CONTRACTOR QUALIFICATIONS AND REQUIREMENTS

Contractor shall design and provide all materials and labor for the following scopes of work:

- Complete Structured data cabling solution including cabling, faceplates, jacks, patch panels, 2 post network equipment racks, and any necessary J hooks or other ceiling supports
- Security cameras (Axis brand cameras) that will connect to existing S2 system
- Installation of security cameras
- S2 NetVR server to support the cameras
- Key Card door access control end points that will connect to existing S2 system
- Audio Visual cabling
- Installation of wireless access points (equipment to be provided by the College)

  The contractor shall be responsible for providing communications infrastructure compliant to current standards; including the procurement of products, installation of cabling infrastructure, fire stopping, verification of performance, and documentation. In addition, the contractor must be an S2 authorized vendor and be able to properly configure all installed security cameras and door access points to integrate with the College's existing S2 NetBox Extreme infrastructure.

Contractor must possess a valid NC contractor's license, and BICSI Certification

Contractor employees shall act in a professional manner, and dressed appropriately for the task. No person shall bring alcoholic beverages, controlled substances, firearms, tobacco, or animals to the jobsite.

All packing material shall be disposed of at the end of each day. The Owner will not be responsible for the loss, theft, or damage of any equipment or material.

Contractor shall follow the security policies and procedures defined by the Owner and College staff. This may include BRCC College staff providing key access, and/or a keycard to access the College's main IT server room located in the renovated portion of the building. Contractor will need physical access to server room for portions of job involving S2 system, and fiber optic cabling.

The Contractor shall take all precautions necessary to protect existing structures. Any items that are damaged during the course of the work shall be repaired or replaced by the contractor at no cost to the Owner.

Contractor will install only material that is new and undamaged. Refurbished or used materials are not acceptable.

Owner expects the workmanship to be of high quality. All equipment shall be plumb and true with the structure. All materials shall be firmly secured in place, adequately supported, and permanent.

Owner will consider the project complete when all work has been completed, the final documentation has been delivered, and the work site has been cleaned to the Owners satisfaction.

Contractor agrees to replace or repair, as new, any defective work or materials, which are identified by the Owner within 2 years of final payment.

E. System Specifications and Standards

Data port wall jacks:

- 2, 4, 6, or 8 position faceplates shall be installed at each location as designated on Special Systems Floor Plan (pages designated ETnnn) and in accompanying worksheet
- Modular CAT 6 jacks should be used
- All faceplates should be labelled following a standard scheme including the telecom room number, patch panel, and port number (123-A-1, 123-B-1, etc.)

Patch Panels:

- 24 port patch panels by Panduit
- Patch panels should be labeled with letters
- Ports in patch panels should be labeled with numbers

Network equipment racks:

- Racks should be installed and bolted to floor and walls with appropriate ladders, vertical wire managers, and wiring supports in each Equipment Room.
- Should be mounted to the floor and oriented so that the front and back are accessible
- Should be mounted at least 6-inches from the nearest wall.
- Fiber optic patch panels should be installed at the top of the rack
- Copper cable patch panels should be installed below fiber patch panels
- Panels should be mounted with a 2 U gap between panels such that a 2 U network switch can be installed directly under patch panels
- Vertical cable management should be installed on one side of rack
- Contractor will install network switches in rack units between patch panels
  - 24 port switches should be fed from panel directly aboveContractor will install patch cables from panel to switch

Data Cable standards:

- All CAT 6 cable should be blue regardless of end use
- All patch cables should be non-booted (i.e. not have any material covering the clip)
- Patch cables for the network closets should be blue and 1 foot in length
- Cables connecting to access points and security cameras in ceiling should be terminated in a standard modular jack in the ceiling and a patch cable shall be used to connect the jack to the device
- Cable in the ceiling is to be kept at least 8-inches above the finished ceiling.
- Cable is to be left loose, without cable ties or tape, in cable trays.

Fiber Cable Standards:

- Each data/telecom room shall interconnect back to the College's core network infrastructure in Patton room 154F using 12 strand (6 pair) of OS2 single mode fiber optic cable
- All fiber optic shall confirm to OS2 Single Mode Fiber specifications
- All fiber optic cable shall have LC connectors on both ends
- Fiber optic cables should have sufficient slack to minimize the risk of a pinched cable
- Where indicated, network closets should also interconnect between floors using fiber optic cable standards outlined above

Standard Audio Video Cabling Scheme:

- 2 HDMI cables from designated workstation (generally indicated by PAV on diagram) to designated TV or projector location
- All HDMI cables must conform to the HDMI 2.1 "Ultra High Speed HDMI" standard
- 1 USB cable that follows the same path as HDMI cables
- The cables should be properly terminated in a modular jack and faceplate at the designated PAV box location
- The cables should have at least 2' of slack at the TV end to ensure the cables can plug into ports on the TV

Security Cameras:
- All security cameras should be Axis brand cameras
- The contractor is responsible for obtaining, configuring and installing all needed software licenses and configurations to add the security cameras to the College's existing S2 infrastructure
- The College will provide 10 interior Axis security cameras for use in the old section of the Patton building.
- Cables from patch panels to security camera location in ceiling should be terminated in ceiling near designated location using a standard modular jack in the ceiling. An appropriate length patch cable shall be used to connect the jack to the actual device

Wireless Access Points:

- Cables connecting to access point locations should be terminated in a standard modular jack in the ceiling and a patch cable shall be used to connect the jack to the device
- Wireless access points shall be properly mounted in the ceiling near the locations indicated on the provided floor plans
- The College will provide all wireless access points and wireless access point mounting hardware
- Provided wireless access points will be Cisco 9105i series or similar

F. Execution

Patton building on the campus of Blue Ridge Community College

This project will involve two stages:

- Existing Patton building cabling work to be performed within a month of signed agreement.
- New Patton building addition cabling work to be performed November/December 2021.

Furnish and install as needed, Cat6 cabling, cabling hangers, j-hooks, jacks, wall boxes, plates, patch panels, equipment racks, and all needed appurtenances, for all network, security cameras, wireless access points, and door access locations.

Requests for minor changes such as the addition of network port locations must be provided at the same unit price as the original bid, with no additional up-charges

Cabling work should take place after conduit, cable tray, and wall and floor mount boxes have been installed and before the walls and ceiling are finished

G. Documentation

The contractor shall provide documentation certifying the installation of all network cabling, both optical fiber and copper.

1. End-to-end testing shall be from wall port to patch panel port
2. Test results should show:
   a. Overall cable length.
   b. System continuity.
   c. Proper connectivity.
   d. Open pairs.
   e. Short circuits.
   f. Reversed pairs.
   g. EMI noise induction.
   h. DC (PoE) resistance unbalance.
   i. Attenuation load in dB.
   j. NEXT in dB.
3. The results shall be provided in hard and soft copy formats.
   a. The soft copy results shall be provided on CD-R or USB media and in a non-proprietary format.

H. Products

All products shall be installed in compliance with the manufactures' instructions. The Owner has identified products, which are approved for this installation. All data cabling equipment should be UL listed and/or TIA/EIA certified. No substitutions of identified products shall be allowed without prior, written, approval. This will ensure a quality installation, guarantee performance, and reduce on-going maintenance costs for the life of the solution.

This is not a complete parts list. Additional products may be required to complete this installation.

1. Horizontal Cabling
    a. The horizontal cabling solution must conform to the Category 6 Cabling Specification.
    b. Plenum cable shall be used.
    c. UTP Cable should be blue
    d. All cable is to be solid (not stranded) 100% copper
2. Termination
    a. Jacks should be standard keystone type and blue in color.
    b. All jacks, whether designated as data or voice, should be terminated as for data.
3. Faceplates
    a. The faceplates shall be the white with the appropriate number of keystone connectors (1, 2, 3, 4 or 6 ports, as needed)
4. Patch Panels
    a. The patch panels shall be 24-port modular (keystone) patch panels
    b. Patch panels should be straight
5. Equipment Racks
    a. The Equipment racks should be standard, black, EIA-310-D network racks, utilizing #12-24 screws, similar to Chatsworth item #66353-703 rack.
    b. A single 6-inch wide vertical cable manager, similar to Panduit item #PR2VD06
6. Security Cameras
    a. All security cameras shall be Axis brand cameras compatible with the S2 NetVR system in use by the College
    b. All security cameras shall support day/night operation
    c. Outdoor security cameras shall include all proper mounting equipment, waterproofing and anti-vandalism features
    d. Security cameras should support minimum resolution of 1080P, or 2560x1440 where necessary

      e. Contractor shall include all licensing, configuration and installation costs in proposal

7. Security Camera Server
      a. S2 NetVR 425 server with 64 TB RAID 5 storage to support the cameras
      b. Contractor shall configure the S2 NetVR server to integrate with the College's existing S2 NetBox Extreme system

8. Door access locations
      a. Contractor shall include all relevant hardware necessary to properly operate door access locations
      b. Contractor shall include all necessary S2 nodes, expansion blades, etc to support door hardware
      c. Contractor shall include all labor involved with installing door hardware as well as configuring door operation in the S2 system
      d. All door access locations shall properly integrate with any accessibility / door opening technology so that the door access system properly overrides any door opening hardware when the door is in a locked state
      e. All door hardware shall be installed to ensure the ADA entrance door is controlled by the door access system
      f. All doors at an exterior vestibule door location shall be be controlled by the door access system so all doors are locked / unlocked by a single keycard at the exterior vestibule location
      g. Specified door access location in the Chemistry storage room shall include a card reader and a keypad for PIN entry