IT Standards and Services
for
New Building Construction and Renovation
of Existing Spaces

Table of Contents

Section1: Overview

Section 1.1: PURPOSE

This document specifies requirements for:

* Communications (voice/data) cabling and terminations

* Access control system, hardware, and cabling

* Classroom technology and integrated audio/visual equipment

* Building automation, control, and alarm integration

* Emergency and courtesy telephones

Section 1.2: AUDIENCE

This document should be used by architects, engineers, project managers, and contractors, both internal and external to SIUE responsible for the design, renovation, or construction of SIUE facilities.

Section 1.3: VARIATIONS

These specifications are intended to be a guide to be used in the preparation of more specific bid and construction documents. Specific project requirements may require alternatives to the specifications outlined.

Variations to these specifications should be approved in advance of bid or construction by an authorized Information Technology Services (ITS) representative.

Section 1.4: VERSION

The most recent version is available at the following locations

Web: https://www.siue.edu/its/construction/

Phone: 618-650-5500

Section 1.5: CHANGELOG

- 2016-02-15: Initial draft document released for review
- 2017-02-24: Final document released for publication
- 2019-07-31: Added detail about acceptable door access panel location

Section 2: Technology by Space

The section describes the various Technology items and IT related infrastructure that ITS recommends considering when designing a new building or renovation of a existing space. Each sub-section is organized by the various space types that exist in a building and provides additional details of technology found in that space.

Section 2.1: Building Entry Points

Two types of entry points into a building that should be considered for Technology items and IT related infrastructure are occupant entry point and infrastructure entry points.

Section 2.1.1: Occupant Entry Points

Card readers for access systems and security cameras are technology that has been identified to be located at some occupant entry points for the purpose controlling and recording entry into a building.

Door Access Systems

SIUE Facilities Management is responsible for managing authorizations of users to gain entry through doors at Exterior Entry points.

- See section 3.6 of this document for general information on these systems.

Camera System
- See section 3.2 of this document for general information on these systems.

Section 2.1.2: Infrastructure Entry Point and Pathway

A entry point will be needed into a building for communications cabling that connects to the SIUE Communication Network maintained by SIUE Information Technology Services (ITS). A normal multi-story building will need two 4" conduits (conduit size could be smaller for smaller buildings) for a communications entry point that will connect a communication/IT closet (Specifications in section 2.6 of this document) with the building's source for communications.

Please contact SIUE ITS-Telecommunications to determine communication sources

Typically, both fiber and copper communication cables will be run into a building through this entry point.

- Specifications for copper and fiber communication cables are in section 4.2.1 of this document.
- Information on using pairs of copper or strands of fiber for purposes outside of the SIUE Communications Network is in section 5.1 of this document.

Section 2.2: Hallways

Hallways will contain technology that is available for use by all University students, faculty, and staff. Examples include Copy/Print stations, House and Emergency phones, and Wireless Internet. Technology used to disseminate information, like Digital Signage, will also be in these areas.

Academic Copy/Print Stations

Copy/print stations may be in hallway areas that are designed as meeting or waiting areas.

- See section 3.4.1 of this document for general information on these systems.

Digital Signage

Digital signage may be located inside building entry points or in areas designated for meeting/waiting.

- See section 3.5 of this document for general information on these systems.

House and Emergency Phones

Major Hallways of campus buildings sometimes require house phones to be installed in major corridors or in hallways near Labs. If so, cable infrastructure will need to be provided at house phone locations.

- See section 3.7.4 of this document for general information on these systems.

Wireless Campus Network Access

*** In Hallways, wireless access point locations will need to be spaced every 30 feet ***

- See section 3.3.2 of this document for general information on these systems.

Section 2.3: Classrooms

Classroom spaces generally need infrastructure for data communications. If the classroom is designated as a SMART (Technology-enhanced) classroom it will require additional infrastructure for audio and video enhancements.

ITS should be consulted about the layout of these spaces by the 50% design stage of the project to ensure it aligns with the technology being provided.

In general, all classroom spaces will have wireless internet coverage.

Wireless Campus Network Access

*** One wireless access point location is needed per Classroom ***

- See section 3.3.2 of this document for general information on these systems.

Technology needs of the various types of classroom spaces are detailed below.

Section 2.3.1: Specialized Learning Spaces

Specialized learning spaces are teaching and learning areas that are uniquely configured for specific school or department needs. These spaces could require a variety of different technology making specific infrastructure details difficult. SIUE's ITS - Labs and Classrooms and Telecommunications groups should be consulted before making any final decisions regarding infrastructure in these types of spaces.

Section 2.3.2: Smart (Technology-enhanced) Classrooms

Audio and Video

Generally, at a minimum, smart classroom spaces will have a dedicated display (TV, projector, etc.), a teaching lectern, AV equipment, and speakers. The teaching lectern will house the AV equipment, network equipment, and will be a termination point for all A/V, network and voice wiring. This lectern will also require 120v power.

- See section 3.1 of this document for general information on these systems.

Smart Classrooms usually require cable infrastructure for a house phone to be installed in or near the lectern so that the user of that space can easily request/receive technology support.

- See section 3.7.4 of this document for general information on these systems.

Wired Campus Network Access

Smart classrooms will require cable infrastructure for one data connection to be installed by the contractor at each lectern location. SIUE will provide a managed switch in the lectern for additional connectivity if needed.

- See section 3.3.2 of this document for general information on these systems.

Section 2.3.3: Computer Classrooms

Audio and Video

Generally, at a minimum, computer classroom spaces will have a dedicated display (TV, projector, etc.), a teaching lectern, AV equipment, and speakers. The teaching lectern will house the AV equipment, network equipment, and will be a termination point for all A/V, network and voice wiring needed for the lectern. This lectern will also require 120v power.

- See section 3.1 of this document for general information on these systems.

House Phone

Computer Classrooms usually require cable infrastructure for a house phone to be installed in or near the podium so that the user of that space can easily request/receive technology support.

- See section 3.7.4 of this document for general information on these systems.

Wired Campus Network Access

Computer classrooms will require cable infrastructure for one data connection to be installed by the contractor at each computer location and each lectern location. SIUE will provide a managed switch for additional connectivity at the lectern.

- See section 3.3.1 of this document for general information on these systems.

Section 2.4: Labs

Lab spaces usually have unique technology needs, making specific infrastructure details difficult. In general, they can require infrastructure for audio and video systems, data and voice communications, camera systems for security or monitoring, and door access systems.

ITS should be consulted about the layout of these spaces by the 50% design stage of the project to ensure it aligns with the technology being provided.

All lab spaces will require wireless network coverage.

Wireless Campus Network Access

*** One wireless access point location is needed per Lab***

- See section 3.3.2 of this document for general information on these systems.

Technology needs of the various types of lab spaces are detailed below.

Section 2.4.1: Computer Lab

Desk or House phone

Computer classrooms may require cable infrastructure for a desk or house phone to be installed in or near the supervisor desk.

- See section 3.7.3 of this document for general information on Desk Phones.

- See section 3.7.4 of this document for general information on House Phones.

Wired Campus Network Access

Each computer location will require cable infrastructure for a data connection:

- See section 3.3.1 of this document for general information on these systems.

Door Access Systems

Some computer labs are not staffed by a supervisor/attendant during open times. These labs typically require a Door Access system to authorize access to them.

- See section 3.6 of this document for general information on these systems.

Camera system

Some computer labs are not staffed by a supervisor/attendant during open times. These labs typically require a security camera system to document any incidents that may occur in these spaces.

- See section 3.2 of this document for general information on these systems.

Section 2.4.2: Teaching Lab

Wired Campus Network Access

Standard Labs will require cable infrastructure for at least one data connection to be installed.

- See section 3.3.1 of this document for general information on these systems.

Section 2.4.3: Research Lab

Wired Campus Network Access

Standard Labs will require cable infrastructure for at least one data connection to be installed.

- See section 3.3.1 of this document for general information on these systems.

Door Access Systems

Most research labs are not open for public use. These labs typically require a Door Access system to authorize access to them.

- See section 3.6 of this document for general information on these systems.

Camera System

Some teaching laboratory spaces require camera systems to document research that is being conducted in them.

- See section 3.2 of this document for general information on these systems.

Section 2.5: Offices and Suites

Office spaces generally require infrastructure for data and voice communications. If the office suite contains a conference room it may require some infrastructure for audio and video enhancements as well. Often existing services (such as desktop computer, faxes, and copier/printers) will need to be scheduled to moved in and out of these spaces before and after construction depending on whether it is new construction or a renovation.

All office spaces will require wireless network coverage.

Wireless Campus Network Access

*** Depending on size, one or more wireless access point location is needed per office suite***

- See section 3.3.2 of this document for general information on these systems.

Section 2.5.1: Offices and Workspaces

Desk phone

Office workspaces usually require a desk phone to be installed near every desk location.

- See section 3.7.3 of this document for general information on these systems.

Wired Campus Network Access

Each desk will usually require cable infrastructure for a data connection:

- See section 3.3.1 of this document for general information on these systems.

Section 2.5.2: Waiting / Reception spaces

Digital Signage

Some departments use Digital Signage systems in their waiting areas to keep the campus community updated on the departments activities.

- See section 3.5 of this document for general information on these systems.

Section 2.5.3: Conference / Meeting spaces

Conference or Desk phone

Conference areas usually require a phone for communication purposes. Small conference areas may use a desk phone while larger areas will need a conference phone that have superior microphones and speakers.

- See section 3.7.2 of this document for general information on Conference phones.
- See section 3.7.3 of this document for general information on Desk phones.

Wired Campus Network Access

Each desk will usually require cable infrastructure for a data connection:

- See section 3.3.1 of this document for general information on these systems.

Section 2.5.4: File / Print Spaces

Fax Line

Fax stations need will require cable infrastructure to be installed that can be used for a voice connection:

- See section 3.7.1 of this document for general information on these systems.

Wired Campus Network Access

Each Copier/Printer station will usually require cable infrastructure for a data connection:

- See section 3.3.1 of this document for general information on these systems.

Section 2.6: Communications and IT closets

Communication and IT closets is a space or room dedicated to cable terminations and permanent equipment mounting frames or racks. Ideally this space should be located towards the center of the building due to cable length restrictions with communications cabling.

ITS should be consulted about the location of these spaces by the 50% design stage of the project. This space shall be a minimum of 10' x 9'. When allowed by code the door shall swing out into the hall way. Telecommunications, Network, and Access Control system locations should be approved by ITS prior to bid or construction.

Section 2.7: Electrical, Mechanical, and Other Spaces

Electrical and Mechanical spaces typically need data and voice communication technology for managing and monitoring systems from a central location.

Section 2.7.1: Elevator Control Locations

Elevator phone line

Each Elevator service typically requires a POTs (Plain Old Telephone system) line for the phone built into the car.

- See section 3.3.1 of this document for general information on these systems.

Door Access Systems

Some elevators require a door access system to restrict access to the elevator or certain floors the elevator accesses. Setting up door access for a elevator may require special hardware not used in most door access installations.

<center>***Please contact SIUE ITS to review design of elevator door access systems***</center>

- See section 3.6 of this document for general information on these systems.

Section 2.7.2: Fire Systems Control Locations

Alarm, Fax, and Modem lines (POTs line)

Each Fire control panel may require cable infrastructure for a modem connection to be used for communication to a central monitoring console:

- See section 3.7.1 of this document for general information on these systems.

Wired Campus Network Access

Each Fire control panel will usually require cable infrastructure for a data connection to be used for communication to a central monitoring console:

- See section 3.3.1 of this document for general information on these systems.

Section 2.7.3: HVAC Control Locations

Wired Campus Network Access

Some HVAC control panels will require cable infrastructure for a data connection to be used for communication to a central management/monitoring console:

- See section 3.3.1 of this document for general information on these systems.

Section 2.8: Building Exterior

Camera System

Some exterior areas of a building, like high-traffic walkways and parking lots, may require a camera system to document incidents that may occur in these areas.

- See section 3.1 of this document for general information on these systems.

Emergency Phone

Some exterior areas of a building, like high-traffic walkways and parking lots, may require a CODE BLUE emergency phone to allow the Campus Community to send a emergency notification to the police when a incident occurs.

- See section 3.7.4 of this document for general information on these systems.

Wireless Campus Network Access

Some exterior areas of building provide outdoor meeting and sitting areas for the campus community that will require Wireless Campus Network access.

- See section 3.3.2 of this document for general information on these systems.

Section 3: Common Technology on SIUE Campus

Section 3.1: Audio and Video

SIUE has a variety of media enhanced spaces on campus used for teaching, presentations, conferencing, and distance learning. These spaces will have one or more displays (either projector systems or LCD's) as well as audio systems. SIUE uses Crestron media controllers to integrate and control the functionality of this equipment and to provide a more user-friendly interface to the clients of these spaces.

It is recommended that ITS be involved in the design of these spaces so that they meet the standards used elsewhere on campus.

- Specifications for audio/video systems are in section 4.1.
- Information for Audio/Video consultation is in section 5.7.

Section 3.2: Camera Systems

Security cameras on the SIUE campus are preferred to be IP-cameras connected to the SIUE network and record to a centrally managed DVR.

Please contact the SIUE Police department to coordinate management of Security Cameras

Research cameras used for documentation in lab research areas on SIUE campus are preferred to be IP-cameras connected to the SIUE network and record to a department managed DVR.

- Specifications for Cameras Systems are in section 4.4.2.

Each IP-camera location will require wiring for Wired Campus Network Access:

- Specifications for data wiring are in section 4.2.3.
- Information to start service for Network Access is in section 5.5.
  - o Note: Power-Over-Ethernet (POE) is a service option for powering cameras.

Each DVR location will require wiring for Wired Campus Network Access:

- Specifications for data wiring are in section 4.2.3.
- Information to start service for Network Access is in section 5.5.
  - o Note: Power-Over-Ethernet (POE) is a service option for powering cameras.

Section 3.3: Campus Network Access

Section 3.3.1: Wired Network Access

Many devices on the SIUE campus require wired network access. In general, each location will require cable infrastructure for a data connection at this location.

- Specifications for data wiring are in section 4.2.3.
- Information to start service for Network Access is in section 5.5.

Section 3.3.2: Wireless Network Access

SIUE ITS maintains the wireless network system for the entire SIUE campus. The wireless network system provides campus network and internet access to students, faculty, and staff (and guests in some cases). Indoor access points for the wireless network system will need to be installed in the ceiling and

are preferred to mount on an electrical box. Outdoor access points can be mounted on a pole or on the side of a building. Access points will require Cat6A cable infrastructure for a single data connection. Access points will be powered via their data cable using Power-Over-Ethernet (POE).

Please contact SIUE ITS to review wireless access point locations

- Specifications for mounting wireless access points are in section 4.2.3 of this document.
    - Includes specifications for cable infrastructure.
- Information on requesting expansion of the wireless network service is in section 5.5 of this document.

Section 3.4: Copy/Print Stations

Section 3.4.1: Academic/Open stations

Student copy and print locations are occasionally located in hallways or in open computer labs. These locations often combine a computer workstation and a multi-function print device. These locations require cable infrastructure for two data connections and a dedicated 120V electrical outlet.

- Information to start service for an Academic Copier is in section 5.6.

Each Copier/Printer location will require wiring for Wired Campus Network Access:

- Specifications for data wiring are in section 4.2.3.
- Information to start service for Network Access is in section 5.5.

Section 3.4.2: Administrative stations

Administrative copy and print stations are usually located in file rooms or designate copier areas. These locations require cable infrastructure for a data connection and a dedicated 120V electrical outlet per device. Some stations will also have an integrated fax and require an analog fax line to be installed nearby.

- Information to start service for an Administrative Copier is in section 5.6.

Each Copier/Printer location will require wiring for Wired Campus Network Access:

- Specifications for data wiring are in section 4.2.3.
- Information to start service for Network Access is in section 5.5.

Section 3.5: Digital Signage

Digital Signage systems on the SIUE campus usually involve Commercial-grade monitor/ LCD between 40" - 60" in size that connects back to a computer that contains their content. The computer that contains the display content can be securely mounted to the back of the monitor or located in a nearby Communication/IT closet. If multiple displays will be installed and all displays will display the same content, it is preferred that displays share the same computer for content (using a video output splitter) located in a central Communication/IT closet.

SIUE ITS supports the primary Digital Signage system on campus known as Visix. This system requires a license to use.

- Specifications for Visix digital signage system are in section 4.3.1 of this document.

- Information on requesting use of the Visix digital signage system is in section 5.4 of this document.

Computers that contain display content will require cable infrastructure for Wired Campus Network Access:

- Specifications for data wiring are in section 4.2.3.
- Information to start service for Network Access is in section 5.5.

Section 3.6: Door Access Systems

SIUE uses a card access system from CBORD called CS-Gold. This system allows central management of user's access rights to door locations and scheduling locking/unlocking of door locations. Card readers for access systems can be configured in a variety of ways on the SIUE campuses. Three common configurations are:

- Electronic locks with built-in card readers
- Card reader combined with an electronic strike
- Card reader combined with an electronic crash bar

In typical configurations, a user will need to swipe their card to unlock a door or if the door is handicap accessible the door will automatically open. In high-security areas a keypad may also be built into a card reader and the user will be required to swipe their card plus enter in a pin number to gain entry.

- Specifications for hardware and infrastructure that can be used with SIUE's CBORD access system are in section 4.4.1 of this document.
- Information on how to subscribe to be a user of the CS-Gold door access service is in section 5.3 of this document.

Control panels for door access systems will require cable infrastructure for Wired Campus Network Access:

- Specifications for data wiring are in section 4.2.3.
- Information to start service for network access is in section 5.5.

Where possible, control panels for door access systems should be installed within a Communication/IT closet.

Section 3.7: Telephony

SIUE uses a Telephony system that is a mixture of analog, digital, and IP phones. New buildings and buildings undergoing major renovation will be using IP phones as the primary telephony device and will need to be able to support analog line (POTS line) in a few select locations.

Section 3.7.1: Alarm, Fax, and Modem lines (POTs line)

Alarm, Fax, and Modem lines are analog phone lines that do not include any phone equipment as part of their service. These lines can be used to dial any campus phones 4-digit extension or call off campus with an authorization code. Each location will require cable infrastructure for a voice connection.

- Specifications for wiring Alarm, Fax, and Modem lines are in section 4.2.3 of this document.

- Information on requesting activation or moving of an existing Alarm, Fax, and Modem line service is in section 5.8 of this document.

Section 3.7.2: Conference phone

Conference phones are typically single-line digital or IP phones and can be used to dial any campus phones 4-digit extension or call off campus with an authorization code. Each location will require cable infrastructure for a voice connection.

- Specifications for wiring Conference phones are in section 4.23. of this document.
- Information on requesting activation or moving of an existing Conference phone service is in section 5.8 of this document.

Section 3.7.3: Desk phone

Desk phones are typically multi-line digital or IP phones and can be used to dial any campus phones 4-digit extension or call off campus with an authorization code. Each location will require cable infrastructure for a voice connection.

IP Desk Phones require Wired Campus Network Access to function. Some SIUE IP Desk Phones can share their Campus Network Access with other devices like desktop computer. In these cases, only cable infrastructure for one data connection is required.

- Specifications for wiring Desk phones are in section 4.2.3 of this document.
- Information on requesting activation or moving of a existing Desk phone service is located in section 5.8 of this document.

Section 3.7.4: House and Emergency Phones

House phones are typically single-line analog or IP phones and can be used to dial any campus phones 4-digit extension or call off campus with an authorization code.

Emergency phones are typically a red single-line analog phone and will directly dial the campus police when the receiver is lifted. Infrastructure for these phones locations are typically located near areas that need a quick communication point for security or life/safety purposes.

Each location will require cable infrastructure for a voice connection.

- Specifications for wiring House and Emergency phones are in section 4.2.3 of this document.
- Information on requesting activation of a House or Emergency phone service is in section 5.8 of this document.

Section 4: Technology Specifications

The following specifications are the minimum requirements SIUE will accept for the listed technology.

Section 4.1: Audio and Video (classrooms and conference rooms)

Section 4.1.1: Mounts

Mounts are generally provided by the contractor based on the type of display device requested by the customer. SIUE's ITS - Labs and Classrooms group should be consulted before making any final decisions, but general guidelines are:

Projector Mounts in Standard Classrooms
- The contractor is expected to provide ceiling plates, 1.5" down tubes, and projector mounts at all projector locations.
- The exact location of projectors will be determined with IT staff on a project by project basis.
- A rough location, for cabling runs, can be determined by using a throw ratio of 1.3 to 2.
- The height of the projector mount should roughly match the top of the projector screen.

Products - Standard Projector Mounts
- Chief RSMAUS (Lock A)

Projector Mounts in Large Lecture Halls and Auditoriums (more than 600 sq. ft.)
- The contractor is expected to provide ceiling plates, down tubes, and projector mounts at all projector locations.
- The exact location of projectors will be determined with IT staff on a project by project basis.

LCD Mounts
- The contractor is expected to provide ceiling plates, down tubes, and LCD mounting brackets for both ceiling and wall mounted LCD displays at all locations.
- In locations where LCD displays will be mounted to the wall, plywood backing should be installed behind the wall.

Section 4.1.2: Projection Screens

Both manual and electric projector screens should be provided and installed by the contractor, and sized based on the size and use of the room. SIUE's ITS - Labs and Classrooms group should be consulted before making any final decisions, but general guidelines are:

- Projector screens should be provided and installed by the contractor, and sized based on the size and use of the room.
- Projection screens should adhere to a 16:9 format.
- Electric screens should also include a low voltage relay control box and connect to a 22/4 control cable that is routed back to the A/V controller in the room.
- The University's IT department may also be consulted for a recommendation on screen size and selection.

Products – Manual Screen
- Da-Lite Model C with CSR Wide Format

Products – Electric Screen
- Da-Lite Tensioned Advantage Electrol

Section 4.1.3: AV Cabling

In general, SIUE prefers to keep cabling runs to a minimum and use specialized equipment to convert audio and video signals rather than installing antiquated cables (RGB, composite, S-Video, etc.). SIUE's ITS - Labs and Classrooms group should be consulted before making any final decisions, but general guidelines are:

Display Device cabling runs

- In all cases, (2) factory terminated CAT6 cabling runs should be provided between the display device and the source equipment.
- One cable run will be used to transmit HDBaseT communications and the second will be used as a backup.
- Runs longer than 100 feet should utilize shielded CAT6 cabling and shielded keystone jacks.

Speaker cabling runs

- All speaker locations should be pre-wired using a minimum of 18-gauge stranded wiring, wired in series for mono audio back to the audio source, unless otherwise specified.
- In conference rooms and hallways, speaker wiring should run back to the display device.
- The contractor will provide 70 volt speakers in all locations except for those connected to a building PA or emergency type paging or alert system.

Section 4.1.4: Floor boxes and Media plates

SIUE's ITS - Labs and Classrooms and Telecommunications groups should be consulted before making any final decisions, but general guidelines are:

Floor boxes for Media

- In all cases where floor boxes for media are used, the contractor should provide the floor box.
- Any CAT6 cabling from a display device should be routed to this location.

Products - Floor Boxes

- Wiremold Evolution 8AT

Wall Plates for Media

- In all cases where wall plates for media are used, a 2-gang wall box should be provided by the contractor.
- Any CAT6 cabling from a display device should be routed to this location.
- In all cases, the University will provide the wall plate.

Section 4.1.5: Millwork

This pertains only to millwork expected to house Audio Visual equipment. SIUE's ITS - Labs and Classrooms group should be consulted before making any final decisions, but general guidelines are:

- Any millwork that will house A/V equipment (podiums, lecterns, cabinets, etc.) should include standard 19" racks.
- Please consult the University's IT department regarding rack height.
- Any equipment racked by the contractor should be mounted using Torx security screws.
- Any door, drawer, or other locked opening should be compatible with "Best" cores.

Section 4.1.6: Electrical Service

- Electrical service should be provided to all source and display locations.
- Wall plates for media should also include electrical service for powering a device located in the wall box.

Section 4.1.7: Other Wall or Ceiling mounted devices

- Mounting specifications for any other wall or ceiling mounted A/V device should be handled on a case by case basis with the University's IT department.

Section 4.1.8: Programming

- The University is responsible for programming all A/V equipment, unless otherwise specified.

- Programming for lighting controls is expected to be performed by the vendor, however, please consult SIUE's ITS - Computer Labs and Classrooms group to identify opportunities to integrate lighting or HVAC controls into the room control system.

Section 4.1.9: A/V Equipment

- Please consult with SIUE's ITS - Computer Labs and Classrooms group to review any equipment being proposed.

Section 4.2: Communications

Section 4.2.1: Structured Cabling - Backbone Cabling

QUALITY ASSURANCE

- Installer must be certified by the cable and connector manufacturer(s) to install the system to provide full warranty coverage.
- Cabling system should be tested and receive a passing result
- The cabling should be tested with a calibrated tester with the cable results being identified with SIUE's labeling scheme
- Documentation can be paper or electronic

CABLING SYSTEM WARRANTY

- Provide a 20-year minimum Fiber Cabling System Warranty.

OPTICAL FIBER BACKBONE CABLING

Fiber optic cable plans should be reviewed in detail with ITS prior to bid or construction.

Labeling

- Cables should be labeled to match a scheme used by SIUE, which is as follows:
  - UUUUUU-WWWWWW-XXX-YYY-ZZ
    - UUUUUU is the originating communications closet's building code and room number.
      - This closet will be the closest to the communications core (DH)

- WWWWWW is the destination communications closet's building code and room number

- XXX is the cable class (OM1, OM2, OM3, OM4, OS1, OS2)

- YYY is the strand count of the cable
- ZZ is a cable number to differentiate cables with the same run path
  - Most commonly this will be 01

Please contact SIUE ITS-Telecommunications to confirm labeling scheme

Cable/Terminating equipment manufacturers:
- Corning
- CommScope.
- Panels
- Corning CCH compatible

Cable
- Inside plant cable should be 12-strand multimode OM-4 50-micron fiber OR 24-strand Single-mode fiber unless otherwise specified.
- Outside plant cable should be 24- strand Single-mode fiber.
- Fiber cables should be single home run from MDF closet to all IDF closet locations
- Fiber cable should be continuous with no splices end to end.

Connectors
- Duplex LC connectors should be used to terminate fiber.

Fiber Termination Enclosure
- shall be mounted at the top of the communications rack and be of open style (not sliding) with a cover to protect the connectors.
- Enclosures should be at least 2 rack units tall or larger to accommodate required terminations or splices

COPPER BACKBONE CABLING
Labeling
Cable Manufacturers:
- Superior Essex
- General

Terminating Equipment Manufacturers:
- Commscope

Cable
- single home run from all MDF/BDF closets to all IDF closet locations
- Inside plant cable (between BDF and IDF) should be a 25-pair 24 AWG Cat3 UTP terminated on a 110 block
- Outside plant cable (between buildings) should be a 100-pair terminated 24 AWG CAT3 UTP terminated on a 110 block

- Cable should be grounded

Section 4.2.2: Structured Cabling - Equipment and Telecommunication Rooms

Telecommunications, Network, and Access Control system locations should be approved by ITS prior to bid or construction. "IDF" is used to specify a space or room dedicated to cable terminations and permanent equipment mounting frames or racks. Minimum size for telecommunication closets shall be 10' X 9'. One wall shall be covered with fire treated ¾" plywood back board. Back board shall consist of 4'X8' sheets mounted vertically and painted white.

Where possible, access control equipment should be installed within a network IDF room.

Space shall be free of air-borne particles and have conditioned air prior to the installation of any Campus Network equipment.

Power

Data network equipment requires a minimum of two, dedicated circuits located adjacent to the network equipment rack. If available, generator backed emergency power should be used to support VoIP equipment:

- one 120VAC, 20A circuit with four NEMA 5-20 receptacles in a single junction box
- one 120VAC, 30A circuit with a single L5-30R
- In buildings with generator-backed emergency power, an additional non-emergency 20A power circuit should be supplied with four NEMA 5-20 receptacles

OPEN FRAME RELAY RACKS

- Two racks will be installed side by side in each communication's closet
  - One rack will be dedicated to patch panels and cable management to support horizontal and vertical cabling
  - One rack will be dedicated for owner-supplied and installed network equipment.
  - Equipment racks shall be grounded
- Size: Fully adjustable nineteen-inch (19") mounting verticals. Overall height shall be 84" with a minimum of 79" of usable height 38U, unless noted otherwise.
- Construction: The frame shall be made of extruded aluminum. Adjustable vertical mounting rails shall be universal EIA channel 1.265" x 3", drilled and tapped on both sides with 12-24 mounting holes at universal EIA spacing.
- Mounting: All racks shall be floor mounted and permanently fixed to the floor with bolt-down kits.
- Ladder Rack: Should be permanently mounted across the room wall from where the cable tray or conduit enter the IDF to the top of the ladder rack.
- Cable Management: Provide horizontal cable management on front of rack and vertical cable management on both front and rear of rack. Horizontal managers shall be placed above and below each patch panel; size of manager shall be 1.75" (1RU) high. Horizontal managers shall have metallic routing clips (plastic is not acceptable) for uniform distribution of cables inserted into patch panels. Provide three (3) additional horizontal managers per rack location for routing of patch cords into owner provided hubs and switches.
- Manufactures:
  - Ortronics.(recommended)
  - Chatsworth (CPI).
  - Great Lakes

- CAT 6A: Patch panels for data runs designated for Wireless Access Points (WAP) in the structured wiring cables shall be MODULAR with capability to accept inserted CAT 6A jacks/connectors (as described elsewhere in this section) in 2-port variety so that it will be a 48-port capacity panel. Each panel shall be provided with labeling strips on the front and rear for labeling each circuit. Panels shall be rack-mounted. Contractor shall determine number of terminations required per wiring closet, add 25% additional capacity and provide the next largest patch panel.
- CAT 6: Patch panels for data runs designated in the structured wiring cables shall be MODULAR with capability to accept inserted CAT 6 jacks/connectors (as described elsewhere in this section) in 2-port variety so that it will be a 48-port capacity panel. Each panel shall be provided with labeling strips on the front and rear for labeling each circuit. Panels shall be rack-mounted. Contractor shall determine number of terminations required per wiring closet, add 25% additional capacity and provide the next largest patch panel.
- CAT 6A and CAT 6 cabling should be terminated on separate patch panels.
- All communications cabling serving a room or area shall terminate at a single patch panel at a single data room – cabling shall not be "split" or divided between data rooms (IDFs) that connect to outlets within a particular room.
- The first panel should start at 70" off the floor (below fiber enclosure).
- The panels should be labeled sequentially and alphabetically starting with the letter A for the topmost panel.
- The patch panel port should be labeled with the room number that corresponding jack is located in.
- Patch Panel Manufacturers
  - Ortronics (recommended).
  - CommScope.
  - Panduit.
  - Leviton.

- Provide one (1) pre-manufactured CAT 6A patch cord per terminated CAT 6A patch panel port. Half of the total shall be three feet (3') in length, and the remaining half shall be five feet (5') in length
- Patch cords, optical cable and CAT 6A copper, shall meet all conventions / specifications conforming to the structured wiring arrangement described above, and shall be factory-manufactured.
- Patch cords manufacturer should match those of the cable and jacks being used and warrantied the same as the cat 6A cable system.

- Provide one (1) pre-manufactured CAT 6 patch cord per terminated patch panel port. Half of the total shall be three feet (3') in length, and the remaining half shall be five feet (5') in length
- Provide one (1) pre-manufactured CAT 6 patch cord per terminated data drop (jack) in the offices, lab and instruction rooms, etc. Half of the total shall be seven feet (7') in length, and the remaining half shall be fifteen feet (15') in length.

- Patch cords, optical cable and CAT 6 copper, shall meet all conventions / specifications conforming to the structured wiring arrangement described above, and shall be factory-manufactured.
- Patch cords manufacturer should match those of the cable and jacks being used and warrantied the same as the cat 6 cable system.

Fiber Optic Patch Cords
- 4 - 3 meter LC –to- LC patch cords should be provided per IDF.
- Patch cords should be 50 micron or single mode to match the Inside plant fiber cable.

TELEPHONE TERMINATIONS
- All telephone terminations communication closets shall be 110 IDC type. Provide terminations in quantities required to terminate all cables at patch panels (premises, VoIP) or telephone terminal boards (TTB) for multi-pair trunks, as well as all cross- connects to Utility equipment. Provide all ancillary frames, clips, etc. required for complete installation.

Section 4.2.3: Structured Cabling - Horizontal Cabling

QUALITY ASSURANCE
- Installer must be certified by the cable and connector manufacturer(s) to install the system to provide full warranty coverage.
- Cabling system should be tested and receive a passing result
- The cabling should be tested with a calibrated tester with the cable results being identified with SIUE's labeling scheme
- Documentation can be paper or electronic

CABLING SYSTEM WARRANTY
- Provide a 20-year minimum CAT-6A & CAT-6 Cabling System Warranty.

Labeling
- Cables should be labeled to match a scheme used by SIUE, which is as follows:
  - WWXXXX-YZZ
    - WW is the building code,
    - XXXX will be the room number of the IDF.
    - Y is the alphabetical label of the patch panel on which the cable is terminated.
    - ZZ is the patch panel port #.

Please contact SIUE ITS-Telecommunications to confirm labeling scheme

CATEGORY 6A CABLE
- Unshielded Twisted-Pair CAT 6A Cable shall meet all the requirements for ANSI/TIA/EIA-568-C.1, requiring spectral bandwidth that may extend to 500 MHz for Multi-Gigabit applications.
- Cable length (excluding patch cables) should not exceed 260 feet.
- Jacket color shall be BLUE
- Cable Manufactures: UTP Enhanced CAT 6 (including patch cords):
  - Berk-Tek.
  - CommScope.
  - General Cable.

CATEGORY 6 CABLE

- Unshielded Twisted-Pair CAT 6 Cable shall meet all the requirements for ANSI/TIA/EIA-568-B.2 – Addendum 1-2002, Commercial Building Telecommunications Cabling Standard, Part 2: Transmission Performance Specifications for 4 pair 100-ohm Category 6 Cabling and support high-speed communication network applications requiring spectral bandwidth that may extend to 250 MHz for applications such as Fast Ethernet and Gigabit applications.
- Cable length (excluding patch cables) should not exceed 260 feet.
- Jacket color shall be BLUE
- Cable Manufactures: UTP Enhanced CAT 6 (including patch cords):
    - Berk-Tek.
    - CommScope.
    - General Cable.

HANGERS AND SUPPORTS FOR COMMUNICATIONS SYSTEMS

- Cabling must be run as concealed open-type plenum rated cable unless otherwise specified.
- Cabling is to be run in an open access support system using either J-hooks or cable tray unless otherwise specified.
- Cables shall be supported with "J-Hooks" a minimum of every six feet. Bridal rings can be used when supporting a maximum of six wires. Support devices are to be attached to existing permanent structure.
- Cables shall be continuous from outlet to termination equipment.
- Cables and supports shall be installed at a readily accessible location above ceilings.

CONDUITS AND BACKBOXES FOR COMMUNICATIONS SYSTEMS

- Furnish and install conduit rough-ins where shown on drawings. Typical rough-in shall consist of a two-gang outlet box, single gang trim ring, and a minimum 1" conduit stubbed above an accessible ceiling. Plastic bushings shall be installed on both ends of conduit. Install blank covers on all unused rough-ins.
- Provide conduit for non-plenum rated cable. Exposed or inaccessible cables shall be installed in conduit. Where possible cables/conduit shall be concealed.
- Conduits should be used where necessary.
- Conduits for all cable runs shall be sized for 40% maximum fill, unless otherwise specified.
- Conduits should have no more than 2 bends; straight runs are preferred w appropriate junction box or access panel attached. Conduit stubs with an accessible open junction (pull location) is preferred to bent conduit.
- Provide pull strings in all conduits and cable trays.
- Conduit bends shall accommodate radius requirements of fiber cable as necessary
- Provide sleeves in all walls which cable runs pass through.
- Provide access panels as necessary for cable routing.

Wireless locations

- Outlet boxes for Wireless locations will be ceiling mounted towards the middle of the space.
- Rough-in shall consist of a two-gang outlet box single gang trim ring.
- A 1" conduit shall be installed if in a locked (inaccessible) ceiling to an accessible location. Plastic bushings shall be installed on both ends of conduit. Install blank covers on all unused rough-ins.

Section 4.2.4: Structured Cabling - Work Area Components

CONNECTORS

- All data system outlets and connectors shall be certified to Category 6A or Category 6 standards depending on cable type.
- All data system locations shall utilize 8-position, 8-conductor conductors / jacks terminated using T568B
- Jacks shall be fog white or equivalent, modular, and labeled
- Exceptions to the specifications which request surface mounting in lieu of flush must be submitted and obtain approval prior to installation. Faceplates shall match material and color of jacks being installed.
- Cat 6A or Cat6 Jack and Wall Plate Manufacturers
  - Ortronics.

PATCH CORDS

- Provide one (1) pre-manufactured CAT 6A or CAT 6 patch cord per terminated patch panel port depending on the patch panel port type. Half of the total shall be three feet (3') in length, and the remaining half shall be five feet (5') in length
- Provide one (1) pre-manufactured CAT 6 patch cord per terminated data drop (jack) in the offices, lab and instruction rooms, etc. Half of the total shall be seven feet (7') in length, and the remaining half shall be fifteen feet (15') in length.
- Patch cords, optical cable and CAT 6 copper, shall meet all conventions / specifications conforming to the structured wiring arrangement described above, and shall be factory-manufactured.
- Patch cords manufacturer should match those of the cable and jacks being used and warrantied the same as the CAT 6a or CAT 6 cable system.

Labeling

Cat6A and Cat6 jacks should be labeled with the Cable ID of the attached cable.

Section 4.3: Mass and Emergency Notifications

Section 4.3.1: Digital Displays

- Displays will be connected via HDMI cabling to a Video content controller located either near the display or in a central IT closet.

- ITS will designate the location of the content controller

- ITS will need to be consulted on the size of the displays per location

- HDMI cabling can be extended using Cat6 cabling and HDMI extenders

- The contractor is expected to provide ceiling plates, down tubes, and LCD mounting brackets for both ceiling and wall mounted LCD displays at all locations.
- In locations where LCD displays will be mounted to the wall, plywood backing should be installed behind the wall.

Products - 40" - 42" Commercial/Professional Displays

- Sharp PN-U423
- NEC P403

- Or approved equivalent

Products - 46" - 48" Commercial/Professional Displays
- Sharp PN-U473
- NEC P463
- Or approved equivalent

Products - 53" - 55" Commercial/Professional Displays
- Sharp PN-U553
- NEC P553
- Or approved equivalent

Products - Mounts
- Chief
- Peerless STL670
- Or approved equivalent

Products - Video Distribution
- Crestron
- Kramer
- Black Box
- Hall Research
- Or approved equivalent

Section 4.4: Access Control and Monitoring systems

Section 4.4.1: Card Reader access systems

Products - Door Controller and Card Reader systems

SIUE uses the CS-Gold campus ID card system to provide access control on the Alton, Edwardsville, and East St. Louis campuses. Example equipment is specified below.

Construction and renovation projects should include access hardware and installation. SIUE departments are responsible for recurring costs per door to have CS-Gold control door access. ITS provides integration and configuration consultation services for access hardware. SIUE electricians are experience in installation of access hardware and wiring.

Proposed access control locations or modification to existing locations should be reviewed and approved in advance by ITS. Integration with elevators will require coordination between ITS, elevator contractor, and electrical contractor. Network Controller locations will require cabling infrastructure to access to the Wired Campus Network.

- Controllers should be contained in an enclosure, in an easily accessible location (not above ceiling grid)
- A local power supply is required to provide 12 or 24
- Provide battery back-up for controllers
- If controller is hardwired for power, provide a power switch near controller
- Use manufacturer approved cabling specs

- CBORD VertX EVO V1000 (Master Network Controller)
- Or approved newer version of above hardware

Products - Door Reader Interface
- CBORD VertX V100 (2 Door Readers)

- Or approved newer version of above hardware

Products - Input Monitor
- CBORD Vertx V200 (16 monitor points)

- Or approved newer version of above hardware

Products - Output Controller
- CBORD Vertx V300 (12 control relays)

- Or approved newer version of above hardware

Products - Card Reader
- CBORD Mercury MR-5
- CBORD Mercury MR-20
- CBORD Mercury BR-20
- Schlage AD-300 series lockset

Products - Power Supply
- Altronix

Door System Programming
- The University is responsible for programming the Door Controllers
- The University uses CBORD's CSGOLD system to program Door Controllers.

Section 4.4.2: Camera systems

Cameras systems should use IP cameras and locations should be coordinated with SIUE Police. SIUE Police should be consulted about DVR system that camera system will connect to.

Cabling requirements
- Cat 6 wiring should be used to connect cameras to the SIUE campus network.
- Wiring should be terminated in a nearby IT/Communications closet.

Power requirements
- Cameras will need be capable of being powered by POE.

Section 5: IT Services

Section 5.1: Communication Cabling

Description of Service Offering:

ITS is available to install and maintain communication cabling (Cat6, Fiber Optic, Copper voice cabling) for Telecommunications or Audio/Video needs when necessary.

Charges:

All communications cabling installations are charged a fee based on the amount of materials and labor required to perform the job.

How to request the service:

Please contact ITS at (618) 650-5500 or help@siue.edu to inquire about requesting this service. This service will require a Fiscal Officer signed Service Request to proceed.

Section 5.2: Desktop Computing

Description of Service Offering:

ITS offers several options to lease or purchase desktop and laptop computers from Apple or Dell for SIUE Faculty and Staff. Please see the following ITS websites for further details:

Computer Leases: http://www.siue.edu/its/fac_staff/lease_program/

Computer Purchases: http://www.siue.edu/its/fac_staff/purchase_program/

Apple Purchases: http://www.siue.edu/its/fac_staff/lease_program/apple_purchase_program.shtml

Charges:

ITS charges a set fee on a quarterly basis for leased computers.

How to request the service:

Please contact ITS at (618) 650-5500 or its_leasing@lists.siue.edu to inquire about requesting this service. This service will require a Fiscal Officer signed Service Request to proceed.

Section 5.3: Door Access System

Description of Service Offering:

ITS maintains a central door access system (CBORD CS-GOLD) for all three of SIUE's campuses, which allows use of card swipes and scheduling to lock and unlock doors.

Charges:

This service charges a month fee per door that is connected to the Door Access System.

How to request the service:

Please contact ITS at (618) 650-5500 or help@siue.edu to inquire about requesting this service. This service will require a Fiscal Officer signed Service Request to proceed.

Section 5.4: Digital Display System

Description of Service Offering:

ITS maintains a central digital display management system (VISIX) for all three of SIUE's campuses, which allows digital content to be shared on a local display or campus-wide.

Charges:

Contact ITS for more information about any charges associated with this system.

How to request the service:

Please contact ITS at (618) 650-5500 or help@siue.edu to inquire about requesting this service. This service may require a Fiscal Officer signed Service Request to proceed.

Section 5.5: Network Access

Description of Service Offering:

ITS provides general and specialized access to SIUE data network and to the Internet for faculty, staff, students and systems. Please see the ITS Telecommunication's website for further details:

http://www.siue.edu/its/network/facstaff/service.shtml

Charges:

ITS charges an activation fee and a monthly fee to connect to the SIUE data network.

How to request the service:

Please contact ITS at (618) 650-5500 or help@siue.edu to inquire about requesting this service. This service will require a Fiscal Officer signed Service Request to proceed.

Section 5.6: Copier/Printing

Description of Service Offering:

ITS offers several options to lease copiers for SIUE departments. For more information please see the ITS Copier/MFD Lease Program website:

http://www.siue.edu/its/fac_staff/lease_program/watts.shtml

Charges:

Please contact ITS for the costs associated with this program.

How to request the service:

Please contact ITS at (618) 650-5500 or its_leasing@lists.siue.edu to inquire about requesting this service. This service will require a Fiscal Officer signed Service Request to proceed.

Section 5.7: Technology- Enhanced Spaces

Description of Service Offering:

ITS offers consultation for designing technology-enhanced learning spaces. ITS can also coordinate the build and maintenance of these spaces or, at a minimum, act as an intermediary between the department and vendor.

Charges:

Costs may be associated on a case-by-case basis depending on scope of requirements. Please contact ITS for the costs associated with this service.

How to request the service:

Please contact ITS at (618) 650-5500 or help@siue.edu to inquire about requesting this service.

Section 5.8: Telephony

Description of Service Offering:

ITS provides a variety of voice service offerings to faculty, staff, housing students and systems. Please see the ITS Telecommunication's website for further details:

http://www.siue.edu/its/network/facstaff/service.shtm

Charges:

ITS charges an activation fee and a monthly fee to connect to the SIUE voice network

How to request the service:

Please contact ITS at (618) 650-5500 or help@siue.edu to inquire about requesting this service. This service will require a Fiscal Officer signed Service Request to proceed.

Appendix A: Project Checklist for IT-related Items

Early Design Phase
- Present overview of construction project and discuss how IT will be involved
- Discuss plans for all teaching and learning spaces
    - Allows ITS to help shape and better support teaching and learning on the campus
- Discuss capacity requirements/changes forecasted with the completion of the project
    - Allows ITS to plan for licensing changes for future use of technology

50% Design phase
- Review communication closet locations with ITS
- Review Classroom and lab layout with ITS

Pre- Design completion
- Review IT/Communication closet layout
- Review labeling of communication wiring for project
- Review location of Wireless Access Point locations
- Review location of Door readers for Door access control
- Review A/V design for classroom, conference rooms, and labs
- Review door access system design
- Request elevator phone lines if elevators will be installed

Construction phase
- Review submittals provided by the contractor for IT or related items.

Punch-list
- Review newly constructed/renovated spaces with architect/contractor/engineer.

Close-out phase
- Receive warranties and/or manuals for new systems to be maintained by ITS.