1. General

1.1. Overview

This document identifies and describes the specification supporting the installation of data cabling, and new wireless Access Points (AP) on the University of Nevada Las Vegas Maryland Campus. It describes the installation, cable certification, labeling and documentation of cabling and related components as well as the installation of required infrastructure for the installation of wireless access points.

A. Contractor shall visit site prior to bid and verify that conditions are as indicated. Contractor shall include in the bid the costs required to make work meet existing conditions.
B. Upon decommissioning the existing equipment and materials, UNLV reserves the first choice to select equipment and materials to keep. Contract will coordinate with UNLV and deliver designated equipment and materials removed under the contract to owner’s designated storage area. Remaining equipment and material removed shall become the property of the Contractor.
C. Contractor shall maintain low voltage service to existing areas during construction. Contractor shall provide cables and termination etc., as required to maintain continuity of service.
D. Contractor shall provide work in accordance with the latest adopted editions of the applicable international building code (IBC), international energy conservation code (IECC), national electric code (NEC), and other applicable federal, state, and local regulations.
E. Contractor shall install conduit in strict compliance with the TIA 569-D standard. Cable shall be installed in strict compliance with TIA 568-C standard.
F. Contractor shall provide all cabling, pathway, ground busses and termination hardware, racks and cabinets with identification (labeling) in accordance with UNLV standards.
G. Contractor shall provide listed firestopping for all telecom/low voltage conduits and cables as required.
H. Conduit/Pathway routing indicated on drawings is for general reference only. Contractor shall field coordinate and verify exact routing as required.
I. Contractor shall maintain separation from electrical feeders, electronic ballasts, transformers, etc. to minimize electromagnetic compatibility issues.
J. Contractor shall perform installation in a workmanlike manner to the satisfaction of UNLV.
K. Work, materials, and equipment shall conform to the latest edition of local, state and national codes and ordinances.
L. All low voltage system components shall be listed or labeled by UL or other nationally recognized testing laboratory (NRTL).
M. All cabling shall be complete, operable, tested (end-to-end) in accordance with the applicable UNLV and TIA standards for the specific media involved.

N. Contractor must use “call before you dig”.

O. Contractor shall contact UNLV planning and construction to verify “call before you dig”.


Q. UNLV shall not loan equipment, tools or ladders to the Contractor. Contractors shall be responsible for bringing all tools and equipment required to complete job.

R. Contractor shall be required to perform some of the work during non-standard business hours.

2. General Requirements

2.1. General Contractor Requirements

A. The UNLV Wiring Standard details requirements for Coordination of Work, Regulatory Requirements, Contractor and Installer Requirements, Submittal Requirements and Approved Manufacturers.

B. The winning contractor shall be responsible for knowing and meeting these requirements.

C. Contractor shall be required to have work inspected weekly by a staff member that holds a current RCDD certification. The Contractor shall provide a weekly status report in the format provided in the UNLV Wiring Standard.

D. Any questions regarding these requirements after award should be directed to the Network Development and Engineering point of contact; however, prior to award all questions should be directed to the Purchasing point of contact.

2.2. Horizontal Cabling Installation

A. Data cabling installation

1. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in applicable diagrams. The cables shall be blue in color. Cabling should be from the approved manufacturers described in the UNLV Wiring Standard.

2. The Category 6/Class E cables shall be utilized for high-speed Local Area Network (LAN) applications at data rates of up to 1Gbps. All cables must be direct runs from the station outlets to the patch panel with no cross-connects or splices. The Category 6/Class E cable contains a maximum of 4-pair per cable jacket. No individual cable run shall exceed a distance of 95 meters of actual cable length measured from the station outlet to the patch panel in the IDF Room. All exposed cables must be organized and secured with black hook and loop tape from the patch panel in the IDF Room to the classroom. The cable installation must comply with appropriate fire and building codes, including the use of conduits as applicable.
3. Minimum penetrations are desired. Cabling in occupied non-plenum and open plenum areas shall be run in conduit.

B. Cable Handling
1. During cable installation, set reels and use sufficient pulleys and manpower so that cables are not pulled around blunt corners or against material that might cause chafing. For the purpose of this paragraph, any edge with a radius of less than 5 inches is considered “blunt”. Any non-rotational surface that has sufficient friction to cause shaving or particles to be pulled off the cable jackets is unacceptable.
2. Observation of improper cabling handling techniques on the job may cause the Customer to require the Contractor to discard observed cables, including any other already installed by the personnel found using improper techniques.
3. In general, communications cable cannot tolerate sharp bends or excessive pull tension during installation. Refer to manufacturer’s recommendations for the limitations on the installed cables.
4. Lubricants specifically designed for installing communications cable may be used to reduce pulling tension as necessary when pulling cable into conduit. After installation, exposed cable and other surfaces must be cleaned free of lubricant residue.
5. Provide pull cords in all sections of conduit. Tapes shall be marked in feet and secured at each end of the conduit.

C. Conduit
1. Conduit shall be Electrical Metallic Tubing produced in accordance with ANSI C80.3 standard and run in the most direct route practical.
2. Conduit runs containing more than two 90-degree bends, or a reverse (180 degree) bend require a pull box. All offsets shall be considered equivalent to a 90-degree bend. Conduit bend radii shall be a standard ten times the outside diameter of conduit unless otherwise approved by UNLV Network Development and Engineering.
3. Conduits entering the IDF through the wall shall be reamed or bushed, and terminated not more than 4 inches from the wall surface.
4. Conduit runs for distribution cables, except station outlets or specified otherwise, shall be not less than 4" in diameter. They shall be equipped with a plastic or nylon number 12 or larger pull line that is rated at 800-lb. test minimum.
5. All conduit runs for station outlets shall be not less than 1" in diameter. They shall be equipped with a plastic or nylon number 12 or larger pull line that is rated at 800-lb. test minimum.
6. After installation, all conduits shall be clean, dry, unobstructed, capped for protection and labeled with their destination (by room number) for identification. Allowable fill capacity is 40% or as defined by the National Electric Code, whichever is lower.
7. Conduit runs for horizontal distribution cables, utilizing the trapeze hanger method to support the conduits, shall utilize threaded rods of not less than 3/8" in diameter.
8. Conduit shall not block access to existing services.
D. Copper Data Jack Terminations

1. Materials should be from approved manufacturers. All data jacks shall be modular, unshielded, 4-pair, 8P8C, Category 6, black, and must meet or exceed EIA/TIA and ISO/IEC Category 6/Class E requirements. All data terminations are to follow ANSI/EIA/TIA 568-B.

2. All faceplates shall be 4 ports, light almond or light ivory, single gang, low profile, with a window for labels. When mounted on wall, they must be flush with the finished wall surface. All unused ports must be covered with a blank insert.

3. The ports on the left side of the faceplates shall always correlate to an odd numbered patch panel port. The ports on the right side of the faceplates shall always correlate to an even numbered patch panel port.

4. Cables terminated at the ceiling for the access point shall be terminated in a metallic 5S electrical box mounted above ceiling grid when possible.

5. Label the cables according to the specification described in Section 2.2.F.

E. IDF Room

1. IDF rooms provide network services to the user community in the same building. It is critical that these services remain operational during the installation. The Contractor is required to perform the work in the room with extreme care and any work activities performed in the room shall not disrupt the network operations.

2. All 24-port 1U data patch panels are to be Leviton QuickPort patch panel (Model number 49255-H24), Siemon MAX patch panel (Model number: MX-PNL-24K), or approved equivalent. The patch panels must meet or exceed EIA/TIA and ISO/IEC Category 6/Class E requirements.

3. All 48-port 2U data patch panels are to be Leviton QuickPort patch panel (Model number 49255-H48), Siemon MAX patch panel (Model number: MX-PNL-48K), or approved equivalent. The patch panels must meet or exceed EIA/TIA and ISO/IEC Category 6/Class E requirements.

4. All terminations are to follow ANSI/EIA/TIA 568-B.

5. Patch panels shall be labeled in the format of “#”. Each patch panel shall have a unique number to the IDF and shall be one digit higher than the highest numbered patch panel in the IDF. For example, if the highest numbered patch panel in the IDF is 4, the new patch panel shall be 5.

6. Terminate all station cables on the 48-port patch panels. Refer to Section 2.2.F on cable labeling specification.

7. Cables entering the IDF shall follow existing cabling pathways and use the existing cable tray/ladder. Hook and loop tape shall be used to secure cabling in the IDF.

F. Cable Labeling

1. Wrap labels shall be required at both ends of station cables. Faceplates, patch panels and patch panel ports shall be labeled.
2. Labeling standards are detailed UNLV’s Wiring Standard. [http://oit.unlv.edu/forms/unlv-wiring-specifications](http://oit.unlv.edu/forms/unlv-wiring-specifications)

3. See [Exhibit 12](http://oit.unlv.edu/forms/unlv-wiring-specifications) for an example of UNLV’s labeling standards.

4. Any questions regarding labeling should be directed to the Network Development and Engineering Point of Contact after award; however, prior to award questions should be directed to Purchasing’s point of contact.

G. Access Point Installation

1. Install the Customer provided Cisco Access Point at the locations specified in applicable diagrams.

2. Contractor shall provide two gray Category 6/Class E patch cables and connect one cable to the Ethernet port of the Access Point and the other to the Console port of the Access Point. Patch cords shall be plenum rated if located above the drop ceiling. The Ethernet port should be the lower patch panel port and the Console port should be the higher patch panel port.

2.3. CABLE TESTING

A. All cables and termination hardware shall be 100% tested for defects in installation and to verify cable performance under installed conditions.

B. Any defect in the cabling system installation including but not limited to cable, connectors, feed-through couplers, patch panels, and connector blocks shall be repaired or replaced in order to ensure 100% usable conductors in all cables installed.

C. Test results shall be submitted and reviewed prior to system acceptance.

D. All test results shall be provided to the UNLV Project Manager and the Technical Point of Contact in PDF format prior to acceptance.

E. All test results must be labeled with the specific cable that was tested by its unique identifier as described in the Labeling section.

F. Cable certification requirements are detailed in UNLV’s Wiring Standard. [http://oit.unlv.edu/forms/unlv-wiring-specifications](http://oit.unlv.edu/forms/unlv-wiring-specifications)

2.4. CERTIFICATION AND ACCEPTANCE

All Category 6 cable runs must be certified by the Manufacturer. Provide manufacturer’s certification within 30 days after the delivery of the cable certification results to the Customer.

2.5. Documentation

A. Provide cabling test results and certification in full compliance with Customer’s specifications.

B. Provide updated as-built which documents the new cable runs
3. **Building Requirements**

This section provides specific information for each building covered by the scope of this project. The contractor is responsible to verify that the work can be done as documented. Any questions regarding these specifications shall be addressed through the Technical Point of Contact.

3.1. **Stan Fulton Building / International Gaming Institute Station**

**A. Building Layout and Characteristics**

The building described in this section is a 3-story building. Only the first and second floors shall be addressed in this section. Please refer to Exhibit 1.1 for the floor plans. Most of the interior walls of the building are dry-wall. Penetrating walls may be required for cable runs, but it is our desire to keep penetrations to a minimum. Most of the ceilings of both floors are drop ceilings with plenum space. There is an IDF room on each floor. On the first floor there are two 4-inch conduits running to room 121 (Surveillance) and room 134 (Audio Visual).

**B. Station Cable**

1. Provide and install a total of 26 new Category 6/Class E plenum station cable runs for connections to the data network. Sixteen (16) cables shall be ran to Intermediate Distribution Facilities (IDF) room 107, and ten (10) cables shall be ran to IDF room 207. Each cable run is a point to point run between the outlet and IDF rooms 107 and 207 without any intermediate termination.
2. Provide and install conduit, junction boxes, and cable supports as required.
3. If local and national electrical code allows, the contractor is not required to use conduit above the drop ceiling.
4. Terminate Cat-6 cables at locations identified and in the quantities identified in Exhibit 1.2.
5. The following items shall provide job specifics which could include drop height, special considerations for AP cables, conduits, sleeves, etc.
   a. Room 100 (Lobby): This room has one (1) AP and shall be installed on the wall at the location specified in Exhibit 1.2A. The AP shall be installed inside room 121 (Surveillance). The antenna shall be installed on the wall in the Lobby. A 1” conduit sleeve shall be installed to allow for the passage of the antenna cables from the antenna to the AP. Both the AP and antenna shall be mounted approximately 10 to 12 feet above the finished floor (AFF). The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling to run in 1-inch conduit to the gutter box and back to IDF 107 using the existing 4-inch conduits inside the gutter box. If possible, cables shall be ran in the conduit with the existing cable.
   b. Room 120 (Casino Lab): This room has existing APs that shall be replaced with customer-supplied equipment. No new cabling or location changes are necessary.
   c. Room 129 (Lounge): This room has one (1) AP and shall be installed on the wall at the location specified in Exhibit 1.2A at approximately 12 feet AFF. Each antenna shall be placed at the same height, approximately 3 to 4 feet on each side of the AP. All cabling shall be ran above grid in existing or new j-hooks and/or conduit to Room
134 (Audio-Visual) and then to IDF 107 using existing 4-inch conduits. If possible, cables shall be ran in the conduit with the existing cable.

d. Room 130 (Saloon): Three (3) new APs antennas shall be installed on the wall at the locations specified in **Exhibit 1.2A**.

- Access Point 1 – The AP shall be installed inside room 132 (Storage) and the antenna shall be installed on the wall in the Saloon, taking into consideration the location of the projection screen, placing the antenna on the side with the larger amount of free space. A 1” conduit sleeve shall be installed to allow for the passage of the antenna cables from the antenna to the AP. Both the AP and antenna shall be mounted approximately 12 feet AFF.

- Access Point 2 – The AP shall be installed in room 133 and the antennas shall be installed on the wall in the Saloon approximately 6 feet apart. If possible, one antenna shall be placed on each side of the projection screen, which may require the AP to be installed in the A/V room. A 1” conduit sleeve shall be installed to allow for the passage of the antenna cables from the antenna to the AP. Both the AP and antenna shall be mounted approximately 12 feet AFF.

- Access Point 3 – The AP shall be installed inside room 135 (Storage) and the antenna shall be installed on the wall in the Saloon, taking into consideration the location of the projection screen, placing the antenna on the side with the larger amount of free space. A 1” conduit sleeve shall be installed to allow for the passage of the antenna cables from the antenna to the AP. Both the AP and antenna shall be mounted approximately 12 feet AFF.

- All cabling shall be ran in 1-inch conduit to room 134 (AV room) and then to IDF 107 using existing 4-inch conduits. If possible, cables shall be ran in the conduit with the existing cable.

e. Second Floor – APs shall be mounted at the locations specified in **Exhibit 1.2B**. All ceiling are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran back to IDF 207 with j-hooks to the cable tray. The cable tray ends in room 214 (Phone). Contractor shall install a 2-inch conduit sleeve to be used to run the cables through the wall and into the IDF. The contractor shall install a 2-inch conduit sleeve to be used to run the cables through the ceiling.

f. Outdoor locations: Three external APs shall be installed on the building exterior at the locations specified in **Exhibit 1.2A**.

- Outdoor 1 – This AP shall be installed on the Southern wall with special consideration given to the location of the building sign and the AP. The AP shall be mounted on the building exterior. Cabling shall be ran in 1-inch conduit out of the building, back to the IDF due to the cable run being located above the women’s restroom. The faceplate shall be placed above grid on the interior wall within 5 feet of the AP location. A 1” conduit sleeve shall be installed to allow for the passage of the supplied outdoor cable.

- Outdoor 2 – This AP shall be installed approximately 5 feet above the top of the soffit outside of the lounge. A 1-inch sleeve conduit installed between the interior and exterior walls. The AP shall be mounted on the building exterior. Cabling inside the lounge shall be ran in new or existing j-hooks/conduit to Room 134 (Audio-Visual) and then to IDF 107 using existing 4-inch conduits. If possible,
cables shall be ran in the conduit with the existing cable. The faceplate shall be placed above grid on the interior wall within 5 feet of the AP location. A 1” conduit sleeve shall be installed to allow for the passage of the supplied outdoor cable.

- Outdoor 3 – This AP shall be installed approximately 15 feet above the exterior ground level. The AP shall be mounted on the building exterior. Cabling shall be ran in 1-inch conduit to Room 134 and then to IDF 107 using existing 4-inch conduits. If possible, cables shall be ran in the conduit with the existing cable. The faceplate shall be placed above grid on the interior wall within 5 feet of the AP location. A 1” conduit sleeve shall be installed to allow for the passage of the supplied outdoor cable.

6. Terminate, label, and certify all new cable runs, in strict compliance with Customer’s specifications.

C. Intermediate Distribution Frame (IDF) Rooms

1. IDF Room 107
   a. Provide and install one (1) 24-port Category 6/Class E universal keystone patch panels (Section 2.2.E.2) to be used for new Cat-6 cabling in the rack in IDF Room 107 at the rack location identified in Exhibit 1.3A.
   b. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 1.3A.
   c. Label all new cabling and components per requirements in Section 2.2.F.
   d. Install new 2RU horizontal rack manager (Panduit Part #: WMPF1E) below new patch panel.

2. IDF Room 207
   a. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the rack in IDF Room 207 at the rack location identified in Exhibit 1.3B.
   b. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 1.3B.
   c. Label all new cabling and components per requirements in Section 2.2.F.
   d. Install new 2RU horizontal rack manager (Panduit Part #: WMPF1E) below new patch panel.

D. Access Points and Antenna

1. Install and mount ten (10) Customer provided access point at the locations specified in Exhibit 1.2A.
2. Install and mount five (5) Customer provided access point at the locations specified in Exhibit 1.2B.
3.2. Taylor Hall

A. Building Layout and Characteristics

The building described in this section is a single story building. Please refer to Exhibit 2.1 for the floor plan. Most of the interior walls of the building are dry-wall. Penetrating walls may be required for cable runs, but it is our desire to keep penetrations to a minimum. Most of the ceiling is drop ceilings with plenum space. There is a wall-mounted, 12 RU switch enclosure in room 101.

B. Station Cable

1. Provide and install a total of 10 new Category 6/Class E plenum station cable runs for connections to the data network. Each cable run is a point to point run between the outlet and the IDF enclosure.
2. Provide and install conduit, junction boxes, and cable supports as required.
3. If local and national electrical code allows, the contractor is not required to use conduit above the drop ceiling.
4. Terminate Cat-6 cables at locations identified and in the quantities identified in Exhibit 2.1.
5. Indoor APs shall be mounted at the locations specified in Exhibit 2.2. The ceilings are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran back to room 105 (Custodial) with j-hooks and use existing conduit sleeve to run cables into the switch enclosure. Contractor shall install a 2-inch conduit sleeve to be used to run the cables through the ceiling into the Custodial room.
6. Exterior APs shall be mounted at the locations specified in Exhibit 2.2. The APs shall be installed approximately 10 - 12 feet above the exterior ground level and shall be mounted on the building exterior. A 1-inch sleeve conduit installed between the interior and exterior walls. The faceplate shall be placed above grid on the interior wall within 5 feet of the AP location. Cabling shall be ran back to room 105 (Custodial) with j-hooks and use existing conduit sleeve to run cables into the switch enclosure.

C. Intermediate Distribution Frame (IDF) Enclosure

1. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the IDF enclosure at the rack location identified in Exhibit 2.3.
2. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 2.3
3. Label all new cabling and components per requirements in Section 2.2.F.

D. Access Points and Antenna

1. Install and mount five (5) Customer provided access points at the locations specified in Exhibit 2.2.
3.3. Paul B. Sogg Architecture Building (ARC)

A. Building Layout and Characteristics
The building described in this section is a two-story multi-purpose building. Please refer to Exhibit 3.1 for the floor plans. Most of the interior walls of the building are made of sheet rock. There are two IDF rooms on the first floor, rooms 148 and 111. There is one telecom room 237 on the second floor that shall converted to an IDF. IDF rooms 148 and 237 are stacked with an existing unverified pathway between them. IDF rooms 148 and 111 have an existing unverified pathway between them. Penetrating walls may be required for cable runs, but it is our desire to keep penetrations to a minimum. Most of the office space ceilings of both floors are drop ceilings with plenum space. The labs are a combination of drop ceilings and open-plenum space.

B. Station Cable

1. Provide and install a total of 82 new Category 6/Class E plenum station cable runs for connections to the data network. Twelve (12) cables shall be ran to Intermediate Distribution Facilities (IDF) room 111 from the first floor and eight (8) cables shall be ran to IDF room 111 from the second floor. Thirty-four (34) cables shall be ran to IDF room 148, and 28 cables shall be ran to IDF room 237. Each cable run is a point to point run between the outlet and IDF rooms 111, 148, and 237 without any intermediate termination.
2. Provide and install conduit, junction boxes, and cable supports as required.
3. If local and national electrical code allows, the contractor is not required to use conduit above the drop ceiling.
4. Terminate Cat-6 cables at locations identified and in the quantities identified in Exhibit 3.2A and 3.2B.
5. The following items shall provide job specifics which could include drop height, special considerations for AP cables, conduits, sleeves, etc.
   a. Room 100 (Lobby) – This room has one (1) AP and shall be installed on the wall at the location specified in Exhibit 3.2A. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be run in 1-inch conduit to the cable tray and back to IDF 148.
   b. Room 101 (Library Study) – This room has two (2) APs and shall be installed at the locations specified in Exhibit 3.2A.
      - Access Point 1 – Shall be mounted on the grid. Cabling shall be ran back to IDF 111 with j-hooks straight back to the IDF.
      - Access Point 2 - A new AP shall be installed on the wall at the location specified in Exhibit 3.2A at approximately 12 feet AFF. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be run in 1-inch conduit to the cable tray in room 105 and back to IDF 111.
   c. Room 114 (Study Room) – This room has one (1) AP and shall be mounted on the grid. Cabling shall be ran back to IDF 111 using j-hooks and the cable tray.
   d. Room 127 (Auditorium) – This room has one new AP installation and two AP replacements.
- One new AP shall be installed in the location specified in Exhibit 3.2A. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit around the room on the North and East walls and penetrate the South wall to go to the cable tray in room 147 (Classroom) and back to IDF 148.
- Two APs shall be replaced with customer-supplied equipment. No new cabling is necessary. The east AP shall have the antenna mounted to the east five (5) feet away from the AP. The west AP shall have the antenna mounted to the west five (5) feet away from the AP.

e. Room 134 (Reception Area) – This room has one (1) AP and shall be installed on the wall at the location specified in Exhibit 3.2A. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be run in 1-inch conduit to the cable tray and back to IDF 148.

f. Room 138 (Office) – This room has one (1) AP and shall be mounted on the grid in the location specified in Exhibit 3.2A. Cabling shall be ran back to IDF 148 with j-hooks to the cable tray and back to the IDF.

g. Room 141 (Files) – This room has one (1) AP and shall be mounted on the grid in the location specified in Exhibit 3.2A. Cabling shall be ran back to IDF 148 with j-hooks to the cable tray and back to the IDF.

h. Room 181 (Studio) – This room has one (1) AP and shall be mounted on the grid in the location specified in Exhibit 3.2A. Cabling shall be ran back to IDF 148 with j-hooks to the cable tray and back to the IDF.

i. The following rooms are open ceiling and the APs shall be installed at the locations specified in Exhibit 3.2A. The APs shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be run in 1-inch conduit to the cable tray and back to IDF 148. Any existing APs and cabling in these rooms shall be removed back to the IDF.
  - Room 152 (Sim Lab)
  - Room 159 (Sim Lab / Model Shop)
  - Room 159A (New Room For You)
  - Room 161 (Photo Lab)
  - Room 178 (N.E.A.T Lab)

j. Room 201 (Stacks) – This room has two (2) new APs that shall be installed on the wall at the locations specified in Exhibit 3.2B. The APs shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be run using j-hooks back to room 207 (Telephone) and down to IDF 111.

k. Room 203 (Computer Lab) – This room has one (1) AP and shall be mounted on the grid in the location specified in Exhibit 3.2B. Cabling shall be ran back to the cable tray with j-hooks to the cable tray to room 207 (Telephone) and down to IDF 111.

l. Room 205 (Study Area) – This room has one (1) AP and shall be installed on the wall at the location specified in Exhibit 3.2B. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be run in 1-inch conduit to the cable tray to room 207 (Telephone) and down to IDF 111.
m. Room 221 (Office) – This room has one (1) AP and shall be mounted on the grid in the location specified in Exhibit 3.2B. Cabling shall be ran back to the cable tray with j-hooks to the cable tray IDF 237.

n. Room 224 (Office) – This room has one (1) AP and shall be mounted on the grid in the location specified in Exhibit 3.2B. Cabling shall be ran back to the cable tray with j-hooks to the cable tray IDF 237.

o. Room 227 (Office) – This room has one (1) AP and shall be mounted on the grid in the location specified in Exhibit 3.2B. Cabling shall be ran back to the cable tray with j-hooks to the cable tray IDF 237.

p. Room 230 (Office) – This room has one (1) AP and shall be mounted on the grid in the location specified in Exhibit 3.2B. Cabling shall be ran back to the cable tray with j-hooks to the cable tray IDF 237.

q. The following rooms are open ceiling and the APs shall be installed at the locations specified in Exhibit 3.2B. The APs shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be run in 1-inch conduit to the cable tray and back to IDF 237. Any existing APs and cabling in these rooms shall be removed back to the IDF.
   - Room 240 (Studio)
   - Room 242 (Studio)
   - Room 244 (Studio)
   - Room 245 (Studio)
   - Room 246 (Studio)
   - Room 248 (Studio)
   - Room 249 (Studio)
   - Room 250 (Studio)
   - Room 251 (Studio)
   - Room 252 (Studio)

r. The following rooms have existing APs and shall be replaced with customer-supplied equipment. No new cabling or location changes are necessary.
   - Room 102 (Stacks)
   - Room 103 (Circulation)
   - Room 147 (Classroom)
   - Room 154 (Sim Lab)
   - Room 168A (Metal Shop)
   - Room 172 (Computer CAD Lab)
   - Room 175 (Building Structures Lab)
   - Room 179 (Computer MAC Lab)
   - Room 180 (Research Studio)
   - Room 241 (Studio)
   - Room 247 (Studio)
   - Room 254 (Grad Studio 2)
   - Room 255 (Grad Studio 1)

s. The following exterior APs shall be installed approximately 10 – 12 feet above the exterior ground level in the locations specified in Exhibit 3.2A. The APs shall be
mounted on the building exterior. A 1” conduit sleeve shall be installed to allow for the passage of the supplied outdoor cable. Cabling shall be ran in j-hooks above the ceiling grid to IDF 111. The faceplate shall be placed above grid on the interior wall within 5 feet of the AP location.

- Exterior AP N1
- Exterior AP N2
- Exterior AP N10

t. The following exterior APs shall be installed approximately 10 – 12 feet above the exterior ground level in the locations specified in Exhibit 3.2A. The APs shall be mounted on the building exterior. A 1” conduit sleeve shall be installed to allow for the passage of the supplied outdoor cable. Cabling shall be ran in 1-inch conduit from the faceplate junction box to the cable tray and back to IDF 148. The faceplate shall be placed on the interior wall within 5 feet of the AP location.

- Exterior AP N4
- Exterior AP N8
- Exterior AP N9

u. The following exterior APs shall be installed approximately 10 – 12 feet above the exterior ground level in the locations specified in Exhibit 3.2A. The APs shall be mounted on the building exterior. A 1” conduit sleeve shall be installed to allow for the passage of the supplied outdoor cable. Cabling shall be ran in j-hooks above the ceiling grid to the cable tray and back to IDF 148. The faceplate shall be placed above grid on the interior wall within 5 feet of the AP location.

- Exterior AP N5
- Exterior AP N6
- Exterior AP N7

v. Exterior AP N3 shall be installed approximately 10 – 12 feet above the exterior ground level in the locations specified in Exhibit 3.2A. The AP shall be mounted on the 5S junction box on the building exterior. Cabling shall be ran in 1-inch conduit underneath the overhang with the other conduits. It shall penetrate the wall with the other conduits and into Room 100 (Lobby) above the hard lid to the cable tray back to IDF 148.

C. Intermediate Distribution Frame (IDF) Rooms

1. IDF Room 111

a. Provide and install two (2) 4-post racks (Panduit Part #: R4PCN or Hoffman Part #: E4DRS19FM45U) in location identified in Exhibit 3.3A.

b. Provide and install three (3) vertical cable managers (Panduit Part #: WMPVHC45E) in between and on both sides of the racks.

c. Provide and install eleven (11) new 2RU horizontal rack managers (Panduit Part #: WMPF1E) between every patch panel and switches in locations identified in Exhibit 3.3B.

d. Provide and install one (1) new 1RU horizontal rack manager (Panduit Part #: WMPFSE) above the first patch panel in location identified in Exhibit 3.3B.

e. Relocate existing patch panels and single-mode fiber enclosure to new rack.
f. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the IDF enclosure at the rack location identified in Exhibit 3.3B.

g. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 3.3B.

h. Label all new cabling and components per requirements in Section 2.2.F.

2. IDF Room 148

a. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the IDF. Rack location to be determined after completion of IDF 237.

b. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel.

c. Label all new cabling and components per requirements in Section 2.2.F.

d. Install one (1) new 2RU horizontal rack manager (Panduit Part #: WMPF1E) below new patch panel (location to be determined).

3. IDF Room 237

a. Provide and install one (1) 4-post rack (Panduit Part #: R4PCN or approved equivalent) in location identified in Exhibit 3.3D.

b. Provide and install two (2) vertical cable managers (Panduit Part #: WMPVHC45E) on both sides of the rack.

c. Provide and install eight (8) new 2RU horizontal rack managers (Panduit Part #: WMPF1E) between every patch panel and switches in locations identified in Exhibit 3.3E.

d. Provide and install one (1) new 1RU horizontal rack manager (Panduit Part #: WMPFSE) above the first patch panel in location identified in Exhibit 3.3E.

e. Remove existing cable tray conduit that runs through ARC 237 in order to expose cabling.

f. Cut and re-terminate all existing data cabling run through ARC 2nd floor to IDF 148. An estimated 200 cables shall be cut and re-terminated. The work must be coordinated with UNLV Network Engineering as it shall be conducted during non-business hours. All existing phone cabling shall continue to the first floor IDF room 148.

g. Provide and install approved Category 6 patch panels, data jacks and face plates necessary to re-terminate cabling and installation of new wireless access point cabling.

h. Test and label all 2nd floor data cabling per UNLV’s Campus Wiring Specification.

i. Contractor shall not be responsible for providing a warranty on re-terminated cabling.
D. Access Points and Antenna

1. Install and mount 35 Customer-provided access points at the locations specified in Exhibit 3.2A.
2. Install and mount 22 Customer-provided access points at the locations specified in Exhibit 3.2B.
3.4. Sidewalk Café

A. Building Layout and Characteristics
The building described in this section is a single story building used as a restaurant. Please refer to Exhibit 4.1 for the floor plan. Most of the interior walls of the building are dry-wall. Penetrating walls may be required for cable runs, but it is our desire to keep penetrations to a minimum. Most of the ceiling is drop ceilings with plenum space. There is a wall-mounted, 12 RU switch enclosure in room 7 (Storage).

B. Station Cable
1. Provide and install a total of eight (8) new Category 6/Class E plenum station cable runs for connections to the data network. Each cable run is a point to point run between the outlet and the IDF enclosure.
2. Provide and install conduit, junction boxes, and cable supports as required.
3. If local and national electrical code allows, the contractor is not required to use conduit above the drop ceiling.
4. Terminate Cat-6 cables at locations identified and in the quantities identified in Exhibit 4.2.
5. The indoor AP shall be mounted at the location specified in Exhibit 4.2. The ceiling is drop ceiling and the AP shall be mounted on the grid. Cabling shall be ran back to room 7 (Storage) with j-hooks and into the switch enclosure. Contractor shall install a 2-inch conduit sleeve to be used to run the cables through the ceiling into the Storage room.
6. The North and South exterior APs shall be mounted at the locations specified in Exhibit 4.2. The APs shall be installed approximately 10 - 12 feet above the exterior ground level and shall be mounted on the building exterior. A 1-inch sleeve conduit installed between the interior and exterior walls. The faceplate shall be placed above grid on the interior wall within 5 feet of the AP location. Cabling shall be ran back to room 7 (Storage) with j-hooks and use existing conduit sleeve to run cables into the switch enclosure.
7. The West exterior AP shall be mounted on the exterior of the parapet wall on the roof of the building. A 1-inch sleeve conduit shall be installed between the interior and exterior parapet walls. The jacks shall terminate in a weatherproof enclosure on the interior of the parapet wall within 5 feet of the AP location. Cabling shall be ran in 1-inch conduit to the existing roof penetration and into the building interior. The cables shall be run in the existing conduit sleeve into the switch enclosure.

C. Intermediate Distribution Frame (IDF) Enclosure
1. Provide and install one (1) 24-port Category 6/Class E universal keystone patch panels (Section 2.2.E.2) to be used for new Cat-6 cabling in the IDF enclosure at the rack location identified in Exhibit 4.3.
2. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 4.3
3. Label all new cabling and components per requirements in Section 2.2.F.
D. Access Points and Antenna

1. Install and mount four (4) Customer provided access points at the locations specified in Exhibit 4.2.
3.5. McDermott Physical Education (MPE) Complex

A. Building Layout and Characteristics

The buildings described in this section consist of two buildings. The first is a 2-story building (Administration Building) and the second is a single-story building (Gymnasium Building). The 2-story building interior walls are mostly gypsum board and the exterior walls are concrete block. Most of the ceilings of both floors are drop ceilings with plenum space. The single-story building interior walls are mostly concrete block with the exception of the Sports Injury Research Center where most are gypsum board. Most of the ceilings are open ceilings with the exception of the Sports Injury Research Center where most are drop ceiling with plenum space. Please refer to Exhibit 5.1 for the floor plan. Penetrating walls may be required for cable runs, but it is our desire to keep penetrations to a minimum.

There is an existing IDF room 139 on the first floor for the Administration building, two existing IDF rooms 307A and 317A in the Gymnasium building. As part of this project, a new enclosure, room 403 in the Gymnasium building, a location to mount a new switch in Mechanical Plant building Room 602A. IDF room 317A shall be removed and relocated to IDF room 102A as part of this project.

B. Station Cable

1. Provide and install a total of 84 new Category 6/Class E plenum station cable runs for connections to the data network. In the Administration building, twelve (12) cables shall be ran to Intermediate Distribution Facilities (IDF) room 139 from the first floor, twelve (12) cables shall be ran to IDF room 139 from the second floor, and ten (10) cables shall be ran to IDF room 139 from the South Gym. Fourteen (14) cables shall be ran to IDF room 307A, 24 cables shall be ran to IDF room 317A, and six (6) cables shall be ran to the enclosure in 403. Each cable run is a point to point run between the outlet and IDF rooms 139, 307A, 317A, and 403 without any intermediate termination.

2. Provide and install conduit, junction boxes, and cable supports as required.

3. If local and national electrical code allows, the contractor is not required to use conduit above the drop ceiling.

4. Terminate Cat-6 cables at locations identified and in the quantities identified in Exhibit 5.2A and 5.2B.

5. The following items shall provide job specifics which could include drop height, special considerations for AP cables, conduits, sleeves, etc.
   a. The following rooms have existing APs and shall be replaced with customer-supplied equipment. No new cabling or location changes are necessary.
      - MPE-A 132 (Corridor)
      - MPE-A 128 (Corridor)
      - MPE-A 102 (Conference)
   b. The following first floor APs shall be mounted at the locations specified in Exhibit 5.2A. All ceilings are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran back to IDF 139 with j-hooks. The contractor shall install a 2-inch conduit sleeve to be used to run the cables through the ceiling and into the IDF.
      - MPE-A 104 (Classroom)
c. The following exterior APs shall be mounted at the locations specified in Exhibit 5.2A. The APs shall be installed approximately 10 - 12 feet above the exterior ground level and shall be mounted on the building exterior. A 1-inch sleeve conduit installed between the interior and exterior walls. The faceplate shall be placed above grid on the interior wall within 5 feet of the AP location. Cabling shall be ran back to IDF 139 with j-hooks and use new 2-inch conduit sleeve to run cables into the IDF.

- Exterior A1
- Exterior A2
- Exterior A3

d. The following second floor APs shall be mounted at the locations specified in Exhibit 5.2B. All ceilings are drop ceiling and the APs shall be mounted on the grid. There are existing 1-inch conduits that run from each room on the second floor to IDF 139. If space is available, the contractor shall use the existing conduit to run cable back to the IDF. The contractor shall be responsible to verify the conduit run from the second floor to the first floor IDF. Cabling shall be ran back to the room conduit with j-hooks. The contractor shall install a 2-inch conduit sleeve to be used to run the cables through the ceiling and into the IDF.

- MPE-A 202 (Office)
- MPE-A 207 (Counseling)
- MPE-A 212 (Counseling)
- MPE-A 223 (Counseling)
- MPE-A 230 (Office)
- MPE-A 233 (Classroom)

e. Room 300 (South Gymnasium) – This room has two (2) APs that shall be mounted at the locations specified in Exhibit 5.2A. The APs shall be installed approximately 10 - 12 feet above the finished floor and shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit along the East wall and penetrate the North wall into room 300A (Mechanical) and be ran to the 4-inch conduits near the stairwell. The contractor shall be responsible to verify the conduit path as some may go to MPE 137 and others may go to MPE 307A. The preferred path is to MPE 307A, but if the conduits only run to MPE 137, that shall be acceptable. The cable shall be ran out of the 4-inch conduits and into the IDF 307A or 139.

- If necessary, the contractor shall install a new 2-inch conduit to penetrate the wall between room 137 and 139.

f. Room 302 (Dance) – This room has one (1) AP that shall be mounted at the location specified in Exhibit 5.2A. The AP shall be installed approximately 10 - 12 feet above finished floor and shall be mounted on a 5S junction box with the cable terminations inside the j-box. A 1-inch sleeve conduit shall be installed between the room 302 and 300A on the back of the box. A Smart-LB or conduit bend maintaining the proper bend radius shall be used to turn down the wall inside room 300A. Cabling
shall be ran in 1-inch conduit down the wall to the 4-inch conduits to IDF 307A or IDF 139.
g. Room 304B (Conference) – This room has one (1) AP that shall be mounted at the location specified in Exhibit 5.2A. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit along the ceiling and back to IDF 307A.
h. Room 306B (Office) – This room has one (1) AP that shall be mounted at the location specified in Exhibit 5.2A. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit along the ceiling and back to IDF 307A.
i. Room 308A (Office) – This room has one (1) AP that shall be mounted at the location specified in Exhibit 5.2A. This room has drop ceiling and the AP shall be mounted on the grid. Cabling shall be ran in j-hooks through room 308 (Campus Recreation) and then in 1-inch conduit after penetrating the East wall of 308. Cabling shall continue to run in 1-inch conduit back to IDF 307A.
j. Room 312 (Equipment Storage) – This room is open ceiling and has one (1) AP that shall be mounted at the location specified in Exhibit 5.2A. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit along the ceiling and back to IDF 307A.
k. Room 318 (Office) – This room is open ceiling and has one (1) AP that shall be mounted at the location specified in Exhibit 5.2A. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit along the ceiling and back to IDF 307A.
l. Room 319 (Weight Room Athletic Fitness) – This room is open ceiling and has one (1) AP that shall be mounted at the location specified in Exhibit 5.2A. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit along the ceiling, into 317A and back to the equipment rack in IDF 317A.
m. Room 226A (Office) - This room is open ceiling and has one (1) AP that shall be mounted at the location specified in Exhibit 5.2A. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit along the ceiling and back to IDF 307A.
n. Room 329 (North Gym) – This room has two (2) APs (NG1 and NG2) that shall be mounted at the locations specified in Exhibit 5.2A. The APs shall be installed approximately 10 - 12 feet above the finished floor and shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit along the East wall and back to the equipment rack in IDF 317A.
o. Room 330D (Office) – This room has one AP that shall be mounted at the location specified in Exhibit 5.2A. This room has drop ceiling and the AP shall be mounted on the grid. Cabling shall be ran in 1-inch conduit back to the enclosure in room 403.
p. Corridor 400B – This area has two (2) APs (P1 and P2) that shall be mounted at the locations specified in Exhibit 5.2A. The APs shall be installed on the overhang above the pool deck, approximately 10 - 12 feet above the finished floor, and shall be mounted on a 5S junction box with the cable terminations inside the j-box. AP P1
Cabling shall be ran in 1-inch conduit along the bottom of the overhang and shall intercept the existing box and 2-inch conduit back to the enclosure in room 403. AP P2 cabling shall be ran in 1-inch conduit along the bottom of the overhang and back to the enclosure in room 403.

q. Corridor 500 – This area has one (1) AP that shall be mounted at the location specified in Exhibit 5.2A. This room has drop ceiling and the AP shall be mounted on the grid. Cabling shall be ran in j-hooks to a box at the West end of the corridor where it becomes hard-lid. A 2-inch conduit shall be ran from the box back to IDF 102A. The contractor shall ensure that the cabling does not make a turn in the box.

r. The following APs shall be mounted at the locations specified in Exhibit 5.2A. These rooms are in high or open-ceiling rooms and cabling shall be ran in 1-inch conduit in these rooms to Corridor 500. Cabling shall be ran in j-hooks or conduit down the corridor to the box at the West end of the corridor. Cabling shall be ran in the 2-inch conduit from the box back to IDF 102A.
   - Room 504 (Lab)
   - Room 506 (Activity Room)
   - Room 508 (Utility Gymnasium)

s. The following APs shall be mounted at the locations specified in Exhibit 5.2A. All ceilings are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran in j-hooks and conduit as necessary to Corridor 500, where it shall be ran in j-hooks or conduit down the corridor to the box at the West end of the corridor. Cabling shall be ran in the 2-inch conduit from the box back to IDF 102A.
   - Sports Injury Research Center Room 105 (Office)
   - Sports Injury Research Center Room 101 (Conference/Meeting)

t. The following exterior APs shall be mounted at the locations specified in Exhibit 5.2A. The APs shall be installed approximately 10 - 12 feet above the exterior ground level and shall be mounted on the building exterior. A 1-inch sleeve conduit installed between the interior and exterior walls. The faceplate shall be placed on the interior wall within 5 feet of the AP location. Cabling shall be ran in 1-inch conduit along the East wall and penetrate the North wall into room 300A (Mechanical) and be ran to the 4-inch conduits near the stairwell. The contractor shall be responsible to verify the conduit path as some may go to MPE 137 and others may go to MPE 307A. The preferred path is to MPE 307A, but if the conduits only run to MPE 137, that shall be acceptable. The cable shall be ran out of the 4-inch conduits and into the IDF 307A or 139.
   - Exterior AP B1
   - Exterior AP B2

u. The following exterior APs shall be mounted at the locations specified in Exhibit 5.2A. The APs shall be installed approximately 10 - 12 feet above the exterior ground level and shall be mounted on the building exterior. A 1-inch sleeve conduit installed between the interior and exterior walls. The faceplate shall be placed on the interior wall within 5 feet of the AP location. Cabling shall be ran in 1-inch conduit along the wall of Corridor 300H and into IDF 307A.
   - Exterior AP B3
   - Exterior AP B4
v. The following exterior APs shall be mounted at the locations specified in [Exhibit 5.2A](#). The APs shall be installed approximately 10 - 12 feet above the exterior ground level and shall be mounted on the building exterior. A 1-inch sleeve conduit installed between the interior and exterior walls. The faceplate shall be placed on the interior wall within 5 feet of the AP location. Cabling shall be ran in 1-inch conduit to Corridor 500. Cabling shall be ran in j-hooks or conduit down the corridor to the box at the West end of the corridor. Cabling shall be ran in the 2-inch conduit from the box back to IDF 102A.

### C. Intermediate Distribution Frame (IDF) Rooms

1. **IDF Room 139**
   a. Provide, install, and terminate two (2) 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in [Exhibit 5.3A](#).
   b. Label all new cabling and components per requirements in [Section 2.2.F](#).

2. **IDF Room 307A (Off-Hours)**
   a. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels ([Section 2.2.E.3](#)) to be used for new Cat-6 cabling in the rack in IDF Room 307A at the rack location identified in [Exhibit 5.3B](#).
   b. Provide and install new data cabling for rooms 317 and 318 in accordance with UNLV OIT specifications. An estimated eight (8) cables shall be installed. The work must be coordinated with UNLV Network Engineering as it shall be conducted during non-business hours. All existing phone cabling shall continue to IDF room 317A.
   c. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in [Exhibit 5.3B](#).
   d. Label all new cabling and components per requirements in [Section 2.2.F](#).
   e. Install new 2RU horizontal rack manager (Panduit Part #: WMPF1E) below new patch panel at location identified in [Exhibit 5.3B](#).

3. **IDF Room 317A**
   a. This room shall be decommissioned. Any existing cabling shall be ran to new IDF room 102A.

4. **IDF Room 403 (NEW)**
   a. Provide and install one (1) wall-mounted enclosure with AC unit (Hoffman Part #: PTHW242428G2A) in the northwest corner, above the audio-visual rack in room 403.
   b. Cut, reroute, and re-terminate all existing data cabling run for the 400-series rooms, rooms 319, 321, 326, 329 to the new enclosure in room 403. An estimated 25 cables shall be cut and re-terminated. The work must be coordinated with UNLV Network Engineering as it shall be conducted during non-business hours. All existing phone cabling shall continue to IDF room 317A.
   c. Provide and install new data cabling for MPE 330. An estimated 24 cables shall be installed and terminated. See [Exhibit 5.1D](#) for new data drop locations.
d. Provide and install approved Category 6 patch panels, data jacks and face plates necessary to re-terminate cabling and installation of new wireless access point cabling.

e. Provide and install one (1) 12-strand SM OS2 cable from MPE 407 to MPE 139.

f. Provide and install one (1) 2RU fiber enclosure. All fiber terminations and specifications shall be met in accordance with UNLV's Campus Wiring Specification (http://oit.unlv.edu/sites/default/files/campus_wiring_standards_9-15-16_v2.pdf).

g. Test and label all data cabling per UNLV's Campus Wiring Specification (http://oit.unlv.edu/sites/default/files/campus_wiring_standards_9-15-16_v2.pdf).

h. Contractor shall provide a warranty for all fiber cabling.

i. Contractor shall not be responsible for providing a warranty on re-terminated cabling.

5. IDF Room 102A (NEW – Relocation of IDF Room 317A)

a. Provide and install one (1) 2-post rack (Panduit Part #: R2P) near the rear of the room, along the east wall.

b. Cut and re-terminate all existing data cabling run for the Sports Injury Research Center and 500-series rooms to the new rack in room 102A. The work must be coordinated with UNLV Network Engineering as it shall be conducted during non-business hours. All existing phone cabling shall continue to IDF room 307A.

c. Provide and install new data cabling for Sports Injury Research Center. An estimated 32 cables shall be installed and terminated. See Exhibit 5.1C for new data drop locations.

d. Provide and install approved Category 6 patch panels, data jacks and face plates necessary to re-terminate cabling and installation of new wireless access point cabling.

e. Provide and install one (1) 12-strand SM OS2 cable from MPE 102A to MPE 139.

f. Provide and install one (1) 2RU fiber enclosure. All fiber terminations and specifications shall be met in accordance with UNLV's Campus Wiring Specification (http://oit.unlv.edu/sites/default/files/campus_wiring_standards_9-15-16_v2.pdf).

g. Test and label all data cabling per UNLV’s Campus Wiring Specification (http://oit.unlv.edu/sites/default/files/campus_wiring_standards_9-15-16_v2.pdf).

h. Contractor shall provide a warranty for all fiber and copper cabling.

i. Contractor shall not be responsible for providing a warranty on re-terminated cabling.

6. IDF Room 602A (NEW)

a. Provide and install two (2) DIN-rails along the southwest wall of the room in the Mechanical Plant building (600-series) for the installation of an industrial switch and power supply.

b. Run new data cabling from the boiler and chiller room control panels within 2 feet of the new switch location. All cables shall be terminated with biscuit jacks inside the panels and labeled in accordance with UNLV standards. The work must be coordinated with UNLV Network Engineering as it shall be conducted during non-business hours. All existing phone cabling shall remain and not be re-terminated.
c. Provide and install new 24-port Category 6 patch panels, 2RU patch panel standoff, data jacks and face plates as necessary to re-terminate cabling and installation of new data cabling.
d. Provide and install one (1) 12-strand SM OS2 cable from MPE 602A to MPE 139.
e. Provide and install one (1) 1RU fiber enclosure. All fiber terminations and specifications shall be met in accordance with UNLV’s Campus Wiring Specification (http://oit.unlv.edu/sites/default/files/campus_wiring_standards_9-15-16_v2.pdf).
g. Contractor shall provide a warranty for all fiber and data cabling.

D. Access Points and Antenna

1. Install and mount 36 Customer-provided access points at the locations specified in Exhibit 5.2A.

2. Install and mount six (6) Customer-provided access points at the locations specified in Exhibit 5.2B.
3.6. Judy Bayley Theatre (JBT)

A. Building Layout and Characteristics

The building described in this section is a two-story theatre with a basement. Please refer to Exhibit 6.1 for the floor plans. Most of the interior walls of the building are made of concrete block, with the office walls being made of sheet rock. There are two IDF rooms in the building, the first in the basement, Room B7 (Equipment/Electrical Room). The second IDF is on the first floor, Room 56 (Custodial). Penetrating walls may be required for cable runs, but it is our desire to keep penetrations to a minimum. The auditorium and back stage areas are high open ceiling and the office spaces are drop ceiling.

B. Station Cable

1. Provide and install a total of 46 new Category 6/Class E plenum station cable runs for connections to the data network. Twelve (12) cables shall be ran to Intermediate Distribution Facilities (IDF) room B7 from the first floor, 20 cables shall be ran to IDF room 56 from the first floor, twelve (12) cables shall be ran to IDF room 56 from the second floor, and two (2) cable shall be ran to IDF room 56 from the basement. Each cable run is a point to point run between the outlet and IDF rooms B7 and 56 without any intermediate termination.

2. If local and national electrical code allows, the contractor is not required to use conduit above the drop ceiling.

3. Terminate Cat-6 cables at locations identified and in the quantities identified in Exhibit 6.2A, 6.2B, and 6.2C.

4. The following items shall provide job specifics which could include drop height, special considerations for AP cables, conduits, sleeves, etc.
   a. Room B19 (Trap Room) – This room is open ceiling and has one (1) AP that shall be mounted at the location specified in Exhibit 6.2A. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit along the ceiling and back to IDF 56.
   b. Room 10 (Lobby) – This room has three (3) APs that shall be mounted approximately 10 to 12 feet above the finished floor at the locations specified in Exhibit 6.2B. The APs shall be mounted on a 5S junction box with the cable terminations inside the j-box. The antennas shall be placed next to the APs with the excess cable coiled neatly behind the antennas. The room is open ceiling and cabling shall be ran in 1-inch conduit to a box where the cabling shall be consolidated to 1.5-inch conduit along the wall and down the wall to the board in IDF B7.
   c. Room 19 (Vestibule) – This room has one (1) AP that shall be mounted at the location specified in Exhibit 6.2B. This room has drop ceiling and the AP shall be mounted on the grid. Cabling shall be ran in 1-inch conduit back to the board in room B7.
   d. Corridor 14 (Stair 1) – This area has one (1) AP that shall be mounted at the location specified in Exhibit 6.2B. This area is hard-lid ceiling and the AP shall be mounted 10 to 12 feet above the finished floor. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. The antenna shall be placed next to
the AP with the excess cable coiled neatly behind the antenna. The cabling shall be run in 1-inch conduit back to IDF 56.

e. Stair 2 - This area has one (1) AP that shall be mounted at the location specified in Exhibit 6.2B. This area is high ceiling and the AP shall be mounted 10 to 12 feet above the finished floor. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. The antenna shall be placed next to the AP with the excess cable coiled neatly behind the antenna. The cabling shall be ran in 1-inch conduit back to IDF 56.

f. Corridor 26 (Stair 3) – This area has one (1) AP that shall be mounted at the location specified in Exhibit 6.2B. This area is high ceiling and the AP shall be mounted 10 to 12 feet above the finished floor. The AP shall be mounted on a 5S junction box with the cable terminations inside the j-box. The antenna shall be placed next to the AP with the excess cable coiled neatly behind the antenna. The cabling shall be ran in 1-inch conduit back to IDF 56.

g. Room 48 (Green Room) – This room has an existing AP and shall be replaced with customer-supplied equipment. No new cabling or location change is necessary.

h. Room 49 (Stage) – This room has two (2) APs that shall be mounted at the locations specified in Exhibit 6.2B. This area is open ceiling and the APS shall be mounted 10 to 12 feet above the finished floor. The APs shall be mounted on 5S junction boxes with the cable terminations inside the j-boxes. The antennas shall be placed next to the APs with the excess cable coiled neatly behind the antennas. Cabling shall be ran in 1-inch conduit back to IDF 56.

i. Room 50 (Workroom) – This room has one (1) AP that shall be mounted at the location specified in Exhibit 6.2B. This area is open ceiling and the AP shall be mounted 10 to 12 feet above the finished floor. The AP shall be mounted on 5S junction box with the cable terminations inside the j-box. The antenna shall be placed next to the AP with the excess cable coiled neatly behind the antenna. Cabling shall be ran in 1-inch conduit back to IDF 56.

j. The following APs shall be mounted at the locations specified in Exhibit 6.2B. All ceilings are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran back to IDF 56 with j-hooks and 1-inch conduit (as necessary).
   - Room 51 (Women’s Dressing Room)
   - Room 52 (Men’s Dressing Room)
   - Room 54 (Workroom)

k. The second floor is above the Auditorium and are catwalks from one side to the other. All six (6) APs shall be mounted at the locations specified in Exhibit 6.2C. These APs shall require the use of a safety strap connected to the catwalk.
   - Catwalk 200E – The three (3) APs shall be mounted on the east catwalk rail. The antennas shall be mounted to the conduit pipe underneath the concrete board located below the catwalk and within five (5) feet of the AP. Cabling shall be ran south using 1-inch conduit along the bottom of the catwalk to the open areas, down the interior of the open area and back to IDF 56. The cabling shall be consolidated into larger conduit as necessary.
   - Catwalk 200C – The three (3) APs shall be mounted on the east catwalk rail. There is a rail on the east side of the catwalk that shall be used to connect a 2-
inch pipe that shall allow the mounting of the antenna approximately one (1) foot below the bottom of the catwalk. The antennas shall be within five (5) feet of the AP. Cabling shall be ran south using 1-inch conduit along the bottom of the catwalk to the open areas, down the interior of the open area and back to IDF 56. The cabling shall be consolidated into larger conduit as necessary.

I. Exterior APs – There are two (2) exterior APs that shall be mounted at the locations specified in **Exhibit 6.2B**. The APs shall be installed approximately 10 - 12 feet above the exterior ground level and shall be mounted on the building exterior. A 1-inch sleeve conduit installed between the interior and exterior walls. The faceplate shall be placed on the interior wall within 5 feet of the AP location with any excess cable coiled neatly.

- Exterior AP (SW Corner) – This AP faceplate is in an open ceiling area. Cabling shall be ran using 1-inch conduit and the conduit path shall follow the existing water pipe in the Lobby and back to IDF 56
- Exterior AP (NW Corner) – This AP faceplate is above drop ceiling. Cabling shall be ran in j-hooks and conduit, as necessary, down to IDF B7.

C. Intermediate Distribution Frame (IDF) Rooms

1. IDF Room B7
   a. Provide and install one (1) 2RU hinged standoff bracket to mount patch panel at the location identified in **Exhibit 6.3A**.
   b. Provide and install one (1) 24-port Category 6/Class E universal keystone patch panels (**Section 2.2.E.2**) to be used for new Cat-6 cabling on the board in IDF Room B7 at the location identified in **Exhibit 6.3A**.
   c. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in **Exhibit 6.3A**.
   d. Label all new cabling and components per requirements in **Section 2.2.F**.

2. IDF Room 56
   a. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (**Section 2.2.E.3**) to be used for new Cat-6 cabling in the enclosure in IDF Room 56 at the location identified in **Exhibit 6.3B**.
   b. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in **Exhibit 6.3B**.
   c. Label all new cabling and components per requirements in **Section 2.2.F**.
   d. Provide and install 2-inch conduit sleeve to be used to run the cables through the ceiling.

D. Access Points and Antenna

1. Install and mount 1 Customer-provided access points at the locations specified in **Exhibit 6.2A**.
2. Install and mount 16 Customer-provided access points at the locations specified in **Exhibit 6.2B**.
3. Install and mount 6 Customer-provided access points at the locations specified in **Exhibit 6.2C**.
3.7. Artemus W. Ham Concert Hall (HCH)

A. Building Layout and Characteristics

The building described in this section is a two-story concert hall with a basement and a single-story building on the southwest corner of the concert hall. Please refer to Exhibit 7.1 for the floor plans. Most of the interior walls of the concert hall are made of concrete block, with some walls being made of sheet rock. The second building exterior walls are made of metal and glass, with the interior walls being made of sheet rock. There are two (2) IDF rooms in the concert hall, Room 113 (IDF) and a new IDF enclosure in Room 207 (Light Spot). There is one (1) IDF enclosure in the second building in Room 128 (Office) that shall be decommissioned and relocated to room 140. Penetrating walls may be required for cable runs, but it is our desire to keep penetrations to a minimum. The auditorium, back stage, and lobby areas are high open ceiling and the office spaces are drop ceiling. The second floor of the concert hall has some seating, but is mainly hexagonal catwalk above the auditorium.

B. Station Cable

1. Provide and install a total of 34 new Category 6/Class E plenum station cable runs for connections to the data network. Twelve (12) cables shall be ran to Intermediate Distribution Facilities (IDF) room 113 from the first floor. Four (4) cables shall be ran to IDF room 140 for the second building. Eighteen (18) cables shall be ran to the new IDF enclosure in room 207. Each cable run is a point to point run between the outlet and IDF rooms 113, 140, and 207 without any intermediate termination.

2. Provide and install conduit, junction boxes, and cable supports as required.

3. If local and national electrical code allows, the contractor is not required to use conduit above the drop ceiling.

4. Terminate Cat-6 cables at locations identified and in the quantities identified in Exhibit 7.2A and 7.2B.

5. The following items shall provide job specifics which could include drop height, special considerations for AP cables, conduits, sleeves, etc.

   a. Room 101 (Lobby) – This room has two (2) APs that shall be mounted approximately 10 to 12 feet above the finished floor at the locations specified in Exhibit 7.2A. The APs shall be mounted on a 5S junction box with the cable terminations inside the j-box. The antennas shall be placed next to the APs with the excess cable coiled neatly behind the antennas. The room is open ceiling and cabling shall be ran in 1-inch conduit to the board in IDF 113.

   b. Room 117 (Auditorium) - This room has three (3) APs that shall be mounted approximately 10 to 12 feet above the finished floor at the locations specified in Exhibit 7.2A. The APs shall be mounted on a 5S junction box with the cable terminations inside the j-box. The antennas shall be placed next to the APs with the excess cable coiled neatly behind the antennas. Cabling shall be ran in 1-inch conduit to the board in IDF 113.

   c. Room 126 (Storage) – This room has one (1) AP that shall be mounted approximately 10 to 12 feet above the finished floor at the location specified in Exhibit 7.2A. The AP shall be mounted on a 5S junction box with the cable
terminations inside the j-box. Cabling shall be ran in 1-inch conduit to the closest IDF (113 or 128).

d. Room 129 (Office) – This room has one (1) AP that shall be mounted at the location specified in Exhibit 7.2A. The room has drop ceiling and shall be mounted to the grid. Cabling shall be ran above grid in j-hooks back to IDF Enclosure 128.
e. Room 130B (North Hallway) – This room has one (1) AP that shall be mounted at the location specified in Exhibit 7.2A. The room has drop ceiling and shall be mounted to the grid. Cabling shall be ran above grid in j-hooks back to IDF Enclosure 128.
f. Second Floor Catwalk – This area has nine (9) APs that shall be mounted at the locations specified in Exhibit 7.2A. This area is above the auditorium and has open ceiling. The catwalk has a hexagonal design and each AP shall be mounted at the top point of each hexagon. The antennas shall be installed at the lowest location possible on the catwalk and within 5 feet of the AP. Cabling shall be ran south in 1-inch conduit along the bottom of the catwalk to the south wall and back to the IDF enclosure room 207. The cabling shall be consolidated into larger conduit as necessary. These APs shall require the use of a safety strap connected to the catwalk.

C. Intermediate Distribution Frame (IDF) Rooms

1. IDF Room 113 (Off-Hours)
   a. Provide and install one (1) 2-post rack (Panduit Part #: R2P) near the rear of the room, along the east wall.
   b. Cut and re-terminate all existing data cabling runs for the building to the new rack. The work must be coordinated with UNLV Network Engineering as it shall be conducted during non-business hours. All existing phone cabling shall continue to IDF room 113.
   c. Provide and install new data cabling for the building. An estimated 25 cables shall be cut and re-terminated. The actual number of data cables shall need to be verified as new cabling shall be installed for the rooms in this area but should be less than 40.
   d. Provide and install approved Category 6 patch panels, data jacks and face plates necessary to re-terminate cabling and installation of new wireless access point cabling.
   e. Provide and install two (2) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling to the board in IDF Room 113 at the location identified in Exhibit 7.3A.
   f. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 7.3A.
   g. Label all new cabling and components per requirements in Section 2.2.F.

2. IDF Room 128
   a. This room shall be decommissioned. Any existing cabling shall be ran to new IDF room 140.
3. **IDF Room 140**
   a. Provide and install one (1) 2-post rack (Panduit Part #: R2P) near the rear of the room, along the east wall.
   b. Cut and re-terminate all existing data cabling run for the Green Room building rooms to the new rack in room 140. The work must be coordinated with UNLV Network Engineering as it shall be conducted during non-business hours. All existing phone cabling shall continue to IDF room 113.
   c. Provide and install new data cabling for the building. An estimated 15 cables shall be cut and re-terminated. The actual number of data cables shall need to be verified as new cabling shall be installed for the rooms in this area but should be less than 30.
   d. Provide and install approved Category 6 patch panels, data jacks and face plates necessary to re-terminate cabling and installation of new wireless access point cabling.
   e. Provide and install one (1) 12-strand SM OS2 cable from HCH 113 to HCH 140.
   f. Provide and install one (1) 2RU fiber enclosure. All fiber terminations and specifications shall be met in accordance with [UNLV’s Campus Wiring Specification](http://oit.unlv.edu/sites/default/files/campus_wiring_standards_9-15-16_v2.pdf).
   g. Test and label all data cabling per [UNLV’s Campus Wiring Specification](http://oit.unlv.edu/sites/default/files/campus_wiring_standards_9-15-16_v2.pdf).
   h. Contractor shall provide a warranty for all fiber cabling.
   i. Contractor shall not be responsible for providing a warranty on re-terminated cabling.

4. **IDF Room 207**
   a. Provide and install one (1) 2-post rack (Panduit Part #: R2P) on the south wall at the location identified in Exhibit 7.3C.
   b. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels ([Section 2.2.E.3](#)) to be used for new Cat-6 cabling in the enclosure in Room 207 at the rack location identified in Exhibit 7.3C.
   c. Provide and install one (1) 12-strand SM OS2 cable from HCH 207 to HCH 113.
   d. Provide and install one (1) 2RU fiber enclosure. All fiber terminations and specifications shall be met in accordance with [UNLV’s Campus Wiring Specification](http://oit.unlv.edu/sites/default/files/campus_wiring_standards_9-15-16_v2.pdf).
   e. Test and label all data cabling per [UNLV’s Campus Wiring Specification](http://oit.unlv.edu/sites/default/files/campus_wiring_standards_9-15-16_v2.pdf).
   f. Contractor shall provide a warranty for all fiber cabling.
   g. Contractor shall not be responsible for providing a warranty on re-terminated cabling.

D. **Access Points and Antenna**
   1. Install and mount eight (8) Customer-provided access points at the locations specified in Exhibit 7.2B.
   2. Install and mount nine (9) Customer-provided access points at the locations specified in Exhibit 7.2C.
3.8. Shadow Lane Campus – Building A (SLC-A)

A. Building Layout and Characteristics
The building described in this section is a two-story building. Please refer to Exhibit 8.1 for the floor plans. This building has offices, dental laboratories, and dental treatment rooms. Most of the interior walls of the building are made of sheet rock. There are three (3) IDF rooms on the first floor, rooms 101C, 108, and 120B. There are two (2) IDF rooms on the second floor, room 200A and 213B. Penetrating walls may be required for cable runs, but it is our desire to keep penetrations to a minimum. Most of the ceilings are drop ceilings with plenum space, but there are some rooms with a high open ceiling. The ceiling height varies from 8 to 15 feet high.

B. Station Cable
1. Provide and install a total of 94 new Category 6/Class E plenum station cable runs for connections to the data network. Sixty-two (62) cable shall be ran to the three (3) IDF rooms on the first floor, and 32 cables shall be ran to the two (2) IDF rooms on the second floor. For the first floor, six (6) cables shall be ran to Intermediate Distribution Facilities (IDF) room 101C, 54 cables shall be ran to IDF room 108A, and two (2) cable shall be ran to IDF room 120B. For the second floor, 18 cables shall be ran to IDF room 200A, and 14 cables shall be ran to IDF room 213B. Each cable run is a point to point run between the outlet and IDF rooms 101C, 108A, 120B, 200A, and 213B without any intermediate termination.
2. Provide and install conduit, junction boxes, and cable supports as required.
3. If local and national electrical code allows, the contractor is not required to use conduit above the drop ceiling.
4. Terminate Cat-6 cables at locations identified and in the quantities identified in Exhibit 8.2A and 8.2B.
5. The following items shall provide job specifics which could include drop height, special considerations for AP cables, conduits, sleeves, etc.
   a. Room 100 (Waiting Room) – There are two APs in this room. Each AP runs to a different IDF (101C and 108). This shall describe the south AP running to IDF 101C. This room is high-ceiling and the AP shall be mounted at the location specified in Exhibit 8.2A. This AP shall be mounted to the 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit back to IDF 101C.
   b. Room 101 (Auditorium) – There are two (2) APs in this room and shall be mounted at the locations specified in Exhibit 8.2A. The ceiling at these locations are hard-lid and the APs shall be mounted to the 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in j-hooks and conduit, as necessary, back to IDF 101C.
   c. Room 100 (Waiting Room) – There are two (2) APs in this room. Each AP runs to a different IDF (101C and 108). This shall describe the north AP running to IDF 108. This room is high-ceiling and the AP shall be mounted at the location specified in Exhibit 8.2A. This AP shall be mounted to the 5S junction box with the cable
terminations inside the j-box. Cabling shall be ran in 1-inch conduit and j-hooks back to IDF 101C.

d. The following first floor APs shall be mounted at the locations specified in Exhibit 8.2A. All ceilings are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran using j-hooks and conduit as necessary back to IDF 108A.

- Hallway 100K
- Hallway 100M
- Corridor 100o
- Corridor 100Q
- Hallway 100W
- Room 102 (Waiting)
- Room 102M (Clinic)
- Corridor 104
- Room 107 (Clinic) – Three (3) APs
- Room 111 (Clinic) – Two (2) APs
- Room 111D (Exam)
- Room 112 (Student Lounge) – Two (2) APs
- Room 114 (Pediatric Clinic)
- Room 119 (Lab)
- Room 121A (Dental Storage and Office)

e. Room 116 (Break Room) – There is one (1) AP in this room that shall be mounted at the location specified in Exhibit 8.2A. This room is high-ceiling and the AP shall be mounted to the wall at approximately 10 to 12 feet above the finished floor. This AP shall be mounted to the 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit and j-hooks back to IDF 108A.

f. The following second floor APs shall be mounted at the locations specified in Exhibit 8.2B. All ceilings are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran using j-hooks and conduit as necessary back to IDF 200A.

- Hallway 200i
- Hallway 200K
- Room 202 (Reception)
- Room 202G (Conference)
- Room 202i (Dean’s Office)
- Room 204B (Conference)
- Room 206A (Conference)
- Room 208 (Simulation Lab) – Two (2) APs

g. The following second floor APs shall be mounted at the locations specified in Exhibit 8.2B. All ceilings are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran using j-hooks and conduit, as necessary, back to IDF 213B.

- Corridor 200N
- Corridor 200o
- Room 201 (Clinic) – Two (2) APs
- Room 209 (Clinic) – Two (2) APs
- Room 211 (Clinic)
h. Exterior APs – There are two (2) exterior APs that shall be mounted at the locations specified in Exhibit 8.2A. The APs shall be installed approximately 10 - 12 feet above the exterior ground level and shall be mounted on the building exterior. A 1-inch sleeve conduit installed between the interior and exterior walls. The faceplate shall be placed on the interior wall within 5 feet of the AP location with any excess cable coiled neatly.

- Exterior AP (West) – This AP faceplate is in an open ceiling area. Cabling shall be ran using 1-inch conduit and back to IDF 120B.
- Exterior AP (East) – This AP faceplate is above drop ceiling. Cabling shall be ran in j-hooks and conduit, as necessary, back to IDF 108A.

C. Intermediate Distribution Frame (IDF) Rooms

1. IDF Room 101C
   a. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the rack in IDF Room 101C at the rack location identified in Exhibit 8.3A.
   b. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 8.3A.
   c. Label all new cabling and components per requirements in Section 2.2.F.
   d. Install two (2) new 2RU horizontal rack managers (Panduit Part #: WMPF1E) at locations identified in Exhibit 8.3A.

2. IDF Room 108A
   a. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the rack in IDF Room 108A at the rack location identified in Exhibit 8.3B.
   b. Provide and install one (1) 24-port Category 6/Class E universal keystone patch panels (Section 2.2.E.2) to be used for new Cat-6 cabling in the rack in IDF Room 108A at the rack location identified in Exhibit 8.3B.
   c. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 8.3B.
   d. Label all new cabling and components per requirements in Section 2.2.F.
   e. Install one (1) new 2RU horizontal rack manager (Panduit Part #: WMPF1E) below new patch panel at location identified in Exhibit 8.3B.
   f. Install one (1) new 1RU horizontal rack manager (Panduit Part #: WMPFSE) below new patch panel at location identified in Exhibit 8.3B.

3. IDF Room 120B
   a. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the rack in IDF Room 120B at the rack location identified in Exhibit 8.3C.
   b. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 8.3C.
   c. Label all new cabling and components per requirements in Section 2.2.F.
   d. Install new 2RU horizontal rack manager (Panduit Part #: WMPF1E) below new patch panel at location identified in Exhibit 8.3C.
e. Install new 1RU horizontal rack manager (Panduit Part #: WMPFSE) at location identified in Exhibit 8.3C.

4. IDF Room 200A
   a. Provide and install one (1) 24-port Category 6/Class E universal keystone patch panels (Section 2.2.E.2) to be used for new Cat-6 cabling in the rack in IDF Room 200A at the rack location identified in Exhibit 8.3D.
   b. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 8.3D.
   c. Label all new cabling and components per requirements in Section 2.2.F.

5. IDF Room 213B
   a. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the rack in IDF Room 213B at the rack location identified in Exhibit 8.3E.
   b. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 8.3E.
   c. Label all new cabling and components per requirements in Section 2.2.F.
   d. Install new 2RU horizontal rack manager (Panduit Part #: WMPF1E) below new patch panel at location identified in Exhibit 8.3E.

D. Access Points and Antenna
   1. Install and mount 31 Customer-provided access points at the locations specified in Exhibit 8.2A.
   2. Install and mount 16 Customer-provided access points at the locations specified in Exhibit 8.2B.
3.9. **Shadow Lane Campus – Building B (SLC-B)**

**A. Building Layout and Characteristics**

The building described in this section is a three-story building. Please refer to Exhibit 9.1 for the floor plans. This building has offices, classrooms, laboratories, and simulation rooms. Most of the interior walls of the building are made of sheet rock. There is one (1) IDF rooms on the first floor, room 109P. There are two (2) IDF rooms on the second floor, rooms 203 and 251. Room 203 shall not be affected by this installation. There are two (2) IDF rooms on the third floor, rooms 304 and 318. Room 304 shall not be affected by this installation. Penetrating walls may be required for cable runs, but it is our desire to keep penetrations to a minimum. Most of the ceilings are drop ceilings with plenum space, but there are some rooms with a hard lid or open ceiling.

**B. Station Cable**

1. Provide and install a total of 28 new Category 6/Class E plenum station cable runs for connections to the data network. Sixteen (16) cables shall be ran to IDF room on the first floor, eight (8) cables shall be ran to the IDF room on the second floor, and four (4) cables shall be ran to the IDF room on the third floor. For the first floor, 12 cables shall be ran to Intermediate Distribution Facilities (IDF) room 109P. For the second floor, four (4) cables shall be ran to the first floor IDF room 109P, and eight (8) cables shall be ran to IDF room 251. For the third floor, four (4) cables shall be ran to IDF room 318. Each cable run is a point to point run between the outlet and IDF rooms 109P, 251, and 318 without any intermediate termination.

2. Provide and install conduit, junction boxes, and cable supports as required.

3. If local and national electrical code allows, the contractor is not required to use conduit above the drop ceiling.

4. Terminate Cat-6 cables at locations identified and in the quantities identified in Exhibit 9.2A, 9.2B, and 9.2C.

5. The following items shall provide job specifics which could include drop height, special considerations for AP cables, conduits, sleeves, etc.
   a. Corridor 109M – This room has one (1) AP that shall be removed with no replacement. Patch cabling shall be removed to the existing faceplate.
   b. The following rooms have existing APs and shall be replaced with customer-supplied equipment. No new cabling or location changes are necessary.
      - Room 109D (Debrief)
      - Room 114 (Clinical Skills Lab 3)
      - Room 118 (Classroom 3)
      - Room 119 (Clinical Skills Lab 1)
      - Room 120 (Clinical Skills Lab 4)
      - Room 121 (Classroom) – Two (2) APs
      - Room 126 (Clinical Skills Lab 2)
      - Room 127 (Classroom 2)
      - Room 128 (Classroom 1)
      - Room 200 (Lobby)
      - Room 201 (Classroom)
      - Room 247 (Office)
The following first floor APs shall be mounted at the locations specified in Exhibit 9.2A. All ceilings are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran using j-hooks and conduit, as necessary, to the cable tray and back to IDF 109P.

- Room 105C (Faculty 3)
- Room 107 (Study)
- Room 109H (Ed Sim)
- Room 109N (Hosp Sim 1)
- Room 122 (Study)

The following second floor APs shall be mounted at the locations specified in Exhibit 9.2B. All ceilings are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran using j-hooks and conduit, as necessary, back to IDF 251.

- Room 225 (Office)
- Room 229 (Workroom)
- Room 239 (Office)

Room 204 (Workroom) - There is one (1) AP in this room and it shall be mounted at the location specified in Exhibit 9.2B. The ceiling at this location is hard-lid and the AP shall be mounted to the 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in j-hooks and conduit, as necessary, back to IDF 251.

Room 307B (Lab) – There is one (1) AP in this room and shall be mounted at the locations specified in Exhibit 9.2C. The ceiling is drop ceiling and the AP shall be mounted on the grid. Cabling shall be ran using j-hooks and conduit, as necessary, back to IDF 318.

Room 317 (Lab) – There is one (1) AP in this room and shall be mounted at the location specified in Exhibit 9.2C. The ceiling is open-ceiling and the AP shall be mounted to the 5S junction box with the cable terminations inside the j-box. Cabling shall be ran using j-hooks and conduit, as necessary, back to IDF 318.

Exterior APs – There are three (3) exterior APs that shall be mounted at the locations specified in Exhibit 9.2A and 9.2B. The APs shall be installed approximately 10 - 12 feet above the exterior ground level and shall be mounted on the building exterior. A 1-inch sleeve conduit installed between the interior and exterior walls. The faceplate shall be placed on the interior wall within 5 feet of the AP location with any excess cable coiled neatly.

- Exterior AP (East) 1st Floor – This AP faceplate is above drop ceiling. Cabling shall be ran in j-hooks and conduit, as necessary, back to the cable tray and to IDF 109P.
- Exterior AP (North) 2nd Floor – This AP faceplate is above drop ceiling. Cabling shall be ran in j-hooks and conduit, as necessary, back to IDF 109P.
- Exterior AP (East) 2nd Floor – This AP faceplate and AP location shall have to be decided in the field. The shown location is in an open ceiling area surrounded by windows. Location may need to be changed to provide an acceptable cable path back to IDF 109P. Cabling shall be ran using j-hook and 1-inch conduit, as necessary, back to IDF 109P.
C. Intermediate Distribution Frame (IDF) Rooms

1. IDF Room 109P
   a. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the rack in IDF Room 109P at the rack location identified in Exhibit 9.3A.
   b. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 9.3A.
   c. Label all new cabling and components per requirements in Section 2.2.F.
   d. Install new 2RU horizontal rack manager (Panduit Part #: WMPF1E) below new patch panel at location identified in Exhibit 9.3A.

2. Intermediate Distribution Frame (IDF) Room 251
   a. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 9.4B.
   b. Label all new cabling and components per requirements in Section 2.2.F.

3. Intermediate Distribution Frame (IDF) Room 318
   a. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the rack in IDF Room 318 at the rack location identified in Exhibit 9.4C.
   b. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 9.4C.
   c. Label all new cabling and components per requirements in Section 2.2.F.
   d. Install new 2RU horizontal rack manager (Panduit Part #: WMPF1E) below new patch panel at location identified in Exhibit 9.4C.

D. Access Points and Antenna

1. Install and mount 16 Customer-provided access points at the locations specified in Exhibit 9.2A.
2. Install and mount 10 Customer-provided access points at the locations specified in Exhibit 9.2B.
3. Install and mount two (2) Customer-provided access points at the locations specified in Exhibit 9.2C.

3.10. Shadow Lane Campus – Building C (SLC-C)

A. Building Layout and Characteristics
The building described in this section is a single story building. Please refer to Exhibit 10.1 for the floor plans. This building has offices, a high bay, and workrooms. Most of the interior walls of the building are made of sheet rock. There is one (1) IDF room in the building, room 110. Penetrating walls may be required for cable runs, but it is our desire to keep penetrations to a minimum. The office ceilings are drop ceilings with plenum space, but the work room ceiling are hard lid.

B. Station Cable
1. Provide and install a total of 12 new Category 6/Class E plenum station cable runs for connections to the data network. All of the cables shall be ran to Intermediate
Distribution Facilities (IDF) room 110. Each cable run is a point to point run between the outlet and IDF room 110 without any intermediate termination.

2. Provide and install conduit, junction boxes, and cable supports as required.

3. If local and national electrical code allows, the contractor is not required to use conduit above the drop ceiling.

4. Terminate Cat-6 cables at locations identified and in the quantities identified in Exhibit 10.2.

5. The following items shall provide job specifics which could include drop height, special considerations for AP cables, conduits, sleeves, etc.
   a. The following APs shall be mounted at the locations specified in Exhibit 10.2. All ceilings are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran using j-hooks and conduit, as necessary, back to IDF 110.
      - Hallway 101
      - Room 123 (Police)
      - Room 127 (Public Lobby)
   b. The following APs shall be mounted at the locations specified in Exhibit 10.2. The ceiling at these locations are hard-lid and the APs shall be mounted to the 5S junction box with the cable terminations inside the j-box. Cabling shall be ran in 1-inch conduit back to IDF 110.
      - Room 110 (IDF)
      - Room 116B (Storage)
      - Room 120 (Office)

C. Intermediate Distribution Frame (IDF) Room 110

1. Provide and install one (1) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the rack in IDF Room 110 at the rack location identified in Exhibit 10.3.

2. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 10.3.

3. Label all new cabling and components per requirements in Section 2.2.F.

4. Install new 2RU horizontal rack manager (Panduit Part #: WMPF1E) below new patch panel at location identified in Exhibit 10.3.

5. Provide and install an access door of 24 inches x 24 inches in this IDF to perform all necessary work. Planning and construction shall have to confirm if the door needs to be fire-rated and what the rating is.

6. The contractor shall install a 2-inch conduit sleeve to be used to run the cables through the ceiling.

D. Access Points and Antenna

1. Install and mount 6 Customer-provided access points at the locations specified in Exhibit 10.2.
3.11. Shadow Lane Campus – Building D (SLC-D)

A. Building Layout and Characteristics
The building described in this section is a two-story building. Please refer to Exhibit 11.1 for the floor plans. This building has offices, classrooms, and dental treatment rooms. Most of the interior walls of the building are made of sheet rock. There is one (1) IDF room in the building, room 130. Penetrating walls may be required for cable runs, but it is our desire to keep penetrations to a minimum. All of the ceilings are drop ceilings with plenum space. The ceiling height varies from 8 to 15 feet high.

B. Station Cable
1. Provide and install a total of 64 new Category 6/Class E plenum station cable runs for connections to the data network. Thirty (30) cables shall be ran to Intermediate Distribution Facilities (IDF) room 130 from the first floor and 34 cables shall be ran to IDF room 130 from the second floor. Each cable run is a point to point run between the outlet and IDF room 130 without any intermediate termination.
2. Provide and install conduit, junction boxes, and cable supports as required.
3. If local and national electrical code allows, the contractor is not required to use conduit above the drop ceiling.
4. Terminate Cat-6 cables at locations identified and in the quantities identified in Exhibit 11.2A and 11.2B.
5. The following items shall provide job specifics which could include drop height, special considerations for AP cables, conduits, sleeves, etc.
   a. All of the interior APs shall be mounted at the locations specified in Exhibit 11.2A and 11.2B. All ceilings are drop ceiling and the APs shall be mounted on the grid. Cabling shall be ran using j-hooks and conduit as necessary back to IDF 130.
   b. Exterior APs – There are four (4) exterior APs that shall be mounted at the locations specified in Exhibit 11.2A. The APs shall be installed approximately 10 - 12 feet above the exterior ground level and shall be mounted on the building exterior. A 1-inch sleeve conduit installed between the interior and exterior walls. The faceplate shall be placed on the interior wall within 5 feet of the AP location with any excess cable coiled neatly.
      • Exterior AP (Northwest) – This AP faceplate is in an open ceiling area. Cabling shall be ran using 1-inch conduit back to IDF 130.
      • Exterior APs (West, Northeast, East) – These AP faceplates are above drop ceiling. Cabling shall be ran in j-hooks and conduit, as necessary, back to IDF 130.

C. Intermediate Distribution Frame (IDF) Room 130
1. Provide and install two (2) 48-port Category 6/Class E universal keystone patch panels (Section 2.2.E.3) to be used for new Cat-6 cabling in the rack in IDF Room 130 at the rack location identified in Exhibit 11.3.
2. Provide, install, and terminate (2) two 4-pair Category 6/Class E plenum cables in each station outlet and the copper patch panel as shown in Exhibit 11.3.
3. Label all new cabling and components per requirements in Section 2.2.F.
4. Install two (2) new 2RU horizontal rack managers (Panduit Part #: WMPF1E) below new patch panels at location identified in Exhibit 11.3.

D. Access Points and Antenna
   1. Install and mount 15 Customer-provided access points at the locations specified in Exhibit 11.2A.
   2. Install and mount 17 Customer-provided access points at the locations specified in Exhibit 11.2B

4. TECHNICAL POINT OF CONTACT
   A. Customer’s technical points of contacts are Eric Kraft and Taylor Gradin at 702-774-4500.
5. Exhibits

Exhibit 1 – Stan Fulton Building (SFB)/International Gaming Institute (IGI)

Exhibit 1.1 – Stan Fulton Building (SFB)/International Gaming Institute (IGI) Floor Plans
Exhibit 1.1A – SFB First Floor

Exhibit 1.1B – SFB Second Floor Plans
Exhibit 1.2 – SFB/IGI Access Point (AP) Locations

Exhibit 1.2A – First Floor AP Locations

Exhibit 1.2B – Second Floor AP Locations
Exhibit 1.3 – SFB/IGI IDF Rack Elevations

Exhibit 1.3A - IDF SFB 107

Exhibit 1.3B – IDF SFB 207
Exhibit 2 – Taylor Hall

Exhibit 2.1 – TAY Floor Plan

Exhibit 2.2 – TAY AP Locations
Exhibit 2.3 – TAY IDF Enclosure Rack Elevation

Exhibit 3 – Paul B. Sogg Architecture Building (ARC)

Exhibit 3.1 – ARC Floor Plans
Exhibit 3.1A – ARC First Floor
Exhibit 3.2B – Second Floor AP Locations

Exhibit 3.3 – ARC IDF Rack Elevations and Room Layouts
Exhibit 3.3A – IDF ARC 111 Room Layout
Exhibit 3.3B – IDF ARC 111 Rack Elevations

Exhibit 3.3C – IDF ARC 148 Rack Elevations
Exhibit 3.3D – IDF ARC 237 Room Layout

Exhibit 3.3E – ARC IDF 237 Rack Elevations
Exhibit 4 – Sidewalk Café (SWC)

Exhibit 4.1: SWC Floor Plan

Exhibit 4.2: SWC Access Point Locations
Exhibit 4.3: Sidewalk Café (SWC) Rack Elevation

Exhibit 5 – McDermott Physical Education (MPE) Complex
Exhibit 5.1: MPE Floor Plans
Exhibit 5.1A: MPE First Floor
Exhibit 5.1B: MPE Second Floor

Exhibit 5.1C: Sports Injury Research Center Drop Locations
Exhibit 5.2B: MPE Second Floor APs

Exhibit 5.3: MPE IDF Rack Elevations
Exhibit 5.3A: IDF MPE 139
Exhibit 5.3D: Enclosure MPE 403

Exhibit 6 – Judy Bayley Theatre (JBT)
Exhibit 6.1 – JBT Floor Plans
Exhibit 6.1A – Basement
Exhibit 6.1B – First Floor

Exhibit 6.1C – Second Floor
Exhibit 6.2 – JBT Access Point Locations

Exhibit 6.2A – Basement APs

Exhibit 6.2B – First Floor APs
Exhibit 6.2C – Second Floor APs

Exhibit 6.3 – JBT Rack Elevations
Exhibit 6.3A – IDF JBT B7
Exhibit 6.3B – IDF JBT 56

Exhibit 7 – Hamm Concert Hall (HCH)
Exhibit 7.1 – HCH Floor Plans
Exhibit 7.1A – Basement
Exhibit 7.2 – HCH AP Locations

Exhibit 7.2A – First Floor APs

Exhibit 7.2B – Balcony APs
Exhibit 7.3 – HCH Rack Elevations

Exhibit 7.3A – IDF HCH 113

Exhibit 7.3B – IDF HCH 128
Exhibit 7.3C – Enclosure HCH 207

Exhibit 8 – Shadow Lane Campus – Building A (SLCA)
Exhibit 8.1 – SLCA Floor Plans
Exhibit 8.1A – First Floor
Exhibit 8.1B – Second Floor

Exhibit 8.2 – SLCA Access Point (AP) Locations
Exhibit 8.2A – First Floor APs
Exhibit 8.2B – Second Floor APs

Exhibit 8.3 – SLC-A Rack Elevations
Exhibit 8.3A – IDF SLCA 101C
Exhibit 9 – Shadow Lane Campus – Building B (SLCB)
Exhibit 9.1 – SLCB Floor Plans
Exhibit 9.1A – First Floor

Exhibit 9.1B – Second Floor
Exhibit 9.1C – Third Floor

Exhibit 9.2 – SLCB Access Point (AP) Locations
Exhibit 9.2A – First Floor APs
Exhibit 9.2B – Second Floor APs

Exhibit 9.2C – Third Floor APs

Exhibit 9.3 – SLCB Rack Elevations
Exhibit 9.3A – IDF SLCB 109P

Exhibit 9.3B – IDF SLCB 251

Exhibit 9.3C – IDF SLCB 318
Exhibit 10 – Shadow Lane Campus – Building C (SLCC)
Exhibit 10.1 – SLCC Floor Plans

Exhibit 10.2 – SLCC Access Point (AP) Locations
Exhibit 10.3 – IDF SLCC 110 Rack Elevations

Legend
- Internal, ceiling grid mounted AP
- Internal, hard-wire mounted AP
- External, wall mounted AP with dipoles
- Outdoor AP
- External, wall mounted AP with directional antenna

E = Existing Cabling; N = New Cabling

Future Patch Panel for WiFi Project
Leviton Part#: 49255-H48
(Contractor provided and installed)
Exhibit 11.2 – SLCD Access Point (AP) Locations

Exhibit 11.2A – First Floor APs

Exhibit 11.2B – Second Floor APs
Exhibit 12 - Standard Labeling Scheme

**UNLV Labeling Scheme**

IDF#-Room#-patch panel#-port#

Example 224D-205-5-13
This cable would terminate in room 205 and IDF 224D patch panel 5 port 13

**Conduit**
1” Diameter

**Faceplate Label:**
This cable run of this jack is terminated at patch panel 5, port number 14 at IDF 224D

**Data Jacks:**
Cat6, 8P8C, Black

**Blank Inserts:**
Match faceplate color

**Wrap Label:**
Required within six inches of both termination points

Preferred: 224D-205 5-13
Acceptable alternate: 224D 205 5-13

**Patch Panel Labels:**
Each patch panel port will be labeled as shown using the scheme listed above

Patch panels will be labeled as shown. The label will contain a number unique to the IDF. If it is the top patch panel in the rack it will be labeled "1". If is the next patch panel down from the top it will be labeled "2" and so on.