

Leland Town Hall Addition & Renovations

Addendum 2

May 3, 2024

To: All Plan Holders

From: Jenny Williams, AIA



General Items

1. Bid date and time remain unchanged.
2. The Work is to be completed in 730 calendar days from Notice to Proceed. After that time, liquidated damages will be as follows:
 1. 1-30 days: \$0 per day (grace period)
 2. 31-90 days: \$250 per day
 3. 91+ days: \$500 per day

Specification Items

1. Spec Section 27 0500 Data and Voice Communications: Revised specification is attached.
 - a. Part 2 Products, 2.01 Acceptable Manufacturers, A. Manufacturers; CommScope is removed from the specification as an acceptable manufacturer.
 - b. Part 2 Products, 2.06 Racks Patch Panels and IDF Cabinets, H. Patch Panels, revised to read: TIA/EIA 568C Category 6 compliant rack-mounted 1U, 24 port keystone patch panel with cable management and support bar and accessory patch cords, with adequate capacity for all active and 25% spare circuits.

Drawing Items

1. Sheet E0.1 Abbreviations and Legend: Revised drawing sheet is attached. Legend has been revised for CAT6 cable requirements for combination data/telephone, wall telephone, floor boxes, and poke-thru floor boxes.

Clarifications

1. None.

Approved Substitutions

The following have been reviewed and accepted:

1. The following products by Erie Metal Specialties, Inc. are an approved manufacturer substitution for expansion joint cover assemblies:
 - ELCFC Series Floor System for Interior Floor Joints Subject to Wind & Seismic Movement.
 - CSS Series (Seismic) for Exterior Wall Joints Subject to Wind & Seismic Movement.

End of Addendum 2

**SECTION 270500
DATA AND VOICE COMMUNICATIONS**

PART 1 GENERAL

1.01 SUMMARY

Section includes termination devices, racks, and premises wiring for telephone and data communication circuits by certified manufacturers and contract installers with certification and testing of all equipment and cabling.

1.02 RELATED SECTIONS:

- A. Painting
- B. General Electrical
- C. Conduit
- D. Boxes
- E. Wiring Devices

1.03 REFERENCES

TIA/EIA 568 (Telecommunications Industries Association/Electronic Industries Association) - Commercial Building Telecommunication Wiring Standard.

TIA/EIA 569 (Telecommunications Industries Association/Electronic Industries Association) - Commercial Building Standard for Telecommunications Pathways and Spaces.

TIA/EIA 606A Administrative Standard (Labeling).

TIA/EIA 607 - Commercial Building Grounding/Bonding Requirements.

NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

NFPA 70 - National Electrical Code.

UL 969 - Standard for Marking and Labeling Systems.

ISO/IEC 11801 - Information Technology, Generic cabling for customer premises.

BISCI - Building Industries Consulting Services International.

BISCI TDMM - Telecommunications Distribution Methods Manual.

BISCI CO-OSP - Customer Outside Plant Design Manual

1.04 SYSTEM DESCRIPTION

- A. Provide, ready for operation, a complete and operational communication network system that is a manufacturer certified Category 6 system. The system shall include, but not be limited

to, cabling (copper and fiber optic), cable protectors, patch panels, racks, faceplates, connectors, hardware, accessories, connections, grounding, and all other material, labor and operations required for a complete system in this building.

- B. Cabling shall be installed in conduit as shown on the Drawings. Cable support structure shall be as specified hereinafter.
- C. The horizontal wiring shall consist of the wiring from the wall mounted – Thinline IDF cabinet to the information services outlet. (The horizontal wiring includes the wiring termination components in the IDF cabinet, the horizontal wiring itself, and the termination components at the outlet).
- D. Backbone cabling shall consist of fiber (optical fiber cabling) and copper cables to connect data and voice services as required and/or as shown on the Drawings.
- E. The system shall provide for current and future voice and data requirements by a planned end-to-end manufacturers system, while recognizing the need for future bandwidth and fault tolerance. The proposed system shall utilize a network of fiber optic and unshielded twisted pair (UTP), riser, tie and station cables. Fiber cables shall terminate on Fiber Distribution Centers and/or modular patch panels as required and/or as shown on the Drawings. Cables and terminations shall be identified at all locations and cables shall terminate in an alphanumeric sequence at all termination locations. The complete system shall be fully standards compliant with guaranteed A Channel performance. All UTP end-to-end Channel Configurations as defined by TIA/EIA 568C-1,2,3 shall be provided by a single manufacturer.

1.05 SUBMITTALS

- A. Submit under provisions of relevant sections of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Certifications: Copies of Cable Installation Technician Certifications shall be submitted with the equipment shop drawings. See also Paragraph 2.1.
- C. Product Data: Submit catalog data for each termination device, cable, rack, etc.
- D. Test Reports: Indicate procedures and results for specified field testing and inspection.
- E. Test Cables on receipt at Project site:
 - 1. Test optical fiber cable to determine the continuity of the strand end to end. Use optical loss test set.
 - 2. Test optical fiber cable while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector, including the loss value of each. Retain test data and include the record in maintenance data.
 - 3. Test each pair of UTP cable for open and short circuits.

1.06 CLOSEOUT SUBMITTALS

- A. Submit under provisions of relevant sections of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Project Record Documents: Record actual locations and sizes of pathways and outlets.

- C. Provide a certificate of completion of the installation with verifications that each copper cable pair has been tested to Category 6 standards.
- D. Provide a certificate of completion of the installation with verifications that each fiber optic cable has been tested to industry standards.
- E. Provide a Certified Installation Warranty Certificate.
- F. Provide Test results for each cable and outlet.
- G. Provide marked up Drawings showing additions, deletions, and modifications also identifying cable routs.
- H. Provide electronic copies of marked up final Drawings.
- I. Provide wall mounted copies of the final system Drawings in each telecommunications room.

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Installer: Company specializing in installing products specified in this section with minimum five years documented experience on projects utilizing infrastructure work similar to that required for this project, and with service facilities within 100 miles of project.
 - 1. The Installer shall be an experienced firm regularly engaged in the layout and the installation of cabling infrastructure systems. Documentation shall be provided to show that the Contractor has successfully completed projects of similar size and scope within the previous twelve months.
 - 2. The Telecommunication Project Manager shall:
 - a. be certified as BICSI RCDD
 - b. be experienced in this type of project and provide technical support.
 - c. attend monthly progress meetings and additional meetings as scheduled or required.
 - d. be a permanent employee. Use of a temporary employee or sub-contracted employee is not permitted.
 - 3. Contractor and authorized sub-contractors shall use manufacturer certified technicians for all cable terminations, use of temporary or un-certified technicians is not permitted.
- C. Testing Agency: Company member of International Electrical Testing Association and specializing in testing products specified in this section with minimum three years documented experience.

1.08 PRE-INSTALLATION MEETING

Convene minimum one week prior to commencing Work of this section.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, the manufacturers offering products that may be incorporated into the Work are limited to the following
1. Siemons
 2. Panduit
 3. Leviton
 4. Hitachi Cable America Inc. (Basis of design for cable)

2.02 COMMUNICATIONS BACKBONE CABLES

A. UTP Cable

1. Description: 100-ohm, 25-pair UTP, covered with a thermoplastic jacket
 - a. Comply with TIA/EIA-568-C.1 for performance specifications.
 - b. Comply with TIA/EIA-568-C.2, Category 3.
 - c. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
 - i. Communications, Riser Rated: Type CMR, complying with UL 1666.

B. UTP Cable Hardware

1. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-C.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.
2. Connecting Blocks: 110-style IDC for Category 6. Provide blocks for the number of cables terminated on the block, plus 25 percent spare. Integral with connector bodies, including plugs and jacks where indicated.
3. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.
 - a. Number of Jacks per Field: One for each four-pair UTP cable, plus spares and blank positions adequate to suit specified expansion criteria.
4. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals.
5. Patch Cords: Factory-made, 4-pair cables in 48-inch (1200-mm) lengths; terminated with 8-position modular plug at each end.
 - a. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.

C. OPTICAL FIBER CABLE

1. Description: Multi mode, 6 -fiber, OM3, nonconductive, tight buffer, optical fiber cable.
 - a. Comply with ICEA S-83-596 for mechanical properties.
 - b. Comply with TIA/EIA-568-C.3 for performance specifications.
 - c. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 1651, and NFPA 70 for the following types:
 - i. General Purpose, Nonconductive: Type OFN or OFNG
 - ii. Plenum Rated, Nonconductive: Type OFNP, complying with NFPA 262.
 - iii. Riser Rated, Nonconductive: Type OFNR complying with UL 1666.

- d. Maximum Attenuation: 0.4 dB/km at 1310 nm; 0.4 dB/km at 1383 nm; 0.3 dB/km at 1550 nm.
- 2. Jacket:
 - a. Jacket Color: OM3 - Aqua
 - b. Cable cordage jacket, fiber, unit, and group color shall be according to TIA/EIA-598-C.
 - c. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches (1000 mm).

D. OPTICAL FIBER CABLE HARDWARE

- 1. Cross-Connects and Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors.
 - a. Number of Connectors per Field: One for each fiber of cable or cables assigned to field, plus spares and blank positions adequate to suit specified expansion criteria.
- 2. Patch Cords: Factory-made, dual-fiber cables in 36-inch lengths. Provide quantities required for patch panels installed plus 25% spare.
- 3. Cable Connecting Hardware:
 - a. Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12. Comply with TIA/EIA-568-C.3.
 - b. Quick-connect, simplex and duplex, Type LC connectors. Insertion loss not more than 0.75 dB.

2.03 COMMUNICATIONS HORIZONTAL CABLES

A. UTP Cable

- 1. Description: 100-ohm, 4-pair UTP, covered with a blue thermoplastic jacket and white thermoplastic jacket for voice.
 - a. Comply with TIA/EIA-568-C.1 for performance specifications.
 - b. Comply with TIA/EIA-568-C.2, Category 6.
 - c. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
 - i. Communications, General Purpose Rated: Type CM or CMG.

B. UTP Cable Hardware

- 1. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-C.2, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.
- 2. Connecting Blocks: 110-style IDC for Category 6. Provide blocks for the number of cables terminated on the block, plus 25 percent spare. Integral with connector bodies, including plugs and jacks where indicated.
- 3. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.
 - a. Number of Jacks per Field: One for each four-pair UTP cable, plus spares and blank positions adequate to suit specified expansion criteria.

4. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals.
5. Patch Cords: Factory-made, 4-pair cables in 48-inch (1200-mm) lengths; terminated with 8-position modular plug at each end.
 - a. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.

2.04 BUILDING ENTRANCE PROTECTORS

Provide building entrance protectors which shall be 66 IN termination and 66 OUT termination configured as standard 489ACA1-100 fully loaded with 4c1s protector 5-pin protector modules. Provide rack mounted protectors where indicated or where required.

2.05 COMMUNICATIONS FACEPLATES AND CONNECTORS

- A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with TIA/EIA-568-C.1.
- B. Workstation Outlets:
 1. Two-port-connector assemblies mounted in single faceplate.
 2. Four-port-connector assemblies mounted in multigang faceplate.
 3. See drawings for other outlet quantities for number of ports. Mount assemblies in multigang faceplate.
 4. Metal Faceplate: Stainless steel, complying with requirements in Section "Wiring Devices."
 5. Flush mounting snap-in jacks.
 6. Provide blanks for unused portions of faceplates.
 7. Legend: Machine printed, in the field, using adhesive-tape label.

2.06 RACKS, PATCH PANELS AND IDF CABINETS.

- A. Racks: Racks shall be two post rack with 44 rack mount spaces of 19" width and an overall interior depth of 28"; black paint with matte (satin) finish. For singular or multiple rack configurations, provide tops, rear doors, and one set of side panels for a singular viewing aspect of each configuration. Secure to floor and wall and cable tray (if utilized) with manufacturers recommended hardware and accessories providing a stable rack, racks shall be connected to the electrical ground system in compliance with TIA/EIA 607. Horizontal and vertical cable management panels shall be provided installed above and below each data patch panel to provide neat and orderly routing of patch cables. Cable management panels shall be sized to accommodate the maximum number of patch cables for the patch panels.
- B. Station cable terminations shall be accomplished using patch panels with 66 style IDC connectors. Patch panels will not exceed 2 RU (3.5") in height.
- C. Telephone backbone and station cables shall be terminated on 66 style terminal blocks. The number of blocks will be determined by installed cables plus 20% capacity. Mount blocks on the telephone backboard in accordance with BICSI TDMM specification for telephone backboards.
- D. Fiber Optic cables shall be terminated in rack mount enclosures in each wiring closet. Enclosures shall be sized based on installed cable count plus 10% spare capacity.
- E. Each rack shall have (2) 120V twist-lock NEMA L5-30 outlets installed on a rear post (one above the other) of the data rack approximately 42 inches above the finished floor or on wall adjacent to rack.

- F Each rack shall have (2) dedicated 110V 20A circuits installed on a rear post of the data rack. These two circuits shall be installed in a quad-type manner and mounted approximately 42 inches above the finished floor.
- G Each rack shall have (2) horizontal Power Distribution Units.
- H Patch Panels: TIA/EIA 568C Category 6 compliant rack-mounted 1U, 24 port keystone patch panel with cable management and support bar and accessory patch cords, with adequate capacity for all active and 25% spare circuits. Provide Category 6 green patch cords for all patch panel jacks, evenly divided between 3, 5 and 7 foot cords, plus 15% spare of each length. Provide Category 6 green patch cord for all telecommunications outlets throughout the facility, evenly divided into 7 and 10 foot cords, plus 15% spare of each length. All supplied from one manufacturer. Provide 1 foot patch cables for WAP's. Provide ten (10) 20 foot patch cables for labs 710 and 614. Data cables shall terminate on manufacturer's specified end-to-end Cat 6 solution.
- I Communication Cable Management and Ladder Rack
 - 1. Horizontal Cable managers shall be provided for routing of cable between termination points and active components. Provide cable managers for each patch panel and/or fiber enclosure in a rack plus one spare. Provide cable managers for each patch panel and/or fiber enclosure in a rack plus one spare. Example, if an TR rack has three switches it would receive 4 wire managers. The passive rack has three patch panels and one fiber enclosure. It would receive 5 wire managers. All patch panels shall be located at top of rack followed by management, switch, management, switch, switch, management, switch, switch management and UPS.
 - 2. Vertical Cable managers shall be provided for routing of cable between termination points and active components. Provide 12"wide vertical cable managers of appropriate height. Provide one manager for exterior of each rack and one in between racks if more than one rack is installed.
 - 3. A system of overhead ladder racks shall be installed in each TR to support and distribute all cabling from where it enters the room to its appropriate termination location. Racks shall be 12" wide min. with 9" spacing between support rungs.
 - 4. Overhead ladder racks shall be installed below finished ceiling, mounted at 7' - 4" and attached to the equipment racks and walls. They shall be supported at least every 6". One cable runway support bracket shall be mounted on top of each equipment rack. Ladder rack shall be bolted to the top of each cable runway support bracket to allow attachment to the equipment rack.
 - 5. Vertical ladder racks shall be installed to tie into any wireways and conduits that enter the TR above 9' AFF. All vertical ladder racks shall be connected to the horizontal ladder rack system.
- J Station cable terminations shall be accomplished using patch panels with 66 style IDC connectors. Patch panels will not exceed 2 RU (3.5") in height.
- K Telephone backbone and station cables shall be terminated on 66 style terminal blocks. The number of blocks will be determined by installed cables plus 20% capacity. Mount blocks in IDF rack.
- L Fiber Optic cables shall be terminated in MDF and IDF rack.
- M Provide receptacle in IDF rack.

PART 3 EXECUTION

3.01 INSTALLATION

- A. The project manager and crew shall be consistent through out the project. The project manager shall be present when any work is being performed. The project manager shall contact the Owner designated contact at the beginning and end of each day that work is to be performed.
- B. Cable shall be installed and terminated per manufacturer's specifications.
- C. Notify the Owner when ready for Owner-furnished equipment to be installed.
- D. Install wire and cable in accordance with TIA/EIA 568C.1,2,3 and TIA/EIA 569A.
- E. All penetrations through walls and floors shall be sleeved. All sleeves shall have permanently attached bushings. Sleeves shall be sized to accept 50% growth. All sleeves shall be fire-stopped using UL7 approved methods and shall maintain assembly fire ratings. All sleeves between floors shall be supported with a conduit riser clamp installed per the manufacturer direction and shall be installed tight to the ceiling with enough sleeve to attach the bushing and rise up three inches above the floor on the opposite end.
- F. Existing sleeves and wall penetrations may be used provided no sleeve exceeds a 40 percent fill ratio. If using an existing sleeve, it shall have a permanently attached bushing, the contractor shall protect all existing cables and be responsible for any damage to existing cables. All existing sleeves and penetrations shall be firestopped and meet state and local codes at the completion of the installation.
- G. All cable shall be installed in a complete, neat and orderly fashion. Install cable with sufficient bending radius as not to kink, shear or damage binders. Bend radius shall meet manufacturers specifications for horizontal cable, fiber-optic cable, inter- and intra- building cable and copper inter- and intra- building cable. Cables shall be groomed, such that cables to be terminated on the left side of the patch panels are routed down the left side of the rack, and cables to be terminated on the right side of the patch panels are to be routed down the right side of the rack.
- H. Terminate all data and telephone cables at outlet devices. Terminate data cables on specified rack designated by the manufacturer's end-to-end solution equipment. Terminate telephone cables on specified rack using manufacturer's end-to-end solution for Cat 6.
- I. Install pullwire in each empty telephone or data conduit.
- J. A minimum of three feet of slack should be left in an appropriate tidy fashion in the IDF Cabinet.
- K. All cables shall be installed according to TIA/EIA 568C-1,2,3 /569A standards. Care shall be taken during the installation to prevent nicks, abrasions, burning and scuffing of the cable. Cables found to be damaged will be replaced at the contractor's expense regardless of whether the cable passes Cat 6 Level III testing standards.

3.02 GROUNDING AND BONDING

- A. Ground and bond pathways, cable shields, racks and equipment under the provisions of Section 260526 and TIA/EIA - 607 - Commercial Building Grounding/Bonding Requirements.

- B. Grounding conductors shall be installed neatly, with as few bends as possible, and routed such as to minimize the length of the conductor runs.
- C. The grounding conductors may be wall mounted or fastened to ladder racks with plastic cable ties. While they may be routed adjacent to telecommunications cables, they should not be attached to them in any way.
- D. An acceptable bond between the grounding conductor and painted metal surfaces is required. In these cases, a small area of the paint should be removed by blade or wire brush prior to the attachment of the ground lug. In TRs, this typically applies to the surface of metal wire ways and to the surface of equipment racks.

E. Definitions

- 1. Bonding conductor (BC) for telecommunications. This conductor links the telecommunications grounding system to the main electrical power grounding system for the building. It originates in the TR.
- 2. Telecommunications main grounding bus bar (TMGB). This bar is located in the TR and serves as the hub for the telecommunications grounding system in the entire building. Bond the TMGB to the BC, TBB, and local building steel.
- 3. Telecommunications bonding backbone (TBB). This conductor links the TGB in each TC back to the TMGB.

F. Required Grounding Configuration

- 1. TGB. One telecommunications grounding busbar shall be installed onto the plywood on the wall of each TC. It shall be installed at 24" AFF. The bar shall be electrically insulated from its mounting bracket.
 - 2. TBB. One insulated, stranded, #6 copper wire shall be installed from the TGB in the TC to the TMGB in the TR. This conductor shall be routed inside the riser conduit system along side the telecommunications riser cables. It shall be fastened to the TGB.
- 3. Equipment racks. A #6 grounding conductor shall be installed between one equipment rack and the TGB using the appropriate grounding lug. The remaining equipment racks shall be connected together in series to the first rack to provide a continuous connection to all racks..
 - 4. Ladder racks. A #6 grounding conductor shall be installed between one section of overhead ladder rack to the TGB or to one of the equipment racks.
- 5. Pathway components. A #6 grounding conductor shall be installed from each distinct wireway or conduit (over 1" in diameter) which exits the TR and houses either horizontal or riser cabling back to the TGB, ladder rack, or equipment rack. As needed, these components may be connected in series to provide a continuous connection to all components. Grounding lugs shall be used to connect the conductor to wireways. Grounding bushings should be installed on conduit ends to connect these conduits to the conductor.

3.03 LABELING

- A. Manufacturers Identification: Each major component of equipment shall have the manufacturers name, address, model number, and rating on a plate securely affixed in a conspicuous place. NEMA code ratings, UL label, or other data which is die-stamped into the surface of the equipment shall be stamped in a location easily visible.
- B. Custom Panel Identification and Nomenclature: Switches, connectors, jacks, receptacles, outlets, cables and cable terminations shall be logically and permanently marked in a manner approved by the Owner. Custom panel nomenclature shall be engraved, etched, or screened. Marking for these items are purposely detailed in the drawings to ensure consistency and clarity. Verify any changes in working type size, and/or placement with the owner prior to marking.

Mount on the custom rack panels as described above a designation of each source machine, which correlates to the system architecture. Submit a sample layout for Architect approval.

- C. Terminal Blocks and Rack Mounted Equipment Identification: All terminal blocks, rack mounted equipment, and active slots of card frame systems shall be clearly and logically labeled in a manner acceptable to the Owner as to their function, circuit, or system as appropriate. Labeling on manufactured equipment shall be engraved plastic laminate with white lettering on black background or dark background. Handwritten identification is not permitted. The contractor may substitute metallized polyester permanent identification labels with black printing on silver, white, or another light color background for the phenolic labels above.
- D. Cable Identification: All cable terminations shall be clearly and permanently labeled with appropriate cable number. Labeling of termination system shall be provided on white labels with black typed lettering. Handwritten labels shall not be permitted. Provide a sample of labeling material and example of the numbering scheme planned for use at the facility with project submittals. The contractor will endeavor to utilize the environmental room number the facility administrators plan to use for new construction projects. If environmental room numbers are not available, the contractor will utilize the most recent set of architectural floor plan room numbers for the cable numbers. Once the contractor has utilized a set of room numbers, those numbers and floor plans showing those numbers must be used for all documentation purposes from that point forward for the project unless changes are approved in writing by the Owners Agent.
- E. The intent of this labeling scheme is to assist in troubleshooting cable problems. Therefore the cables are labeled in a manner that will direct the technician to the opposite end of the cable to allow for testing and troubleshooting.
- F. All fiber backbone cables will be labeled with a unique identifier at each end and at junction / pull boxes. Fiber backbone cables shall be labeled 12" from each end of the cable with a destination tag that identifies each cable's remote destination and the unique identifier.

Example: A fiber strand from Room 503 to the MDF 500D would be labeled:

In MDF 500D: = ARoom 503-O1≅

In Room 503: = ARoom 500D-O1≅

Example: A fiber cable from Room 617A would be labeled:

In MDF 500D: ARoom 617A-O4≅

In Room 617A: ARoom 500D-O4≅

- G. All telecommunication outlet (TO) cables shall be labeled within 12" of each end of the cable using the above described identifier. TO numbers in each room are determined by numerical sequence starting from the main doorway of each room and continuing in a clockwise manner around the room. Each faceplate containing data ports shall be labeled starting in the upper left hand corner of each 1 gang section and assigned in a left to right and top to bottom direction.
- H. Switch: Ports shall be labeled using the Room ID- Port ID of the TO serviced by the patch panel port. Telecommunication Outlets (TO) that are serviced by a patch panel will be labeled using IDF ID - Patch Panel ID - Port ID. Example: Patch panel AA≅, Port 26 in Room 500D servicing Port #2 in Room 500 = 500D-A-26
- I. All test report documentation will contain a complete circuit identification based on the applicable labeling scheme.

3.04 TESTING

- A. A Certified Cat 6 cable tester, Level III, shall perform the certification test on all Cat 6 cables and adhere to TIA/EIA-568C.

- B. All test equipment shall be consistent throughout the installation. All test equipment shall be available for inspection by the Owner at any time. A valid and current calibration certificate traceable to the National Institute of Standards and Technology for any test equipment to be used shall be provided to the Owner.
- C. Upon substantial completion of the data network, test every data port for the functional requirements as listed in previously. Document, on a contractor generated form, the compliance of every port. The testing individual will initialize the results of each location. Submit a electronic copy of the reports detailing the results of initial adjustments and verification tests including all relevant drawings, charts, and photographs.
- D. Copper Cable Tests: Test and document results for each four (4) pair UTP data cable for the following conditions. (These tests are minimum requirements for Cat 3 Cable). A wire map test of the cable may be used to demonstrate conformance of the cable to the following parameters where applicable.
 - a. Proper polarity
 - b. No reversals
 - c. No transpositions
 - d. Continuity
 - e. No shorts
 - f. No AC voltage
 - g. No DC voltage
 - h. No opens
 - i. Proper numbering at each termination

All Cat 6 UTP cable testing shall be in accordance with proposed TIA/EIA TSB-67 Transmission Performance Specification test parameters for the permanent link. Testing shall be performed using Level IIe test equipment and shall meet or exceed the following performance parameters:

- a. Length of cable \leq 90 meters/300 feet
- b. Attenuation @ 100Mhz \leq 24dB
- c. Pair-to-Pair Near-end Crosstalk (P-P NEXT) \geq 30dB
- d. Power Sum Near-End Crosstalk (PS NEXT) \geq 27dB
- e. Far-End Crosstalk (ELFEXT) \geq 19dB
- f. Power Sum Far-End Crosstalk \geq 16dB
- g. Return Loss \geq 10.1 dB
- h. Calculated ACR \geq 6dB
- i. Calculated PS ACR \geq 3dB

E. Fiber Testing

1. Factory Testing: All fiber optic cable shall be factory tested on a reel basis with performance data for each cable supplied to the contractor and to the owner. Tests shall be conducted utilizing an OTDR (Optical Time Domain Reflectometer) at 850nm and 1300 nm with the attenuation in dB/km recorded for each fiber.
2. Post Rough-In Test: Upon completion of the installation of all fiber optic cable and prior to termination, each fiber optic strand shall be tested for light continuity to insure no damage occurred during installation. (The contractor may wish to perform a light continuity test on each fiber optic strand of the cable upon receipt of reel from manufacturer to insure no damage occurred during shipping.
3. Termination Testing: After completion of the installation provide the following tests. An Optical Test Set consisting of an Optical Source (transmitter) and Optical Meter (receiver) shall be used to determine end-to-end attenuation and fiber length. This testing shall be in Accordance with EIA/TIA-526-14 Method B: Optical Power Loss Measurement of Installed

Multi-mode Fiber Optic Plant. Each fiber shall be measured in one direction at both 850 and 1300 wavelengths. Record each measurement and provide copies to the Owner. Use of an OTDR for this measurement is acceptable provided the Contractor utilize the appropriate launch and receive jumper cables in front of and behind the cable being tested.

- F. Test parameters shall be verifiable by independent parties. Provide electronic copies of tests for every cable as part of the Verification Test Report.
- G. The Contractor is responsible for bringing any copper or fiber that fails to meet the standards into compliance at the Contractors expense.
- H. Two printed copies of the computer generated reports of the test results (in 8.5" by 11" hard cover binders) are required plus two compact disc copies.

3.05 FIELD QUALITY CONTROL

- A. Field inspection and testing shall be performed under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.
- B. Inspect, test and certify all cabling and equipment and terminations as specified and in accordance with TIA/EIA 568 C.

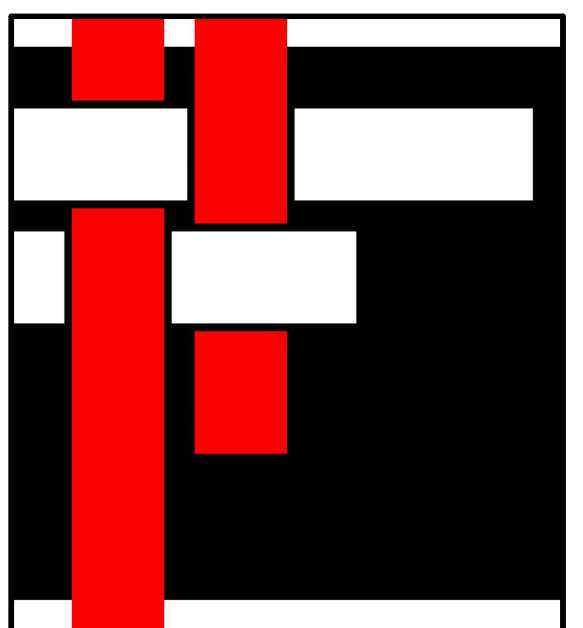
3.06 WARRANTY

The Contractor shall provide the following minimum warranty:

- A. All materials and equipment shall be new and warranted free of faulty workmanship and damage.
- B. The warranty shall include all parts, labor (including travel), expenses and equipment necessary to perform replacement and/or repairs.
- C. The total system (parts and labor) shall be warranted free of defects for a period of one (1) year from date of final acceptance.
- D. Replacement of defective materials and repair of faulty workmanship shall take place within 48 hours of notification by Owner and shall be guaranteed at no cost to the Owner during the warranty period.
- E. The minimum warranty provisions specified above shall not diminish the terms of individual equipment manufacturers warranties.

END OF SECTION

ELECTRICAL LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CEILING FAN, SEE LIGHTING FIXTURE SCHEDULE FOR TYPE		CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, 360° COVERAGE 2 = SECOND CONTACT TO BE PROVIDED FOR CONNECTION TO BUILDING MANAGEMENT
	2x4 LIGHT FIXTURE, RECESSED OR SURFACE MOUNTED		CEILING MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, LONG RANGE COVERAGE 2 = SECOND CONTACT TO BE PROVIDED FOR CONNECTION TO BUILDING MANAGEMENT
	2x2 LIGHT FIXTURE, RECESSED OR SURFACE MOUNTED		WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, 180° COVERAGE 2 = SECOND CONTACT TO BE PROVIDED FOR CONNECTION TO BUILDING MANAGEMENT
	4FT OR 8FT LIGHT FIXTURE, RECESSED OR SURFACE MOUNTED		WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, PIR TECHNOLOGY OCCUPANCY SENSOR, LOW VOLTAGE (24VDC) 19mA DRAW, WATTSTOPPER CX100-1, LONG RANGE SENSOR. INSTALL WHERE FREE OF OBSTRUCTIONS.
	4FT OR 8FT CHANNEL LIGHT FIXTURE, SUSPENDED OR SURFACE MOUNTED		WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, PIR TECHNOLOGY OCCUPANCY SENSOR, LOW VOLTAGE (24VDC) 19mA DRAW, WATTSTOPPER CX100-3, TWO SIDED AISLEWAY. INSTALL WHERE FREE OF OBSTRUCTIONS.
	UNDER COUNTER LIGHT FIXTURE		WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, SINGLE BUTTON ON/OFF CONTROL, 180° COVERAGE, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
	DIRECT/INDIRECT FIXTURE, SUSPENDED		WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, DUAL BUTTON ON/OFF CONTROL, 180° COVERAGE, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
	TRACK WITH LIGHT KIT		WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, DUAL BUTTON ON/OFF CONTROL, 180° COVERAGE, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
	RECESSED LIGHT FIXTURE		WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, DUAL BUTTON ON/OFF CONTROL, 180° COVERAGE, ADDITIONAL POWER SUPPLY FOR FAN OPERATION, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
	SURFACE LIGHT FIXTURE		WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, SINGLE BUTTON ON/OFF CONTROL, 180° COVERAGE, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
	RECESSED WALL WASH LIGHT FIXTURE		WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR, DUAL BUTTON ON/OFF CONTROL, 180° COVERAGE, ADDITIONAL POWER SUPPLY FOR FAN OPERATION, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
	WALL MOUNTED LIGHT FIXTURE		WALL MOUNTED DIGITAL TIMED SWITCH (5 MINS TO 12 HRS), SINGLE BUTTON ON/OFF CONTROL, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
	EXIT SIGN, SINGLE FACE, CEILING, CHEVRON INDICATES DIRECTION.		RECESSED SINGLE/DOUBLE GANG BOX WITH BLANK COVER PLATE, MOUNTED 16" AFF, UNLESS OTHERWISE NOTED
	EXIT SIGN, DOUBLE FACE, CEILING MOUNTED, CHEVRON INDICATES DIRECTION.		RECESSED DEDICATED/PICTURE/CLOCK SINGLE OUTLET, 120VAC, 20A, MOUNTED AS INDICATED ON DRAWINGS.
	EXIT SIGN W/EMERGENCY LIGHTING UNIT, CEILING MOUNTED, CHEVRON INDICATES DIRECTION.		RECEPTACLE, DUPLEX, 120VAC, 20A, MOUNTED 16" AFF, UNLESS OTHERWISE NOTED. (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	EXIT SIGN, SINGLE FACE, WALL/END MOUNTED, CHEVRON INDICATES DIRECTION.		RECEPTACLE, DUPLEX, 120VAC, 20A, MOUNTED 6" ABOVE COUNTER TOP OR BACK SPLASH.
	EXIT SIGN, DOUBLE FACE, WALL/END MOUNTED, CHEVRON INDICATES DIRECTION.		RECEPTACLE, QUADPLEX, 120VAC, 20A, MOUNTED 16" AFF UNLESS OTHERWISE NOTED (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	EMERGENCY LIGHTING UNIT, 2-HEAD WITH BATTERY BACK-UP, WALL MOUNTED, "NOT SWITCHED"		RECEPTACLE, QUADPLEX, 120VAC, 20A, MOUNTED 6" ABOVE COUNTER TOP OR BACK SPLASH.
	EMERGENCY LIGHTING UNIT, 2-HEAD WITH BATTERY BACK-UP, CEILING MOUNTED, "NOT SWITCHED"		RECEPTACLE, DUPLEX, GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A, MOUNTED 16" AFF, UNLESS OTHERWISE NOTED. (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	**FOR ALL LIGHTING FIXTURE TYPES ABOVE: LETTER ADJACENT TO FIXTURE INDICATES FIXTURE TYPE. SEE LIGHTING FIXTURE SCHEDULE		RECEPTACLE, DUPLEX, GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A, MOUNTED 6" ABOVE COUNTER TOP OR BACK SPLASH.
	POWER & SWITCH LEG		RECEPTACLE, QUADPLEX, GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A MOUNTED 16" AFF UNLESS OTHERWISE NOTED (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	UNSWITCHED LEG		RECEPTACLE, QUADPLEX, GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A MOUNTED 16" AFF UNLESS OTHERWISE NOTED (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	CONDUIT, HOME RUN TO PANEL BOARD		RECEPTACLE, DUPLEX, GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A, MOUNTED 6" ABOVE COUNTER TOP OR BACK SPLASH.
	PHOTOCELL, REMOTE MOUNTED, 120V, 10 SECOND TIME DELAY, UL WET LOCATION, RATED FOR 1500 W @ 120 VAC AND 4000 W @ 277 VAC (FOR USE WITH LAMP SOURCE(S) SHOWN).		RECEPTACLE, QUADPLEX, GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A MOUNTED 16" AFF UNLESS OTHERWISE NOTED (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	SWITCH, SINGLE POLE, 120/277VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED. SEE ELECTRICAL DEVICES MOUNTING HEIGHT DETAIL. LOWER CASE LETTER INDICATES FIXTURE SWITCHING, WHEN INDICATED.		RECEPTACLE, DUPLEX, 250VAC, 2 POLE, 3 WIRE, WALL MOUNTED, SIZE AS INDICATED ON DRAWING
	3-WAY SWITCH, 120/277 VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED SEE ELECTRICAL DEVICES MOUNTING HEIGHT DETAIL. LOWER CASE LETTER INDICATES FIXTURE SWITCHING, WHEN INDICATED.		RECEPTACLE, 480VAC, 2 POLE, 3 WIRE, WALL MOUNTED, SIZE AS INDICATED ON DRAWING
	4-WAY SWITCH 120/277 VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED SEE ELECTRICAL DEVICES MOUNTING HEIGHT DETAIL. LOWER CASE LETTER INDICATES FIXTURE SWITCHING, WHEN INDICATED.		RECEPTACLE, DUPLEX, 120VAC, 20A CEILING MOUNTED (LAY-IN / GYPSBOARD / SUSPENDED)
	INDICATES BI-LEVEL SWITCHING, 1 SWITCH SWITCHES OUTSIDE LAMPS, 1 SWITCH SWITCHES INSIDE LAMPS. SEE ELECTRICAL DEVICES MOUNTING HEIGHT DETAIL. LOWER CASE LETTER INDICATES FIXTURE SWITCHING, WHEN INDICATED.		RECEPTACLE, DUPLEX, 120VAC, 20A RECESSED FLOOR MOUNTED.
	WEATHERPROOF SWITCH, SINGLE POLE 120/277 VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.		UPS FED RECEPTACLE, DUPLEX, 120VAC, 20A, MOUNTED 16" AFF, UNLESS OTHERWISE NOTED. (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	DIMMER SWITCH, 0-10V OR LINE VOLTAGE RATING AS REQUIRED BY LIGHTING FIXTURE(S), LINE VOLTAGE RATED DIMMERS MUST BE 1500W FOR 120 VAC AND 4000W 277VAC MINIMUM.		UPS FED RECEPTACLE, QUADPLEX, 120VAC, 20A, MOUNTED 16" AFF, UNLESS OTHERWISE NOTED. (SEE ELECTRICAL MOUNTING HEIGHT DETAIL)
	ADJUSTABLE FAN CONTROL, 120/277VAC, SINGLE POLE, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED. SEE ELECTRICAL DEVICES MOUNTING HEIGHT DETAIL. LOWER CASE LETTER INDICATES FIXTURE SWITCHING, WHEN INDICATED		
			SAFETY SWITCH, FUSED, HEAVY DUTY, SIZE AS INDICATED ON DRAWINGS ##A = DISCONNECT SIZE / # = NUMBER OF POLES / # = NEMA RATING, /##AF = FUSE SIZE
			ENCLOSED BREAKER, SIZE AS INDICATED ON DRAWINGS ##A = BREAKER SIZE / # = NUMBER OF POLES / # = NEMA RATING
			VARIABLE FREQUENCY DRIVE (VFD)
			STARTER, FULL VOLTAGE, SIZE AS INDICATED ON DRAWINGS
			COMBINATION STARTER WITH CIRCUIT BREAKER DISCONNECT, FULL VOLTAGE, SIZE AS INDICATED ON DRAWINGS
			MANUAL MOTOR STARTER, ELECTRICAL CONTRACTOR SHALL COORDINATE POLES AND SIZE WITH EQUIPMENT ## = AMPERAGE RATING WHEN INDICATED ON DRAWING
			1 BUTTON CONTROLLER
			2 START/STOP PUSHBUTTON CONTROLLER
			3 UP/STOP/DN PUSHBUTTON CONTROLLER
			WALL MOUNTED 120V EMERGENCY OFF PUSH BUTTON WITH RED MUSHROOM STYLE HEAD WITH MANUAL PULL REST, NORMALLY OPEN. WITH CLEAR PROTECTIVE COVER. MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
			WALL MOUNTED PUSH PLATE MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.
			PANELBOARD, SURFACE OR RECESSED MOUNTED AS SHOWN. SIZE, RATINGS, AND MOUNTING AS INDICATED ON PANEL SCHEDULE. CONTRACTOR IS RESPONSIBLE FOR REQUIRED CLEARANCE IN FRONT OF ELECTRICAL PANEL. SEE NEC TABLE 110.26 WORKING SPACES FOR ADDITIONAL CLEARANCE CONDITIONS.
			TRANSFORMER, SIZE AS INDICATED ON DRAWING
			METER
			SERVICE POLE, HUBBELL, LEGRAND, OR EQUAL, EXTRUDED ALUMINUM SERVICE POLE, 2-CHANNELS WITH CEILING TRIM, ANODIZED ALUMINUM, MULTI-SERVICE, TWO-CHANNEL POLE WITH (2) KNOCKOUTS, (2) 20AMP RECEPTACLES. ADJUSTABLE T-BAR ASSEMBLY FOR MOUNTING POLES IN MIDDLE OF CEILING. UL LISTED. EACH POWER POLE SHOWN ON PLAN SHALL HAVE PROVISIONS FOR (2) DATA DROPS AND (1) VOICE DROP.
			ELECTRICAL MOTOR
			GROUND BUS, "E" INDICATES ELECTRICAL GROUND BAR, "TG" INDICATES TELECOMMUNICATIONS GROUND BAR
			CABLE TRAY, LADDER TYPE
			CABLE TRAY, CENTER HUNG TYPE
			CABLE TRAY, BASKET TYPE
			HAND HOLE, IN GRADE, TIER RATING AS INDICATED ON DRAWING
			HATCHING INDICATES ITEMS TO BE DEMOLISHED. REMOVE DEVICE, EQUIPMENT, FIXTURE INDICATED, CIRCUIT, AND CONDUIT BACK TO SOURCE UNLESS OTHERWISE NOTED.
			DEMOLITION KEY NOTE SYMBOL
			KEY NOTE SYMBOL
			REVISION DELTA
			WIRELESS ACCESS POINT, PROVIDE DUAL GANG BOX WITH A SINGLE GANG PLASTER RING, OWNER SHALL PROVIDE SURGE PROTECTOR AND WAP DEVICE, THE ELECTRICAL CONTRACTOR SHALL INSTALL, PROVIDE AND INSTALL 1 CAT6 DATA CABLE WP - LISTED WEATHER-RESISTANT TYPE DEVICE WP - LISTED WEATHER-RESISTANT TYPE DEVICE WP - LISTED WEATHER-RESISTANT TYPE DEVICE
			COMBINATION DATA/TELEPHONE OUTLET, MOUNTED 18" AFF UNLESS OTHERWISE NOTED. PROVIDE 1 1/4" CONDUIT TO ABOVE ACCESSIBLE GRID CEILING W/PULL STRING. FOR OUTLETS LOCATED BELOW HARD (GYPSBOARD) CEILINGS ROUTE 1 1/4" CONDUIT W/PULL STRING TO TELEPHONE/DATA ROOM. PROVIDE AND INSTALL 2 CAT6 DATA CABLES
			WALL TELEPHONE OUTLET, MOUNTED 60" AFF UNLESS OTHERWISE NOTED. PROVIDE 1 1/4" CONDUIT TO ABOVE ACCESSIBLE GRID CEILING W/PULL STRING. FOR OUTLETS LOCATED BELOW HARD (GYPSBOARD) CEILINGS, ROUTE 1 1/4" CONDUIT W/PULL STRING TO TELEPHONE/DATA ROOM. PROVIDE AND INSTALL 1 CAT6 DATA CABLE.
			COMBINATION DATA/TELEPHONE OUTLET, RECESSED CEILING MOUNTED (LAY-IN / GYPSBOARD) PROVIDE 1 1/4" CONDUIT TO ABOVE ACCESSIBLE GRID CEILING W/PULL STRING. FOR OUTLETS LOCATED BELOW HARD (GYPSBOARD) CEILINGS, ROUTE 1 1/4" CONDUIT W/PULL STRING TO TELEPHONE/DATA ROOM. PROVIDE AND INSTALL 2 CAT6 DATA CABLES.
			6" FIRE RATED POKE THRU FLOOR BOX WITH TWO DUPLEX RECEPTACLES, AND ONE GANG FOR TELECOMMUNICATIONS DEVICES. HUBBELL SYSTEM ONE WITH 50/50 SPLIT SUB-PLATES OR APPROVED EQUAL. MATCH EXISTING FLOOR BOX FINISH. PROVIDE 1 1/4" CONDUIT TO ABOVE ACCESSIBLE GRID CEILING. PROVIDE AND INSTALL 4 CAT6 DATA CABLES.
			NON-METALLIC 2 GANG FLOOR BOX WITH ONE DUPLEX RECEPTACLE AND ONE GANG FOR TELECOMMUNICATIONS DEVICES. PROVIDE AND INSTALL 1" CONDUIT FOR POWER AND 1 1/4" CONDUIT WITH PULL STRING TO ACCESSIBLE CEILING CAVITY. PROVIDE AND INSTALL 4 CAT6 DATA CABLES. MATCH EXISTING FLOOR BOXES INSTALLED IN BUILDING.
			FIRE RATED POKE THRU FLOOR BOX WITH ONE DUPLEX RECEPTACLE AND ONE GANG FOR TELECOMMUNICATIONS DEVICES. PROVIDE AND INSTALL 1-1" CONDUIT FOR POWER AND 1 1/4" CONDUIT WITH PULL STRING TO ACCESSIBLE CEILING CAVITY. PROVIDE AND INSTALL 4 CAT6 DATA CABLES. RL - RELOCATED EXISTING WHEN INDICATED
			JUNCTION BOX - WALL MOUNTED +##" - INDICATES MOUNTING HEIGHT OF DEVICE IN INCHES AFF (if given)
			JUNCTION BOX - CEILING/ABOVE CEILING MOUNTED
			JUNCTION BOX - FLOOR MOUNTED
			WALL
			CLNG



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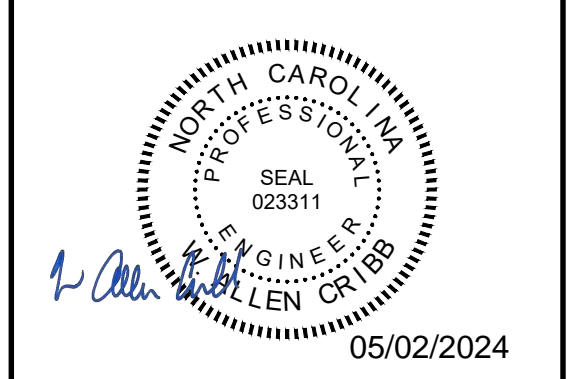
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05/02/2024

**Leland Town Hall
Addition &
Renovations**
102 Town Hall Drive
Leland, NC 28451

Construction Drawings

Issue Date: February 23, 2024

Abbreviations and Legend

Rev.	Date	Notes
	05.02.24	REVISED REQUIRED DATA QUANTITIES FOR DATA DROPS, TELEPHONE AND FLOOR BOXES

E0.1

SEE ARCHITECTURAL DRAWINGS SHEET G3.0 FOR PROJECT PHASING REQUIREMENTS