ADDENDUM NO. 3

December 13, 2023

ISSUED BY:

Wichita State University Campus for Applied Sciences and Technology 4004 N Webb Rd Wichita, Kansas 67226

ISSUED FOR ARCHITECT/ENGINEER

GLMV Architecture 1525 E. Douglas Wichita, Kansas 67211 Contact: Monica Abbott Phone Number: 316-265-9367 E-Mail: monica.abbott@glmv.com

NOTICE ALL BIDDERS FOR THE:

Wichita State University Campus of Applied Sciences and Technology WSU Tech East High Snap-On Lab Wichita, Kansas

You are instructed to read and to note the following described changes, corrections, clarifications, omissions, deletions, additions, approvals, and statements pertinent to the Contract Bid and Construction Documents.

The Addendum 3 is a part of the Contract Bid and Construction Documents and shall govern in the performance of the Work.

Article 3-1, Clarification:

A. Question: Will the bid form be modified to provide lines for the alternate pricing?

B. Clarification: A new Bid Form has been updated to the WSU Tech Purchasing website.

Article 3-2, Clarification:

A. Question: Please confirm that the folding operable partition material and installation is to be an alternate?

B. Clarification: The folding operable partition and installation shall be an alternate.

Article 3-3, Clarification:

A. Question: Please confirm that no bid bond needs to be submitted with the bid.

B. Clarification: No bid bond is required.

Article 3-4, Clarification:

- A. Question: Please confirm that no performance/payment bond will be required for the project.
- B. Clarification: No performance/payment bond is required.

Article 3-5, Clarification:

A. Question: There is an alternate called out in spec section #012300 for adding new RTU's #1,2 &
4. The bid form provided has no alternates listed, are we to write in alternate or will new bid form be provided?

B. Clarification: A new Bid Form has been updated to the WSU Tech Purchasing website.

Article 3-6, Clarification:

- A. Question: Please confirm that at trench infills, in locations not noted by detail 2/A-541, the existing sloped flooring is to stay as is and just the trench will be infilled.
- B. Clarification: No, in locations not noted by 2/A541, the trench is to remain as is, and not be filled in.

Article 3-7, Clarification:

- A. Question: The drawings do not reflect the existing conditions in the classroom. Please clarify the scope as it relates to the existing conditions in the classrooms. The trench currently has a cover and electrical power for the tables is run in the trench and a wall is currently built out in front of the doors.
- B. Clarification: Additional demolition notes have been added in these areas.

Article 3-8, Clarification:

- A. Question: Are we filling floor joints?
- B. Clarification: At existing concrete floors in Rooms 102 and 126, existing joints are to remain unfilled. Classrooms 120, 121, and 123, new joints shall remain unfilled.

Article 3-9, Clarification:

Question: Note on scope summary says: "Design patches in roof to infill openings left by ductwork from the paint booths. A new roof over the entire building will be put on at a later date by USD 259."
 Are we to include cost of final roof openings or temporary patch only until new roof goes on, at

Are we to include cost of final roof openings or temporary patch only until new roof goes on, at which time the new roof sub would carry cost for permanent roof openings, please advise.

B. Clarification: The Contractor for this Project shall provide temporary roof patches over the existing openings from the paint booth penetrations. The roof subcontractor from the USD 259 Reroof Project shall be responsible for final roof openings. The Contractor for this Project shall coordinate the scope of Work with the roof subcontractor for the USD 259 Reroof Project.

Article 3-10, Clarification:

- A. Question: Are there specs for the Conc 2 polished concrete? or more info as to what they expect?
- B. Clarification: Specification Section 03 3543 "POLISHED CONCRETE FINISHING" has been added as part of this Addendum.

Article 3-11, Clarification:

- A. Question: To what extent does Conc 1 clean & buff mean? Do we need to grind? Are we grinding away the yellow safety striping?
- B. Clarification: Cleaning and buffing shall include the removal of the existing yellow safety striping. Grinding shall not be required for buffing. Please refer to added Specification Section 03 3543 "POLISHED CONCRETE FINISHING" for additional information on cleaning and buffing the existing concrete floor as noted. The General Contractor shall be responsible for installation of new yellow safety striping as required for new layout in existing bays.

Article 3-12, Clarification:

- A. Question: The walls clouded in sheet A-101 do not indicate a wall type. I am requesting what wall type the glazing type W1 and type W3 are to be built into. Will this be a wall that extends up to the deck, or to a certain elevation above finish floor.
- B. Clarification: Both walls are 5B. A tag has been added to the Plan.

Article 3-13, Clarification:

- A. Question: Is 3rd party certified inspection acceptable instead of a AISC fabricator
- B. Clarification: Third-party certification in the shop of a non-certified fabricator is acceptable in accordance with IBC Section 1704.2.5.

Article 3-14, Clarification:

- A. Question: Do you have a detail showing the framing of the new head at where the new OH Door location will be?
- B. Clarification: Additional wall section and detail are included on Sheet A-311 in Addendum 3. At Exterior Overhead Doors reference 1/S-501 and 4/A-201, match existing by utilizing existing exposed beam as header. The intent is for the new overhead door opening to extend up to the bottom of the existing perimeter steel beam. Therefore, there is no header or steel framing at the top of the opening.

Article 3-15, Clarification:

- A. Question: The exposed spiral duct on the supply air side off the RTU's the detail 5 on M-501 calls for the exposed duct to not be insulated, I'm guessing the intent is for it to be double wall duct. The detail calls for 1" insulation but the spec metal duct section 233213 3.10 D.1 calls out 2".
- B. Clarification: Spiral supply ductwork shall be dual wall insulated with perforated inner liner and 2-inch interstitial insulation.

Article 3-16, Specification Section 08 3613 OVERHEAD SECTIONAL DOORS - Revision:

A. Revise Specification Part 2, 2.1, A., 1. as Follows: Model for Exterior Overhead Doors:904U: Aluminum full-view sectional door, polyurethane insulated.

Article 3-17, Specification Section 08 3613 OVERHEAD SECTIONAL DOORS - Revision:

- A. Add Specification Part 2, 2.1, A., 2. as Follows:
 - 1. Model for Interior Overhead Door 120.2: 904: Aluminum full-view sectional door, polyurethane.

Article 3-18, Specification Section 08 3613 OVERHEAD SECTIONAL DOORS - Revision:

- A. Revise Specification Part 2, 2.2, A., 4., b., as Follows:
 - 1. Configuration Type: Vertical-lift-track to match existing tracks for exterior overhead doors and vertical-high-lift-track for Interior Overhead Door 120.2.

Article 3-19, Specification Section 10 2239 FOLDING PANEL PARTITIONS - Revision:

- A. Revise Specification Part 2, 2.2, A., 1. as Follows:
 - 1. Manufacturer's Basis of Design: Modernfold, Premier Panel System, with full height marker boards and high-pressure laminate on the panels. Reference Sheet I-101 FLOOR FINISH PLAN and Sheet I-601 FINISH SCHEDULE AND CODES. Laminate shall be selected from the manufacturer's full range of selections.

Article 3-20, Specification Section 03 3543 POLISHED CONCRETE FINISHING (ATTACHMENT):

A. Added Specification Section 03 3543 POLISHED CONCRETE FINISHING.

<u>Article 3-21, Specification Section 23 8106 PACKAGED ROOFTOP AIR CONDITIONING UNITS –</u> <u>Medium Capacity Substitution Request - Clarification:</u>

- A. Question: Substitution request for Division 23 to include Trane Valent RTU selection.
- B. Clarification: Valent is an approved alternate for the RTU.

Article 3-22, Specification Section 27 0501 COMMON WORK RESULTS FOR LOW-VOLTAGE SYSTEMS -(ATTACHMENT):

A. Clarification: Specification Section was added.

Article 3-23, Specification Section 27 0502 COMMON WORK RESULTS FOR LOW-VOLTAGE SYSTEMS CABLING - (ATTACHMENT):

A. Clarification: Specification Section was added.

Article 3-24, Drawing Change G-001 - COVER SHEET (ATTACHMENT):

A. Clarification: The Sheet Index has been revised to indicate the current Drawing revision number.

Article 3-25, Drawing Change G-101 – CODE PLAN (ATTACHMENT):

A. Clarification: Fire Protection Systems, Automatic Sprinkler Systems edited for further clarification.

Article 3-26, Drawing Change AD-101 - DEMOLITION PLAN (ATTACHMENT):

A. Clarification: Additional clarifying demolition notes added at trench drains and partitions in front of Garage Doors.

Article 3-27, Drawing Change A-101 - ARCHITECTURAL FLOOR PLAN (ATTACHMENT):

- A. Clarification:
 - 1. Added additional wall tag.
 - 2. Adjusted length of concrete curb to ensure 1'-6" clear to door.

Article 3-28, Drawing Change A-311 - WALL SECTIONS (ATTACHMENT):

- A. Clarification:
 - 1. New Interior Wall Section added at Overhead Door C/A-311.
 - 2. New Section Detail added at Overhead Door Header H/A-311.
 - 3. Details re-lettered.

Article 3-29, Drawing Change F-101 - FIRE PROTECTION PLAN (ATTACHMENT):

- A. Clarification:
 - 1. Delete Sheet F-101 FIRE PROTECTION PLAN in its entirety.
 - 2. Contractor shall remove the existing fire sprinkler system at the south end of the building, including the sprinkler heads, the branch piping, and the horizontal mains. The existing sprinkler entrance including the vertical main up to the first elbow turning horizontal shall remain and be capped.

Article 3-30, Drawing Change PD101 - PLUMBING DEMOLITION PLAN (ATTACHMENT):

A. Clarification: Extended the demolition of the trench drains.

Article 3-31, Drawing Change M-501 - HVAC DETAILS (ATTACHMENT):

A. Clarification: Changed the insulation thickness on Detail 5 from 1" to 2".

Article 3-32, Drawing Change – E-131 POWER AND SYSTEMS PLAN – 1ST FLOOR (ATTACHMENT):

A. Clarification: Added Note for low-voltage cabling.

SECTION 033543 - POLISHED CONCRETE FINISHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Polished concrete finishing.
 - 2. Concrete for polished concrete, including concrete materials, mixture design, placement procedures, initial finishing, and curing is specified in Section 033000 "Cast-in-Place Concrete."

1.3 DEFINITIONS

A. Design Reference Sample: Sample designated by Architect in the Contract Documents that reflects acceptable surface quality and appearance of polished concrete.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with polished concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Polished concrete finishing Subcontractor.
 - 2. Review cold- and hot-weather concreting procedures, curing procedures, construction joints, concrete repair procedures, concrete finishing, and protection of polished concrete.
 - 3. Minimum Agenda: Polisher shall demonstrate understanding of work required by reviewing and discussing procedures for, but not limited to, the following:
 - a. Tour representative areas of required work, discuss and evaluate for compliance with Contract Documents, including substrate conditions, surface preparations, sequence of procedures, and other preparatory work performed by other installers.
 - b. Review Contract Documents requirements.
 - c. Review approved Submittals.

- d. Review Procedures Including, But Not Limited To:
 - 1) Protection of concrete substrate during construction and prior to polishing process.
 - 2) Project phasing and scheduling for each step of grinding, honing and polishing operations, including, but not limited to:
 - a) Quality of qualified personnel committed to Project.
 - b) Quality and size of grinders committed to Project.
 - c) Proper disposal of concrete slurry and/or concrete dust.
 - 3) Details of each step of grinding, honing, and polishing operations.
 - a) Application of liquid-applied products.
 - b) Protecting polished concrete floors after polishing work is complete.
- 4. Reports: Record discussions, including decisions and agreements reached, and furnish copy of record to each party attending.

1.5 ACTION SUBMITTALS

- A. Sustainable Design Submittals:
 - 1. Laboratory Test Reports: For liquid floor treatments, indicating compliance with requirements for low-emitting materials.
- B. Product Data: Manufacturer's technical literature for each product indicated, specified, or required. Include manufacturer's technical data, application instructions, and recommendations.
- C. Installer Qualifications: Data for company, principal personnel, experience, and training specified in PART 1 "Quality Assurance" Article.
- D. Maintenance Data: For inclusion in maintenance manual required by Division 01.
 - 1. Include instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use.
 - 2. Include precautions against cleaning products and methods which may be detrimental to finishes and performance.
- E. Polishing Schedule: Submit plan showing polished concrete surfaces and schedule of polishing operations for each area of polished concrete before start of polishing operations. Include locations of all joints, including construction joints.
- F. Samples for Initial Selection: For each type of product requiring color selection.
- G. Samples for Verification: For each type of exposed color.

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1.6 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Repair materials.
 - 2. Liquid floor treatments.

1.7 QUALITY ASSURANCE

- A. Polisher Qualifications:
 - 1. Experience: Company that has successfully completed 5 projects similar in design, products, and extent to scope of this Project; with a record of successful in-service performance; and with sufficient production capability, facilities, and personnel to produce specified work.
 - 2. Supervision: Maintain a competent supervisor who is at Project during times specified work is in progress, and is currently certified as Craftsman Level I or higher by CPAA, CPC Craftsman, or equivalent.
 - 3. Manufacturer Qualification: Approved by manufacturer to apply liquid-applied products.
- B. Field Sample Panels: After approval of verification sample and before casting concrete, produce field sample panels to demonstrate the approved range of selections made under Sample submittals. Produce a minimum of 3 sets of full-scale panels, approximately 48 by 48 inches minimum, to demonstrate the expected range of finish and appearance variations.
 - 1. Locate panels as indicated or, if not indicated, as directed by Architect.
 - 2. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed Work.
 - 3. Demolish and remove field sample panels when directed.
- C. Mockups: Before engaging in polishing, build mockups to verify selections made under Sample submittals and to demonstrate typical joints, surface finish, tolerances, and standard of workmanship. Build mockups to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
 - 2. Demonstrate finishing and protecting of polished concrete.
 - 3. Mockup shall be representative of work to be expected.
 - 4. Perform grinding, honing, and polishing work as scheduled for Project using same personnel as will perform work for Project.
 - 5. Approval is for the Following Aesthetic Qualities:
 - a. Compliance with approved Submittals.
 - b. Compliance with specified aggregate exposure class.
 - c. Compliance with specified appearance level.

6. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 FIELD CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Damage Prevention: It is the responsibility of the Contractor to prevent damage and staining of concrete surfaces to be polished.
 - 1. Prohibit use of markers, spray paint, and soapstone.
 - 2. Prohibit improper application of liquid membrane film forming curing compounds.
 - 3. Prohibit vehicle travel or parking over concrete surfaces.
 - 4. Prohibit pipe-cutting operations over concrete surfaces.
 - 5. Prohibit storage of any items over concrete surfaces for not less than 28 days after concrete placement.
 - 6. Prohibit ferrous metals storage over concrete surfaces.
 - 7. Protect from petroleum, oil, hydraulic fluid, or other liquid dripping from equipment working over concrete surfaces.
 - 8. Protect from acids and acidic detergents contacting concrete surfaces.
 - 9. Protect from painting activities over concrete surfaces.
- C. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting liquid-applied product application.

PART 2 - PRODUCTS

2.1 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatments for Polished Concrete Finish: Clear, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and is suitable for polished concrete surfaces.
- B. Liquid Densifier: An aqueous solution of silicon dioxide dissolved in 1 of the following hydroxides that penetrates into the concrete surface and reacts with the calcium hydroxide to provide a permanent chemical reaction that hardens and densifies the wear surface of the cementitious portion of the concrete.
 - 1. Sodium silicate.
 - 2. Potassium silicate.
 - 3. Lithium silicate.
 - 4. Alkali solution of colloidal silicates or silica.

- C. Liquid Densifier Enhancer: An aqueous lithium solution that penetrates the concrete surface and that chemically hardens, seals, densifies, and provides chloride protection for ground, honed, or polished concrete surfaces.
- D. Microfilm: Hybrid surface treatment that creates a durable micro-thin layer to seal already hardened or densified concrete floors that enhances and protects concrete surfaces.

2.2 ACCESSORIES

- A. Repair Material: A product that is designed to repair cracks and surface imperfections. The specified material must have sufficient bonding capabilities to adhere after the polishing to the concrete surface and provide abrasion resistance equal to or greater than the surrounding concrete substrate.
- B. Grout Material: A thin mortar used for filling spaces. Acceptable products shall be:
 - 1. Epoxy, urethane, polyurea, or polyaspartic resins.
 - 2. Latex or acrylic binders mixed with cement dust from previous grinding steps.
 - 3. Silicate binders mixed with cement dust from previous grinding steps.

2.3 POLISHING EQUIPMENT

- A. Field Grinding and Polishing Equipment:
 - 1. A multiple-head, counter-rotating, walk-behind or ride-on machine, of various size and weights, with diamond tooling affixed to the head for the purpose of grinding concrete. Excludes janitorial maintenance equipment.
 - 2. If dry grinding, honing, or polishing, use dust-extraction equipment with flow rate suitable for dust generated, with squeegee attachments to meet OSHA requirements.
 - 3. If wet grinding, honing, or polishing, use slurry extraction equipment suitable for slurry removal and containment prior to proper disposal.
- B. Edge Grinding and Polishing Equipment: Hand-held or walk-behind machines which produce the same results, without noticeable differences, as field grinding and polishing equipment.
- C. Burnishing Equipment: High-speed, walk-behind or ride-on machines capable of generating 1,000 to 2,000 revolutions per minute and with sufficient head pressure of not less than 20 pounds to raise floor temperature by 20 degrees F.
- D. Diamond Tooling: Abrasive tools that contain industrial-grade diamonds within a bonded matrix (such as metallic, resinous, ceramic, etc.) that are attached to rotating heads to refine the concrete substrate.
 - 1. Bonded Abrasive: Abrasive medium that is held within a bonding that erodes away to expose new abrasive medium as it is used.
 - 2. Metal Bond Tooling: Diamond tooling that contains industrial-grade diamonds with a metallic bonded matrix that is attached to rotating heads to refine the concrete substrate.

These tools are available in levels of soft, medium, and hard metallic matrices that are matched with contrasting concrete substrates (i.e., hard matrix/soft concrete, medium matrix/medium concrete, soft matrix/hard concrete) and are typically used in the grinding and early honing stages of the polishing process.

- 3. Resin Bond Tooling: Diamond tooling that contains industrial-grade diamonds within a resinous bonded matrix (poly-phenolic, ester-phenolic, and thermoplastic-phenolic) that is attached to rotating heads to refine the concrete substrate. Resin bond tooling does not have the soft/medium/hard characteristics of metal bond tooling and is typically used for the later honing and polishing stages of the polishing process.
- 4. Hybrid Tooling: Diamond tooling that combines metal bond and resin bond that has the characteristics of both types of tooling. These types of tools are typically used as either transitional tooling from metal bond tools to resin bond tools, or as a first cut tool on smooth concrete surfaces.
- 5. Transitional Tooling: Diamond tooling that is used to refine the scratch pattern of metal bond tooling prior to the application of resin bond tooling in an effort to extend the life of resin bond tooling and to create a better foundation for the polishing process.
- 6. Abrasive Pad: An abrasive pad, resembling a typical floor maintenance burnishing pad, that has the capability of refining the concrete surface on a microscopic level that may or may not contain industrial-grade diamonds. These pads are typically used for the maintenance and/or restoration of previously installed polished concrete flooring.

2.4 CLEANING AND BUFFING EXISTING CONCRETE

- A. Buffing Equipment:
 - 1. Multiple-head, counter-rotating, walk-behind or ride-on machine, of various sizes and weights, with tooling affixed to the head for purpose of buffing concrete. Excludes janitorial maintenance equipment.
 - 2. Buffing pads shall be used to remove scuffs and any markings, such as heel marks, and to enhance floor appearance.
 - 3. Cleaning pads shall be used to remove light soil and all painted yellow safety striping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Acceptance of Surfaces and Conditions: Examine substrates to be polished for compliance with requirements and other conditions affecting performance.
- B. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents.
- C. Starting work within a particular area shall be construed as acceptance of surface conditions.

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3.2 PREPARATION

- A. Cleaning New Concrete Surfaces:
 - 1. Prepare and clean concrete surfaces.
 - 2. Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, paint splatter, and other contaminants incompatible with liquid-applied products and polishing.

3.3 BUFFING EXISTING CONCRETE

A. Use low-speed rotary machine to remove scuff marks, black shoe heel marks, painted safety markings, and any light soil markings on the existing slab.

3.4 POLISHING

- A. Polish: Level 4: Gloss shine, 3,000 grit to match design reference Sample.
- B. Apply polished concrete finish system to cured and prepared slabs to match accepted mockup.
 - 1. Machine grind floor surfaces to receive polished finishes level and smooth and to depth required to reveal aggregate to match approved mockup.
 - 2. Apply penetrating liquid floor treatment for polished concrete in polishing sequence and according to manufacturer's written instructions, allowing recommended drying time between successive coats.
 - 3. Continue polishing with progressively finer-grit diamond polishing pads to gloss level, to match approved mockup.
 - 4. Control and dispose of waste products produced by grinding and polishing operations.
 - 5. Neutralize and clean polished floor surfaces.
- C. Perform all polishing procedures to ensure a consistent visual appearance from entire polished area.
- D. Initial Grinding:
 - 1. Use grinding equipment with metal or semi-metal bonding tooling.
 - 2. Begin grinding in 1 direction using sufficient size equipment and diamond tooling to meet specified aggregate exposure class.
 - 3. Make sequential passes with each pass perpendicular to previous pass using finer grit tool with each pass, up to 100 grit metal bonding tooling.
 - 4. Achieve maximum refinement with each pass before proceeding to finer grit tools.
 - 5. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk-behind auto scrubber suitable to remove all visible loose debris and dust.
 - 6. Continue grinding until aggregate surface exposure matches approved field mockup.

E. Treating Surface Imperfections:

- 1. Mix patching compound or grout material with dust created by grinding operations, manufacturer's tint, or sand to match color of adjacent concrete surfaces.
- 2. Fill surface imperfections including, but not limited to, holes, surface damage, small and micro cracks, air holes, pop-outs, and voids with grout to eliminate micro pitting in finished work.
- 3. Work compound and treatment until color differences between concrete surface and filled surface imperfections, compared to mockup, are not reasonably noticeable when viewed from 20 feet away under lighting conditions that will be present after construction.
- F. Liquid Densifier Application: Apply undiluted to point of rejection, remove excess liquid, and allow curing according to manufacturer's instructions.
- G. Grout Grinding:
 - 1. Use grinding equipment and appropriate grit and bond diamond tooling.
 - 2. Apply grout, forced into the pore structure of the concrete substrate, to fill surface imperfections.
 - 3. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk-behind auto scrubber suitable to remove all visible loose debris and dust.
- H. Honing:
 - 1. Use grinding equipment with hybrid or resin bonded tooling.
 - 2. Hone concrete in 1 direction starting with 100 grit tooling and make as many sequential passes as required to remove scratches, each pass perpendicular to previous pass, up to 400 grit tooling, reaching maximum refinement with each pass before proceeding to finer grit tooling.
- I. Liquid Densifier Enhancer Application: Apply undiluted to point of rejection, remove excess liquid, and allow curing according to manufacturer's instructions.
- J. Microfilm: Micro-thin layer applied as the final step to give added protection.
- K. Final Polished Concrete Floor Finish:
 - 1. Aggregate Exposure: Match Architect's Sample and mockup.
- L. Appearance Level 4 Highly Polished to Match Sample and Mockup:
 - 1. Procedure: Not less than 4 steps with full refinement of each diamond tool with 1 application of densifier.
 - 2. Measurement: Determine the Image Clarity Value, percentage, and the Haze Index:
 - a. Image Clarity Value, Percentage: An average value of 70 to 100 measured in accordance with ASTM D5767 prior to the application of sealers.

- b. Haze Index: An average value less than 10 measured in accordance with ASTM D4039 prior to the application of sealers.
- c. The minimum number of tests distributed across the polished surface should be 3 for areas up to 1,000 square feet and 1 additional test for each 1,000 square feet or fraction thereof. This applies to both the Image Clarity Value and the Haze Index.

3.5 **PROTECTION**

- A. Polished floors shall be free of all blemishes, stains, or tire tracks.
- B. Protect polished floors with suitable cover until Substantial Completion of each phase of entire Project.

END OF SECTION 033543

SECTION 270501 - COMMON WORK RESULTS FOR LOW VOLTAGE SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Installation of raceways, conduit sleeves etc. as required for routing of low voltage systems cabling shall be per specifications Section "RACEWAY SYSTEMS".

1.2 SUMMARY:

- A. The extent of the low voltage systems cabling work is indicated by drawings, details, and other specification sections. Low voltage systems cabling installation is hereby defined to include, but not be limited to the installation of cabling for voice, data, video, CATV, CCTV, security, nurse call, code blue, fire alarm, access control, public address (P.A.), lighting, and temperature control systems.
- B. All cabling materials, cabling, jacks, patch panels, racks, etc. are specified in other sections or on the construction documents and shall be provided by the Contractor. The Contractor shall be responsible for all testing as specified in individual specifications sections.
- C. It is the intent of the Drawings and Specifications to provide a complete workable telecommunication cabling system ready for the Owner's use. Any item not specifically shown on the Drawings or called for in the Specification, but normally required for a complete system, are to be considered a part of the contract.

1.3 SUBMITTALS:

- A. Product Data: Provide submittals for each type of product specified with this section, including but not limited to cable supports, cable wraps, fire rated sleeves, etc.
- B. Statement of Warranty
- C. Manuals and Technical "Documents
- D. Record Drawings

1.4 COORDINATION:

A. The Contractor will cooperate and coordinate with the Owner to minimize conflict with Owner's operations.

- B. Coordinate with other building trades and electrical work including wires and cables, electrical boxes and fittings, and raceways to properly interface installation of systems with other work.
- C. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
- D. Sequence installation of low voltage systems cabling with other work to minimize possibility of damage and soiling during remainder of construction.
- E. Contractor will be responsible for ceiling tile replacement, wall repainting, etc. due to damage caused by installation of this equipment and cabling.

1.5 PERFORMANCE AND QUALITY ASSURANCE:

- A. National Fire Protection Association:
 - 1. NFPA 70: National Electrical Code.
 - 2. NFPA 75: Standard for the Fire Protection of Information Technology Equipment.
- B. UL LLC (UL):
 - 1. UL 486A: Wire connectors and soldering lugs for use with copper conductors.
 - 2. UL 1449: Transient voltage surge suppressors.
 - 3. UL 1863: Communications Circuit Accessories
 - 4. UL 813: Commercial Audio Equipment
- C. Telecommunications Industry Association (TIA):
 - 1. ANSI/TIA-568-0 and addenda "Generic Telecommunications Cabling for Customer Premises".
 - 2. ANSI/TIA-568-1 and addenda "Commercial Building Telecommunications Cabling Standard".
 - 3. ANSI/TIA-568-2 and addenda "Balanced Twisted-Pair Telecommunications Cabling & Components Standard".
 - 4. ANSI/TIA-568-3 and addenda "Optical Fiber Cabling and Components Standard".
 - 5. ANSI/TIA-568-4 and addenda "Broadband Coaxial Cabling and Components Standard".
 - 6. ANSI/TIA-569: Telecommunications Pathways and Spaces.
 - 7. ANSI/TIA-606: Administration Standard for Telecommunications Infrastructure
 - 8. TIA-160: Sound Systems.
 - 9. TIA-299A: Loudspeakers, Dynamic Magnetic Structures and Impedance.
 - 10. CEA-310-E "Design Requirements for Cabinets, Panels, Racks, and sub-Racks".
 - 11. SE-101-A: Amplifier for Sound Equipment.
 - 12. SE-103: Speakers for Sound Equipment.
- D. Federal Communications Commission (FCC):
 - 1. FCC Regulations, Part 15 Title 47.

- E. Maintenance Qualifications:
 - 1. Experienced in manufacturing equipment of the types and capacities specified for this project.
 - 2. Equipment has a record of successful in-service performance.
- F. Contractor Qualifications:
 - 1. Established communications and electronics contractor for at least five (5) years.
 - 2. Authorized distributor for the equipment supplied with full manufacturer's warranty privileges.
 - 3. Maintains a fully equipped service organization capable of providing full maintenance and service of the installed system within twenty four (24) hours.
 - 4. Maintains the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being installed.
- G. Manufacturer's Instructions: Comply with all installation instructions and methods recommended or required by the manufacturer.

1.6 EQUIPMENT AND MATERIALS:

- A. Contractor shall install low voltage systems cabling per the system manufacturer recommendations or requirements or as otherwise specified on the drawings or elsewhere in the specifications.
 - 1. The Manufacturers and Products specified in this document are to be used. No substitutions of components specifically referenced will be allowed without approval prior to bid.
 - 2. All products and materials shall be new, clean, free of defects and free of damage and corrosion.
 - 3. All products installed will meet or exceed the minimum performance requirement as listed in the technical specification of this document and its corresponding addendums.

1.7 WORKMANSHIP:

- A. All work shall be done in a workman like fashion. All equipment and materials are to be installed in a neat and secure manner, while cables are to be properly dressed. Workers must clean any debris and trash at the close of each workday.
- B. No substitution of product or services will be accepted without prior approval from both the Owner and the Manufacturer providing the Application warranty.

1.8 DELIVERY, STORAGE, AND HANDLING:

- A. Delivery: Deliver low voltage system equipment and components in factory-fabricated containers or wrappings, which properly protect equipment from damage.
- B. Storage: Store low voltage system equipment and components in original packaging. Store inside in a well-ventilated space protected from weather, moisture, soiling, humidity, extreme temperatures, and vandalism. Protection against vandalism will be at the Contractor's expense. Storage recommendations by manufacturer shall be followed.
- C. Handling: Handle low voltage system equipment and components carefully to prevent damage, breaking, and scoring of finishes. Do not install damaged units or components; replace with new.

1.9 AS-BUILT DRAWINGS:

A. Show on black line prints in red ink all low voltage cable system jack identification numbers, actual cable routing paths, as well as all changes from original plans made during the installation. Separate As-Built drawings shall be provided for each low voltage system installed. Return the "as-built" red lined drawings, specifications, and addenda, as set forth in the General conditions, to the Architect/Engineer upon completion of the project.

PART 2 - PRODUCTS

2.1 BACKBOARDS:

- A. Backboards shall be provided as needed or as required or recommended by low voltage systems manufacturer. Field verify exact quantity and sizes needed. Backboards shall meet the following requirements.
 - 1. Fire rated or treated on all sides with at least two coats of fire-retardant light-colored paint (minimum 1-hour rating).
 - 2. A/C grade or better, void free.
 - 3. Unless noted otherwise, 8 foot high, with minimum 3/4" thickness.
 - 4. Kiln dried to maximum moisture content of 15% (to prevent warping).
 - 5. Plywood shall be mounted at a minimum of 8" AFF with "A" side exposed. Mount securely to wall framing members to ensure that plywood can support attached equipment.

2.2 RACEWAYS

A. All low voltage cabling shall be installed in raceway systems when located in concealed, non-accessible locations. In general, raceways are required for outlets in walls up to above accessible ceilings, above non accessible ceilings, all wall penetrations etc. Provide bushings at all raceway terminations. Fire stop and fire seal all penetrations of fire rated walls.

B. Surface Raceway:

- 1. Surface raceway shall only be used with prior approval in remodels and modifications to existing spaces where wall and ceiling voids do not permit concealed installation. Surface raceway shall not be used at any other location unless called for on the drawings. All surface raceway and outlets must be painted to match the surface it is attached to. Use outlets and fittings by the same Manufacturer and approved for use with the raceway.
- 2. Surface raceways shall be Wiremold #500 or #700 series or approved equal. In all cases, do not exceed the fill per the Manufacturers published data.

2.3 CABLE SUPPORTS:

- A. Appropriate cable supports shall be used at all times to prevent unnecessary tension or slag in the cable bundles. Support spacing and size shall be as required to comply with applicable ANSI Standards and manufacturers recommendations.
- B. Cable Tray: Wire mesh basket cable tray shall be provided as shown on the drawings. Cable tray shall be sized to support all cable with a maximum fill of 40%. Wire mesh spacing shall not exceed 2 inches (5 cm) by 4 inches (10 cm). Refer to section "COMMUNICATIONS CABLE TRAY".
- C. J-Hooks: J-Hooks shall be sized to support all cable with a maximum fill of 40%.
- D. Cable Wraps: All cable wraps shall be plenum rated re-enterable hook and loop type, sized as required.

2.4 CONDUIT SLEEVES:

- A. Conduit sleeves shall be one of the following:
 - 1. Rigid steel or IMC conduit with threaded ends and non-metallic bushings on each end.
 - 2. EMT conduit with U.L. Listed slide on non-metallic bushings on each end.
- B. Fire rated conduit sleeves shall be:
 - 1. Provided at fire rated walls or penetrations and as indicated on the drawings.
 - 2. 'Hilti' #CP 653 or approved equal.

2.5 CABLE LABELS:

- A. Labels shall meet the legibility, defacement, exposure, and adhesion requirements of UL 969 and the latest addition of ANSI/TIA-606.
- B. All labels shall be preprinted, or computer printed type. Handwritten labels are not acceptable.
- C. Labels shall have a design life equal to or greater than that of the labeled component.

- D. Labels shall be industrial, extra strength adhesive, laminated label that will resist scuff/scratch, heat, cold, water, UV, corrosive, and chemical environments.
- E. Labels shall have a split backing for easy removal.

2.6 GROUNDING AND BONDING: REFER TO "GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS".

PART 3 - EXECUTION

3.1 REQUIREMENTS FOR LOW VOLTAGE SYSTEMS CABLE INSTALLATION:

- A. General: Examine areas and conditions under which low voltage cabling systems are to be installed. Notify the Engineer in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Cable Pathways:
 - 1. Pathways shall be designed and installed to meet applicable local and national building and electrical codes or regulations.
 - 2. All pathway components shall be installed according to manufacturer's specifications.
 - 3. Grounding/Earthing and bonding of pathways shall comply with applicable codes and regulations.
 - 4. Pathways shall not have exposed sharp edges that may come into contact with low voltage systems cables.
 - 5. The number of cables placed in a pathway shall not exceed manufacturer specifications, nor shall the geometric shape of a cable be affected.
 - 6. Pathways shall not be located in elevator shafts.
 - 7. Vertically routed cables through chases must be supported per manufacturers and applicable ANSI Standards to prevent cable tension from occurring.
 - 8. All cables above accessible ceilings shall be supported by cable trays and/or jhooks located approximately 6" above lay-in ceilings below all mechanical and other electrical equipment.
 - 9. Cable Tray: All cabling should be installed in low voltage cable trays where possible. Power cable must never reside in the same cable tray as the low voltage system cabling. All cabling installation procedures shall also adhere to the recommended "Do's and Don'ts" in TIA 568.
 - 10. J-Hooks: J-Hooks shall be used in common areas where cable trays are not available and/or as indicated on the plans. J-Hooks shall be located with a maximum spacing of 4'-0" on center. Cables shall not contact the ceilings, piping, light fixtures, ducts, etc. All cables must be suspended independently from other supports.

- 11. Cable Wraps: Cable wraps shall be used at appropriate intervals to secure cable between j-hooks or cable trays, and to provide strain relief at termination points. These wraps shall not be over tightened to the point of deforming or crimping the cable sheath. Cable wraps should rotate 360 degrees when applied correctly. Spacing shall be a maximum of 4'-0". Placement shall not be over cable labels. Cable wraps (zip-tie type or Velcro type) shall not be used as a means of support.
- 12. Conduit Sleeves: Conduit sleeves shall be provided where cables are indicated to pass through walls and at other locations as indicated on the plans. Sleeves shall be 2-inch conduit minimum extending 6-inches on either side of walls. Where possible, sleeves shall be located 6-inches above ceiling. See paragraph "FIRESTOPPING" for sleeves located in fire rated partitions or floors.
- C. Bend Radius:
 - 1. The maximum cable bend radii shall not exceed manufacturer's specifications.
- D. Wiring Methods
 - 1. Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters. Conceal raceway and cables except in unfinished spaces.
 - a. Install plenum rated cable in environmental air spaces, including plenum ceilings.
 - 2. Bundle, lace and train cables within enclosures. Connect to terminal points with no excess and without exceeding manufacturer's limitations on bending radii.

3.2 FIRESTOPPING:

- A. Properly installed fire stop systems shall be installed to prevent or retard the spread of fire, smoke, water, and gases through all floors, and fire/smoke walls. Fire stops shall be UL listed for the wall rating and construction method. This requirement applies to openings designed for low voltage systems cabling use that may or may not be penetrated by cables, wires, or raceways.
 - 1. Raceways: Completely fill and seal clearances between raceways and openings with fire stop material.
 - 2. Fire Rated Sleeves: Completely fill and seal clearances between sleeves and openings with fire stop material. Fire rated conduit sleeves shall comply with paragraph "CONDUIT SLEEVES".
- B. Fire stops shall be installed according to applicable codes.
- C. Documentation of fire stops shall be in accordance with the latest edition of TIA-606.

3.3 ADJUSTING AND CLEANING:

A. Cleaning: Clean all equipment and components of dirt and construction debris upon completion of installation. Remove scrap cable components off site as required.

- B. Touch-up: Touch-up scratched or marred enclosure surfaces to match original finishes.
- C. Protection: Protect installed equipment, cabling and components from damage during remainder of construction period.

3.4 LABELING:

- A. Labeling shall consist of lettering or numbering as required by Owner to coordinate with existing labeling schemes. Contractor to coordinate exact labeling scheme of cables with Owner.
- B. Documentation of labeling shall be in accordance with the latest edition of TIA-606.
- C. Telecommunication Spaces:
 - 1. Labels shall be affixed at the entry to all telecommunications rooms and spaces (Includes entrance facilities, communication equipment rooms, communication equipment spaces and work areas).
 - 2. Adhesive laminated type labels shall be used for all communications space labeling.
 - 3. Affix labels to entrance doors and inside the room so that the label is visible by those working in the room coordinate with owner.
- D. Pathways:
 - 1. Pathways shall be marked at each endpoint and at all intermediate pull or junction boxes. In the case of partitioned pathways (i.e., innerduct) each partition shall have a unique identifier.
 - 2. Label pathways using the recommended identifiers shown in the latest edition of ANSI/TIA-606.
 - 3. Pathway labels shall be laminated adhesive type labels.
- E. Grounding and Bonding:
 - 1. The Primary Bonding Busbar (PBB) and the Secondary Bonding Busbar(s) (SBBs) shall be labeled as defined in the latest edition of ANSI/TIA-606.
 - 2. The identifier shall be a laminated adhesive type label(s) affixed to the components specified in the latest edition of ANSI/TIA-606.
- F. Firestopping:
 - 1. Each firestopping location shall be labeled at each location where firestopping is installed, on each side of the penetrated fire barrier, within 300 mm (12 in.) of the firestopping material as specified in the latest edition of ANSI/TIA-606.

3.5 REMOVAL OF EXISTING CABLE:

A. Existing low voltage systems cable that is not terminated at both ends at a connector or other equipment shall be removed unless identified for future use with a tag.

END OF SECTION 270501

SECTION 270502 - COMMON WORK RESULTS FOR LOW VOLTAGE SYSTEMS CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Refer to section "COMMON WORK RESULTS FOR LOW VOLTAGE SYSTEMS" for additional information.

1.2 SUMMARY:

- A. The extent of the communications system work is indicated by drawings and details, and is hereby defined to include, but not be limited to the installation of voice, data, fiber, video, CATV, and CCTV.
- B. All cabling materials, cabling, jacks, patch panels, racks, etc. are specified in other sections and shall be provided by the Contractor. The Contractor shall be responsible for all testing as specified in individual specifications sections.
- C. It is the intent of the Drawings and Specifications to provide a complete workable telecommunication cabling system ready for the Owner's use. Any item not specifically shown on the Drawings or called for in the Specification, but normally required for a complete system, are to be considered a part of the contract.

1.3 SUBMITTALS:

- A. Installer's qualifications (including references).
- B. Statement of Warranty
- C. Manuals and Technical Documents
- D. Record Drawings

1.4 QUALITY ASSURANCE:

- A. Codes and Standards: Refer to section "COMMON WORK RESULTS FOR LOW VOLTAGE SYSTEMS" in addition to the following:
 - 1. Rural Utilities Service (RUS): Comply with Rural Utilities Service specifications pertaining to construction and installation of telephone cabling.

- B. System Manufacturers Application Warranty: The system manufacturer shall provide a total application assurance warranty per Part 3 of this section. Contractors shall be certified by the manufacturer to be an approved system installer. The manufacturer and the certified installer shall take full responsibility for a quality installation complying with all applicable standards.
- C. Contractor Qualifications and Training:
 - 1. The Contractor shall be fully conversant and capable in the cabling of low voltage applications such as, but not limited to data, voice and imaging network systems. The Contractor shall at a minimum possess the following qualifications:
 - a. Licenses/permits required performing telecommunications installations in the specified jurisdiction.
 - b. Personnel trained and certified by the proposed Cabling System Manufacturer.
 - c. All installation Personnel on site must be under the supervision of an individual trained and certified to install the approved manufacturers cabling System.
 - d. The Designer and Installers shall show proof of current certification of the proposed Cabling System Manufacturer via a current card given after attending a minimum 5- day course or a re-certification class. This card must be current and be in the possession at all times they are on the project.
 - e. Provide (3) previous references of the type of installation provided in this specification.
 - f. Personnel trained and certified in fiber optic cabling, splicing, termination and testing techniques. Personnel must have experience using a light meter and OTDR.
 - g. Personnel trained in the installation of pathways and support for housing horizontal and backbone cabling.
 - h. Personnel knowledgeable in local, state, province and national codes, and regulations. All work shall comply with the latest revision of the codes or regulations. When conflict exists between local or national codes or regulations, the most stringent codes or regulations shall be followed.
 - i. Have at least (5) years successful installation experience with projects utilizing telephone, data, video and other low voltage systems and wiring similar to that required for this project to ensure system is compliant with standards.
 - j. Must be a Building Industry Consulting Service International (BICSI) member and have an RCDD or BICSI certified ITS Technician on staff.
 - k. Must possess current liability insurance certificates.

1.5 EQUIPMENT AND MATERIALS:

- A. Refer to section "COMMON WORK RESULTS FOR LOW VOLTAGE SYSTEMS".
- B. All products installed will meet or exceed the minimum performance requirement as listed in the technical specification of this document and its corresponding addendums.

1.6 WORKMANSHIP AND SUBSTITUTIONS:

- A. Refer to section "COMMON WORK RESULTS FOR LOW VOLTAGE SYSTEMS".
- B. All work shall be done in a workman like fashion of the highest standards in the telecommunications industry. All equipment and materials are to be installed in a neat and secure manner, while cables are to be properly dressed.
- C. No substitution of product or services will be accepted without prior approval from both the Owner and the Manufacturer providing the Application warranty.

1.7 AS-BUILT DRAWINGS:

A. See Section "COMMON WORK RESULTS FOR LOW VOLTAGE SYSTEMS".

1.8 SUPPORT AND WARRANTY:

- A. Applications Supported:
 - 1. Existing and future applications supported for a channel model warranty include those approved by the Institute of Electronic and Electrical Engineers (IEEE), the Asynchronous Transfer Mode (ATM) Forum, the American National Standards Institute (ANSI) or the International Organization of Standards (ISO) that specify compatibility with the cable referenced herein. Additional applications that are covered by this warranty include all future applications developed for the specified structured cabling system.
- B. Basic Warranty:
 - 1. Either a basic link or channel model configuration may be applied to the horizontal and/or backbone sub-systems of the structured cabling system. Applications assurance is only applied to a channel model configuration.
- C. Applications Assurance Warranty:
 - 1. A twenty (20) year warranty shall be provided for an end-to-end channel model installation which covers applications assurance, cable, connecting hardware and the labor cost for the repair or replacement.
- D. Product Warranty:
 - 1. The manufacturer of passive telecommunications equipment used in a manner not associated with the Systems Warranty must have a minimum five (5) year Component Warranty on its entire product. The Products Warranty covers the components against defects in material or workmanship under normal and proper use.

PART 2 - PRODUCTS

2.1 BACKBOARDS:

A. See Section "COMMON WORK RESULTS FOR LOW VOLTAGE SYSTEMS".

2.2 RACEWAYS

A. Refer to section "COMMON WORK RESULTS FOR LOW VOLTAGE SYSTEMS" Execution and section "RACEWAY SYSTEMS".

2.3 REQUIREMENTS FOR COMMUNICATIONS INSTALLATION:

- A. General: Examine areas and conditions under which systems are to be installed. Notify the Engineer in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Intrabuilding Backbone Cable Routing:
 - 1. The backbone subsystem shall include cable installed in a vertical manner between floor telecommunications room/closets and the main or intermediate cross-connect in a multi-story building and cable installed horizontally between telecommunications room/closets and the main or intermediate cross-connect (i.e. in a long single story building such as a factory).
 - 2. The backbone cables shall be installed in a star topology, emanating from the main cross-connect to each telecommunications room/closet. An intermediate cross-connect may be present between the main cross-connect and the horizontal cross-connect. This is known as a hierarchical star topology.
 - 3. Unless otherwise recommended by the manufacturer, all fiber cables shall be run in innerduct. Fibers shall be terminated using connectors in wall mounted interconnect centers or rack mounted panels equipped with sufficient ports, slack storage space and splice trays if required to terminate and secure all fibers.
 - 4. Backbone pathways shall be installed or selected such that the minimum bend radius of backbone cables is kept within manufacturer specifications both during and after installation.
 - 5. Riser sleeve/slot space shall be provided as shown with the ability to ingress the area at a later date in all Telecommunications rooms/closets, such that no drilling of additional sleeves/slots is necessary. A minimum of 30% spare capacity shall be provided.
- C. Interbuilding Backbone Cable Routing:
 - 1. The backbone subsystem shall include cable installed between buildings via underground ducts from the main cross-connect to an intermediate, or horizontal cross-connect, in a multi-building campus.

- 2. Unless otherwise recommended by the manufacturer, all interbuilding backbone fiber cables shall be run in fabric innerduct (MaxCell or equal). Fibers shall be terminated in telecommunications rooms/closets using connectors in wall mounted interconnect centers or rack mounted panels equipped with sufficient ports, slack storage space and splice trays if required to terminate and secure all fibers.
- 3. In an underground system, adequate underground conduit space shall be available and accessible at each building. The conduits shall not exceed a fill factor of 53% for one cable, 31% for two cables or 40% for three or more cables.
- 4. All underground systems shall be installed to prevent water runoff from entering the building.
- 5. Optical fiber cable shall be run for all Interbuilding backbone segments, unless otherwise noted.
- 6. Each copper cable run must include a #3/0 cu. ground/counterpoise run along with cable and grounded/bonded on both ends to telecommunications grounding system. Each fiber cable run must include trace wire or tape for locating purposes.
- D. Horizontal Cable Routing:
 - 1. All horizontal cables, regardless of media type, shall not exceed 295 ft (90 m) in total length from the telecommunications outlets in the work area to the horizontal cross connect. This does not include the allowable distances for equipment cords and patch cords as listed below.
 - 2. The length of patch cords in the telecommunications room/closet shall not exceed 16 ft (4.9 m) and equipment cords in the work area shall not exceed 16 ft (4.9 m) unless used in conjunction with a multi-user telecommunications outlet assembly (MUTOA).
 - 3. Horizontal pathways shall be installed or selected such that the minimum bend radius of horizontal cables is kept within manufacturer specifications both during and after installation.
 - a. Minimum conduit bend radius shall not be less than 6 times the diameter for 2" conduit and smaller.
 - b. Minimum conduit bend radius shall not be less than 10 times the diameter for conduits larger than 2".
 - 4. Cables shall be supported by means that are structurally independent of the suspended ceiling, its framework, or supports. These supports shall be spaced no more than 4 ft apart.
 - 5. The installation of telecommunications cabling installed in grounded metallic conduit shall maintain a 12 inch minimum distance from all sources of Electrical Magnetic Interference (EMI), such as; fans, motors, fluorescent fixtures, transformers, etc. Cabling installed in cable tray or j-hooks shall maintain a 24 inch minimum distance from all sources of EMI. All cables shall maintain a 48 inch minimum distance from transformers. Engineer shall be notified in advance if these clearances cannot be met.

- 6. The installation of telecommunications cabling shall maintain a minimum clearance of 10 ft from power cables in excess of 480 Vrms. No telecommunications cross-connects shall be physically located within 20 ft (6 m) of electrical distribution panels, step down devices, or transformers, which carry voltages in excess of 480 Vrms. Engineer shall be notified in advance if these clearances cannot be met.
- 7. Cables shall be run using a star topology from the telecommunications room serving that floor to every individual telecommunications outlet.
- 8. The Contractor shall observe the bending radius and pulling strength requirements of the 4-pair UTP and fiber optic cable during handling and installation.
 - a. Pulling force on 4-pair UTP cable shall not exceed 25lb/f.
 - b. Pulling force on 2 or 4-strand optical fiber shall not exceed 50lb/f.
- 9. Each run of UTP cable shall not contain splices between the horizontal portion of the cross-connect in the telecommunication room and the telecommunications outlet.
- 10. In the telecommunications room where cable trays or cable racking are used, the contractor shall provide appropriate means of cable management such as hook and loop cable managers to create a neat appearance and practical installation.
- 11. Continuous conduit runs installed by the contractor should not exceed 100 ft (30.5 m) or contain more than two (2) 90-degree bends without utilizing appropriately sized pull boxes.
- 12. All horizontal pathways shall be installed and grounded to meet applicable local and national building and electrical codes.
- 13. The number of horizontal cables placed in a cable support or pathway shall not exceed manufacturer's recommendations and shall not cause a change in the geometric shape of the cables.
- 14. Maximum conduit pathway capacity shall not exceed a 40% fill. Perimeter and furniture fill shall be limited to 60% fill for moves, adds and changes.
- 15. Horizontal distribution cables shall not be exposed in the work area or other locations with public access.
- 16. Cables routed in a suspended ceiling shall not be draped across the ceiling tiles. Cable supports shall be mounted as close as possible to 6 in (15 cm) above the ceiling grid supporting the tiles.
- E. Work Area Termination:
 - 1. All UTP cables wired to the telecommunications outlet/connector shall have 4pairs terminated in eight-position eight conductor (8P8C) modular outlets in the work area. All pairs shall be terminated.
 - 2. The telecommunications outlet/connector shall be securely mounted.
 - 3. The height of the telecommunications faceplates shall be to applicable codes and regulations, and/or the same height of nearby electrical faceplates.
 - 4. Provide specialized outlets for the specific systems furniture manufacturer. Outlets must be fully compatible. Verify systems furniture manufacturer with Architect or Owner.

- F. Tightening: Tighten electrical connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors.
- G. Bend Radius:
 - 1. The maximum cable bend radii shall not exceed manufacturer's specifications.
 - 2. In spaces with UTP cable terminations, the maximum bend radius for 4-pair cables shall not exceed four times the outside diameter of the cable. The maximum bend radius for multi-pair cables shall not exceed ten times the outside diameter of the cable. Manufacturer specifications shall be followed if more stringent.
 - 3. During the actual installation, bend radius on 4-pair cables shall not exceed eight times the outside diameter of the cable and multi-pair cables shall not exceed ten times the outside diameter of the cable. Manufacturer specifications shall be followed if more stringent.
 - 4. The bend radius of 2 or 4-strand optical fiber cable shall be 1" (2.5 cm) minimum under no load and 2" (5 cm) minimum under load. Manufacturer specifications shall be followed if more stringent.
- H. Slack:
 - 1. In the work area, a minimum of 12 in (30 cm) shall be left for UTP cables. A minimum of 3 ft (1 m) shall be left for fiber cables.
 - 2. In telecommunications room/closets a minimum of 10 ft (3 m) of slack shall be left for all fiber cables and a minimum of 15 ft (5 m) of slack shall be left for all UTP cables. This slack must be neatly managed on trays or other support types.
- 2.4 LABELS:
 - A. See Section "COMMON WORK RESULTS FOR LOW VOLTAGE SYSTEMS".

2.5 GROUNDING:

A. See Section "GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS".

PART 3 - EXECUTION

3.1 TESTING PROCEDURES:

- A. Testing of each system shall be performed in accordance with the manufacturer's specifications and as outlined in the other individual low sections of this specification.
- B. All installed channels shall perform equal to or better than the minimum standards.

3.2 LABELING

A. SEE SECTION "COMMON WORK RESULTS FOR LOW VOLTAGE SYSTEMS".

B. Cables:

- 1. Horizontal and backbone cables shall be marked within 12" of each endpoint using laminated labels with identifier repeating itself a minimum of four times on label for easy identification from all viewing angles. Marking directly on the cable is not permitted.
- 2. Any cable installed in conduit shall be labeled at all intermediate pull or junction boxes.
- 3. Label cables using the appropriate horizontal line identifier.
- 4. No cabling identifier will duplicate any previous, active cable identifier.
- C. Faceplates:
 - 1. A unique identifier shall be marked on each faceplate to identify it as connecting hardware.
 - 2. Each port in the faceplate shall be labeled with its identifier.
 - 3. For faceplates that use clear plastic cover strips, insert an 'unpeeled' label with backing intact.
 - 4. For faceplates without clear plastic cover strips, laminated adhesive type labels shall be affixed to the faceplate. Marking directly on the faceplates is not permitted.
- D. Racks, Panels, Blocks:
 - 1. A unique identifier shall be marked on each piece of connecting hardware to identify it as connecting hardware.
 - 2. Patch panels shall be labeled with an identifier and all individual ports shall be labeled with an identifier.
 - 3. Patch panels ports may be labeled with adhesive type laminated labels or 'unpeeled' labels with backing intact if the panel has a clear label strip.
 - 4. Each cable termination position on blocks shall be labeled with number designators.
 - 5. Use adhesive laminated type labels for all block labels. Marking directly on the block is not permitted.
 - 6. For 110-style blocks where a clear plastic cover is used, insert an 'unpeeled' label with backing intact.

3.3 RECORDS:

- A. All records shall be created by the installation contractor and turned over at the completion of work. The format shall be computer based. Both soft copies and hard copies shall be included as part of the As-Built package. The minimum requirements include:
 - 1. Cable records must contain the identifier, cable type, and termination positions at both ends, splice information as well as any damaged pairs/conductors.
 - 2. Connecting hardware and connecting hardware position records must contain the identifier, type, damaged position numbers, and references to the cable identifier attached to it.
 - 3. Test documentation on all cable types shall be included as part of the As-built package.

3.4 DOCUMENTATION/AS-BUILTS/RECORDS:

- A. All cables shall be labeled in accordance with the Owner's labeling standards.
- B. All cables shall be labeled at minimum with-in 12-inches of each end of the cable jacket, ((to include each end in the telecom space, at the work area, and at the consolidation point (CP) if present) per the latest edition of the ANSI/TIA-606 Standard. Prior to bidding, Contractor shall verify with Designer of Record whether a higher class of labeling is required for the project, per the latest edition of the ANSI/TIA-606 Standard.
- C. No cabling identifiers shall duplicate any previous active cable identifier.
- D. All documentation, such as, As-Builts and records shall be kept on file by the Certified Installer for the entire term of the warranty.
- E. As-built drawing shall be supplied by the contractor showing the locations of and identifiers for all components.

END OF SECTION 270502

WICHITA STATE UNIVERSITY CAMPUS OF APPLIED SCIENCES AND TECHNOLOGY EAST HIGH SNAP ON LAB 301 S. Grove, Wichita, KS 67211 CERTIFIED FINAL

PROJECT DIRECTORY

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GENERAL NOTES

- DRAWINGS AND SPECIFICATIONS SHALL REMAIN THE PROPERTY OF THE ARCHITECT AND MAY NOT BE REPRODUCED IN ANY MANNER WITHOUT EXPRESSED WRITTEN CONSENT.
- . ALL SUBSTITUTIONS AND CHANGES TO THESE DRAWINGS MUST BE SUBMITTED TO THE ARCHITECT FOR APPROVAL.
- . THE GENERAL CONTRACTOR SHALL INVESTIGATE ALL FIELD CONDITIONS RELEVANT TO THE PROJECT, INCLUDING BUT NOT LIMITED TO DIMENSIONS, ELEVATIONS, GENERAL CONDITIONS AND OTHER MISCELLANEOUS EXISTING CONDITIONS AND SHALL PROMPTLY NOTIFY THE ARCHITECT OF ANY WHICH DO NOT AGREE WITH THOSE IN THESE DRAWINGS.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR SUPPLYING AND INSTALLING ALL COMPONENTS AND ACCESSORIES, EQUIPMENT, MATERIALS, HARDWARE, AND OTHER ITEMS NECESSARY (UNLESS NOTED OTHERWISE) FOR A COMPLETE AND FINISHED JOB CONSISTENT WITH THE DESIGN INTENT PRESENTED IN THESE DRAWINGS.
- . THE GENERAL CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL THE APPLICABLE BUILDING PERMITS.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL CODES AND REGULATIONS ADOPTED BY THE AUTHORITIES HAVING JURISDICTION OVER THE LOCATION OF THE PROJECT, WHICH ARE APPLICABLE AT THE TIME OF ISSUANCE OF THE BUILDING PERMITS.
- THE GENERAL CONTRACTOR SHALL NOT REPRODUCE ANY PORTION OF THE CONTRACT DRAWINGS FOR USE IN ANY PORTION OF A SUBMITTAL.
- . ALL ABBREVIATIONS INCLUDED FOLLOW INDUSTRY STANDARDS. CONTACT ARCHITECT IF ANY ABBREVIATIONS ARE NOT CLEAR.
- . GRAPHIC AND WRITTEN INFORMATION ON DRAWINGS SHALL BE COORDINATED WITH ALL TRADES PRIOR TO INSTALLATION.
- 0. REFERENCE SPECIFICATION FOR ALL MATERIALS NOTED ON DRAWINGS.
- . THE GENERAL CONTRACTOR SHALL COORDINATE ACCESS TO/AND STORAGE ON SITE WITH THE OWNER, THE GENERAL CONTRACTOR SHALL ALSO REPAIR DAMAGE TO ALL ADJACENT AREAS OCCURRING DURING CONSTRUCTION. THE GENERAL CONTRACTOR WILL BE RESPONSIBLE FOR THE REMOVAL OF ALL EXCESS TRASH AND OTHER MISCELLANEOUS MATERIALS FROM THE SITE
- 2. PATCH ALL FLOORS, WALLS AND CEILINGS ALTERED DURING CONSTRUCTION AS REQUIRED TO MATCH EXISTING. PATCH ANCHOR HOLES IN MASONRY WALL WHERE ACCESSORIES HAVE BEEN MOVED AND/OR OMITTED.
- 13. IN ALL EXISTING AREAS, RENOVATION WORK SHALL BE ACCOMPLISHED WITH MINIMAL DISRUPTION O OPERATIONS. IF REQUIRED, THE OWNER RESERVES THE RIGHT TO TEMPORARILY STOP WORK OF SPECIFIC CONSTRUCTION OPERATIONS SHOULD THE OWNER IDENTIFY AN EMERGENCY OR DANGER EXISTS TO THE WELFARE OF THE OCCUPANTS ON ACCOUNT OF SUCH WORK OR OPERATIONS
- 4. ERECT AND MAINTAIN DUST PARTITIONS AS REQUIRED FOR ALL PHASES OF CONSTRUCTION TO PREVENT DIRT, DUST OR WET SURFACES/FINISHES FROM ENTERING ADJACENT OCCUPIED SPACES.
- 5. SCHEDULE ALL WORK PRODUCING EXCESS NOISE OR VIBRATIONS WITH OWNER TO MINIMIZE DISRUPTION TO BUILDING TENANTS. ALL WORK FOUND TO BE DISRUPTIVE SHALL BE SUSPENDED IMMEDIATELY UPON NOTICE FROM OWNER AND RESCHEDULED IN ADVANCE TO ALLOW ADVANCE NOTICE AND ALTERNATE ACCOMMODATIONS FOR TENANTS. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING THE WORK IN ADVANCE SO AS NOT TO DELAY THE PROGRESS OF THE WORK.
- 16. MAINTAIN ALL EXIT PATHS FOR THE DURATION OF THE CONSTRUCTION. 7. SCHEDULE WITH OWNER ALL WORK REQUIRING THE DISABLING OF ALL BUILDING SAFETY SYSTEMS, INCLUDING BUT NOT LIMITED TO; STANDPIPES, SPRINKLERS, FIRE ALARMS, AND SECURITY SYSTEMS. THE WORK SHALL BE SCHEDULED IN ADVANCE TO ALLOW ADVANCE NOTICE AND ALTERNATE ACCOMMODATIONS FOR TENANTS. THE CONTRACTOR IS RESPONSIBLE FOR
- SCHEDULING THE WORK IN ADVANCE SO AS NOT TO DELAY THE PROGRESS OF THE WORK. 8. SCHEDULE WITH OWNER ALL UTILITY SHUTDOWNS AFFECTING AREAS OF THE BUILDING BEYOND THE PROJECT LIMITS OF WORK. THE WORK SHALL BE SCHEDULED IN ADVANCE TO ALLOW ADVANCE NOTICE AND ALTERNATE ACCOMMODATIONS FOR TENANTS. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING THE WORK IN ADVANCE SO AS NOT TO DELAY THE PROGRESS OF
- THE WORK. 9. ERECT AND MAINTAIN APPROPRIATE SAFETY BARRIERS AND PATHWAYS TO PROTECT AND SEPARATE PUBLIC/TENANTS FROM HAZARDOUS CONDITIONS. BARRIERS SHALL BE MAINTAINED THROUGH DURATION OF THE PROJECT TO PROHIBIT UNAUTHORIZED PERSONNEL FROM ENTERING THE CONSTRUCTION AREA/SITE.
- 20. OWNER SHALL BE RESPONSIBLE FOR RELOCATION, INSTALLATION AND STORAGE OF EXISTING FURNITURE.
- 21. CONTRACTOR SHALL NOT REPRODUCE ANY PORTION OF A CONTRACT DRAWING FOR USE IN ANY PORTION OF A SUBMITTAL.
- 22. ALL DIMENSIONS ARE FROM THE FACE OF STUD FRAMING, FACE OF MASONRY, FACE OF CONCRETE, OR CENTER LINE OF STRUCTURAL STEEL, U.N.O..
- 23. ALL DOORS ARE LOCATED 4 INCHES FROM THE ADJACENT PERPENDICULAR STUD WALL FRAMING AND 4 INCHES FROM THE ADJACENT PERPENDICULAR CMU WALL FRAMING TO THE HINGE SIDE OF THE DOOR OPENING, U.N.O..
- 24. COORDINATE THE LOCATION AND INSTALLATION OF ALL MECHANICAL AND ELECTRICAL DEVICES, REGISTERS, FIXTURES, ETC. PRIOR TO INSTALLATION OF FINISH MATERIAL. 25. ALL A.D.A. ACCESSIBLE WATER CLOSETS MUST BE LOCATED 18 INCHES MINIMUM FROM THE
- FINISHED FACE OF THE NEAREST ADJACENT WALL TO THE CENTER LINE OF THE FIXTURE, U.N.O.. 26. PROVIDE CONTROL JOINTS ON CONTINUOUS GYPSUM BOARD SURFACES IN EXCESS OF 30'-0", AT A
- MAXIMUM INCREMENT OF 30'-0" ON CENTER, U.N.O.. 7. PROVIDE SEALANT IN FLOOR JOINTS OF EXPOSED FINISHES PER FLOOR COATING MANUFACTURER'S RECOMMENDATIONS.
- 28. SEE SHEET A-601 FOR PARTITION TYPES; SEE ARCHITECTURAL FLOOR PLANS FOR ADDITIONAL PARTITION IDENTIFICATION.
- 29. REFER TO STRUCTURAL NOTES FOR ALL CAST-IN-PLACE CONCRETE AND MASONRY CONTROL JOINTS.





ADD#3

SHEET INDEX

SHEET		REVISION
NUNDER	SHEET NAME	NU.
01 [G] GENERAL		
G-001	COVER SHEET	ADD#3
G-101	CODE SUMMARY	ADD#3
G-102	CODE FLOOR PLAN	
G-111	TYPICAL MOUNTING HEIGHTS AND CLEARANCES	
07 [S] STRUCTURA	L	
S-000	STRUCTURAL COVER SHEET	
S-001	STRUCTURAL GENERAL NOTES	
S-101	FOUNDATION PLAN	
S-102	ROOF FRAMING PLAN	
S-501	DETAILS	
S-502	DETAILS	
08 [A] ARCHITECTU	RAL	
A-001	LEGENDS, SYMBOLS, & ABREVIATIONS	
AD101	DEMOLITION PLAN	ADD#3
A-101	ARCHITECTURAL FLOOR PLAN	ADD#3
A-111	REFLECTED CEILING PLAN	
A-121	ROOF PLAN	
A-201	EXTERIOR ELEVATIONS	
A-311	WALL SECTIONS	ADD#3
A-401	ENLARGED PLANS AND ELEVATIONS	
A-541	DETAILS	
A-601	PARTITION/EXTERIOR WALL TYPES	
A-611	DOOR SCHEDULE	
A-621	GLAZING/WINDOW SCHEDULE	
A-801	EQUIPMENT PLAN	ADD#2
09 [I] INTERIORS		
I-101	FLOOR FINISH PLAN	
I-201	INTERIOR ELEVATIONS	
I-202	INTERIOR ELEVATIONS	
I-601	FINISH SCHEDULE AND CODES	
IF101	FURNITURE REFERENCE PLAN	

SHEET INDEX

		REVISION
		NO.
14 [MP] MECHANICA	AL/PLUMBING	
MP001	MECHANICAL COVER SHEET	
PD101	PLUMBING DEMOLITION PLAN	ADD#3
P-101	PLUMBING PLAN	
P-401	ENLARGED PLUMBING PLAN	
P-501	PLUMBING DETAILS	
P-601	PLUMBING SCHEDULES	
MD101	HVAC DEMOLITION PLAN	
MD120	ROOF DEMOLITION PLAN	
M-101	HVAC PLAN	ADD#2
M-120	ROOF MECHANICAL PLAN	
M-501	HVAC DETAILS	ADD#3
M-601	MECHANICAL SCHEDULES	ADD#2
M-701	CONTROL DETAILS	
E-001	ELECTRICAL GENERAL NOTES AND SYMBOLS	
E-101		
E-102	ELECTRICAL DEMOLITION PLAN - MEZZANINE	
E-103	ELECTRICAL DEMOLITION PLAN - ROOF	
E-131	POWER & SYSTEMS PLAN - 1ST FLOOR	ADD#3
E-132	POWER & SYSTEMS PLAN - MEZZANINE	
E-141	LIGHTING PLAN	
E-501	ELECTRICAL DETAILS	
E-601	ELECTRICAL ONE-LINE DIAGRAM - DEMOLITION	ADD#2
E-602	ELECTRICAL SCHEDULES	ADD#2
E-611	ELECTRICAL SCHEDULES	ADD#2

ALTERNATE SCHEDULE:

I. HVAC REPLACEMENT FOR NEW RTUS 1, 2, 4 AND ASSOCIATED WORK, INCLUDING DUCTWORK, PIPING, SUPPORT, AND POWER CONNECTIONS TO THESE RTUS AS SHOWN ON THE DRAWINGS.

2. MODERNFOLD OPERABLE PARTITIONS AT CLASSROOMS. HEADER (REF. 1/A-541) TO REMAIN AS PART OF BASE BID.





SF	IEET KEYNUTES
#	DESC
1	PREPARE FLOOR SUBSTRATE FOR NEW FINIS
2	REMOVE EXISTING WALL CONSTRUCTION AS
3	REMOVE PLUMBING FIXTURES.
4	REMOVE METAL CAGING.
5	REMOVE EXISTING OVERHEAD DOOR AND TRA
6	REMOVE EXISTING OVERHEAD DOOR AND TR/
7	REMOVE EXISTING OVERHEAD DOOR AND TRA
8	REMOVE PAINT BOOTH, CONCRETE PAD, AND ASSOCIATED WITH THE PAINT BOOTH. THE CO IN METAL DECK AND ROOF ASSEMBLY WHERE SHALL PATCH AND MATCH CONCRETE WHERE ASSOCIATED WITH THE PATCH SHALL MATCH CONCRETE.
9	REMOVE PAINT BOOTH, CONCRETE PAD AND ASSOCIATED WITH THE PAINT BOOTH. SALVAG OPENINGS IN METAL DECK AND ROOF ASSEM
10	REMOVE TRENCH DRAIN AS SHOWN. PREP AF
11	REMOVE DOOR AND FRAME.
12	REMOVE THE CEILING FINISH, LIGHT FIXTURE
13	REMOVE PORTION OF WALL TO ALLOW FOR IN REFER TO ARCHITECTURAL FLOOR PLAN FOR
14	VEHICLE LIFT TO BE RELOCATED, REFERENCE SLAB TO BE REMOVED. PREP CONCRETE FLC BEEN REMOVED.
15	REMOVE AND DISPOSE OF ALL LOCKERS.
16	REMOVE CARPET, PREP SLAB FOR REFINISHIN
18	REMOVE EYEWASH STATION AND SPIGOT AND
19	REMOVE ACCESS PANEL AND TANK, PREPARE
20	SALVAGE OVERHEAD DOOR TRACK, OPERATO
21	GC SHALL REMOVE EXISTING LIFT. GC SHALL STEEL STUDS IN CONCRETE SLAB ARE TO RE STUDS AND PROTECT STUDS FROM DAMAGE.

	G
CRIPTION	#
H. SHOWN DASHED	1
	2
ACK AND SALVAGE FOR RELOCATION.	3
ACK AND PREP FOR RELOCATED DOOR.	_
ACK.	
MECHANICAL AND PLUMBING COMPONENTS ONTRACTOR SHALL PATCH AND MATCH OPENINGS E DUCTWORK WAS REMOVED. THE CONTRACTOR	4
THE FLATNESS AND FINISH OF ADJACENT	5
MECHANICAL AND PLUMBING COMPONENTS GE PAINT BOOTH AND RETURN TO OWNER. PATCH BLY WHERE DUCTWORK WAS REMOVED.	6
REA TO RECEIVE NEW CONCRETE INFILL.	
	7
S, AND ANY MECHANICAL IN THE CEILING.	
NSTALLATION OF A NEW DOOR AND FRAME.	8
E FLOOR PLAN. STEEL STUDS WITHIN CONCRETE DOR TO RECEIVE NEW INFILL WHERE STUDS HAVE	
	9
	10
NG.	11
D ASSOCIATED PLUMBING.	
E TO INFILL WITH CONCRETE.	12
DR, AND CHAIN. RETURN TO OWNER.	
STORE LIFT FOR REINSTALLATION. THE EXISTING MAIN. GC SHALL FINISH FLOOR UP TO EXISTING	13

GENERAL NOTES NOTES PATCH/REPAIR EXISTING WALLS TO REMAIN. PATCHING/REPAIR SHALL BE DONE BY WORKERS SKILLED IN THAT TRADE. DEMOLITION SHALL BE DONE IN SUCH A MANNER TO REDUCE THE AMOUNT OF DAMAGE TO ADJACENT MATERIALS THAT REMAIN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING AND REPAIR OF DAMAGE TO ADJACENT MATERIALS DUE TO DEMOLITION ACTIVITIES. REMOVE ALL EXCESS TRASH AND DEMOLITION DEBRIS DAILY. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REMOVAL OF ALL DEBRIS OFF SITE WHICH ORIGINATES AT THE CONSTRUCTION SITE. DISPOSE OF AS DIRECTED BY OWNERS. GENERAL CONTRACTOR SHALL INVESTIGATE ALL FIELD CONDITIONS RELEVANT TO DEMOLITION, AND SHALL PROMPTLY NOTIFY THE ARCHITECT OF CONDITIONS THAT DO NOT AGREE WITH THOSE SHOWN IN THESE DRAWINGS. REFERENCE MECHANICAL, ELECTRICAL AND FIRE PROTECTION DRAWINGS FOR ADDITIONAL DEMOLITION FOR RESPECTIVE TRADES. IN ALL EXISTING & ADJACENT AREAS, RENOVATION WORK SHALL BE ACCOMPLISHED WITH MINIMAL DISRUPTION TO OPERATIONS. IF REQUIRED, THE OWNER RESERVES THE RIGHT TO TEMPORALLY STOP WORK OF SPECIFIC CONSTRUCTION OPERATIONS SHOULD THE OWNER IDENTIFY AN EMERGENCY OR DANGER EXIST TO THE WELFARE OF THE OCCUPANTS ON ACCOUNT OF SUCH WORK OR OPERATIONS. FIELD VERIFY EXISTING CONDITIONS AND COMPARE WITH ALL DRAWINGS TO DETERMINE EXACT EXTENT OF DEMOLITION REQUIRED. REPORT ALL DISCREPANCIES TO OWNER, ARCHITECT, OR RESPECTIVE ENGINEER PRIOR TO START OF WORK. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL MATERIAL IN A LEGAL MANNER NOT SCHEDULED FOR REUSE UNDER THIS PROJECT. FOR ALL MATERIAL, IF ANY, OWNER WISHES TO RETAIN, CONTRACTOR SHALL DELIVER TO LOCATION DETERMINED BY OWNER. PROTECT EXISTING MATERIAL THAT WILL REMAIN DURING DEMOLITION AND CONSTRUCTION. COORDINATE THE EXTENTS OF SALVAGEABLE MATERIAL, FIXTURES, ETC. WITH OWNER. REF. NEW CONSTRUCTION DRAWINGS FOR EXTENTS OF NEW FLOOR FINISHES, WALLS, AND CEILINGS. EXISTING FLOOR FINISHES, WALL BASES AND CEILINGS TO BE REMOVED IN THEIR ENTIRETY WHERE NOTED. EXISTING WALL FINISHES REMAINING TO HAVE SURFACES PREPPED FOR NEW FINISHES. REF. IMPROVEMENT PLANS. 14 ALL LIGHT FIXTURES, HVAC COMPONENTS, AND OTHER CEILING MOUNTED DEVICES TO BE

REMOVED IN THEIR ENTIRETY WHERE CEILING IS BEING REMOVED.

G.C. TO COORDINATE WITH OWNER ABOUT SALVAGEABLE ITEMS.

REMOVED IN THEIR ENTIRETY, U.N.O.

15 CEILINGS TO BE REMOVED IN THEIR ENTIRETY IN AREAS WITH DEMOLISHED WALLS U.N.O.

WHERE DOORS ARE BEING REMOVED, THE DOOR PANEL, FRAME, AND THRESHOLD SHALL BE

LINETYPE LEGEND HALFTONE LINE INDICATES EXISTING ELEMENT TO REMAIN SOLID BLACK LINE INDICATES NEW ELEMENT

 HEAVY DASHED LINE INDICATES EXISTIN REMOVED IN ITS ENTIRETY

HATCH LEGEND





ES EXISTING ELEMENT TO BE











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A WALL SECTION - CLERESTORY GLAZING









. PLANS ARE SCHEMATIC IN NATURE, LAYOUT IS BASED DIMENSIONS. BRING ANY DISCREPANCIES FROM THE REPRESENTATIVE IMMEDIATELY. MINOR CHANGES IN THE SCOPE OF THE DEMOLITION WORK SHALL NOT . CONTRACTOR SHALL CLEAN ALL EXISTING PLUMBING WORK TO LIKE-NEW CONDITION AND PROVIDE A LIST OF ANY DEFICIENCIES TO OWNER'S REPRESENTATIVE. DEMOLISH ALL DUCTWORK, PIPING AND EQUIPMENT







-SHORT RADIUS RIGID METAL ELBOWS WHERE 1.50 FLEX ELBOW CAN NOT BE



WITH UNFACED FIBERGLASS BATT INSULATION. -2" THK x 2 LB/CF FIBERGLASS INSULATION BY M.C. (INSTALL

OVER VINYL MASS BARRIER)

-ACOUSTICAL SURFACE 2 LB

NOISE STOP MASS LOADED

VINYL NOISE BARRIER OR

APPROVED EQUAL.

PER SPECIFICATIONS AND MANUFACTURER REQUIREMENTS. WRAP WITH ALUMAGUARD

-ROOF INSULATION

-SEAL PENETRATIONS WEATHER TIGHT

-BOLT CONDENSING UNIT TO UNISTRUT PER MANUFACTURER'S REQUIREMENTS

-THIRD PARTY LOUVERED HAIL GUARDS BY EQUIPMENT SUPPLIER. TURBO EAGLE OR







$\langle \# \rangle$	KEYN
F2	EXISTING DE
P1	RELOCATED WITH CONTR
P2	RECEPTACL THREAD PO\ REQUIREME
P3	FUSTAT FOR SCREEN PRO REQUIREME ROUGH-IN.
P4	POWER FOR ASSOCIATED SCHEDULES
P5	POWER FOR CONTROLLE
P7	EPO. EMERG INTERLOCKE PROVIDE NA
P9	SWITCH FOR
P10	TRANSFORM DETAIL X/XX
S1	CONTRACTO THIS LOCATI EQUIPMENT WITH 2 COAT
S2	TELECOMMU DETAIL 5/E-5

<u>L0'</u>	W VOLTAGE CABLING SCOPE
•	CONTRACTOR WILL INSTALL THE CATEGORY CABLING (CAT6) FROM THE IT RACK LOCATION AND TERMINATE IT IN THE JACK. CONTRACTOR WILL NOT TERMINATE (PUNCH DOWN OR CONNECT) THE CAT 6 CABLE TO THE IT RACK.
•	• LEAVE 15FT OF SLACK TO BE PROVIDED ON ALL CABLES AT THE IT RACK LOCATION CABLE TYPE: CAT 6 CABLING REQUIRED.
•	JACK/WALL PLATE: JACK TO BE LEVITON 61110-BE6 WITH KEYSTONE WALL PLATES.
•	FIBER TO BE RUN FROM THE DEMARC POINT AT THE NORTH END OF BUILDING C ON THE SECOND LEVEL TO THE PROPOSED AV ROOM 105.
	 FIBER TO BE CORNING 012E88-33131-A3 MIC TIGHT-BUFFERED, INTERLOCKING ARMORED CABLE, PLENUM, 12 FIBER, SINGLE-MODE (OS2), 6 CONNECTOR LC CCH PANEI PROVIDE 1" CONDUIT FOR ROUTING OF FIBER, CONDUIT TO BE ABOVE BOTTOM CHORD
	FOR TRUSS.
•	CONTRACTOR TO PROVIDE CABLING TO ALL AP'S AND SECURITY/ACCESS CONTROLS DEVICES PER OWNER'S LAYOUT.
	 VERIFY QUANTITIES, LOCATION, AND CONNECTION REQUIREMENTS WITH OWER'S MANUFACTURER LAYOUT.
٠	ALL AV CABLING AND EQUIPMENT WILL BE PROVIDED AND INSTALLED BY OWNER.
•	ALL TELECOMMUNICATIONS RACKS AND ACTIVE EQUIPMENT WILL BE PROVIDED AND

IOTES

EVICE RELOCATED IN PROPOSED WALL. D OVERHEAD DOOR POWER. PROVIDE INTERLOCKING FROLLER AS REQUIRED.

CLE FOR MOVEABLE POWER POLE. POWER POLE TO BE OWER HUB OR EQUAL. VERIFY CONNECTION ENTS WITH EQUIPMENT PROVIDED PRIOR TO ROUGH-IN. R LOCAL DISCONNECTING MEANS FOR POWERED ROVIDED BY OTHERS. VERIFY CONNECTION ENTS AND LOCATIONS WITH EQUIPMENT PRIOR TO

R MOTORIZED DAMPER. PROVIDE INTERLOCKING WITH ED EXHAUST FAN AS REQUIRED. SEE MECHANICAL S FOR MORE INFORMATION.

R OVERHEAD DOOR. PROVIDE INTERLOCKING WITH ER AS REQUIRED.

RGENCY POWER OFF MUSHROOM PUSHBUTTON TO BE KED WITH ADJACENT PANEL (P1 OR P2 RESPECTIVELY). IAMEPLATE TO INDICATE USAGE AND ASSOCIATED PANEL. R CONTROL OF MOTORIZED SCREEN.

MER MOUNTED ON STAND AT 24" AFF. REFERENCE

OR TO PROVDE 3/4" X 4'W. X 8'H. AC GRADE PLYWOOD IN TION FOR MOUNTING OF TELECOMMUNICATIONS T AND COMPONENTS. BACKBOARD SHALL BE PAINTED ATS OF WHITE, FIRE RETARDANT PAINT.

IUNICATIONS PRIMARY BONDING BUSBAR. REFERENCE

and a second a second

POWER GENERAL NOTES BRANCH CIRCUITS ARE INDICATED AS ONE CIRCUIT HOME RUNS WITH INDIVIDUAL NEUTRALS. A MAXIMUM OF THREE CIRCUITS (MAXIMUM OF THREE PHASE CONDUCTORS) MAY BE GROUPED IN A SINGLE CONDUIT. WHERE MULTIPLE CIRCUITS ARE LOCATED IN THE SAME RACEWAY, JUNCTION BOX OR ENCLOSURE, NEUTRALS SHALL BE MARKED OR LABELED TO INDICATE WHICH CIRCUIT THEY ARE ASSOCIATED WITH. SEE SPECIFICATION SECTION "LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES" FOR ADDITIONAL INFORMATION.

A GROUND CONDUCTOR SIZED PER N.E.C. ARTICLE 250 IS REQUIRED IN ALL CONDUITS.

. FOR CONNECTION REQUIREMENTS TO MECHANICAL UNITS, SEE MECHANICAL EQUIPMENT CONNECTION SCHEDULE.

. REFER TO THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR LOCATIONS OF FIRE RATED WALLS AND CEILINGS AND THE ASSOCIATED U.L. ASSEMBLY NUMBERS.

. FOR ALL PENETRATIONS IN FIRE RATED WALLS AND CEILINGS, PROVIDE AN ASTM E814 COMPLIANT, U.L. LISTED THROUGH PENETRATION FIRE STOPPING SYSTEM THAT IS SPECIFIC TO THE WALL OR CEILING CONSTRUCTION ASSEMBLY. INSTALL SYSTEM IN STRICT COMPLIANCE WITH THE U.L. ASSEMBLY INDICATED IN THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.

. ALL PIPING, CONDUIT, AND OUTLET BOXES (ELECTRIC, TELEPHONE, COMPUTER, ETC.) IN FIRE RATED WALLS OR CEILINGS SHALL BE CONSTRUCTED OF NON-COMBUSTIBLE MATERIAL.

. OUTLET BOXES (ELECTRIC, TELEPHONE, COMPUTER, ETC.) ON OPPOSITE SIDES OF FIRE RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF 24 INCHES OR PROTECTED BY OTHER MEANS ALLOWED BY THE SPECIFIC U.L. ASSEMBLY.

REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF STC RATED WALLS. OUTLET BOXES (ELECTRIC, TELEPHONE, COMPUTER, ETC.) ON OPPOSITE SIDES OF STC RATED WALLS SHALL BE LIMITED TO TWO OUTLET BOXES PER STUD SPACE AND COVERED WITH "PUTTY PAD" TYPE MOLDABLE FIRE BARRIER.

. FIELD VERIFY THE EXACT LOCATION OF ALL FLOOR BOXES AND WITH ARCHITECT PRIOR TO ROUGH-IN.

HAZARDOUS CLASSIFICATION: ROOMS 101, 102, AND 126 ARE CLASS 1 DIVISION 2 UP TO 18" AFF. PROVIDE ALL CONDUIT SEAL OFF'S AS REQUIRED PER N.E.C. FOR ALL CONDUIT ENTERING AND EXITING THE

SPACES.

