and permanent recording and live streaming appliances for broadcasting events. Recommend the projector in the control room with a new 20,000 operating hour laser projector that will minimize servicing and operating costs (lap changes, etc.) since there are no consumable components or serviceable filters that need regular support. Relocating the projector to outside of the booth on a new mount will help with controlling noise and heat in the booth and help with stabilizing the projector image on the screen. Replacing the existing front projection screen with a new larger 16:9 screen is also recommended.
4. Recommended changes to this space would include:
    a. Do acoustics study of space (architectural scope)
    b. Re-work AV system to merge classroom system into theatrical system
    c. Re-program space
    d. Address theatrical lighting controls and connect to AV control system that can be managed from both a light control board and the AV control touch screen(s)
    e. Add better stage lighting including new LED spotlights and focusable stage lights
    f. Replace rear projector with new laser model and move out of control booth to a mount or shelf about control room window
    g. Add safety row aisle lighting (architectural scope)
    h. Address side window curtain to help control or "black-out" space from external sunlight (architectural scope)
    i. Re-work stage connections to simplify disconnect of podium
    j. Create rear openable window for audio technician to hear space when needed

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Figure 19 Auditorium stage.

Figure 20 Lighting Controls.

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Figure 21 Rear control room and rack/storage.

Figure 22 Projector in rear control room.

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F. STEM Lab #229/231

1. The STEM Lab on the SouthEast campus is a very impressive space with the amount of functionality and tools that it holds for the District. Students can explore 3D printing, an interactive augmented reality table for demonstrating effects with changing topography, viewing 3-dimensional content, exploring virtual reality and other interactive tools.
2. This lab takes up two smaller rooms – one being the exploratory space and the other being set up in more of a classroom style which includes a larger interactive TV on a rolling stand used for presentations. The greatest concern in this space is that they are physically out of room for expansion of the program leaving no more room for storage and new equipment stations. This space should be looked at, as part of a growing program, to double its size (at minimum) to accommodate more students and more technology and experimental stations.

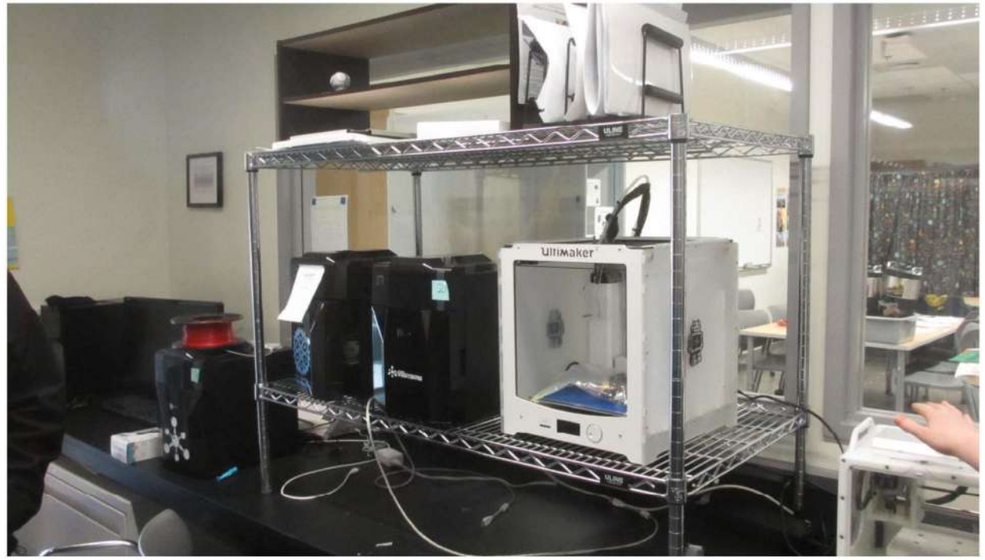

Figure 23 3D print station.

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Figure 25 Augmented Reality Table.

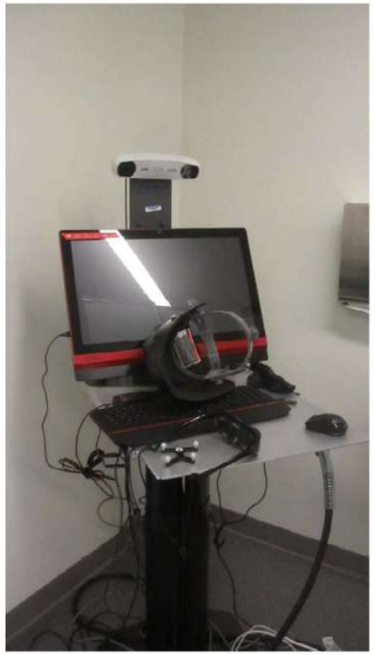

Figure 25 Virtual Reality Station

G. Conference Spaces

1. The various conference spaces throughout the District have been configured differently based on the specific building program during implementation. The District has added components such as video conferencing equipment in some spaces to better collaborate with remote locations across the campus spaces, but this has fallen out of use for more internet-based solutions and conferencing applications such as Google Hangouts, Adobe Connect, etc. In Southeast room 100, this is a large conference space that includes a rolling videoconferencing cart that is now used for the display only. The space is used for interviews but is limited due to the size of the room with the smaller camera. The District is looking to grow the web-conferencing capability across all campuses and standardize on a software platform for all staff to use.

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Vantage recommends establishing a consistent "kit of parts" that can be deployed in the various conferencing spaces that would best support this including a flat panel display that is appropriately sized for the room for best viewing (can be wall or rolling cart mounted), a dedicated room computer (can be a small-form factor PC behind the display) and wireless mouse and keyboard, a semi-pro grade HD USB camera mounted either under or above the TV (depending on size and location) and an audio conferencing solution such as a USB audio bridge (with dialer) and table microphones or even a simple USB microphone/speaker pod. This combination of components will work with the variety of web-based solutions including Zoom, Goto Meeting, Skype, WebEx, Adobe, Google, etc. and will provide good flexibility for the future to bridge in remote participants communicating via video/audio conference bridge services as well as via phones, computers and other mediums. Light control within the rooms should also be reviewed as this will help the cameras work better.

Figure 26 Southeast Conference Room #100 & Rolling VTC Monitor Cart.

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H. Typical Classroom Systems

1. Vantage's scope was not to review all typical classroom across the campuses however, for the purposes of discussions and understanding the PCC Media Services preferences and typical system operation prior to reviewing the specialty systems, a basic review of a few sample general classrooms was included.
2. In typical classrooms, it was expressed that a wireless collaboration and screen mirroring appliance is desired to accommodate more instructor mobility while interacting with the classroom. This was discussed to have a follow-up call with PCC to provide Vantage's experience with the various manufacturer models available (that Vantage has tested internally or have seen on other peer institutions. Other technologies that were considered for these space types include support for distance education including USB connected HD cameras and microphones for web collaboration through a connected dedicated PC.
3. Many of the older classrooms are not yet added to the networked management software for remote helpdesk support and control. These should be added to the Crestron Fusion™ control software (see specific section for that system following this section).
4. PCC has been going through a process to ensure that all classrooms are built up to a typical design through the technology refresh process. This process should include additional functionality preferred once tested and accepted through the Media Services Group and Academic / Curriculum Development Groups. Vantage can assist in a visioning session(s) with specific stakeholders to look at the various technologies and systems to help with the development of new tools and usage for educational staff and curriculum development.
5. Vantage recommends that once typical design concept is determined, this should be documented as part of a standard for use for consistency in all typical spaces and used as the based model for any A-typical classroom types. This could be included within a technology standards guidelines document that might include the more typical audiovisual system configurations and equipment as well as preferences for data structured cabling and security systems that can be used as a reference for future building and renovation projects throughout the district. If needed, Vantage can provide a sample of this type of document that has been produced for other institutions for reference.
6. Vantage recommends that PCC perform a more comprehensive classroom evaluation and assessment incorporating space planning and classroom utilization to assess if PCC has the right kind of classrooms in the right locations with the pedagogically appropriate technologies. Building on this data to develop a review and refresh cycle so that classrooms are refreshed in accordance with technology lifecycles and aligned with institutional needs. Examples of the kind of data to be collected includes:
    - Emerging pedagogies at PCC as a basis for new modalities, classroom configurations, and technologies.

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- Capacity issues for wired and wireless network access in teaching and learning rooms.
- Access for effective interaction with central systems and application servers.
- Ranking, room-by-room of the condition of classroom technology cross referenced with room utilization and other important institutional characteristics.
- Identification of deferred maintenance issues, resource inefficiencies, and the upgrade strategies and policy changes to address them.
- Peer review of equivalent classroom technology conditions and IT best practices
- Benchmark current conditions, funding, and operations with institutional peers
- Explore gaps between current conditions and need / peer context.

Figure 27 Sylvania Library 204 Conference Rm.

Figure 278 Instructor Podium.

Figure 289 Touch Control Panel Layout.

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Figure 29 Equipment ack and annotation tablet..

I. Cascade Fire Training & Simulation Space
   1. Like the Sylvania campus' Nursing Simulation Lab, the Fire Training and Simulation space utilizes the active mannequin system that is compatible with the other units deployed across the various district simulation spaces for emergency care training. The space has also started to be outfitted with cameras for the recording and playback of the active training sessions for briefing and analysis of tactics. The program is wanting to be expanded for a more elaborate and functional solution that comprises not only the local "station" space (both in vehicle bay and out) but also within a moving transport and at other remote locations where audio-video recorded footage and synchronized mannequin stats can be downloaded and reviewed once back at the classroom location. The control room needs to be updated not only for general control and content management but also as an active location participant as the "command operations" portion in a situation or crisis as part if the simulation training exercise.
   2. Recommended changes to this space would include:
      - Upgrade the entire AV system to be a complete solution with new warranty including new cameras, microphones and recording & management equipment
      - Add provisions for field recording for classroom review as part of a more holistic training simulation experience
      - Add provisions for on-board vehicle wireless for mannequin control and statistics recording

J. Remote Media Systems Management & Helpdesk Support

1. Many of the audiovisual systems across the district are run on Crestron Electronics control equipment. The move to implement a district-wide classroom remote management and control tool would help manage the growing number of systems by leveraging the PCC network to govern and view system status from a central "helpdesk" location. The District has a current license for Crestron Fusion™ but is not actively deployed.
2. The real-time status for audiovisual system state (on, off, etc.), lamp hours, error reporting and help requests from instructors or operators can be viewed or even emailed to support staff upon designated event triggers. This system would be "cloud" supported so no on-site servers or application software would be required to be hosted by PCC.
3. This system will be a licensed system per location (negotiated in bulk by manufacturer). The system should be consistent with most of the classroom control equipment and is the Crestron Fusion™ cloud-based solution that the District already has a current license for but is just not deployed. This system would encourage training for PCC support staff for the continual use and the addition of new systems as well as for the expanded reporting features for administration purposes for usage studies. The creation of this position for dedicated classroom remote support and management should be considered as an annual cost and part of this bond program for space to house this new team member and the supporting computing, etc. equipment.

V. Technology Environmental Conditions

A. HVAC

1. The majority of PCC's IT technology spaces have some form of environmental control intended to keep the spaces within an acceptable temperature range. While PAE's report on mechanical conditions is the primary review of these spaces, we have included brief notes on findings related to IT spaces showing anomalies. Temperature and electrical load data was acquired from the PCC APC Struxureware management system monitoring UPS load and a temperature sensor. Of critical note, coordination between IT and facilities is in need of improvement. For rooms that have had recurring temperature issues, no documentation is available to indicate the problem or resolution making root cause analysis, common mode failure remediation and proactive improvement difficult at best.

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Vantage recommends that all HVAC maintenance, problem reporting and resolution in IT spaces be maintained in a work order system with reporting available to both facilities and IT with periodic review by both teams. Additionally, we recommend a tighter coordination within the design team for new spaces to better align the mechanical design with the heat load installed in the space. The below table provides a summary of temperature in IT spaces that had temperature events out of the desired range during a 1-year period:

LEGEND

SEVERE TEMP ISSUES (86° and up)	MODERATE TEMP ISSUES (80-85°)

Device	Location	Units	Min Value	Max Value	Average Value	Last Known Value
caepbdf-ups (172.17.255.236)	CA EP BDF	° F	69.8	89.6	78.1	71.6
cajhbdf-ups (172.17.255.204)	CA JH BDF	° F	68	86	73.2	73.4
cajhidf1-ups (172.17.255.206)	CA JH IDF1	° F	66.2	89.6	71.7	69.8
camahmdf-ups (172.17.255.200)	CA MAH MDF	° F	64.4	95	71.3	69.8
capbdf-ups (172.17.255.250)	CA PB BDF	° F	62.6	84.2	72.4	68
capebdf-ups (172.17.255.232)	CA PE BDF	° F	64.4	82.4	75.2	80.6
capsebdf-ups (172.17.255.208)	CA PSEB BDF	° F	66.2	86	68.6	69.8
casubdf-ups (172.17.255.247)	CA SU BDF	° F	60.8	84.2	68.8	68
cathbdf-ups (172.17.255.222)	CA TH BDF	° F	66.2	82.4	70.2	73.4
cathidf1-ups (172.17.255.224)	CA TH IDF1	° F	68	82.4	70.8	69.8
cdmdf-ups (172.23.191.242)	CD MDF	° F	60.8	86	70.7	66.2
cpmdf-ups (172.23.63.240)	Capitol Park	° F	62.6	105.8	81.4	77
hcmdf-ups (172.22.63.200)	HC MDF	° F	59	80.6	71.1	69.8
rcb2idf1-ups (172.18.255.202)	RC B2 IDF1	° F	62.6	80.6	67.6	62.6

Device	Location	Units	Min Value	Max Value	Average Value	Last Known Value
rcb3bdf-ups (172.18.255.208)	RC B3 BDF	° F	55.4	86	65.9	60.8
rcb3idf1-ups (172.18.255.210)	RC B3 IDF1	° F	62.6	91.4	71.6	68
rcb3idf2-ups (172.18.255.212)	RC B3 IDF2	° F	60.8	89.6	71.1	71.6
rcb4bdf-ups (172.18.255.214)	RC B4 BDF	° F	62.6	89.6	73.3	68
rcb5idf1-ups (172.18.255.218)	RC B5 IDF1	° F	71.6	87.8	77.3	75.2
rcb7bdf-ups (172.18.255.222)	RC B7 BDF	° F	57.2	93.2	70.3	73.4
rcb7idf1-ups (172.18.255.224)	RC B7 IDF1	° F	68	104	73.6	71.6
rcb7idf2-ups (172.18.255.226)	RC B7 IDF2	° F	57.2	102.2	68	69.8
rcb7idf3-ups (172.18.255.227)	RC B7 IDF3	° F	66.2	93.2	72.2	73.4
rcbarnbdf-ups (172.18.255.250)	RC Barn BDF	° F	57.2	87.8	73.2	71.6
rcvtbdf-ups (172.18.255.251)	RC Vet Tech BDF	° F	62.6	86	76.6	75.2
selcbdf-ups (172.19.255.249)	SE LC BDF	° F	71.6	96.8	74.9	73.4
selcidf1-ups (172.19.255.248)	SE LC IDF1	° F	68	91.4	72.6	69.8
semt114.srvr-ups (172.19.255.207)	SE MT 114	° F	71.6	98.6	76.4	80.6
senpbdf-ups (172.19.255.241)	SE NP BDF	° F	55.4	95	65.4	59
sewpbdf-ups (172.19.255.240)	SE WP BDF	° F	50	114.8	71.2	60.8
syccidf2-ups (172.16.255.252)	SY CC IDF2	° F	62.6	96.8	71.8	66.2
syccidf4-ups (172.16.255.228)	SY CC IDF4	° F	60.8	86	68.9	66.2
syctbdf-ups (172.16.255.247)	SY CT BDF	° F	73.4	84.2	76.7	78.8
syhtidf2-ups (172.16.255.248)	SY HT IDF2	° F	69.8	107.6	78.5	77
sypacbdf-ups (172.16.255.244)	SY PAC BDF	° F	62.6	84.2	71.6	69.8

Device	Location	Units	Min Value	Max Value	Average Value	Last Known Value
syscbdf-ups (172.16.255.233)	SY SC BDF	° F	64.4	95	71.3	66.2
syssidf1-ups (172.16.255.234)	SY SS IDF1	° F	64.4	87.8	72.6	87.8
systbdf-ups (172.16.255.237)	SY ST BDF	° F	33.8	113	60.8	60.8
systidf3-ups (172.16.255.236)	SY ST IDF3	° F	69.8	91.4	78.4	71.6
sytc108-ups (172.16.255.240)	SY TC 108	° F	80.6	87.8	83.5	82.4
sytcidf2-ups (172.16.255.238)	SY TC IDF2	° F	69.8	82.4	72.5	71.6

For additional details, please see the PAE report.

B. Electrical and generator

The table below displays the output load percentage of the UPS devices in each IT space where the load is near the generally accepted maximum load level of 75%. In all three cases, the steady-state load is acceptable but with minimal margin. Further evaluation of anticipated load increases or opportunities to decrease the load to provide additional margin should be conducted. These values were pulled from PCC's APC Struxureware UPS management system over the same one-year period that was used for the temperature readings. These spaces are being identified as needing remediation in regard to their electrical load requirements:

			Output Load %			
Device	Location	UPS Model	Min Value (%)	Max Value (%)	Average Value (%)	Last Known Value (%)
ccmdf-ups (172.22.255.200)	CC MDF	Symmetra 20K	70 (est.)	70 (est.)	70 (est.)	70 (est.)
sytcidf1-ups (172.16.255.239)	SY TC IDF 1	Smart-UPS RT 5000 RM XL	71.6	75.2	72.1	71.6
semt114.srvr-ups (172.19.255.207)	SE MT 114	Smart-UPS RT 6000 XL	55	73	63	72
sylrcbdf-ups (172.16.255.243)	SY LRC BDF	Symmetra LX 16000 RM	68	77	71.8	73.4

For additional details, see the PAE report

VI. Additional Items

A. Active electronics

1. PCC's network infrastructure is over 7 years old including switches, routers and firewalls. Over 75% of the network infrastructure is past the end of its intended service life and nearing the end of manufacturer support. The remaining 25% is expected to be end of life (per the manufacturer) within the next 2 years. Replacing the aging network electronics is required to support the needs of the faculty and students while reducing the risk of unauthorized access (e.g., security breach) to sensitive PCC data. PCC's compliance obligations for regulations including HIPAA, PCI, and GBLA requiring network devices that are adaptable to the constantly changing threat landscape. Active electronics due for replacement include 650 switches, 4 routers, and 42 firewalls.

B. Information Security (InfoSec)

No detailed assessment of PCC's InfoSec program was performed. As this is a facilities master planning project (FMP), a key question is how InfoSec applies to FMP. Many facilities related system use the IT network for communication and are critical to building or campus operations. Those systems include:

- Building automation systems (BAS) are critical to the operation of modern facilities. BAS communication is typically on the IT network, tends to be highly insecure (BACNet is the most common protocol and has no security whatsoever)
- Card access control
- Surveillance
- Parking
- Lighting control
- Wayfinding

These systems tend to be operational for extended lifecycles, have minimal if any firmware or software upgrades applied and generally not be treated as the information technology systems they are. In addition, manufacturers and vendors in the related fields do not tend to take InfoSec seriously – there are many examples of surveillance gear coming pre-loaded with malware! To mitigate these threats, InfoSec best practices must be applied to facilities IT infrastructure. That means:

- Inventory of all hardware and software
- Monitoring of vendor InfoSec notifications and prompt remediation
- Segmentation of Systems with strong controls and InfoSec tools (e.g., firewalls and IDS) separating them from each other and the rest of the network. Least privilege rules should be the default to only allow communication between Systems of the minimum type necessary to accomplish the task.

C. Enterprise Architecture

1. As defined by EDUCAUSE1, the holistic practice of enterprise architecture plans the entire IT landscape, examines requirements across applications, and provides an overall blueprint for how IT can contribute to an organization's strategic goals. Throughout the IT stakeholder interview process, a recurring theme were issues experienced or opportunities missed because no comprehensive and cohesive enterprise architecture exists at PCC.

VII. Proposed Capital Projects

The Working Group has identified the below IT projects for potential inclusion in the next capital campaign. This list only represents the projects whose priorities is high enough to justify inclusion.

[1] See https://er.educause.edu/articles/2017/7/enterprise-architecture-practices-a-holistic-approach-for-planning-next-generation-services for a summary white paper on ITEA in higher-education.

Project	Description	Estimated Cost	Priority (L/M/H)
WiFi upgrades	Replace ageing WiFi active electronics at SE, CLIMB and NC	$1M	H
Network Performance tools	Software tools to identify potential issues and improve performance	$200k	M
OSP Inventory	Document and inventory outside plant pathways and communications infrastructure into Mapcom	$400k	M
TR and DC ME	High priority improvements to telecom room and datacenter mechanical and electrical systems	$500k	H
Datacenter Improvements	Improvements to the Sylvania data center including active electronics, blanking panels and separation of conditioned/return air (e.g., hot aisle containment or chimneys)	$1.2M	M
Generator Roll-up lug	Install a roll-up lug for a temporary generator to support the Sylvania data center and Cascade core network room	$40k	L
Active electronics updates	Replace end-of-life networking equipment	$12M	H
Outdoor WiFi coverage	Add WiFi coverage in selected outdoor areas of high student or academic usage	$1M	M
Enterprise Architecture	Initial creation of an enterprise architecture plan	$400k	M
TR and DC ME	General improvements to telecom room and datacenter mechanical and electrical systems	$1M	M
BC/DR planning	IT Business Continuity and Disaster Recovery planning.	$300k	H
AudioVisual and Classroom Technologies	• Sylvania Maker Lab #101 (Automotive Technology) • Sylvania Clinical/Nursing Simulation #HT315 • Rock Creek Performing Arts Theater #114 • Rock Creek Event Center #122 • Cascade Auditorium #MAHB 104 • Cascade Fire Training & Simulation Space • Southeast STEM Lab #229/231 • Conference Spaces (Including Southeast Conference Room)	$110k $150k $185k $135k $205k $30k $45k $5k-$20k per room	H M M H H M M M
	• Remote Media Systems Management & Helpdesk • Digital Classroom Technology Upgrades	$5k $1M	M H
Total		**$20M**	

IT Infrastructure Existing Conditions Report
Prepared for the Portland Community College April 17, 2018

VIII. Appendix

A. Cascade Campus TR Review

B. Rock Creek Campus TR Review

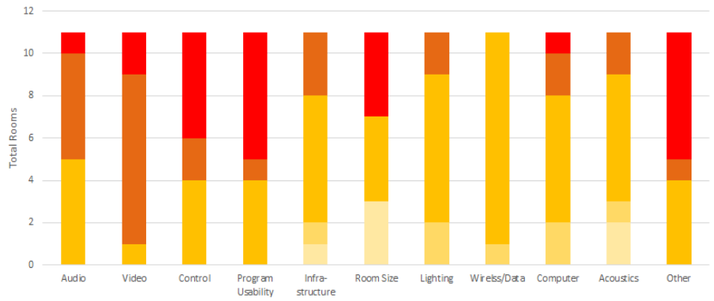
C. Satellite Campuses TR Review

D. Southeast Campus TR Review

E. Sylvania Campus TR Review

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT

BREAKDOWN OF CAMPUSES	
· CASCADE CAMPUS · ROCK CREEK CAMPUS · SOUTHEAST CAMPUS · SLYVANIA CAMPUS	



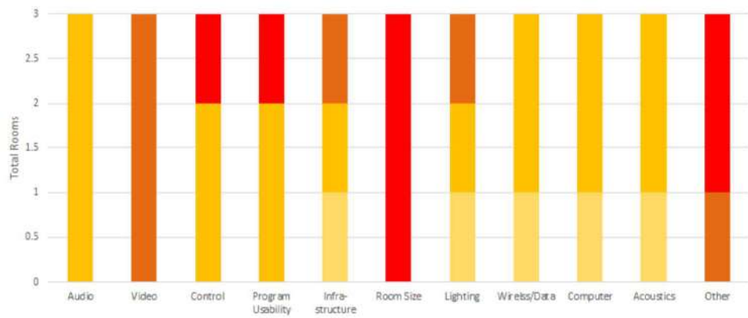
•80% of the Av assessment require racks complaint with National Electric code. Recommend accommodations for control spaces

•50% of the Control needs expansion to accommodate for Cameras and Sim stations.

•60% Audio assessment requires audio equipment replacement.

5 BAD, IN URGENT NEED OF REMEDIATION OR REPLACEMENT.	4 POOR CONDITION, SIGNIFICANT DEFICIENCIES RELATIVE TO PCC STANDARDS.	3 FAIR TO AVERAGE, ADEQUATE FOR CURRENT NEEDS. MINOR DEFICIENCIES.	2 GOOD TO VERY GOOD, MAJOR RESPECTS MEET PCC STANDARDS AND CRITERIA.	1 EXCELLENT CONDITION, EXCEEDS PCC AND INDUSTRY STANDARDS.

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
SYLVANIA CAMPUS



5 BAD, IN URGENT NEED OF REMEDIATION OR REPLACEMENT.	4 POOR CONDITION, SIGNIFICANT DEFICIENCIES RELATIVE TO PCC STANDARDS.	3 FAIR TO AVERAGE, ADEQUATE FOR CURRENT NEEDS. MINOR DEFICIENCIES.	2 GOOD TO VERY GOOD, MAJOR RESPECTS MEET PCC STANDARDS AND CRITERIA.	1 EXCELLENT CONDITION, EXCEEDS PCC AND INDUSTRY STANDARDS.

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT

SYLVANIA CAMPUS: HEALTH TECH, 1ST FLOOR, MAKER LAB

Campus	Building	Room	Location	Audio	Video	Control	Programming/Usability	Infos Tech/Int	Room Size	Lighting	WiFi	Computer	Acoustics	Other	Comments
SY	Automotive Metals	Maker Space	SYAM101	3	4	3	3	4	5	4	3	3	3	5	Refer to Narrative

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT

SYLVANIA CAMPUS: HEALTH TECH, 3RD FLOOR, SIM LAB

Campus	Building	Room	Location	Audio	Video	Control	Programming/Usability	Infos Tech/Int	Room Size	Lighting	WiFi	Computer	Acoustics	Other	Comments
SY	Health Technology	Sim Lab	SYHT315	3	4	5	5	2	5	2	2	2	3	5	Refer to Narrative

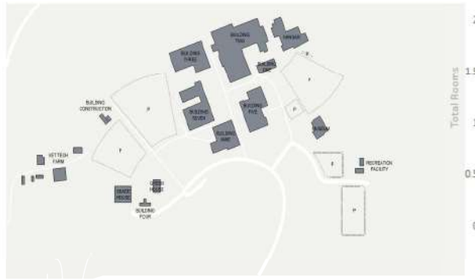
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

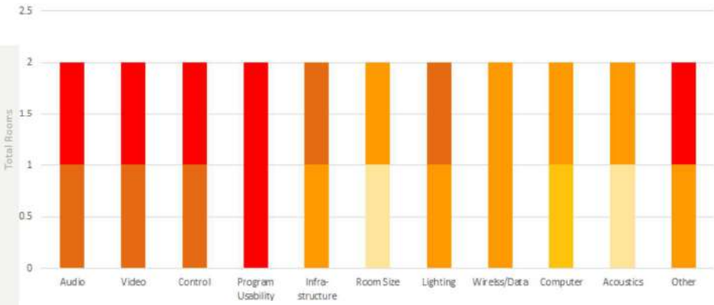
AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
SYLVANIA CAMPUS: HEALTH TECH, 3RD FLOOR, RADIOLOGY

Campus	Building	Room	Location	Audio	Video	Control	Programming/Usability	Infrastructure	Room Size	Lighting	WiFi	Computer	Acoustics	Other	Comments
SY	Health Technology	Radiology	SYHT312	3	4	3	3	3	5	3	3	3	2	4	Refer to Narrative

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
ROCK CREEK CAMPUS





5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 3, 1ST FLOOR, FORUM & MUSIC TECH LAB

Campus	Building	Room	Location	Audio	Video	Control	Programming/Usability	Infrastructure	Room Size	Lighting	WiFi	Computer	Acoustics	Other	Comments
RC	Building 3	Forum	RC3/114	1	2	4	1	3	1	4	3	2	1	4	Refer to Narrative
RC	Building 3			INFORMATION NOT AVAILABLE											Refer to Narrative

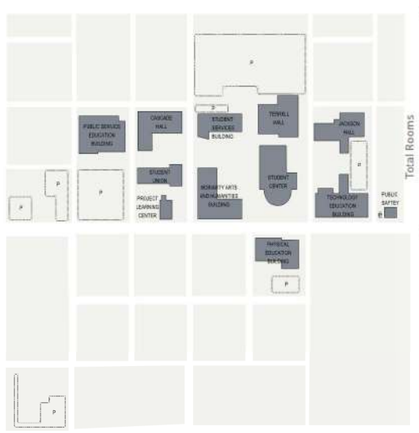
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

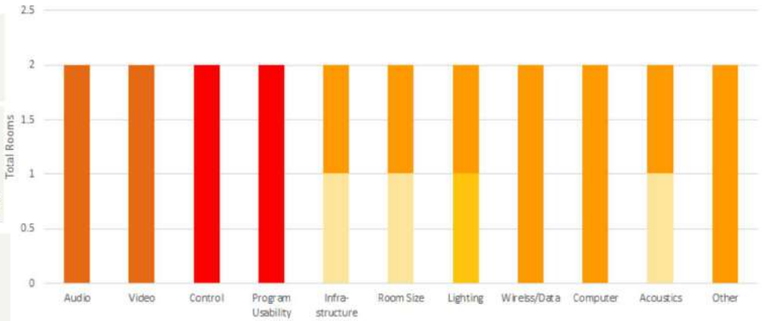
AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 9, ??, EVENT CENTER

Campus	Building	Room	Location	Audio	Video	Control	Programming/Usability	Infrastructure	Room Size	Lighting	WiFi	Computer	Acoustics	Other	Comments
RC	Building 9	Event Center	RC9/122ABC	4	4	5	5	4	3	3	3	3	3	3	Refer to Narrative

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
CASCADE CAMPUS





5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
CASCADE CAMPUS: MAH, 1ST FLOOR, AUDITORIUM

Campus	Building	Room	Location	Audio	Video	Control	Programming/Usability	Infrastructure	Room Size	Lighting	WiFi	Computer	Acoustics	Other	Comments
CA	Moiarty Arts and Humanities Building	Classroom/Auditorium	CAMAH104	4	4	5	5	1	1	2	3	3	1	2	Refer to Narrative

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
CASCADE CAMPUS: STUDENT UNION, 2ND FLOOR, AUDITORIUM & MULTI PURPOSE ROOM

Campus	Building	Room	Location	Audio	Video	Control	Programming/Usability	Infrastructure	Room Size	Lighting	WiFi	Computer	Acoustics	Other	Comments
CA	Student Union	SPCC Multi Purpos	CASU302/304	4	4	5	5	3	3	2	3	3	3	3	Refer to Narrative
CA	Student Union	Meeting Room	CASU302/304	INFORMATION NOT AVAILABLE											Refer to Narrative

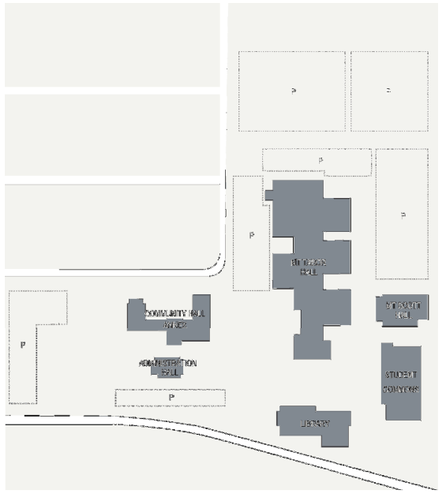
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

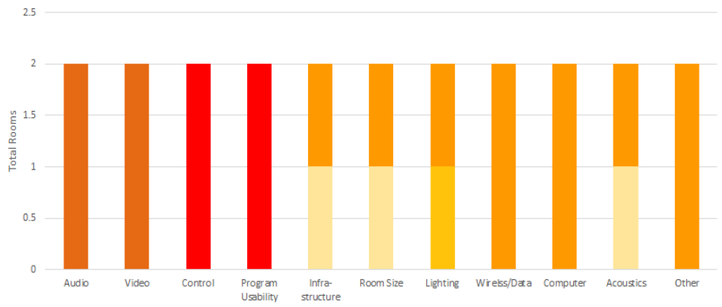
AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
CASCADE CAMPUS: PUBLIC SERVICES EDUCATION BLGD, 1ST FLOOR, DISPATCH LAB & APPARATUS BAY

Campus	Building	Room	Location	Audio	Video	Control	Programming/Usability	Infrastructure	Room Size	Lighting	WiFi	Computer	Acoustics	Other	Comments
CA	Cascade Hall	Public Services	CAPSEB	INFORMATION NOT AVAILABLE											Refer to Narrative
CA	Cascade Hall	Public Services	Apparatus Bays	INFORMATION NOT AVAILABLE											Refer to Narrative

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
SOUTHEAST CAMPUS

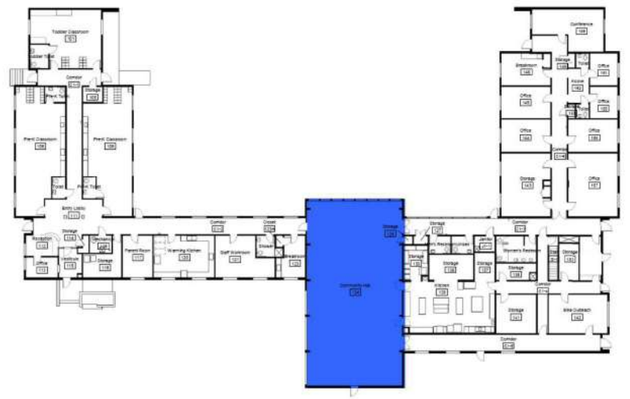




ANALYSIS ON AV INFORMATION ABOVE...

5 BAD	4 POOR	3 FAIR	2 GOOD	1 EXCELLENT

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
SOUTHEAST CAMPUS: ANNEX, 1ST FLOOR, COMMUNITY HALL



Campus	Building	Room	Location	Audio	Video	Control	Programming/Usability	Infrastructure	Room Size	Lighting	WiFi	Computer	Acoustics	Other	Comments
SE	Annex	Community Hall	SEANNEX	INFORMATION NOT AVAILABLE											Refer to Narrative

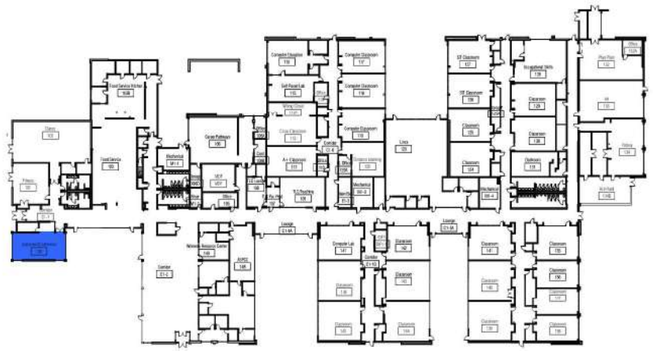
5 BAD	4 POOR	3 FAIR	2 GOOD	1 EXCELLENT

AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
SOUTHEAST CAMPUS: TABOR HALL, 2ND FLOOR, LAB / STEM LAB

Campus	Building	Room	Location	Audio	Video	Control	Programming/Usability	Infrastructure	Room Size	Lighting	WiFi	Computer	Acoustics	Other	Comments
SE	Student Commons	STEM LAB	SESCOM229/231	3	5	3	3	4	5	3	3	4	3	5	Refer to Narrative

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

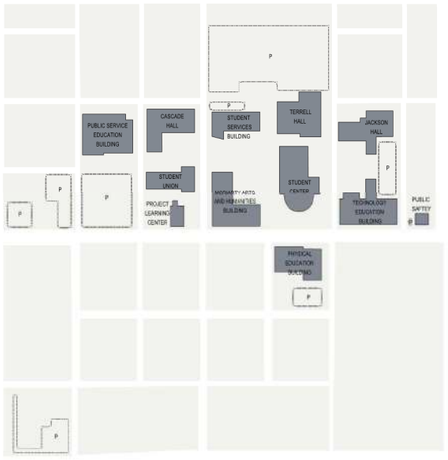
AUDIO VISUAL "ONE-OFF" ROOMS ASSESSMENT
SOUTHEAST CAMPUS: TABOR 100, 1ST FLOOR, POLYCOM VIDEO CONFERENCE CART



Campus	Building	Room	Location	Audio	Video	Control	Programming/Usability	Infrastructure	Room Size	Lighting	WiFi	Computer	Acoustics	Other	Comments
SE	Tabor Hall	om Video Conferenc	SEPVCC100	4	4	3	3	3	1	3	3	3	4	5	Refer to Narrative

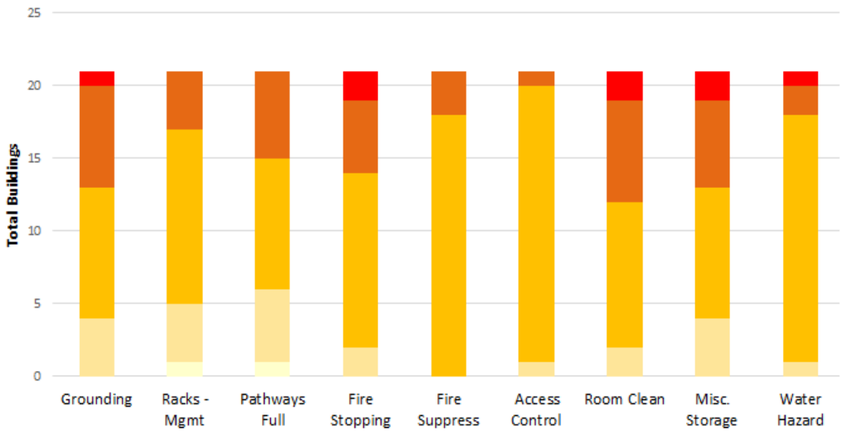
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CAMPUS: CASCADE



BREAKDOWN OF TELECOMMUNICATION		
CASCADE HALL · BDF · IDF 1 · IDF 2 EP · BDF JACKSON HALL · BDF · IDF 1 LIBRARY · BDF MORIARTY ARTS & HUMANITIES BLGD · IDF 1 · MDF PARAGON · BDF	PHYSICAL EDUCATION BLGD · BDF UNDERGROUND PARKING · BDF PUBLIC SAFTEY · BDF PUBLIC SERVICED EDUCATION BLDG · BDF STUDENT SERVICES BLGD · BDF · IDF 2 STUDENT UNION · BDF · IDF 1 · IDF 2	TECHNOLOGY EDUCATION BLDG · BDF · IDF 1 TERRELL HALL · BDF · IDF 1

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: BREAKDOWN



•30% of the buildings on this campus do not employ effective Firestop methods entering or exiting the communications spaces. Recommend proper installation of approved firestop materials.

•25% of the conduits and cable trays entering the communications spaces are filled beyond recommended capacity. This allows no expansion and potentially damages cable in the tray due to excess weight. Recommend removing abandoned cabling, or adding parallel pathways for future expansion. The critical entrance conduits can be further evaluated during a campus wide Outside Plant pathway identification and inventory project.

•30% of the buildings have ground bus bars and ground conductors that are out of compliance with NEC codes or PCC Standards. Recommend electrical contractors perform testing on ground systems flagged as "less than compliant" and visually inspect the bonding connections to system ground, and recommend corrective measures.

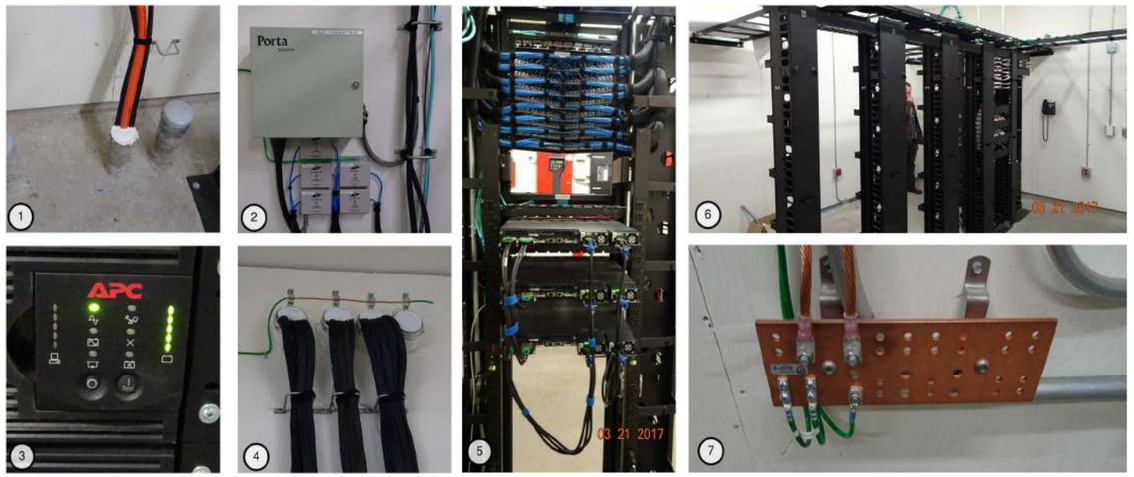
5 BAD, IN URGENT NEED OF REMEDIATION OR REPLACEMENT.	4 POOR CONDITION, SIGNIFICANT DEFICIENCIES RELATIVE TO PCC STANDARDS.	3 FAIR TO AVERAGE, ADEQUATE FOR CURRENT NEEDS, MINOR DEFICIENCIES.	2 GOOD TO VERY GOOD, MAJOR RESPECTS MEET PCC STANDARDS AND CRITERIA.	1 EXCELLENT CONDITION, EXCEEDS PCC AND INDUSTRY STANDARDS.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: CASCADE HALL, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Wear Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	10:45 AM	2005	CA	Cascade Hall	CACHBDF	1	2	2	4	3	2	3	2	2	1	Smart-UPS RT 8000 XL	1173	194	12

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

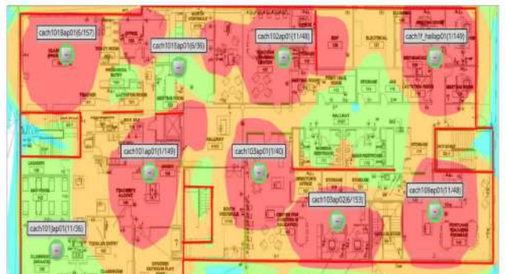
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: CASCADE HALL, 1ST FLOOR, BDF



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Conduit seal & cap good practice – sealant is not intumescent fire stop.
2. Proper circuit protection used for outdoor terminations (Blue Light phones, etc).
3. Load and Charge good on UPS.
4. Properly grounded conduits - sealant is not intumescent fire stop.
5. Cable management good.
6. Available expansion space above PCC standards.
7. Grounding methods & materials good.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: CASCADE HALL, 1ST FLOOR



Coverage in 5GHz

Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Cascade Hall	1st	CACH - 1	2	1	1	N/A

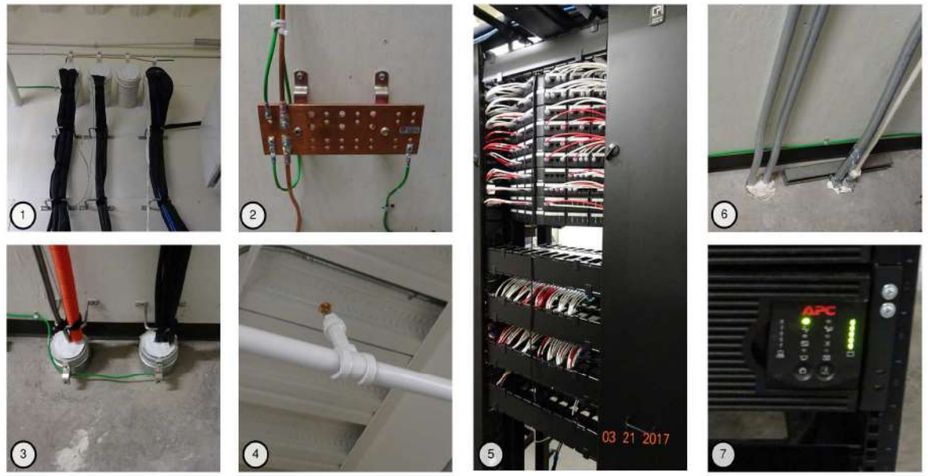
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: CASCADE HALL, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	10:45 AM	2005	CA	Cascade Hall	CACHIDF1	1	2	2	4	3	2	2	2	2	1	Smart-UPS RT 6000 XL	1111	177	16

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: CASCADE HALL, 2ND FLOOR, IDF



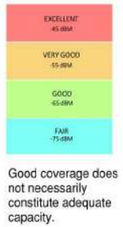
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. & 3. Properly grounded conduits - sealant is not intumescent fire stop.
2. Grounding methods & materials good.
4. Overhead fire suppression present.
5. Cable management good.
6. Sealant is not intumescent fire stop.
7. Load and Charge good on UPS.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: CASCADE HALL, 2ND FLOOR

Coverage in 5GHz

Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Cascade Hall	2nd	CACH - 2	1	1	1	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: CASCADE HALL, 3RD FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	11:10 AM	2005	CA	Cascade Hall	CACHIDF2	3	3	2	3	3	2	3	3	3	1	Smart-UPS RT 6000 XL	1112	168	17

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: CASCADE HALL, 3RD FLOOR, IDF 2

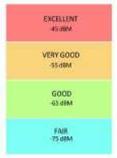
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Properly grounded conduits - sealant is not intumescent fire stop.
2. Load and Charge good on UPS.
3. Grounding methods & materials good.
4. Sealant is not intumescent fire stop.
5. & 7. Available expansion space conforms to PCC standards.
6. Light fixture too close to cable path.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: CASCADE HALL, 3RD FLOOR

Coverage in 5GHz

Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Cascade Hall	3rd	CACH - 3	1	1	1	N/A

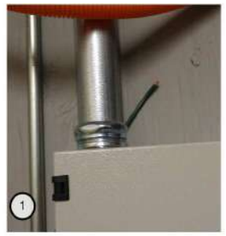
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

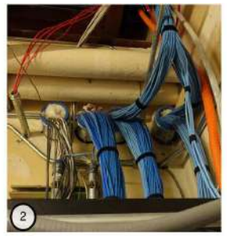
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: JACKSON HALL, 1ST FLOOR

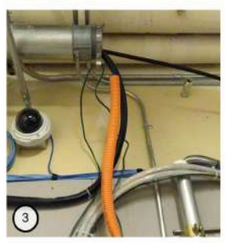
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	M&C Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	2:36 PM	2010	CA	Jackson Hall	CAJHBDF	4	3	3	4	3	3	3	3	3	4	Smart-UPS RT 6000 XL	2277	132	*14*

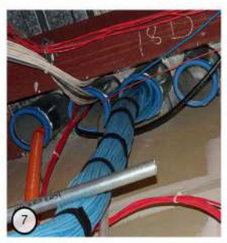
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: JACKSON HALL , 1ST FLOOR, BDF





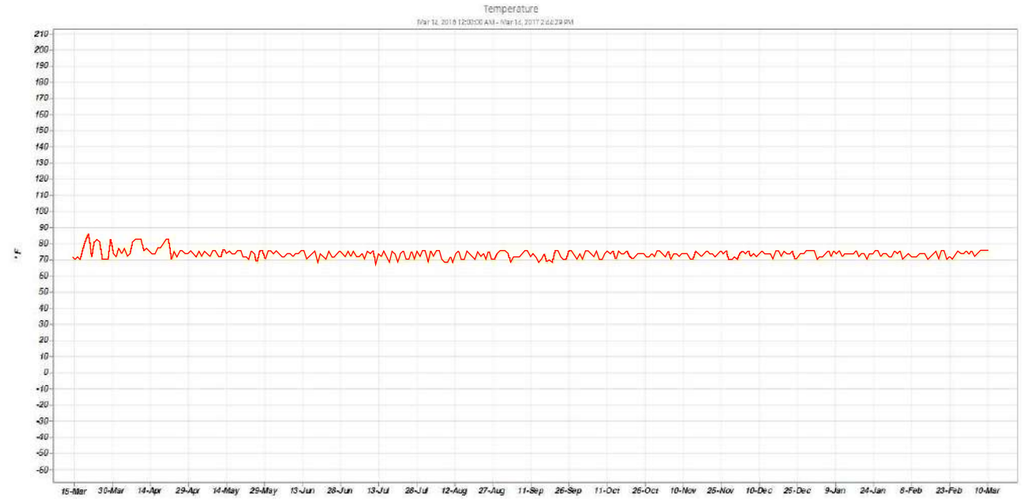




POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. & 5. Ground wire run but not connected to anything.
2. Conduits overfilled.
3. Cables not supported at conduit entrance - Fire stop materials not present.
4. UPS load good, unit is more than 6 years old.
6. Expansion capacity adequate, good cable management.
7. Fire stop materials not present.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
CASCADE CAMPUS: JACKSON HALL, 1ST FLOOR, BDF



Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
HC	cajhbdf-ups (172.17.255.204)	Temp	CA JH BDF	2:52:18 PM	° F	68	86	73.2	73.4	Mid Mar 2016 - (1) High temp event over 86 °

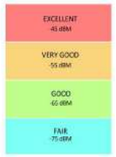
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: JACKSON HALL, 1ST FLOOR

Coverage in 5GHz

Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Jackson Hall	1st	CAJH - 1	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: JACKSON HALL, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	MSC. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	2:36 PM	2010	CA	Jackson Hall	CAJHBDF	4	3	3	4	3	3	3	3	3	3	Smart-UPS RT 6000 XL	2277	132	14

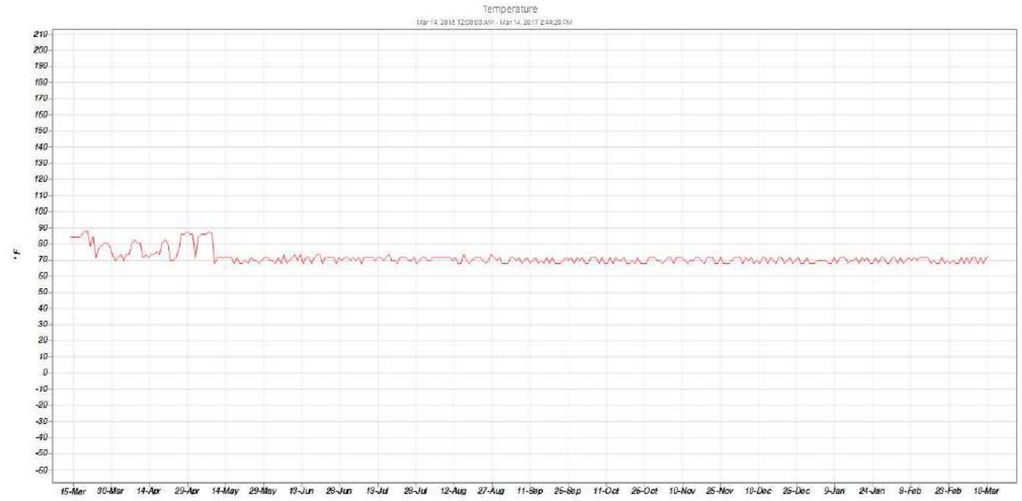
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: JACKSON HALL, 1ST FLOOR, IDF 1

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Firestop materials not correct.
2. Expansion capacity adequate, good cable management.
3. Dirt / Dust accumulating on floor.
4. Rear cable management adequate.
5. Water pipes present over rack.
6. UPS load good, unit is more than 6 years old.
7. Conduits overfilled & cable bundles not supported.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
CASCADE CAMPUS: JACKSON HALL, 1ST FLOOR, IDF 1



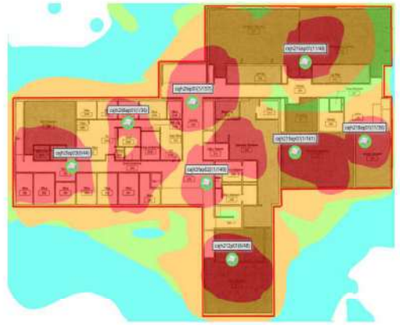
Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
RC	cajhidf1-ups (172.17.255.206)	Temp	CA JH IDF1	2:52:18 PM	° F	66.2	89.6	71.7	69.8	Mid Mar 2016 to May 2016 - Several days of high temp events over 86 °

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: JACKSON HALL, 2ND FLOOR

Coverage in 5GHz



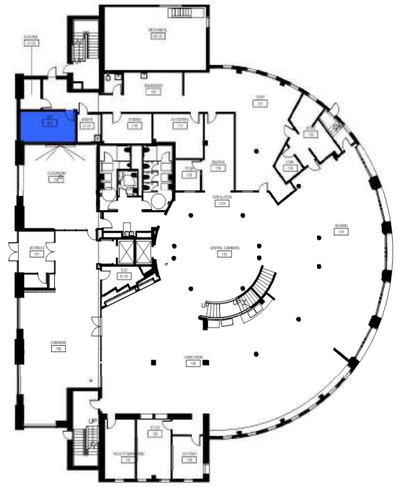
Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Jackson Hall	2nd	CAJH - 2	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: LIBRARY, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	2:40 PM	0	CA	Library - Learning Ctr.	CALBRBDF	3	3	4	3	3	3	3	2	3	3	Smart-UPS X 2000	N/A	N/A	17

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: LIBRARY, 1ST FLOOR, BDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS.
2. Cables not supported at conduit entrance - Fire stop materials not present.
3. Rack management good, excellent room for expansion.
4. Fiber or cable coiled loose on floor.
5. Conduit capacity good, but required Firestop / sealant is not present.

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: LIBRARY, 1ST FLOOR, BDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

6. System ground conforms to PCC standard.
7. & 8 Rack management good, excellent room for expansion.

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: LIBRARY, 1ST FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

EXCELLENT -45 dBM
VERY GOOD -55 dBM
GOOD -65 dBM
FAIR -75 dBM

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Student Center	1st	CASC - 1	2	2	3	Heatmap doesn't show signal from APs on ceiling

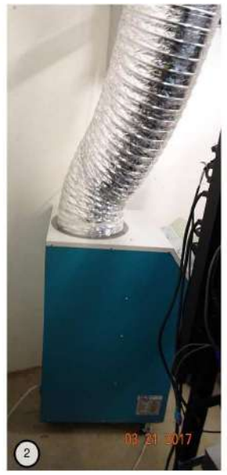
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: MORIARTY ARTS & HUMANITIES BUILDING, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	M&C. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	9:00 AM	2020	CA	Moriarty Arts and Humanities Building	CAMAHIDF1	3	4	4	2	3	3	3	4	3	2	Smart-UPS RT 10000 XL	2277	225	23

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

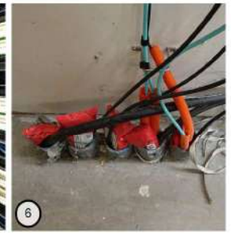
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: MORIARTY ARTS AND HUMANITIES BUILDING, 1ST FLOOR, MDF



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. NEMA cabinet housing First Responder DAS equipment – horizontal link not 2hr rated.
2. Temporary cooling unit and fan – main HVAC unit shuts off or fails frequently.
3. Incorrect use of Firestop pillows.

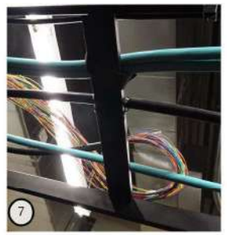
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: MORIARTY ARTS AND HUMANITIES BUILDING, 1ST FLOOR, MDF

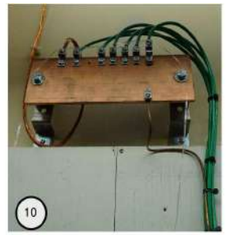


POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

4. Conduit capacity good, Firestop applied correctly.
5. Expansion capacity adequate, good cable management.
6. Incorrect use of Firestop pillows.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: MORIARTY ARTS AND HUMANITIES BUILDING, 1ST FLOOR, MDF

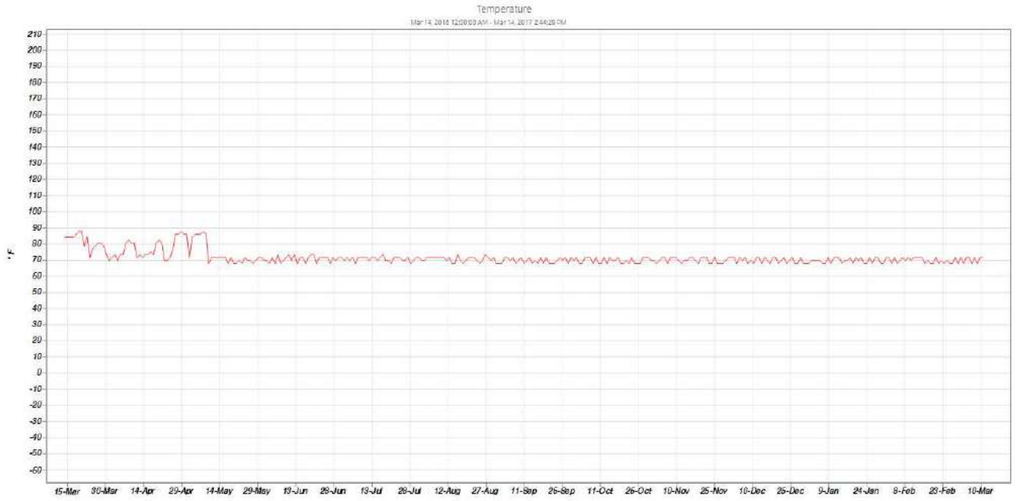




POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

7. Bare & unterminated fiber strands coiled on ladder tray – safety hazard.
8. Temporary fan in place to augment cooling.
9. Unterminated (blunt) end of copper feeder across pathway.
10. System ground conforms to PCC standard.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
CASCADE CAMPUS: MORIARTY ARTS & HUMANITIES BUILDING, 1ST FLOOR, MDF

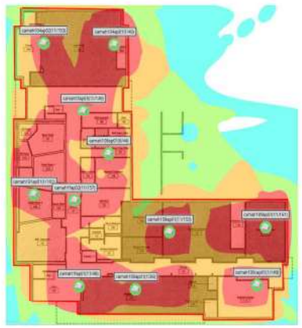


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
RC	camahmdf-ups (172.17.255.200)	Temp	CA MAH MDF	2:52:18 PM	° F	64.4	95	71.3	69.8	Start of Apr 2016 - Several days of high temp events over 86°

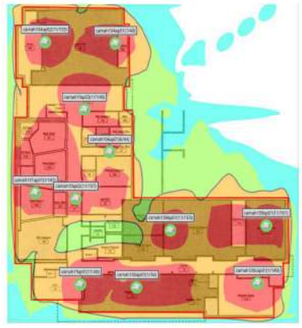
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: MORIARTY ARTS & HUMANITIES BUILDING, 1ST FLOOR



Coverage in 5GHz



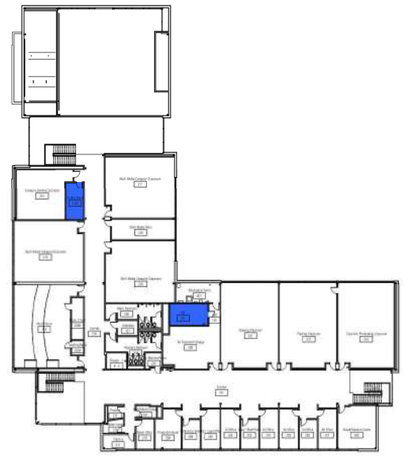
Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Moiarty Arts and Humanities Building	1st	CAMAH - 1	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

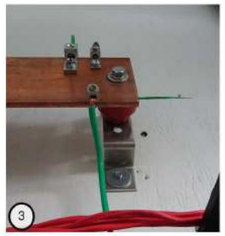
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: MORIARTY ARTS AND HUMANITIES BUILDING, 2ND FLOOR

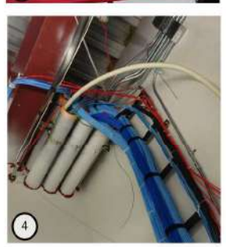


Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	8:20 AM	2020	CA	Moiarty Arts and Humanities Building	CAMAHMDF	2	2	2	3	3	3	4	4	3	1	Smart-UPS RT 10000 XL	434	124	

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: MORIARTY ARTS & HUMANITIES BUILDING, 1ST FLOOR, IDF





POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

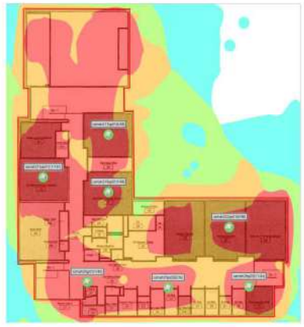
1. & 2. Expansion capacity adequate, good cable management.
3. System ground barely conforms to PCC standard; lacks individual connections to required components.
4. Conduits filled beyond recommended capacity – expansion limited – no firestop present.
5. Load and Charge good on UPS.
6. Firestop not properly placed in conduits or around floor penetration.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: MORIARTY ARTS & HUMANITIES BUILDING, 1ST FLOOR, IDF

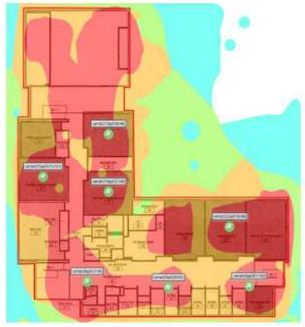
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

7. Cable support great – improper use of Firestop pillows.
8. Clearance behind equipment well under PCC standards.

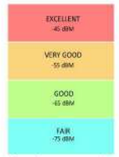
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: MORIARTY ARTS AND HUMANITIES BUILDING, 2ND FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

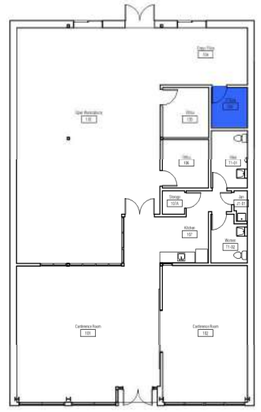


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Moiarty Arts and Humanities Building	2nd	CAMAH - 2	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

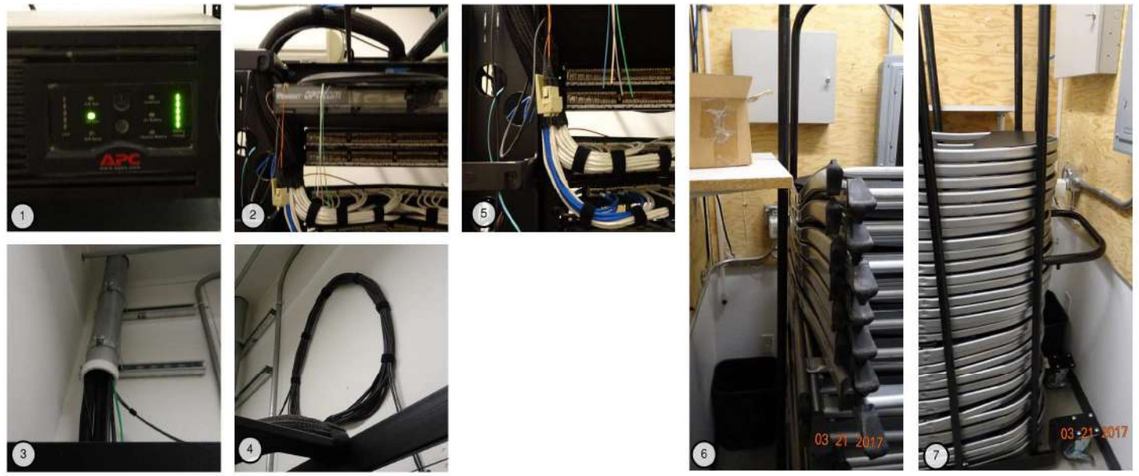
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PARAGON, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	9:30 AM	2110	CA	Paragon Club	CAPBBDF	4	3	2	2	3	3	4	5	3	1		2421	83	13

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

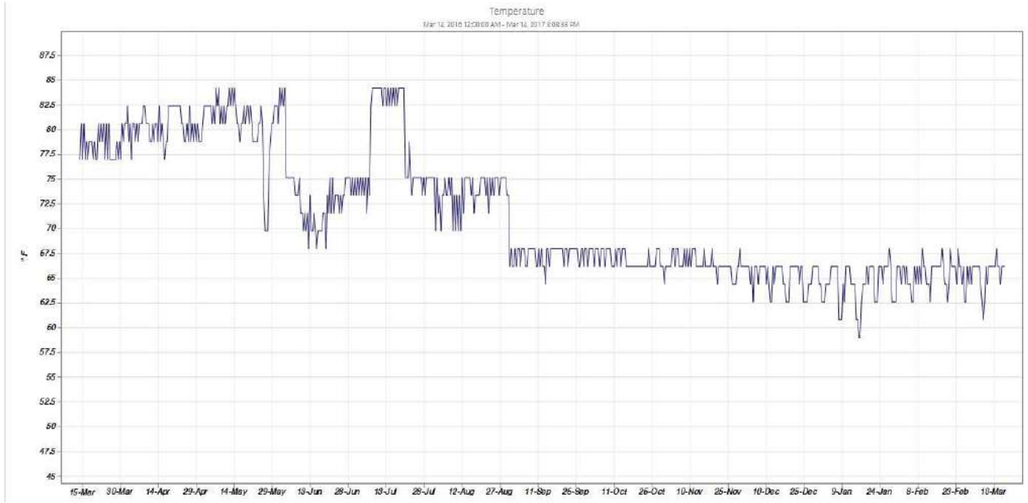
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PARAGON, 1ST FLOOR BDF



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS.
2. & 5. Bare unterminated fiber optic strands hanging from rack, unsupported fiber connection.
3. Conduits filled beyond recommended capacity – expansion limited – no firestop present.
4. Good example of Fiber optic service loop.
6. & 7 Chair storage behind racks do not allow for clearance to PCC standards.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
CASCADE CAMPUS: PARAGON, 1ST FLOOR, MDF

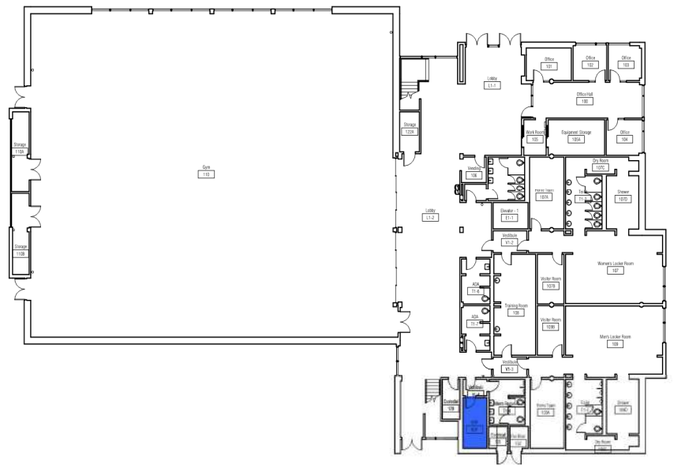


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
RC	capbbdf-ups (172.17.255.250)	Temp	CA PB BDF	2:52:18 PM	°F	62.6	84.2	72.4	68	Mid Mar to mid July 2016 - Many events over 80°

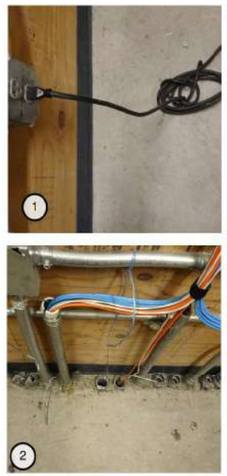
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PHYSICAL EDUCATION BUILDING, 1ST FLOOR



TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PHYSICAL EDUCATION BUILDING, 1ST FLOOR BDF



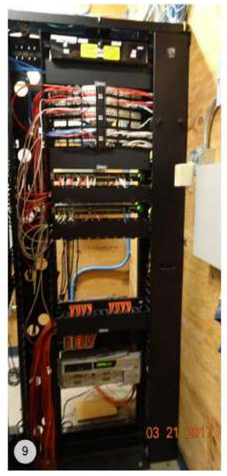
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	12:15 PM	2030	CA	Physical Education Building	CAPEBDF	4	4	3	4	3	3	4	4	3	5	Smart-UPS RT 10000 XL	2277	181	13

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Cord from UPS in aisle – trip hazard and accidental power disruption possible.
2. & 5. & 6. - Conduit capacity good, but required Firestop / sealant is not present.
3. Space behind rack limited – not to PCC standards.
4. Load and Charge good on UPS.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PHYSICAL EDUCATION BUILDING, 1ST FLOOR BDF

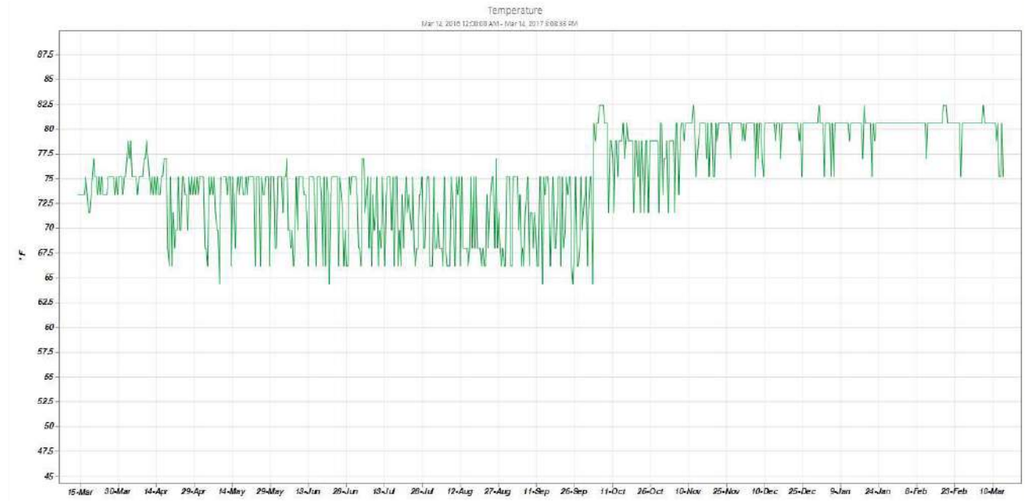


POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

7. &9. Expansion capacity adequate, cable management fair.

8. Ladder near racks unsecured – could damage equipment in earthquake.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
CASCADE CAMPUS: PHYSICAL EDUCATION BLDG, 1ST FLOOR, BDF

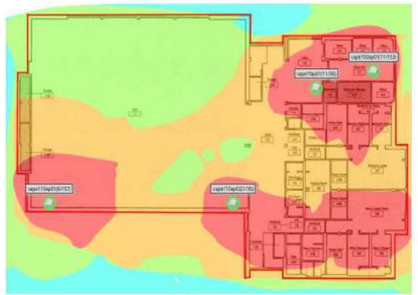


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
RC	capebdf-ups (172.17.255.232)	Temp	CA PE BDF	2:52:18 PM	°F	64.4	82.4	75.2	80.6	Start of Oct 2016 to Mar 2017 - Many temp events over 86°

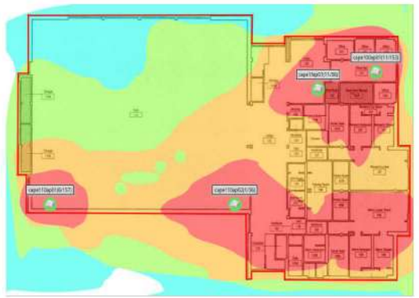
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

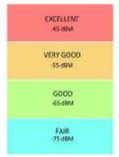
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PHYSICAL EDUCATION BUILDING, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

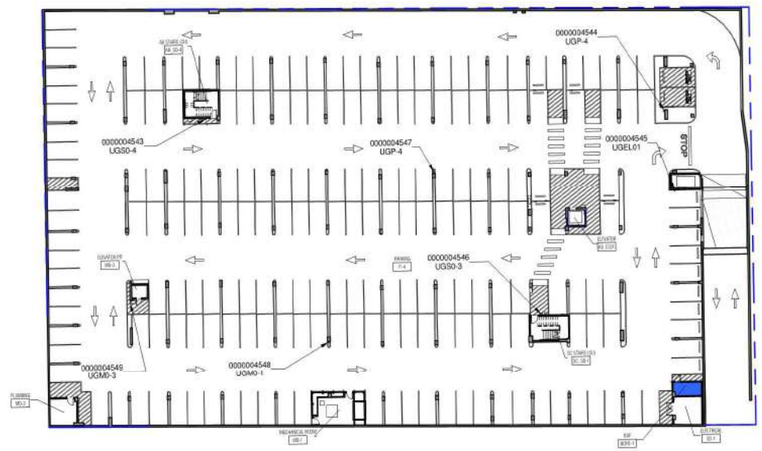


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Physical Education Building	1st	CAPEB - 1	1	2	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

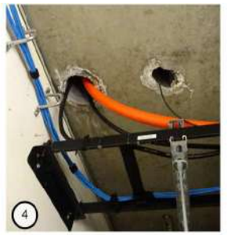
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: UNDERGROUND PARKING

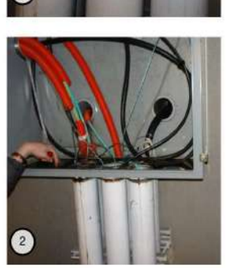


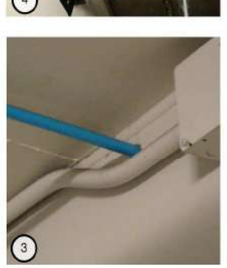
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	11:25 AM	0	CA	Parking Lot	CAEPBDF	3	3	2	3	3	3	3	3	3	2	Smart-UPS RT 8000 XL	1501	78	9

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: UNDERGROUND PARKING, BDF







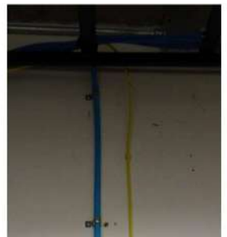
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

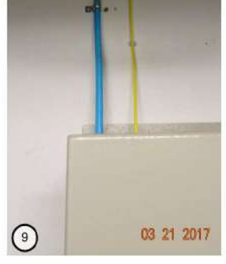
1. & 2. & 6. Water infiltration of communications ducts and pull box.

3. First Responder BDA COAX not sleeved through wall, no 2hr rating pathway.

5. & 6. & 7. Water, dirt from conduit directly above rack.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: UNDERGROUND PARKING, BDF



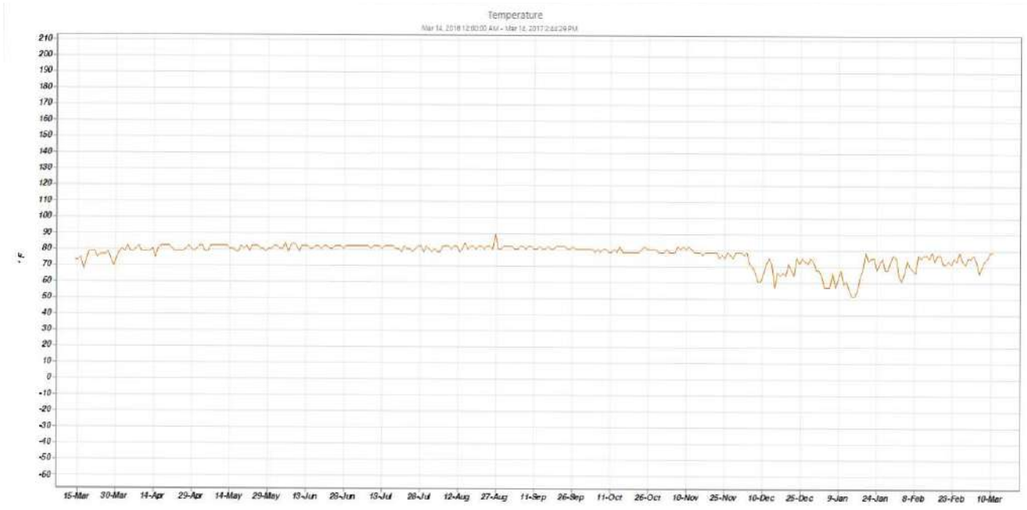


POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

8. Water, dirt from conduit directly above rack.

9. First Responder BDA COAX not sleeved through wall, no 2hr rating pathway.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
CASCADE CAMPUS: UNDERGROUND PARKING, BDF TEMPERATURE

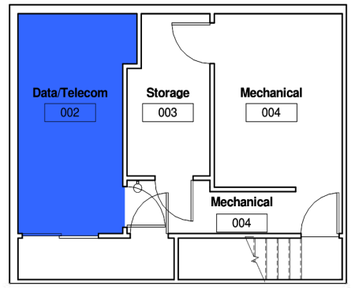


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
CP	caepbdf-ups (172.17.255.236)	Temp	CA EP BDF	2:52:18 PM	°F	69.8	89.6	78.1	71.6	End of Aug 2016 - (1) High temp event over 86°

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PUBLIC SAFTEY, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery	Run Time (min)	UPS Utilization %
3/21/17	1:15 PM	2050	CA	Public Safety	CAPSBDF	5	4	4	5	4	4	5	5	4	1	Smart-UPS 3000 RM XL	2421	631	17	

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PUBLIC SAFTEY, 1ST FLOOR BDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Clearance at rack not to standards.
2. Clearance to signal cabinets on wall not to code or PCC Standards.
3. Cables supported by pipes not to code. – vibration can abrade insulation and short conductors.
4. & 5. & 7. Unterminated, unprotected communications cables hazardous.
6. Data cable run adjacent to light fixture – harmful interference possibly induced.

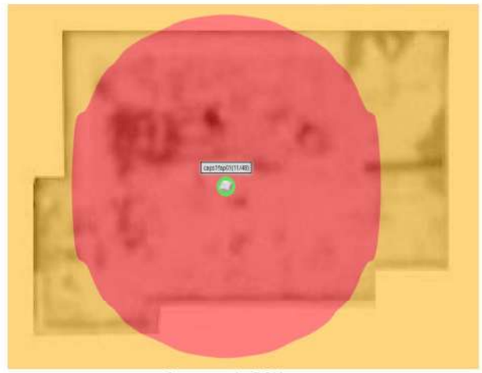
Not Shown:

Source of ground to building not found.

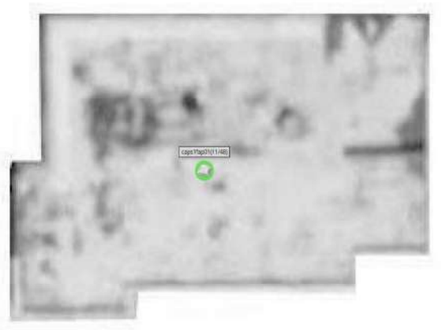
No Firestopping.

Storage impedes access to equipment.

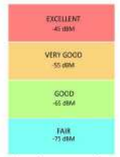
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PUBLIC SAFTEY, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Public Safety	1st	CAPS - 1	1	5	3	Floorplan blurry, no 2.4GHz signal shown

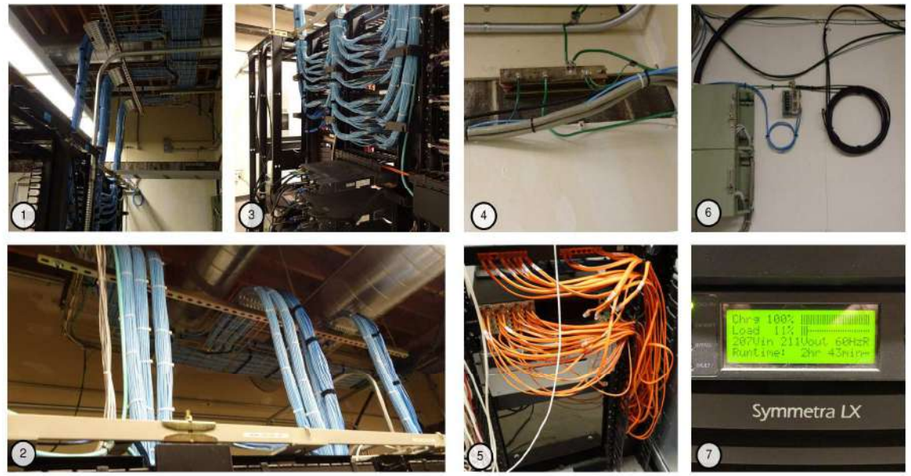
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PUBLIC SERVICE EDUCATION BUILDING, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	11:15 AM	2040	CA	Public Service Education Building	CAPSEBDF	4	3	3	4	3	3	4	4	3	4	Smart-UPS RT 10000 XL	2259	154	11

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

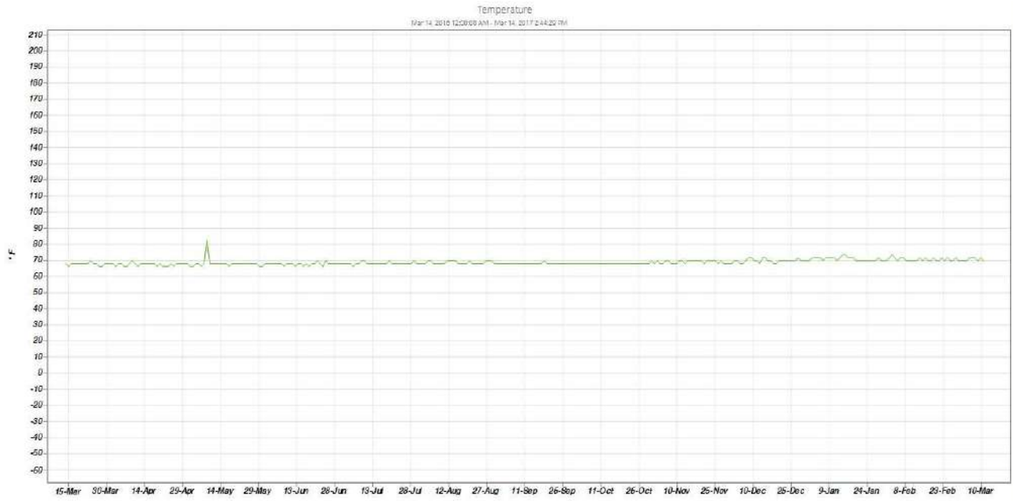
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PUBLIC SERVICE EDUCATION BUILDING, 1ST FLOOR BDF



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. & 2. Good cable support and cable tray management with transition plates.
3. Rack management good, excellent room for expansion.
4. System ground conforms to PCC standard.
5. Abandoned patch cords should be removed.
6. Proper circuit protections used for outdoor terminations (Blue Light phones, etc).
7. Load and Charge good on UPS.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PUBLIC SERVICE EDUCATION BUILDING, 1ST FLOOR, BDF TEMPERATURE



Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
RC	capsebdf-ups (172.17.255.208)	Temp	CA PSEB BDF	2:52:18 PM	°F	66.2	86	68.6	69.8	Start of May 2016 - (1) High temp event over 86°

LEGEND

SEVERE TEMP ISSUES
MODERATE TEMP ISSUES
SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: PUBLIC SERVICE EDUCATION BUILDING, 1ST FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Public Service Education Building	1st	CAPSEB - 1	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT SERVICES BUILDING, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	2:25 PM	2070	CA	Student Services Building	CASSBDF	2	1	1	3	3	2	2	2	2	1	Smart-UPS X 2200	1659	259	27
3/21/17	2:20 PM	2070	CA	Student Services Building	CASSBIDF2	3	2	3	3	3	3	3	3	3	1	Smart-UPS 3000 RM XL	264		10

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT SERVICES BUILDING, 2ND FLOOR, BDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. & 4. System ground conforms to PCC standard.
2. & 3. Rack management good, excellent room for expansion.
5. & 6. & 7. Rack management good, excellent room for expansion.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT SERVICES BUILDING, 2ND FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Student Services Building	2nd	CASSB-2	1	1	3	N/A

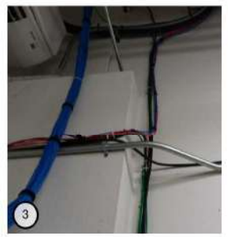
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT SERVICES BUILDING, 3RD FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	Electrical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	2:20 PM	2070	CA	Student Services Building	CASSBIDF2	3	2	3	3	3	3	3	3			Smart-UPS 3000 RM XL	264		10

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT SERVICES BUILDING, 3RD FLOOR



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Rack management good, excellent room for expansion.
2. System ground conforms to PCC standard.
3. Poor cable support and routing.
4. Voice Data cables, Electrical, HVAC lines sharing core – no sleeve or Firestop – code violation.
5. Load and Charge good on UPS.
6. Conduit capacity good, but required Firestop / sealant is not present.
7. Cable management good.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT SERVICES BUILDING, 3RD FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

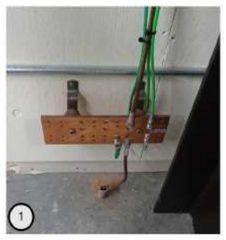
Good coverage does not necessarily constitute adequate capacity.

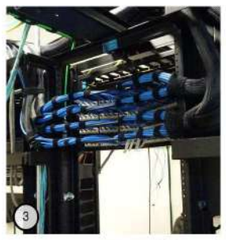
Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Student Services Building	3rd	CASSB - 3	1	1	3	N/A

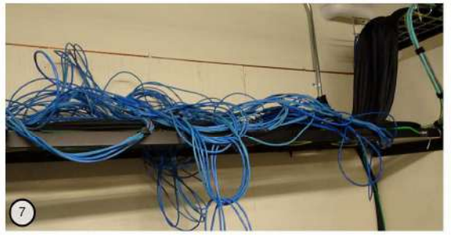
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT UNION BUILDING, 1ST FLOOR

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT UNION BUILDING, 1ST FLOOR







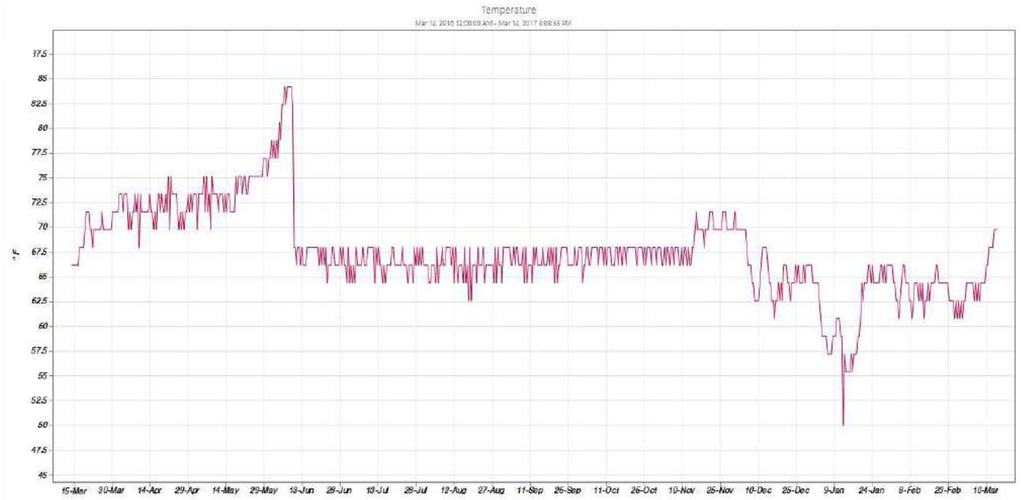
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	9:45 AM	2075	CA	Student Union	CASUBDF	2	2	2	3	3	3	2	2	3	2	Symmetra LX 16000 RM	1111	157	16

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. System ground conforms to PCC standard.
2. & 5. Conduit seal good, sealant is not intumescent fire stop.
3. & 6. Rack management good, excellent room for expansion.
4. Load and Charge good on UPS.
7. Unterminated cables on ladder tray (could be work in progress).

TELECOMMUNICATION TEMPERATURE ASSESSMENT
CASCADE CAMPUS: STUDENT UNION BLDG, 1ST FLOOR, BDF

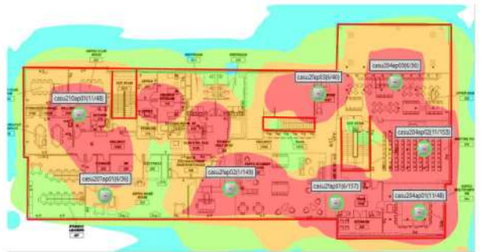


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
RC	casubdf-ups (172.17.255.247)	Temp	CA SU BDF	2:52:18 PM	° F	60.8	84.2	68.8	68	Start of jun 2016 - (3) Moderate temp events over 80°

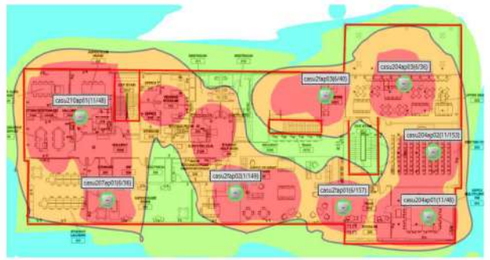
LEGEND

SEVERE TEMP ISSUES
MODERATE TEMP ISSUES
SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT UNION BUILDING, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Student Union	1st	CASU - 1	2	1	1	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT UNION BUILDING, 2ND FLOOR

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT UNION BUILDING, 2ND FLOOR IDF 1

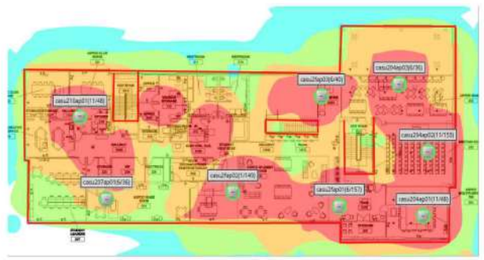
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	10:05 AM	2075	CA	Student Union	CASUIDF1	3	3	3	3	3	3	3	3	3	2	Smart-UPS RT 10000 XL	379	47	11

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

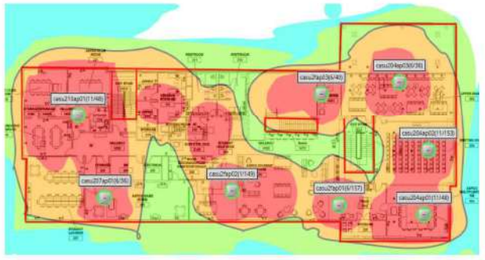
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. System ground conforms to PCC standard.
2. & 3. Conduit seal good , sealant is not intumescent fire stop.
4. Load and Charge good on UPS.
5. Rack management good, excellent room for expansion.
6. Fire stop materials not present.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT UNION BUILDING, 2ND FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Student Union	2nd	CASU - 2	1	1	1	N/A

1 BAD | 2 POOR | 3 FAIR | 4 GOOD | 5 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT UNION BUILDING, 3RD FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	10:20 AM	2075	CA	Student Union	CASUIDF2	2	3	2	3	3	3	3	3	1	Smart-UPS RT 5000 RM XL	2907	187	5

1 BAD | 2 POOR | 3 FAIR | 4 GOOD | 5 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT UNION BUILDING, 3RD FLOOR IDF 2

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. & 3. & 5. Conduit seal good – sealant is mostly not intumescent fire stop.
2. Load and Charge good on UPS.
4. Rack management good, excellent room for expansion.
6. System ground conforms to PCC standard.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: STUDENT UNION BUILDING, 3RD FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Student Union	3rd	CASU - 3	1	2	1	N/A

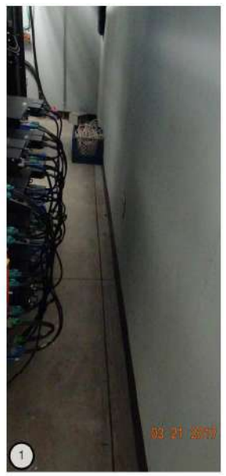
5 BAD	4 POOR	3 FAIR	2 GOOD	1 EXCELLENT

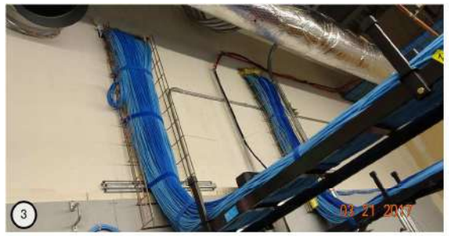
TELECOMMUNICATION ASSESSMENT

CASCADE CAMPUS: TECHNOLOGY EDUCATION BUILDING, 1ST FLOOR

TELECOMMUNICATION ASSESSMENT

CASCADE CAMPUS: TECHNOLOGY EDUCATION BUILDING, 1ST FLOOR BDF





POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Clearance behind racks not PCC standard.
2. Stacked crates create hazard – personal injury or equipment damage during earthquake.
3. Fire stop materials not present.
4. Load and Charge good on UPS.
5. Incorrect use of Firestop pillows.

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	12:40 PM	2080	CA	Technology Education Building	CATEBDF	3	3	4	4	3	3	3	3	3	3	Smart-UPS SRT 5000	2157	61	

BAD | POOR | FAIR | GOOD | EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: TECHNOLOGY EDUCATION BUILDING, 1ST FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Technology Education Building	1st	CATEB - 1	1	1	3	N/A

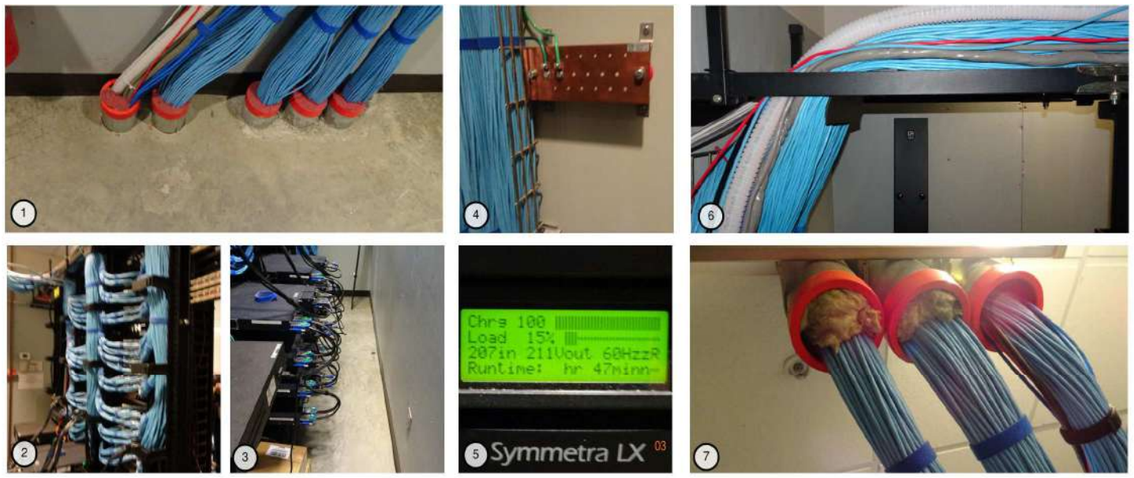
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: TECHNOLOGY EDUCATION BUILDING, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	12:50 PM	2080	CA	Technology Education Building	CATEBIDF1	3	3	3	3	3	3	3	3	3	3	Smart-UPS RT 5000 RM XL	2213	410	15

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

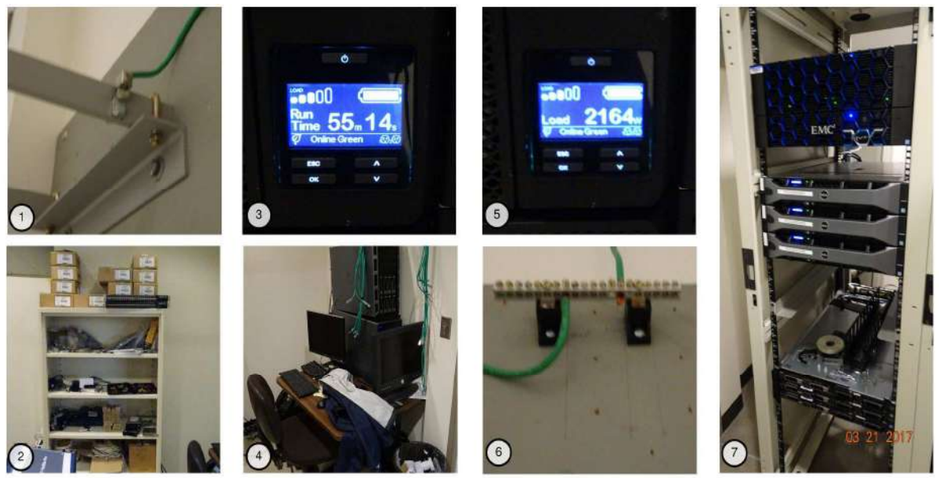
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: TECHNOLOGY EDUCATION BUILDING, 2ND FLOOR, IDF 1



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Conduits filled beyond recommended capacity, future expansion limited.
2. Expansion capacity adequate, good cable management.
3. Clearance behind racks not PCC standard.
4. System ground barely conforms to PCC standard.
5. Load and Charge good on UPS.
6. Cable tray loading exceeds recommended capacity.
7. Firestop materials not correct.

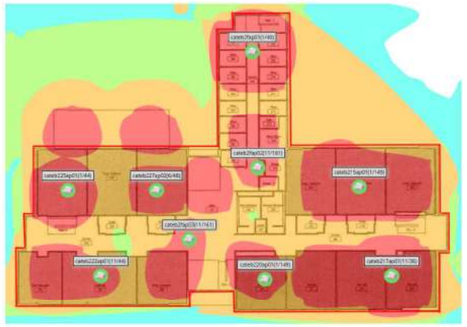
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: TECHNOLOGY EDUCATION BUILDING, 2ND FLOOR, SERVER RM 229



ANALYSIS ON POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

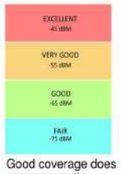
1. & 6. Ground conductors are undersized and Grounding Buss Bar not approved type.
2. & 4. Items stacked could cause injury or equipment damage in earthquake.
3. & 5. Load and Charge good on UPS.
7. Expansion capacity adequate.

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: TECHNOLOGY EDUCATION BUILDING, 2ND FLOOR



Coverage in 5GHz

Coverage in 2.4GHz

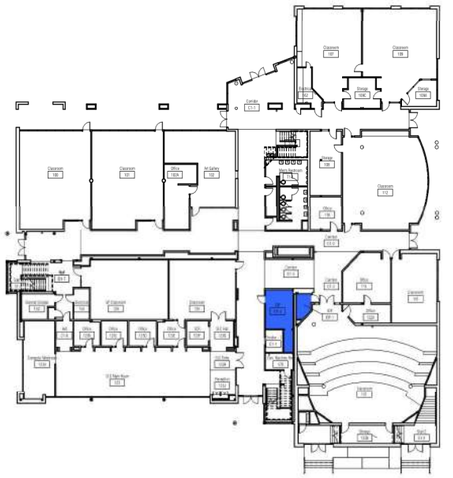


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Technology Education Building	2nd	CATEB - 2	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

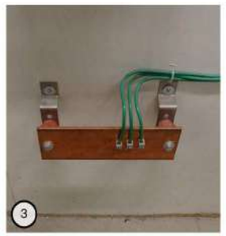
TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: TERRELL HALL, 1ST FLOOR

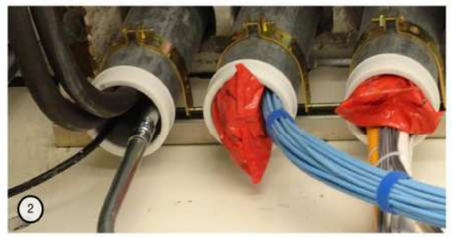


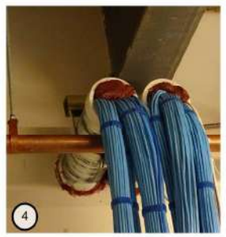
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	1:55 PM	2090	CA	Terrell Hall	CATHBDF	3	2	4	3	4	3	4	4	3	3	Smart-UPS X 2000	2277	405	16

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: TERRELL HALL, 1ST FLOOR, BDF



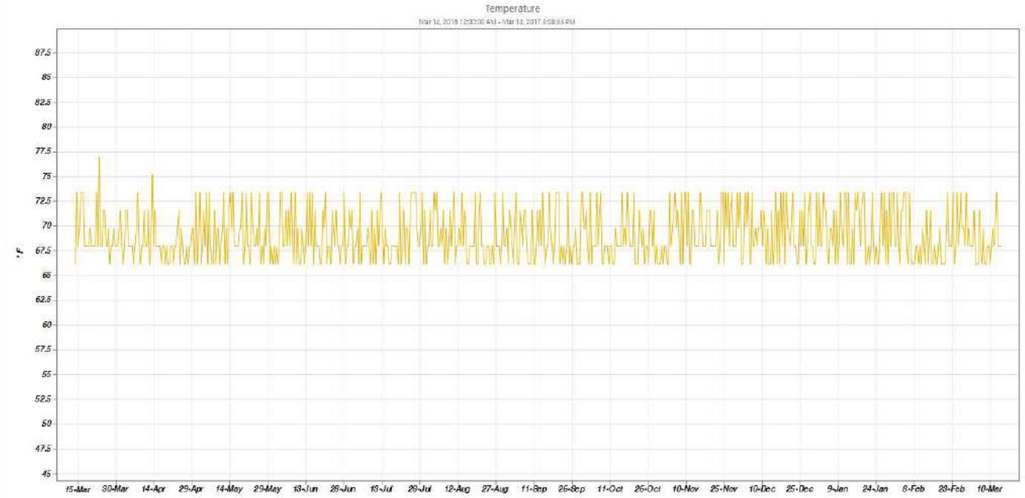




POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Storage of racks (not bolted) create hazard – personal injury or equipment damage during earthquake.
2. & 4. & 6. Incorrect use of Firestop pillows or Firestop materials not present.
3. System ground barely conforms to PCC standard; lacks individual connections to required components.
5. Expansion capacity adequate, good cable management.
7. Load and Charge good on UPS.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
CASCADE CAMPUS: TERRELL HALL, 1ST FLOOR, BDF



Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
RC	cathbdf-ups (172.17.255.222)	Temp	CA TH BDF	2:52:18 PM	°F	66.2	82.4	70.2	73.4	Table shows moderate temp event over 80° but graph does not

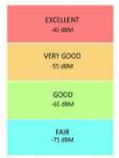
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: TERRELL HALL, 1ST FLOOR

Coverage in 5GHz

Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Terrell Hall	1st	CATH - 1	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: TERRELL HALL, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	2:00 PM	2090	CA	Terrell Hall	CATHIDF1	3	4	4	3	3	3	3	3	3	4	Smart-UPS SRT 5000	2277	49	28

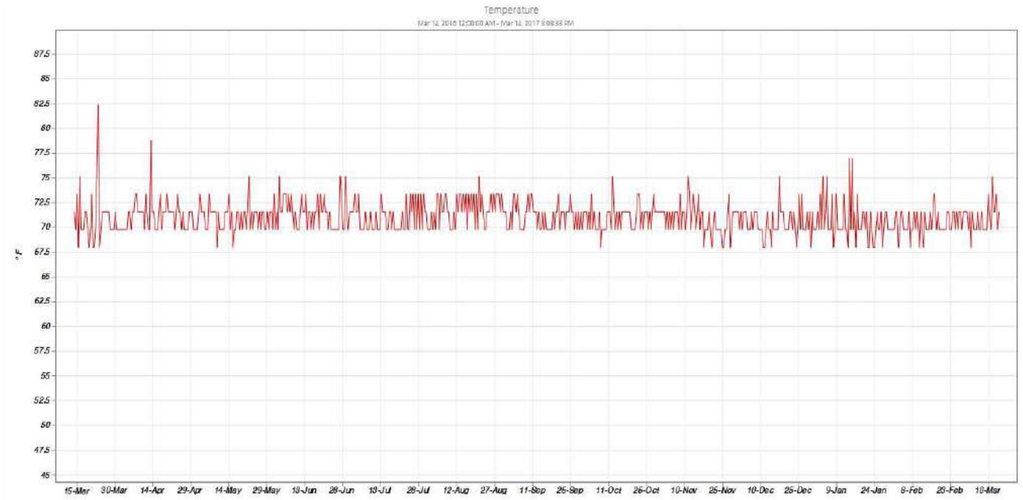
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: TERRELL HALL, 2ND FLOOR, IDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Incorrect use of Firestop pillows.
2. System ground conforms to PCC standard.
3. Load and Charge good on UPS.
4. & 5. Expansion capacity adequate, good cable management.
6. Unterminated cables (could be work in progress).

TELECOMMUNICATION TEMPERATURE ASSESSMENT
CASCADE CAMPUS: TARRELL HALL, 2ND FLOOR, IDF



Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
RC	cathidf1-ups (172.17.255.224)	Temp	CA TH IDF1	2:52:18 PM	°F	68	82.4	70.8	69.8	End of Mar 2016 - (1) Moderate temp event over 80°

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
CASCADE CAMPUS: TERRELL HALL, 2ND FLOOR

Coverage in 5GHz

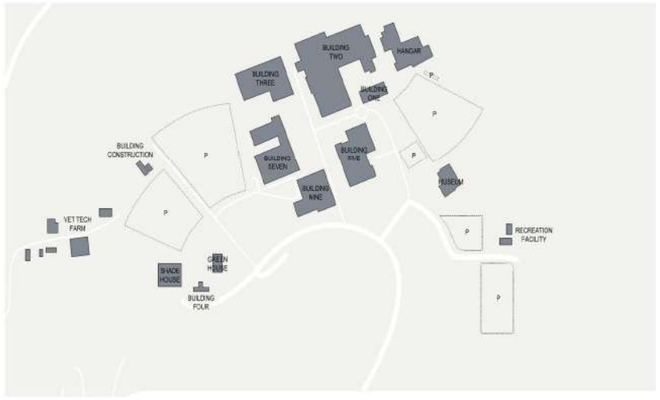
Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

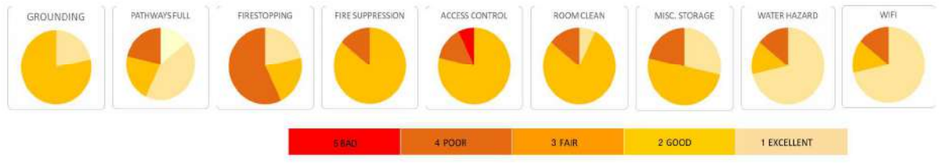
Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CA	Terrell Hall	2nd	CATH - 2	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

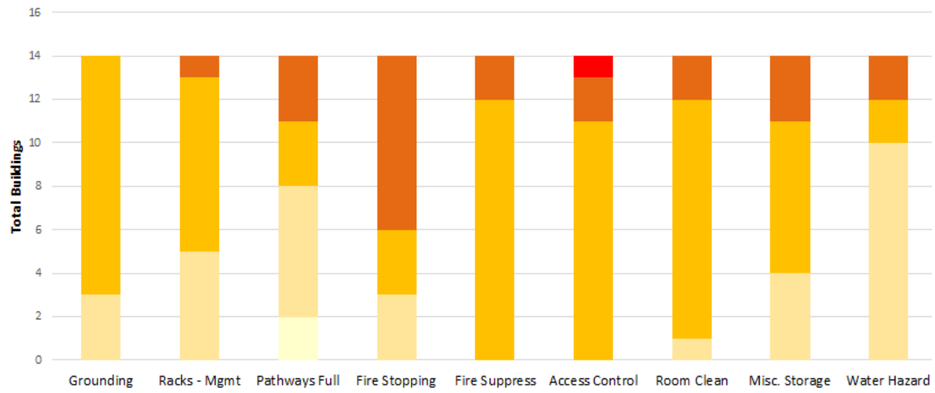
TELECOMMUNICATION ASSESSMENT
CAMPUS: ROCK CREEK CAMPUS



BREAKDOWN OF TELECOMMUNICATION	
BUILDING 1 ·BDF BUILDING 2 · MDF · IDF · IDF 2 BUILDING 3 · BDF · IDF 1 · IDF 2 BUILDING 4 · BDF BUILDING 5 · BDF · IDF	BUILDING 6 · BDF BUILDING 7 · BDF · IDF 1 · IDF 2 BUILDING 9 · BDF · IDF 1 · IDF 2 · IDF 3 · IDF 4



TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BREAKDOWN

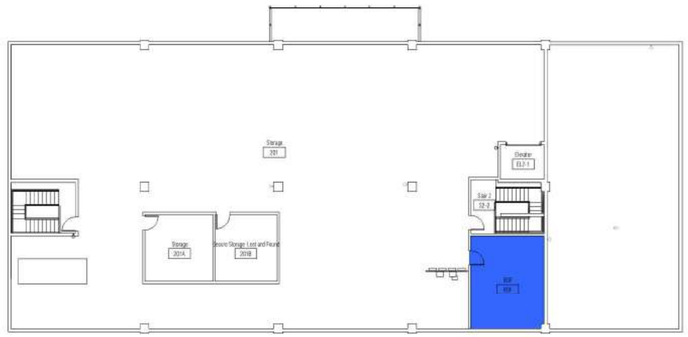


•65% of the buildings on this campus do not employ effective firestop methods entering or exiting the communications spaces. Recommend proper installation of approved firestop materials.

•20% of the conduits and cable trays entering the communications spacesare filled beyond recommended capacity. This allows no expansion and potentially damages cable in the tray due to excess weight. Recommend removing abandoned cabling, or adding parallel pathways for future expansion. The critical entrance conduits can be further evaluated during a campus wide Outside Plant pathway identification and inventory project.

5 BAD, IN URGENT NEED OF REMEDIATION OR REPLACEMENT.	4 POOR CONDITION, SIGNIFICANT DEFICIENCIES RELATIVE TO PCC STANDARDS.	3 FAIR TO AVERAGE, ADEQUATE FOR CURRENT NEEDS, MINOR DEFICIENCIES.	2 GOOD TO VERY GOOD, MAJOR RESPECTS MEET PCC STANDARDS AND CRITERIA.	1 EXCELLENT CONDITION, EXCEEDS PCC AND INDUSTRY STANDARDS.

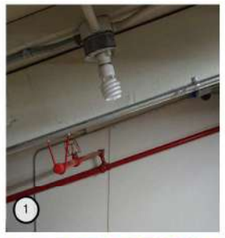
TELECOMMUNICATION ASSESSMENT
ROCK CREEK: BUILDING 1, 2ND FLOOR

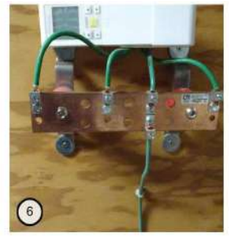


Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	9:55 AM	3010	RC	Building 1	RCB1BDF	3	4	3	3	3	3	4	4	3	1	Smart-UPS RT 5000 RM XL	1660	174	9

6 BAD	4 POOR	3 FAIR	2 GOOD	1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK: BUILDING 1, 2ND FLOOR, BDF

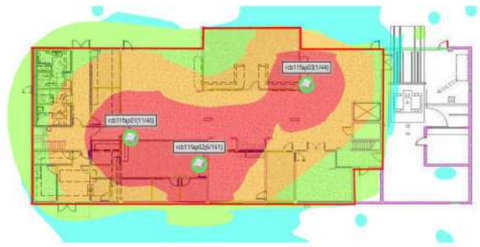




POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Unprotected light bulb on low sloped ceiling – personal injury hazard.
2. Power cables across floor – easy to disconnect equipment, also personal injury hazard.
3. Firestop materials not present, Incorrect use of Firestop pillows.
4. Trash, material storage, and dirt adjacent to equipment.
5. Load and Charge good on UPS.
6. System ground conforms to PCC standard but connections are not using industry standard lug types.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 1, 1ST FLOOR



EXCELLENT -45 dBM
VERY GOOD -55 dBM
GOOD -65 dBM
FAIR -75 dBM

Good coverage does not necessarily constitute adequate capacity.

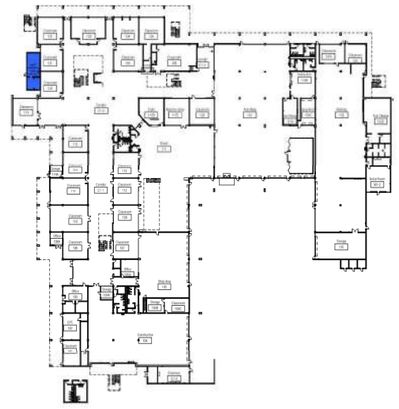
Coverage in 5GHz

Coverage in 2.4GHz

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
RC	Building 1	1st	RCB1 - 1	2	2	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK: BUILIDING 2, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	9:00 AM	3020	RC	Building 2	RCB2MDF	2	3	4	3	3	3	4	3	3	3	Smart-UPS 2200 XL	2496	118	15

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK: BUILDING 2, 1ST FLOOR, MDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Main power disconnects accessible to public at sidewalk HVAC and / or UPS Main power for campus communications center could be disabled.
2. Conduit capacity good, but required Firestop / sealant is not present.
3. Grounding is fair, but conductor size and lug clamps are incorrect type / size.
4. Rack management good, excellent room for expansion.
5. Conduits filled beyond recommended capacity future expansion limited.
6. Clearance at rear of UPS not to PCC Standards.

Not shown: lighting poor throughout.

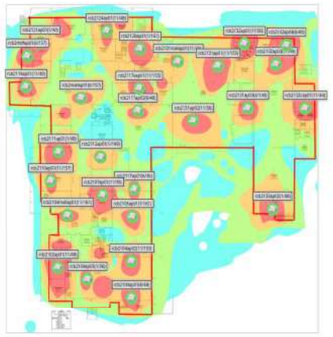
TELECOMMUNICATION ASSESSMENT
ROCK CREEK: BUILDING 2, 1ST FLOOR, MDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

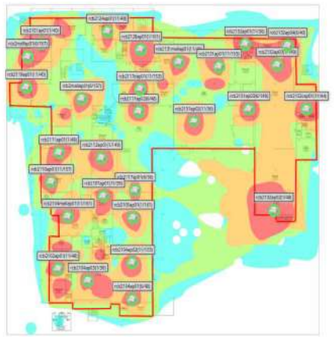
7. Rack management good, excellent room for expansion.
8. Conduits not sealed properly.

Not shown: lighting poor throughout.

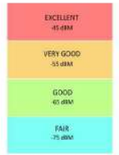
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 2, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
RC	Building 2	1st	RCB2 - 1	3	3	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 2, 2ND FLOOR

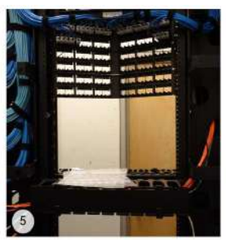
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	9:20 AM	3020	RC	Building 2	RCB2IDF1	3	4	3	4	3	3	3	3	3	3	Smart-UPS SRT 10000	891	66	29
3/23/17	9:25 AM	3020	RC	Building 2	RCB2IDF2	4	2	3	4	3	3	3	3	3	3	Symmetra LX 16000 RM	1632	136	25

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

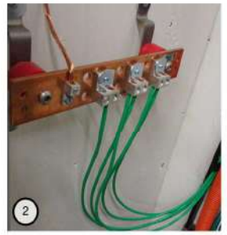
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 2, 2ND FLOOR, IDF 1

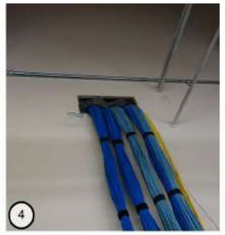
1


3


5


7


2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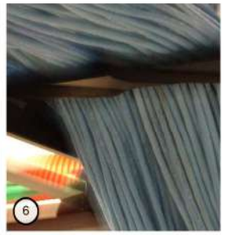

6

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS.
2. System ground conforms to PCC standard but connections are not using industry standard lug types.
3. Fiber spare coil is good practice. Firestop missing from conduit.
4. Cable support poor – fire stop material not present.
5. Expansion capacity adequate, good cable management.
6. Weight of cable bundle at sharp edge could damage cables.
7. Firestop and seal of conduits good.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 2, 2ND FLOOR, IDF 2


1

4


2

3

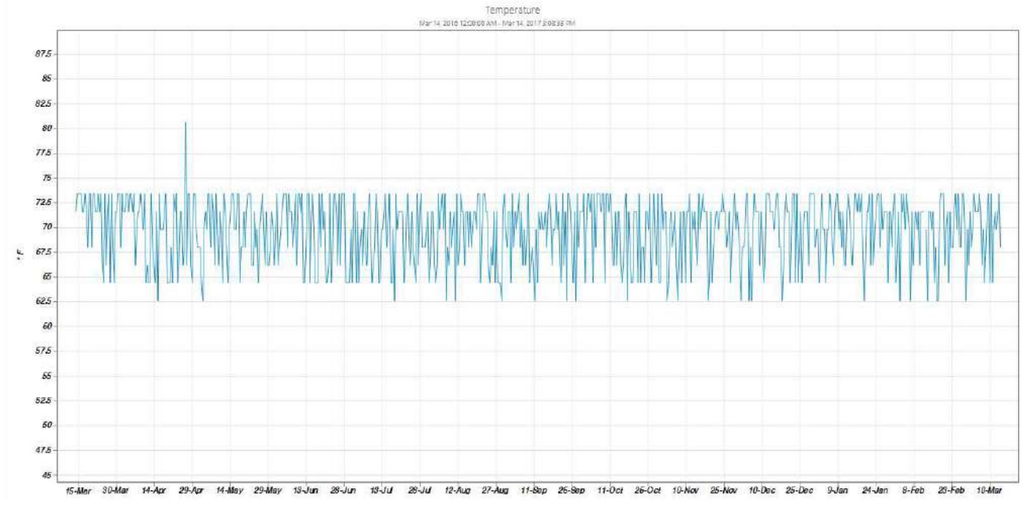

5


6

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Rack management good, excellent room for expansion.
2. Conduit capacity good, Firestop not applied correctly.
3. Load and Charge good on UPS.
4. & 6. Firestop materials not present.
5. Transformer adds heat to room, does not have required clearance – code violation.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 2, 2ND FLOOR, IDF 1



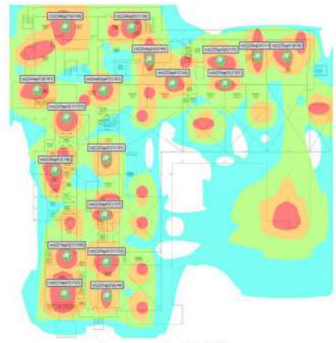
Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Vlue	Notes
RC	rcb2idf1-ups (172.18.255.202)	Temp	RC B2 IDF1	2:52:18 PM	° F	62.6	80.6	67.6	62.6	N/A

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 2, 2ND FLOOR

Coverage in 5GHz



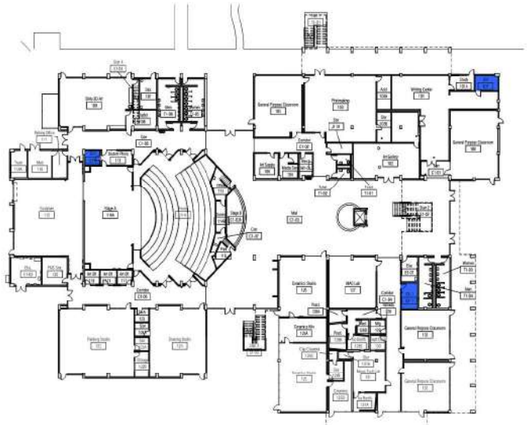
Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
RC	Building 2	1st	RCB2 - 1	3	3	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

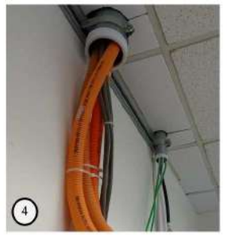
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 3, 1ST FLOOR

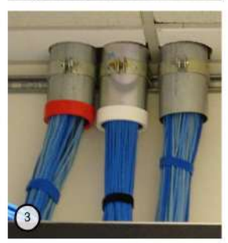


Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	12:00 AM	3030	RC	Building 3	RCB3BDF	4	2	3	4	3	3	3	3	3	3	Smart-UPS RT 10000 XL	1631	340	7
3/23/17	12:00 AM	3030	RC	Building 3	RCB3IDF1	3	3	4	4	3	3	3	3	3	3	Smart-UPS RT 10000 XL	1659	125	15
3/23/17	1:35 PM	3030	RC	Building 3	RCB3IDF2	3	3	4	4	3	3	3	3	3	3	Symmetra LX 16000 RM	1588	174	7

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 3, 1ST FLOOR, BDF

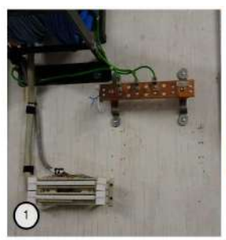


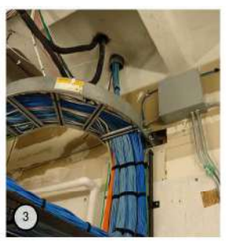


POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Expansion capacity adequate, good cable management.
2. Load and Charge good on UPS.
3. & 4. Conduits filled beyond recommended capacity – future expansion limited – no Firestop.
5. Grounding Buss Bar not approved type.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 3, 1ST FLOOR, IDF1

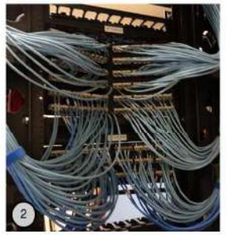




POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. System ground barely conforms to PCC standard; lacks individual connections to required components.
2. Load and Charge good on UPS.
3. & 4. No Firestop system at cable tray penetration.
5. Power disconnect mounted too low – easy to hit by accident when behind rack.

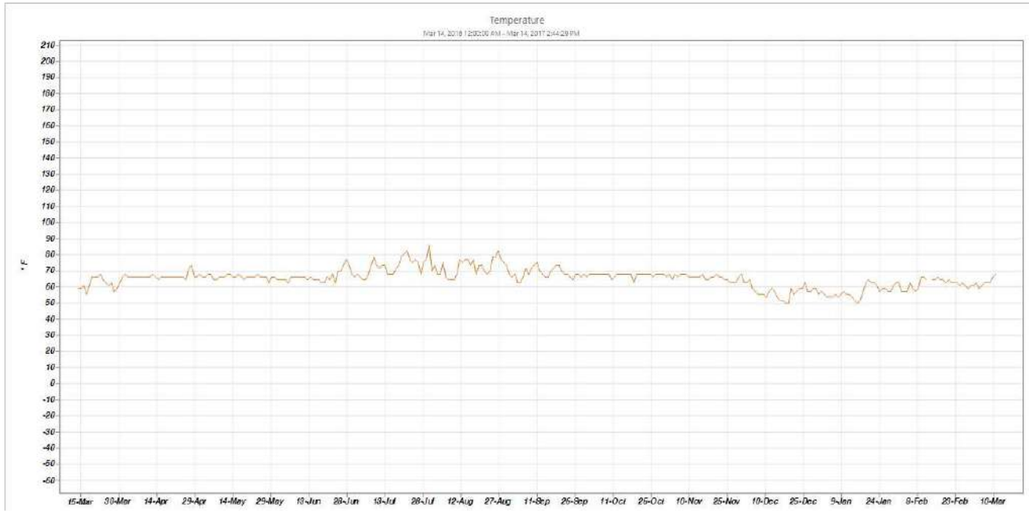
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 3, 1ST FLOOR, IDF2



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Incorrect use of Firestop pillows.
2. Expansion capacity adequate, good cable management.
3. Load and Charge good on UPS.
4. Conduits filled beyond recommended capacity – future expansion limited.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 3, 1ST FLOOR, BDF

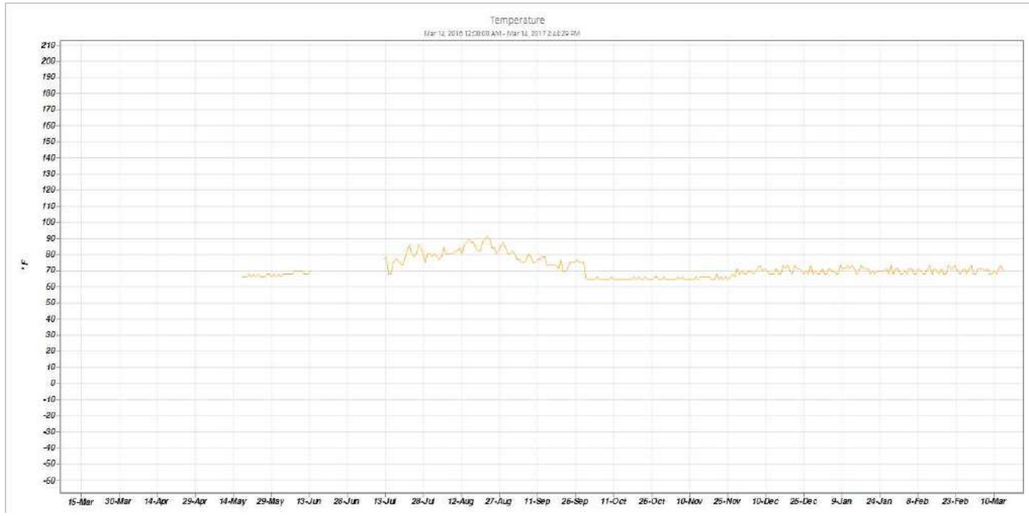


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
RC	rcb3bdf-ups (172.18.255.208)	Temp	RC B3 BDF	2:52:18 PM	° F	55.4	86	65.9	60.8	Start of Aug 2016 - (1) High temp event over 86°

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- POWER ISSUE NO GRAPH
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 3, 1ST FLOOR, IDF 1

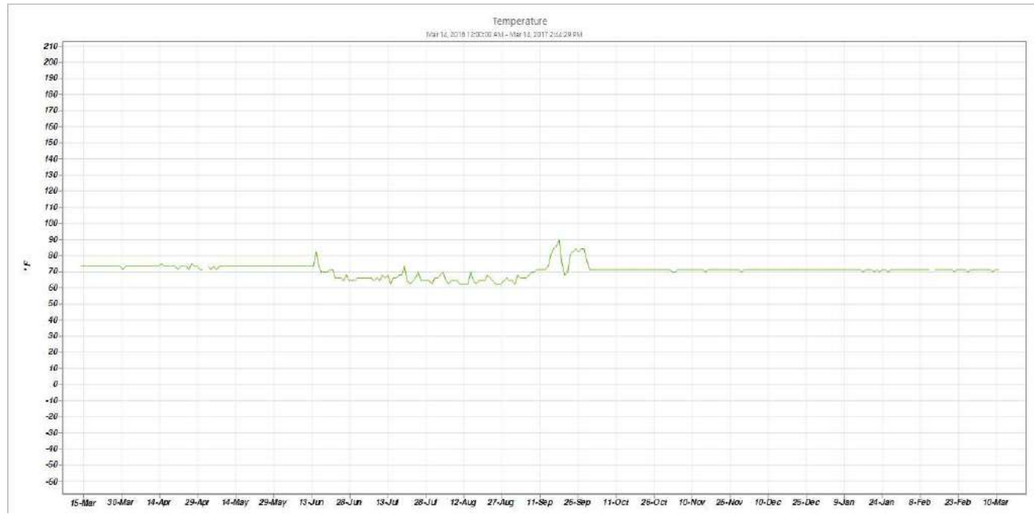


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
RC	rcb3idf1-ups (172.18.255.210)	Temp	RC B3 IDF1	2:52:18 PM	° F	62.6	91.4	71.6	68	Mid Jul to Sept 2016 - Several days of high temp events over 86°

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 3, 1ST FLOOR, IDF 2



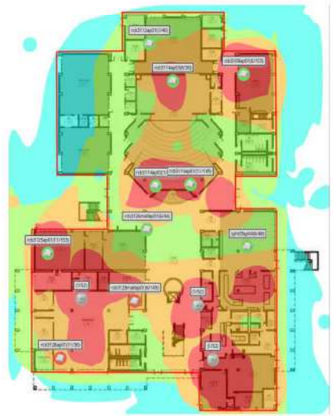
Campus	Building	Room	Location	Time	Units	Min. Value	Max Value	Average Value	Last known Vlue	Notes
RC	rcb3idf2-ups (172.18.255.212)	Temp	RC B3 IDF2	2:52:18 PM	° F	60.8	89.6	71.1	71.6	End of Sept 2016 - (1) High temp event over 86°

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 3, 1ST FLOOR

Coverage in 5GHz



Coverage in 2.4GHz

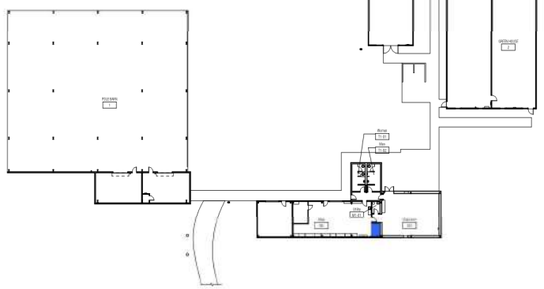
EXCELLENT -45 dBM
VERY GOOD -55 dBM
GOOD -65 dBM
FAIR -75 dBM

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
RC	Building 3	1st	RCB3 - 1	2	2	3	Some AP-224s here, OK to remain in place

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

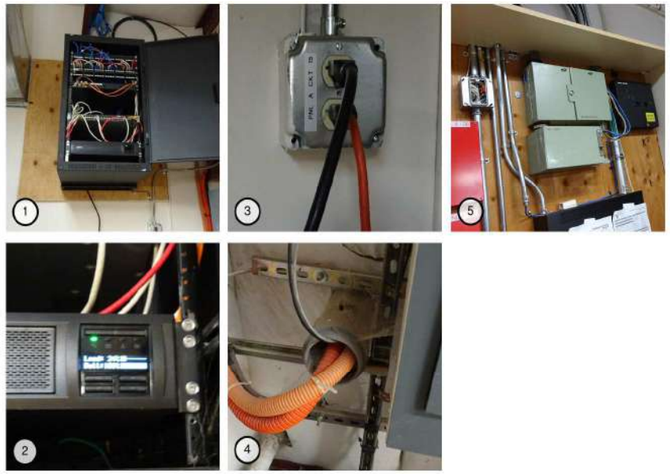
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 4, 1ST FLOOR



Date	Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	3/23/17	12:28 PM	3040	RC	Building 4	RCB4BDF	4	3	3	4	4	4	3	3	3	1	Symmetra LX 16000 RM	383	44	23

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 4, 1ST FLOOR, BDF

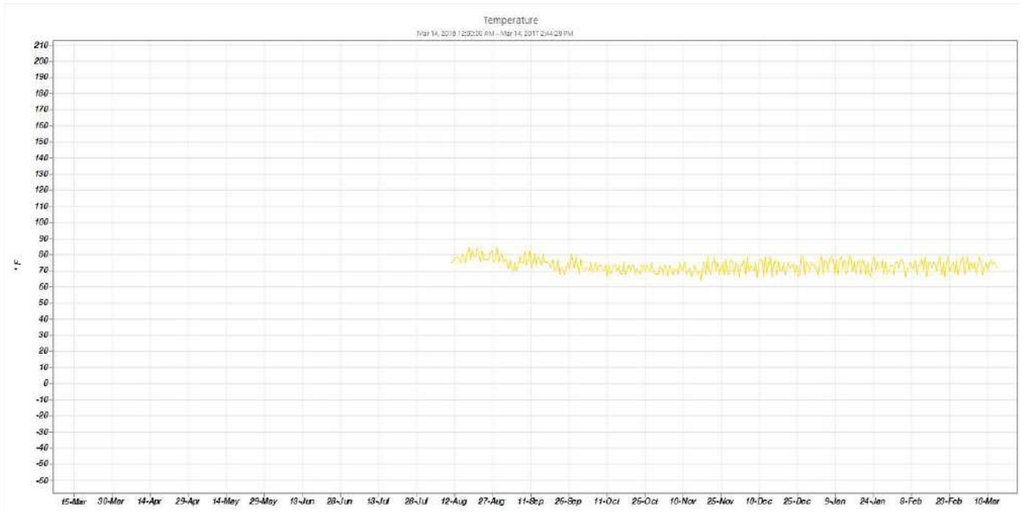


POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Expansion capacity adequate, fair cable management.
2. Load and Charge good on UPS.
3. Rack grounded to outlet box only – and powered on shared circuit.
4. Firestop materials not present.
5. Open outlet box – needs cover per code.

Not shown: Bldg lacks generator

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 4, 1ST FLOOR, BDF

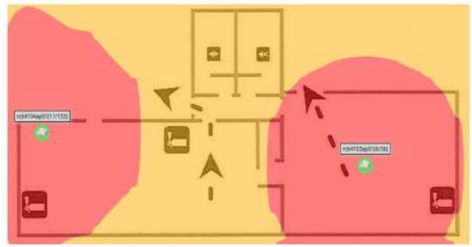


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
RC	rcb4bdf-ups (172.18.255.214)	Temp	RC B4 BDF	2:52:18 PM	°F	62.6	89.6	73.3	68	End of Aug 2016 - (2) High temp events over 86°

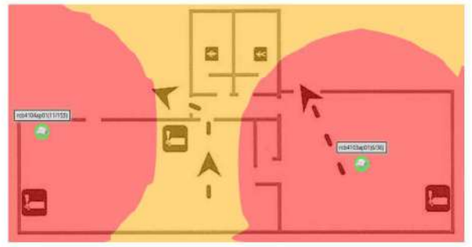
LEGEND

SEVERE TEMP ISSUES
MODERATE TEMP ISSUES
SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 4, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

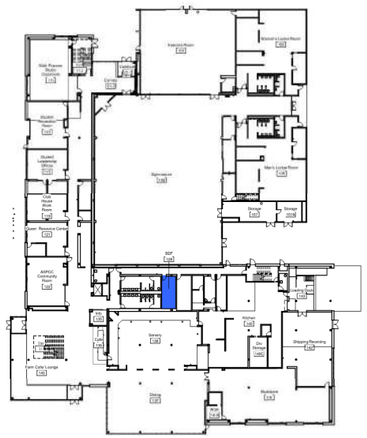
EXCELLENT -45 dBM
VERY GOOD -55 dBM
GOOD -65 dBM
FAIR -75 dBM

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	N+P Service Life	Comments
RC	Building 4	1st	RCB4 - 1	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

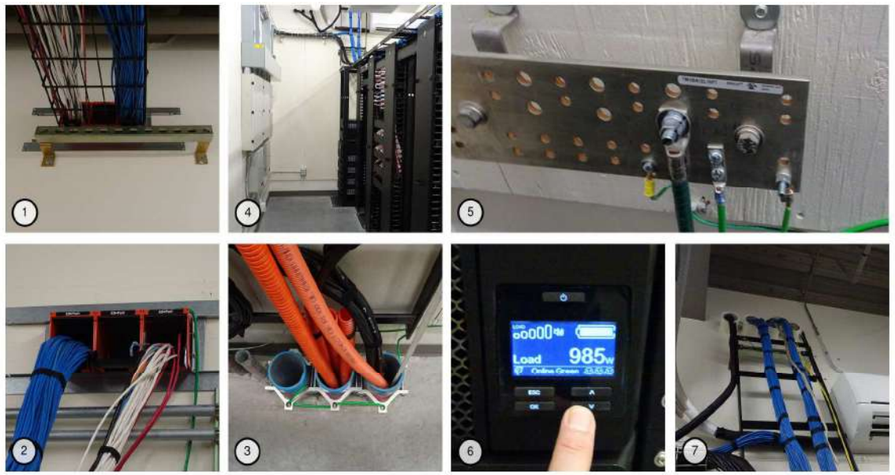
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 5, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	10:21 AM	3050	RC	Building 5	RCB5BDF	3	3	3	4	3	3	2	2	3	2	Symmetra LX 16000 RM	505	349	11

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

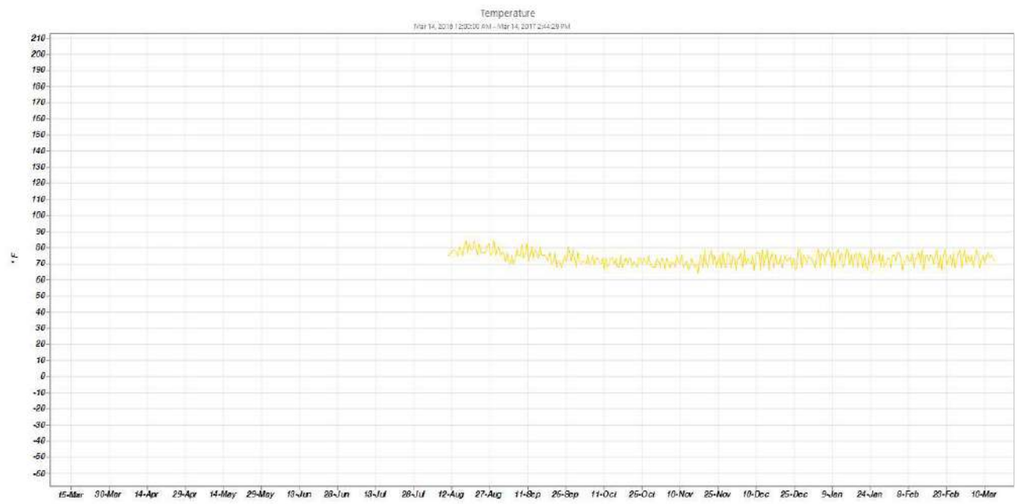
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 5, 1ST FLOOR, BDF



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. & 2. Firestop systems properly used in conformance with PCC Standards.
3. & 7. Conduit capacity good, but required Firestop / sealant is not present.
4. Rack management good, excellent room for expansion.
5. Grounding is fair, but conductor size and lug clamps are incorrect type / size.
6. Load and Charge good on UPS.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 5, 1ST FLOOR, IDF 1



Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
RC	rcb5idf1-ups (172.18.255.218)	Temp	RC B5 IDF1	2:52:18 PM	°F	71.6	87.8	77.3	75.2	Start of June - (1) High temp event over 86°

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 5, 1ST FLOOR

Good coverage does not necessarily constitute adequate capacity.

Coverage in 5GHz

Coverage in 2.4GHz

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
RC	Building 5	1st	RCB5 - 1	2	2	3	Some AP-224s here, OK to remain in place

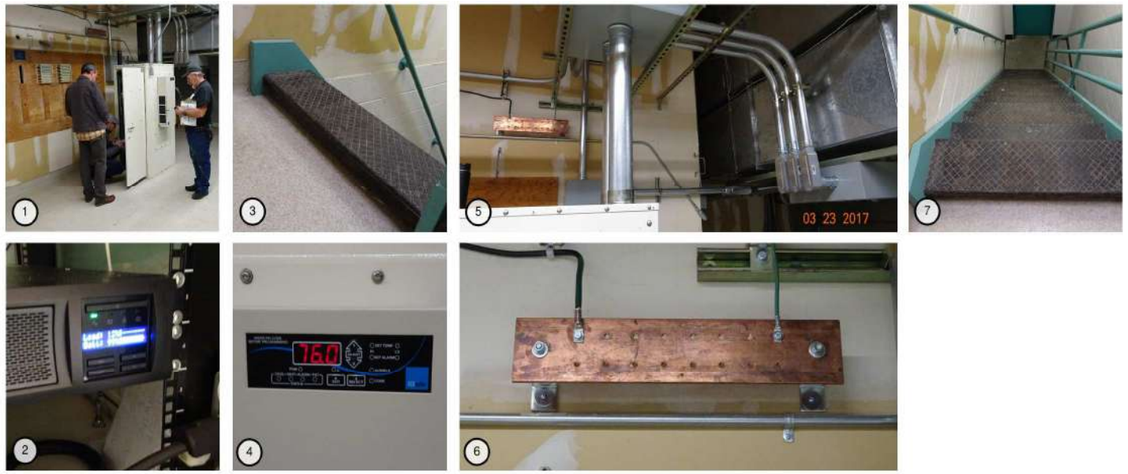
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 5, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	12:00 AM	3050	RC	Building 5	RCB5IDF1	3	2	2	3	3	3	2	2	3		Smart-UPS RT 10000 RM XL	636	242	15

5 BAD	4 POOR	3 FAIR	2 GOOD	1 EXCELLENT

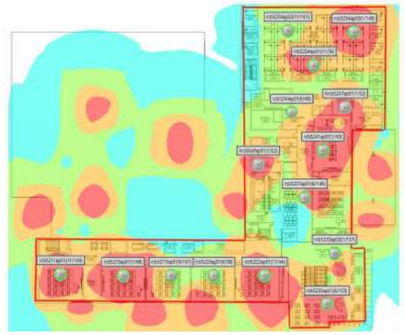
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 5, 2ND FLOOR, IDF 2



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

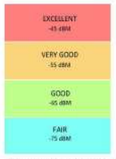
1. IDF is a NEMA cabinet with self-cooling systems, inside structure.
2. Load and Charge good on UPS.
3. & 7. Raised top step is trip hazard – potential to cause personal injury.
4. Temperature being maintained, but no fail-over.
5. Conduits sized per fill ration, but use of 90 degree elbows violate bend radius of cables.
6. System ground barely conforms to PCC standard; uses only a single undersized conductor for entire NEMA cabinet.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 5, 2ND FLOOR



Coverage in 5GHz

Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
RC	Building 5	2nd	RCB5 - 2	2	1	3	Some AP-224s here, OK to remain in place

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 6, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	9:45 AM	3060	RC	Building 6	RCB6BDF	3	2	2	3	3	3	3	3	3		Smart-UPS X 1500	1659	148	12

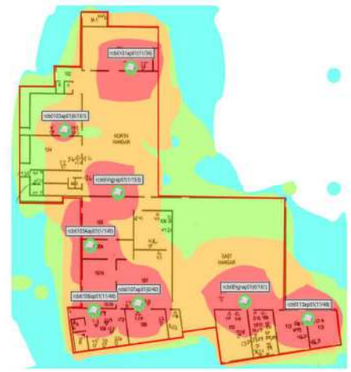
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 6, 1ST FLOOR, BDF

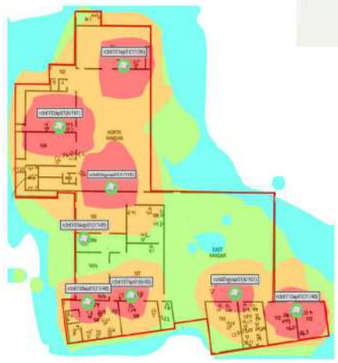
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Overhead cable tray capacity excellent – suitable for expansion.
2. Conduit capacity good, but required Firestop / sealant is not present.
3. System ground conforms to PCC standard but connections are not using industry standard lug types.
4. Cable management good.
5. Load and Charge good on UPS.

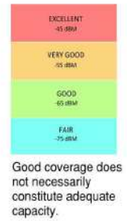
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 6, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
RC	Building 6	1st	RCB6 - 1	2	2	3	N/A

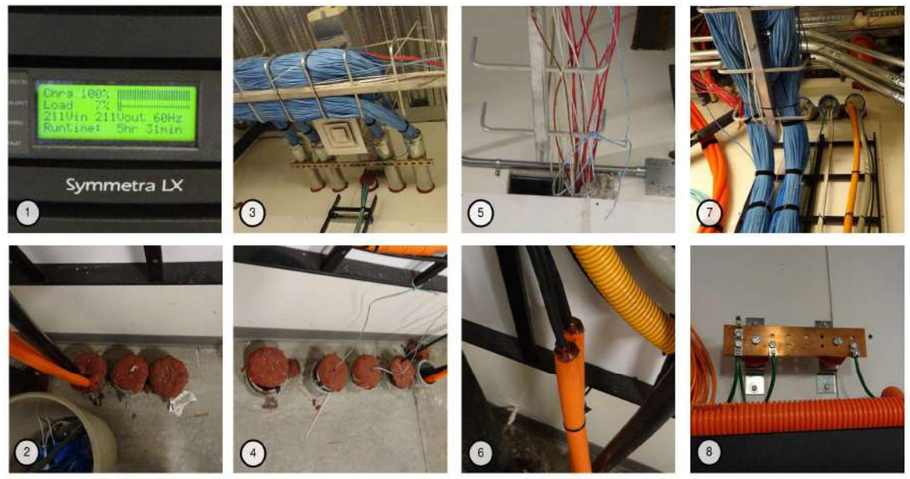
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	12:57 PM	3070	RC	Building 7	RCB7IDF1	3	3	2	4	3	4	4	4	3	5	Smart-UPS SRT 10000	1625	235	10
3/23/17	1:05 PM	3070	RC	Building 7	RCB7IDF2	4	3	3	4	3	3	3	3	5	5	Smart-UPS X 2000	1605	108	17

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

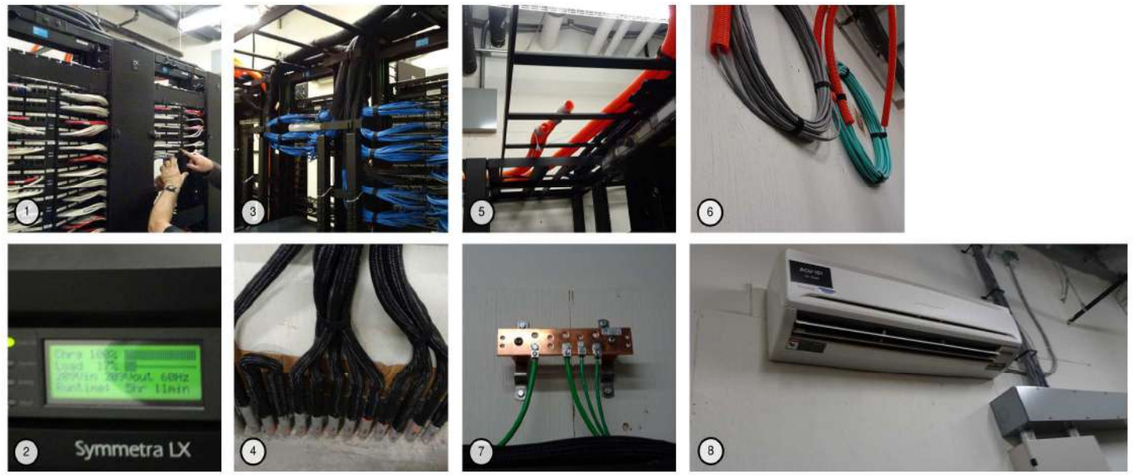
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 1ST FLOOR, BDF



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS.
2. & 4. & 6. - Firestop systems properly used in conformance with PCC Standards (except for one conduit where system was removed and not replaced).
3. & 5. & 7. - Firestop materials not correct or not present.
8. System ground conforms to PCC standard but connections are not using industry standard lug types.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 1ST FLOOR, IDF 3



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

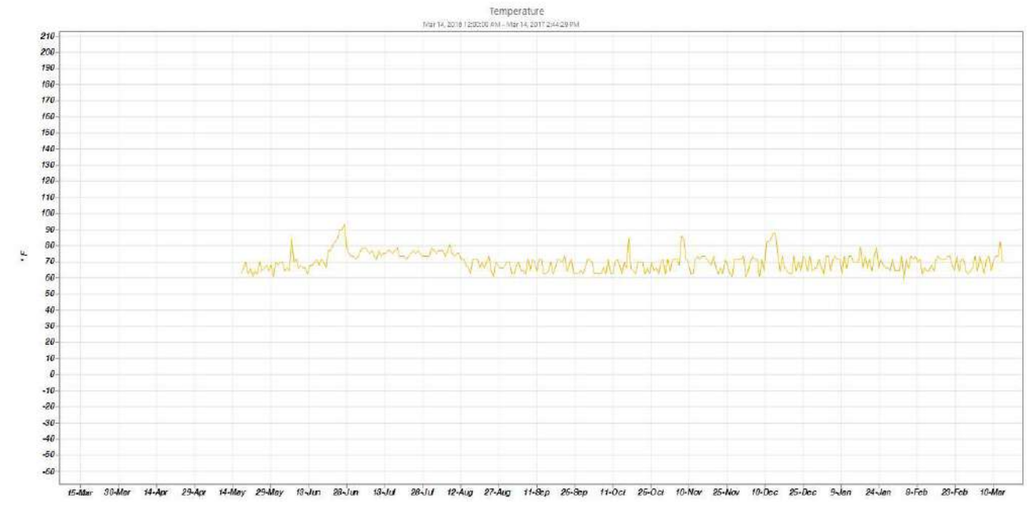
1. & 3. Rack management good, excellent room for expansion.
2. Load and Charge good on UPS.
4. Conduits filled beyond recommended capacity; Firestop materials not present.
5. Overhead cable tray capacity excellent – suitable for expansion.
6. Service loops for Fiber links per PCC Standards.
7. System ground conforms to PCC standard.
8. Split system could leak condensate into electrical trough.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 1ST FLOOR, IDF 3

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

9. Water pipes directly over equipment racks with no pan. Extreme water hazard.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 1ST FLOOR, BDF

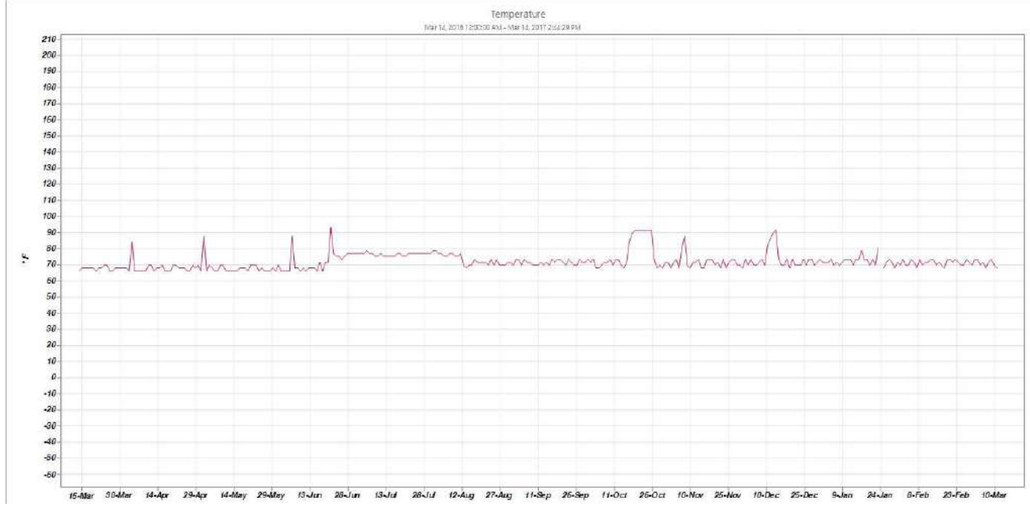


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Vlue	Notes
RC	rcb7bdf-ups (172.18.255.222)	Temp	RC B7 BDF	2:52:18 PM	° F	57.2	93.2	70.3	73.4	June, Nov, and Dec 2016 - (4) High temp events over 86°

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION TEMPERATURE ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 1ST FLOOR, IDF 3

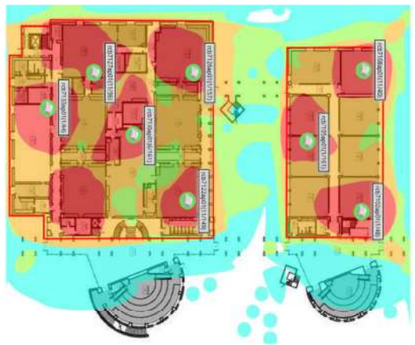


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Vlue	Notes
RC	rcb7idf3-ups (172.18.255.227)	Temp	RC B7 IDF3	2:52:18 PM	° F	66.2	93.2	72.2	73.4	All of 2016 - (6) High temp events over 86°

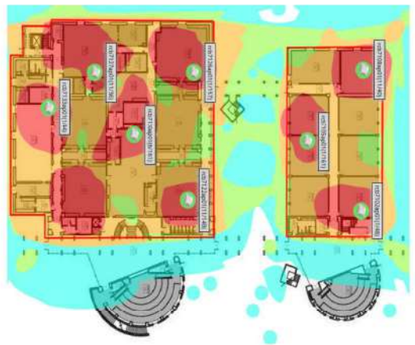
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

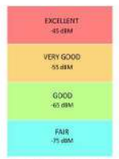
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
RC	Building 7	1st	RCB7 - 1	2	1	3	Some AP-224s here, OK to remain in place

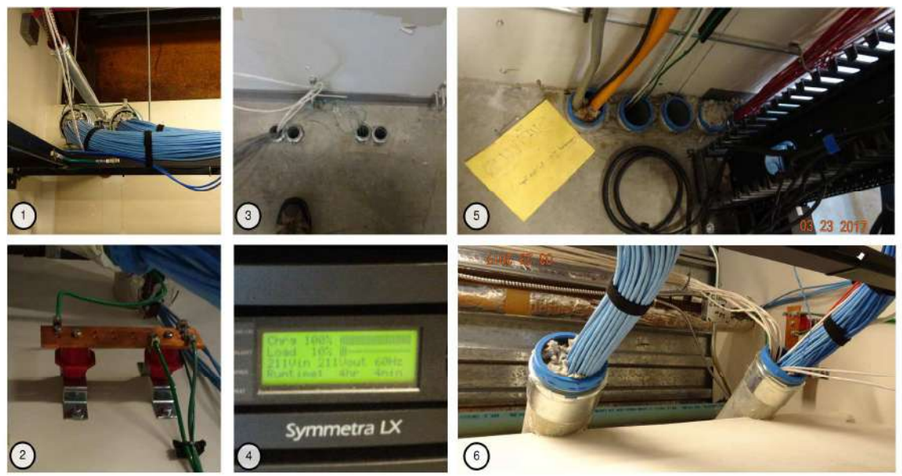
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	12:57 PM	3070	RC	Building 7	RCB7IDF1	3	3	2	4	3	4	4	4	3	5	Smart-UPS SRT 10000	1625	235	10
3/23/17	1:05 PM	3070	RC	Building 7	RCB7IDF2	4	3	3	4	3	3	3	3	5	5	Smart-UPS X 2000	1605	108	17

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

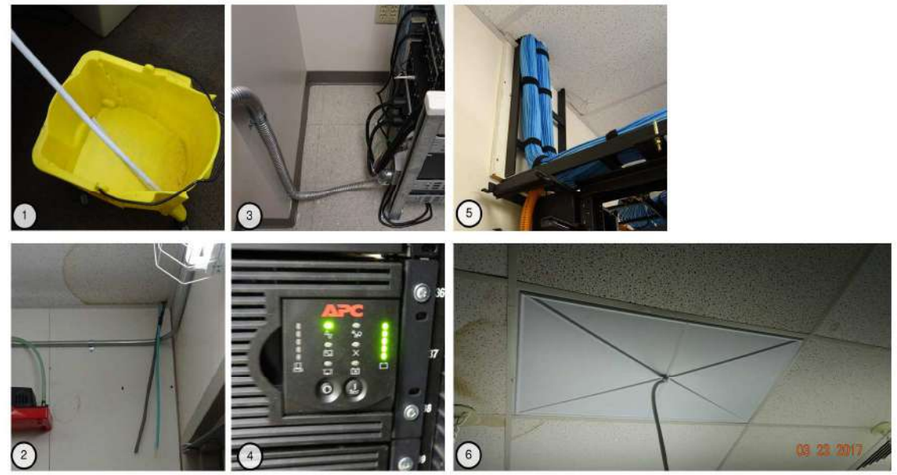
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 2ND FLOOR, IDF 1



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Conduits filled beyond recommended capacity – future expansion limited.
2. System ground barely conforms to PCC standard; lacks individual connections to required components.
3. & 5. & 6. Firestop materials not present.
4. Load and Charge good on UPS.

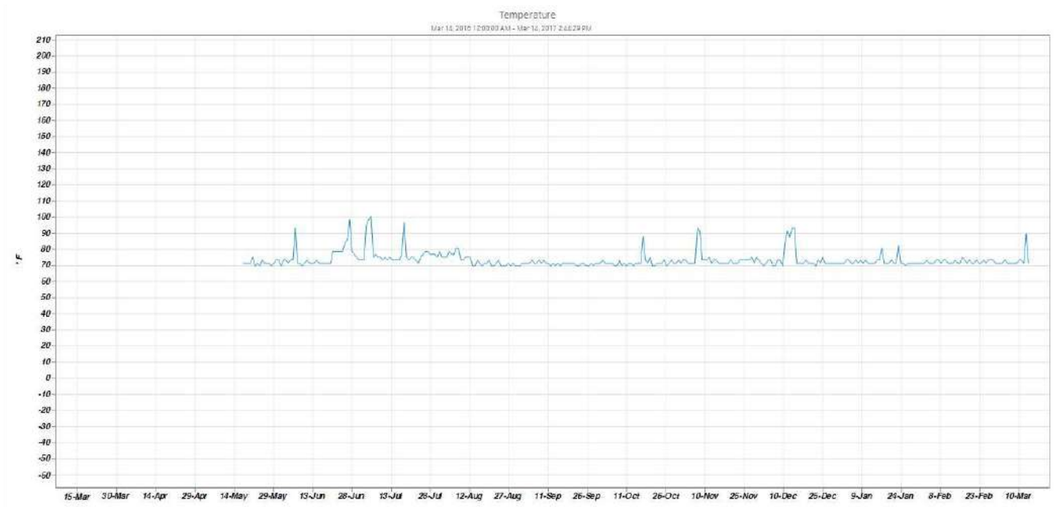
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 2ND FLOOR, IDF 2



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. & 6. Water collection system for roof leak adjacent to IDF.
2. Evidence of water leak inside IDF.
3. Electrical feed to rack not to code.
4. Load and Charge good on UPS.
5. Firestop materials not present.

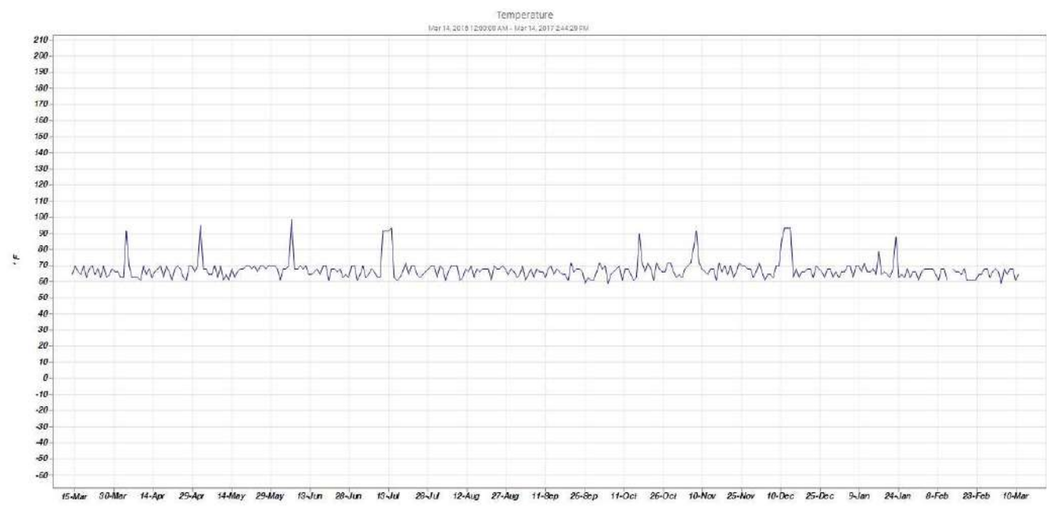
TELECOMMUNICATION TEMPERATURE ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 1ST FLOOR, IDF 1



Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Vlue	Notes
RC	rcb7idf1-ups (172.18.255.224)	Temp	RC B7 IDF1	2:52:18 PM	°F	68	104	73.6	71.6	All of 2016 - (7) High temp events over 86°

LEGEND
- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

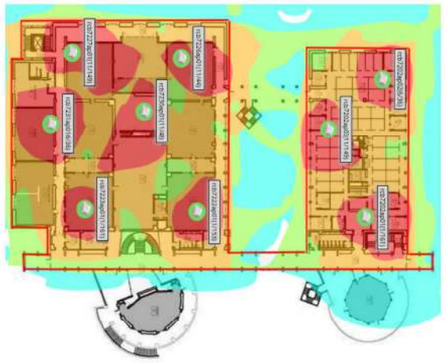
TELECOMMUNICATION TEMPERATURE ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 1ST FLOOR, IDF 2



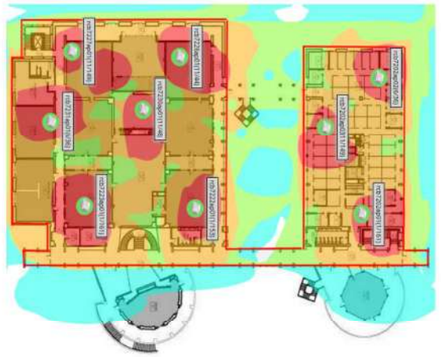
Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Vlue	Notes
RC	rcb7idf2-ups (172.18.255.226)	Temp	RC B7 IDF2	2:52:18 PM	°F	57.2	102	68	69.8	All of 2016 - (8) High temp events over 86°

LEGEND
- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

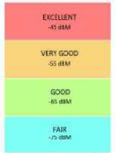
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 7, 2ND FLOOR



Coverage in 5GHz



Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
RC	Building 7	2nd	RCB7 - 2	2	1	3	Some AP-224s here, OK to remain in place

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 9, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	11:24 AM	3090	RC	Building 9	RCB9BDF	2	2	3	4	3	3	4	3	4	3	Smart-UPS RT 10000 XL	1617	268	12
3/23/17	11:15 AM	3090	RC	Building 9	RCB9IDF2	3	3	4	4	3	3	3	3	3	3	Smart-UPS X 2000	1659	118	16

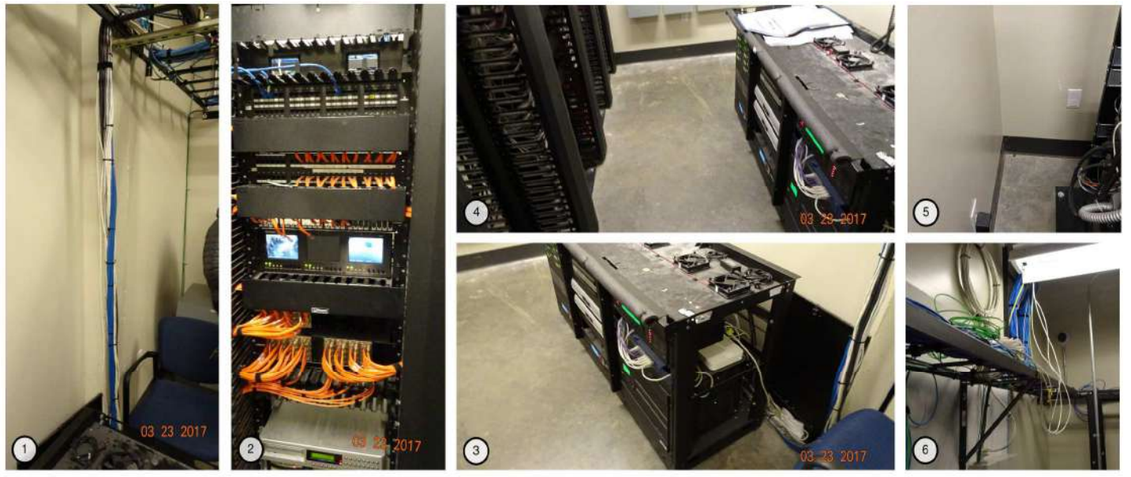
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 9, 1ST FLOOR, BDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Clearance behind rack limited – not to PCC Standards.
2. HVAC system over racks with no drip pan.
3. Transformer in room adds heat, and is possible source of EMI.
4. System ground conforms to PCC standard.
5. Condensate pump over cabling (Water Hazard) – Cables overfilled on tray.
6. Load and Charge good on UPS.
7. Conduit capacity good, but required Firestop / sealant is not present.

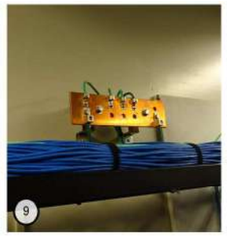
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 9, 1ST FLOOR, IDF 1



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Unsupported AV Cables to adjacent space, for the AV cabinet.
2. CCTV systems in room. Not shown: Camera power power brick easily disconnected.
3. & 4. AV Media cabinet placed in room – restricting PCC Clearances – Dirt on top of cabinet can infiltrate IT as well as AV equipment, leading to failure, AV cabinet ground not connected to IDF TGB.
5. Clearance behind UPS not to PCC Standards.
6. AV cabling added to room for Media Cabinet not managed.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 9, 1ST FLOOR, IDF 1

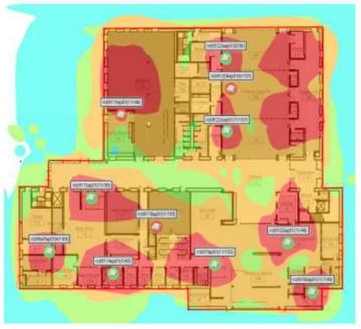


POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

7. Conduits filled beyond recommended capacity; Incorrect use of Firestop pillows.
8. Load and Charge good on UPS.
9. System ground conforms to PCC standard.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 9, 1ST FLOOR

Coverage in 5GHz



Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WaP Service Life	Comments
RC	Building 9	1st	RCB9 - 1	2	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 9, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Rnh Time (min)	UPS Utilization %
3/23/17	11:04 AM	3090	RC	Building 9	RCB9211S	4	3	3	3	3	3	4	4	3	3	Symmetra LX 16000 RM	1330	37	52
3/23/17	10:42 AM	3090	RC	Building 9	RCB9IDF1	3	4	3	3	3	3	4	4	3	3	Symmetra LX 16000 RM	1659	107	18
3/23/17	10:55 AM	3090	RC	Building 9	RCB9IDF3	3	2	3	4	3	3	3	3	3	3	Smart-UPS RT 6000 XL	555	113	24

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

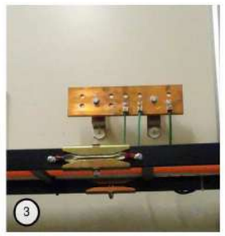
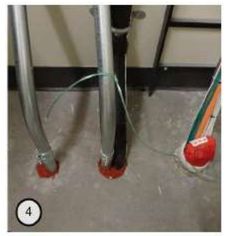
TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 9, 2ND FLOOR, IDF 2

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. less than 1ft clearance behind rack – not to PCC Standards.
2. HVAC lines sharing conduit with fiber, voice, and data lines – code violation. Firestop not present.
3. Load and Charge good on UPS.
4. System ground conforms to PCC standard.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 9, 2ND FLOOR, IDF 3

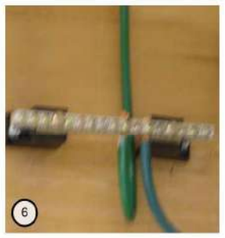



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Conduit capacity good, but required firestop / sealant is not present.
2. Rack management good, excellent room for expansion.
3. System ground barely conforms to PCC standard; lacks individual connections to required components.
4. Incorrect use of Firestop pillows.
5. Load and Charge good on UPS.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 9, 2ND FLOOR, SERVER ROOM

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1, 2, & 3 HVAC unit not operable – Temp cooling systems in place.
4. UPS Load exceeds recommended headroom.
5. UPS for servers load and charge good.
6. Ground conductors are undersized and Grounding Buss Bar not approved type.

TELECOMMUNICATION ASSESSMENT
ROCK CREEK CAMPUS: BUILDING 9, 2ND FLOOR

Coverage in 5GHz

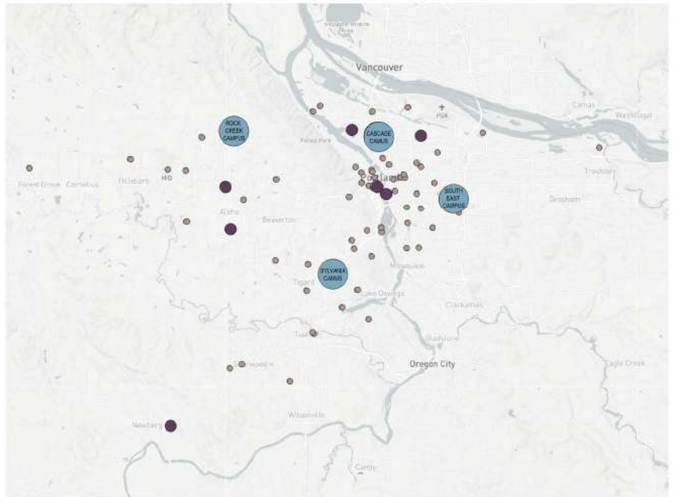
Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
RC	Building 9	2nd	RCB9 - 2	2	1	3	N/A

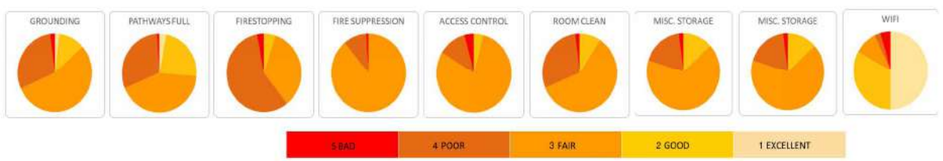
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
PORTLAND COMMUNITY COLLEGE: ALL CAMPUS BREAKDOWN

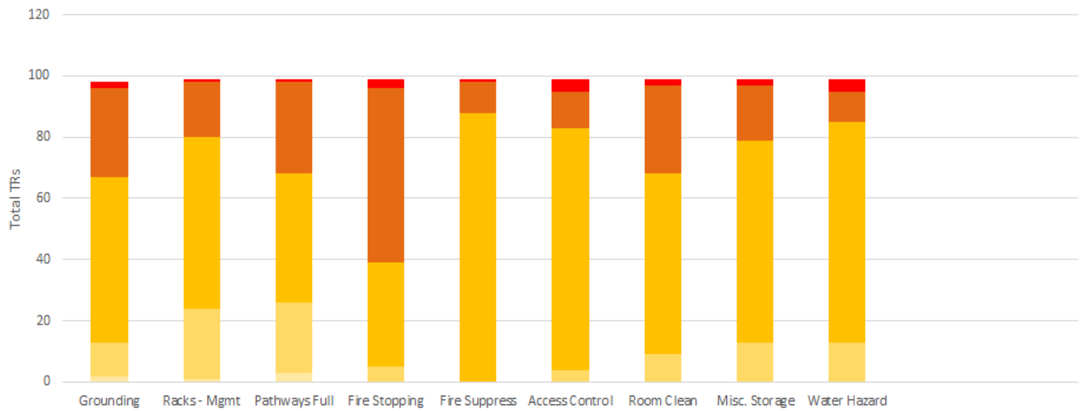


BREAKDOWN OF CAMPUSES

- CASCADE CAMPUS
- ROCK CREEK CAMPUS
- SOUTHEAST CAMPUS
- SLYVANIA CAMPUS
- CLIMB CENTER FOR ADVANCEMENT
- COLUMBIA COUNTY
- DOWNTOWN CETNER
- HILLSBORO CENTER
- NEWBERG CENTER
- PORTLAND METROPOLITAN
- SWAN ISLAND TRADES CENTER
- WILLOW CREEK CENTER



TELECOMMUNICATION ASSESSMENT
PORTLAND COMMUNITY COLLEGE: ALL CAMPUS BREAKDOWN



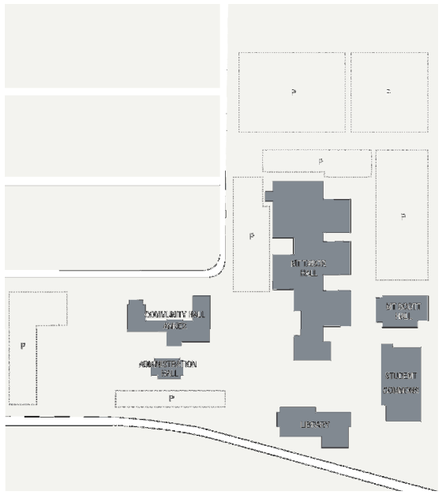
•40% of the buildings on this campus do not employ effective firestop methods entering or exiting the communications spaces. Recommend proper installation of approved firestop materials.

•30% of the conduits and cable trays entering the communications spaces, are filled beyond recommended capacity. This allows no expansion and potentially damages cable in the tray due to excess weight. Recommend removing abandoned cabling, or adding parallel pathways for future expansion. The critical entrance conduits can be further evaluated during a campus wide Outside Plant pathway identification and inventory project.

30% of the rooms have inadequate grounding. Recommend providing appropriate grounding system in each room.

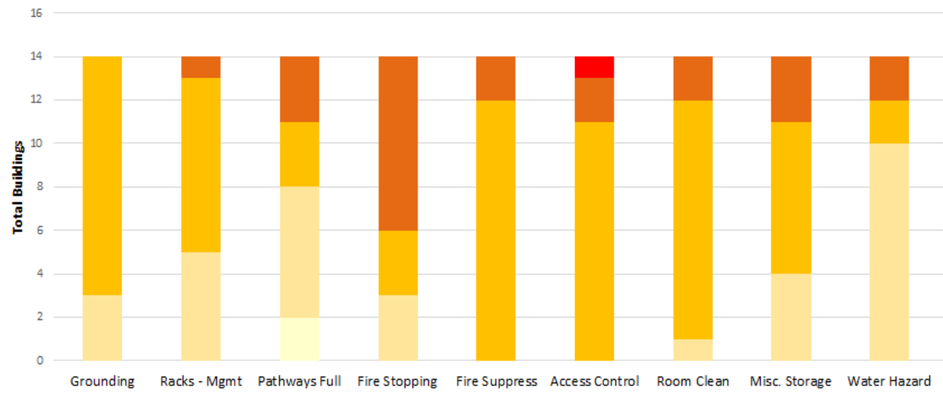
5 BAD, IN URGENT NEED OF REMEDIATION OR REPLACEMENT.	4 POOR CONDITION. SIGNIFICANT DEFICIENCIES RELATIVE TO PCC STANDARDS.	3 FAIR TO AVERAGE. ADEQUATE FOR CURRENT NEEDS. MINOR DEFICIENCIES.	2 GOOD TO VERY GOOD. MAJOR RESPECTS MEET PCC STANDARDS AND CRITERIA.	1 EXCELLENT CONDITION. EXCEEDS PCC AND INDUSTRY STANDARDS.

TELECOMMUNICATION SPACES - SURVEY DATA
SOUTHEAST CAMPUS: BREAKDOWN



BREAKDOWN OF SPACES		
COMMUNITY HALL ANNEX · BDF ADMINISTRATION · BDF 1 · IDF 4-1 LEARNING CENTER (LIBRARY) · BDF · IDF 1 MT. SCOTT HALL · BDF MT. TABOR HALL · MDF · IDF 1 · IDF 2 · SERVER ROOM 114	STUDENT COMMONS · BDF · IDF 1 · IDF 2	

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: BREAKDOWN



•50% of the buildings on this campus do not employ effective firestop methods entering or exiting the communications spaces. Recommend proper installation of approved firestop materials.

•20% of the conduits and cable trays entering the communications spaces, are filled beyond recommended capacity. This allows no expansion and potentially damages cable in the tray due to excess weight. Recommend removing abandoned cabling, or adding parallel pathways for future expansion. The critical entrance conduits can be further evaluated during a campus wide Outside Plant pathway identification and inventory project.

5 BAD. IN URGENT NEED OF REMEDIATION OR REPLACEMENT.	4 POOR CONDITION. SIGNIFICANT DEFICIENCIES RELATIVE TO PCC STANDARDS.	3 FAIR TO AVERAGE. ADEQUATE FOR CURRENT NEEDS. MINOR DEFICIENCIES.	2 GOOD TO VERY GOOD. MAJOR RESPECTS MEET PCC STANDARDS AND CRITERIA.	1 EXCELLENT CONDITION. EXCEEDS PCC AND INDUSTRY STANDARDS.

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: ANNEX BUILDING, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	11:53 AM	4003	SE	Community Hall Annex	SEAABDF	2	2	4	4	4	3	3	3	2	1	Smart-UPS RT 10000 XL	3832	546	21

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

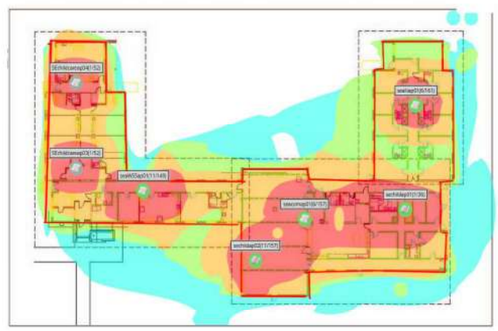
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: ANNEX BUILDING, 1ST FLOOR, BDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

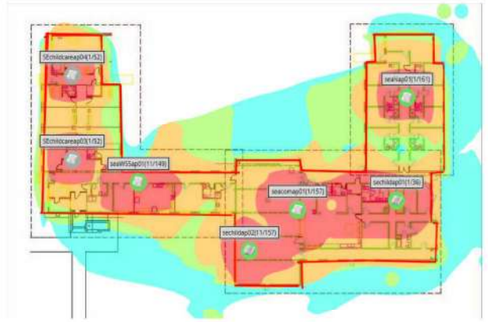
1. Conduits filled beyond recommended capacity – future expansion limited.
2. System ground conforms to PCC standard.
3. Fire stop materials not present.
4. & 5. Rack management good, but little room for expansion.
6. Secondary exhaust fan inoperable and not thermostatically controlled.
7. UPS load good, but unit is over 10 years old.

(not shown) Two of three doors have card access, one is direct to outside. 3rd door was missing door knob.

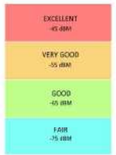
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: ANNEX BUILDING, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

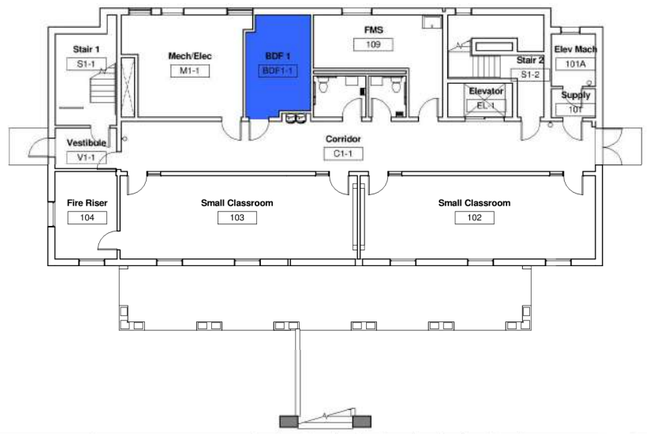


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SE	Community Hall Annex	1st	SEAA - 1	2	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

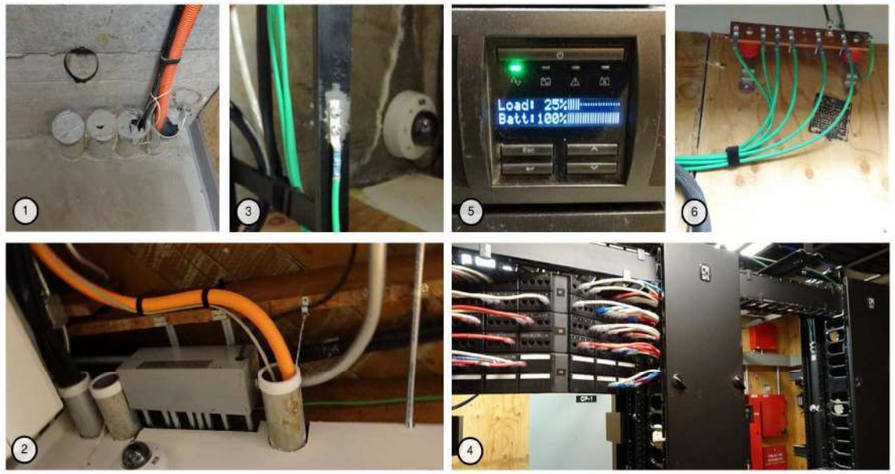
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: ADMINISTRATION BUILDING, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	11:26 AM	4030	SE	Administration Building	SEASBDF	2	3	2	4	4	3	3	2	2	1	Smart-UPS SRT 5000	1224	299	25

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

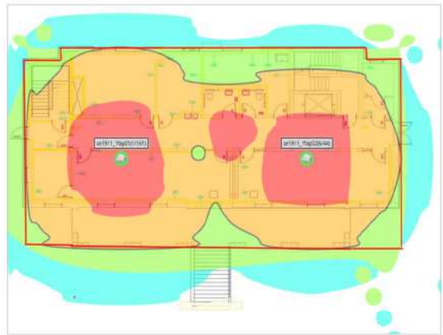
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: ADMINISTRATION BUILDING, 1ST FLOOR, BDF



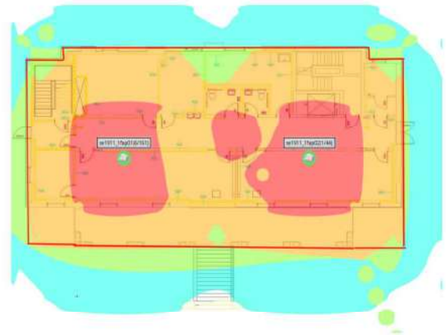
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Conduit capacity good, but required Firestop / Sealant is not present.
2. Fire stop materials not present.
3. & 6 System ground conforms to PCC standard.
4. Rack management good, excellent room for expansion.
5. UPS load good, but unit is over 10 years old.

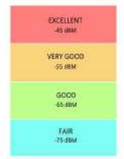
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: ADMINISTRATION BUILDING, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

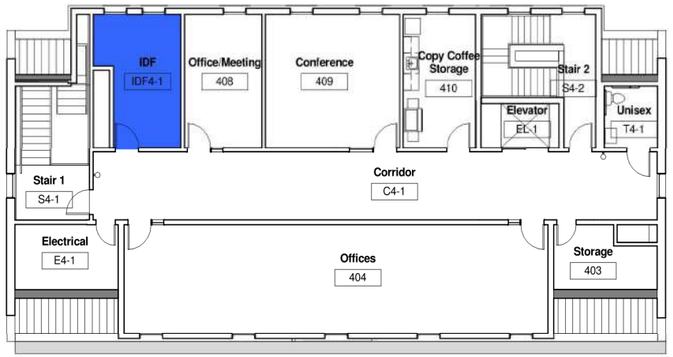


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	N/AP Service Life	Comments
SE	Southeast Administration Building	1st	SEAS - 1	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: ADMINISTRATION BUILDING, 4TH FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	11:36 AM	4030	SE	Administration Building	SEASIDF1	2	2	2	4	3	5	3	3	4	1	Smart-UPS 1500	2537	818	10

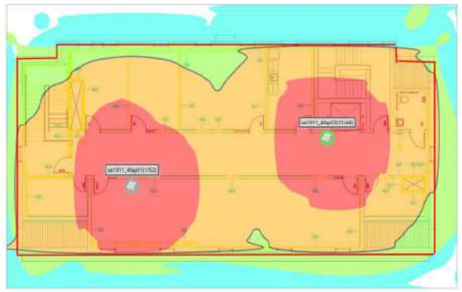
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: ADMINISTRATION BUILDING, 4TH FLOOR, IDF1

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

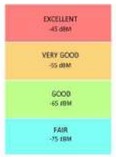
1. Window contributes to heat in room.
2. Water leak evidence on ceiling. Fire stop materials not present.
3. & 4 Expansion capacity adequate, good cable management.
5. UPS load good, but unit is over 10 years old.
6. System ground conforms to PCC standard.

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: ADMINISTRATION BUILDING, 4TH FLOOR



Coverage in 5GHz

Coverage in 2.4GHz

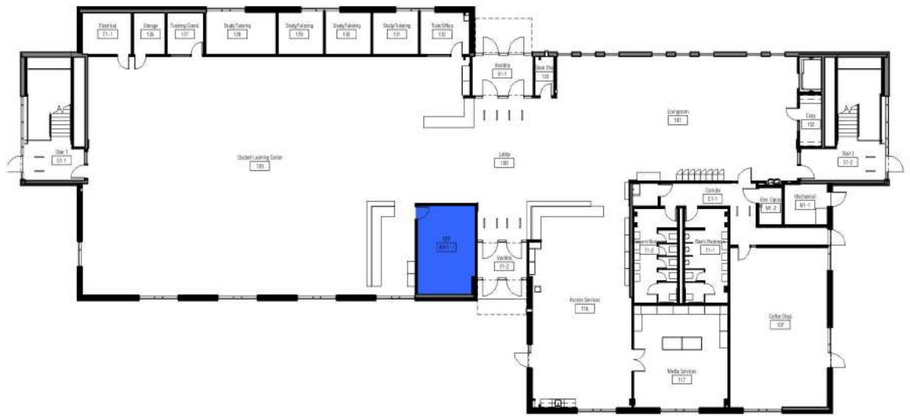


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SE	Southeast Administration Building	4th	SEAS - 4	2	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: LEARNING CENTER, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	10:40 AM	4005	SE	Learning Commons	SELCBDF	3	3	2	3	3	3	2	2	4	3	Smart-UPS X 1500	1239	138	10

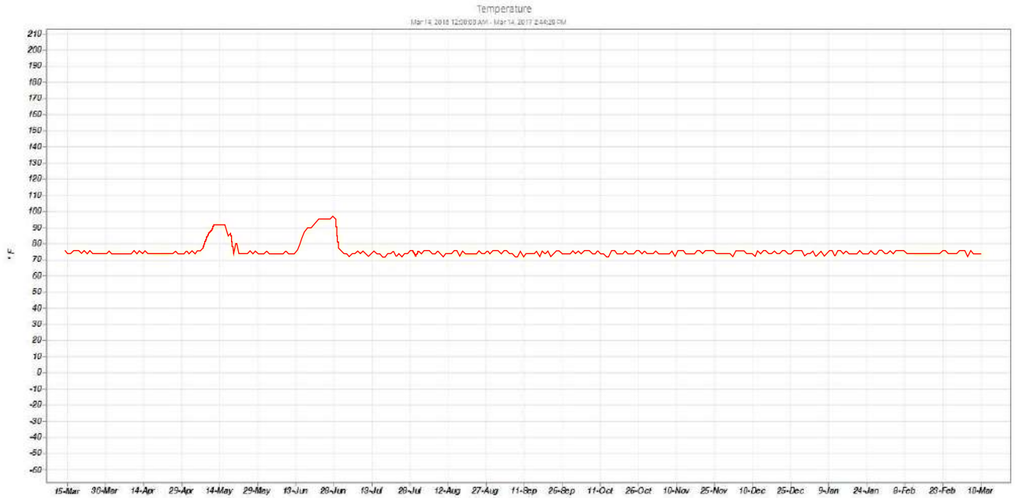
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: LEARNING CENTER, 1ST FLOOR, BDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. &5. Rack management good, excellent room for expansion.
2. UPS load good, unit is less than 4 years old.
3. Multiple water lines above rack systems – potential water hazard.
4. Fire stop systems in place – conforms to PCC standards.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SOUTHEAST CAMPUS: LEARNING CENTER. BDF



Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
SE	selcbdf-ups (172.19.255.249)	Temp	SE LC BDF	2:52:18 PM	° F	71.6	96.8	74.9	73.4	Mid May to end of June 2016 - Several high temp events over 86°

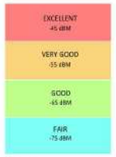
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: LEARNING CENTER, 1ST FLOOR

Coverage in 5GHz

Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SE	Learning Commons	1st	SELC - 1	1	1	1	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: LEARNING CENTER, 3RD FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	11:00 AM	4005	SE	Learning Commons	SELCIDF1	3	3	2	4	3	3	3	2	3	3	Smart-UPS 3000 RM XL	2909	513	12

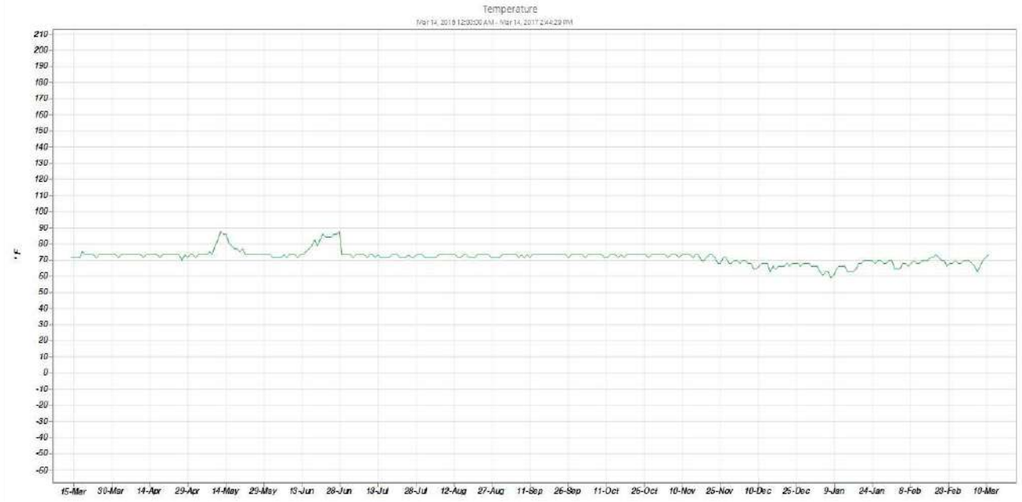
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: LEARNING CENTER, 3RD FLOOR, IDF1

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. &2. Rack management good, excellent room for expansion.
3. Conduit capacity good, but required Firestop / Sealant is not present.
4. System ground barely conforms to PCC standard; lacks individual connections to required components.
5. UPS load good, unit is 8 years old.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SOUTHEAST CAMPUS: LEARNING CENTER, IDF 1



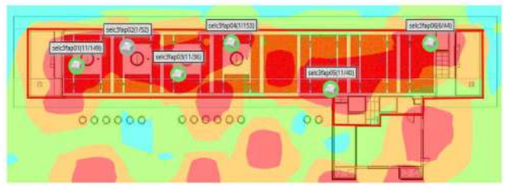
Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
SY	selcidf1-ups (172.19.255.248)	Temp	SE LC IDF1	2:52:18 PM	°F	68	91.4	72.6	69.8	Mid May to end of June 2016 - Several high temp events over 86°

LEGEND

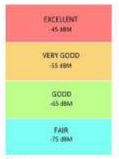
- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: LEARNING CENTER, 3RD FLOOR

Coverage in 5GHz



Coverage in 2.4GHz

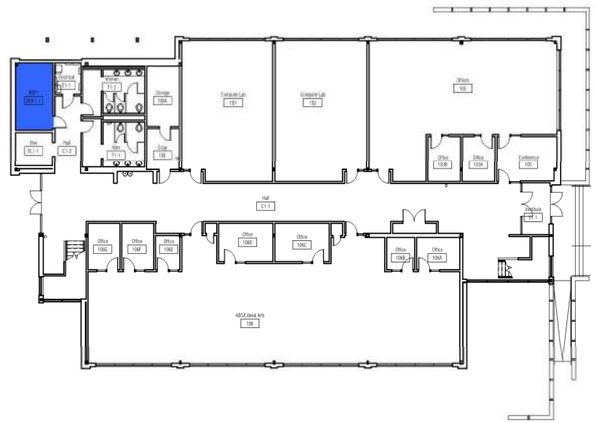


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SE	Learning Commons	3rd	SELC - 3	1	1	3	AP-134's here, rest of building has 224's

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

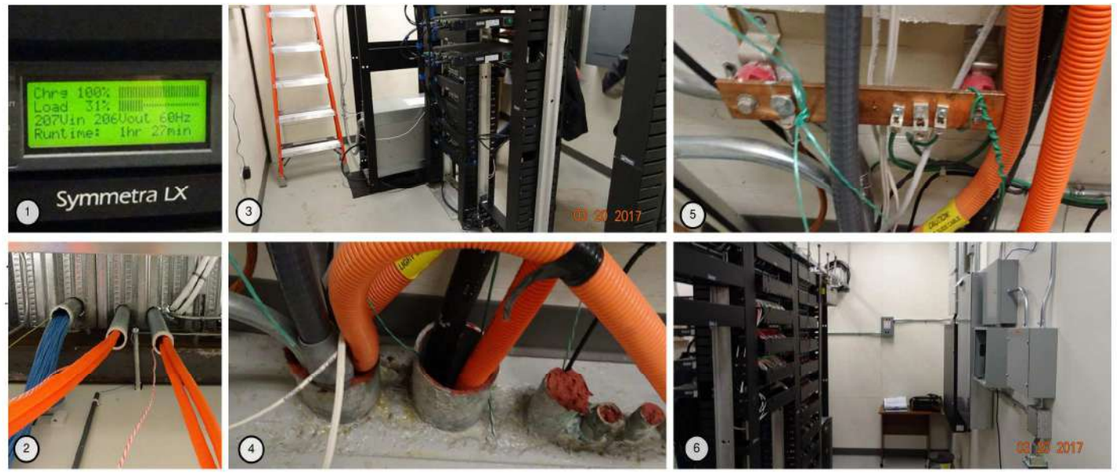
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: MT. SCOTT HALL, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	9:21 AM	4010	SE	Mount Scott Hall	SEMSBDF	3	3	4	4	3	3	3	4	2	3	Smart-UPS X 2200	183	84	31

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

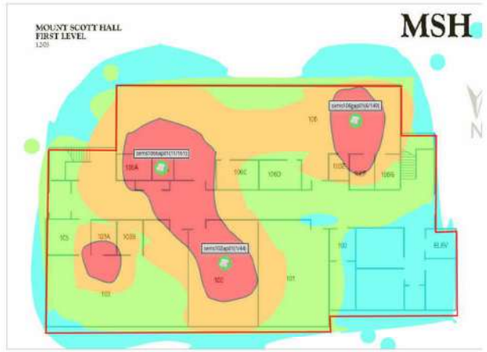
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: MT. SCOTT HALL, 1ST FLOOR, BDF



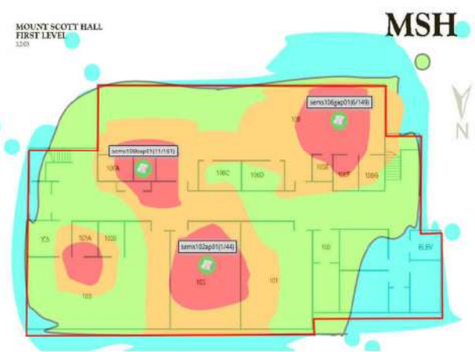
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. UPS load good, unit is almost new.
2. Conduits to upper floors are full, with no spare. Expansion requires new conduit installation.
3. Ladders and other tall objects may fall on equipment in earthquake.
4. Firestop removed and not replaced.
5. Grounding is fair, but conductor size and lug clamps are incorrect type / size.
6. Rack management good, excellent room for expansion.

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: MT. SCOTT HALL, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SE	Mount Scott Hall	1st	SEMSI - 1	4	2	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: MT. TABOR HALL, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	9:00 AM	4020	SE	Mount Tabor Hall	SEMT114.SRVR	3	3	3	3	3	4	4	3	2	5	Symmetra LX 16000 RM	920	8	63
3/20/17	7:55 AM	4020	SE	Mount Tabor Hall	SEMTIDF1	3	3	4	4	3	3	3	3	2	3	Smart-UPS RT 5000 RM XL	957	61	31
3/20/17	8:20 AM	4020	SE	Mount Tabor Hall	SEMTIDF2	3	3	3	4	3	3	3	4	2	1	Symmetra LX 8000	2613	615	23
3/20/17	7:20 AM	4020	SE	Mount Tabor Hall	SEMTMDF	3	2	2	4	3	3	3	2	2	3	Smart-UPS X 2000	2466	173	43

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: MT. TABOR HALL, 1ST FLOOR, MDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. UPS load good, unit is approaching 7 years old.
2. Entry Access operable and conforms to PCC Standards.
3. Overhead cable tray capacity excellent – suitable for expansion.
4. Rack management good, excellent room for expansion.
5. Limited room for expansion beyond existing panels on this wall.
6. System ground conforms to PCC standard but connections are not using industry standard lug types.

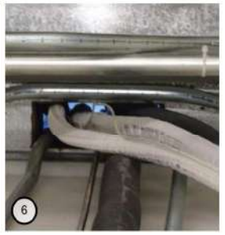
(not shown) No security camera.

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: MT. TABOR HALL, 1ST FLOOR, IDF1

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. UPS load good, unit is approaching 3 years old.
2. & 5 System ground barely conforms to PCC standard; lacks individual connections to required components.
3. & 4 Pathway at wall penetrations not utilizing industry approved methods, fire stop not present.
6. Boxes and storage on floor.

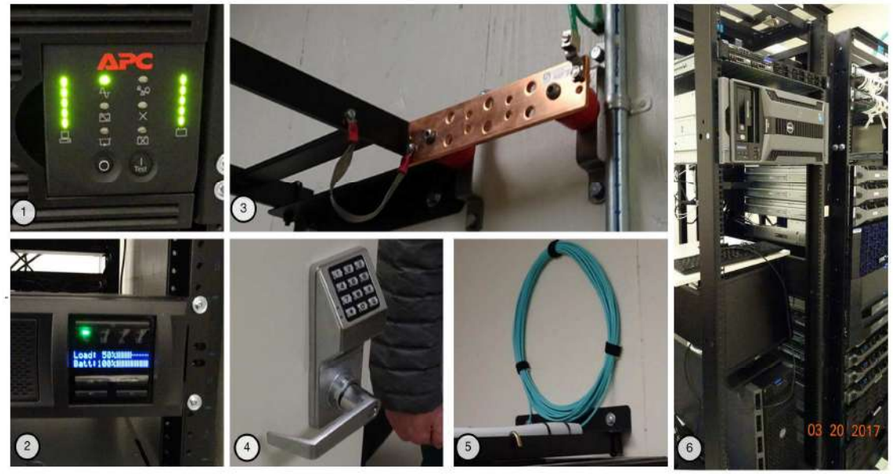
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: MT. TABOR HALL, 1ST FLOOR, IDF2



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. UPS load good, unit is over 7 years old.
2. Good example of service loop for Fiber Optic cable.
3. Typical split system wall mounted unit.
4. Rack management good, good room for expansion.
5. System ground barely conforms to PCC standard; lacks individual connections to required components.
6. Penetration to floor above shared with other services – fire stop not present.

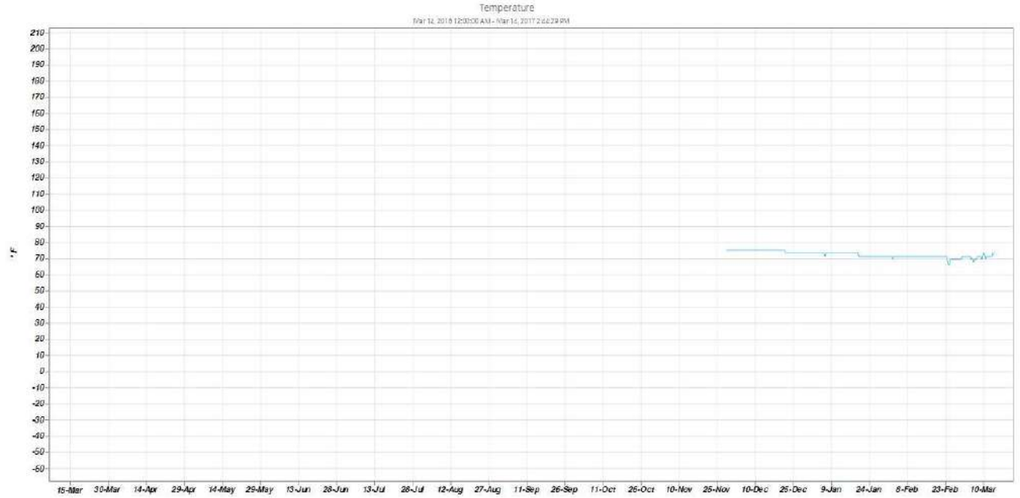
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: MT. TABOR HALL, 1ST FLOOR, SERVER RM 114



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. UPS load higher than recommended – allows no headroom. Unit is approaching 3 years old.
3. System ground barely conforms to PCC standard; lacks individual connections to required components.
4. Entry access secure, but not PCC standard system.
5. Good example of service loop for Fiber Optic cable.
6. Good rack management, good room for expansion.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SOUTHEAST CAMPUS: MT. TABOR HALL, RM 114



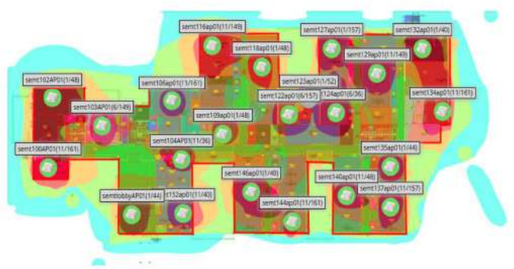
Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
SY	semt114.srvr-ups (172.19.255.207)	Temp	SE MT 114	2:52:18 PM	° F	71.6	98.6	76.4	80.6	Max of 98° shown in table, graph missing data before Dec 2016

LEGEND

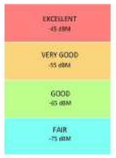
- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: MT. TABOR HALL, 1ST FLOOR

Coverage in 5GHz



Coverage in 2.4GHz

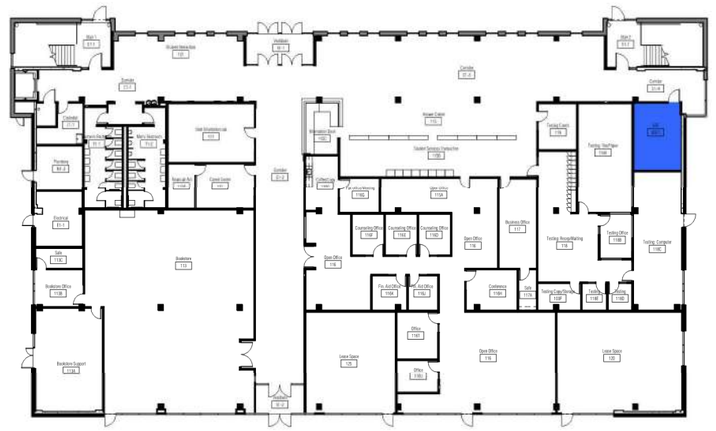


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SE	Mount Tabor Hall	1st	SEMT - 1	2	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

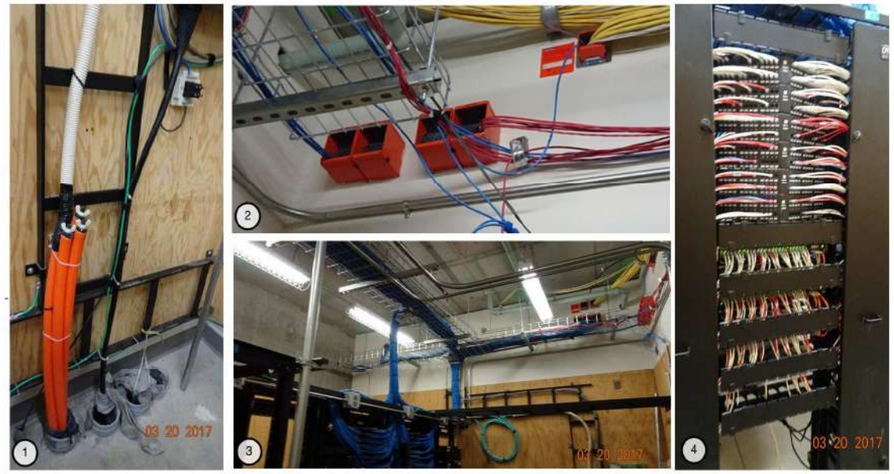
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: STUDENT CENTER, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	9:49 AM	4040	SE	Student Commons	SESCBDF	3	2	2	2	3	3	3	3	2	3	Smart-UPS RT 10000 XL	1329	447	

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: STUDENT CENTER, 1ST FLOOR, BDF

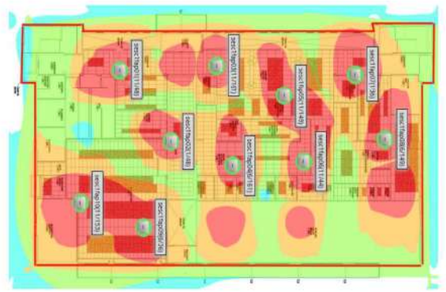


POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

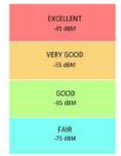
1. Conduit capacity good, but required firestop / sealant is not present.
2. Fire stop systems in place – conforms to PCC standards.
3. Cable tray at good capacity with appropriate room left for expansion.
4. Rack management good, fair room for expansion.

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: STUDENT CENTER, 1ST FLOOR

Coverage in 5GHz



Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SE	Student Commons	1st	SESC - 1	1	1	1	N/A

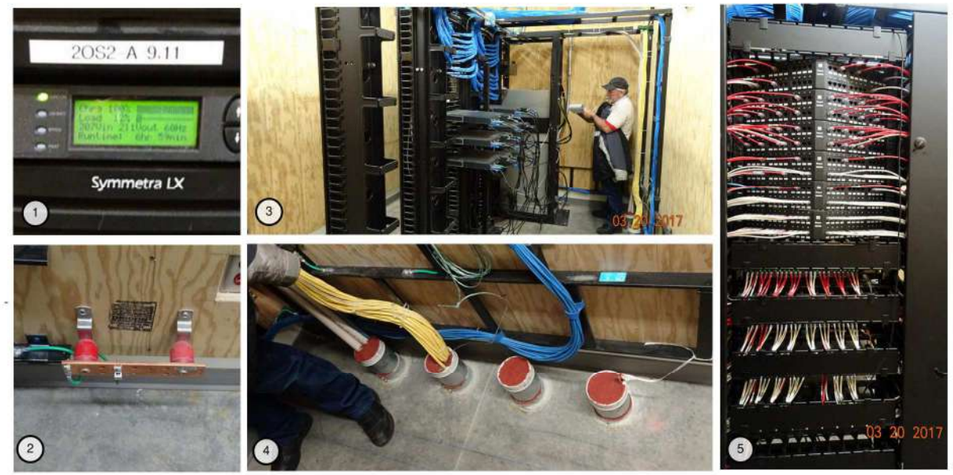
5 BAD	4 POOR	3 FAIR	2 GOOD	1 EXCELLENT

LECOMMUNICATION ASSESSMENT
UTHEAST CAMPUS: STUDENT CENTER, 2ND FLOOR

	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
7	10:05 AM	4040	SE	Student Commons	SESCIDF1	3	2	1	2	3	3	3	3	3	3	Smart-UPS 2200 XL	1315	398	12

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

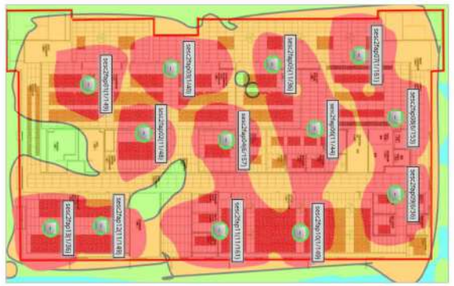
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: STUDENT CENTER, 2ND FLOOR, IDF1



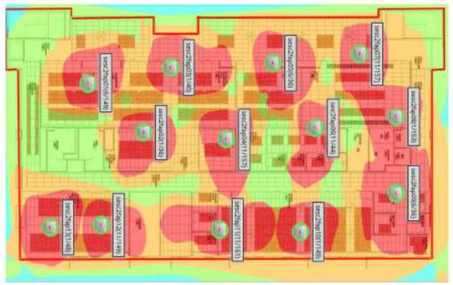
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. UPS load good, unit is close to four years old.
2. System ground barely conforms to PCC standard; lacks individual connections to required components.
3. & 5. Rack management very good, sufficient room for expansion.
4. Conduit capacities excellent with lots of room for expansion. Fire stop method to PCC standard.

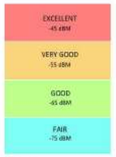
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: STUDENT CENTER, 2ND FLOOR



Coverage in 5GHz



Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SE	Student Commons	2nd	SESC - 2	1	1	1	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: STUDENT CENTER, 3RD FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	10:23 AM	4040	SE	Student Commons	SESCIDF2	3	4	1	2	3	3	3	4	2	3	Symmetra LX 16000 RM	1330	775	6

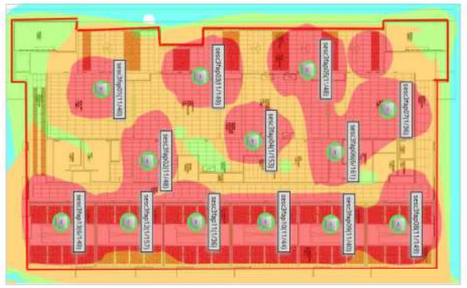
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: STUDENT CENTER, 3RD FLOOR, IDF2

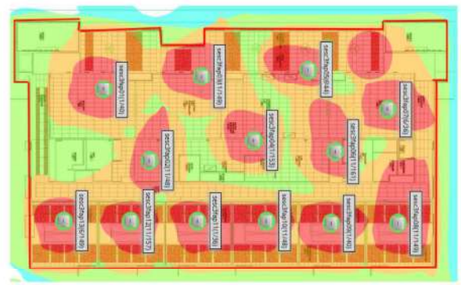
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Rack management very good, sufficient room for expansion.
2. Proximity of data cables to fluorescent light fixture not to standards – should be moved or shielded from EMI.
3. Conduit capacities excellent with lots of room for expansion. Fire stop method to PCC standard.
4. 1 UPS load good, unit is close to three years old.

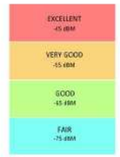
TELECOMMUNICATION ASSESSMENT
SOUTHEAST CAMPUS: STUDENT CENTER, 3RD FLOOR



Coverage in 5GHz



Coverage in 2.4GHz



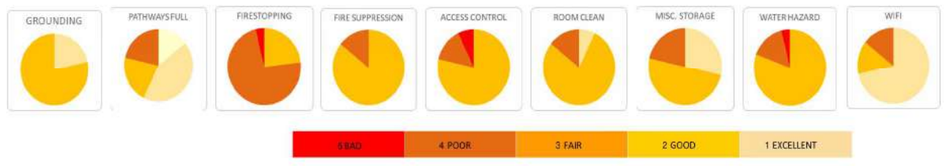
Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SE	Student Commons	3rd	SESC - 3	1	1	1	N/A

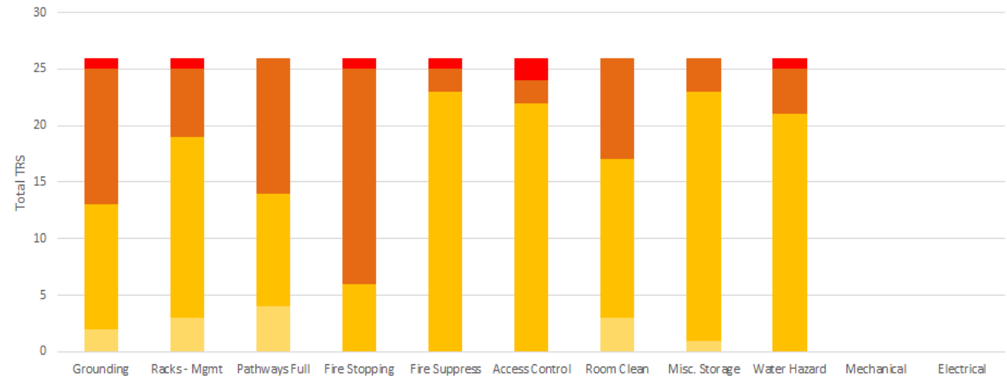
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CAMPUS: SYLVANIA

BREAKDOWN OF TELECOMMUNICATION		
AUTOMOTIVE AND METALS ·IDF BOOKSTORE · BDF COLLEGE CENTER · IDF 1 · IDF 2 · IDF 3 · IDF 4 · MDF COLLEGE SERVICES · BDF · IDF COMM. TECH · BDF · IDF	HEAT PLANT · BDF HEALTH TECHNOLOGIES · BDF · IDF 1 · IDF 2 LIBRARY · BDF · IDF 1 PERFORMING ARTS BLDG. · BDF SMALL CLASSROOM BLDG. · BDF SOCIAL SCIENCE · BDF · IDF 1	SCIENCE AND TECHNOLOGY · BDF · IDF 3 TECHNOLOGY CLASSROOM BLGD · BDF · IDF 1 · IDF 2 · 108



TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: BREAKDOWN



•75% of the buildings on this campus do not employ effective firestop methods entering or exiting the communications spaces. Recommend proper installation of approved firestop materials.

•45% of the conduits and cable trays entering the communications spaces, and the trays located in tunnel areas between buildings, are filled beyond recommended capacity. This allows no expansion and potentially damages cable in the tray due to excess weight. Recommend removing abandoned cabling, or adding parallel pathways for future expansion. The critical entrance conduits can be further evaluated during a campus wide Outside Plant pathway identification and inventory project.

•50% of the buildings have ground bus bars and ground conductors that are out of compliance with NEC codes or PCC Standards. Recommend electrical contractors perform testing on ground systems flagged as "less than compliant" and visually inspect the bonding connections to system ground, and recommend corrective measures.

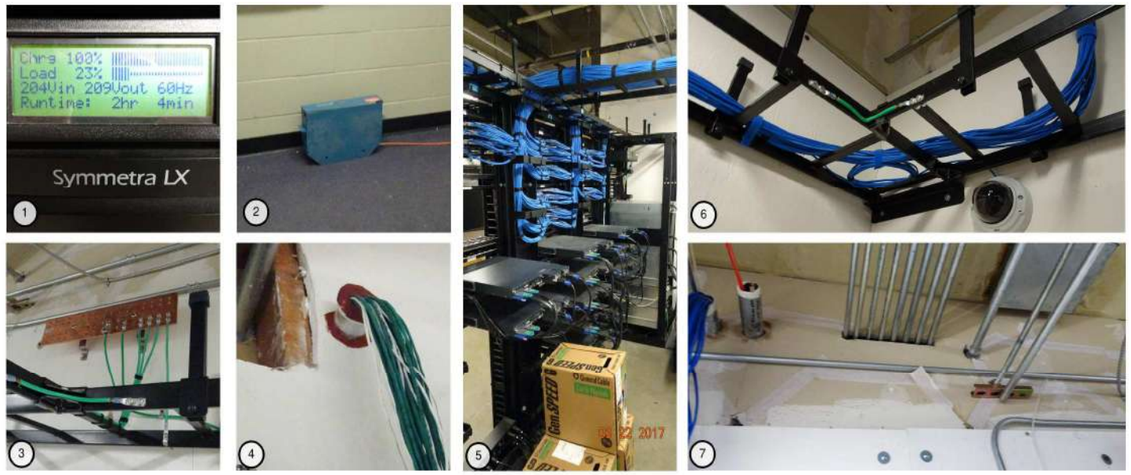
5 BAD, IN URGENT NEED OF REMEDIATION OR REPLACEMENT.	4 POOR CONDITION, SIGNIFICANT DEFICIENCIES RELATIVE TO PCC STANDARDS.	3 FAIR TO AVERAGE, ADEQUATE FOR CURRENT NEEDS. MINOR DEFICIENCIES.	2 GOOD TO VERY GOOD, MAJOR RESPECTS MEET PCC STANDARDS AND CRITERIA.	1 EXCELLENT CONDITION, EXCEEDS PCC AND INDUSTRY STANDARDS.

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: AUTOMOTIVE METALS, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	10:30 AM	1010	SY	Automotive Metals	SYAMBDF	2	3	3	4	3	3	3	3	3	3	Symmetra LX 16000 RM	1651	122	23

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: AUTOMOTIVE METALS, 1ST FLOOR, BDF



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load less than 25% utilization.
2. Fiber Termination box on floor.
3. System ground conforms to PCC standard.
4. Wall opening adjacent to fire stopped conduit needs to be sealed.
5. Rack management good, excellent room for expansion.
6. Overhead cable tray capacity excellent – suitable for expansion.
7. Fire stop materials not present.

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: AUTOMOTIVE METALS, 1ST FLOOR, BDF

ANALYSIS ON POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

8 unrestricted air ducts (no vent or damper) laying on conduits

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: AUTOMOTIVE METALS, 1ST FLOOR

Coverage in 5GHz

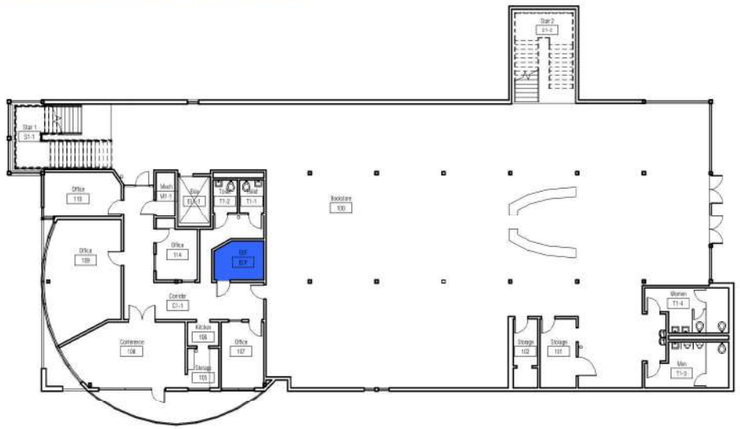
Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Automotive and Metals	1st	SYAM - 1	1	2	3	5ghz coverage better than 2.4

5 BAD	4 POOR	3 FAIR	2 GOOD	1 EXCELLENT

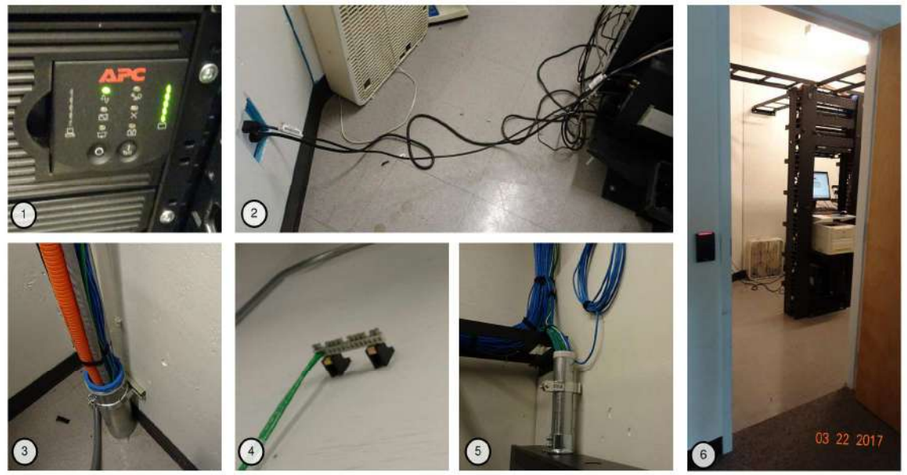
TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: BOOKSTORE, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS utilization %
3/22/17	1:25 PM	1020	SY	Bookstore	SYBKBDF	4	4	4	4	3	3	4	4	3	3	Symmetra LX 16000 RM	1659	195	11

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

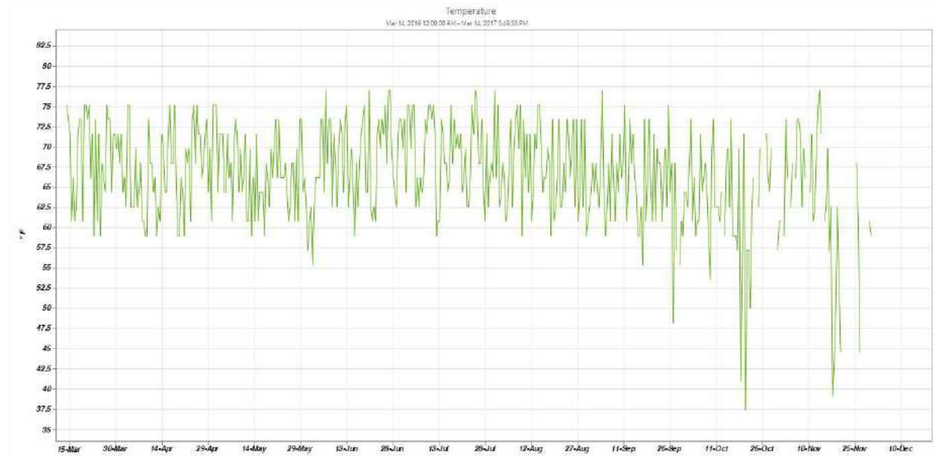
TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: BOOKSTORE, 1ST FLOOR, BDF



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load Less than 17% utilization.
2. Cooling not sufficient in room – fan power cords create trip hazard.
3. Conduits filled beyond recommended capacity – future expansion limited. Firestop missing.
4. Grounding Buss Bar not approved type.
5. Cable not supported in corner.
6. Entry Access control in place.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SYLVANIA CAMPUS: BOOKSTORE, 1ST FLOOR, BDF



Total sensors:1

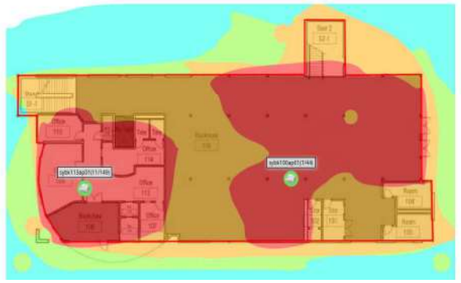
Color	Monitored Device	Sensor	Units	Last Know...	Minimum ...	Maximum ...	Average Va...	Delta Value	Location	Parent Device
☑	sybkbdf-ups (172.16.255.245)	Temperature - Port 1:Sensor 1 (sybkbdf-ups (172.16.255.245))	°F	48.2	32.0	77.0	66.7	45.0	SY BK BDF	SYCCMDFSTXWARE (StruxureWare D...

Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
SY	sybkbdf-ups (172.16.255.245)	Temp	SY BK BDF	2:52:18 PM	°F	32	77	66.8	Unplugged	End of Sept to Dec 2016 - Several low temp events and no current data

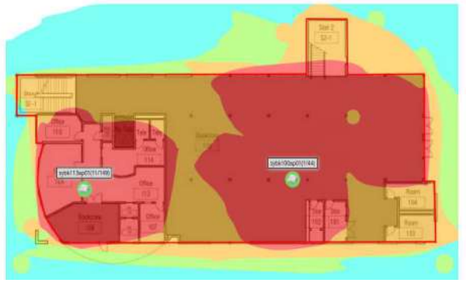
LEGEND

SEVERE TEMP ISSUES
MODERATE TEMP ISSUES
SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: BOOKSTORE, 1ST FLOOR



Coverage in 5GHz



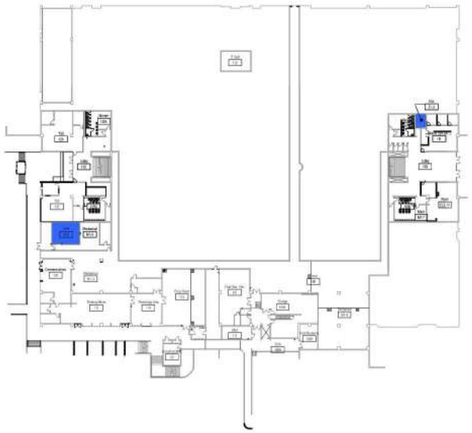
Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Bookstore	1st	SYBK - 1	1	1	3	

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE CENTER, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	M&C Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	9:10 AM	1030	SY	College Center	SYCCIDF1	3	3	3	4	3	3	2	2	3	1	Smart-UPS X 2000	3735	26	44

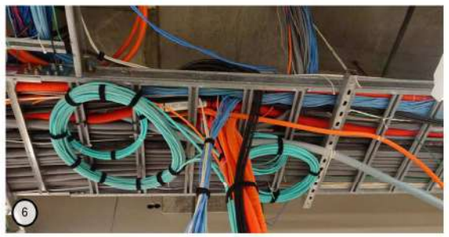
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

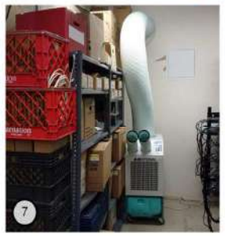
TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE CENTER, 1ST FLOOR, MDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. "Permanent" temporary cooling system in place due to frequent failures.
2. & 3. Rack management good, excellent room for expansion.
4. Filter constricted – in need of maintenance.
5. Cable trays filled beyond capacity.

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE CENTER, 1ST FLOOR, MDF

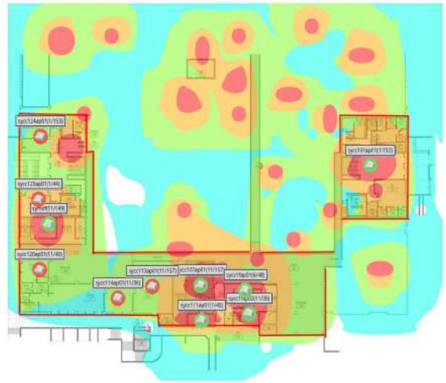




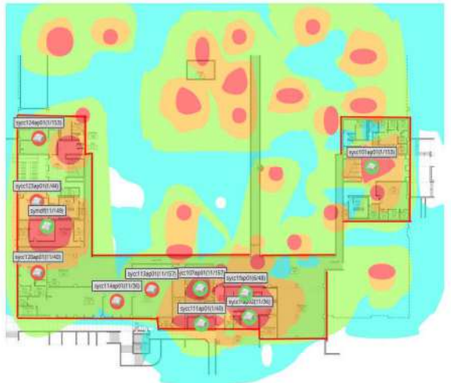
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

6. Cable tray no room for expansion.
7. Storage not stable in the event of an earthquake – potential personal injury
8. Abandoned cables not removed

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE CENTER, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

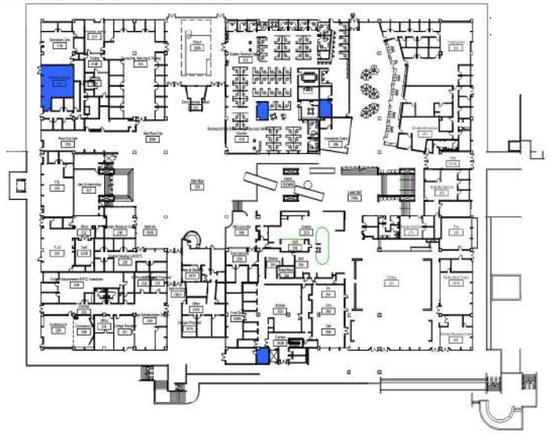
Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	CC	1st	SYCC - 1	3	2	3	

6 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT

SYLVANIA CAMPUS: COLLEGE CENTER, 2ND FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	9:00 AM	1030	SY	College Center	SYCCIDF2	3	3	2	4	3	3	3	3	4	4	Smart-UPS RT 10000 XL	1246	16	15
3/22/17	8:50 AM	1030	SY	College Center	SYCCIDF3	3	3	4	3	3	3	3	3	3	3	Symmetra LX 10000 RM	1180	00	63
3/22/17	12:00 AM	1030	SY	College Center	SYCCIDF4	2	3	2	3	3	3	3	3	4	3	Smart-UPS RT 10000 XL	2338	169	12

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT

SYLVANIA CAMPUS: COLLEGE CENTER, 2ND FLOOR, IDF 1

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

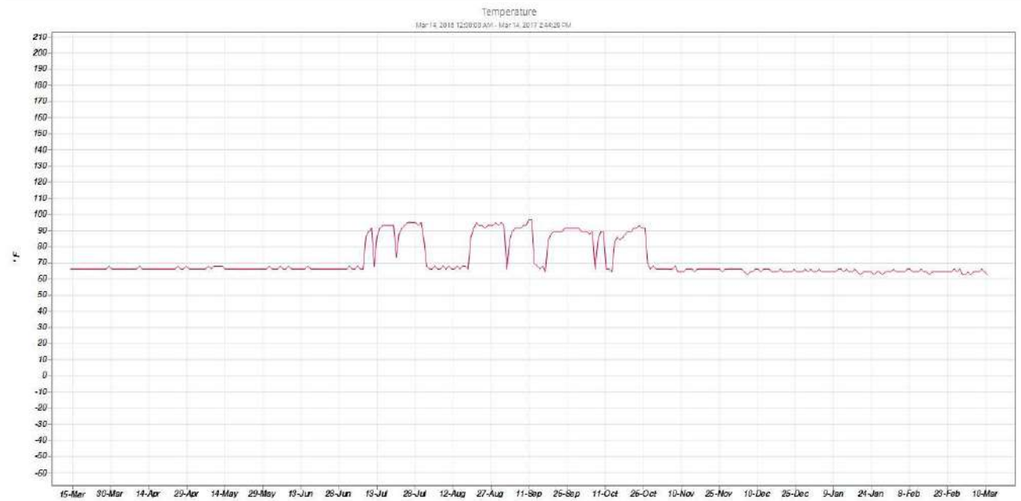
1. System ground barely conforms to PCC standard; lacks individual connections to required components.
2. Airflow restricted due to Split system placement.
3. Firestop materials not present.
4. Clearance behind rack not to PCC Standard.
5. Load less than 50% utilization.

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE CENTER, 2ND FLOOR, IDF 2

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Underfloor cable management good.
2. & 5. & 6. Fire stop materials not present.
3. Load less than 17% utilization.
4. System ground barely conforms to PCC standard; lacks individual connections to required components.
7. Drain pipe in room, water hazard

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SYLVANIA CAMPUS: COLLEGE CENTER, 2ND FLOOR, IDF 2



Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Ave Rge Value	Last known Value	Notes
SY	syccidf2-ups (172.16.255.252)	Temp	SY CC IDF2	2:52:18 PM	° F	62.6	96.8	71.8	66.2	Start of Jul to end of Oct 2016 - Many high temp events over 86°

LEGEND

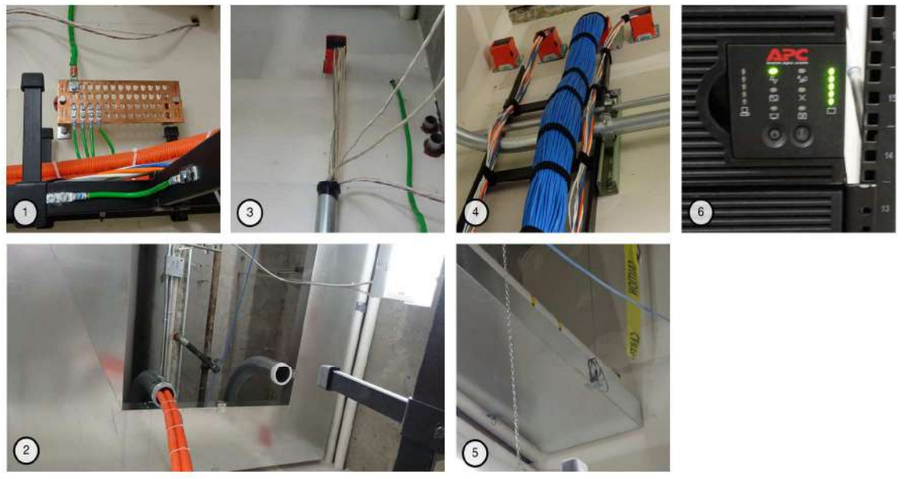
- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE CENTER, 2ND FLOOR, IDF 3

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Electrical J-Box open – code violation.
2. Fire stop assemblies filled – (4" units were specified, but 2" units were installed).
3. Load and Charge good on UPS.
4. System ground barely conforms to PCC standard; lacks individual connections to required components.
5. Fire Life Safety conductors not in continuous conduit.

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE CENTER, 2ND FLOOR, IDF 4



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. System ground conforms to PCC standard.
2. & 5 Perimeter of room has tray – several water pipes in room.
3. Fire stop systems not used – other penetrations lack fire stop materials.
4. Good cable supports and use of fire stop systems.
6. Load and Charge good on UPS.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SYLVANIA CAMPUS: COLLEGE CENTER. 2ND FLOOR. IDF 4

Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
SY	syccidf4-ups (172.16.255.228)	Temp	SY CC IDF4	2:52:18 PM	° F	60.8	86	68.9	66.2	End of Jan 2016 - (1) High temp event over 86°

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE CENTER, 2ND FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	CC	2nd	SYCC - 2	2	2	3	

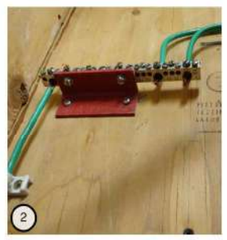
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

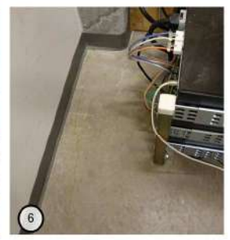
TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE SERVICES, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	10:55 AM	1040	SY	College Services Building	SYCSBDF	4	4	4	4	3	3	3	3	3	1	Symmetra LX 16000 RM	2280	712	12

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE SERVICES, 2ND FLOOR, BDF





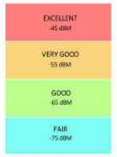
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS.
2. Grounding Buss Bar not approved type.
3. Expansion capacity adequate, good cable management.
4. & 5 Fire stop materials not present.
6. Clearance behind rack not to PCC Standard.

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE SERVICES, 2ND FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

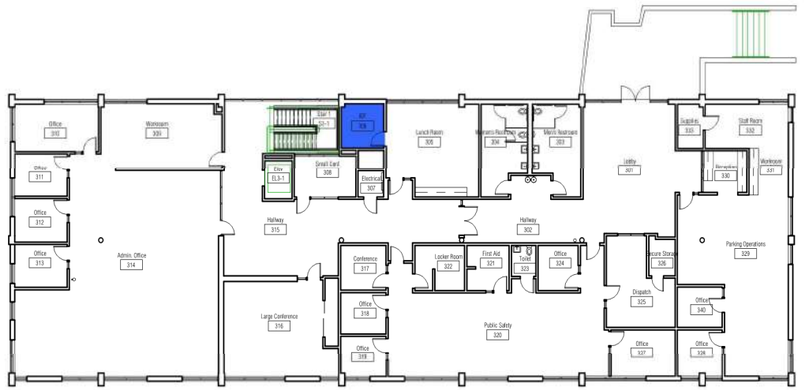


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	CSB	2nd	SYCSB - 2	1	1	3	

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

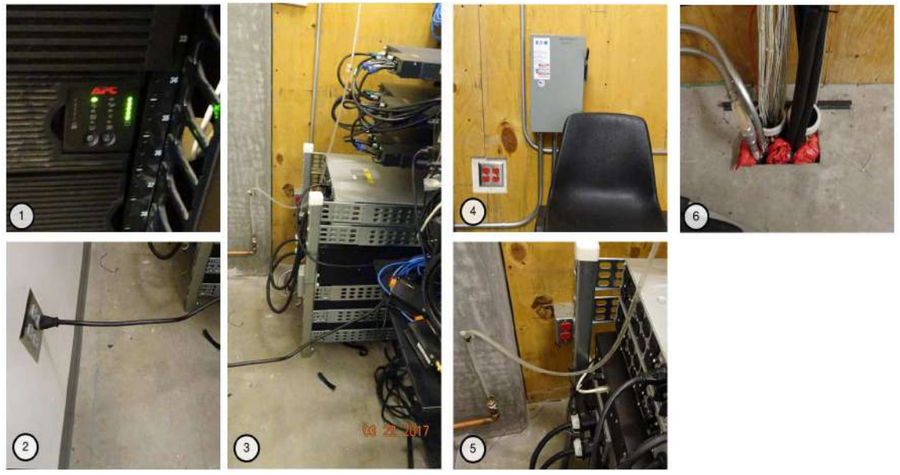
TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE SERVICES, 3RD FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	11:00 AM	1040	SY	College Services Building	SYCSIDF1	3	4	4	4	3	3	3	3	4	1	Symmetra LX 16000 RM	1785	112	11

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE SERVICES, 3RD FLOOR IDF 1



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS.
2. Power cord to equipment is trip hazard - potential for personal injury or equipment outage.
3. & 5 Water condensate (clear tube) run over and around active equipment (Water Hazard).
4. Power disconnect mounted low – easy to get caught on and shut power down.
6. Fire stop in conduits not present.

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COLLEGE SERVICES, 3RD FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Campus Services Building	3rd	SYCSB - 3	1	1	3	5ghz coverage better than 2.4

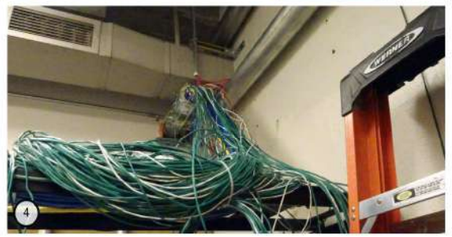
5 BAD	4 POOR	3 FAIR	2 GOOD	1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COMM. TECH, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	1:36 PM	1050	SY	Communication Technology	SYCTBDF	4	3	4	4	3	3	3	3	3	3	Smart-UPS RT 10000 RM XL	1543	54	

BAD | POOR | FAIR | GOOD | EXCELLENT

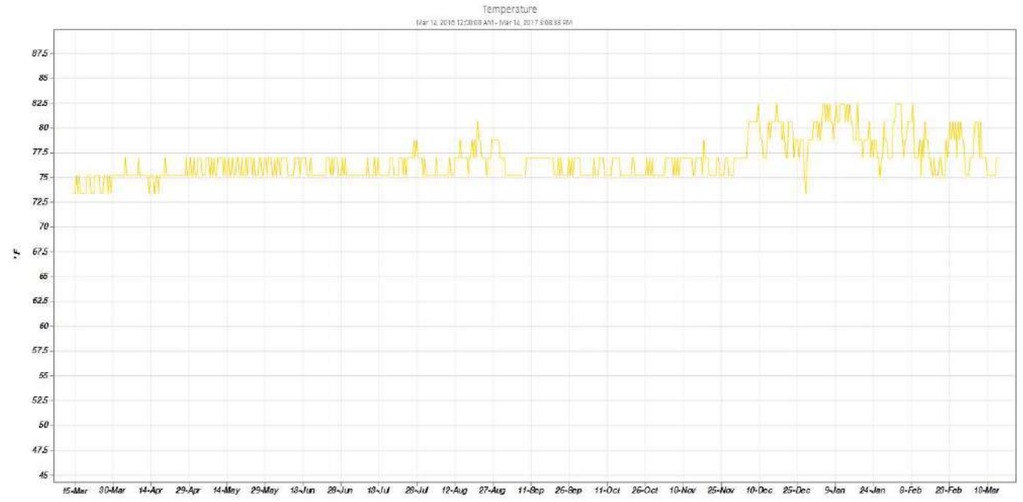
TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COMM.TECH, 1ST FLOOR, BDF



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS.
2. Conduit ground present per standards.
3. & 4 – Cable management poor on basket tray transition to ladder tray.
5. Expansion capacity adequate, good cable management.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SYLVANIA CAMPUS: COMM.TECH, 1ST FLOOR, BDF

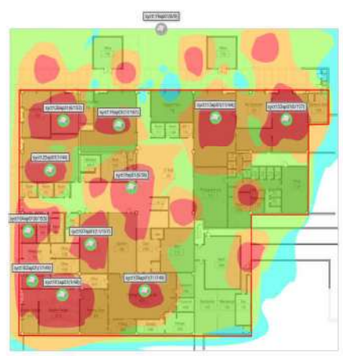


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
SY	syctbdf-ups (172.16.255.247)	Temp	SY CT BDF	2:52:18 PM	° F	73.4	84.2	76.7	78.8	Mid Aug to Mar 2017 - Many moderate temp events over 80°

LEGEND

SEVERE TEMP ISSUES
MODERATE TEMP ISSUES
SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COMM.TECH, 1ST FLOOR



Coverage in 5GHz

Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Communication Technology	1st	SYCT - 1	2	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COMM.TECH, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	12:00 AM	1050	SY	Communication Technology	SYCTIDF1	4	3	4	4	3	3	3	3	3	3		1464		27

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COMM.TECH, 2ND FLOOR, IDF 1

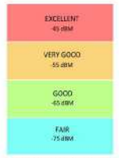
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Conduits filled beyond recommended capacity – future expansion limited.
2. Rack management good, excellent room for expansion.
3. & 6. Conduits filled beyond recommended capacity – future expansion limited.
4. Grounding Buss Bar not approved type.
5. Load and Charge good on UPS.

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: COMM.TECH, 2ND FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

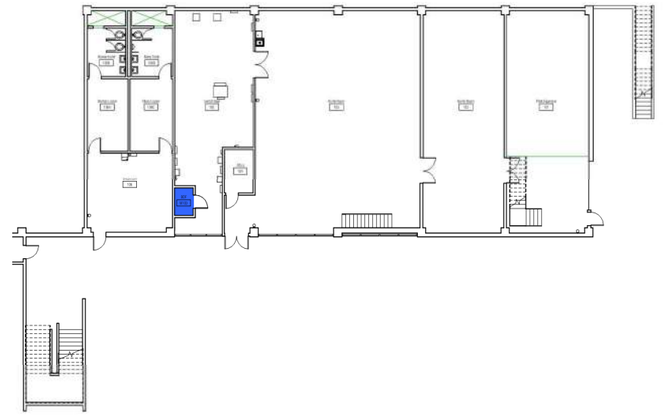


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	CT	2nd	SYCT - 2	2	1	3	

6 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: HEAT PLANT, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	10:45 AM	1060	SY	Heat Plant	SYHPBDF	4	4	4	5	4	4	4	3	3	1	Smart-UPS RT 5000 RM XL	2012	604	8

6 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: HEAT PLANT, 1ST FLOOR, BDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Copper cables not managed or supported properly -cannot access connection points.
2. Spare fiber optics coil not supported and protected, pull box open.
3. & 4. Cable penetrations lack sleeves and fire stop materials.
5. Distance Learning rack in an unsecured, dusty environment – Cabinet contains fiber to the street.
6. Load and Charge good on UPS.
7. Station cable not supported.

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: HEAT PLANT, 1ST FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	W4P Service Life	Comments
SY	HP	1st	SYHP - 1	1	1	3	

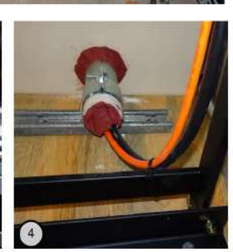
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

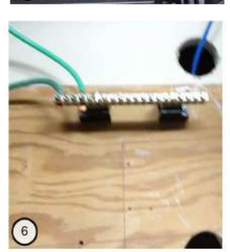
TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: HEALTH TECHNOLOGIES, 1ST FLOOR

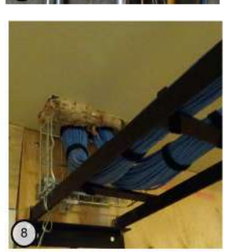
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Rtn Time (min)	UPS Utilization %
3/22/17	2:05 AM	1070	SY	Health Technology	SYHTBDF	4	3	3	4	3	3	4	3	3	3	Smart-UPS RT 10000 RM XL	1866	155	11

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: HEALTH TECHNOLOGIES, 1ST FLOOR, BDF



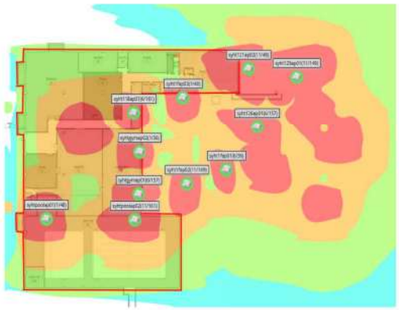




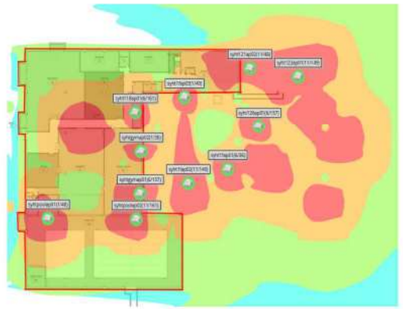
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. & 2 Copper cables not managed or terminated – remove if abandoned.
3. Clearance behind racks not per PCC standards.
4. Penetration firestop and fill ration is good.
5. Load and Charge good on UPS.
6. Grounding Buss Bar not approved type.
7. & 8. Fire stop materials not present or correctly installed.

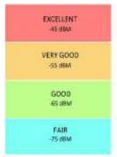
TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: HEALTH TECHNOLOGIES, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

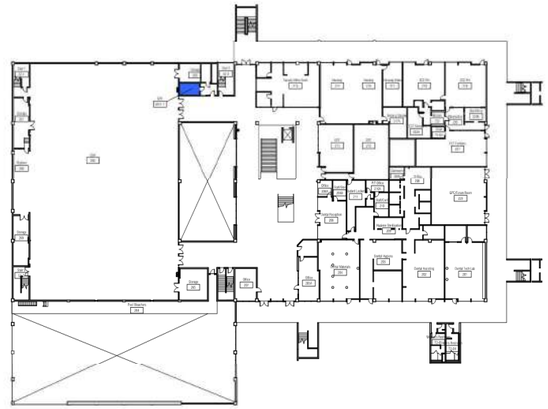


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	W&P Service Life	Comments
SY	Health Technology	1st	SYHT - 1	2	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: HEALTH TECHNOLOGIES, 2ND FLOOR

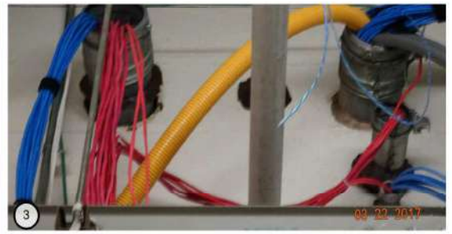


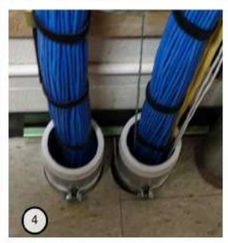
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	2:15 PM	1070	SY	Health Technology	SYHTIDF1	4	4	3	4	4	5	4	3	3	3	Symmetra LX 16000 RM	1866	46	32

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT

SLYVANIA CAMPUS: HEALTH TECHNOLOGIES, 2ND FLOOR, IDF 1



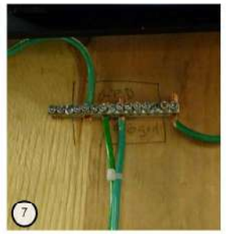


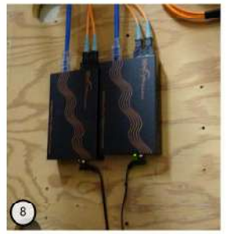
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Access control poor (easy to climb over wall).
2. Clearance behind racks not per PCC standards.
3. & 4. & 6. Conduits filled beyond recommended capacity; required firestop is not present.
5. Load and Charge good on UPS.

TELECOMMUNICATION ASSESSMENT

SYLVANIA CAMPUS: HEALTH TECHNOLOGIES, 2ND FLOOR, IDF 1





POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

7. Grounding Buss Bar not approved type.
8. Fiber optic transceivers are positioned so the power cable can be accidentally pulled out.

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: HEALTH TECHNOLOGIES, 2ND FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

EXCELLENT -45 dBM

VERY GOOD -55 dBM

GOOD -65 dBM

FAIR -75 dBM

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Health Technology	2nd	SYHT - 2	1	1	3	N/A

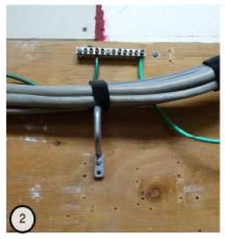
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: HEALTH TECHNOLOGIES, 3RD FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	2:00 PM	1070	SY	Health Technology	SYHTIDF2	4	3	2	4	3	5	4	4	3	4	Smart-UPS RT 10000 XL	1866	22	38

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

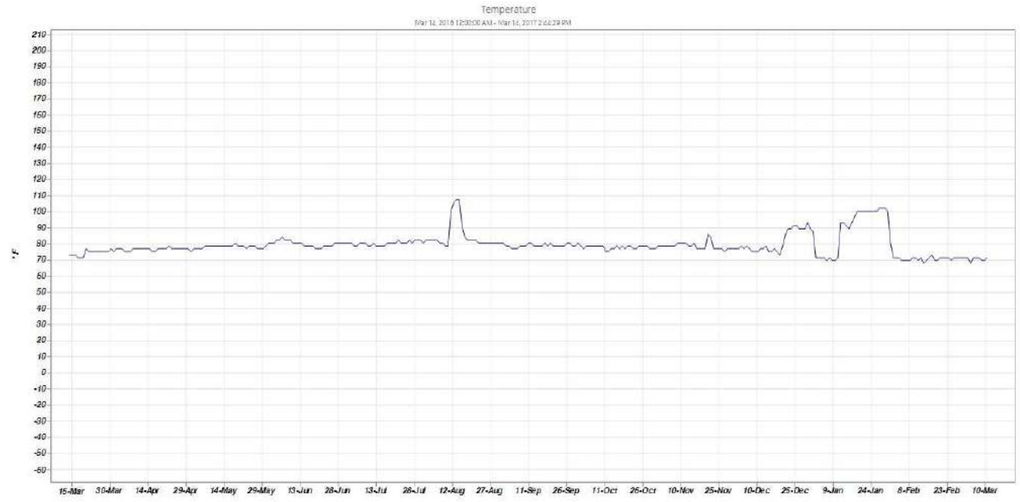
TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: HEALTH TECHNOLOGIES, 3RD FLOOR, IDF 2



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Overhead cable tray capacity excellent – suitable for expansion.
2. Grounding Buss Bar not approved type.
3. UPS indicated bad battery.
4. Incorrect use of Firestop pillows.
5. Conduits filled beyond recommended capacity.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SYLVANIA CAMPUS: COLLEGE CENTER, 3RD FLOOR, IDF 2

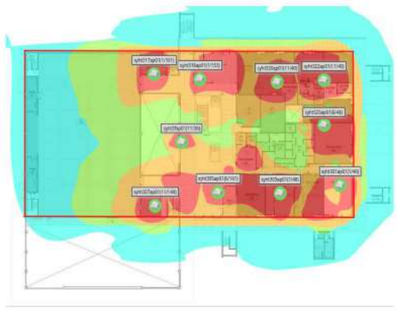


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
SY	syhtidf2-ups (172.16.255.248)	Temp	SY HT IDF2	2:52:18 PM	°F	69.8	108	78.5	77	Mid Aug 2016 to Start of Feb 2017 - Several high temp events over 86°

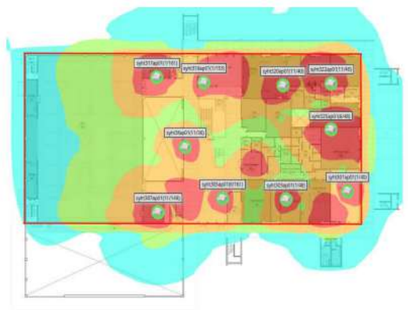
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: HEALTH TECHNOLOGIES, 3RD FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	MAP Service Life	Comments
SY	Health Technology	3rd	SYHT - 3	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: LIBRARY, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	1:08 PM	1080	SY	Library	SYLRCBDF	3	3	4	4	3	3	3	3	3	3	Smart-UPS 2200 XL	1701	266	72
3/22/17	1:00 PM	1080	SY	Library	SYLRCIDF1	3	3	3	4	3	3	3	3	4	3	Smart-UPS RT 10000 XL	1699	388	68

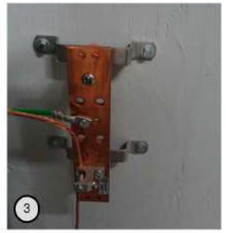
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: LIBRARY, 2ND FLOOR, BDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS.
2. Grounding is fair, but conductor size and lug clamps are incorrect type / size.
3. Conduit capacity fair, but required firestop / sealant is not present.
4. Conduits filled beyond recommended capacity.

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: LIBRARY, 2ND FLOOR, IDF 1



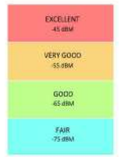
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Power strips (PDUs) for network equipment are not plugged into the UPS .
2. Load and Charge good on UPS.
3. System ground barely conforms to PCC standard; lacks individual connections to required components.
4. Roof penetrations over equipment.
5. & 6. Conduits filled beyond recommended capacity – future expansion limited.
7. Camera placements good.

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: LIBRARY, 2ND FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

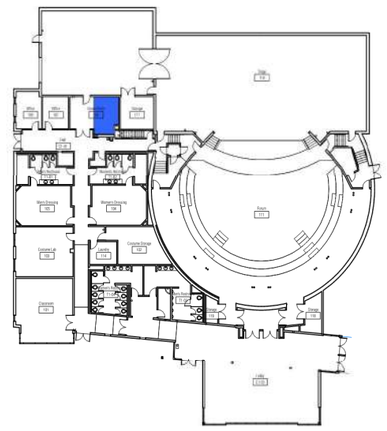


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Library	2nd	SYLIB - 2	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: PERFORMING ARTS BUILDING, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	1:18 PM	1090	SY	Performing Arts Center	SYPACBDF	4	4	3	4	3	3	4	3	3	3	Smart-UPS RT 10000 XL	2475		12

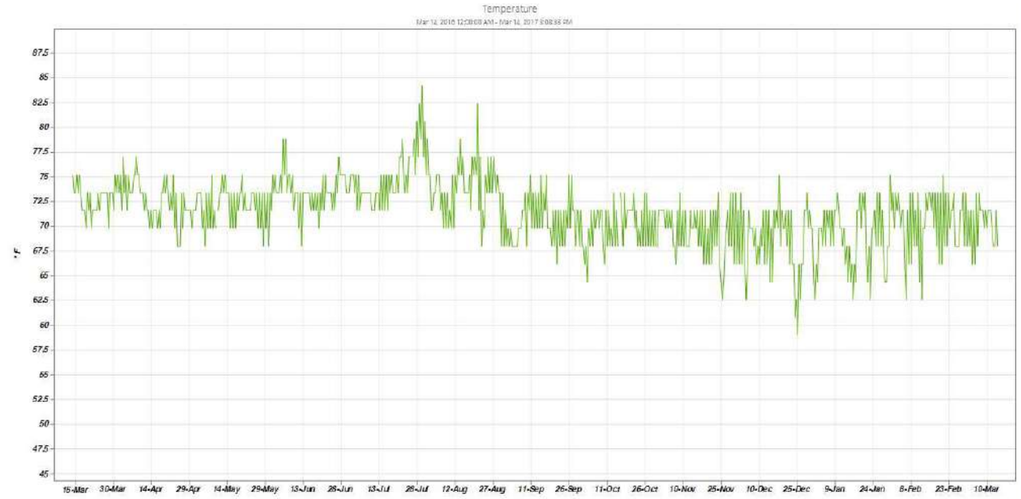
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: PERFORMING ARTS BUILDING, 1ST FLOOR, BDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. & 2. No side cable management at rack.
3. Load and Charge good on UPS.
4. & 5. Fiber optic coils loose on ground, required firestop / sealant is not present.
6. Telecommunications ground wire connected to nothing.
7. Cable management poor – remove abandoned cables.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SYLVANIA CAMPUS: PERFORMING ARTS CENTER, 1ST FLOOR, BDF



Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
SY	sypacbdf-ups (172.16.255.244)	Temp	SY PAC BDF	2:52:18 PM	° F	62.6	84.2	71.6	69.8	End of Jul to end of Aug 2016 - Several moderate temp events over 80°

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: PERFORMING ARTS BUILDING, 1ST FLOOR

Coverage in 5GHz

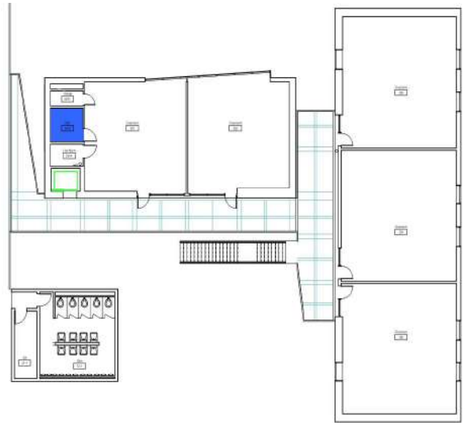
Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Performing Arts Center	1st	SYPAC - 1	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

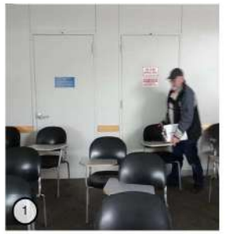
TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: SMALL CLASSROOM BUILDING, 2ND FLOOR

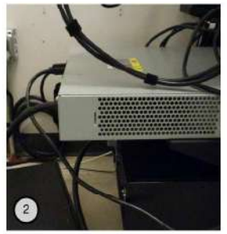


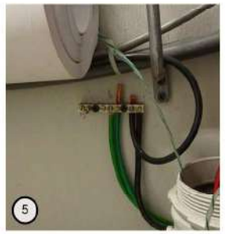
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	1:18 PM	1090	SY	Performing Arts Center	SYPACBDF	4	4	3	4	3	3	4	3	3	3	Smart-UPS RT 10000 XL	2475		12

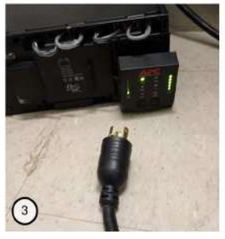
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: SMALL CLASSROOM BUILDING, 2ND FLOOR, BDF







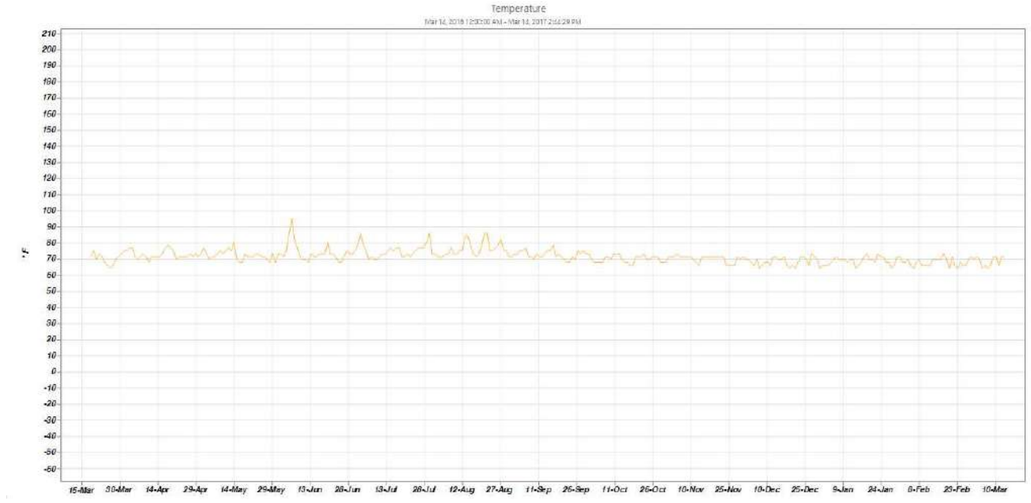


POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. No Access control – door obstructed.
2. & 3. Equipment not mounted – potential damage in the event of an earthquake.
4. Dirt in room – harmful for equipment.
5. Ground conductors are undersized and Grounding Buss Bar not approved type.

Not shown – no cooling in room.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SLYVANIA CAMPUS: SMALL CLASSROOM, 2ND FLOOR, BDF

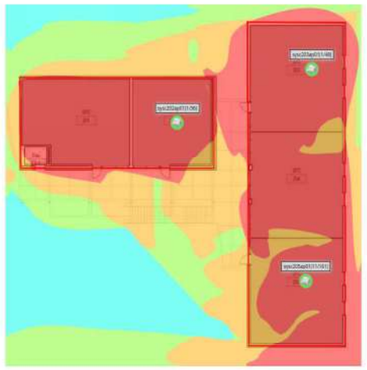


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
SY	syscbdf-ups (172.16.255.233)	Temp	SY SC BDF	2:52:18 PM	°F	64.4	95	71.3	66.2	Start of June to end of Aug 2016 - (5) High temp events over 86°

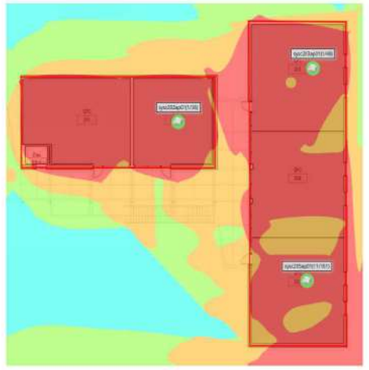
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: SMALL CLASSROOM BUILDING, 2ND FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

EXCELLENT -45 dBM

VERY GOOD -55 dBM

GOOD -65 dBM

FAIR -75 dBM

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	SCB	1st	SYSCB - 1	1	1	3	

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: SOCIAL SCIENCE BLDG, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	MSc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	9:30 AM	1110	SY	Social Sciences	SYSSBDF	3	2	4	3	3	3	2	3	3	3	Symmetra LX 16000 RM	1497	63	25

BAD | POOR | FAIR | GOOD | EXCELLENT

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: SOCIAL SCIENCE, 1ST FLOOR, BDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Rack management good, but little room for expansion.
2. System ground barely conforms to PCC standard; lacks individual connections to required components.
3. Portable AC in case of sys failure.
4. Load and Charge good on UPS.
5. Clearance behind rack not to PCC Standard.
6. Rack management good, excellent room for expansion.

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: STUDENT UNION BUILDING, 1ST FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Social Science and Technology	1st	SYSS - 1	1	1	3	N/A

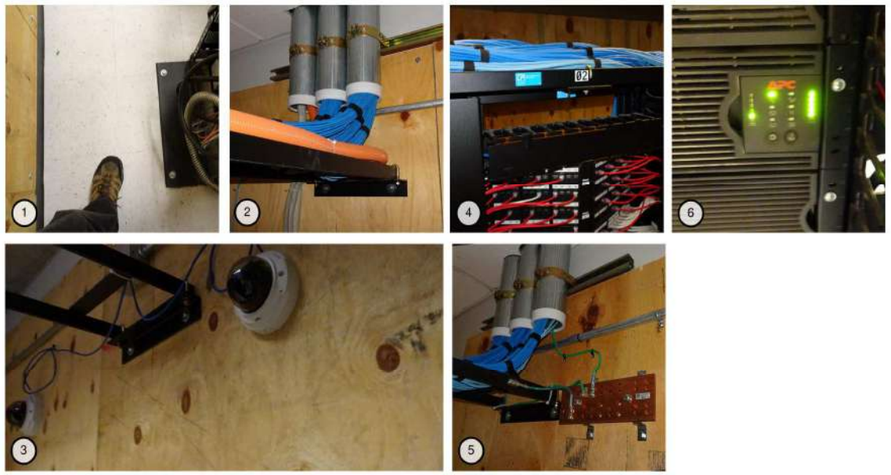
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: SOCIAL SCIENCE BLDG, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	9:42 AM	1110	SY	Social Sciences	SYSSIDF1	3	2	3	3	3	3	2	3	3	3	Symmetra LX 16000 RM	1497	149	23

BAD | POOR | FAIR | GOOD | EXCELLENT

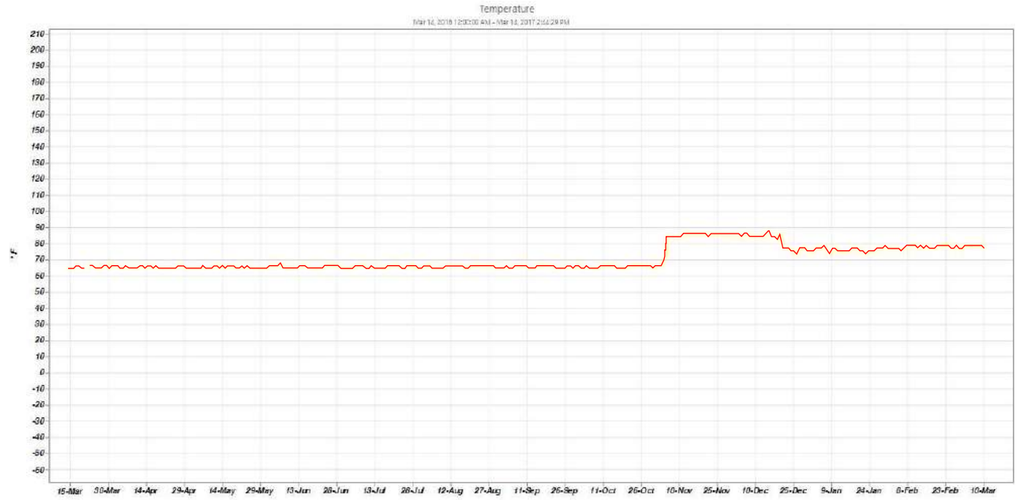
TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: SOCIAL SCIENCE, 2ND FLOOR, IDF 1



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Clearance behind rack not to PCC Standard.
2. Conduits filled beyond recommended capacity – future expansion limited. Required firestop not present.
3. Good camera placements.
4. Expansion capacity adequate, good cable management.
5. System ground conforms to PCC standard.
6. Load and Charge good on UPS.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SYLVANIA CAMPUS: SOCIAL SCIENCE, 2ND FLOOR, IDF 1



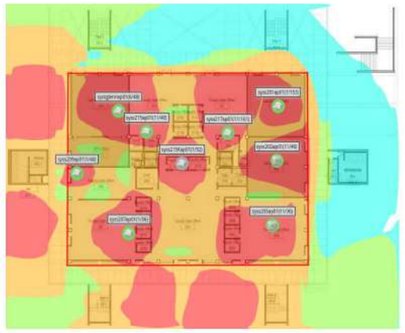
Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Ave Rge Value	Last known Value	Notes
SY	syssidf1-ups (172.16.255.234)	Temp	SY SS IDF1	2:52:18 PM	° F	64.4	87.8	72.6	87.8	Mid Nov to Mid Dec 2016 - Several high temp events over 86°

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: SOCIAL SCIENCE, 2ND FLOOR

Coverage in 5GHz



Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Social Science and Technology	1st	SYSS - 2	1	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT

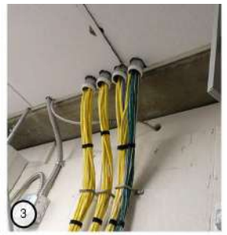
SYLVANIA CAMPUS: SCIENCE AND TECHNOLOGY, 2ND FLOOR

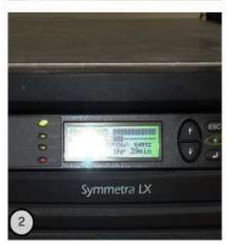
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Rtn Time (min)	UPS Utilization %
3/22/17	9:52 AM	1120	SY	Science Technology	SYSTBDF	3	3	4	4	3	3	4	3	3	4	Smart-UPS 2200 XL	1660	5	30

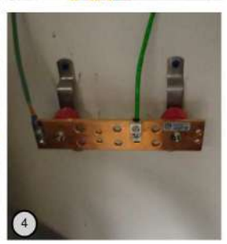
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT

SYLVANIA CAMPUS: SCIENCE AND TECHNOLOGY, 2ND FLOOR, BDF



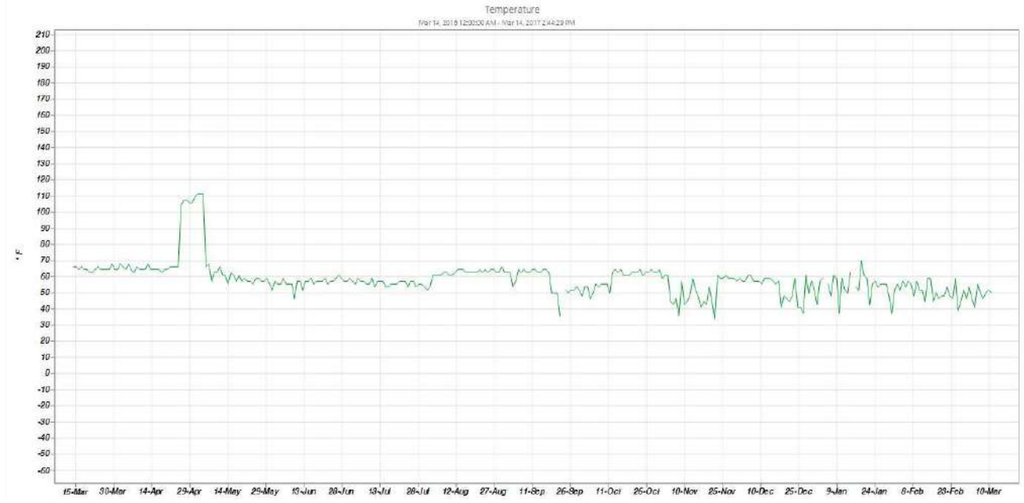




POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Unterminated cables hanging – may be work in progress.
2. Load and Charge good on UPS.
3. Penetrations not sealed.
4. System ground barely conforms to PCC standard; lacks individual connections to required components.
5. Cables above ceiling resting on structure under slab – bend radius not maintained – possible damage.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SYLVANIA CAMPUS: SCIENCE AND TECHNOLOGY, 2ND FLOOR, BDF

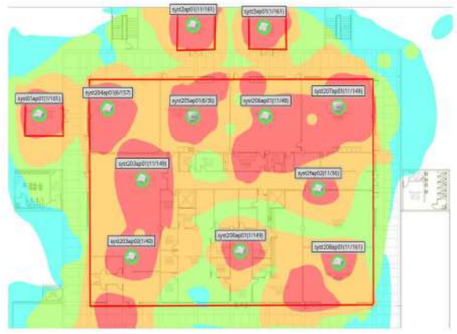


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
SY	systbdf-ups (172.16.255.237)	Temp	SY ST BDF	2:52:18 PM	° F	33.8	113	60.8	60.8	End of Apr to start of May 2016 - Several high temp events over 86°

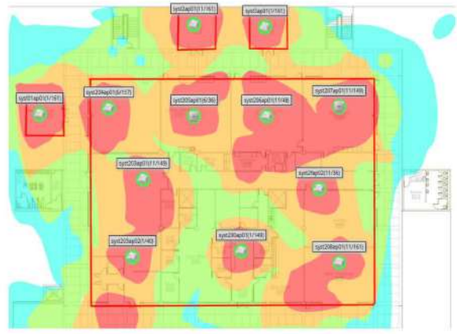
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: SCIENCE AND TECHNOLOGY, 2ND FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

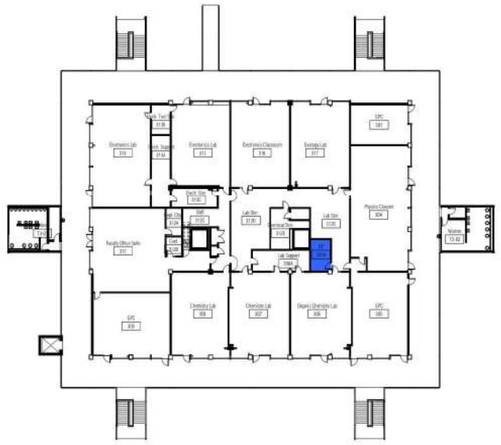
Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Science Technology	2nd	SYST - 2	1	1	3	Some AP-224s here, OK to remain in place

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT

SLYVANIA CAMPUS: SCIENCE AND TECHNOLOGY, 3RD FLOOR

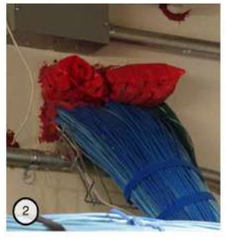


Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	10:06 AM	1120	SY	Science Technology	SYSTIDF3	5	3	4	4	5	3	3	3	5		Smart-UPS RT 3000 XL	1684	237	20

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT

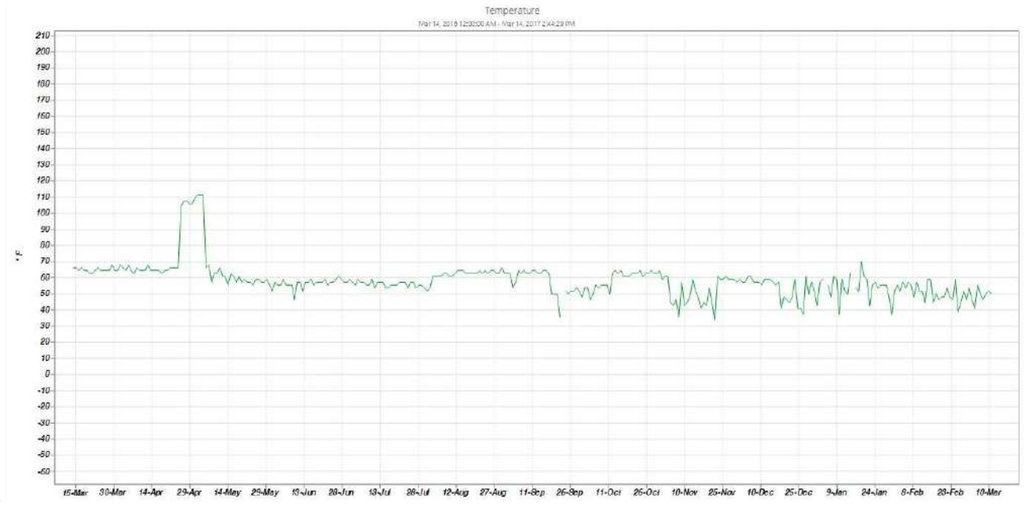
SLYVANIA CAMPUS: SCIENCE AND TECHNOLOGY, 3RD FLOOR, IDF 3



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Rack management good, excellent room for expansion
2. Correct application of Fire stop pillows
3. Clearance behind rack not to PCC Standard
4. Load and Charge good on UPS
5. Sprinkler head too close to electrical box and device wiring
6. Roof drains over equipment
7. Loose cables on floor – trip hazard

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SLYVANIA CAMPUS: SCIENCE AND TECHNOLOGY, 2ND FLOOR, IDF 3

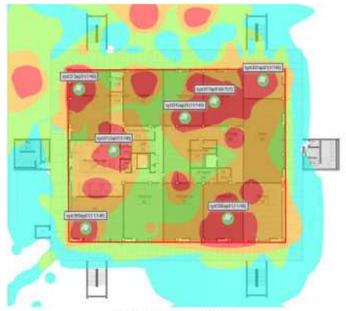


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Ave Bgn Value	Last known Value	Notes
SY	systidf3-ups (172.16.255.236)	Temp	SY ST IDF3	2:52:18 PM	° F	69.8	91.4	78.4	71.6	Mid Apr to mid Nov 2016 - Many high temp events over 86°

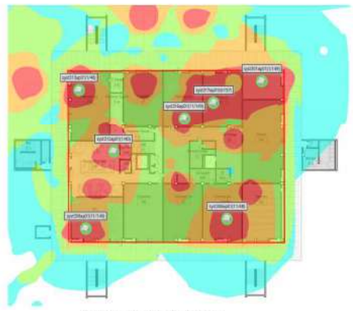
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SLYVANIA CAMPUS: SCIENCE AND TECHNOLOGY, 3RD FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Science Technology	3rd	SYST - 3	2	2	3	N/A

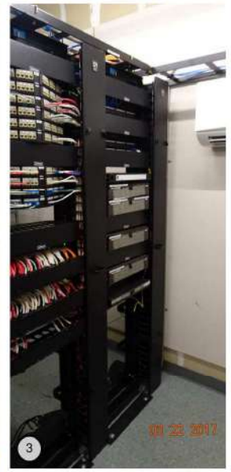
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY CLASSROOM, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	12:42 PM	1130	SY	Technology Classroom Building	SYTCBDF	3	2	3	4	3	3	3	3	3	3	Smart-UPS RT 10000 XL	1497	162	17
3/22/17	12:00 AM	1130	SY	Technology Classroom Building	SYTC108 / utl	INFORMATION NOT AVAILABLE										Smart-UPS RT 10000 XL	1214	124	10

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

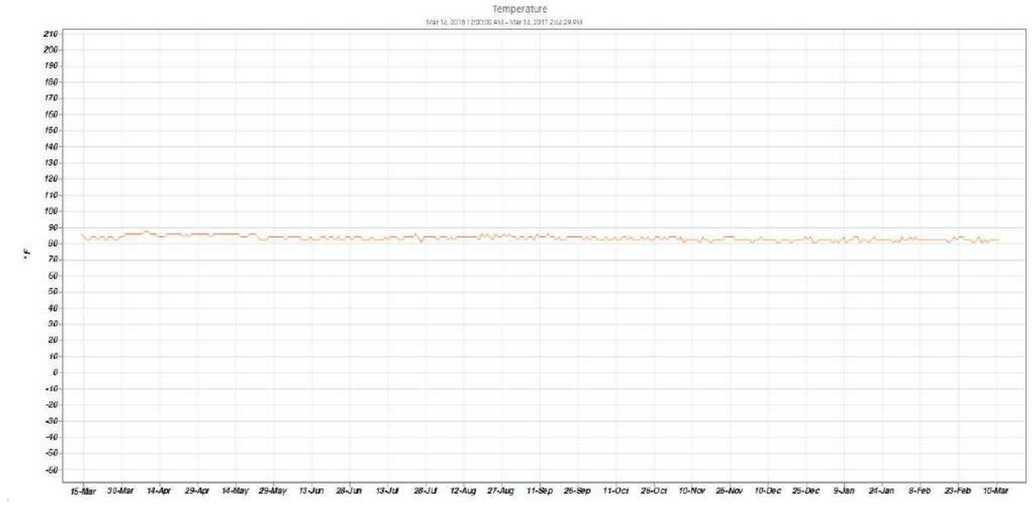
TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY CLASSROOM, 1ST FLOOR BDF



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. System ground conforms to PCC standard.
2. Chiller lines, condensate tube, electrical flex sharing same conduit – code violation. Incorrect use of Firestop pillows.
3. Expansion capacity adequate, good cable management.
4. Load and Charge good on UPS.
5. Sleeves and fire stop materials not present.

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY CLASSROOM, 1ST FLOOR, RM 108

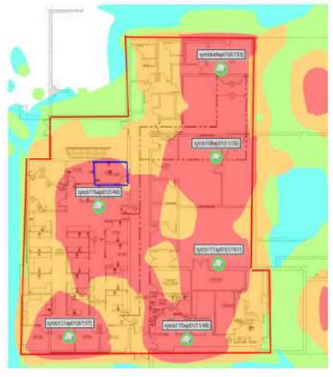


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Vlue	Notes
SY	sytc108-ups (172.16.255.240)	Temp	SY TC 108	2:52:18 PM	° F	80.6	87.8	83.5	82.4	All of 2016 - Many high temp events over 86°

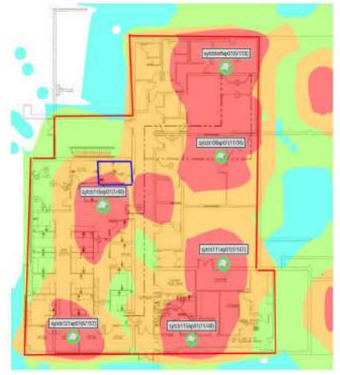
LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY CLASSROOM, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Technology Classroom Building	1st	SYTCB - 1	1	2	3	5ghz coverage better than 2.4

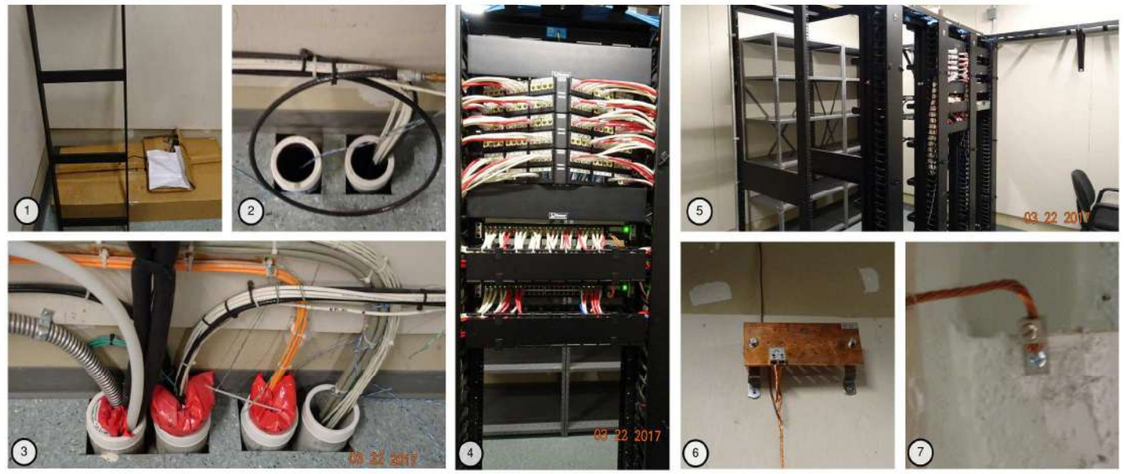
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY CLASSROOM, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	12:00 AM	1130	SY	Technology Classroom Building	SYTCIDF1	4	3	2	4	3	3	3	3	3	3	Symmetra LX 16000 RM	1491	314	72

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY CLASSROOM, 2ND FLOOR, IDF 1



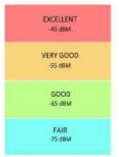
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Ladder tray leaning up – potential personal injury or equipment damage in the event of an earthquake.
2. & 3. Fire stop or sealant materials not present.
4. & 5. Rack management good, excellent room for expansion.
6. System ground lacks individual connections to required components.
7. Bond to building steel not approved method.

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY EDUCATION BUILDING, 2ND FLOOR

Coverage in 5GHz

Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Technology Classroom Building	2nd	SYTCB - 2	2	2	3	5ghz coverage better than 2.4

6 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY CLASSROOM, 3RD FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	12:00 AM	1130	SY	Technology Classroom Building	SYTCIDF2	4	3	3	3	3	3	3	3	3	3	Symmetra LX 16000 RM	1497	43	23

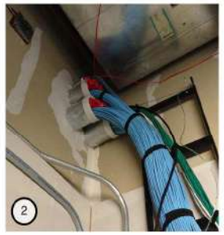
6 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY CLASSROOM, 3RD FLOOR, IDF 2

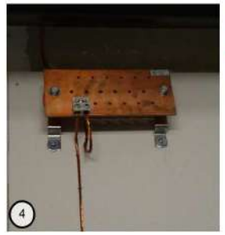
1

3

5



2



4

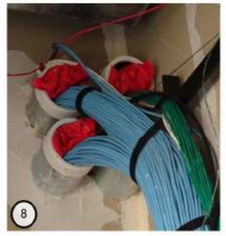
6

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS
2 Incorrect use of Firestop pillows
3 Cable tray loading exceeds recommended capacity – Cables and fiber routed under tray not supported
4 & 5 System ground lacks individual connections to required components
6. Firestop not properly placed in conduits or around floor penetration

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY CLASSROOM, 3RD FLOOR, IDF 2

7

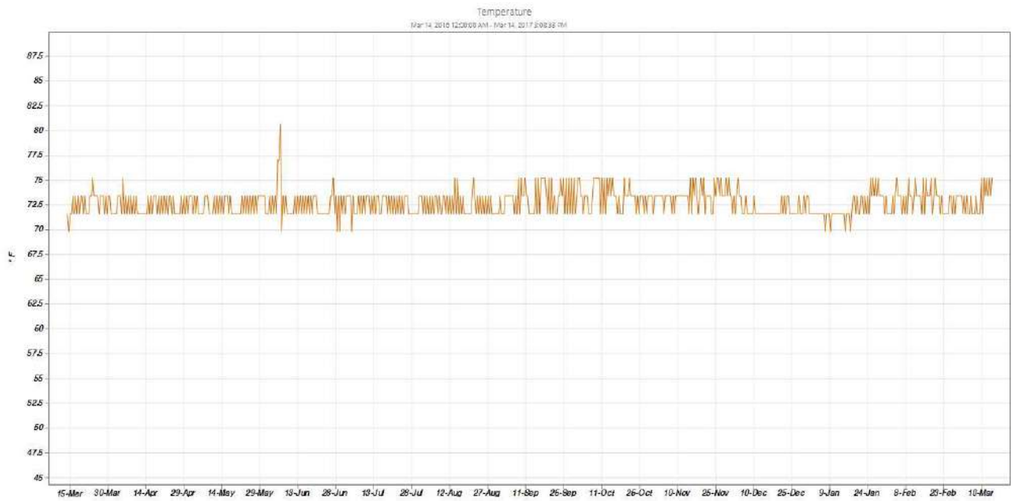


8

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

7. & 8. Fire stop not properly placed in conduits or around floor penetration

TELECOMMUNICATION TEMPERATURE ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY CLASSROOM, 3RD FLOOR, IDF 2



Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
SY	sytcidf2-ups (172.16.255.238)	Temp	SY TC IDF2	2:52:18 PM	°F	69.8	82.4	72.5	71.6	Start of Jun 2016 - 1 moderate temp event over 80°

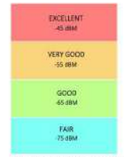
LEGEND

SEVERE TEMP ISSUES
MODERATE TEMP ISSUES
SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
SYLVANIA CAMPUS: TECHNOLOGY CLASSROOM, 3RD FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

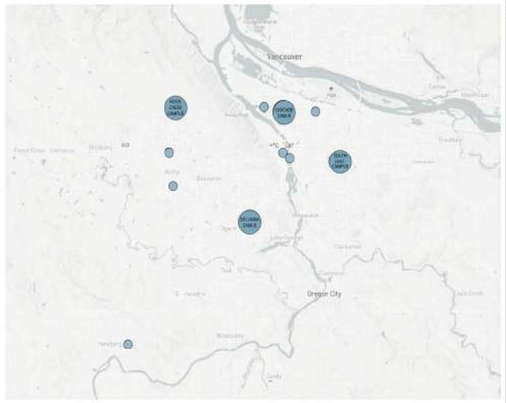


Good coverage does not necessarily constitute adequate capacity.

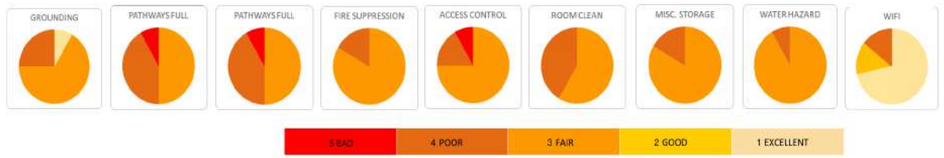
Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
SY	Technology Classroom Building	3rd	SYTCB - 3	2	2	3	5ghz coverage better than 2.4

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

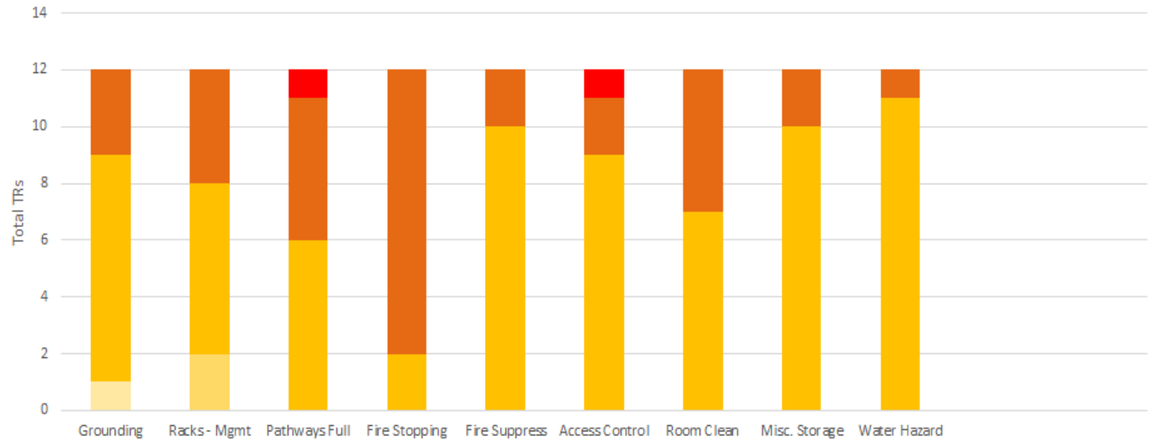
TELECOMMUNICATION ASSESSMENT
SATELLITE CAMPUSES



BREAKDOWN OF TELECOMMUNICATION		
CAPITAL PARK CAMPUS ·MDF CENTRAL DISTRIBUTION ·MDF CLIMB CENTER ·MDF DOWNTOWN CENTER ·IDF HILLSBORO CENTER ·MDF NEWBERG CENTER ·BDF PORTLAND METRO CENTER ·MDF ·BDF	WILLOW CREEK ·MDF SWAN ISLAND ·IDF 1 ·IDF 2	



TELECOMMUNICATION ASSESSMENT
SATELLITE CAMPUS: BREAKDOWN



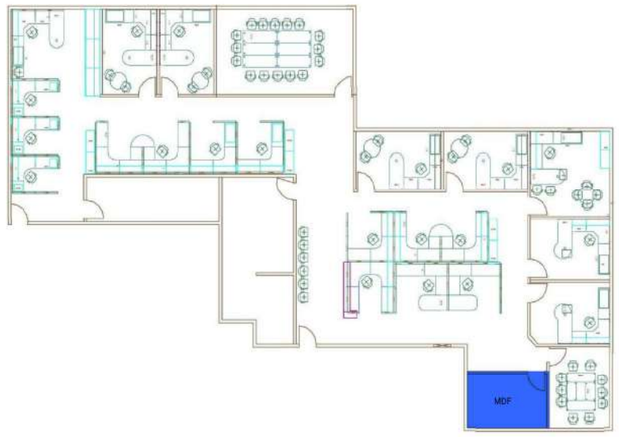
•80% of the buildings on this campus do not employ effective firestop methods entering or exiting the communications spaces. Recommend proper installation of approved firestop materials.

•50% of the conduits and cable trays entering the communications spaces, are filled beyond recommended capacity. This allows no expansion and potentially damages cable in the tray due to excess weight. Recommend removing abandoned cabling, or adding parallel pathways for future expansion. The critical entrance conduits can be further evaluated during a campus wide Outside Plant pathway identification and inventory project.

40% of the rooms have dust, debris, and other miscellaneous dirt in them. Recommend cleaning rooms and identifying sources of dirt etc.

5 BAD. IN URGENT NEED OF REMEDIATION OR REPLACEMENT.	4 POOR CONDITION. SIGNIFICANT DEFICIENCIES RELATIVE TO PCC STANDARDS.	3 FAIR TO AVERAGE. ADEQUATE FOR CURRENT NEEDS. MINOR DEFICIENCIES.	2 GOOD TO VERY GOOD. MAJOR RESPECTS MEET PCC STANDARDS AND CRITERIA.	1 EXCELLENT CONDITION. EXCEEDS PCC AND INDUSTRY STANDARDS.

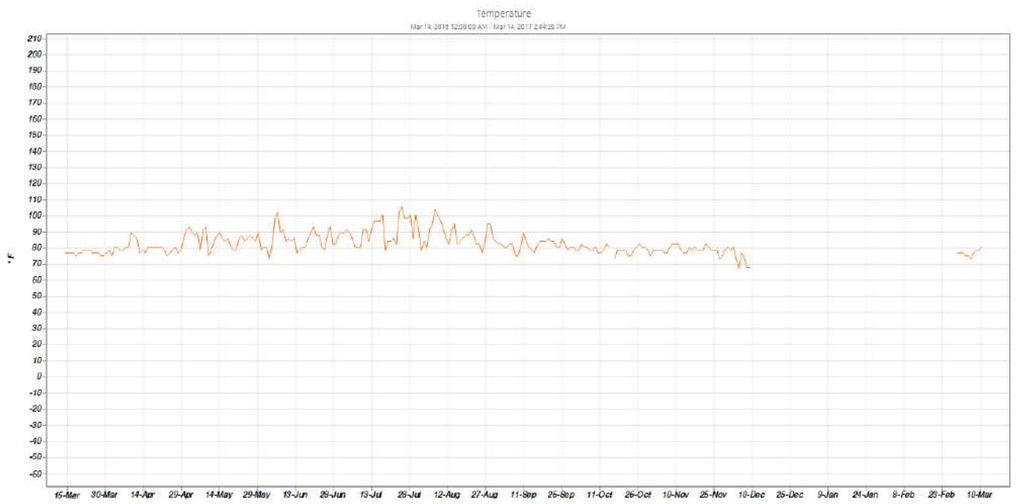
TELECOMMUNICATION ASSESSMENT
CAPITAL PARK: CAPITAL PARK, 2ND FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	Electrical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
1/0/00	12:00 AM	0	CP	0	CPMDF	INFORMATION NOT AVAILABLE											Smart-UPS RT 10000 XL	Unplugged	3	54

5 BAD	4 POOR	3 FAIR	2 GOOD	1 EXCELLENT

TELECOMMUNICATION TEMPERATURE ASSESSMENT
CAPITAL PARK: CAPITAL PARK, MDF

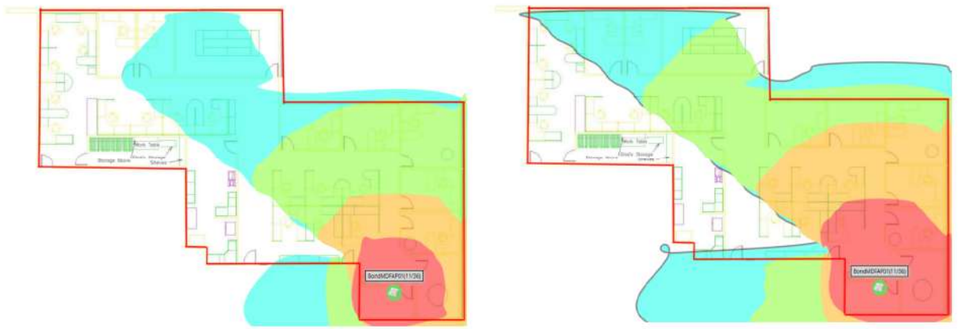


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last Known Value	Notes
RC	cpmdf-ups (172.23.63.240)	Temp	Capitol Park	2:52:18 PM	°F	62.6	106	81.4	77	Start of Apr to Oct 2016 - Many days of high temp events over 86°

LEGEND

SEVERE TEMP ISSUES
MODERATE TEMP ISSUES
SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
CAPITAL PARK CAMPUS: CAPITAL PARK, 1ST FLOOR

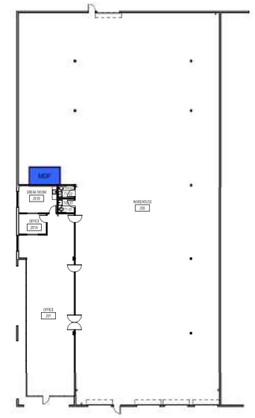


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CP (Capitol Park)	Building 1	2nd	CBB1 - 1	5	4	3	Only 1 AP, bad coverage

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
CENTRAL DISTRIBUTION: CENTRAL DISTRIBUTION, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/22/17	7:00 AM	6010	CD	Central Distribution Services Building	CDMDF	4	3	3	4	4	5	4	4	3	3	Symmetra LX 16000 RM	2279	209	35

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

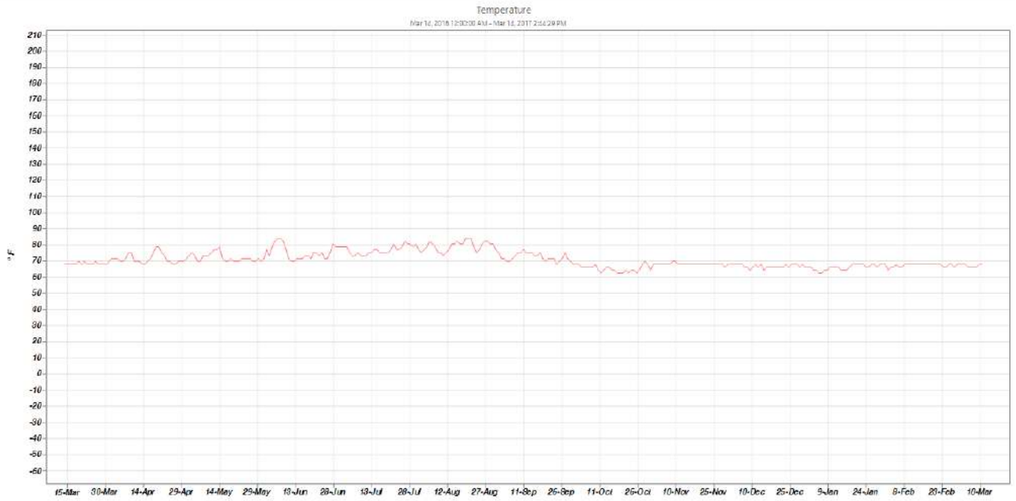
TELECOMMUNICATION ASSESSMENT
CENTRAL DISTRIBUTION: CENTRAL DISTRIBUTION, 1ST FLOOR, MDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. No access control or security for equipment. Cable management & expansion good. Drains and valves present in room - water danger.
2. Grounding Buss Bar not approved type
3. & 1 Clearance at rack for workspace limited – easy to bump into equipment or cables
4. Ladder and adjacent objects could fall and damage equipment during earthquake.
5. Load and Charge good on UPS

Not shown – Drywall dust and dirt adjacent to equipment

TELECOMMUNICATION TEMPERATURE ASSESSMENT
CENTRAL DISTRIBUTION: CENTRAL DISTRIBUTION, MDF TEMPERATURE

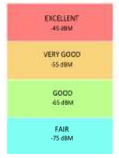


Campus	Building	Room	Location	Time	Units	Min Value	Max Value	Average Value	Last known Value	Notes
RC	cdmdf-ups (172.23.191.242)	Temp	CD MDF	2:52:18 PM	* F	60.8	86	70.7	66.2	Start of June and Mid Aug 2016 - Several days of high temp events over 86*

LEGEND

- SEVERE TEMP ISSUES
- MODERATE TEMP ISSUES
- SPECIAL CONSIDERATION

TELECOMMUNICATION ASSESSMENT
CENTRAL DISTRIBUTION CAMPUS: CENTRAL DISTRIBUTION, 1ST FLOOR



Good coverage does not necessarily constitute adequate capacity.

Coverage in 5GHz

Coverage in 2.4GHz

TELECOMMUNICATION ASSESSMENT
CLIMB CENTER: CLIMB CENTER, 2ND FLOOR

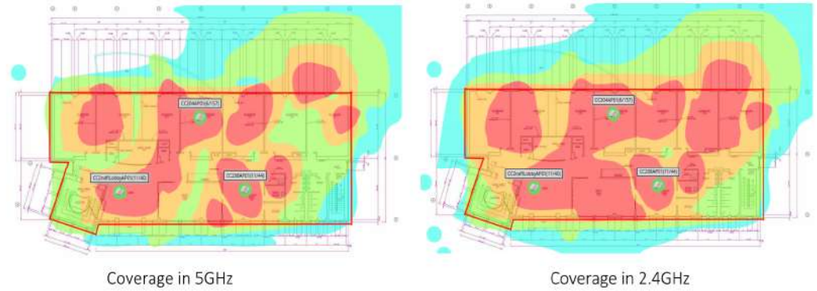
Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	2:33 PM	0	CC	0	CCMDF	3	3	4	4	3	3	3	3	3	3	Symmetra 20K	2265		70

TELECOMMUNICATION ASSESSMENT
CLIMB CENTER: CLIMB CENTER, 2ND FLOOR, MDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. System ground barely conforms to PCC standard; lacks individual connections to required components.
2. & 5 Rack management good. excellent room for expansion.
3. Load approaching recommended headroom on UPS.
4. Cable support poor.

TELECOMMUNICATION ASSESSMENT
CLIMB CENTER: CLIMB CENTER, 2ND FLOOR



Coverage in 5GHz

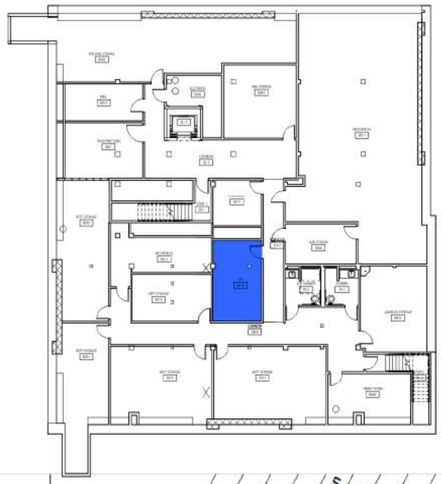
Coverage in 2.4GHz

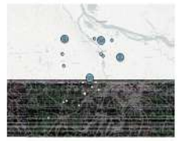
Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
CLIMB	Building 1	2nd	CLIMB - 2	1	2	3	Planned APs shown

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
DOWNTOWN CENTER: DOWNTOWN CENTER, BASEMENT

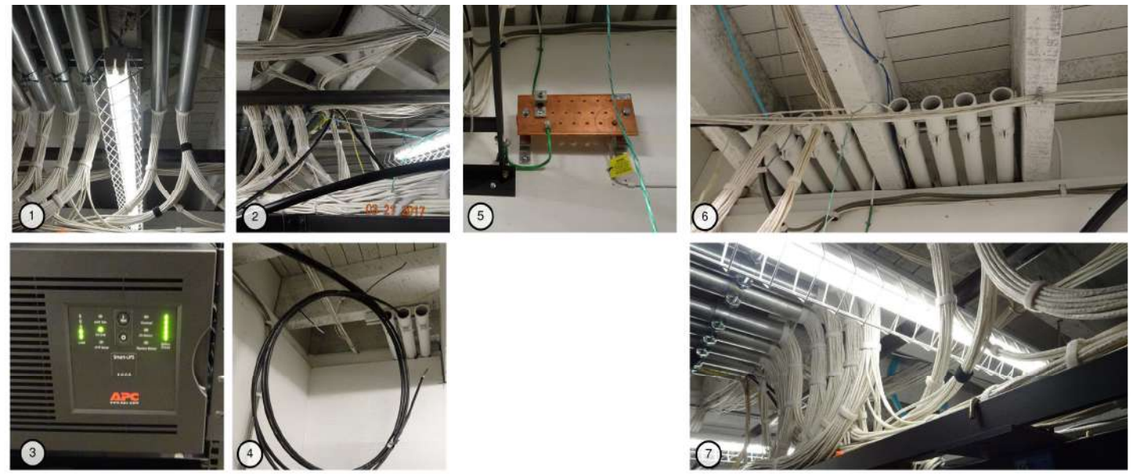




Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	7:37 AM	5200	DC	Downtown Center	DCIDF1	3	4	4	4	3	3	3	3	3	1	Smart-UPS RT 5000 RM XL	573	35	40

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

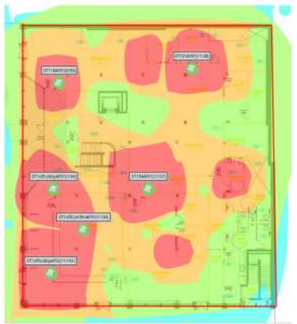
TELECOMMUNICATION ASSESSMENT
DOWNTOWN CENTER: DOWNTOWN CENTER, BASEMENT, IDF



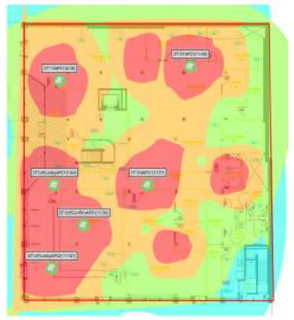
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. & 2, & 7 – Data cables too close to light fixtures – Electro-magnetic interference may introduce errors.
3 Load and Charge good on UPS.
4. Loose unterminated fiber optic cable.
5. System ground barely conforms to PCC standard; lacks individual connections to required components.
6. Fire stop materials not present.

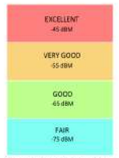
TELECOMMUNICATION ASSESSMENT
DOWNTOWN CENTER: DOWNTOWN CENTER, BASEMENT



Coverage in 5GHz



Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
DC (Downtown Center)	Building 1	1st	DCB1 - 1	2	2	3	N/A

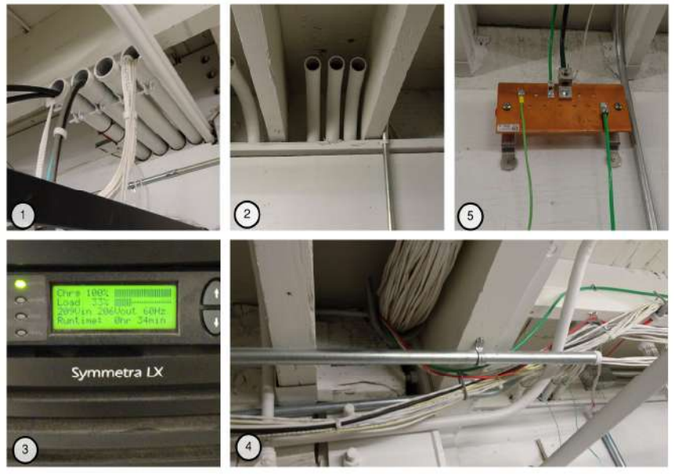
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
DOWNTOWN CENTER: DOWNTOWN CENTER, 3RD FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/21/17	7:20 AM	5200	DC	Downtown Center	DCMDF	3	3	4	4	3	3	3	3	3	1	Smart-UPS RT 5000 RM XL	2844	31	33

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

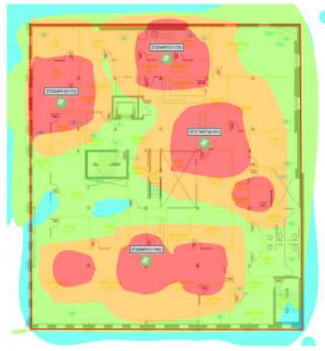
TELECOMMUNICATION ASSESSMENT
DOWNTOWN CENTER: DOWNTOWN CENTER, 3RD FLOOR, MDF



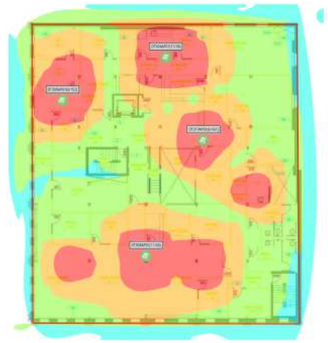
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Cables lack support – Fire stop materials not present.
2. Spare conduits to floors below – good expansion. Conduits not firestopped.
3. Load and Charge good on UPS.
4. Bridle ring cable supports induce bends and deformities in data cables, affecting performance.
5. System ground barely conforms to PCC standard; lacks individual connections to required components.

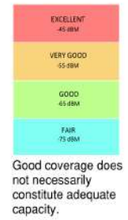
TELECOMMUNICATION ASSESSMENT
DOWNTOWN CENTER: DOWNTOWN CENTER, 3RD FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

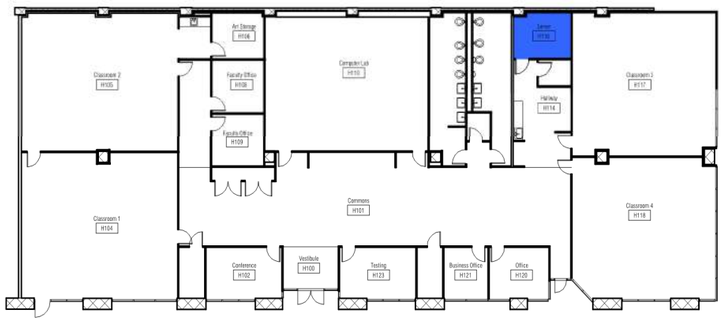


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
DC (Downtown Center)	Building 1	3rd	DCB1 - 3	2	2	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

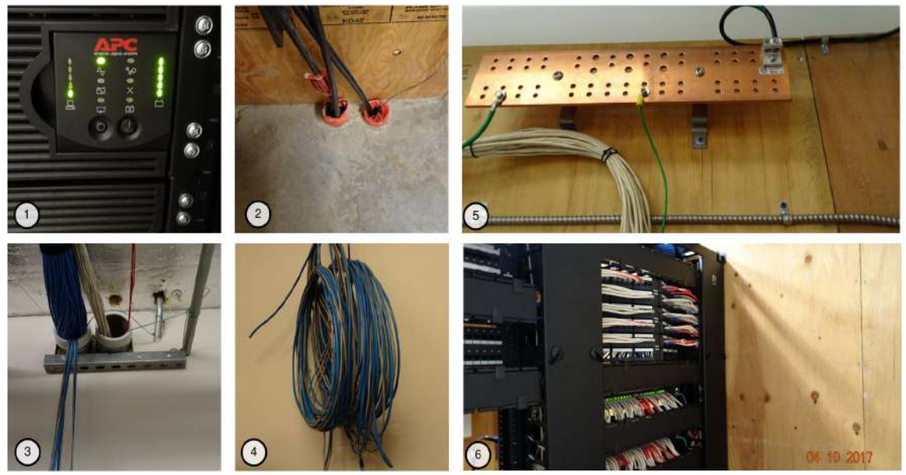
TELECOMMUNICATION ASSESSMENT
HILLSBORO CENTER: HILLSBORO CENTER, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	Electrical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
4/9/17	11:45 AM	0	HC	Hillsboro Center	HCMDF	4	3	4	4	3	3	4	4	3			Smart-UPS X 2000	2485	227	17

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
HILLSBORO CENTER: HILLSBORO CENTER, 1ST FLOOR, MDF



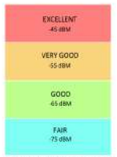
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS
2. & 3 Conduit capacity good, but required firestop / sealant is not present
4. Unterminated cables hanging – possible work in progress
5. System ground lacks individual connections to required components and conductor is undersized
6. Expansion capacity adequate, good cable management

TELECOMMUNICATION ASSESSMENT
HILLSBORO CENTER: HILLSBORO CENTER, 1ST FLOOR

Coverage in 5GHz

Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	M&P Service Life	Comments
HC (Hillsboro)	Building 1	1st	HCB1 - 1	2	1	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

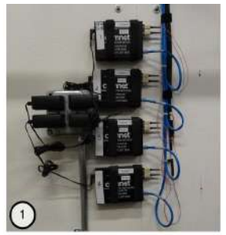
TELECOMMUNICATION ASSESSMENT
NEWBERG CENTER: NEWBERG CENTER, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	M&C. Storage	Water Hazard	Mechanical	Electrical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
4/10/17	10:37 AM	5400	NB	Newberg Center	NBMDF	3	2	3	4	3	3	3	3	3			Symmetra PX 250	637	231	15

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT

NEWBERG CENTER: NEWBERG CENTER, 1ST FLOOR, BDF

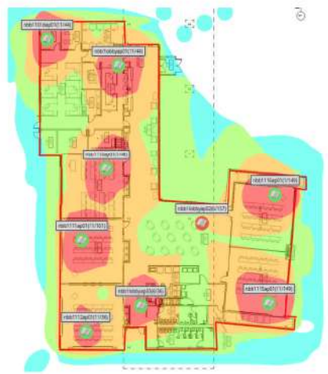


POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

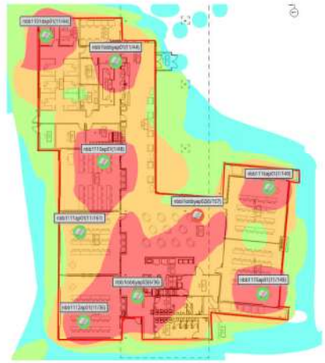
1. Fiber optics transceivers not protected – power easily disconnected.
2. Spare fiber feeds to street – previous carrier.
3. & 4 Load and Charge good on UPS.
5. & 7 Cables through floor system – no sleeves or fire stop present.
6. Expansion capacity adequate, good cable management.
7. System ground barely conforms to PCC standard; lacks individual connections to required components.

TELECOMMUNICATION ASSESSMENT

NEWBERG CENTER: NEWBERG CENTER, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
HS (Hampton Square)	Building 1	1st	HSB1 - 1	2	1	1	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT

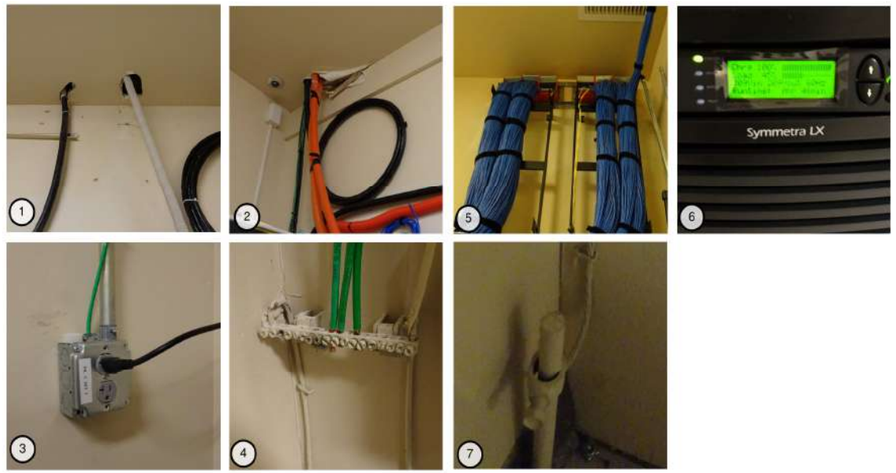
PORTLAND METRO CENTER: PORTLAND METRO CENTER, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	Electrical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	1:04 PM	5500	PM	Portland Metro Building 1	PMB1MDF	4	4	3	4	3	4	4	3	3			Smart-UPS 5000	221	40	45

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT

PORTLAND METRO CENTER: PORTLAND METRO CENTER, 1ST FLOOR B1, MDF



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1 & 2 Cables and conduits penetrate ceiling - required firestop and sleeve not present.

3 Ground wire not ties to correct ground source.

4. Grounding Buss Bar not approved type.

5. Firestop systems properly used in conformance with PCC Standards.

6. Load and Charge good on UPS.

7. Ground clamps at rod not approved type.

TELECOMMUNICATION ASSESSMENT
PORTLAND METRO CENTER: PORTLAND METRO CENTER, 1ST FLOOR B1

Coverage in 5GHz

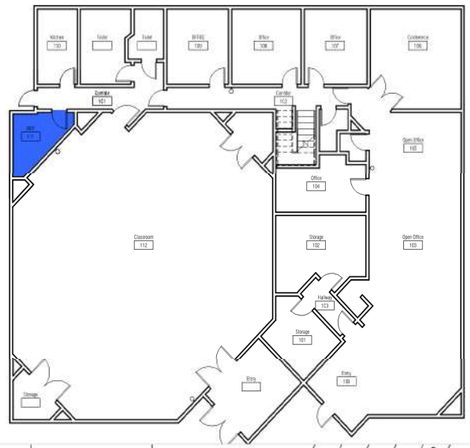
Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
PM (Portland Metro)	Building 1	1st	PMB1 - 1	1	2	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
PORTLAND METRO CENTER: PORTLAND METRO CENTER, 1ST FLOOR B2

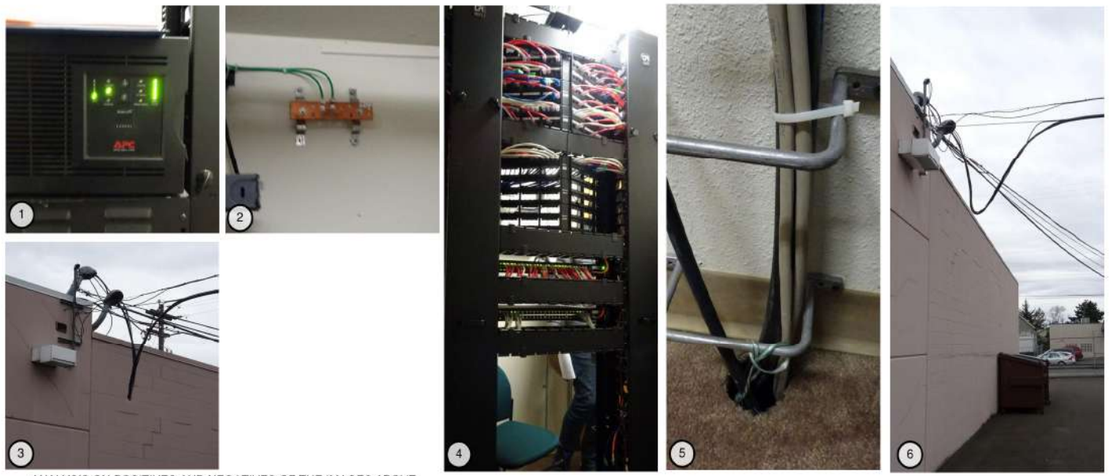


Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	Electrical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	1:26 PM	5500	PM	Portland Metro Building 2	PMB2BDF	3	3	5	4	4	3	4	3	3			Symmetra LX 16000 RM	2475	270	30

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT

PORTLAND METRO CENTER: PORTLAND METRO CENTER, 1ST FLOOR B2, BDF

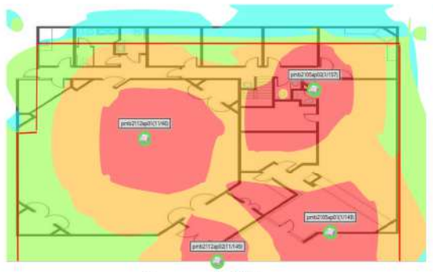


ANALYSIS ON POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS.
2. System ground barely conforms to PCC standard: lacks individual connections to required components.
3. & 6 – Outside overhead feed between B1 & B2 not supported well – hazard of being damaged by trash truck.
4. Expansion capacity adequate, good cable management.
5. Carpet in BDF not recommended – fire stop materials not present.

TELECOMMUNICATION ASSESSMENT

PORTLAND METRO CENTER: PORTLAND METRO CENTER, 1ST FLOOR B2



Coverage in 5GHz

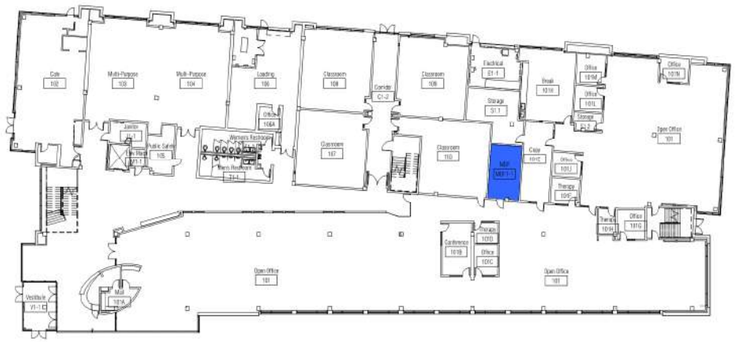
Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
PM (Portland Metro)	Building 2	1st	PMB2 - 1	2	3	3	N/A

5 BAD	4 POOR	3 FAIR	2 GOOD	1 EXCELLENT

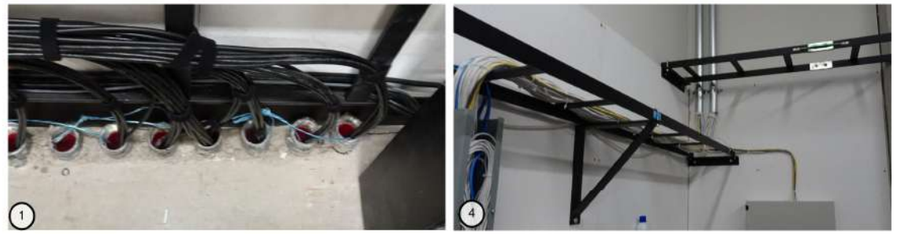
TELECOMMUNICATION ASSESSMENT
WILLOW CREEK CENTER: WILLOW CREEK, 1ST FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	12:00 AM	5600	WC	Willow Creek	WCMDF	3	4	3	3	3	4	4	3	3	3	Smart-UPS RT 10000 XL	3073	60	47

5 BAD	4 POOR	3 FAIR	2 GOOD	1 EXCELLENT

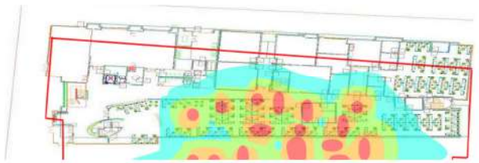
TELECOMMUNICATION ASSESSMENT
WILLOW CREEK: WILLOW CREEK, 1ST FLOOR, MDF



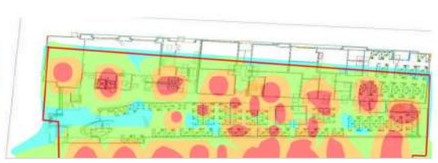
POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Conduit capacity good, but required firestop / sealant is not present
2. Materials on floor present trip hazard – possible personal injury
3. System ground conforms to PCC standard
4. Overhead cable tray capacity good – suitable for expansion
5. Load and Charge good on UPS
6. Rack management good, excellent room for expansion

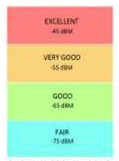
TELECOMMUNICATION ASSESSMENT
WILLOW CREEK: WILLOW CREEK, 1ST FLOOR



Coverage in 5GHz



Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
WC (Willow Creek)	Building 1	1st	WCB1 - 1	1	3	3	All planned APs only, check building model

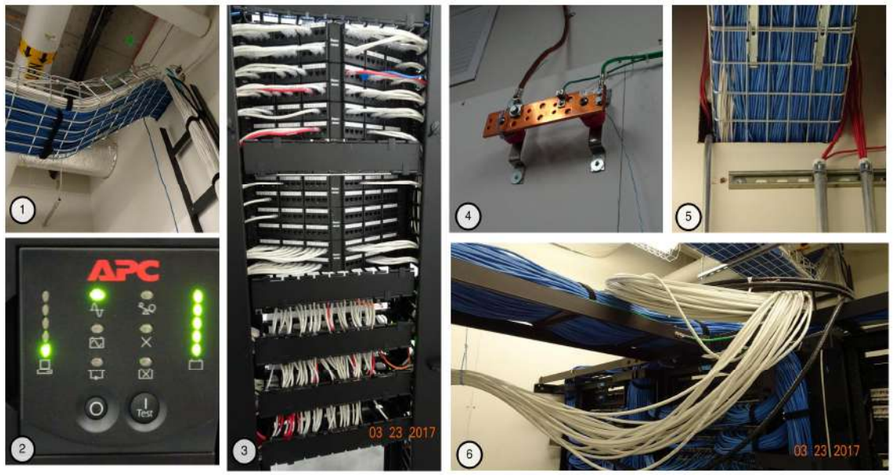
5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
WILLOW CREEK: WILLOW CREEK, 2ND FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	MEC. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	8:10 AM	5600	WC	Willow Creek	WCIDF1	3	4	4	4	3	3	3	3	3	3	Smart-UPS RT 10000 RM XL	1261	49	25
3/23/17	12:00 AM	5600	WC	Willow Creek	WCIDF2	3	3	3	4	3	3	3	3	3	3	Smart-UPS RT 5000 RM XL	3040	36	28

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

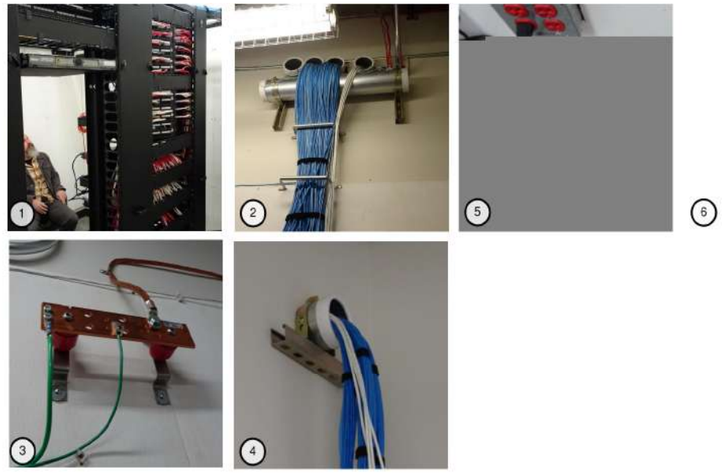
TELECOMMUNICATION ASSESSMENT
WILLOW CREEK: WILLOW CREEK, 2ND FLOOR, IDF 1



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. & 5 No firestop system at cable tray penetration.
2. Load and Charge good on UPS.
3. Expansion capacity adequate, good cable management.
4. System ground conforms to PCC standard.
6. Cable tray loading exceeds recommended capacity.

TELECOMMUNICATION ASSESSMENT
WILLOW CREEK: WILLOW CREEK, 2ND FLOOR, IDF 2



POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Rack management good, excellent room for expansion.
2.& 4 Fire stop materials not present.
3. System ground barely conforms to PCC standard; lacks individual connections to required components.
5. Dirt in room bad for equipment – tape as conduit sealant not good practice.
6. Power cord presents trip hazard.

TELECOMMUNICATION ASSESSMENT

WILLOW CREEK: WILLOW CREEK, 2ND FLOOR, WIRING

① ② ⑥

③ ④ ⑤ ⑦

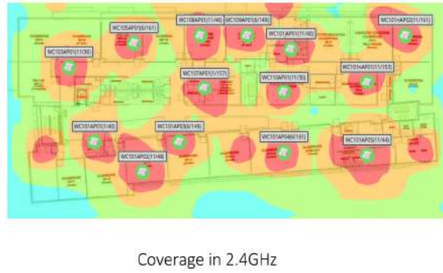
ANALYSIS ON POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1.
2.
3.
4.
5.

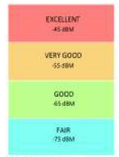
TELECOMMUNICATION ASSESSMENT

PORTLAND METRO CENTER: PORTLAND METRO CENTER, 1ST FLOOR

Coverage in 5GHz



Coverage in 2.4GHz

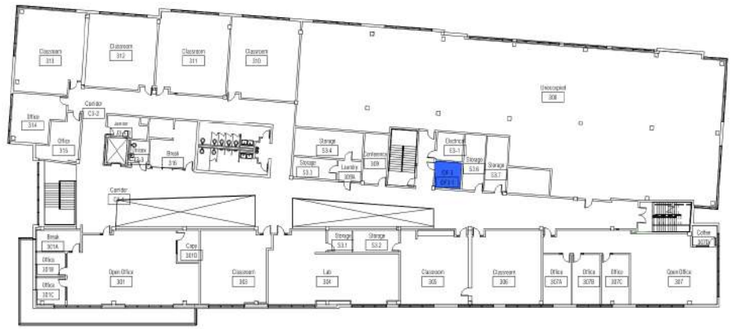


Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
PM (Portland Metro)	Building 2	1st	PMB2 - 1	2	3	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
WILLOW CREEK CENTER: WILLOW CREEK, 3RD FLOOR



Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/23/17	12:00 AM	5600	WC	Willow Creek	WCIDF3	3	3	3	4	3	3	3	3	3	3	Smart-UPS RT 5000 RM XL	3040	36	28

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
WILLOW CREEK: WILLOW CREEK, 1ST FLOOR, IDF 3

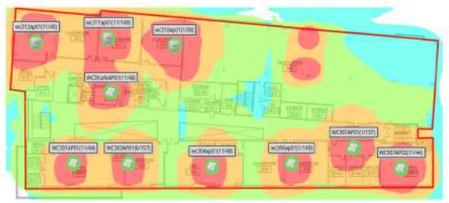
1 2 6

3 4 5 7

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

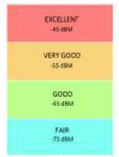
1.
2.
3.
4.
5.

TELECOMMUNICATION ASSESSMENT
WILLOW CREEK: WILLOW CREEK, 3RD FLOOR



Coverage in 5GHz

Coverage in 2.4GHz



Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	WAP Service Life	Comments
WC (Willow Creek)	Building 1	3rd	WCB1 - 3	3	2	3	Some AP-224s here, OK to remain in place

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SWAN ISLAND CENTER: SWAN ISLAND, 1ST FLOOR

Date	Time	AIM #	Campus	Building	Location	Grounding	Racks - Mgmt	Pathways Full	Fire Stopping	Fire Suppression	Access Control	Room Clean	Misc. Storage	Water Hazard	Mechanical	UPS Model	UPS Age (days)	UPS Battery Run Time (min)	UPS Utilization %
3/20/17	2:10 PM	5700	ST	Swan Island	STCMDF	1	2	3	3	3	3	3	3	4	3	Symmetra LX 16000 RM	1160	107	17

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT

TELECOMMUNICATION ASSESSMENT
SWAN ISLAND: SWAN ISLAND, 1ST FLOOR, MDF

POSITIVES AND NEGATIVES OF THE IMAGES ABOVE...

1. Load and Charge good on UPS.
2. Evidence of water leak – wall damaged.
3. Rack management good, excellent room for expansion.
4, 5, & 6 System ground conforms to PCC standard.

TELECOMMUNICATION ASSESSMENT
SWAN ISLAND: SWAN ISLAND, 1ST FLOOR

Coverage in 5GHz

Coverage in 2.4GHz

Good coverage does not necessarily constitute adequate capacity.

Campus	Building	Floor	Location	Coverage in 2.4GHz	Coverage in 5GHz	NMP Service Life	Comments
STC (Swan Island)	Building 1	1st	STC1 - 1	1	2	3	N/A

5 BAD | 4 POOR | 3 FAIR | 2 GOOD | 1 EXCELLENT