



SUNY/PPAA
State University of New York
Physical Plant Administration Association

PPAA 2019

Track 1: Technology & Emerging Trends

Technology and Adaptive Space Reuse

Wednesday, July 17, 2019 1:30 – 2:30 pm
Course No. ER0310

king+king
ARCHITECTS



Archi-Technology
Technology Consultants LLC

This Course is valid for 1.0 LU/HSW Credits

King + King Architects, LLP is a Registered Provider with the American Institute of Architects Continuing Education System. Credit earned on completion of this program will be reported to CES Records for AIA members. Certificates of Completion for non-AIA members are available on request.

This program is registered with the AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product. Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

This course is also approved for 1.0 Professional Development hour for Engineering Registration in NYS.

Learning Objectives

1. **Understand Planning Methodologies** for adaptive reuse of space and technology integration implications.
2. **Realize Programming efficiencies and trends** related to technology usage in the revitalization of existing campus program areas.
3. **Identify Academic, Social, Living, and Sustainable use strategies** for technology in collaborative environments.
4. **Make connections** to resources (consultants, vendors, systems) that expand the palette of available tools for successful and innovative technology planning.
5. Develop **an understanding of the challenges and lessons learned** for technology integration in case-study examples (Lemoyne College Madden School of Business, Onondaga Community College Whitney Commons, and the Carmelo Anthony Basketball Practice Facility).

About the Presenters

Kirk Narburgh, King + King Architects

- Partner-in-charge of King + King's Education Studio
- One of the first LEED accredited professionals in the Syracuse area
- Also Syracuse University's School of Architecture adjunct professor

Tom Rauscher, Archi-Technology LLC

- President of independent technology consulting firm for 20+ years
- Served BICSI's Technical Information and Methods Committee Chair
- Holds CSI Fellowship for work on national technology standards

Agenda: Architectural Case Studies

Presented by Kirk Narburgh, CEO/Managing Partner, King + King Architects LLP

LE MOYNE



ONONDAGA
COMMUNITY COLLEGE

SYRACUSE UNIVERSITY



ITHACA COLLEGE

Agenda: Technology in every phase of a building

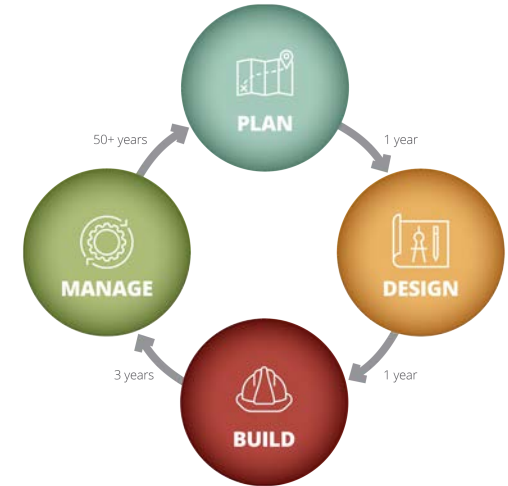
Presented by Tom Rauscher, Archi-Technology LLC

Technology Trends

- IoT and building-technology systems
- The importance of spaces in your physical network

Technology for every phase of a building's life

- **Plan:** Assessment, Planning and standards
- **Design:** Systems design via Architects
- **Build:** Technology Construction Management via Owners
- **Maintain:** Systems documentation and ongoing planning



Examples of IP-connected systems & devices



Overhead Paging



Emergency Notification



Access Control



Security Blue Lights



Video Surveillance



Instructional Technology



Wireless Access



IP Clock/Display

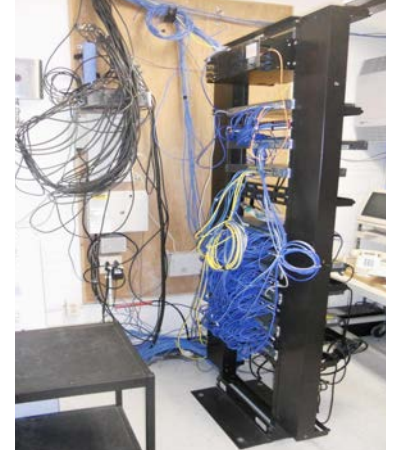
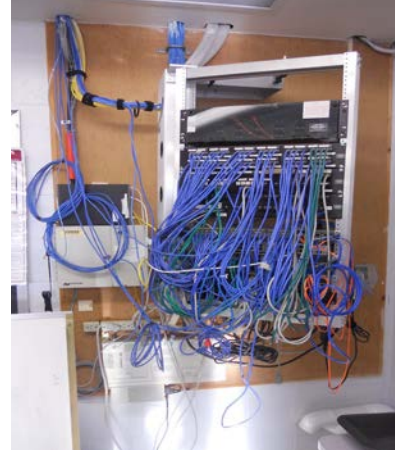
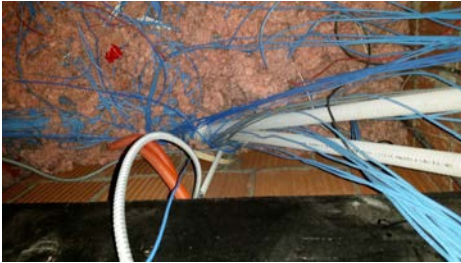


Digital Signage



Telephone

It takes significant planning, design and effort to go **from this...**



...to this!

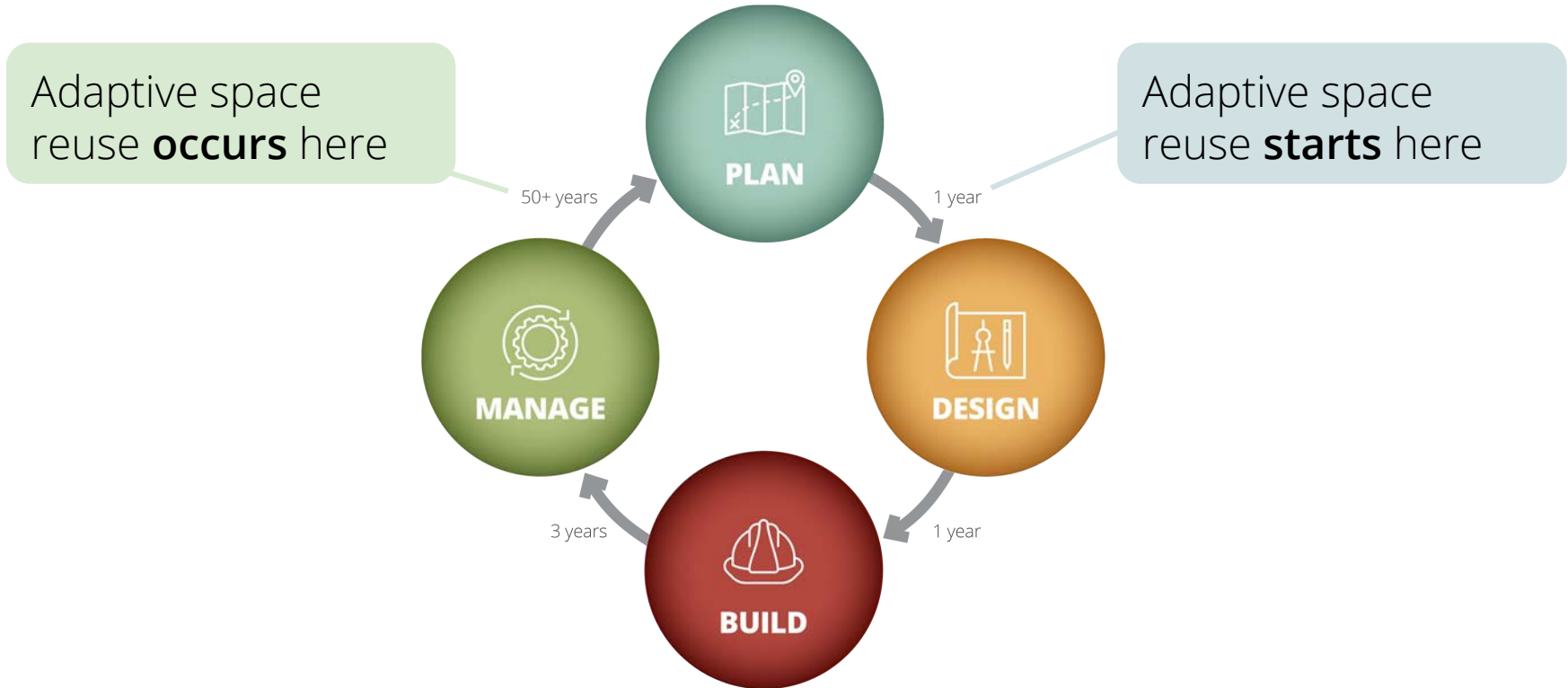


Technology compared to MEP

Side-by-Side Comparison

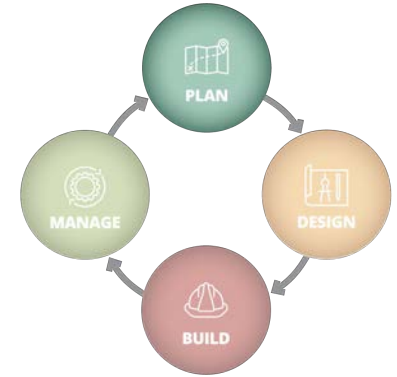
MEP	Technology
Code Based	Standards Based
Architectural Focused	Owner Centric
Owner Review	Owner Involved
Vendor Neutral	Vendor Influenced

A Plan-to-Manage approach to technology



PLAN: Getting from here to there

- **Technology Conditions Surveys:** Get an objective knowledge baseline of current conditions:
 - Starts with technology infrastructure
 - Extends to all IP-connected systems
- **Comprehensive Technology Plan:** Develop a realistic 10-year actionable plan that accounts for:
 - Current and future projects needed to achieve goals
 - Optimal use of available funding sources
 - Project dependencies and timelines
- **CER Master Plan:** Develop standards for all Communications Equipment Rooms on your campus.



Assessment: Technology Conditions Survey (TCS)

- Conducted by a credentialed Registered Communications Distribution Designer (**RCDD**) who specializes in the systems that transport data through buildings and campuses.
- The **TCS Report** provides an accurate, vendor-agnostic informational foundation from which strategic technology planning efforts can begin.

Archi-Technology LLC
Presented to MARCH Associates

Whitesboro Central School District
Technology Conditions Survey Report

1. Technology Existing Conditions: Westmorland Elementary School (cont.)

Instructional Technology

Integrated AV Systems	Consistent with district trends.
PCs, Laptops, Tablets	Consistent with district trends.

Communication Systems

PA System	1. The PA system is getting older. The system effectively serves its purpose but is limited in its capabilities because of its age. 2. The PA head-end equipment is located in a storage room in the main office.
Telephone System	1. Consistent with district trends. 2. There are some phones in the district office that are using VOIP.
Local PA Systems	Consistent with district trends.
Master Clock Systems	Consistent with district trends.

Security Systems

Access Control	Consistent with district trends.
Visitor Entry Systems	Consistent with district trends.
Video Surveillance Systems	Consistent with district trends.

MIDDLE SCHOOL

Telecommunications Infrastructure

Horizontal Cabling	Consistent with district trends.
Backbone Cabling	Consistent with district trends.
Communications Pathways	Consistent with district trends.

Example of Visitor Entrance and Video Surveillance Systems



Horizontal Cables in Attic



Example of Insufficient Cable Pathways



continued on next page

December 28, 2015

Archi-Technology.com • 585.424.1952, x38

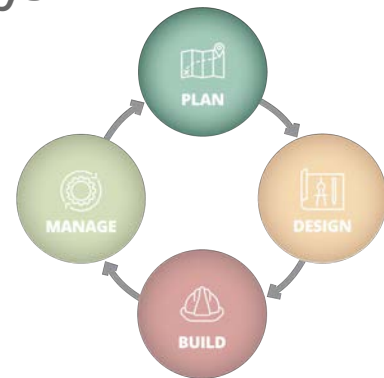
16

Physical Network conditions are crucial to operations

Physical Infrastructure is primarily comprised of **Cables, Pathways and Spaces** including Communications Equipment Rooms (CER).

Maintaining **industry best practices** for these components is crucial to enable:

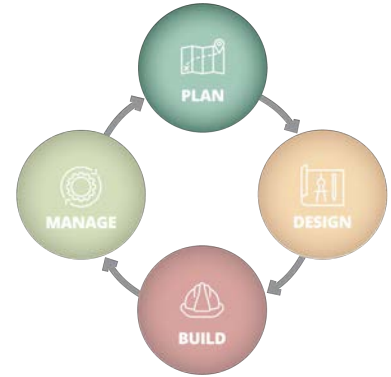
1. Network, data and physical security
2. Internet connection reliability
3. Life Safety systems reliability
4. Instructional and business systems connectivity
5. Efficient troubleshooting, Moves, Adds and Changes (MACs), and future expansion.



Comprehensive Technology Plans

An effective 10-year Comprehensive Technology Plan (CTP):

- Is based on the findings of the TCS Report.
- Aligns all projects with broad, long-range organizational goals.
- Includes feedback and goals from all stakeholders.
- Includes current technology projects and those with technology components.
- Identifies new tech projects required to meet goals.
- Provides rough cost estimates for new projects.
- Optimizes available funding for new projects.
- Prioritizes and schedules projects for next 10 years.



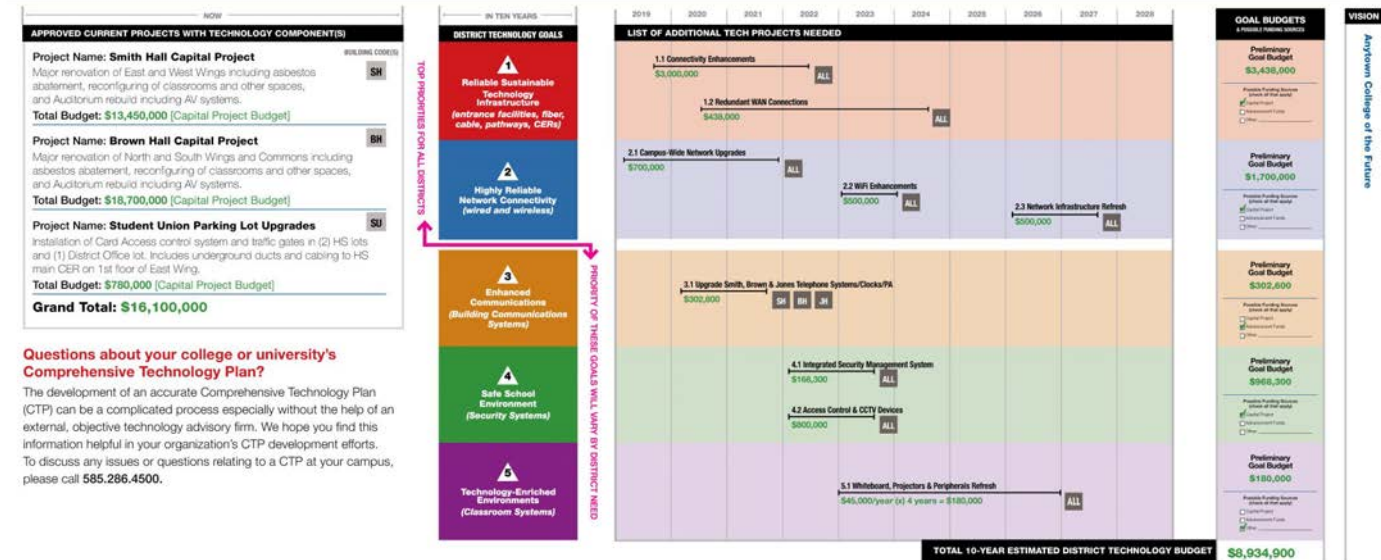
Comprehensive Technology Plan (cont.)

Anytown College Comprehensive Technology Planning: 10-Year Roadmap

Anytown College



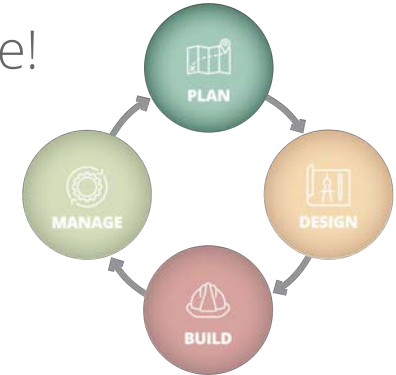
BUILDING CODES **SH** Smith Hall **JH** Jones Hall **BH** Brown Hall **ML** Main Library **SU** Student Union **D1** Dorm No. 1 **D2** Dorm No. 2 **D-1** Bus Garage **D-2** Press Box **ALL** College-Wide



Budgeting for Technology

Budget as much as \$25/sq. ft.

Clinical environments can be as much as \$40/sq. ft. or more!



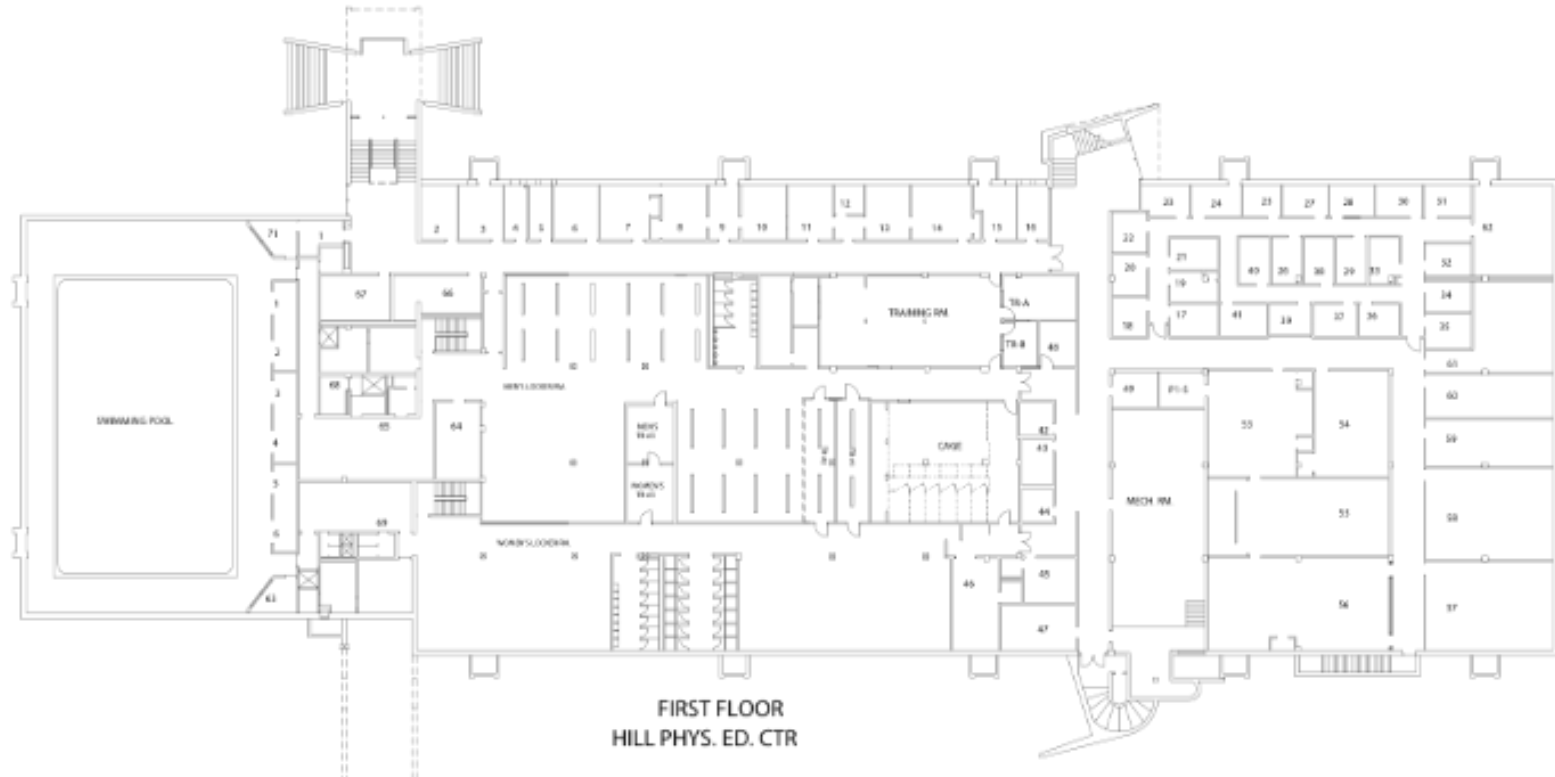
Estimated Construction Costs: NEW PROJECT				Total Sq. Ft. 394,000.00			
	Total			Based on	\$ per sq ft	Item - Total	Comments
\$	295,500.00	Division 00 - 25	\$ 0.75				
		Division 00 and 01		394,000	\$ 0.25	\$ 98,500.00	
		Divisions 2-25 - Architectural		394,000	\$ 0.50	\$ 197,000.00	likely in CM numbers
\$	985,000.00	CA - Cabling	\$ 3.50				
		Inside Cabling		394,000	\$ 2.50	\$ 985,000.00	more network connected devices
\$	-	Outside Plant		-	\$ 1.00	\$ -	
\$	1,970,000.00	CP - Communications Pathways	\$ 5.00				
		Conduits and Backboxes		394,000	\$ 3.50	\$ 1,379,000.00	in CM number reflects increased
		Cable Tray		394,000	\$ 1.50	\$ 591,000.00	material cost and labor from priors
\$	2,758,000.00	CM - Communication Systems	\$ 7.00				
		Printers and Workstations		394,000	\$ 3.50	\$ 1,379,000.00	just below PICU/AICU because Radiology
		Network Ports		394,000	\$ 1.50	\$ 591,000.00	is relocating - not all will be new.
		Wireless		394,000	\$ 2.00	\$ 788,000.00	
\$	598,500.00	SS - Safety and Security	\$ 1.60				
		Access Control		394,000	\$ 0.75	\$ 295,500.00	
		Video Surveillance		394,000	\$ 0.75	\$ 295,500.00	CCTV in CC was high due to Lin Acc
		Intrusion Detection		75,000	\$ 0.10	\$ 7,500.00	
\$	839,250.00	AV - Audio Visual	\$ 8.00				
		Integrated (conference rooms)		50,000	\$ 5.00	\$ 250,000.00	early plug number till scope is clearer
		Distributed (paging)		394,000	\$ 0.50	\$ 197,000.00	allow for some work at headend
		CATV		200,000	\$ 1.00	\$ 200,000.00	Vendor 1 system
		Leaky Cable - Basement/Ground		75,000	\$ 1.25	\$ 93,750.00	minimal amount - plug number
		Intercom		394,000	\$ 0.25	\$ 98,500.00	depends on modality intercoms
\$	1,850,000.00	CL - Clinical	\$ 23.00				
		Nurse Call		200,000	\$ 3.00	\$ 600,000.00	new system
		Patient Monitoring		100,000	\$ 10.00	\$ 1,000,000.00	TBD
		Radiology Integration/Coord.		25,000	\$ 10.00	\$ 250,000.00	plug number
\$	80,250.00	BA - Build Automation	\$ 0.25				
		Network Interface and Gateways		321,000	\$ 0.25	\$ 80,250.00	also see mechanical division.
Total	\$ 9,376,500.00	All Categories		w Clinical	\$ 49.10		
	\$ 1,970,000.00	Minus CP in Electrical scope		w/o Clinical	\$ 26.10		
	\$ 7,406,500.00	CLA specific items					



ITHACA COLLEGE

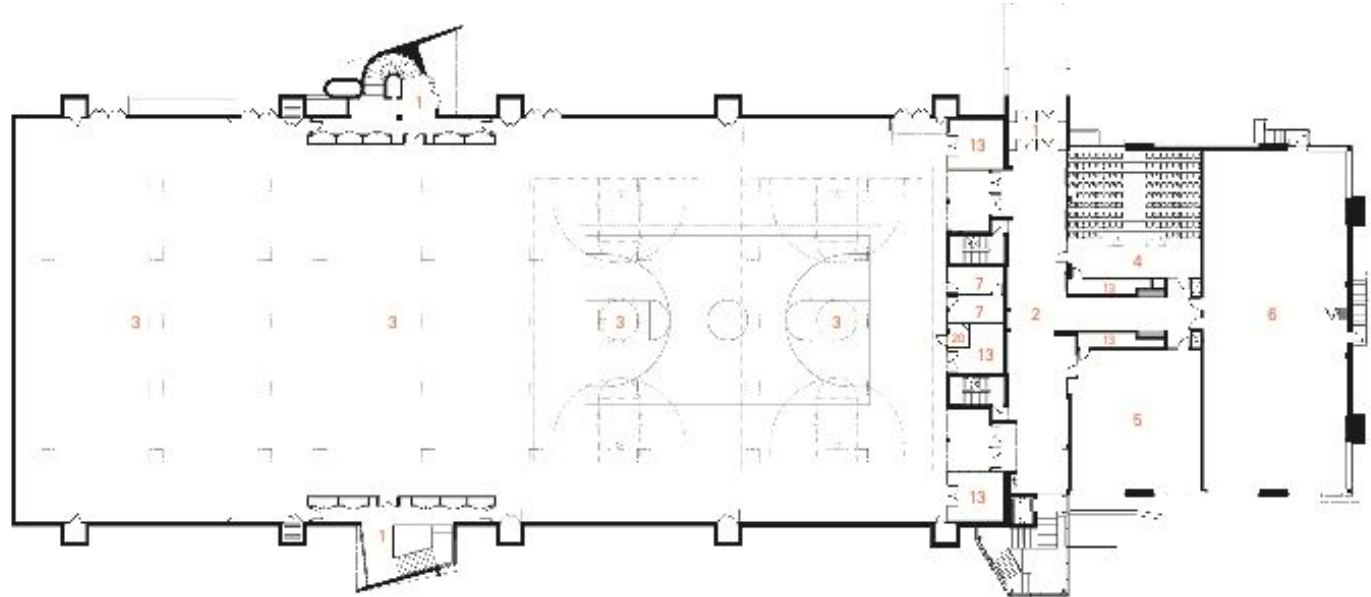
Hill Center

Ithaca College - Hill Center



Ithaca College Hill Center - Existing Plan

- 1 vestibule
- 2 lobby
- 3 gym
- 4 lecture
- 5 classroom
- 6 multipurpose
- 7 office
- 8 toilet room
- 9 lounge
- 10 athletic training treatment
- 11 athletic training hydrotherapy
- 12 athletic training exam
- 13 storage
- 14 recording studio
- 15 conference
- 16 locker room
- 17 equipment
- 18 lab
- 19 mechanical
- 20 janitor



Ithaca College - Hill Center



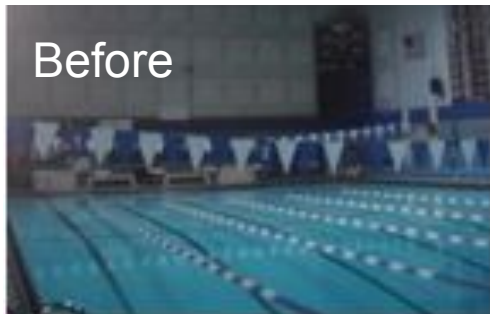
Before



Ithaca College - Hill Center



Ithaca College - Hill Center



Questions and Discussion

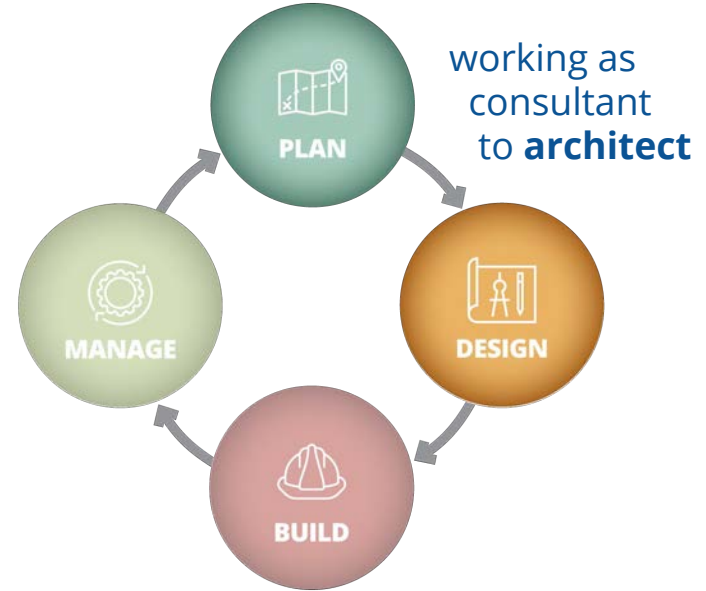
- Are you receiving the expertise guidance necessary to achieve success on the varied projects requiring technology integration ?
- What are some of your lessons learned ?

Varied relationships during a project

During the **Plan** and **Design** phases, technology consultants represent the project owner working as a consultant to their **architects**.

Deliverables include:

- Narratives
- Drawings
- Specifications



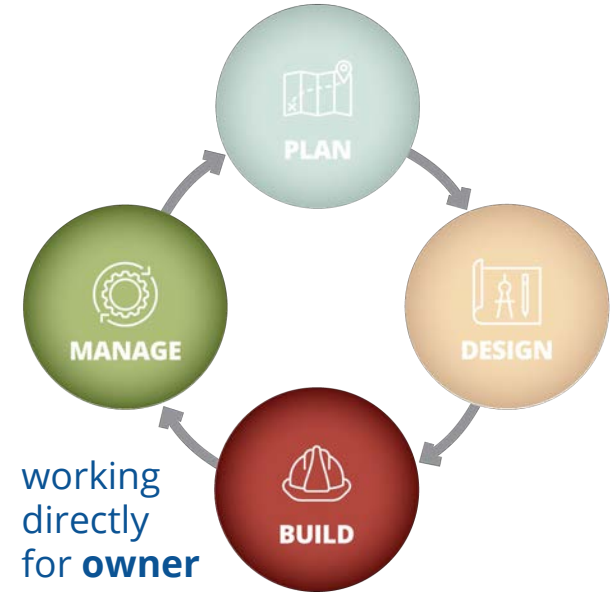
Varied relationships during a project (cont.)

During the **Build** and **Manage** phases, technology consultants work directly for the owner.

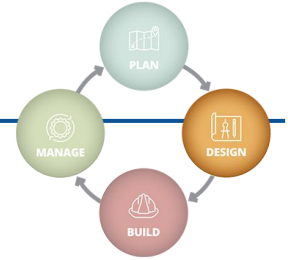
Technology Construction Management (TCM) is critical during **Build**:

- More **labor intensive** than Construction Administration.
- Ensures **continuity** between systems design and installation.

The major **deliverable** is As-Built documentation.

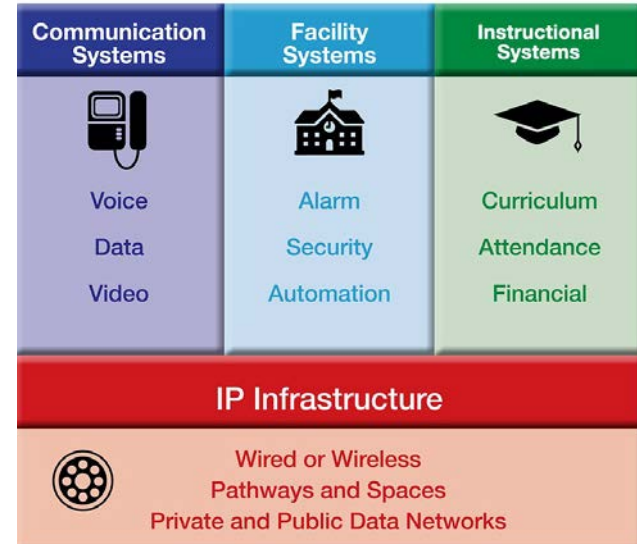


Design Phase Considerations

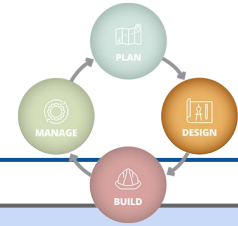


The importance of Technology Infrastructure

- The proliferation of internet- connected systems places an **increasingly larger burden** on the physical network of a campus.
- Poor or inadequate infrastructure puts an organization's entire operations at **risk**.
- There is a need to work with firms that **understand** the complex, interrelated nature of these building-based systems.
- This skill set is **seldom possessed** by architects, electrical engineers, etc.



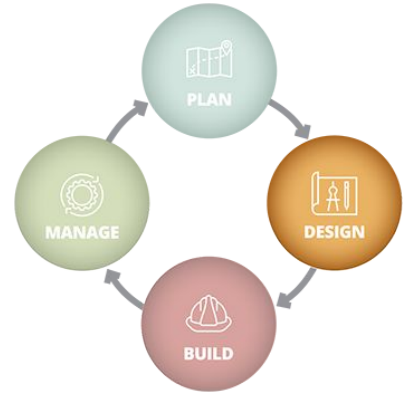
Technology Systems by Department



Administration and Planning	Facilities Department	Communications Departments	Clinical Systems
• Assessment • Technology Plans • Budgeting • Design Standards • Drawings and Documentation • Site/Civil/Architectural/MEP	• Fire Alarm • Fire Suppression • Automation • Energy Management • Clock • Security • Access Control • Paging • Intercom • Audio/Visual	• Data Systems • Voice • Time Clock • Integrated AV • Video Conferencing • Data Network Switches • Internet • Spaces • Pathways • Copper Cabling • Fiber Cabling • 802.11	• Monitoring • Telemetry • Lab • Pharmacy • Radiology • Dietary • Cath/Echo, etc. • Nurse Call • Code Blue • IR/RF
Construction	Division 26	Divisions 27 & 28	Standalone

Language barriers during Design

- Facilities and IT **communications** issues
 - Facilities staff common acronyms
 - BTUs, AHUs, PMs, BacNet, LEED, SEQRA
 - Technology staff common acronyms
 - WAN, Bits/Bytes, DNS, IP, Cloud Computing
- Overlapping and changing **responsibilities** with IP-centric systems shifting from analog to digital:
 - Paging
 - Video Surveillance
 - Telephone



Do you feel you have effective interdepartmental communications?



SYRACUSE UNIVERSITY

**Syracuse University Carmelo Anthony
Basketball Practice Center**

Carmelo Anthony Basketball Practice Center



Carmelo Anthony Basketball Practice Center



Carmelo Anthony Basketball Practice Center



Carmelo Anthony Basketball Practice Center



Carmelo Anthony Basketball Practice Center



Carmelo Anthony Basketball Practice Center



Questions and Discussion

- What highly specialized systems are you having to integrate in your facilities ?
- Is the appropriate representation at the table to have effective communications and decision-making?



LE MOYNE

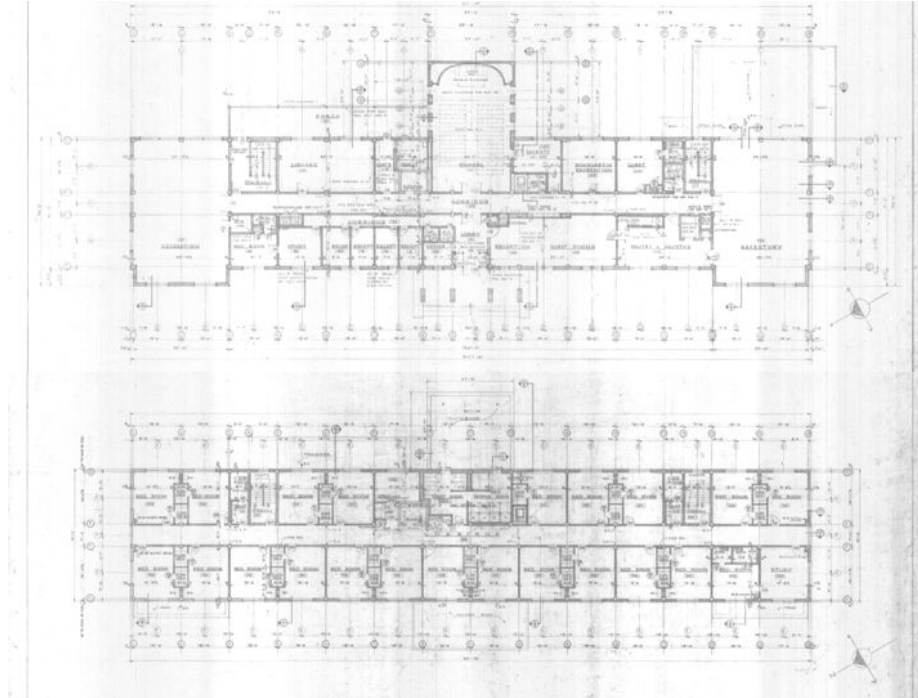
SPIRIT. INQUIRY. LEADERSHIP. *JESUIT.*

Madden School of Business at Mitchell Hall

Madden School of Business - Mitchell Hall



Madden School of Business - Mitchell Hall

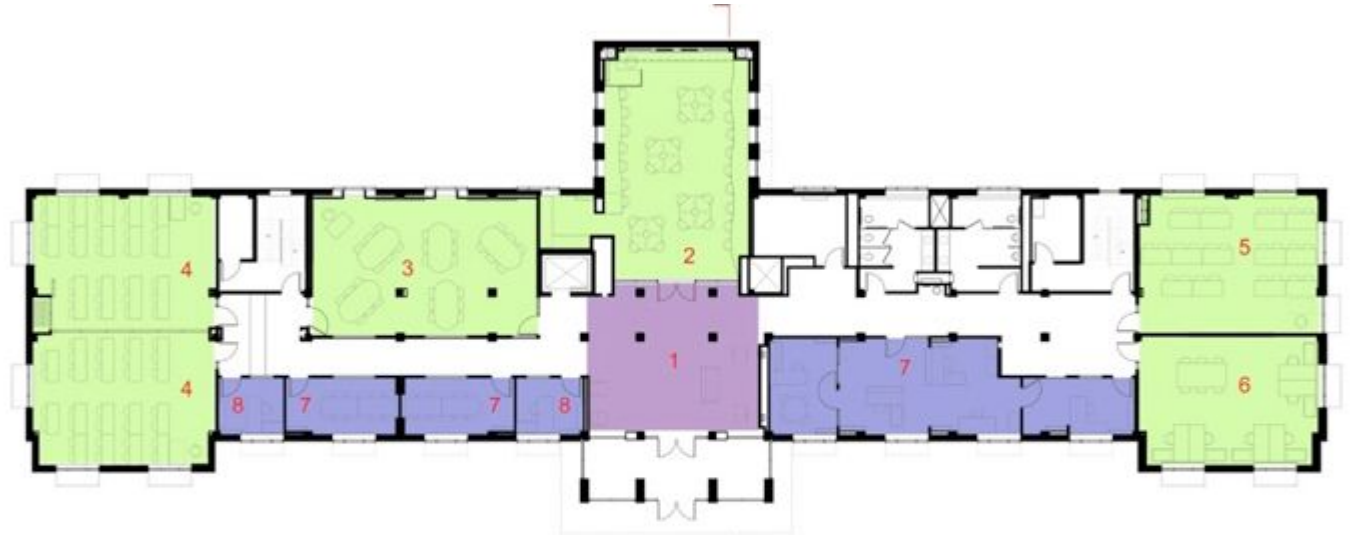


Madden School of Business - Mitchell Hall



Madden School of Business - Mitchell Hall

- 1 Vestibule & Lobby
- 2 Trading Room Lab
- 3 Marketing lab
- 4 Video-Conferencing Classroom
- 5 Computer Lab
- 6 Classroom
- 7 Collaboration Space
- 8 Faculty Office
- 9 Dean's Office Suite



Madden School of Business - Mitchell Hall



Madden School of Business - Mitchell Hall



Madden School of Business - Mitchell Hall



Madden School of Business - Mitchell Hall



Madden School of Business - Mitchell Hall



Madden School of Business - Mitchell Hall



What did we learn?

Programming

- Faculty challenges with “shift” in educational delivery
- Flexible teaching space constraints
- Importance of early involvement by IT Department

Construction

- Planning for multi-phase project
- Increase coordination between various systems (low ceiling, no ducts)

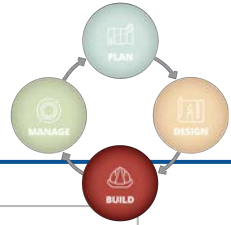
Operations

- Shift in how to operate the systems; building behavior change (new materials)
- Commissioning of IT: First use on Day 1 and adjusting beyond Cutover

Questions and Discussion

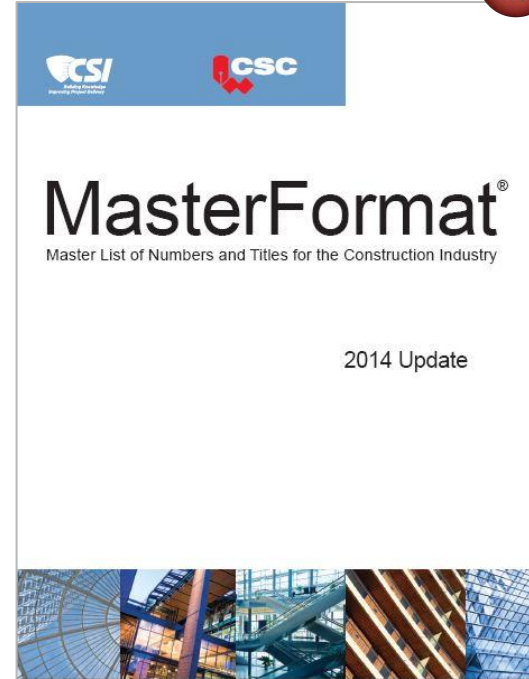
- What are some of your campus challenges with the design and implementation of collaborative environments ?
- Is there campus support for maintaining and upgrading these systems ?

Build Phase Considerations

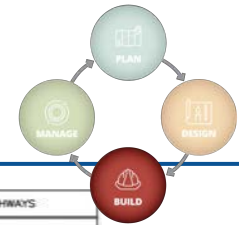


Dedicated Drawings and Specs

- **2004 MasterFormat Technology Divisions**
 - Division 27, Communications
 - Division 28, Electronic Safety and Security
- **Related Divisions that require coordination**
 - Division 25, Building Automation
 - Division 8, Door Hardware
 - Access control
 - Electrified Hardware
 - Division 33, Site and Utilities



Dedicated Drawings and Specs (cont.)

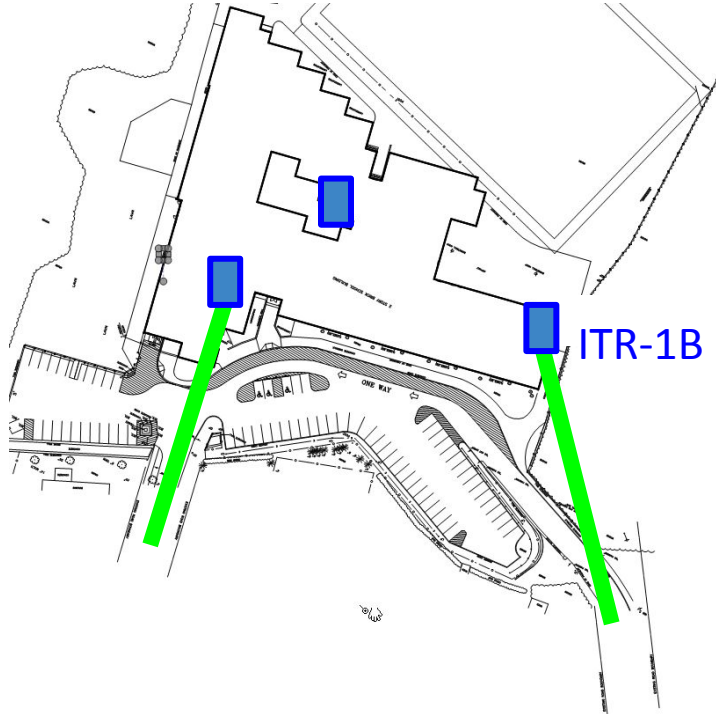
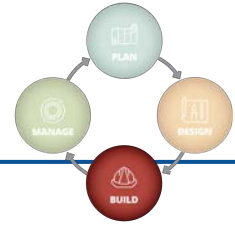


"T" Series Drawings:

- T0 - Sites Drawings
- T1 - Full Floor
- T2 - Serving Zones
- T3 - Rooms: MTRs, ITRs and CTRs
- T4 - Enlarged Drawings
- T5 - Details
- T6 - Schedules

RECOMMENDED SYMBOLS FOR COMMUNICATIONS PATHWAYS			
DEMO	EXISTING	NEW	DESCRIPTION
			TELECOM OUTLET - FLOOR BOX
			TELECOM OUTLET - CEILING MOUNTED
			TELECOM OUTLET - WALL MOUNTED
			CONDUITS - SIZE AS INDICATED
			J-HOOKS - WHERE INDICATED
			CONDUIT WITH BUSHINGS
			PULLBOX: X = SIZE: (S) SMALL, (M) MEDIUM, (L) LARGE
			EQUIPMENT CABINET WITH ZONE CABLING
			ACCESS PANEL - CEILING MOUNT
			VERTICAL RACEWAY - DOWN
			VERTICAL RACEWAY - UP
			VERTICAL CABLE TRAY - DOWN
			VERTICAL CABLE TRAY - UP
			CONDUIT/SLEEVE - UP
			CONDUIT/SLEEVE - DOWN
			CONDUIT/SLEEVE - THRU (BETWEEN FLOORS)
			SURFACE RACEWAY
			HORIZONTAL CABLE TRAY
			4-11/16" X 4-11/16" JUNCTION BOX
			SERVING ZONE OR MTR/ITR BOUNDARY
--- NEW/EXISTING OUTLET SUBSCRIPT KEY ---			
(REFER TO ADDITIONAL DESCRIPTORS THIS DRAWING)			
			"SY" SYSTEM INTENDED FOR DROP
			"E" EXISTING OUTLET NOTE
			"X" SIZE OF BOX AND MUD RING
			"Y" CONNECTION/PATHWAY TYPE
			"Z" OUTLET DESCRIPTOR
			"A" ROOM LOCATION CODE
--- OUTLET SYSTEM TYPE (SY SUBSCRIPT) ---			
AV	AUDIO VISUAL		
NC	NURSE CALL		
PM	PATIENT MONITORING		
CM	COMMUNICATIONS		
SS	SAFETY AND SECURITY		

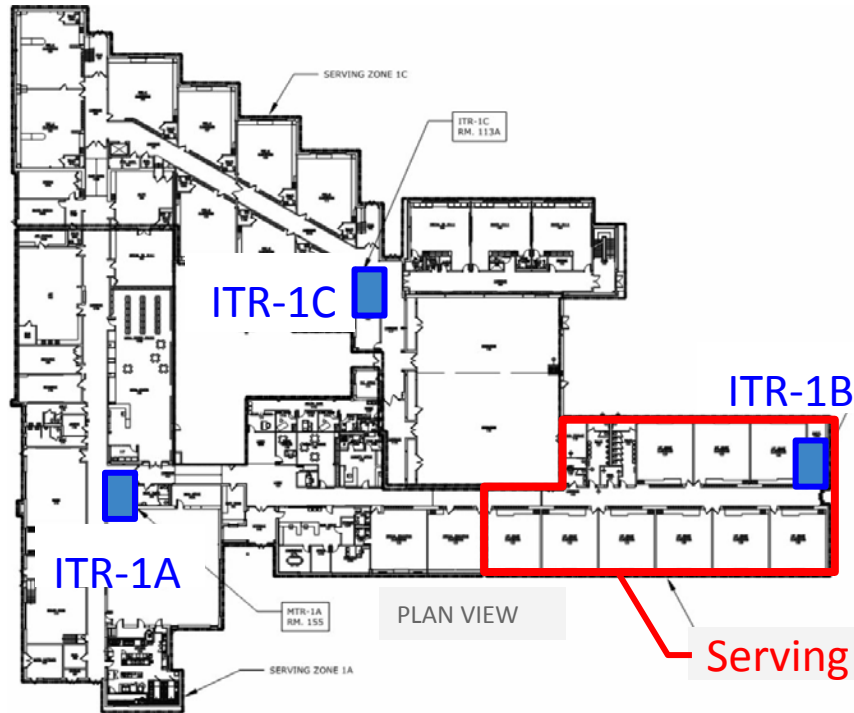
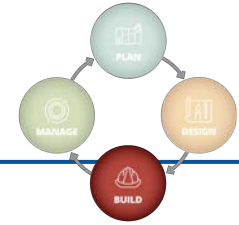
T0 Drawing



Entrance Facilities Redundancy

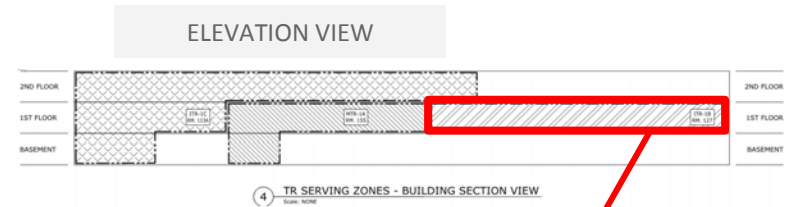
- Physical
- Logical

T1 Drawing



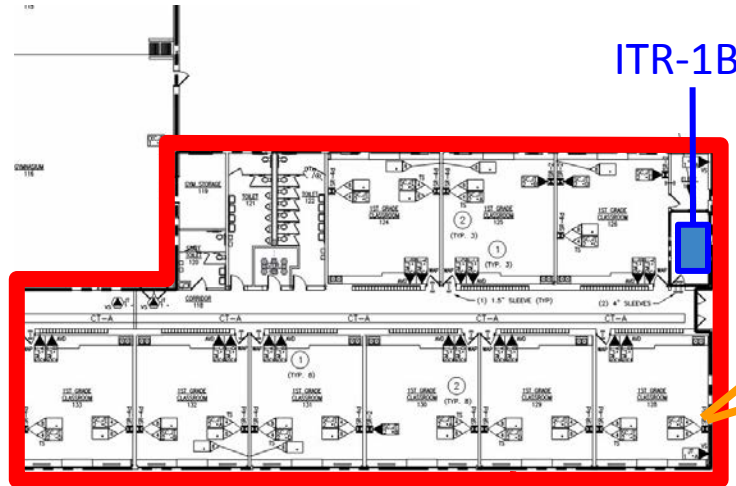
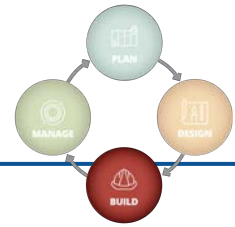
Spaces and Serving Zones

- Technical (328')
- Physical (Pathway - Gym)
- Logical (Field House/Gym)

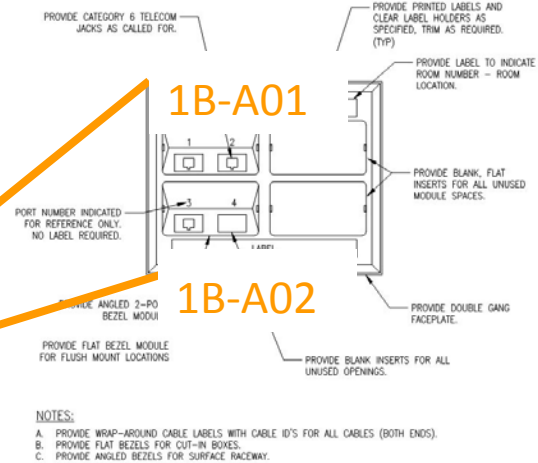


Serving Zone 1B

T2 Drawing

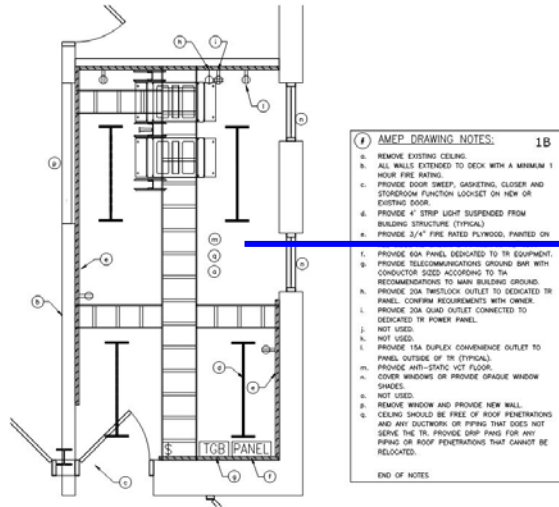
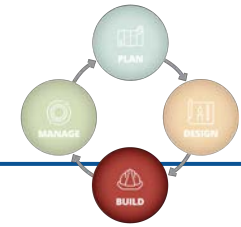


Serving Zone 1B

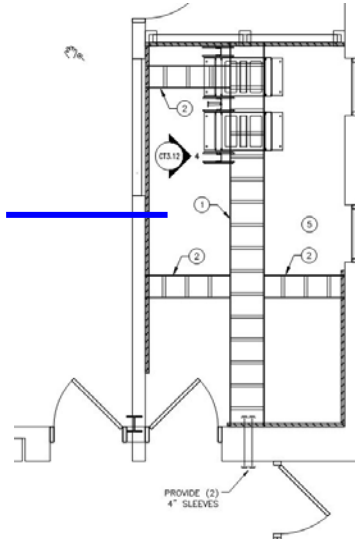


14 DOUBLE GANG FACEPLATE LABELING
SCALE: NOT TO SCALE

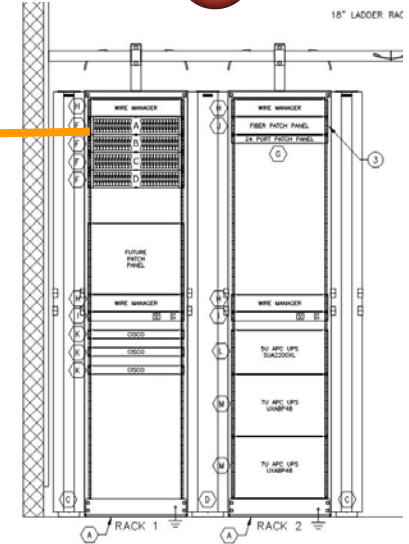
T3 Drawing



ITR-1B

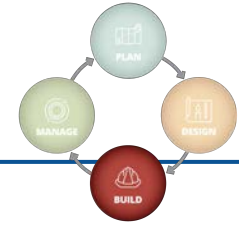


1B-A01



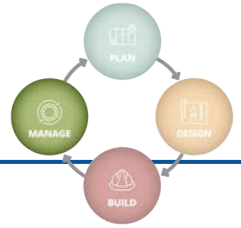
- AMEP Coordination
- Consolidation of systems in Technology Rooms

Constructing Rooms, Not Closets



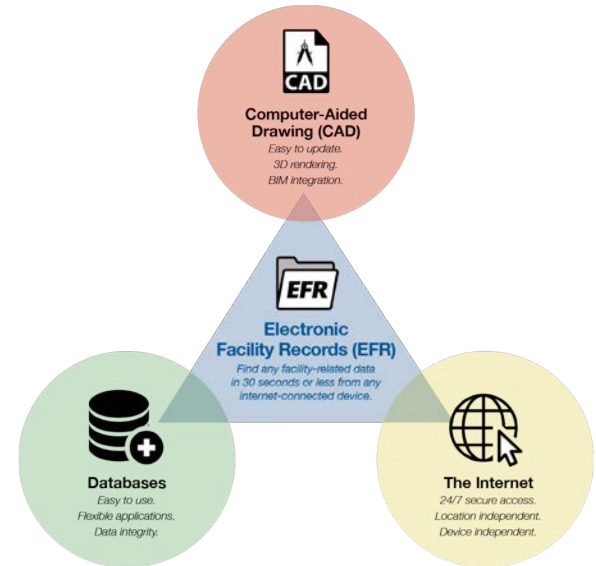
- Ensure all walls extend to the deck and are sealed (1 hour minimum).
- Ensure door has seals and a sweep (especially important during construction).
- Door hardware shall be keyed with a lockset and keys distributed to personnel responsible for the service and maintenance of the systems and infrastructure in the space. Restrict access to authorized personnel only.
- Paint all walls white.
- Provide ¾" AC grade plywood on all walls with fire retardant paint on all sides.
- Provide environmental cooling and control based on current and planned equipment.
- Provide lighting coordinated with rack locations (front and back).
- Provide power (racks, wall mounted and courtesy outlets).
- Provide grounding infrastructure (critical for higher data rates).
- Construct primary cable pathways between the room and the corridor for new and future cabling (e.g., 480 cables = 8-10 – 4" sleeves plus other systems and backbone connections). Avoid landlocking TRs with only one wall to exit.

Manage Phase Considerations



The benefits of T-Series Drawings extend into the Manage phase by providing operational efficiencies:

- Facilitates design standardization
- Reduces material expenses
 - More efficient during installation
- Increases infrastructure reliability
 - Strategic and proactive vs tactical and reactive
- Reduces systems service costs/times
 - Easier to maintain when you know what you have
- Institutionalizes technology-related data.
- Supports facility-succession planning
 - Staff knowledge is retained when someone leaves or retires





ONONDAGA COMMUNITY COLLEGE

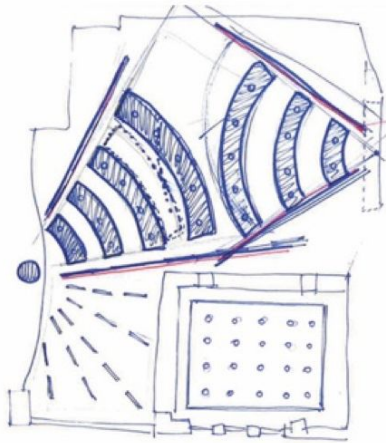
Whitn3y Commons

Onondaga Community College - Whitn3y Commons

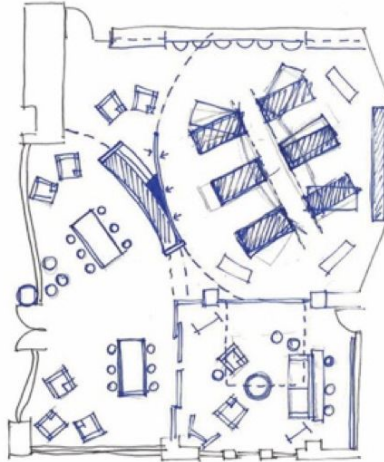
- 1. Multimedia Room
- 2. Corridor
- 3. Office
- 4. Electrical Closet
- 5. Media Closet



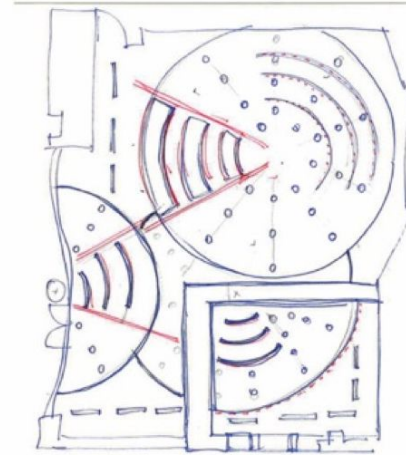
Onondaga Community College - Whitn3y Commons



Design Concept



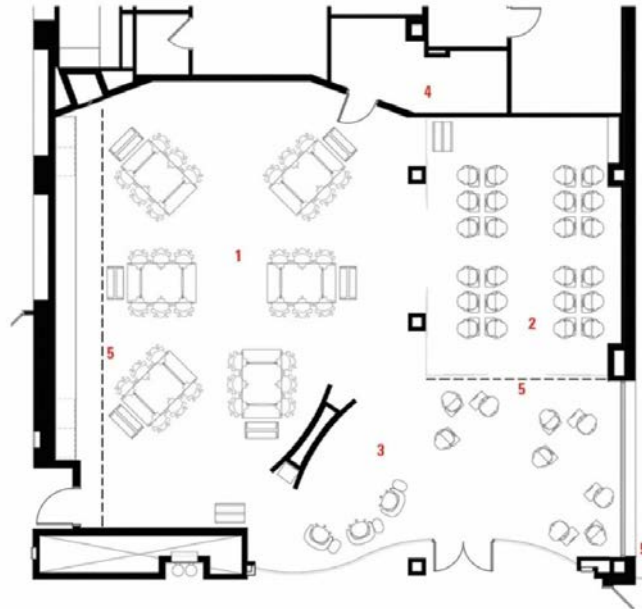
Conceptual Floor Plan



Conceptual Reflected Ceiling Plan

Onondaga Community College - Whitn3y Commons

- 1. Large Group Learning
- 2. Collaborative Area
- 3. Small Group Learning
- 4. Media Closet
- 5. Electronic Ticker Display

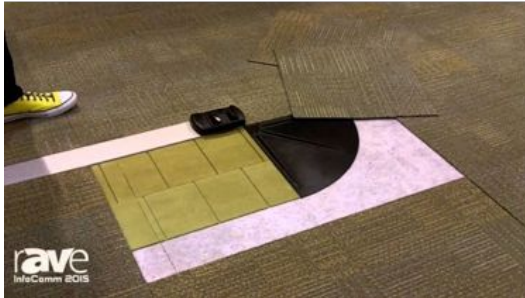
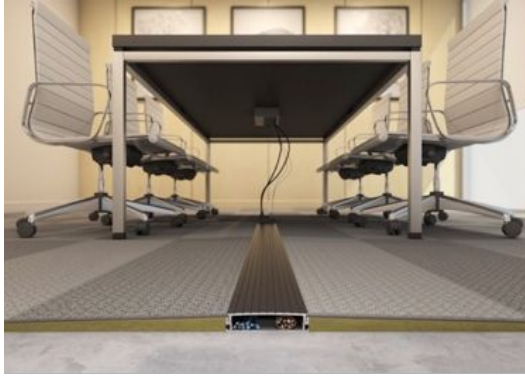


-
- This architectural floor plan illustrates the Temple of Aphaia at Aegina. The plan shows the temple's footprint, including the cella (sanctuary) and the surrounding colonnade. Key features include:
- 1:** The central cella, which is a square room with a circular apse at one end.
 - 2:** The circular apse at the rear of the cella.
 - 3:** The circular apse at the front of the cella.
 - 4:** The circular apse at the front of the cella.
 - 5:** The circular apse at the front of the cella.
 - 6:** The circular apse at the front of the cella.
- The plan also shows the surrounding colonnade, which is a rectangular room with a circular apse at one end. The plan is divided into several areas, each labeled with a number in red. The plan is oriented with the entrance at the top.

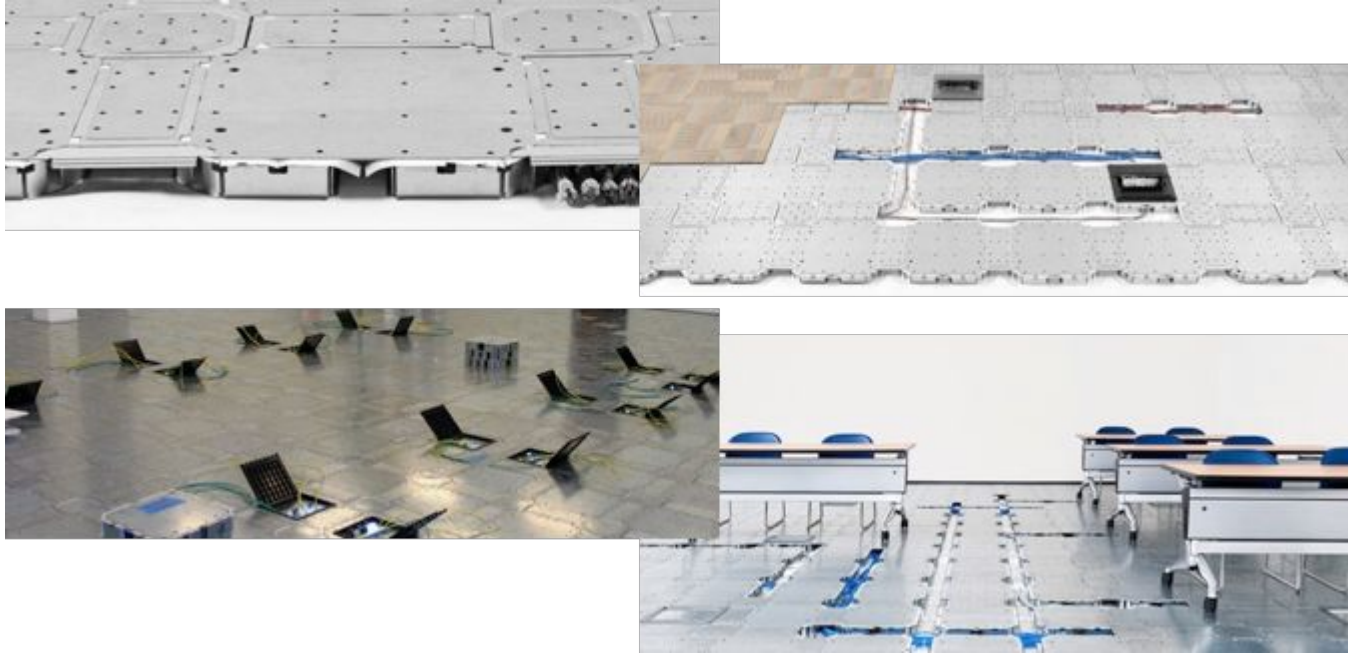
Onondaga Community College - Whitn3y Commons



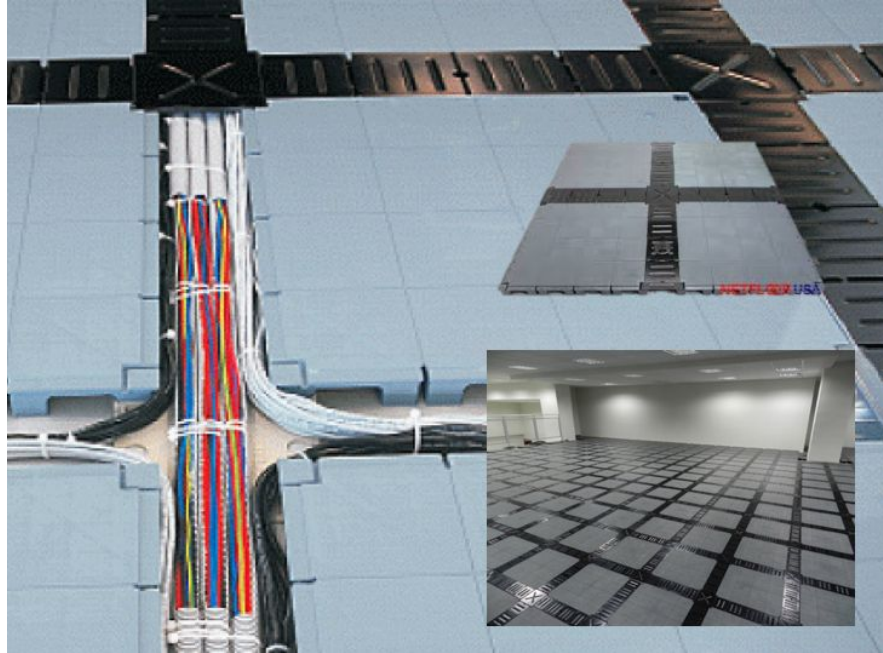
Onondaga Community College - Whitn3y Commons



Onondaga Community College - Whitn3y Commons



Onondaga Community College - Whitn3y Commons



Onondaga Community College - Whitn3y Commons



Onondaga Community College - Whitn3y Commons



Onondaga Community College - Whitn3y Commons



Onondaga Community College - Whitn3y Commons



Onondaga Community College - Whitn3y Commons



Onondaga Community College - Whitn3y Commons



Onondaga Community College - Whitn3y Commons



Questions and Discussion

- What tools/resources are you utilizing when integrating technologies in common spaces?
- Do you have campus standards for the same?



SUNY/PPAA
State University of New York
Physical Plant Administration Association

PPAA 2019

Track 1: Technology & Emerging Trends

Technology and Adaptive Space Reuse Q&A

king+king
ARCHITECTS



Archi-Technology
Technology Consultants LLC