

## **Hayes Intermediate 5/6 School AV Upgrades**

Grand Ledge Public Schools is accepting bids for a Hayes Intermediate 5/6 School AV Upgrades project. Bids must be received by 11:00 AM on May 5, 2025, at the Sawdon Administration Building, 220 Lamson Street, Grand Ledge, MI. The District will not consider or accept any bids received after the submission deadline.

Bids will be opened publicly at 11:15 AM on May 5, 2025, at the Sawdon Administration Building, 220 Lamson Street, Grand Ledge, MI.

Bids shall be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the owner or employee of the Bidder and any member of the Board of Education of the School District, or the Superintendent of the School District. The Board of Education of the School District will not consider a Bid that does not include this sworn and notarized statement.

Information for bidders can be found at [GLcomets.net/Bids](https://GLcomets.net/Bids)

Detailed project specifications and bid instructions may be found at <https://sigma.michigan.gov/PRDVSS1X1/Advantage4>

*Information for Bidders is on the following pages.*



## HAYES INTERMEDIATE 5/6 SCHOOL AV UPGRADES

### PROJECT MANUAL

APRIL 16, 2024

Consultant:  
Hamilton AV Design



Owner:  
Grand Ledge Public Schools

#### **Included Documents:**

RFP  
Bid Form  
General Requirements  
Specifications  
Drawings

## SECTION 00 1116 – INVITATION TO BID

### 1.1 PROJECT INFORMATION

- A. Notice to Bidders: Bidders are invited to submit bids for Project as described in this Document.
- B. Project Identification: Hayes Intermediate 5/6 School AV Upgrades
  - 1. Project Location: 12620 Nixon Rd, Grand Ledge, MI 48837
- C. Owner: Grand Ledge Public Schools.
- D. Consultant: Hamilton AV Design 55 E. Main Ave, Zeeland, MI 49464.
- E. Project Description: Project consists of AV technology upgrades/renovations to several spaces within the intermediate School.
- F. Construction Contract: Bids will be received for the following Work:
  - 1. General Contract – AV.
    - a. GC will work with Owner's representatives to coordinate installation timeframes.
    - b. All Electrical contract work will be performed under a separate contract administered by the District.

### 1.2 SUBMITTAL AND OPENING

- A. A. Owner will receive sealed bids until the bid time and date via sealed envelope. Owner will consider bids prepared in compliance with the Instructions to Bidders issued by Owner, and delivered as follows:
  - 1. Bid Date: Monday, May 5, 2025.
  - 2. Bid Time: 11:00 a.m., local time.
  - 3. Location: GLPS District Services Office: 220 Lamson St, Grand Ledge, MI 48837
  - 4. Submit not less than three (3) copies of the bid on the supplied bid form.
- B. Bids will be opened at 11:15am at the above location.
- C. By making a Bid, each Bidder represents that the Bidder has read and understands the Project Documents, has visited the site, has become familiar with local conditions affecting the Work, has correlated observations with the requirements of the Documents, and has based the Bid upon the materials, systems and equipment required by the Documents.

### 1.3 PREBID CONFERENCE

- A. A prebid conference for all bidders will be held via zoom on Thursday, April 24, at 10:00am. Tours of the facility can be arranged on an as-needed basis at the school.
- B. Meeting can be joined at the following link:

[Join the meeting now](#)

Meeting ID: 210 058 837 699 9

Passcode: qV7Nm2xy

- C. Sub-bidders, potential suppliers, and other interested persons may attend.
- D. An attendance sheet will be circulated. Bidders must identify themselves as such on the attendance sheet. Sub-bidders and others are requested to indicate their trade or specialty. Identified Bidders will be notified whenever an Addendum is issued.

### 1.4 DOCUMENTS

- A. Online Procurement and Contracting Documents: See bid advertisement for document location.
- B. Bidders and Sub-bidders shall promptly notify the Designer of ambiguities, inconsistencies or errors discovered in examining the Documents or the site and local conditions, so that the Designer may issue written clarifications to all Bidders. The Designer may issue Addenda before receipt of bids, to modify

the Documents. In the space provided in the Bid Form, bidders shall acknowledge receipt of such Addenda.

1. Questions and RFI's regarding the documents and project scope shall be submitted to the consultant at this email address: [tim@hav.design](mailto:tim@hav.design)
  2. All questions submitted to the consultant will be answered via written addendum.
  3. All questions must be submitted by 2pm on Tuesday, April 29, 2025.
  4. Questions submitted after that time will not be answered.
- C. Bids shall be based on products indicated in the Documents. No substitutions may be made without prior approval from the Designer. Procedures for product substitution requests and approvals are outlined in the bid documents.

#### **1.5 TIME OF COMPLETION**

- A. A. Bidders shall begin the Work on receipt of the Notice to Proceed and shall complete the Work within the Contract Time.
1. Installation is expected to commence on or around July 1, 2025 and complete by July 30, 2025.

#### **1.6 BIDDER'S QUALIFICATIONS**

- A. Bidders must have a local business presence (within 250 miles of the project site) for long-term service and support of the systems.
- B. Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work. Costs for these items shall be clearly identified on the bid form.
1. A Bid Bond, in an amount not less than 5% of the Bid amount, in a form acceptable to the Owner will be required of all bids.
  2. A Performance Bond, a separate Labor and Material Payment Bond in a form acceptable to Owner will be required of the successful Bidder.
  3. Insurance in a form acceptable to Owner will be required of the successful Bidder.

**END OF SECTION 00 1116**





SEALED BILL LABEL

*Separate, or fold over, the label on the line below, and affix to the exterior of sealed container so information is clearly visible for Bid Submission. Ensure label is attached in a manner to prevent accidental removal or defacement. Label shall serve as sole identification for sealed bid at submission.*

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BID TO:           Grand Ledge Public Schools  
                      Attention: Mr. Mark Deschaine  
                      220 Lamson Street  
                      Grand Ledge, MI 48837

BID FROM:       \_\_\_\_\_

                      \_\_\_\_\_

                      \_\_\_\_\_

PROJECT:        HAYES INTERMEDIATE 5/6 SCHOOL AV UPGRADES

INCLUDING      Addendum No. \_\_\_\_ Dated \_\_\_\_\_  
ADDENDA:       Addendum No. \_\_\_\_ Dated \_\_\_\_\_

DUE:             10:00 am on April 18, 2025





**HAV.DESIGN**

Appendix A Total	\$ _____ Lump Sum
Appendix B Total	\$ _____ Lump Sum
Appendix C Total	\$ _____ Lump Sum
Performance Bond Price	\$ _____ Lump Sum
Bid Bond Price	\$ _____ Lump Sum
<b>Total Base Bid</b>	<b>\$ _____ Lump Sum</b>

**Acknowledge receipt of Addenda:**

Addendum # 1 \_\_\_\_\_

Addendum # 2 \_\_\_\_\_

Addendum # 3 \_\_\_\_\_

**Alternate Pricing:**

Alternate # 1 \$ \_\_\_\_\_ Lump Sum

Alternate # 2 \$ \_\_\_\_\_ Lump Sum

Alternate # 3 \$ \_\_\_\_\_ Lump Sum

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

Dated: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Email: \_\_\_\_\_

### Familial Relationship Disclosure Form

All Bidders must complete the following familial disclosure and attach this information to the bid.

By the attached sworn and notarized statement we are disclosing the following familial relationship(s) that exist between the owner or any employee of the bidder and any member of the Grand Ledge Public Schools Board of Education, Superintendent, School Director or Principal. Grand Ledge Public Schools will not accept a Proposal that does not include this sworn and notarized disclosure statement.

Disclose any familial relationship and complete the form below in its entirety:

The following are familial relationships as described above (provide employee name, family contact name, family contact position and familial relationship or NONE.)

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Signature(s): \_\_\_\_\_ Title \_\_\_\_\_

Name of firm:

STATE OF MICHIGAN  
COUNTY OF \_\_\_\_\_ } ss

On this \_\_\_\_\_, 20\_\_\_\_, before me a Notary Public in and for said county,  
personally appeared \_\_\_\_\_, agent of the said firm \_\_\_\_\_  
and who acknowledged the same to be his free act and deed as such agent.

\_\_\_\_\_  
Notary Public

**AFFIDAVIT OF COMPLIANCE – IRAN ECONOMICS SANCTIONS ACT**  
**Michigan Public Act No. 517 of 2012**

The undersigned, the owner or authorized office of the below-named contractor (the “Contractor”), pursuant to the compliance certification requirement provided in the Grand Ledge Public Schools’ (the “School District”) Request for Proposals For Hayes Intermediate School AV Upgrades (the “RFP”), hereby certifies, represents and warrants that the Contractor (including its officers, directors and employees) is not an “Iran linked business” within the meaning of the Iran Economics Sanctions Act, Michigan Public Act No. 517 of 2012 (the “Act”), and that in the event Contactor will not become an “Iran linked business” at any time during the course of performing any services under the contract.

The Contractor further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than \$250,000.00 or 2 times the amount of the contract or proposed contract for which the false certification was made, whichever is greater, the cost of the School District’s investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on a request for proposal for three (3) years from the date it is determined that the person has submitted the false certification.

**CONTRACTOR:**

\_\_\_\_\_  
Name of Contractor

By: \_\_\_\_\_

Its: \_\_\_\_\_

Date: \_\_\_\_\_

STATE OF MICHIGAN } ss  
COUNTY OF \_\_\_\_\_

This instrument was acknowledged before me on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_,  
by \_\_\_\_\_.

\_\_\_\_\_  
,Notary Public

\_\_\_\_\_  
County, \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

Acting in the County of: \_\_\_\_\_



**Contract Exceptions**

*Check one Box*

☐ Bidder takes no exception to, and agrees to comply with all sections, terms, conditions and/or requirements of the Contract Documents.

☐ Bidder proposes the following exceptions to the Contract Documents:

<i>Paragraph Number</i>	<i>Explanation</i>

**NOTE:**  
Exception(s) to any bid sections, terms, conditions and/or requirements deemed excessive for any reason by the Owner and/or Designer may result in disqualification of Bid.

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**Certificate of Liability Insurance**

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**(Contractor to submit a copy of their current COI)**

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**Certificate of Worker's Compensation Insurance**

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**(Contractor to submit a copy of their current COI)**



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Sample Contract

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The School District expects each vendor to include its appropriate purchase or leasing documents in its Proposal for consideration by the School District. Submitted contractual documents of the successful vendor may be subject to negotiation, and the following terms and conditions shall be included or incorporated into any purchase or leasing document between the School District and the selected vendor. For purposes of these provisions, "Contractor" means the successful vendor; and "Agreement" means the contractual document entered into between the School District and the successful vendor.

1. **Insurance.** Contractor agrees that it shall maintain commercial general liability and automobile liability coverage with minimum combined single limit, bodily injury and property damage liability of not less than One Million Dollars (\$1,000,000.00) per occurrence/aggregate. Contractor further agrees that it shall maintain workers' compensation coverage with statutory limits and will also maintain employers' liability coverage with a limit of at least Five Hundred Thousand Dollars (\$500,000.00) for each accident. School District is to be included as an additional insured on both the commercial and general liability. The general liability are to be issued on an occurrence-made basis. Contractor agrees to provide School District with current, valid insurance certificates evidencing required coverages under the Agreement with required policies or certificates of insurance properly endorsed to give School District at least thirty (30) days' notice of cancellation or material reduction of insurance coverage. Insurance provided by Contractor must be placed with insurers that meet a minimum Best financial rating of A:10.
2. **General Indemnification.** Contractor agrees to indemnify and hold harmless and defend the School District, its Board and its Board members in their official and individual capacities, its successors, assignees, employees, contractors and agents from and against any and all claims, costs, expenses, damages, and liabilities, including reasonable attorney's fees, arising out of the (i) negligent act or willful misconduct of the Contractor, its officers, directors, employees and agents; (ii) any breach of the terms of the Agreement by Contractor; or (iii) any breach of any representation or warranty by Contractor under the Agreement.
3. **Governing Law.** The Agreement shall be construed in accordance with, and its performance governed by, the laws of the State of Michigan.

## **SECTION 00 2113 – GENERAL REQUIREMENTS**

### **1.1 SUMMARY OF WORK**

- A. Work Covered by Contract Documents
  - 1. This project consists of technical systems upgrades to Hayes Intermediate 5/6 School.
  - 2. The Instructions to Bidders, Project Manual, Request for Proposals, dated March 28, 2025, issued by owner, General Requirements and Owner-Contractor Agreements, are a part of all divisions and all contract documents. The order of precedence for interpretation shall be the Agreement between Owner and Contractor, RFP, the Instruction to Bidders, the Project Manual, the General Conditions and the Contractor's Proposal. Execution of the Contract signifies that the Contractors are fully knowledgeable with all requirements of all divisions and documents. No claims for additional compensation will be entertained or paid to any Contractor on account of its failure to be fully informed of all requirements of all Contract Documents.
- B. Replace AV systems with new AV systems in gymnasium, cafeteria, band room and choir room.

### **1.2 CONTRACTS**

- A. Construct the work of each contract under a separate lump-sum/fixed price contract with the Owner. Coordination of the work will be provided as specified herein.
- B. Contractors shall carefully examine all drawings and read all divisions of the specifications and Contract Documents and shall include all Work required of them for a complete project.
- C. Requirements for a specific trade or contract will generally be described in that portion of the Specifications or Drawings related to that trade or contract. Such requirements may, however, be described in other sections of the Contract Documents. Contractors will be held responsible for having carefully examined all drawings and read all divisions of the specifications and all contract documents to avoid omissions or duplications and to ensure a complete job.
- D. Each Contractor is deemed to be fully informed about conditions relating to the construction of the Project and the employment of labor thereon by execution of the Contract. The Contractor will not be relieved of its obligation to furnish all material and labor necessary to carry out the provisions of the Contract.
- E. Any claim by the Contractor of an inability to meet any requirement set forth on the Contract Documents, or that any requirement of these documents is impractical or unreasonable, will not be recognized, unless the claim was made at the time the Contractor's proposal was submitted, and specific provision is made for such claim in the Contract.
- F. Unless otherwise specified, the Contractor shall supply all labor, supervision, materials, transportation, apparatus, fuel, energy and tools, necessary for the entire and proper completion of the Work. It shall perform all Work herein described in a workmanlike manner in accordance with the Contract Documents and shall provide everything properly incidental thereto as shown on the drawings, stated in the specifications or reasonably implied there from.
- G. Each Contractor shall be responsible for its own Work and every part thereof, and all Work of every description used in connection therewith. It shall specifically and distinctly assume all risks of damage or injury from whatever cause to property or persons used or employee on or in connection with his Work, and undertake and promise to indemnify, defend and hold harmless the Owner, Architect and District against all claims rising out and or on account of any such damage or injury.
- H. Each Contractor shall be held responsible for the execution of a satisfactory and complete piece of Work in accordance with the true intent of the drawings and specifications. It shall provide without extra charge all incidental items required as a part of its Work, even though not particularly specified or indicated. If it has good reason for objecting to the use of any material, application

or method of construction as shown or specified, it shall make report of such objection to the District and obtain proper adjustment before the Contract is executed.

- I. Should any material or workmanship be found defective or in any way contrary to the Contract, it may be rejected by the Owner regardless of its state of completion and same must be remedied or removed by the Contractor at no additional cost or expense to Owner.

### **1.3 WORK BY OTHERS**

- A. Work on the Project which is excluded from this Contract is as follows:
  1. Materials testing
  2. Asbestos abatement

### **1.4 WORK SEQUENCE**

- A. Construct Work in stages to accommodate the Owner's use of the premises during the construction period, as applicable
- B. Bidders are to assume that their Work will be coordinated in a manner consistent with industry practice and the efficient coordination of all trades and that are to recognize that the sequence and pace of their work may be dictated by other trades.
  1. Calendar dates associated with the completion of work of any particular contract are not assured.
  2. All Bidders recognize and will accept modifications to the schedule which, in the opinion of the District, are reasonable for the general interest of the Project as a result of allowable time extensions (formally or informally approved) in any contract, and that such modifications are inherent to the construction process and shall not qualify as a basis for extra compensation from the Owner.
  3. The Bidder, in submitting a proposal for a particular bid category, agrees to commit the necessary resources to complete the Work activities of the bid category within a period of time not longer than the planned duration. Work included in a bid category, but not specifically defined by a work activity, is to be accomplished in a reasonable manner in conjunction with other work of the bid category, and in such a way as to avoid complication of or to delay the work of other bid categories.

### **1.5 CONTRACTOR USE OF PREMISES**

- A. Each Contractor shall limit its use of the premises for Work and for storage related specifically to the Work, to allow for Work by other Contractors.
- B. Use of the premises will be coordinated by the District.
- C. Each Contractor shall assume complete responsibility for the protection and safekeeping of their products stored on site.
- D. Each Contractor shall move its stored products, which interfere with operation of the Owner.
- E. Each Contractor shall obtain and pay for the use of additional storage or Work areas if needed for operations.

### **1.6 PARTIAL OWNER OCCUPANCY**

- A. Each Contractor shall schedule his operations for completion of portions of the Work, as designated in Schedule for the Owner's occupancy prior to substantial completion of the entire work.

### **1.7 PROJECT COORDINATION**

- A. It shall be the responsibility of the District to coordinate and expedite all phases of construction. All separate Contractors shall fully cooperate with the District.
- B. Contractors shall assist the District in coordinating, scheduling and timing of construction activities to ensure orderly progress of the Work.

- C. Each Separate Contractor shall
1. Within ten (10) days of receipt of Notice of Pending Award of Contract, submit to the District a list of the Contractor's principle staff, including on-site superintendent. Coordinate the work of its employees and Sub-contractors.
  2. Expedite its Work to assure compliance with schedules.
  3. Coordinate its Work with that of other separate Contractors and Work by Owner. Contractor will prepare and submit coordination drawings wherever close and careful coordination is required.
  4. Comply with directions and instructions of the District.
  5. Verify dimensions shown on the drawings and obtain all measurements required for proper execution of Work.
  6. Place sleeves and inserts correctly for pipes, conduits and similar items required for its Work, in forms, walls, partitions, and floors. All said Work shall be done in cooperation with the affected Contractors. All items shall be placed in ample time so as not to delay concrete operations. Do not place sleeves so they pass through beams, girders, and similar construction, unless locations are approved by the Architect.
  7. Each Contractor shall see that sleeves and inserts are kept in their proper positions and not displaced by the placing of concrete or other construction Work. The separate Contractors of the Mechanical and Electrical Work involved shall be responsible for inclusion of these items in the Work and shall advise the District and Architect of all changes of sleeves and inserts locations.

#### **1.8 CONSTRUCTION ORGANIZATION AND START-UP**

- A. District shall establish on-site lines of authority and communications. District will:
1. Conduct the pre-construction meetings.
  2. Conduct progress meetings.
  3. Establish procedures and lines of communication:
    - a. Submittals
    - b. Reports and records
    - c. Recommendations
    - d. Coordination drawings
    - e. Schedules
  4. Contract Documents:
    - a. Consult with Designer to obtain interpretation.
    - b. Assist in resolution of questions or conflicts which may arise.
    - c. Transmit written interpretations to other Contractors, and to other concerned parties.
  5. Assist in obtaining permits and approvals:
    - a. Building permits and special permits required for permanent improvements or for temporary facilities.
    - b. Verify that Contractors and Sub-Contractors have obtained permits for inspections and for temporary facilities.

#### **1.9 CUTTING AND PATCHING NEW WORK**

- A. Each Contractor whose Work requires it, shall be responsible for all cutting, fitting and patching, including excavation and backfill, required to complete the Work in accordance with Contract Documents or to:

1. Properly fit parts together or to receive Work of other Contractors.
  2. Uncover portions of the Work to provide for installation of ill-timed Work.
  3. Remove and replace defective Work.
  4. Remove and replace work not conforming to requirements of Contract Documents.
  5. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
- B. Preparation
1. Provide adequate temporary support as necessary to assure the structural value or integrity of the affected portion of the Work.
  2. Provide devices and methods to protect other portions of the Project from damage.
  3. Provide protection from the elements for that portion of the Project which may be exposed by cutting and patching work and maintain excavations free from water.
- C. Performance
1. Execute cutting and demolition by methods which will prevent damage to other Work and will provide proper surfaces to receive installation of repairs.
  2. Execute excavating and backfilling by methods which will prevent settlement or damage to other Work.
  3. Employ the original installer or fabricator to perform cutting and patching in accordance with Contract Documents for:
    - a. Weather-exposed or moisture-resistant elements.
    - b. Sight-exposed finished surfaces.
  4. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
  5. Restore Work which has been cut or removed; install new products to provide completed Work in accordance with requirements of Contract Documents.
  6. Fit Work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
  7. Maintain Fire Wall penetrations.
  8. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
    - a. For continuous surfaces, refinish to nearest intersection.
    - b. For an assembly, refinish the entire unit.
    - c. 01095.6

#### **1.10 EQUAL OPPORTUNITY FOR EMPLOYMENT (MICHIGAN)**

- A. Each Contractor will comply with all applicable provisions of the Federal Civil Rights Act and the Michigan Fair Employment Practices Act, and the violation of either shall be cause for cancellation of this contract.
- B. Each Contractor, in accordance with the Michigan Fair Employment Practices Act, to the extent such act is applicable, shall not discriminate against any employee or applicant for employment, to be employed in the performance of such contract, with respect to the hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment because race, color, religion, national origin or ancestry (or age or sex, except where based on a bona fide occupational qualification). Contractor shall not maintain or provide for his employees any segregated facilities.

### **1.11 SHOP DRAWINGS, PRODUCT DATA, SAMPLES**

- A. All submittals shall be clearly identified with project name and location, and Contractor's name. The District shall indicate its review by means of his stamp, with his initials and date of review, prior to submitting to the Architect for review.
- B. Shop drawing details shall be identified by reference to sheet and detail, schedule of room or door numbers shown on Contract Documents.
- C. Product data copies shall be clearly marked to identify pertinent products, models, or part numbers; shall show performance characteristics and capacities, dimensions and clearances required, and during or piping diagrams and controls.
- D. Samples shall be of sufficient size and quantity to clearly illustrate functional characteristics of the product with related parts and attachment devices, showing full range of color, texture and pattern.
- E. Shop drawing submissions unless otherwise noted, shall be electronically transmitted.
- F. Product data submissions, unless otherwise noted or otherwise instructed at the pre-construction meeting, shall be electronically transmitted.
- G. Sample submissions, unless otherwise noted or otherwise instructed, shall consist of three (3) physical samples.
- H. Each Contractor shall submit a list of dates for the proposed shop drawings delivery schedules for the District's review within ten (10) days of Notice of Pending Award.
- I. Allow three (3) weeks for initial review. Allow additional time if further review is required with other disciplines.
- J. It is the Contractor's sole responsibility to submit shop drawings, coordination drawings, product data and samples in a timely fashion for review and approval, including resubmittals if necessary. No time extensions will be allowed for failure to submit these items.

### **1.12 SPECIAL SCHOOL CONSTRUCTION POLICIES**

- A. There will be no Radios, Boom Boxes, CD Players, or similar items allowed on the jobsite. Failure to comply can result in the removal from site.
- B. There will be no smoking or tobacco allowed on school grounds. Failure to comply can result in the removal from site.

### **1.13 STARTING OF SYSTEMS**

- A. See specifications for requirements on starting, testing, adjusting and balancing of equipment and systems appropriate to the Scope of Work associated with each Bid Category.

### **1.14 CONTRACT CLOSE OUT: SUBSTANTIAL COMPLETION**

- A. Before Contractor requests inspection for certification of substantial completion, complete the following:
  - 1. Complete final clean-up requirements as directed by District, including touch-up and otherwise repair and restore marred exposed surfaces.
- B. The following items must be completed before final acceptance and final payment is made:
  - 1. All Work and Punch List items must be completed.
  - 2. Final Application for Payment must be submitted and approved for payment.
  - 3. All guarantees and warranties must be submitted.
  - 4. Final waiver of lien and sworn statements must be submitted with Application for Payment.
  - 5. Record drawings, maintenance manuals, and similar record documentation must be submitted.

6. All items of Work for Contractor must be approved by regulatory agencies such as, but not limited to, the State Fire Marshall, Health Department, Mechanical Inspector and Electrical Inspector.
7. Submit a copy of the Architect's final punch list signed by Contractor's representative, stating that each item has been completed or otherwise resolved for acceptance.
8. Consent of surety to final payment must be submitted.

**1.15 SPARE PARTS AND MAINTENANCE MATERIALS**

- A. Each Contractor shall retain all loose and small detachable parts of the apparatus and equipment furnished under his contract, as well as keys and tools required for maintenance, until the completion of the work. Each Contractor shall then turn same over to the Owner, or his representative designated to receive them and obtain from him an itemized receipt thereof in triplicate. He shall retain one copy of this receipt for finally payment for the work.

**END OF SECTION 00 2113**



## **SECTION 27 4100 – GENERAL CONDITIONS FOR AUDIO-VIDEO SYSTEMS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

The AV Contractor shall coordinate with the General Contractor, Electrical Contractor, and all other Building Trades as needed for junction box locations, raceways, pull boxes, and other pathways related to the AV systems installation.

- A. The following specification sections relate to and are covered by this section:
  - 1. 27 4110 – Training for Audio-Video Systems
  - 2. 27 4116 – Integrated Audio-Video Systems
  - 3. 27 4125 – Audio-Video Control Systems

#### **1.2 SUMMARY**

- A. This project is part of the Grand Ledge Hayes Intermediate School Renovations project. Refer to the plans and specifications for further information.
- B. The audio-video systems reference the systems specifically identified for the above referenced project. These systems are identified as:
  - 1. Audio Systems including but not limited to:
    - a. Input equipment
    - b. Distribution equipment
    - c. Mixing consoles and controllers
    - d. Power amplifiers
    - e. Digital Signal Processing
    - f. Loudspeakers
    - g. Wire and Cable
    - h. Rigging and Hardware
  - 2. Displays including but not limited to:
    - a. Flat Panel Displays
    - b. Video Projectors
    - c. LED Video Walls
  - 3. Video Systems including but not limited to:
    - a. Input equipment
    - b. Distribution equipment
    - c. Wire and Cable
    - d. Rigging and Hardware
  - 4. Control Systems including but not limited to:
    - a. Touchpanels
    - b. Button Panels
    - c. Virtual Panels
    - d. Control Processors
    - e. Control Programming
    - f. Wire and Cable
  - 5. Miscellaneous



- a. Equipment Racks
- b. Wall plates and Rack Panels
- c. Equipment Carts
- d. Power Distribution and Conditioning

### **1.3 SUMMARY OF WORK**

A. General:

- 1. Provide audio-video systems engineering and installation for the above listed Project. Systems are to include all devices, equipment, installation, programming and commissioning in accordance with requirements of the contract documents and drawings.
- 2. The Work detailed within the Contract Documents has been specified to meet certain requirements for performance, appearance, and costs. It shall be the responsibility of the Contractor to implement the guidelines and requirements contained in the Contract Documents and translate them into a complete design package containing all elements necessary for a complete, operational, and functionally integrated Audio-Visual System(s).
- 3. Provide all work as detailed in the Contract Documents as a turnkey installation including all material, labor, engineering, warranties, taxes, freight, and permits. Only items and requirements specifically stated to be provided by others shall not be a requirement for this Section of the Work.

### **1.4 GENERAL CONDITIONS**

- A. The General Conditions of the above referenced project shall be considered part of this specification. Unless this Section contains statements, which are more definitive or more restrictive than those contained in the Owner's General Conditions, this Specification shall not be interpreted as waiving or overruling any requirements expressed in the General Conditions.
- B. Work Experience
- 1. Contractor agrees that they are familiar with the and have significant work experience in projects of this nature and scope. Contractor agrees to provide all materials, product and work to provide a complete and functional systems to the owner.
  - 2. Contractor must state if they intend to utilize a subcontractor for any portion of the work on this project. Contractor shall be liable for all work performed by any subcontractor. The Owner reserves the right to approve or disapprove any subcontractors.
  - 3. Contractor shall comply with all local and state regulations covering this work. Contractor shall rectify any work found to not be in compliance with any local or state regulatory agency.
  - 4. All permits and any required certifications shall be obtained and paid for by the Contractor. Contractor will forward evidence of any such required items to the owner.

### **1.5 DEFINITIONS**

- A. The following shall be used as general identifiers as specified herein:
- 1. Owner – Organization or person who has undertaken the above referenced project.
  - 2. Construction Manager – Contractor hired by the owner to coordinate and facilitate the construction of the project.
  - 3. Contractor – The company awarded the work of this section by the Construction Manager.
  - 4. Consultant – Company hired by the Owner or Architect to design the Audio-Video Systems.
  - 5. Electrical Contractor – The company awarded the work for the electrical and raceway portions of the project, typically, but not limited to, Division 26.
  - 6. Subcontractor -- Company or organization contracted by the Contractor to perform or supply any portion of this specification.

7. Work – The term “Work” means all construction and services specified within this document. The Work includes all related labor, materials, equipment, and services provided, or to be provided, by the Contractor to fulfill the specification’s obligations.
8. Drawings – The term “Drawings” means all Audio-Video Systems Drawings and associated sketches, details, riser diagrams, etc.
9. As used in the Drawings and Specifications for the Work, certain nontechnical words and phrases shall be understood to have specific meanings as follows, regardless of indications to the contrary in the General Conditions or other documents governing the Work.
  - a. “Furnish” – Purchase and deliver to the project site complete with all necessary parts, pieces, and accessories. Where required, purchasing shall include payment of all necessary sales taxes as may be required.
  - b. “Install” – Unload new equipment or take an item furnished by others and place or mount at the location indicated by the project drawings or specifications.
  - c. “New” – Manufacturer’s current and most recent model, manufactured within the past year and not previously used.
  - d. “Provide” – Furnish and Install.
10. Where the word “conduit” is used without specific reference to type, it shall be understood to mean “raceway”.
11. Reference to “U.L. (Materials Construction) Standards” shall mean the “Standards for Safety” published by Underwriters Laboratories, Inc. Standards published by other certification agencies such as CSA and ETL may also be used.

## **1.6 DIVISION OF LABOR**

- A. Electrical Contractor shall furnish and install all conduit and boxes associated with the AV Systems as specified, as shown on the drawings, and as required by the Contractor.
- B. Electrical Contractor shall supply a pull string in all conduits for the Contractor.
- C. All Audio-Video wiring shall be supplied and installed by the Contractor.
- D. All electrical connections carrying line voltage (above 100 volts) shall be connected and terminated by the Electrical Contractor. All line voltage wire and cable for the audio and video systems shall be provided by the Electrical Contractor.
- E. All electrical connections carrying low voltage (below 100 volts) shall be connected and terminated by the Installing Contractor. All low voltage wire and cable for the audio and video systems shall be provided by the Installing Contractor.

## **1.7 QUALITY ASSURANCE**

- A. All electrical installation shall be in compliance with the N.E.C., and shall be inspected by the Local or State Electrical Inspection Authority. All installation shall be subject to inspection by the Local Authority Having Jurisdiction. All installation shall be in accordance with the AHJ. Any installation methods found to not be in compliance with the AHJ shall be rectified by the contractor without claim for additional payment.
- B. Bidders for this section are expected to be an authorized dealer for all major pieces of equipment or purchasing them through an authorized dealer. Documentation of dealer status may be requested from bidders. Failure to provide adequate documentation may be grounds for disqualification from the bidding process.
- C. The master/lead technician working on site shall have a minimum certification of CTS with CTS-I highly preferred. The primary project engineer shall have a minimum certification of CTS with CTS-D highly preferred. Failure to provide proper qualifications shall be grounds for disqualification from the bidding process.
- D. Any AV work found by the Architect, Construction Manager, Owner, or Consultant to not be acceptable or in compliance with the specifications and drawings will be rectified by the Contractor with no additional claim for compensation.

- E. Any expense incurred by the Owner to correct or rectify unsatisfactory work of the Contractor shall be borne by the Contractor. The Owner may withhold any money due to the contractor or recover any money already paid to the contractor to cover any such expenses.

## 1.8 PRE-INSTALLATION SUBMITTALS

- A. Submittal sheets are required to be submitted for all specified equipment. All submittals and shop drawings shall be submitted and approved by the Consultant prior to the beginning of installation. These submittals shall be provided not more than 4 weeks following award of contract.
1. A control system is part of the project therefore the touch panel layouts and control system programming shall be submitted for approval prior to the start of installation. See specification section 27 4125 for Control System requirements.
  2. Contractor shall furnish an electronic PDF document for any equipment request that is not the specified product. If requested by the Construction Manager, a printed submittal set can be submitted and is to be bound on the left side and printed on 8.5x11 inch paper.
  3. A complete Bill of Materials (with associated cut sheets for each piece of equipment) will be submitted by the Installing Contractor showing all the equipment to be installed. **Materials will be listed in the same order that the products are listed in the Appendix of the corresponding specification.** Each sub system will be shown with all the products to be installed as part of that sub system in the order listed in the specification. The Bill of Materials will indicate the quantity being supplied, the manufacturer, the model of the equipment, and a brief description of the equipment.
  4. All product data sheet submittals shall be organized in the same order that products are listed in the appendix of this specification. Each sub system of the design shall have the product data sheet for each piece of equipment contained in that sub system – organized in the order listed in the specification. Under no circumstance shall the product data sheets be organized in alphabetical order. **Any product data sheet submittals not conforming to this will be automatically rejected.**
  5. Contractor shall furnish an electronic PDF set of shop drawings detailing a complete installation plan. Shop drawings are expected to expand upon the construction documents and shall show all components and wires, complete with individual wire numbers, proposed rack layouts, riser diagrams and schematics for individual subsystems, calculations, and details of proposed rigging. Schematics shall show a separate designation for each device and labeling shall correspond to that of the rack layouts. Installing Contractor shall convey that the system is ready to install as shown in the shop drawings, and that details not explicitly defined by this specification or on the drawings have been addressed by the Contractor. Submittal drawings should match the native size of drawings in the project documentation.
  6. Scanned or copied versions of the construction documents will not be accepted and shall be automatically rejected.
  7. Failure to furnish all information as noted above shall result in the rejection of submittals.
  8. Some of the Consultant's floor plan drawings may be available for use by the Contractor in preparing shop drawings.

## 1.9 STANDARDS

- A. All equipment and installation practices, where applicable standards have been established, shall be built and installed to the standards of the following institutions:
1. Underwriters Laboratories, Inc. (UL): Comply with requirements of UL-50
  2. NFPA 70, National Electric Code (NEC)
  3. InfoComm 2M-2010: AV Design and Coordination Processes
  4. InfoComm F501.01:2015: Cable Labeling for Audiovisual Systems
  5. InfoComm V202.01:2016: Display Image Size

6. ANSI/InfoComm 10:2013: Audiovisual Systems Performance Verification
7. ANSI/InfoComm 1M-2009: Audio Coverage Uniformity
8. ANSI-J-STD-710: Audio, Video and Control Architectural Drawing Symbols
9. EIA Compliance: Comply with following Electronics Industries Standards:
  - a. Sound Systems, EIA-160
  - b. Loudspeakers, Dynamic Magnetic Structures and Impedance, EIA-299-A
  - c. Racks, Panels and associated equipment, EIA-310-A
  - d. Amplifiers for Sound Equipment, SE-101-A
  - e. Speakers for Sound Equipment, SE-103
10. TIA/EIA-607 Telecommunications Grounding
11. BICSI Telecommunications Distribution Methods Manual (Ninth Edition)
12. Federal Communications Commission Part 15
13. Audio Engineering Society (AES)

#### **1.10 DELIVERY, STORAGE, AND CONDITIONS**

- A. Include delivery, storage, and handling of all products and materials to be delivered and installed.
- B. Contractor shall be responsible for providing on-site storage if necessary. Contractor may negotiate a storage facility with the Construction Manager, but shall still be responsible for his own materials.
- C. Contractor shall provide all necessary means to protect and safeguard their work from damage by other contractors and trades up to the date of final acceptance by the Owner. Contractor shall be responsible for all costs to clean and repair any damage to installed systems unless the contractor proves to the Owner's satisfaction that the damage was caused by other contractors.
- D. Installing Contractor bears the responsibility to verify all site conditions and coordinate with the Electrical Contractor to ensure a complete and functional system is supplied to the Owner.
- E. Verify dimensions of major components to check for entry through doors, ceiling height clearance, and column interference prior to the installation of the equipment.
- F. Installing Contractor shall stay aware of all project time schedules and shall coordinate with all other trades for all aspects of the work.
- G. Installing Contractor shall include provisions in the bid to make at least three (3) visits to the site prior to beginning of site work to verify site conditions, coordinate with other trades, meet with representatives of the Owner, or deal with other issues that may arise in the course of building construction.
- H. In addition to the three (3) site visits the Installing Contractor shall attend progress meetings and foreman meetings as required by the Construction Manager.

#### **1.11 OWNER FURNISHED EQUIPMENT**

- A. The Owner reserves the right to furnish any materials necessary for the Project.
- B. For items of equipment which are to be installed but not purchased as part of the Work, the Work shall include:
  1. Coordination of any necessary delivery.
  2. Unloading equipment and boxes from delivery trucks.
  3. Safe handling of the equipment until final installation.
  4. Inspection of all items and testing as necessary to verify proper operation of the equipment.
  5. Immediately notify the Owner of any non-functional items. Any damaged item not brought to the owner's attention within 1 week will be considered damaged by the Contractor.
  6. Install all owner furnished items as noted in the project specifications and drawings.

## **1.12 WARRANTY**

- A. The Installing Contractor shall provide timely maintenance of any malfunctions of the installed systems, at no additional cost to the owner, for a period of twelve (12) months from the date of acceptance by the owner unless damage or failure of the system is caused by misuse, abuse, neglect, or accident.
- B. The Installing Contractor shall guarantee availability of local service by factory-trained personnel from an authorized distributor of the equipment manufacturer. The distributor shall have available a stock of the manufacturer's standard parts.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Refer to sections under section 27 41 00 -- Part 1 for all Equipment Specifications listed by space and type.
- B. Refer to the associated Appendices for all equipment to be installed. Contractor shall be liable to provide a complete and functional system regardless of whether parts are specifically identified in the specifications and equipment lists.
- C. In the event that a conflict would arise between the equipment lists and the associated drawings the contractor shall provide the greater quantity or cost impact to the project.
- D. If the contractor has bid a product of lesser value that does not meet the project requirements and standards to form a complete and fully functional system, the contractor shall provide the more expensive item that does meet the standards at no additional cost to the owner.

### **2.2 REQUESTS FOR ALTERNATES**

- A. Requests for equipment to be considered as alternates shall be considered under the following circumstances:
  - 1. Alternate requests shall be submitted to the consultant.
  - 2. Show the original item specified and the proposed alternate.
  - 3. Provide a shop drawing showing how the equipment integrates to the rest of the system.
  - 4. Provide speaker mapping data (if alternate requested is a loudspeaker).
  - 5. Provide a demo piece of equipment for testing by the consultant (if requested).
  - 6. Install the specified equipment if the request is denied.

## **PART 3 - EXECUTION**

### **3.1 GENERAL INSTALLATION (MATERIAL AND WORKMANSHIP)**

- A. Non-compliance with any of the following as deemed by the Owner or Consultant shall be cause for rejection of Work by the Owner, and replacement by Contractor to Owner's satisfaction, and at no added cost to the Owner.
  - 1. All materials, methods, and workmanship shall be performed as specified.
  - 2. If an installation practice contrary to these specifications and drawings is desired by the contractor, then the Contractor shall make a written request to that effect. Modifications shall not be implemented without written approval from the Consultant and/or Owner.
  - 3. If a circumstance should arise where the specified item is no longer available, then the Contractor shall supply the manufacturer's current model and verify that the product is compatible with the other system components. Contractor shall bear all costs associated with this verification and testing. Failure to properly verify compatibility shall not be grounds for any additional payment.
  - 4. All installation shall be in accordance with generally accepted broadcast, video, and audio engineering practices.
  - 5. Contractor shall work closely with all other trades on the project to meet appropriate deadlines and complete work in a timely manner. Should Contractor fail to meet such

deadlines, appropriate compensation for lost usage of the systems and space shall be withheld from payment of any fees Contractor is due or has already been paid.

6. Contractor is responsible to verify all site conditions and to coordinate with other trades to ensure that a complete and functional system is provide to the Owner. Verify all dimensions of equipment for clearance through doors and other potential obstructions.
7. Contractor shall be liable to protect their work from damage up to the date of final acceptance by the owner.
8. All permanently installed equipment will be secured in place with a minimum safety factor of 5.

### **3.2 FIRMWARE UPDATES**

- A. All audio, video, and control equipment shall be updated with the latest firmware prior to the project turnover to the Owner.
- B. Every piece of equipment must have the firmware verified and properly installed.
- C. All time required for firmware updates should be included as part of the Contractor's cost for the project.

### **3.3 TRIM RINGS AND COVERS**

- A. Contractor shall work with other trades to ensure that all boxes are mounted plumb, square, and do not have excessive gaps between the box and surrounding wall.
- B. Contractor shall supply a suitable trim or extension for any panel that does not cover the gap between the wall and edge of the panel.

### **3.4 SUBCONTRACT**

- A. The Installing Contractor shall be responsible for the complete and unconditional implementation of each system, even though he may have subcontracted a portion of the installation or had certain manufacturers install their own equipment.
- B. Any delay in system commissioning caused by a Subcontractor shall be the responsibility of the Installing Contractor. If such delays cause significant disruption to the successful completion and usage of the project, the Installing Contractor shall be liable for reasonable compensation to the owner.

### **3.5 CONDUIT AND CABLE ROUTING**

- A. Electrical Contractor shall furnish and install all conduit and boxes associated with the audio and video systems as shown on the drawings. Contractor shall coordinate with the Electrical Contractor for any additional conduits that may be required.
- B. Electrical Contractor shall provide all junction boxes for the audio and video systems with appropriate covers.
- C. All conduits not specifically identified shall be 3/4".
- D. All conduits below grade shall be PVC or as required by code. All conduits above grade shall be EMT or as required by code. Refer to Division 26 documents for conduit specification details.
- E. There shall be no more than three (3) 90-degree bends in audio or video conduit between pull points. If a conduit run requires more than two bends or if the conduit run is in excess of 150' in total length, insert a pull box. If it is not practical to install a pull box in the run due to field conditions, the conduit size shall be increased to the next trade size for each additional 90-degree bend. Offsets shall be considered as equivalent to a 90-degree bend.
- F. All conduits to be labeled at the source box with the destination box in a clear and logical manner.
- G. Ends of all conduits are to be deburred and bushed.
- H. All conduits terminating inside of an audio/video enclosure (e.g. rack) or not terminating in a junction/pull box shall be provided with plastic insulated bushings.
- I. Electrical Contractor shall be responsible to provide a poly pull-line in each conduit.



- J. Line voltage conduits shall maintain a minimum of 24" separation from audio or video signal conduits except to cross at 90-degree angles when necessary.
- K. All metal Audio and Video equipment racks must be isolated or insulated from any metallic conduits. The final connection to these audio racks or panels shall be with PVC, non-metallic flex or any other non-metallic conduit. Or, where appropriate and approved, the cables can enter the rack or panel in a bundle through a bushed opening.
- L. Junction boxes and pull boxes in the conduit system do not have to be isolated, only racks or panels with electrical power and electronic audio devices.
- M. Electrical power feed to an audio rack or audio panel shall also be via PVC or non-metallic or insulated conduit.
- N. All cables shall be laced or tied securely to assure no malfunctions resulting from interference of other trades or routine future maintenance.

### **3.6 CABLE INSTALLATION AND LABELLING:**

- A. The AV contractor shall supply all jumper cables and interconnect cables for equipment within racks.
- B. All cables and wires throughout the installation will have a unique wire label at each termination and connection point. Labels shall use clear wrap-around number or letter cable markers. Any unlabeled cables found at system checkout shall be immediately labeled. Failure to label wires will be grounds for rejection of work.
- C. All wire markers in a given rack shall face a common direction for easy reading.
- D. Cable wire markers shall be approximately 4" from the shell of the connector and must be visible outside of any cable bundle or lacer bar.
- E. XLR connectors utilizing insulation displacement or solderless connections will not be acceptable.
- F. All cable used in plenum spaces or air ducts shall be plenum rated or in conduit.
- G. Under no circumstance shall a wire splice be installed in conduit.
- H. No cable shall be installed with a bend radius less than what is recommended by the manufacturer.
- I. All cables shall be grouped according to the signal level type. Cabling should be separated into the following general categories:
  - 1. Power Cables
  - 2. Control Cables
  - 3. Video Cables
  - 4. Microphone level audio cables
  - 5. Line level audio cables
  - 6. Speaker level audio cables
- J. Run power cables, control cables, and speaker level cables on the left side of the rack. All other cables shall be run on the right side of the rack.
- K. All cables shall be secured in place utilizing Velcro wraps. Wire "zip ties" shall not be used to secure cables.
- L. All inter-rack cabling shall be neatly strapped, dressed, and supported as approved by the Owner or Consultant. Cabling within racks shall be contained in Panduit finger tray and secured to lacer bars when appropriate.
- M. All cabling installed outside of racks shall be dressed in a suitable harness or loom to keep cables clean, neat, and tidy.
- N. All cables shall be cut to the length dictated by the run. All equipment installed in racks shall have a service loop of appropriate length.

1. For equipment mounted in racks accessible from both front and back, provide a service loop length sufficient to plug and unplug cable from the unit to allow for troubleshooting and service of equipment.
2. For equipment mounted in racks accessible from the front only, provide a service loop length sufficient to remove the unit from the rack and easily plug and unplug all connectors.

### **3.7 IDENTIFICATION**

- A. All labels on panels or plates shall be white lettering on black background. All lettering on panels and plates shall be engraved. Panels and plates shall have a minimum thickness of .125". All labels shall correspond to the drawings. Any labels found unacceptable shall be remedied by the Contractor without claim for additional payment.
- B. Every piece of rack-mounted equipment should have a label on the front and back showing the following:
  1. Input and output lines
  2. Schematic drawing designation
  3. Devices outside the rack serviced by the equipment

### **3.8 TESTING AND ADJUSTMENTS**

- A. Acceptance testing: Before Acceptance Tests are scheduled, the Installing Contractor shall perform his own systems checkout. Installing Contractor shall furnish all required test equipment and shall perform all work necessary to determine and/or modify performance of the system to meet the requirements of these specifications and drawings. This work shall include the following:
  1. Testing of all inputs, outputs, and tie-lines.
  2. Testing of all display devices, equipment configurations, speakers and jacks.
  3. Testing of any other wires or components.
  4. Test all audio for compliance with the Performance Standards.
  5. Check all controls functions, from all controlling points to all controlled devices, for specified operation.
- B. Testing Personnel: The Installing Contractor shall have a minimum of two persons knowledgeable as to the systems as installed available for testing and adjustment with the Consultant.
  1. All costs to the Installing Contractor for testing personnel shall be included in the bid.
  2. Installing Contractor shall allow for up to (8) eight hours of testing and adjustments with the Consultant.
  3. Failure of the Installing Contractor to provide adequate personnel or testing equipment causing lost time to the Consultant shall result in the Installing Contractor paying the Consultant's standard hourly rate for additional time and expenses as necessary.
- C. Test Equipment: Contractor shall have the following available for testing and commissioning of the system:
  1. All test equipment shall be furnished by the Contractor
  2. Computer measurements shall be performed using SMAART or EASERA
  3. Current laptop computer with the DSP manufacturer's current software installed
  4. High quality multi-meter: Fluke or Similar
  5. Sweepable tone generator
  6. Impedance meter
  7. RF scanner (100 MHz up to 5 MHz)
- D. Noise, rattle, or buzz
  1. Run the system in each specified mode of operation



2. Make sure the system is free of any hum, noise, rattles or other distortions
  3. Use both speech and high-quality music to test the system
  4. Apply swept sine waves to the system to listen for any anomalies
  5. Correct any issues revealed by the above tests
- E. Provide a written report to the consultant documenting the system testing performed.

### **3.9 FINAL ACCEPTANCE**

- A. After approval of the Contractor's test report the Contractor shall demonstrate the basic operation of the system and each major component of the system.
- B. A printed "quick start" guide will be given to each of the training participants. Additionally, the quick start guide will be posted at the tech desk and on the equipment rack. Guides should be laminated.
- C. The Contractor shall provide a copy of the software for every component that utilizes an outboard computer for setup and configuration. The Installing Contractor shall demonstrate the usage of each configuration software to the Owner's Representative.
- D. All final "As-Built" drawings, manuals, any other required documents shall be reviewed and approved.
- E. Any additional time incurred by the Consultant required to oversee system testing due to improper system installation shall be charged directly to the Contractor at the Consultant's standard hourly rate.

**END OF SECTION 27 4100**

## SECTION 27 4110 – TRAINING FOR AUDIO-VIDEO SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Some information contained in this specification is also found on the associated drawings and in the following specification sections. Work shown on drawings or described in other spec sections is deemed to be in both.
- B. Related Specification Sections:
  - 1. 27 4100 – Training for Audio-Video Systems
  - 2. 27 4116 – Integrated Audio-Video Systems
  - 3. 27 4125 -- Audio-Video Control Systems

#### 1.2 TRAINING FORMAT

- A. Presenter: The presenter for the training session should be an individual who has been directly involved with the project and is very familiar with both the design intent and the actual installation. It is essential that the Presenter have experience with operating and training similar systems.
- B. Attendees: The client or end user should determine who will be at the training. Generally smaller groups (4-6 persons max) are better. Training should occur at a time and place arranged with the client or end user after the system(s) are fully complete and operational.
- C. Audio Instruction: A presentation of basics and fundamentals of how sound systems function should be included as part of the training. The following topics should be discussed:
  - 1. Frequency
  - 2. Gain Structure
  - 3. Inputs, outputs, and controls
  - 4. Loose equipment
- D. Field Training: Hands on instruction for the use and maintenance of the systems.
  - 1. Demonstrate all controls.
  - 2. Demonstrate how all temporary or portable connections are performed.
  - 3. Demonstrate any routing or configuration options

#### 1.3 TRAINING LENGTH

- A. The client or end user shall be entitled to a total of 3 hours of initial training time. Generally, this would be (3) 60-minute sessions at or near the time of substantial completion.
- B. The client or end user shall be entitled to a follow up training session approximately 1 month after the initial training is completed. Exact scheduling can vary. This training session is to be (1) 45-minute session.

#### 1.4 SUPPORT MATERIALS

- A. Training Manuals containing the following:
  - 1. Cover sheet indicating the type of training being performed
  - 2. Contact information
  - 3. Table of contents
  - 4. Printed copy of any presentations
  - 5. Materials List including any loose equipment
  - 6. Owner's and instruction manuals
  - 7. Record Documents including an as-built drawings.

**PART 2 - PRODUCTS**

**PART 3 - EXECUTION**

A. PREPARATION

1. Submit a copy of all training materials to the consultant for review and approval prior to the training sessions.

**END OF SECTION 27 4110**

## **SECTION 27 4116 – INTEGRATED AUDIO-VIDEO SYSTEMS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Some information contained in this specification is also found on the associated drawings and in the following specification sections. Work shown on drawings or described in other spec sections is deemed to be in both.
- B. Related Specification Sections:
  - 1. 27 4100 – General Conditions for Audio-Video Systems
  - 2. 27 4110 – Training for Audio-Video Systems
  - 3. 27 4125 – Audio-Video Control Systems

#### **1.2 CHOIR B102, BAND ROOM B108 AV SYSTEM**

- A. The following AV equipment will be provided and installed in Choir B102 and Band Room B108:
  - 1. (2) 8" two-way wall-mounted loudspeakers to cover each room
  - 2. High power amplifier(s) for speakers
  - 3. New QSC QSYS DSP and Controls
  - 4. (1) Wall-mounted 7" QSYS touchpanel for system controls in each room
  - 5. (1) Wall-mounted Bluetooth and consumer audio inputs in each room
  - 6. New wall-mounted equipment rack in nearby storage room
  - 7. Rack-mounted UPS and power strip
  - 8. (1) wall-mounted HDMI input box in each room
  - 9. (1) Apple TV (provided by school) w/ contractor furnished HDMI video switcher for each room.

#### **1.3 GYMNASIUM B132 AV SYSTEM**

- A. The following AV equipment will be provided and installed in Auxillary Gym G104:
  - 1. (9) loudspeakers to cover the court
  - 2. High power amplifier(s) for all speakers
  - 3. New QSC QSYS DSP and Controls
  - 4. (1) Wall-mounted 7" QSYS touchpanel with cover for system controls
  - 5. (1) Wall-mounted Bluetooth and consumer audio inputs with cover
  - 6. (1) new wireless microphone channel with (1) bodypack and (1) handheld transmitter
  - 7. New wall-mounted equipment rack in nearby storage room
  - 8. Rack-mounted UPS and power strip
  - 9. (1) new 16' x 9' motorized projection screen
  - 10. 10,000 lumen WUXGA laser projector
  - 11. (1) portable HDMI-to-AVoIP input box
  - 12. (1) fixed HDMI-to-AVoIP input box
  - 13. (1) Apple TV (provided by school) w/ contractor furnished AVoIP input box

#### **1.4 CAFETERIA C113 AV SYSTEM**

- A. The following AV equipment will be provided and installed in Cafeteria C113:

1. (16) 6" ceiling-recessed loudspeakers
2. High power amplifier(s) for all speakers
3. New QSC QSYS DSP and Controls
4. (1) Wall-mounted 7" QSYS touchpanel with cover for system controls
5. (1) Wall-mounted Bluetooth and consumer audio inputs with cover
6. (1) existing wireless microphone channels with existing wireless transmitters
7. New wall-mounted equipment rack in upstairs storage room
8. Rack-mounted UPS and power strip
9. (1) new 65" x 116" motorized projection screen
10. (1) 6,000 lumen WUXGA laser projector
11. (1) portable HDMI-to-AVoIP input box
12. (1) fixed HDMI-to-AVoIP input box
13. (1) Apple TV (provided by school) w/ contractor furnished AVoIP input box

## **PART 2 - PRODUCTS**

### **2.1 AUDIO EQUIPMENT**

- A. See appendices for specific Manufacturer and Model numbers for each system and subsystem.
- B. Cross reference all drawings to the equipment list as shown in the appendices. Contractor shall provide a complete and functional system as designed regardless of whether a specific component is specifically noted in the Appendix.
- C. All equipment shall be new and shall be the manufacturer's newest and most current version of the product.
- D. Following are general categories of equipment that will form the system. See drawings for quantities and sizing of all equipment.
  1. Equipment Racks
    - a. Full size (44 RU) gang and stand-alone racks
    - b. Wall-mounted equipment racks
    - c. Desktop equipment racks
    - d. Podium/lectern mounted equipment racks
  2. Power sequencing and distribution
    - a. Power sequencing panel
    - b. Power raceway
    - c. UPS devices
    - d. Distributed power outlets
    - e. Rackmounted Power & Lights
    - f. Rackmounted Power outlets
  3. Mixers and Mixing Consoles
  4. Loudspeakers
    - a. Line Array Speakers
    - b. Point Source Speakers
    - c. Digitally steered column arrays

- d. Distributed Speakers
  - 1) Wall-mounted
  - 2) Ceiling
- 5. Amplifiers
- 6. Digital Signal Processors
  - a. Fixed input/output configuration
  - b. Expandable systems
  - c. Fixed internal architecture
  - d. Open/flexible internal architecture
- 7. Wireless microphones
- 8. Audio Sources & Outboard Equipment
- 9. Control System – See specification section 27 4125 for Control System components.

## **2.2 VIDEO EQUIPMENT**

- A. See appendix A for specific Manufacturer and Model numbers for each system and subsystem.
- B. Cross reference all drawings to the equipment list as shown in Appendix A. Contractor shall provide a complete and functional system as designed regardless of whether a specific component is specifically noted in the Appendix.
- C. Following are general categories of equipment that will form the system. See drawings for quantities and sizing of all equipment.
  - 1. Displays
    - a. Projectors and Lens
    - b. Screens and Control Modules
    - c. Direct View Monitors
    - d. LED Video Walls
  - 2. Switching
    - a. Presentation Switchers
    - b. Matrix Switchers
  - 3. Video Distribution
    - a. HDBT
    - b. Digital Media
    - c. DTP
  - 4. Cameras
    - a. Pan/Tilt/Zoom
    - b. Fixed
    - c. Professional Tripod
  - 5. Video Conferencing
    - a. Codecs
    - b. Interface boxes
  - 6. Control System
    - a. Touchpanel Controls

- b. Button Panel Controls
- c. Processors
- d. Input/Output converters and transport
- 7. Tabletop boxes
  - a. Inserts
  - b. Modules
  - c. Cabling

## **2.3 ALLOWANCES**

- A. Contractors shall include a \$750 allowance for changes that may be directed by the Consultant. Any allowance not used during the project shall be credited back to the client.

## **2.4 CORDS AND ADAPTERS**

- A. Provide all necessary cords, adapters, cables, and interfaces to accept the input and output signals from the specified equipment to the rest of the system.

## **2.5 CABLING & WIRE**

- A. Not all cabling types listed below will necessarily be used. Some cables may not be used in this project. Additional cabling requirements may be noted in related spec sections, drawings, and in the equipment appendix. All AV cabling in the project shall have a gray jacket to differentiate it from other building cables.
  - 1. Mic/Line Wire: 22 AWG 2-conductor twisted pair with drain wire, foil shield, and overall jacket. Provide plenum version in all required spaces.
    - a. Belden 9451 (Plenum -- 9451P)
    - b. West Penn 454 (Plenum – D25454)
  - 2. Speaker Wire: 10 AWG 2-conductor twisted pair with overall jacket and waterproof jacket.
    - a. West Penn C210
  - 3. Speaker Wire: 12 AWG 2-conductor twisted pair with overall jacket. Provide plenum version in all required spaces.
    - a. West Penn 227 (Plenum – 25227)
    - b. Belden 6200UE (Plenum – 6000UE)
  - 4. Speaker Wire: 14 AWG 2-conductor twisted pair with overall jacket. Provide plenum version in all required spaces.
    - a. West Penn 225 (Plenum – 25225)
    - b. Belden 6200UE (Plenum – 6100UE)
  - 5. HDMI cable: Pre-terminated HDMI cable. Confirm length in field prior to ordering. Limit cable length to less than 4.5 meters. Confirm long cables are within manufacturer's specifications for signal type in the specific application
    - a. Crestron CBL-HD-XX
    - b. Extron HDMI Ultra/X
  - 6. Cat6 Unshielded: Eight Conductor, 24 AWG, unshielded, twisted pair cable with overall jacket.
    - a. Belden 2412
  - 7. Cat6 Shielded: Eight Conductor, 24 AWG, shielded, twisted pair cable with overall jacket. Provide plenum version in all required spaces.
    - a. Extron XTP DTP 24/1000 (Plenum – XTP DTP 24P/1000)

- b. Crestron DM-CBL-8G-NP (Plenum – DM-CBL-8G-P

## **2.6 CONNECTORS**

- A. All connectors shall be manufactured by Neutrik unless expressly noted on the drawings or in the specifications. All panel mounted connectors should be compatible with Neutrik D-Series holes.
  - 1. Audio – XLR type
    - a. Cable: NC3FX-BAG or NC3MX-BAG
    - b. Panel: NC3FDL-1-BAG or NC3MDL-1-BAG
  - 2. Audio – ¼" type
    - a. Cable: NP3C-BAG
    - b. Panel: NJ3FP6C-B
  - 3. Audio – RCA type
    - a. Cable: NF2C-B-2
    - b. Panel: NF2D-B-9 and NF2D-B-2
  - 4. Audio – Speakon type
    - a. Cable NL4FC
    - b. Panel: NL4MP
  - 5. Video – BNC type:
    - a. Cable: match part number to manufacturer's cable
    - b. Panel: NBB75DFIB or Canare BCJ-JRU
  - 6. Video – Ethercon type
    - a. Cable: NE8MC6-MO
    - b. Panel: NE8FDY-C6-B

## **PART 3 - EXECUTION**

- A. COORDINATION
  - 1. Coordinate with all other building trades to facilitate a smooth and complete installation.
  - 2. Coordinate all power requirements and locations with the Electrical Contractor. Contractor shall provide appropriate direction to the Electrical Contractor pertaining to the location and quantity of electrical outlets serving Audio-Video Equipment.
- B. EXECUTION
  - 1. Provide a service loop of cable between any racks and the associated cabling/infrastructure on the nearby wall such that the rack can be moved away from the wall a sufficient distance to facilitate easy service of the rack and equipment.
- C. EQUIPMENT LISTS – Appendix A, B, C
  - 1. See the attached appendices for the equipment lists for the Audio-Video Systems. Lists are provided as a reference. Confirm all quantities with the related drawings. In case of conflict between the equipment lists and the related drawings, the contractor shall furnish the greater quantity or price impact. Note any quantity conflicts and bring to the attention of the consultant as appropriate.



Appendix A - Choir B102, Band B108 AV Equipment			
Qty	Make	Model	Description
<b>Loudspeakers &amp; Amplification</b>			
4	QSC	E110-BK	10" 2-way, externally powered, live sound-reinforcement loudspeaker. Color - Black -- verify color w/ owner's rep [SP-1 thru SP-4]
1	QSC	CX-Q 2k4	4-Channel 500W/CH Q-SYS Network Amplifier, Lo-Z, 70V, 100V direct drive, FlexAmp™, Mic/line Inputs, 100-240V. [for SP-1 thru SP-4]
<b>DSP &amp; Control</b>			
1	QSC	Core 8 Flex	System DSP with Flex IO [DSP-1]
1	QSC	SL-QUD-8N-P	Q-SYS Core 110 UCI Deployment Software License, Perpetual. [for DSP-1]
1	QSC	SL-QSE-8N-P	Q-SYS Core 110 Scripting Engine Software License, Perpetual. [for DSP-1]
1	QSC	SLDAN-16-P	Q-SYS Dante 16x16 Channel License, Perpetual. [for DSP-1]
2	QSC	TSC-70-G3	Q-SYS 7" PoE Touch Screen Controller for In-Wall Mounting. [TP-1, 2]
1	Netgear	GSM4230PX	24x1G PoE+ 1,440W 2x1G and 4xSFP+ Managed Switch [SW-1]
<b>Audio Inputs &amp; Accessories</b>			
2	Symetrix	80-191	xIO Bluetooth RCA-3.5, Black [BT-1, 2]
2	ProCo	MN-25	25' Mic Cable
2	Light Speed	ALN	Wireless audio base station [ALN-1, 2]
2	Light Speed	FMN	Pendant-style transceiver
2	Light Speed	SMN	Handheld transceiver
<b>Video Inputs &amp; Accessories</b>			
2	Crestron	HD-MD4X1-4KZ-E	4x1 4K60 4:4:4 HDR AV Switcher [VSW-1, VSW-2]
2	Cable EZ	Single Gang	1-gang cable management cover [for VP-1, VP-2]
2	Comprehensive AV	HD18G-100PROPAF	Pro AV/IT Integrator Series™ Certified 18Gb 4K Plenum Active Optical HDMI Cable with ProGrip™, SureLength™ 100ft [for VP-1, VP-2]
2	OFE	Apple TV	Apple TV device [TV-1, 2]
2	Comprehensive AV	MHD18G-3PROGRY	3ft 4K60 HDMI cable, grey [for TX-5, 6]
<b>Video Projection</b>			
2	OFE		OFE projector (already installed)
2	Comprehensive AV	HD18G-100PROPAF	Pro AV/IT Integrator Series™ Certified 18Gb 4K Plenum Active Optical HDMI Cable with ProGrip™, SureLength™ 100ft [for PRJ-1, PRJ-2]
<b>Racks</b>			
1	Middle Atlantic	DWR-16-22	DWR Series Pivoting Wall Rack, 16RU [AVR]

1	Middle Atlantic	VFD-16	16 RU vented front door (no key – thumb latch only)
1	Middle Atlantic	UPX-2000R-2	NEXSYS™ 2000VA, 20 Amp UPS Backup Power System, Bank Outlet Control
1	Middle Atlantic	PD-815R-PL	Rackmount Power, 8 Outlet, 15A, Basic Surge Protection
1	Middle Atlantic	FWD-LB-1A-4PK	Lacer Bar - 4 pack -- <i>quantity as needed</i>
1	Middle Atlantic	TW12	Velcro Cable Wrap - 12 piece -- <i>quantity as needed</i>
1	Middle Atlantic	UD2	Drawer
1	Middle Atlantic	EB1	1 RU Blank Panel -- <i>quantity as needed</i>
1	Middle Atlantic	EB2	2 RU Blank Panel -- <i>quantity as needed</i>
<b>Labor</b>			
1			*Programming -- <i>quantity as needed</i>
1			*Engineering/PM -- <i>quantity as needed</i>
1			*Custom Plates -- <i>quantity as needed</i>
1			*Lift Rental -- <i>quantity as needed</i>
<b>Wiring</b>			
1			*Network wire -- <i>quantity as needed</i>
1			*Control wire -- <i>quantity as needed</i>
1			*Mic wire -- <i>quantity as needed</i>
1			*Speaker wire -- <i>quantity as needed</i>

**\*\*Product equipment list is provided as a reference. Report any conflicts in quantities to the consultant. Some products may not be listed above. See project drawings for items used, part numbers, quantities, and further details.**

Appendix B - Gymnasium B132 AV Equipment			
Qty	Make	Model	Description
<b>Loudspeakers &amp; Amplification</b>			
9	QSC	E110-BK	10" 2-way, externally powered, live sound-reinforcement loudspeaker. Color - Black -- verify color w/ owner's rep <b>[SP-1 thru SP-9]</b>
1	QSC	CX-Q 4k4	4-Channel 1000W/CH Q-SYS Network Amplifier, Lo-Z, 70V, 100V direct drive, FlexAmp™, Mic/line Inputs, 100-240V. <b>[for SP-1 thru SP-9]</b>
<b>DSP &amp; Control</b>			
1	QSC	Core 8 Flex	System DSP with Flex IO <b>[DSP-1]</b>
1	QSC	SL-QUd-8N-P	Q-SYS Core 110 UCI Deployment Software License, Perpetual. <b>[for DSP-1]</b>
1	QSC	SL-QSE-8N-P	Q-SYS Core 110 Scripting Engine Software License, Perpetual. <b>[for DSP-1]</b>
1	QSC	SLDAN-16-P	Q-SYS Dante 16x16 Channel License, Perpetual. <b>[for DSP-1]</b>
1	QSC	TSC-70-G3	Q-SYS 7" PoE Touch Screen Controller for In-Wall Mounting. <b>[TP-1]</b>
1	Netgear	GSM4230PX	24x1G PoE+ 1,440W 2x1G and 4xSFP+ Managed Switch <b>[SW-1]</b>
1	Global Cache	IP2CC-P	PoE IP-to-Contact Closure device <b>[RLY-1]</b>
<b>Audio Inputs &amp; Accessories</b>			
1	Symetrix	80-0191	xIO Bluetooth RCA-3.5, Black <b>[BT-1]</b>
1	ProCo	MN-25	25' Mic Cable
1	Shure	SLXD4	Wireless audio base station <b>[WM-1]</b>
1	Shure	SLXD1	Body pack transmitter
1	Shure	SM31FH	Fitness headset condenser microphone
1	Shure	SLXD2/SM58	Handheld transceiver w/ SM58 capsule
<b>Video Inputs &amp; Accessories</b>			
1	Visionary Solutions	DuetE-WP-H	AVoIP Duet Wallplate Encoder w/ HDMI only <b>[TX-1]</b>
1	Comprehensive AV	MHD18G-15PROBLKA	15ft 4K60 HDMI cable, black <b>[for TX-1]</b>
1	Visionary Solutions	DuetE-WP-H	AVoIP Duet Wallplate Encoder w/ HDMI only <b>[TX-3]</b>
1	RDL	DC-2B	Desktop Decora Chassis, 2 Gang, Black -- verify color w/ owner's rep <b>[for TX-3]</b>
1	Comprehensive AV	MHD18G-15PROBLKA	15ft 4K60 HDMI cable, black <b>[for TX-3]</b>
1	OFE	Apple TV	Apple TV device <b>[TV-1]</b>
1	Visionary Solutions	DuetE-2	AVoIP Duet Surface Mount Encoder <b>[TX-2]</b>
1	Comprehensive AV	MHD18G-3PROGRY	3ft 4K60 HDMI cable, grey <b>[for TX-2]</b>

Video Projection			
1	Epson	EB-PU2010B	10,000 lumen, WUXGA, laser <b>[PRJ-1]</b>
1	Epson	ELPLM15	Middle Zoom #15 Lens -- <i>confirm appropriate lens before ordering</i> <b>[for PRJ-1]</b>
1	Chief	PG3A	Large projector security cage, Black <b>[for PRJ-1]</b>
1	Chief	CMA 395	Heavy Duty Ceiling Mount Accessory <b>[for PRJ-1]</b>
1	Chief	CMSxxxx	Adjustable Extension Column, Pole -- <i>confirm appropriate length before ordering</i> <b>[for PRJ-1]</b>
1	Chief	CMA348W	Vibration Isolation unit for mount <b>[for PRJ-1]</b>
1	Chief	RPAU	Universal Projector Mount <b>[for PRJ-1]</b>
1	Visionary Sololutions	D4100	AVoIP Surface Mount Video Decoder <b>[for PRJ-1]</b>
1	Comprehensive AV	MHD18G-3PROGRY	3ft 4K60 HDMI cable, grey <b>[for PRJ-1]</b>
1	Da-Lite	21872L	Tensioned Cosmopolitan, 108" x 192" motorized projection screen w/ 1.1 Progressive HD Surface <b>[SCR-1]</b>
Racks			
1	Middle Atlantic	DWR-16-22	DWR Series Pivoting Wall Rack, 16RU <b>[AVR]</b> (no Key, thumb latch only)
1	Middle Atlantic	VFD-16	16 RU vented front door
1	Middle Atlantic	UPX-2000R-2	NEXSYS™ 2000VA, 20 Amp UPS Backup Power System, Bank Outlet Control
1	Middle Atlantic	PD-815R-PL	Rackmount Power, 8 Outlet, 15A, Basic Surge Protection
1	Middle Atlantic	FWD-LB-1A-4PK	Lacer Bar - 4 pack -- <i>quantity as needed</i>
1	Middle Atlantic	TW12	Velcro Cable Wrap - 12 piece -- <i>quantity as needed</i>
1	Middle Atlantic	UD2	Drawer
1	Middle Atlantic	EB1	1 RU Blank Panel -- <i>quantity as needed</i>
1	Middle Atlantic	EB2	2 RU Blank Panel -- <i>quantity as needed</i>
Labor			
1			*Programming -- <i>quantity as needed</i>
1			*Engineering/PM -- <i>quantity as needed</i>
1			*Custom Plates -- <i>quantity as needed</i>
1			*Lift Rental -- <i>quantity as needed</i>
Wiring			
1			*Network wire -- <i>quantity as needed</i>
1			*Control wire -- <i>quantity as needed</i>
1			*Mic wire -- <i>quantity as needed</i>
1			*Speaker wire -- <i>quantity as needed</i>

**\*\*Product equipment list is provided as a reference. Report any conflicts in quantities to the consultant. Some products may not be listed above. See project drawings for items used, part numbers, quantities, and further details.**

Appendix C - Cafeteria C113 AV Equipment			
Qty	Make	Model	Description
<b>Loudspeakers &amp; Amplification</b>			
16	QSC	AD-C6T-LPZB	6" 2-way, externally powered, low profile ceiling speaker. Color - White -- <i>verify color w/ owner's rep</i> <b>[SP-1 thru SP-16]</b>
1	QSC	MP-A40V	800W FlexAmp technology Hi-Z / Lo-Z amplifier, 4 x 200W into 4Ω, 8Ω, 70V and 100V, Highpass filter per channel, GPIO for Remote Standby and Amp Status. <b>[for SP-1 thru SP-16]</b>
<b>DSP &amp; Control</b>			
1	QSC	Core 8 Flex	System DSP with Flex IO <b>[DSP-1]</b>
1	QSC	SL-QUD-8N-P	Q-SYS Core 110 UCI Deployment Software License, Perpetual. <b>[for DSP-1]</b>
1	QSC	SL-QSE-8N-P	Q-SYS Core 110 Scripting Engine Software License, Perpetual. <b>[for DSP-1]</b>
1	QSC	SLDAN-16-P	Q-SYS Dante 16x16 Channel License, Perpetual. <b>[for DSP-1]</b>
1	QSC	TSC-70-G3	Q-SYS 7" PoE Touch Screen Controller for In-Wall Mounting. <b>[TP-1]</b>
1	Netgear	GSM4230PX	24x1G PoE+ 1,440W 2x1G and 4xSFP+ Managed Switch <b>[SW-1]</b>
1	Global Cache	IP2CC-P	PoE IP-to-Contact Closure device <b>[RLY-1]</b>
<b>Audio Inputs &amp; Accessories</b>			
1	Symetrix	80-0191	xiO Bluetooth RCA-3.5, Black <b>[BT-1]</b>
1	ProCo	MN-25	25' Mic Cable
1	Shure	SLXD4	Wireless audio base station <b>[WM-1]</b>
1	Shure	SLXD1	Body pack transmitter
1	Shure	SM31FH	Fitness headset condenser microphone
1	Shure	SLXD2/SM58	Handheld transceiver w/ SM58 capsule
<b>Video Inputs &amp; Accessories</b>			
1	Visionary Solutions	DuetE-WP-H	AVoIP Duet Wallplate Encoder w/ HDMI only <b>[TX-1]</b>
1	Comprehensive AV	MHD18G-15PROBLKA	15ft 4K60 HDMI cable, black <b>[for TX-1]</b>
1	Visionary Solutions	DuetE-WP-H	AVoIP Duet Wallplate Encoder w/ HDMI only <b>[TX-3]</b>
1	RDL	DC-2B	Desktop Decora Chassis, 2 Gang, Black -- <i>verify color w/ owner's rep</i> <b>[for TX-3]</b>
1	Comprehensive AV	MHD18G-15PROBLKA	15ft 4K60 HDMI cable, black <b>[for TX-3]</b>
1	OFE	Apple TV	Apple TV device <b>[TV-1]</b>
1	Visionary Solutions	DuetE-2	AVoIP Duet Surface Mount Encoder <b>[TX-2]</b>
1	Comprehensive AV	MHD18G-3PROGRY	3ft 4K60 HDMI cable, grey <b>[for TX-2]</b>
<b>Video Projection, Distribution</b>			

1	Epson	EB-PU2010B	10,000 lumen, WUXGA, laser <b>[PRJ-1]</b>
1	Epson	ELPLW06	Wide Zoom #2 Lens -- <i>confirm appropriate lens before ordering</i> <b>[for PRJ-1]</b>
1	Chief	PG3A	Large projector security cage, Black <b>[for PRJ-1]</b>
1	Chief	CMA 395	Heavy Duty Ceiling Mount Accessory <b>[for PRJ-1]</b>
1	Chief	CMSxxx	Adjustable Extension Column, Pole -- <i>confirm appropriate length before ordering</i> <b>[for PRJ-1]</b>
1	Chief	RPAU	Universal Projector Mount <b>[for PRJ-1]</b>
1	Visionary Sololutions	D4100	AVoIP Surface Mount Video Decoder <b>[for PRJ-1]</b>
1	Comprehensive AV	MHD18G-3PROGRY	3ft 4K60 HDMI cable, grey <b>[for PRJ-1]</b>
1	Da-Lite	89978LS	Tensioned Contour, 65" x 116" motorized projection screen w/ 1.1 Progressive HD Surface <b>[SCR-1]</b>
1	Sharp NEC	4P-B65EJ2U	65" LED LCD 4K Monitor <b>[MON-1]</b>
1	Chief	LTM1U	Large Fusion® Micro-Adjustable Tilt Wall Mount <b>[for MON-1]</b>
1	Visionary Sololutions	D4100	AVoIP Surface Mount Video Decoder <b>[for MON-1]</b>
1	Comprehensive AV	MHD18G-3PROGRY	3ft 4K60 HDMI cable, grey <b>[for MON-1]</b>
<b>Racks</b>			
1	OFE		Owner Furnished Equipment Rack
1	Middle Atlantic	UPX-2000R-2	NEXSYS™ 2000VA, 20 Amp UPS Backup Power System, Bank Outlet Control
1	Middle Atlantic	PD-815R-PL	Rackmount Power, 8 Outlet, 15A, Basic Surge Protection
1	Middle Atlantic	EB1	1 RU Blank Panel -- <i>quantity as needed</i>
1	Middle Atlantic	EB2	2 RU Blank Panel -- <i>quantity as needed</i>
<b>Labor</b>			
1			*Programming -- <i>quantity as needed</i>
1			*Engineering/PM -- <i>quantity as needed</i>
1			*Custom Plates -- <i>quantity as needed</i>
1			*Lift Rental -- <i>quantity as needed</i>
<b>Wiring</b>			
1			*Network wire -- <i>quantity as needed</i>
1			*Control wire -- <i>quantity as needed</i>
1			*Mic wire -- <i>quantity as needed</i>
1			*Speaker wire -- <i>quantity as needed</i>

**\*\*Product equipment list is provided as a reference. Report any conflicts in quantities to the consultant. Some products may not be listed above. See project drawings for items used, part numbers, quantities, and further details.**

**END OF SECTION 27 41 16**

## **SECTION 27 4125 – AUDIO-VIDEO CONTROL SYSTEMS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Some information contained in this specification is also found on the associated drawings and in the following specification sections. Work shown on drawings or described in other spec sections is deemed to be in both.
- B. Related Specification Sections:
  - 1. 27 4100 – General Conditions for Audio-Video Systems
  - 2. 27 4110 – Training for Audio-Video Systems
  - 3. 27 4116 – Integrated Audio-Video Systems

#### **1.2 GENERAL DESCRIPTION**

- A. The audio and video signals for the facility will be controlled via QSYS touch panels and a QSYS control processor.
- B. A QSYS Core will run the systems in each space.
- C. Mobile peripherals (HDMI inputs, audio inputs, touchpanels, etc.) must be programmed in a way that they can be used between separate spaces interchangeably.

#### **1.3 FUNCTIONAL DESCRIPTION**

- A. CHOIR B102, BAND ROOM B108 - The following is a functional description of the intent for what the touch panels are intended to do. This is not a complete description of all functions, and some additional functions may be required.
  - 1. The control system(s) in this venue will handle the control of video input and output routing, projector display power ON/OFF and basic sound system operation.
  - 2. There is one (1) primary touch panel installed in each room (total 2 panels). The control system should provide true live feedback from all devices and settings on the touchpanel.
  - 3. Splash page. There should be a welcoming splash page where the user should be asked to enter a passcode. Entering the code should trigger the system to pass audio to the main speakers.
    - a. The user should never have the option to switch inputs on the projector. The system should always force the projector to the connected HDMI input when the projector powers on.
    - b. Audio level controls should include all available audio inputs in the system.
    - c. The main video source selection labels should match the labeling to the installed inputs.
    - d. A video routing page should be created to allow for any available input to be routed to any or all the available outputs.
    - e. Individual power ON/OFF should be available for the projector along with screen up/down.
    - f. A system power off (with confirmation) should round out the Simple interface taking the user back out to the splash screen. The power off should sequence mute all audio outputs and shut off the projectors.
    - g. No lighting control required.
- B. AUX GYMNASIUM G104 - The following is a functional description of the intent for what the touch panels are intended to do. This is not a complete description of all functions, and some additional functions may be required.



1. The control system(s) in this venue will handle the control of video input and output routing, projector display power ON/OFF and basic sound system operation.
  2. There is one (1) primary touch panel installed in the system at a fixed location. The touch panel should provide true live feedback from all devices and settings across all touch panels.
  3. Splash page. There should be a welcoming splash page where the user should be asked to enter a passcode. Entering the code should trigger the system to pass audio to the main speakers.
    - a. The user should never have the option to switch inputs on the projector. The system should always force the projector to the connected HDMI input when the projector powers on.
    - b. Audio level controls for Simple mode audio must be expanded to include all available audio inputs in the system.
    - c. Muting of the available audio zones should be provided.
    - d. The main video source selection labels should match the labeling to the installed inputs.
    - e. A video routing page should be created to allow for any available input to be routed to any or all the available outputs.
    - f. Individual power ON/OFF should be available for the projector along with screen up/down.
    - g. A system power off (with confirmation) should round out the Simple interface taking the user back out to the splash screen. The power off should sequence mute all audio outputs, shut off the projector and raise the screen.
    - h. No lighting control required.
- C. CAFETERIA C113 - The following is a functional description of the intent for what the touch panels are intended to do. This is not a complete description of all functions, and some additional functions may be required.
1. The control system(s) in this venue will handle the control of video input and output routing, projector display power ON/OFF and basic sound system operation.
  2. There is one (1) primary touch panel installed in the system at a fixed location. The control system should provide true live feedback from all devices and settings on the touchpanel.
  3. Splash page. There should be a welcoming splash page where the user should be asked to enter a passcode. Entering the code should trigger the system to pass audio to the main speakers.
    - a. The user should never have the option to switch inputs on the projector. The system should always force the projector to the connected HDMI input when the projector powers on.
    - b. Audio level controls for Simple mode audio must be expanded to include all available audio inputs in the system.
    - c. Muting of the available audio zones should be provided.
    - d. The main video source selection labels should match the labeling to the installed inputs.
    - e. A video routing page should be created to allow for any available input to be routed to any or all the available outputs.
    - f. Individual power ON/OFF should be available for the projector along with screen up/down.

- g. A system power off (with confirmation) should round out the Simple interface taking the user back out to the splash screen. The power off should sequence mute all audio outputs, shut off the projector and raise the screen.

- h. No lighting control required.

#### **1.4 PROGRAMMER CERTIFICATION**

- A. All Control System programming is to be performed by the Contractor. Contractor must have a factory trained and experienced programmer on staff with at least 2 years of experience programming QSC systems. Programmer must have successfully completed Q-SYS Level 2 Training and QSYS Control Training 201. Contractor may also wish to subcontract the services of an independent programmer.
- B. Contractors bidding this section must have a programmer with Q-SYS Level One Training and Q-SYS Control Training 101 on staff. Failure to have a certified programmer will be grounds for disqualification of a bidder. Verification of programmer status will be required during the post-bid interview. Programming may be performed by a third-party programmer or may be performed by a staff programmer, but the AV contractor will have a Level 1 and Control 101 programmer on staff for program updates, firmware updates, and long-term maintenance of the system

#### **1.5 PROGRAMMING SUBMITTALS**

- A. All Control System programming and touch panel layouts are to be submitted to the Consultant for review. Touch panel layouts for the control system are to be complete and fully labeled, representing all the touch panels for the entire project. The touch panel submittals should be complete enough to serve as a User Manual for the end User. Refer to "TP User Guide – EXAMPLE" document as a reference to the level of detail, level of graphical design, and User Interface format we expect to see for the programming and submittals. If the example file is not included with this Bid Package, please submit an RFI request.
- B. Programming of touch panels is to be submitted to the Consultant prior to writing of code.
- C. Bids shall allow for at least two (2) revisions of touch panel layouts.
- D. All touch panel programming and control processor programming shall be completed prior to the beginning of installation.
- E. Contractor shall be responsible for all programming and implementation of the Control System.
- F. The client or end-user may provide some template files to use as the basis of the layout for the programming, if they exist.

### **PART 2 - PRODUCTS**

#### **2.1 CONTROL SYSTEM EQUIPMENT**

- A. See appendices for specific Manufacturer and Model numbers for each system and subsystem.
- B. Cross reference all drawings to the equipment list as shown in the appendices. Contractor shall provide a complete and functional system as designed regardless of whether a specific component is specifically noted in the Appendix.
- C. All equipment shall be new and shall be the manufacturer's newest and most current version of the product.

#### **2.2 REQUESTS FOR ALTERNATE EQUIPMENT**

- A. Procedures for alternate equipment requests are outlined in section 27 4100.

## **PART 3 - EXECUTION**

### **3.1 PROGRAMMING UPDATES**

- A. Bids shall be inclusive of two (2) minor programming updates after substantial completion of the project and once the owner has had the chance to use the system on a daily basis. These updates are not intended as a re-write of any panels, rather they are intended to correct any labelling issues, add/remove any needed buttons from a given panel, and make other minor updates to optimize the use of the panels.

### **3.2 REJECTION OF PROGRAMMING**

- A. If the touchpanel layouts or processor programming are deemed unacceptable by the Consultant, client, end user, or architect the Contractor shall take whatever means necessary to provide acceptable programming without claim for additional payment.

**END OF SECTION 27 4125**







BOX #	TYPE	MOUNTING HEIGHT	MOUNTING TYPE	BOX & COVER PROVIDED BY	CONN. PLATE PROVIDED BY	COMMENTS
AVR	DWR-16-22	3' - 0"	WALL	AV	AV	
BT-1	2 GANG	3' - 2"	SURFACE	EXST	AV	
MP-1	1 GANG	7' - 6"	FLUSH	EC	AV	
SJ-1	1 GANG	8' - 0"	FLUSH	EC	AV	
SJ-2	1 GANG	8' - 0"	FLUSH	EC	AV	
TP-1	2 GANG	4' - 6"	FLUSH	EC	AV	
VJ-1	2 GANG	8' - 6"	FLUSH	EC	AV	
VP-1	2 GANG	3' - 6"	SURFACE	EXST	AV	

LABEL	MAKE	MODEL
OFE PRJ-1	OFE	OFE

LABEL	MAKE	MODEL	MOUNTING HEIGHT	PITCH	AZIMUTH
SP-1	QSC	E110	7' - 0"	-10.00°	0.00°
SP-2	QSC	E110	7' - 0"	-10.00°	0.00°

BOX #	TYPE	MOUNTING HEIGHT	MOUNTING TYPE	BOX & COVER PROVIDED BY	CONN. PLATE PROVIDED BY	COMMENTS
AVR	DWR-16-22	3' - 0"	WALL	AV	AV	
BT-1	2 GANG	3' - 2"	SURFACE	EXST	AV	
MP-1	1 GANG	7' - 6"	FLUSH	EC	AV	
SJ-1	1 GANG	8' - 0"	FLUSH	EC	AV	
SJ-2	1 GANG	8' - 0"	FLUSH	EC	AV	
TP-1	2 GANG	4' - 6"	FLUSH	EC	AV	
VJ-1	2 GANG	8' - 6"	FLUSH	EC	AV	
VP-1	2 GANG	3' - 6"	SURFACE	EXST	AV	

LABEL	MAKE	MODEL
OFE PRJ-2	OFE	OFE

LABEL	MAKE	MODEL	MOUNTING HEIGHT	PITCH	AZIMUTH
SP-3	QSC	E110	7' - 0"	-10.00°	0.00°
SP-4	QSC	E110	7' - 0"	-10.00°	0.00°

BOX #	TYPE	MOUNTING HEIGHT	MOUNTING TYPE	BOX & COVER PROVIDED BY	CONN. PLATE PROVIDED BY	COMMENTS
AVR	DWR-16-22	3' - 0"	WALL	AV	AV	
CTRL-1	12x24x6	4' - 6"	FLUSH	EXST	AV	
VJ-1	1 GANG	30' - 6"	SURFACE	EC	AV	
WP-1	2 GANG	1' - 6"	SURFACE	EC	AV	

LABEL	MAKE	MODEL	ASPECT RATIO	IMAGE HEIGHT	IMAGE WIDTH	THROW DISTANCE	LENS
PRJ-1	EPSON	EB-PU2010B	16x9	108"	192"	35' - 0"	ELPLM15

LABEL	MAKE	MODEL	ASPECT RATIO	SCREEN HEIGHT	SCREEN WIDTH
SCR-1	DALITE	21872L	16x9	108"	192"

LABEL	MAKE	MODEL	MOUNTING HEIGHT
SP-1	QSC	E110	26' - 0"
SP-2	QSC	E110	26' - 0"
SP-3	QSC	E110	26' - 0"
SP-4	QSC	E110	26' - 0"
SP-5	QSC	E110	26' - 0"
SP-6	QSC	E110	26' - 0"
SP-7	QSC	E110	26' - 0"
SP-8	QSC	E110	26' - 0"
SP-9	QSC	E110	26' - 0"

BOX #	TYPE	MOUNTING HEIGHT	MOUNTING TYPE	BOX & COVER PROVIDED BY	CONN. PLATE PROVIDED BY	COMMENTS
AVR	DWR-16-22	3' - 0"	WALL	EXST	EXST	
BT-1	2 GANG	3' - 6"	FLUSH	EC	AV	
TP-1	2 GANG	3' - 6"	FLUSH	EC	AV	
VJ-1	1 GANG	13' - 10"	FLUSH	EC	AV	
VJ-2	PAC525	1' - 6"	FLUSH	EC	AV	
VP-1	2 GANG	3' - 6"	SURFACE	EXST	AV	
WP-1	1 GANG	1' - 6"	FLUSH	EC	AV	

LABEL	MAKE	MODEL	ASPECT RATIO	IMAGE HEIGHT	IMAGE WIDTH	THROW DISTANCE	LENS
PRJ-1	EPSON	EB-PU2010B	16x9	65"	116"	13' - 0"	ELPLW06

LABEL	MAKE	MODEL	ASPECT RATIO	SCREEN HEIGHT	SCREEN WIDTH
SCR-1	DALITE	89978LS	16x9	65"	116"

LABEL	MAKE	MODEL	MOUNT
MON-1	NEC	4P-B65EJ2U	LTM1U

LABEL	MAKE	MODEL	MOUNTING HEIGHT
SP-1	QSC	AD-C6T-LPZB	13' - 10"
SP-2	QSC	AD-C6T-LPZB	13' - 10"
SP-3	QSC	AD-C6T-LPZB	13' - 10"
SP-4	QSC	AD-C6T-LPZB	13' - 10"
SP-5	QSC	AD-C6T-LPZB	13' - 10"
SP-6	QSC	AD-C6T-LPZB	13' - 10"
SP-7	QSC	AD-C6T-LPZB	13' - 10"
SP-8	QSC	AD-C6T-LPZB	13' - 10"
SP-9	QSC	AD-C6T-LPZB	13' - 10"
SP-10	QSC	AD-C6T-LPZB	13' - 10"
SP-11	QSC	AD-C6T-LPZB	13' - 10"
SP-12	QSC	AD-C6T-LPZB	13' - 10"
SP-13	QSC	AD-C6T-LPZB	9' - 6"
SP-14	QSC	AD-C6T-LPZB	9' - 6"
SP-15	QSC	AD-C6T-LPZB	9' - 6"
SP-16	QSC	AD-C6T-LPZB	9' - 6"

02.03.2025	100 CD
03.28.2025	AV BIDS

DRAWN	Author
REVIEWED	Approver

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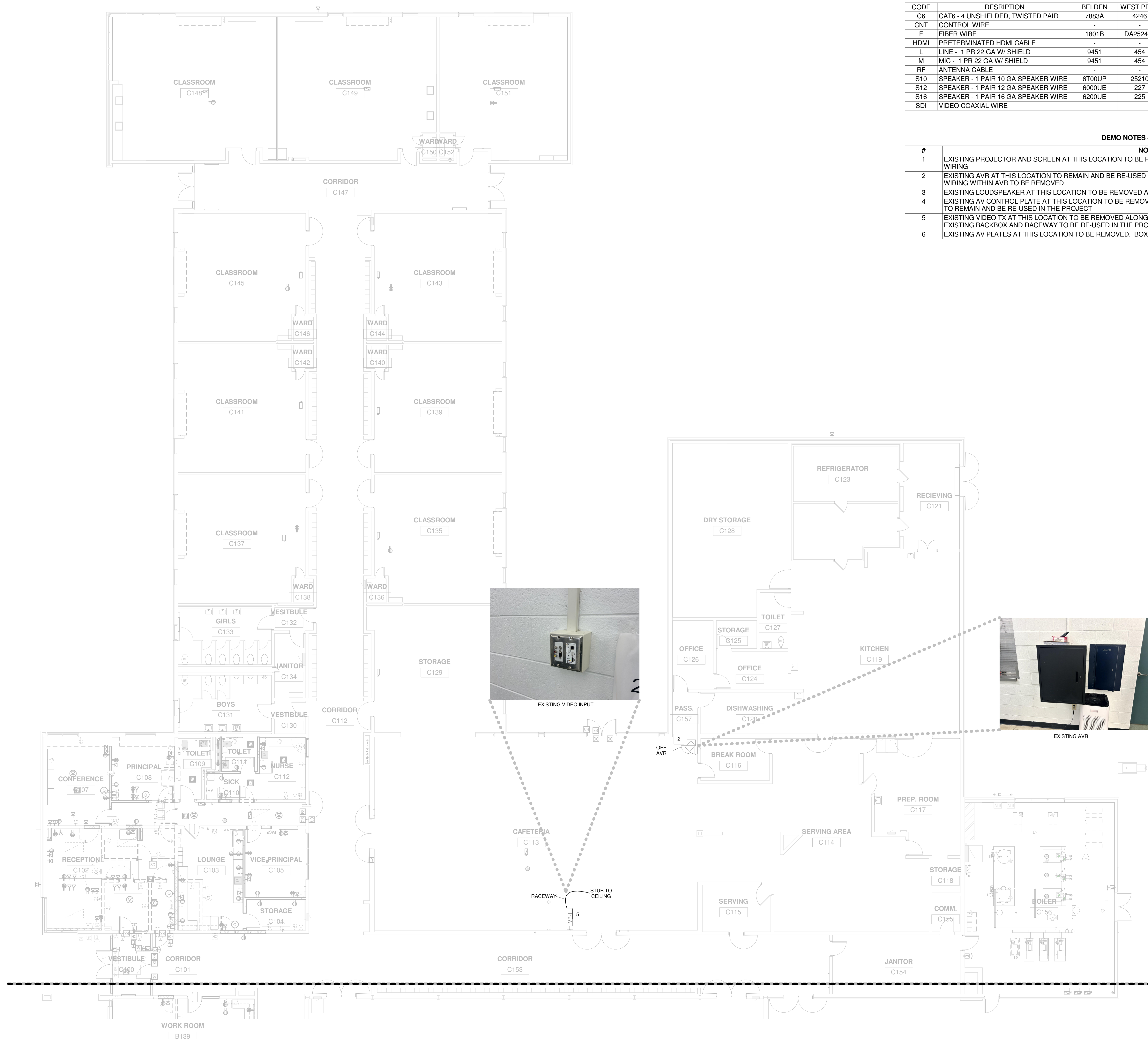






CABLE TYPES - AV					
CODE	DESCRIPTION	BELDEN	WEST PENN	WINDY CITY	OTHER
C6	CAT6 - 4 UNSHIELDED, TWISTED PAIR	7883A	4246	CAT6	
CNT	CONTROL WIRE				CABLE TYPE AS REQUIRED BY DEVICE
F	FIBER WIRE	1801B	DA252401	OCC-DZ006TSLX9YP	
HDMI	PRETERMINATED HDMI CABLE		-	-	4K60 CAPABLE
L	LINE - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ	
M	MIC - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ	
RF	ANTENNA CABLE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE
S10	SPEAKER - 1 PAIR 10 GA SPEAKER WIRE	6T00UP	25210	10-02P	
S12	SPEAKER - 1 PAIR 12 GA SPEAKER WIRE	6000UE	227	12-02	
S16	SPEAKER - 1 PAIR 16 GA SPEAKER WIRE	6200UE	225	16-02	
SDI	VIDEO COAXIAL WIRE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE

DEMO NOTES - AV	
#	NOTES
1	EXISTING PROJECTOR AND SCREEN AT THIS LOCATION TO BE REMOVED ALONG WITH ALL ASSOCIATED HARDWARE AND WIRING
2	EXISTING AVR AT THIS LOCATION TO REMAIN AND BE RE-USED IN THE PROJECT. EXISTING EQUIPMENT AND ALL ASSOCIATED WIRING WITHIN AVR TO BE REMOVED
3	EXISTING LOUDSPEAKER AT THIS LOCATION TO BE REMOVED ALONG WITH ALL ASSOCIATED WIRING
4	EXISTING AV CONTROL PLATE AT THIS LOCATION TO BE REMOVED ALONG WITH ALL ASSOCIATED WIRING. EXISTING BACKBOX TO REMAIN AND BE RE-USED IN THE PROJECT
5	EXISTING VIDEO TX AT THIS LOCATION TO BE REMOVED ALONG WITH ALL ASSOCIATED WIRING AND TURNED OVER TO OWNER. EXISTING BACKBOX AND RACEWAY TO BE RE-USED IN THE PROJECT
6	EXISTING AV PLATES AT THIS LOCATION TO BE REMOVED. BOXES TO REMAIN AND BE RE-USED IN THE PROJECT



ISSUANCES	
03.28.2025	AV BIDS

DRAWN	Author
REVIEWED	Approver

PROJECT NO. 5-6003

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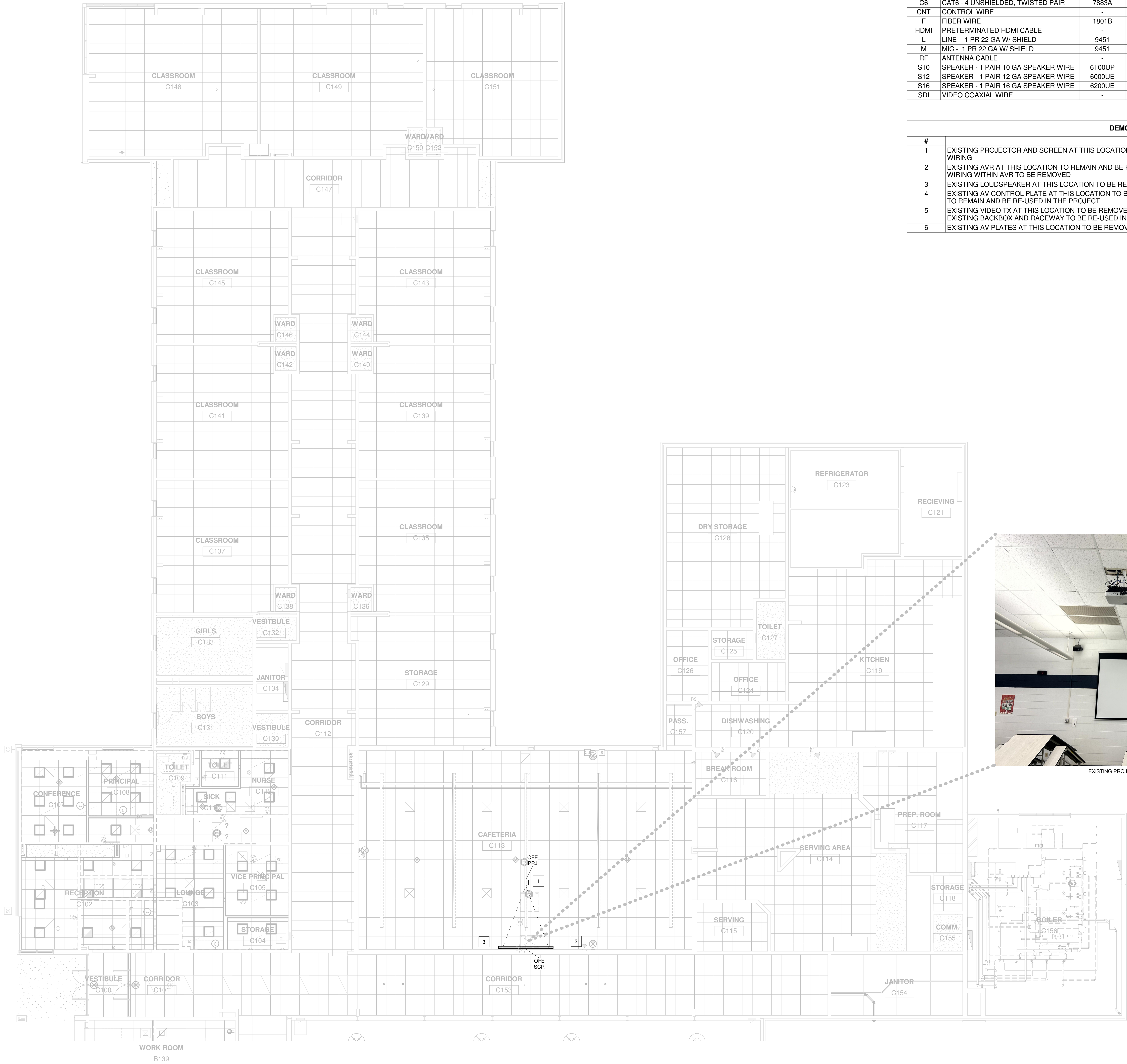
AV EXISTING PLAN - FIRST  
FLOOR - UNIT C

# TA101C



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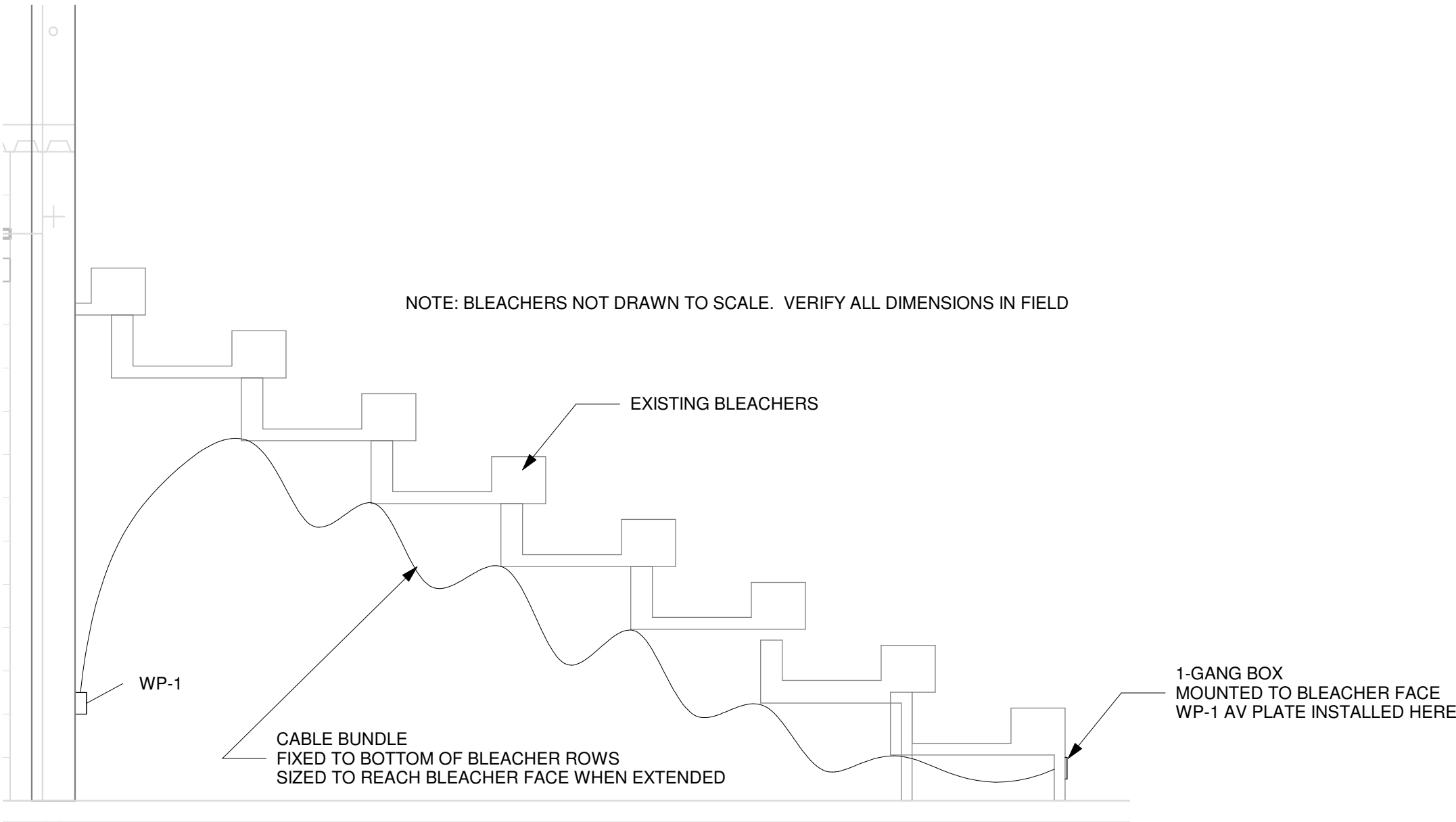
1 AV EXISTING RCP - FIRST FLOOR - UNIT 'C'  
1/8" = 1'-0"



CABLE TYPES - AV					
CODE	DESCRIPTION	BELDEN	WEST PENN	WINDY CITY	OTHER
C6	CAT6 - 4 UNSHIELDED, TWISTED PAIR	7883A	4246	CAT6	
CNT	CONTROL WIRE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE
F	FIBER WIRE	1801B	DA252401	OCC-DZ006TSLX9YP	
HDMI	PRETERMINATED HDMI CABLE	-	-	-	4K60 CAPABLE
L	LINE - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ	
M	MIC - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ	
RF	ANTENNA CABLE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE
S10	SPEAKER - 1 PAIR 10 GA SPEAKER WIRE	6T00UP	25210	10-02P	
S12	SPEAKER - 1 PAIR 12 GA SPEAKER WIRE	6000UE	227	12-02	
S16	SPEAKER - 1 PAIR 16 GA SPEAKER WIRE	6200UE	225	16-02	
SDI	VIDEO COAXIAL WIRE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE

DEMO NOTES - AV	
#	NOTES
1	EXISTING PROJECTOR AND SCREEN AT THIS LOCATION TO BE REMOVED ALONG WITH ALL ASSOCIATED HARDWARE AND WIRING
2	EXISTING AVR AT THIS LOCATION TO REMAIN AND BE RE-USED IN THE PROJECT. EXISTING EQUIPMENT AND ALL ASSOCIATED WIRING WITHIN AVR TO BE REMOVED
3	EXISTING LOUDSPEAKER AT THIS LOCATION TO BE REMOVED ALONG WITH ALL ASSOCIATED WIRING
4	EXISTING AV CONTROL PLATE AT THIS LOCATION TO BE REMOVED ALONG WITH ALL ASSOCIATED WIRING. EXISTING BACKBOX TO REMAIN AND BE RE-USED IN THE PROJECT
5	EXISTING VIDEO TX AT THIS LOCATION TO BE REMOVED ALONG WITH ALL ASSOCIATED WIRING AND TURNED OVER TO OWNER. EXISTING BACKBOX AND RACEWAY TO BE RE-USED IN THE PROJECT
6	EXISTING AV PLATES AT THIS LOCATION TO BE REMOVED. BOXES TO REMAIN AND BE RE-USED IN THE PROJECT

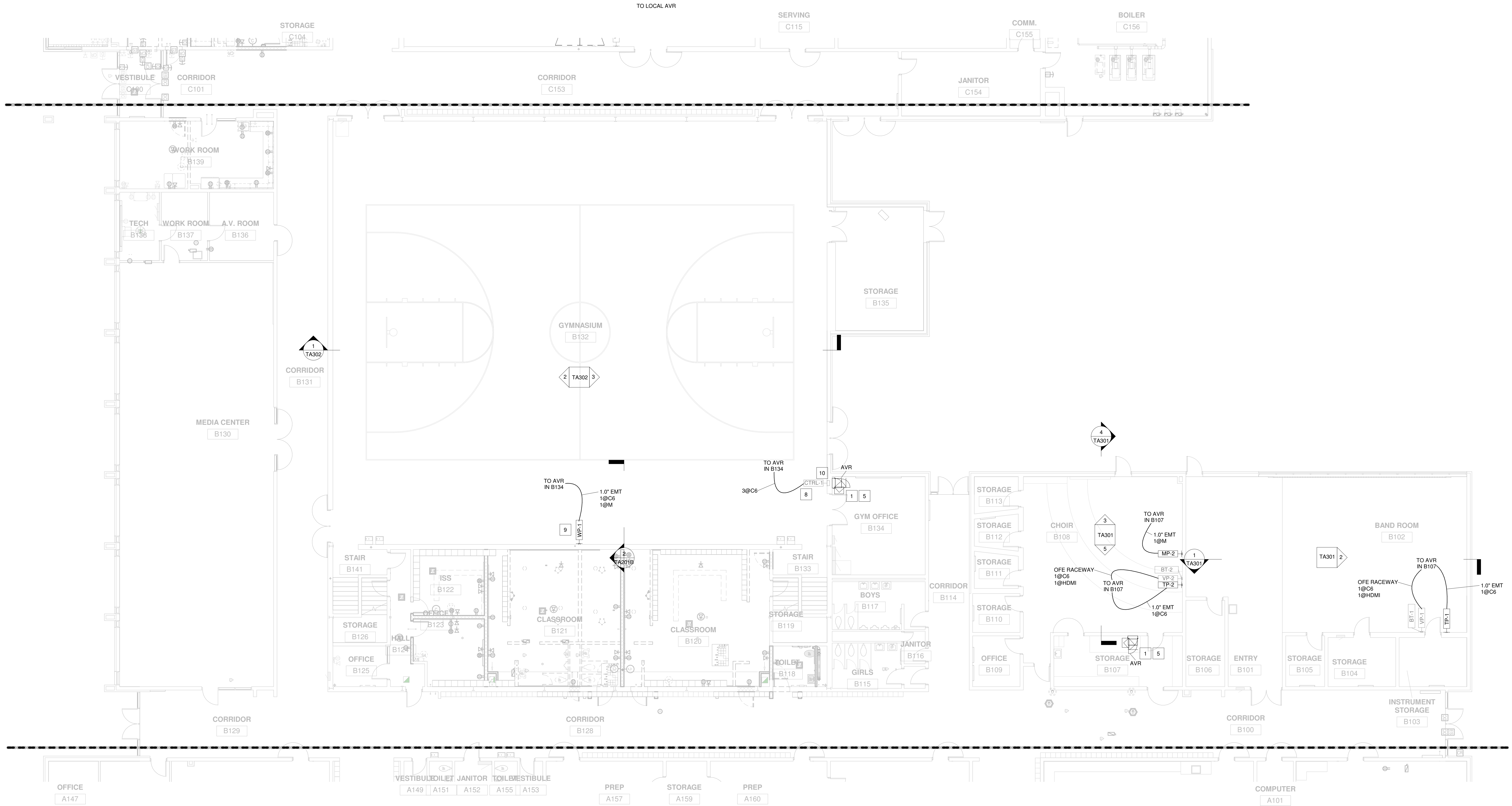




2 AV DETAIL - WP-1 BLEACHER EXTENSION  
NOT TO SCALE

GENERAL NOTES - AV	
#	NOTES
1	EC TO PROVIDE (2) 20A/120V CIRCUITS WITHIN AVR AT THIS LOCATION
2	EC TO PROVIDE (1) 20A/120V CIRCUIT AT CEILING BY PROJECTOR/SCREEN AT THIS LOCATION
3	COORDINATE VJ-x LOCATION W/ THROW DISTANCE OF OFE PROJECTOR. COORDINATE DETAILS W/ OWNER'S REP
4	LOUDSPEAKER AT THIS LOCATION TO BE MOUNTED TO BOTTOM CHORD OF STRUCTURE. COORDINATE FINAL LOCATION IN FIELD
5	IT TO PROVIDE (2) DATA DROPS AT THIS LOCATION
6	WIRELESS MIC ANTENNA TO BE MOUNTED TO TOP OF AVR. AV TO PROVIDE NECESSARY HARDWARE AND INSTALL AS NEEDED
7	WIRELESS MIC ANTENNAS TO BE INSTALLED AT THIS LOCATION @ 10'-0" AFF.
8	AV TO INSTALL TP-1, BT-1 WITHIN EXISTING BACKBOX AT THIS LOCATION. PROVIDE CUSTOM MOUNTING PLATE W/ PLEXIGLASS COVER & VERIFY WIRE PATH FROM TP-1, BT-1 TO LOCAL AVR IN FIELD
9	WP-1 TO BE INSTALLED TO WALL BENEATH BLEACHERS AT THIS LOCATION. PROVIDE NEW 1-GANG BOX FLUSH-MOUNTED TO FRONT OF BLEACHERS AT THIS LOCATION TO HOST WP-1 AV PLATE. PROVIDE CABLE BUNDLE FROM WP-1 TO 2-GANG FLUSH-MOUNTED BOX ON BLEACHER FACE. SEE DETAIL 2 ON TA201B FOR REFERENCE
10	EC TO PROVIDE 1.5" STUB THROUGH WALL TO LB FITTING. EC TO PROVIDE 1.5" CONDUIT UP WALL TO CEILING. PAINT ALL NEW CONDUIT TO MATCH EXISTING WALLS. LABEL CONDUIT AND PROVIDE APPROPRIATE PULL STRING. COORDINATE SPECIFICS WITH AV CONTRACTOR

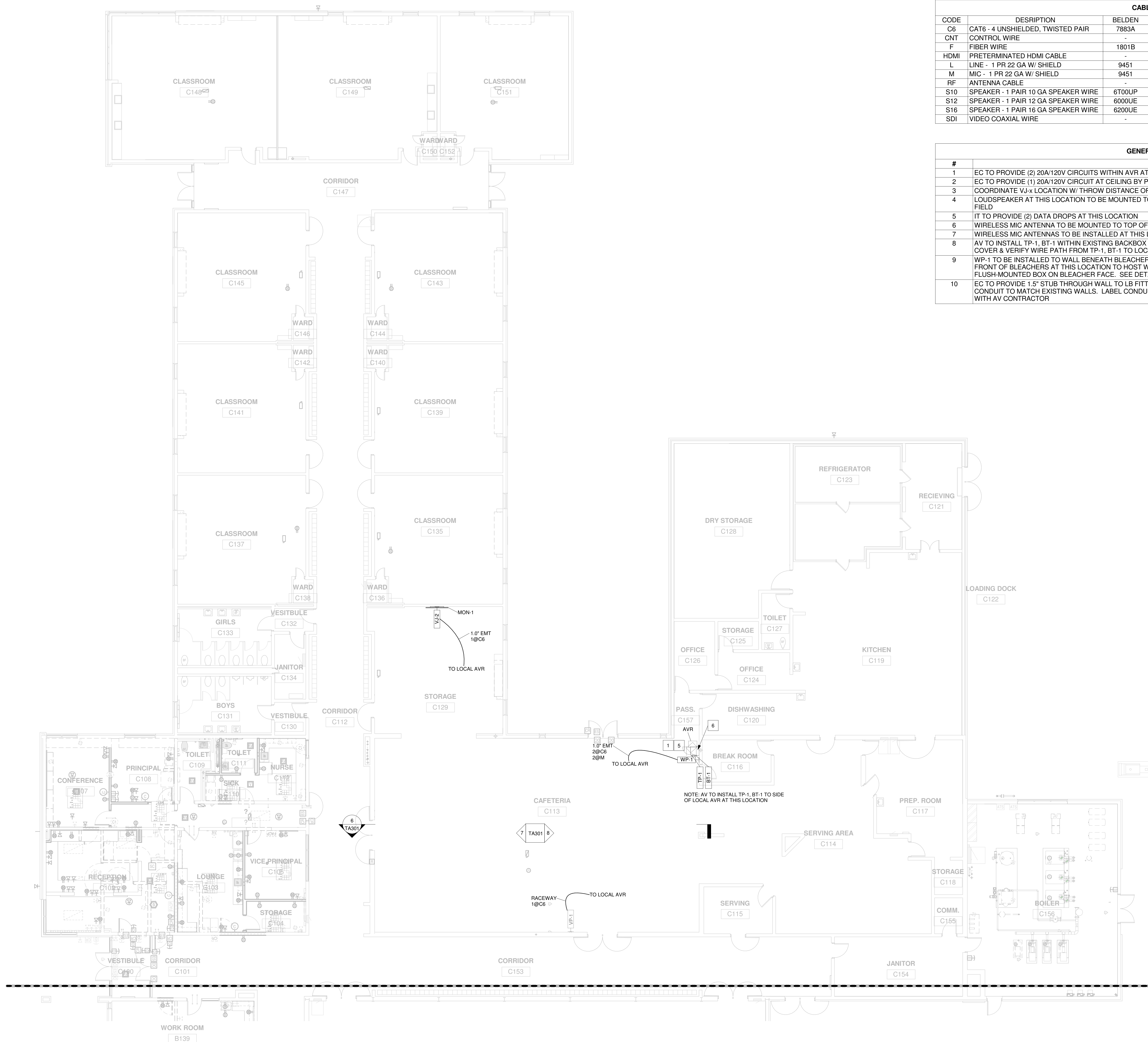
CABLE TYPES - AV					
CODE	DESCRIPTION	BELDEN	WEST PENN	WINDY CITY	OTHER
C6	CAT6 - 4 UNSHIELDED, TWISTED PAIR	7883A	4246	CAT6	CABLE TYPE AS REQUIRED BY DEVICE
CNT	CONTROL WIRE	-	-	-	
F	FIBER WIRE	1801B	DA252401	OCC-DZ006TSLX9YP	4K60 CAPABLE
HDMI	PRETERMINATED HDMI CABLE	-	-	-	
L	LINE - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ	CABLE TYPE AS REQUIRED BY DEVICE
M	MIC - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ	
RF	ANTENNA CABLE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE
S10	SPEAKER - 1 PAIR 10 GA SPEAKER WIRE	6T00UP	25210	10-02P	
S12	SPEAKER - 1 PAIR 12 GA SPEAKER WIRE	6000UE	227	12-02	
S16	SPEAKER - 1 PAIR 16 GA SPEAKER WIRE	6200UE	225	16-02	
SDI	VIDEO COAXIAL WIRE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE



1 AV PLAN - FIRST FLOOR - UNIT 'B'  
1/8" = 1'-0"

CABLE TYPES - AV						
CODE	DESCRIPTION	BELDEN	WEST PENN	WINDY CITY	OTHER	
C6	CAT6 - 4 UNSHIELDED, TWISTED PAIR	7893A	4246	CAT6		
CNT	CONTROL WIRE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE	
F	FIBER WIRE	1801B	DA252401	CC-DZ006TSLX9YP		
HDMI	PRETERMINATED HDMI CABLE	-	-	-	4K60 CAPABLE	
L	LINE - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ		
M	MIC - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ		
RF	ANTENNA CABLE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE	
S10	SPEAKER - 1 PAIR 10 GA SPEAKER WIRE	6T00UP	25210	10-02P		
S12	SPEAKER - 1 PAIR 12 GA SPEAKER WIRE	6000UE	227	12-02		
S16	SPEAKER - 1 PAIR 16 GA SPEAKER WIRE	6200UE	225	16-02		
SDI	VIDEO COAXIAL WIRE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE	

GENERAL NOTES - AV	
#	NOTES
1	EC TO PROVIDE (2) 20A/120V CIRCUITS WITHIN AVR AT THIS LOCATION
2	EC TO PROVIDE (1) 20A/120V CIRCUIT AT CEILING BY PROJECTOR/SCREEN AT THIS LOCATION
3	COORDINATE VJ-x LOCATION W/ THROW DISTANCE OF OFE PROJECTOR. COORDINATE DETAILS W/ OWNER'S REP
4	LOUDSPEAKER AT THIS LOCATION TO BE MOUNTED TO BOTTOM CHORD OF STRUCTURE. COORDINATE FINAL LOCATION IN FIELD
5	IT TO PROVIDE (2) DATA DROPS AT THIS LOCATION
6	WIRELESS MIC ANTENNA TO BE MOUNTED TO TOP OF AVR. AV TO PROVIDE NECESSARY HARDWARE AND INSTALL AS NEEDED
7	WIRELESS MIC ANTENNAS TO BE INSTALLED AT THIS LOCATION @ 10'-0" AFF.
8	AV TO INSTALL TP-1, BT-1 WITHIN EXISTING BACKBOX AT THIS LOCATION. PROVIDE CUSTOM MOUNTING PLATE W/ PLEXIGLASS COVER & VERIFY WIRE PATH FROM TP-1, BT-1 TO LOCAL AVR IN FIELD
9	WP-1 TO BE INSTALLED TO WALL BENEATH BLEACHERS AT THIS LOCATION. PROVIDE NEW 1-GANG BOX FLUSH-MOUNTED TO FRONT OF BLEACHERS AT THIS LOCATION TO HOST WP-1 AV PLATE. PROVIDE CABLE BUNDLE FROM WP-1 TO 2-GANG FLUSH-MOUNTED BOX ON BLEACHER FACE. SEE DETAIL 2 ON TA201B FOR REFERENCE
10	EC TO PROVIDE 1.5" STUB THROUGH WALL TO LB FITTING. EC TO PROVIDE 1.5" CONDUIT UP WALL TO CEILING. PAINT ALL NEW CONDUIT TO MATCH EXISTING WALLS. LABEL CONDUIT AND PROVIDE APPROPRIATE PULL STRING. COORDINATE SPECIFICS WITH AV CONTRACTOR



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03.28.2025	AV BIDS

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REVIEWED	Approver

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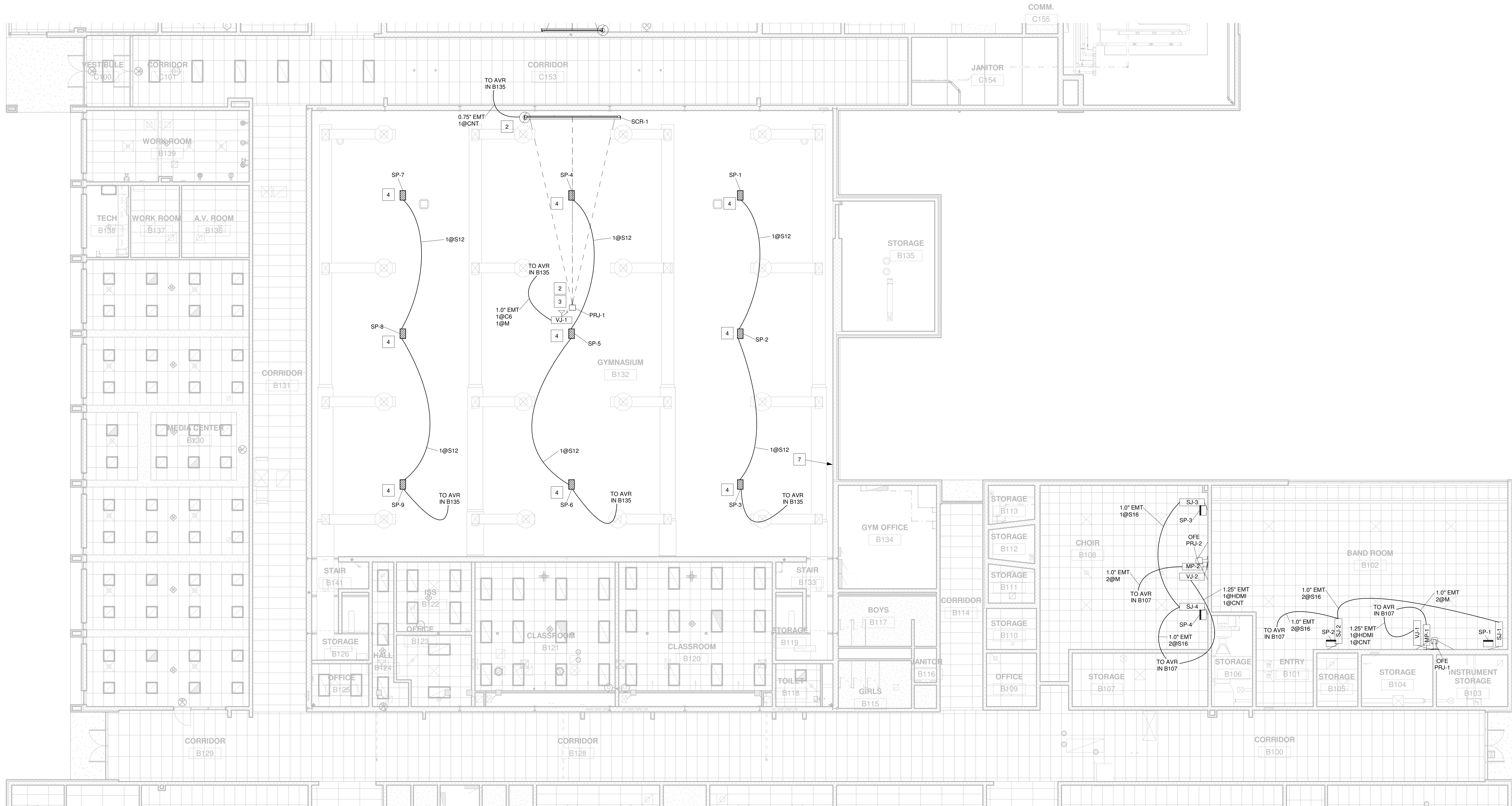
AV PLAN - FIRST FLOOR - UNIT  
C

TA201C



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1 AV RCP - FIRST FLOOR - UNIT 'B'  
1/8" = 1'-0"



GENERAL NOTES - AV	
#	NOTES
1	EC TO PROVIDE (2) 20A/120V CIRCUITS WITHIN AVR AT THIS LOCATION
2	EC TO PROVIDE (1) 20A/120V CIRCUIT AT CEILING BY PROJECTOR/SCREEN AT THIS LOCATION
3	COORDINATE VJ-x LOCATION W/ THROW DISTANCE OF OFE PROJECTOR. COORDINATE DETAILS W/ OWNER'S REP
4	LOUDSPEAKER AT THIS LOCATION TO BE MOUNTED TO BOTTOM CHORD OF STRUCTURE. COORDINATE FINAL LOCATION IN FIELD
5	IT TO PROVIDE (2) DATA DROPS AT THIS LOCATION
6	WIRELESS MIC ANTENNA TO BE MOUNTED TO TOP OF AVR. AV TO PROVIDE NECESSARY HARDWARE AND INSTALL AS NEEDED
7	WIRELESS MIC ANTENNAS TO BE INSTALLED AT THIS LOCATION @ 10'-0" AFF.
8	AV TO INSTALL TP-1, BT-1 WITHIN EXISTING BACKBOX AT THIS LOCATION. PROVIDE CUSTOM MOUNTING PLATE W/ PLEXIGLASS COVER & VERIFY WIRE PATH FROM TP-1, BT-1 TO LOCAL AVR IN FIELD
9	WP-1 TO BE INSTALLED TO WALL BENEATH BLEACHERS AT THIS LOCATION. PROVIDE NEW 1-GANG BOX FLUSH-MOUNTED TO FRONT OF BLEACHERS AT THIS LOCATION TO HOST WP-1 AV PLATE. PROVIDE CABLE BUNDLE FROM WP-1 TO 2-GANG FLUSH-MOUNTED BOX ON BLEACHER FACE. SEE DETAIL 2 ON TA201B FOR REFERENCE
10	EC TO PROVIDE 1.5" STUB THROUGH WALL TO LB FITTING. EC TO PROVIDE 1.5" CONDUIT UP WALL TO CEILING. PAINT ALL NEW CONDUIT TO MATCH EXISTING WALLS. LABEL CONDUIT AND PROVIDE APPROPRIATE PULL STRING. COORDINATE SPECIFICS WITH AV CONTRACTOR

CABLE TYPES - AV					
CODE	DESCRIPTION	BELDEN	WEST PENN	WINDY CITY	OTHER
C6	CAT6 - 4 UNSHIELDED, TWISTED PAIR	7883A	4246	CAT6	
CNT	CONTROL WIRE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE
F	FIBER WIRE	1801B	DA252401	OCC-DZ006TSLX9YP	
HDMI	PRETERMINATED HDMI CABLE	-	-	-	4K60 CAPABLE
L	LINE - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ	
M	MIC - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ	
RF	ANTENNA CABLE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE
S10	SPEAKER - 1 PAIR 10 GA SPEAKER WIRE	6T00UP	25210	10-02P	
S12	SPEAKER - 1 PAIR 12 GA SPEAKER WIRE	6000UE	227	12-02	
S16	SPEAKER - 1 PAIR 16 GA SPEAKER WIRE	6200UE	225	16-02	
SDI	VIDEO COAXIAL WIRE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE



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1 AV RCP - FIRST FLOOR - UNIT 'C'  
1/8" = 1'-0"



CABLE TYPES - AV					
CODE	DESCRIPTION	BELDEN	WEST PENN	WINDY CITY	OTHER
C6	CAT6 - 4 UNSHIELDED, TWISTED PAIR	7883A	4246	CAT6	
CNT	CONTROL WIRE		-	-	CABLE TYPE AS REQUIRED BY DEVICE
F	FIBER WIRE	1801B	DA252401	OCC-DZ006TSLX9YP	
HDMI	PRETERMINATED HDMI CABLE				4K60 CAPABLE
L	LINE - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ	
M	MIC - 1 PR 22 GA W/ SHIELD	9451	454	22-1PREZ	
RF	ANTENNA CABLE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE
S10	SPEAKER - 1 PAIR 10 GA SPEAKER WIRE	6T00UP	25210	10-02P	
S12	SPEAKER - 1 PAIR 12 GA SPEAKER WIRE	6000UE	227	12-02	
S16	SPEAKER - 1 PAIR 16 GA SPEAKER WIRE	6200UE	225	16-02	
SDI	VIDEO COAXIAL WIRE	-	-	-	CABLE TYPE AS REQUIRED BY DEVICE

GENERAL NOTES - AV	
#	NOTES
1	EC TO PROVIDE (2) 20A/120V CIRCUITS WITHIN AVR AT THIS LOCATION
2	EC TO PROVIDE (1) 20A/120V CIRCUIT AT CEILING BY PROJECTOR/SCREEN AT THIS LOCATION
3	COORDINATE VJ-x LOCATION W/ THROW DISTANCE OF OFE PROJECTOR. COORDINATE DETAILS W/ OWNER'S REP
4	LOUDSPEAKER AT THIS LOCATION TO BE MOUNTED TO BOTTOM CHORD OF STRUCTURE. COORDINATE FINAL LOCATION IN FIELD
5	IT TO PROVIDE (2) DATA DROPS AT THIS LOCATION
6	WIRELESS MIC ANTENNA TO BE MOUNTED TO TOP OF AVR. AV TO PROVIDE NECESSARY HARDWARE AND INSTALL AS NEEDED
7	WIRELESS MIC ANTENNAS TO BE INSTALLED AT THIS LOCATION @ 10'-0" AFF.
8	AV TO INSTALL TP-1, BT-1 WITHIN EXISTING BACKBOX AT THIS LOCATION. PROVIDE CUSTOM MOUNTING PLATE W/ PLEXIGLASS COVER & VERIFY WIRE PATH FROM TP-1, BT-1 TO LOCAL AVR IN FIELD
9	WP-1 TO BE INSTALLED TO WALL BENEATH BLEACHERS AT THIS LOCATION. PROVIDE NEW 1-GANG BOX FLUSH-MOUNTED TO FRONT OF BLEACHERS AT THIS LOCATION TO HOST WP-1 AV PLATE. PROVIDE CABLE BUNDLE FROM WP-1 TO 2-GANG FLUSH-MOUNTED BOX ON BLEACHER FACE. SEE DETAIL 2 ON TA201B FOR REFERENCE
10	EC TO PROVIDE 1.5" STUB THROUGH WALL TO LB FITTING. EC TO PROVIDE 1.5" CONDUIT UP WALL TO CEILING. PAINT ALL NEW CONDUIT TO MATCH EXISTING WALLS. LABEL CONDUIT AND PROVIDE APPROPRIATE PULL STRING. COORDINATE SPECIFICS WITH AV CONTRACTOR

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HAV.DESIGN

HAYES INTERMEDIATE SCHOOL RENOVATIONS  
GRAND LEDGE PUBLIC SCHOOLS  
GRAND LEDGE, MICHIGAN

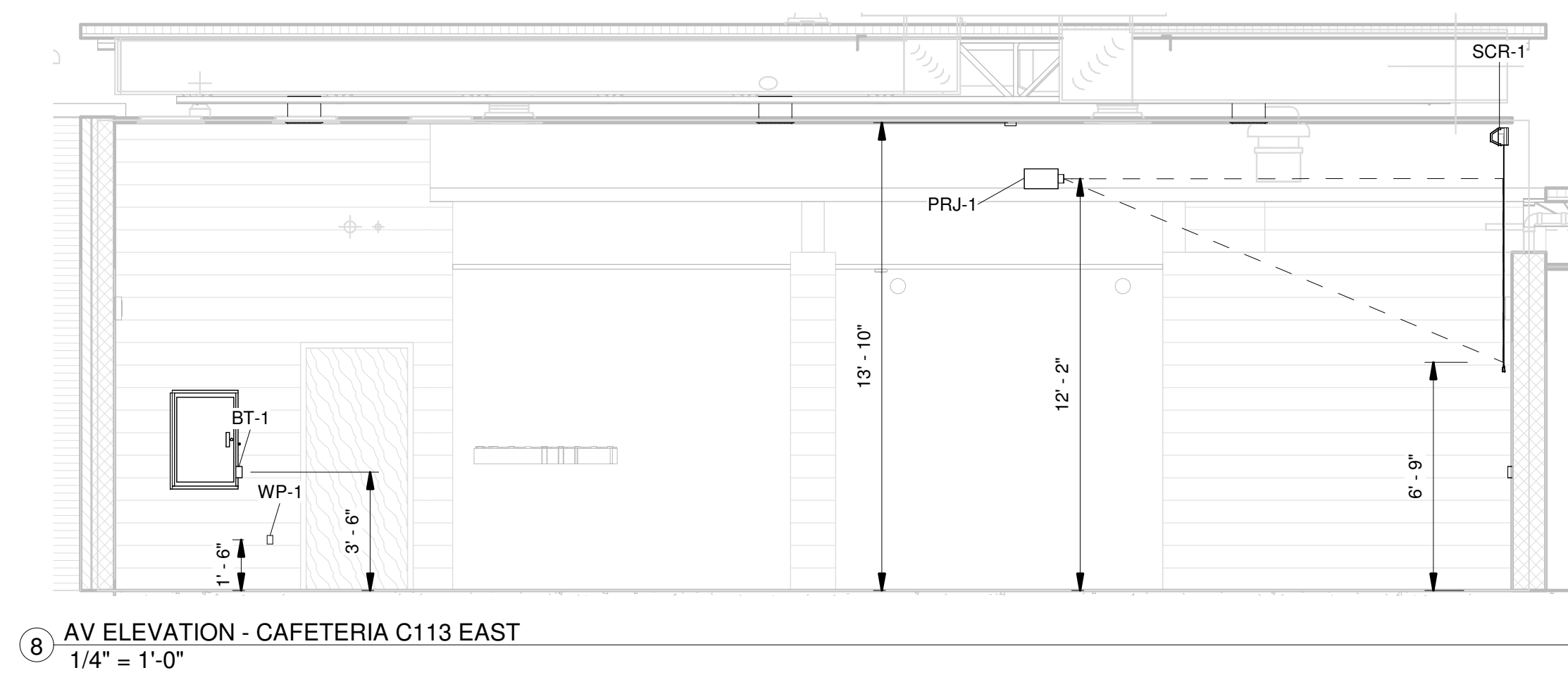
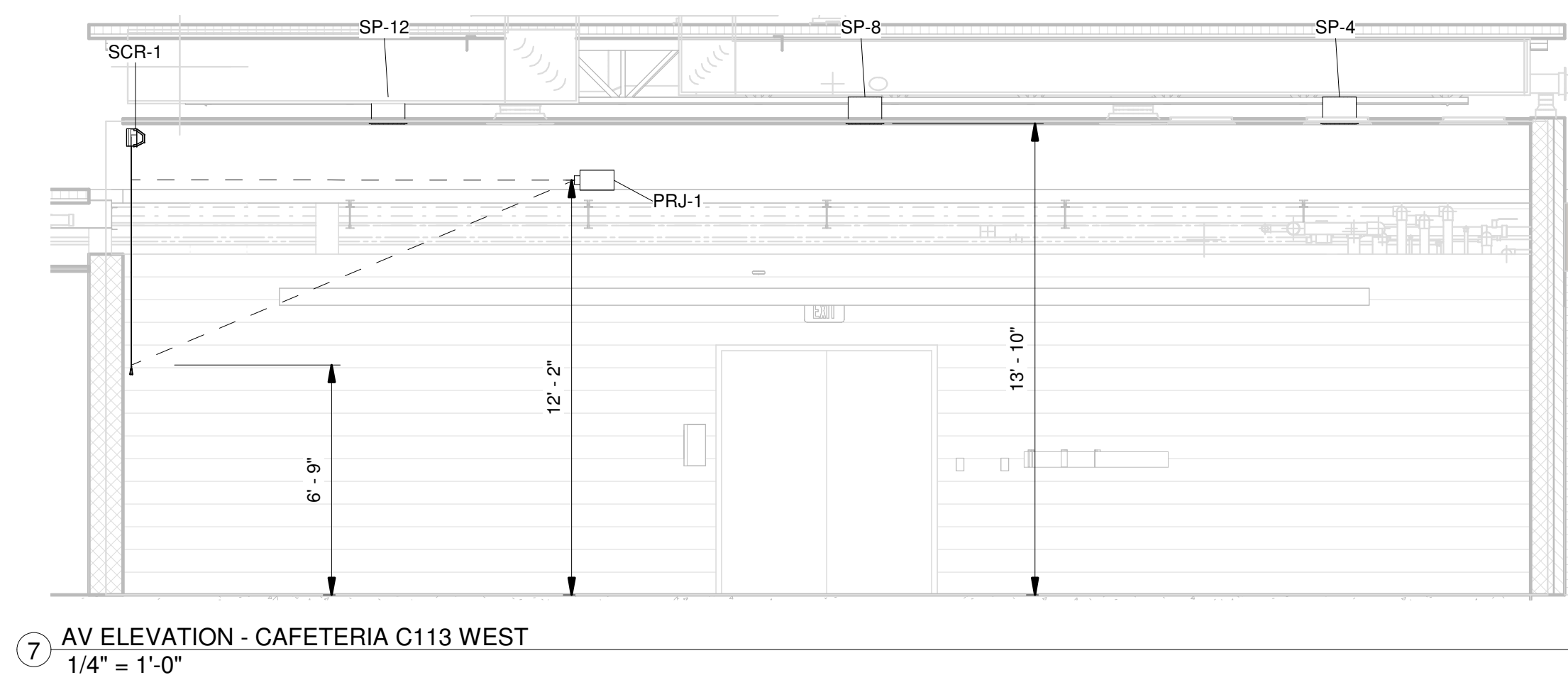
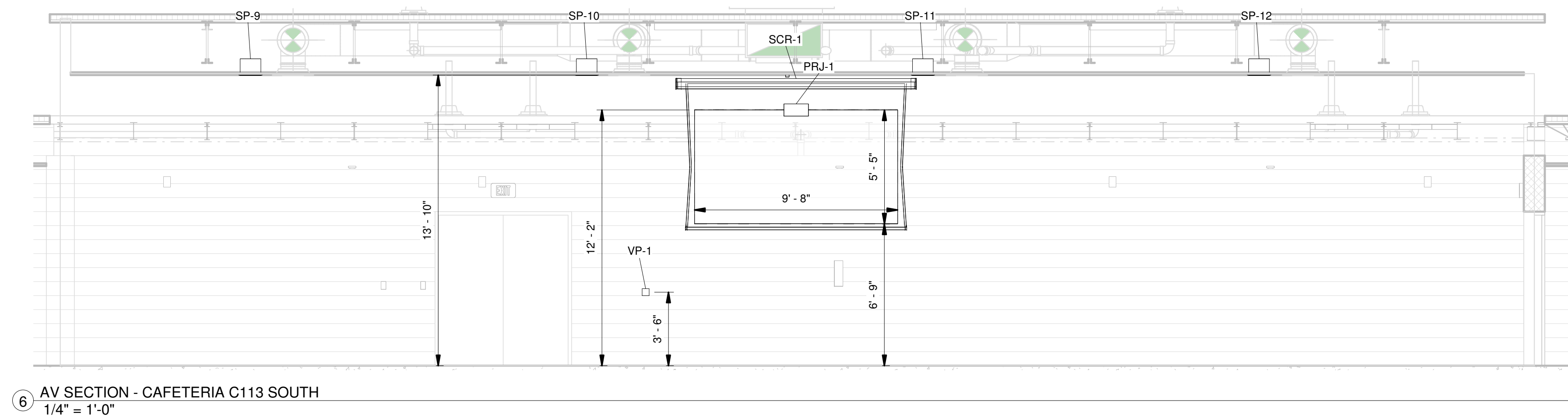
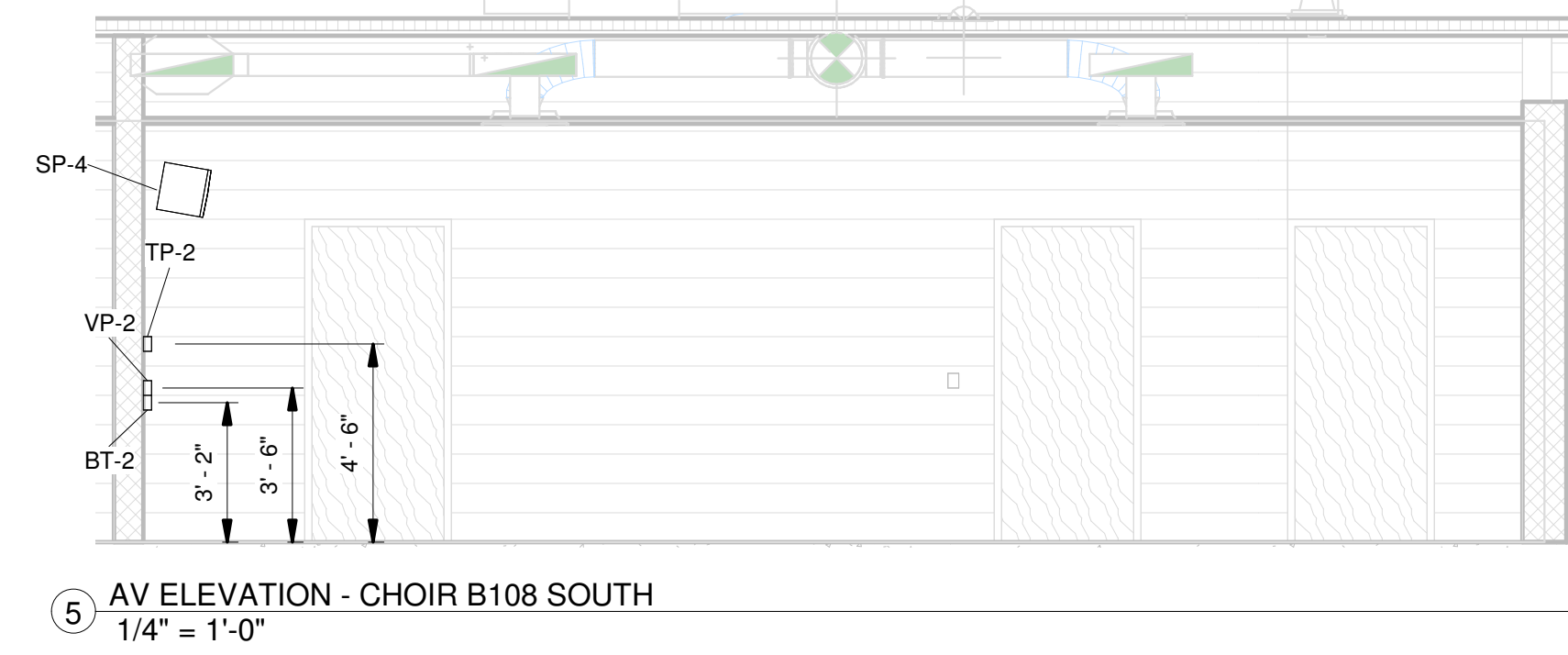
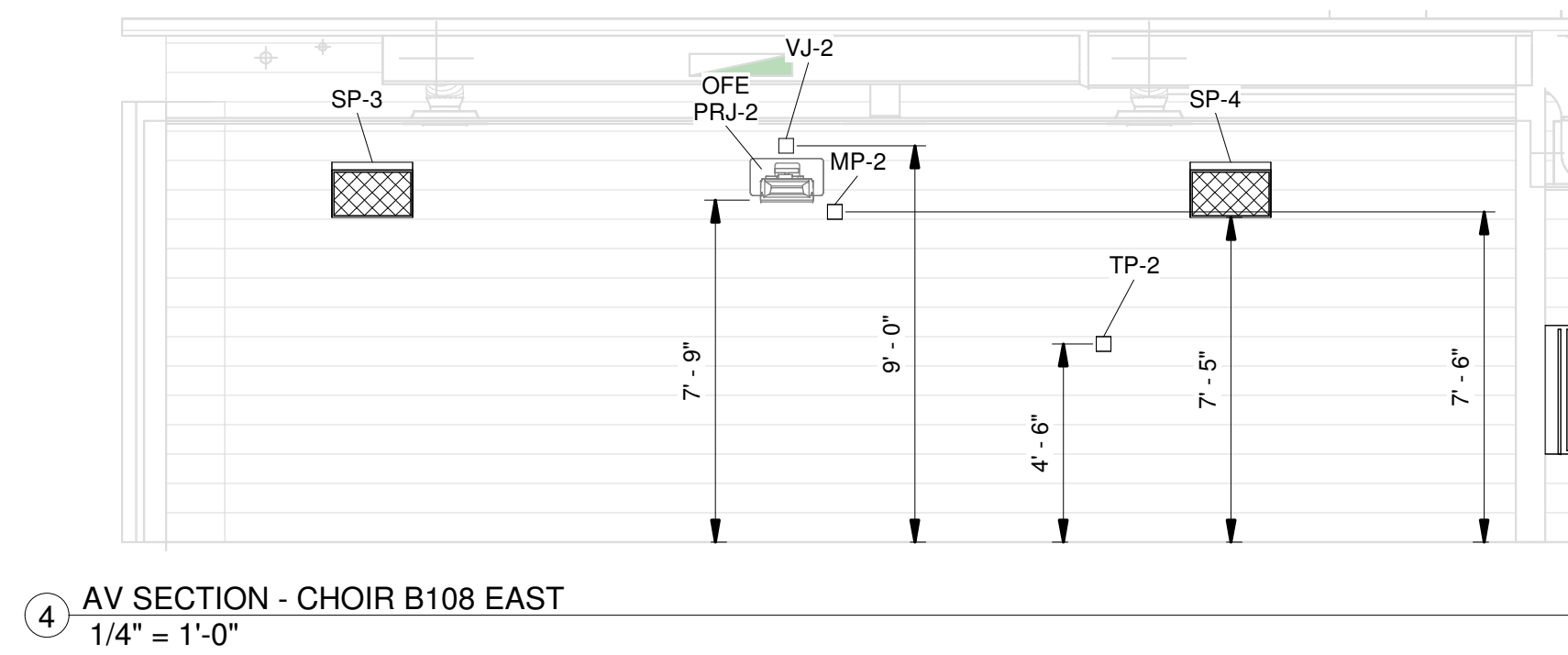
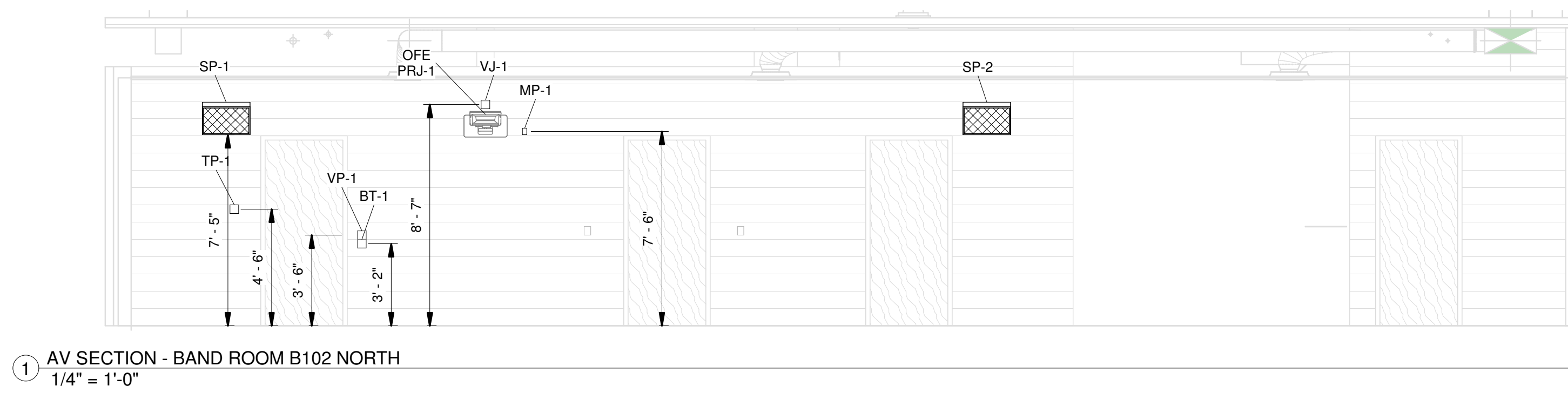
ISSUANCES	
02.03.2025	100 CD
03.28.2025	AV BIDS

DRAWN	Author
REVIEWED	Approver

PROJECT NO. 5-6003  
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AV RCP - FIRST FLOOR - UNIT C

TA211C



ISSUANCES		
02.03.2025	100 CD	
03.28.2025	AV BIDS	

DRAWN	Author
REVIEWED	Approver

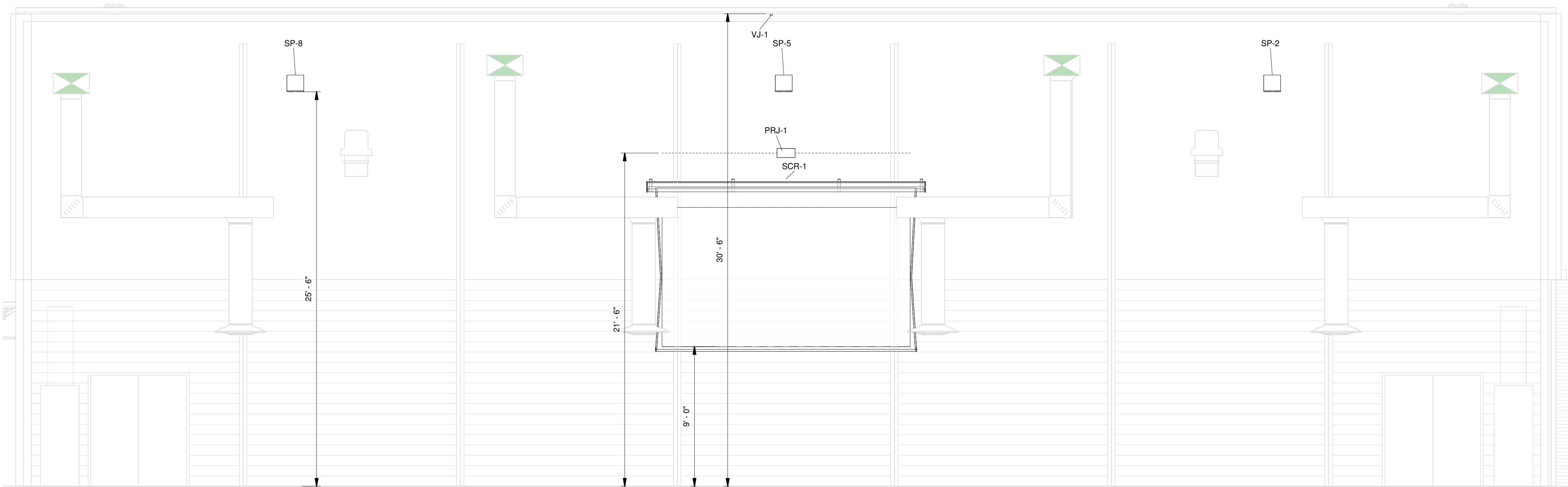
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AV SECTIONS, ELEVATIONS

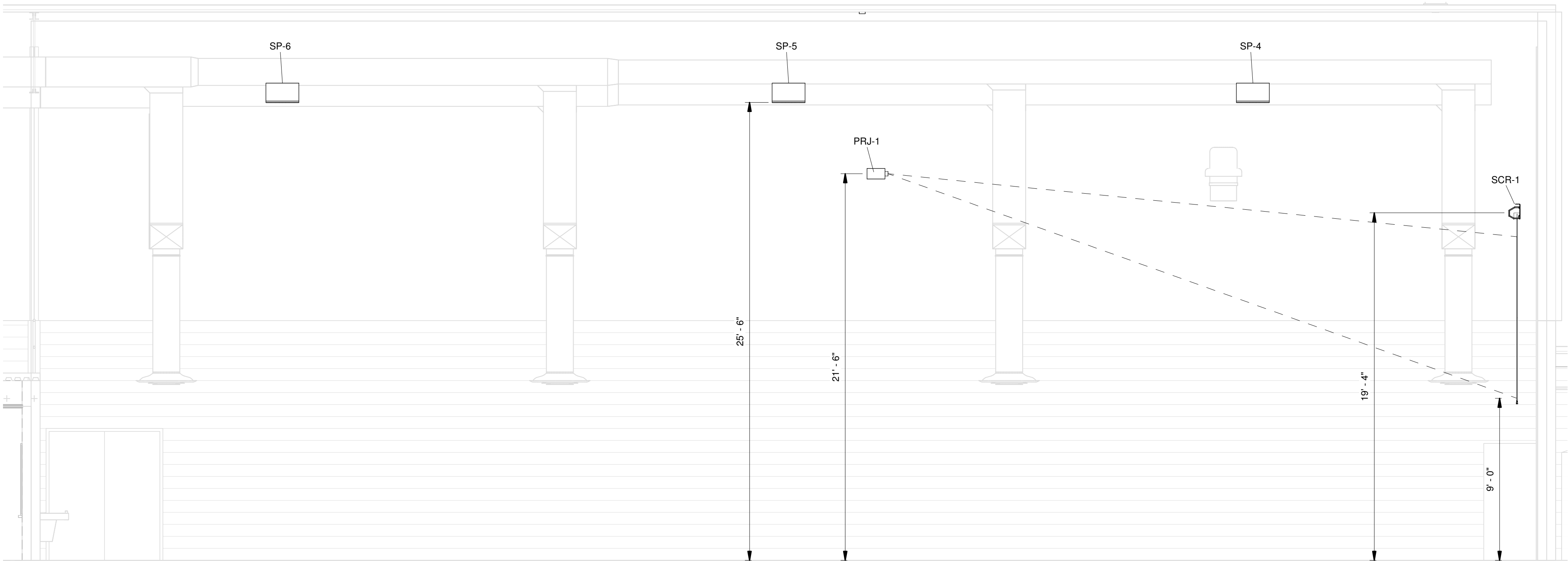
TA301



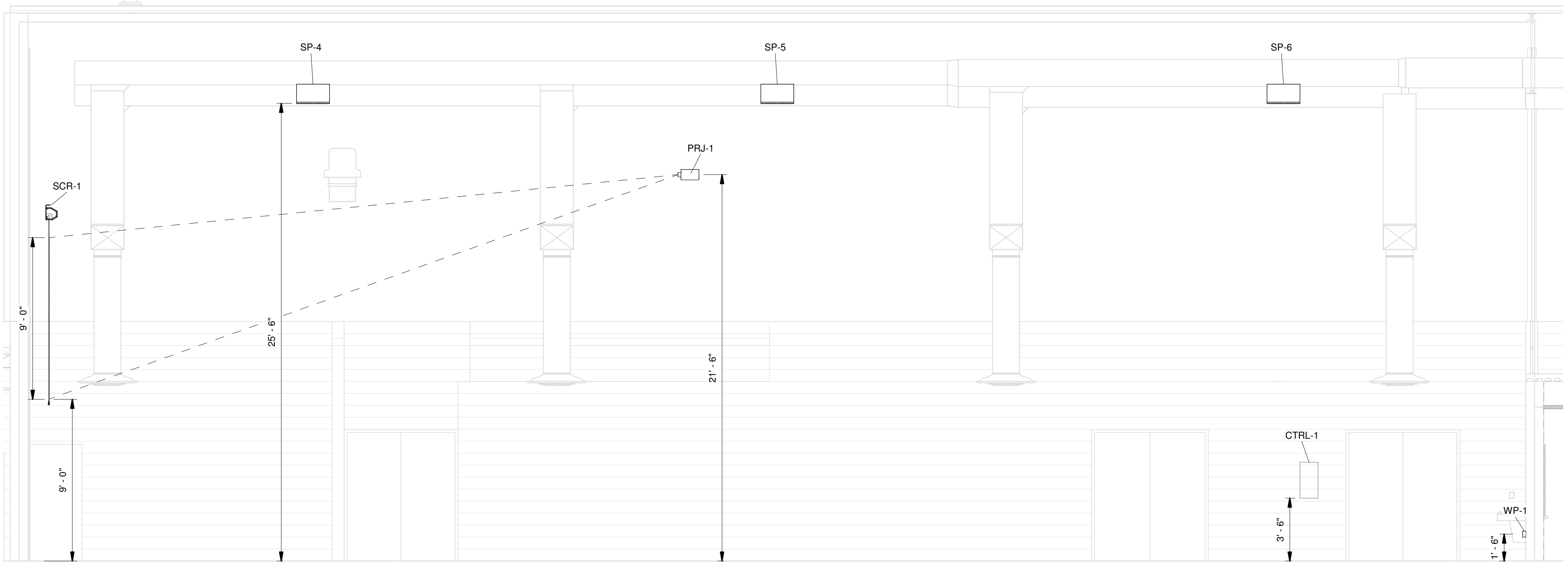
Autoset Docx: 5-6003 Grand Ledge Hayes Intermediate School Renovations: 5-6003 AV 2022.rvt  
3/31/2025 4:51:35 PM



① AV SECTION - GYMNASIUM B132 NORTH  
1/4" = 1'-0"



② AV ELEVATION - GYMNASIUM B132 WEST  
1/4" = 1'-0"



③ AV ELEVATION - GYMNASIUM B132 EAST  
1/4" = 1'-0"

ISSUANCES		
02.03.2025	100 CD	
03.28.2025	AV BIDS	

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REVIEWED	Approver

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AV SECTIONS, ELEVATIONS  
CONT.

NOTE: WP-1 AV PLATE TO BE INSTALLED IN BLEACHER FACE. SEE TA2018 FOR DETAILS

NOTE: AV TO PROVIDE CUSTOM PANEL FOR TP-1, BT-1, TX-1 MOUNTING TO EXISTING AV BACKBOX W/ PLEXIGLASS COVER

WP-1 1-GANG

TP-1 (QSC TSC-70-G3)

BT-1 (SYMETRIX 80-191)

TX-1 (VISIONARY SOLUTIONS DUETE-WP-H)

CTRL-1 PLATE NOT SHOWN TO SCALE

CTRL-1

The image displays three technical drawings of switchgear units, categorized by their number of gangs (1-GANG and 2-GANG).

**1-GANG Units:**

- WP-1 (VISIONARY SOLUTIONS DUETTE-WP-H):** A single-gang unit showing internal components labeled M-1 and AV-1. It includes a 1-GANG label.
- BT-1 (SYMMETRIX 80-191):** A single-gang unit showing internal components labeled TX-1. It includes a 1-GANG label.

**2-GANG Unit:**

- VP-1:** A two-gang unit showing internal components labeled TX-1. It includes a 2-GANG label.

**AVR**  
**DWR-16-22**  
**16-SP WALL RACK**

Slot	Equipment
1	POWER (IPC 36160-PL) MISC.
3	1 RU SHELF (TV-1, TX-5) APPLE TV
5	1 RU SHELF (TV-2, TX-6) APPLE TV
7	1 RU SHELF (BLV.1, 2 (PDC-2)) CONTACT CLOSURES
9	1 RU (SHUNT BLA2D) WIRELESS WM 1.3
11	1 RU (SHUNT BLA2D) WIRELESS WM 1.3
13	2 RU (UPS1 (UPX-2000R-2)) POWER SUPPLY
15	1 RU (OSC CDSORE 4 FLE) DIGITAL SIGNAL PROCESSOR
16	1 RU BLANK MISC.
17	1 RU BLANK MISC.
18	1 RU (SW1 (SMA3209P)) AV NETWORK SWITCH
19	1 RU BLANK MISC.
20	1/2 RU (OSC CX G 2K4) MAINS
21	2 RU DRAWER (UD) MISC.

**AVR DWR-16-22 16-SP WALL RACK**

Port	Device	Connection
1 RU	POWER (P0-16-PL)	MISC.
1 RU	BLANK	MISC.
1 RU SHELF	TV-1, TX-2	APPLE TV
1 RU SHELF	REL.V1	CONTACT CLOSURES
1 RU	WM 1,2	WIRELESS MIC TX
1 RU	(SHURE BL-2HD)	MISC.
2 RU	UPS-1 (LFX-200R-2)	POWER SUPPLY
1 RU	DSP-1 (QSC COBRE-1 FLEX)	DIGITAL SIGNAL PROCESSOR
1 RU	BLANK	MISC.
1 RU	W-1 (SMA50MP)	AV NETWORK SWITCH
1 RU	BLANK	MISC.
1/2 RU	A-01 (QSC CX-0 2x4)	MAINS
2 RU	DRAWER (UD2)	MISC.

AVR  
OFE

12-SP WALL RACK

12	1 RU	POWER (PDU 800-100)	MISC.
11	1 RU	BLANK	MISC.
10	1 RU SHELF	TV-1, TX-2	APPLE TV
9	1 RU SHELF	REV-1 (PSC03P)	CONTACT® CLOSURES
8	1 RU SHELF	WM 1-2 (C02)	WIRELESS MIC. PA
7	1 RU	BLANK	MISC.
6	2 RU	UPS-1 (UPK-2000R-2)	POWER SUPPLY
5	1 RU	(OSC-008R) (E.L.E.D.)	DIGITAL SIGNAL
4	1 RU	SW-1 (GMA-003P)	AV NETWORK SWITCH
3	1 RU	BLANK	MISC.
2	1 RU	A-01 (OSC-MP-A05V)	MAINS
1			

20A/120V

120V

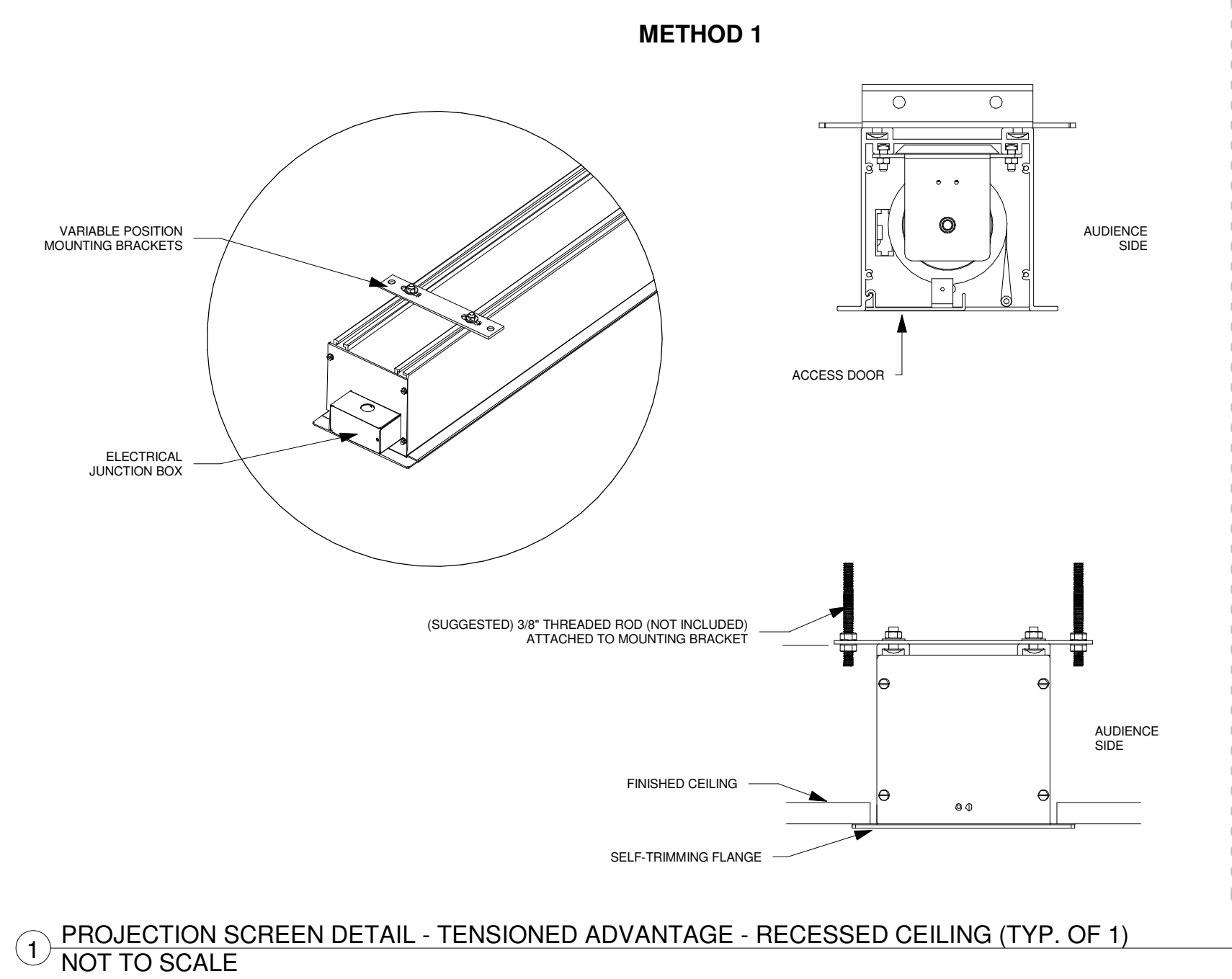
20A

20A

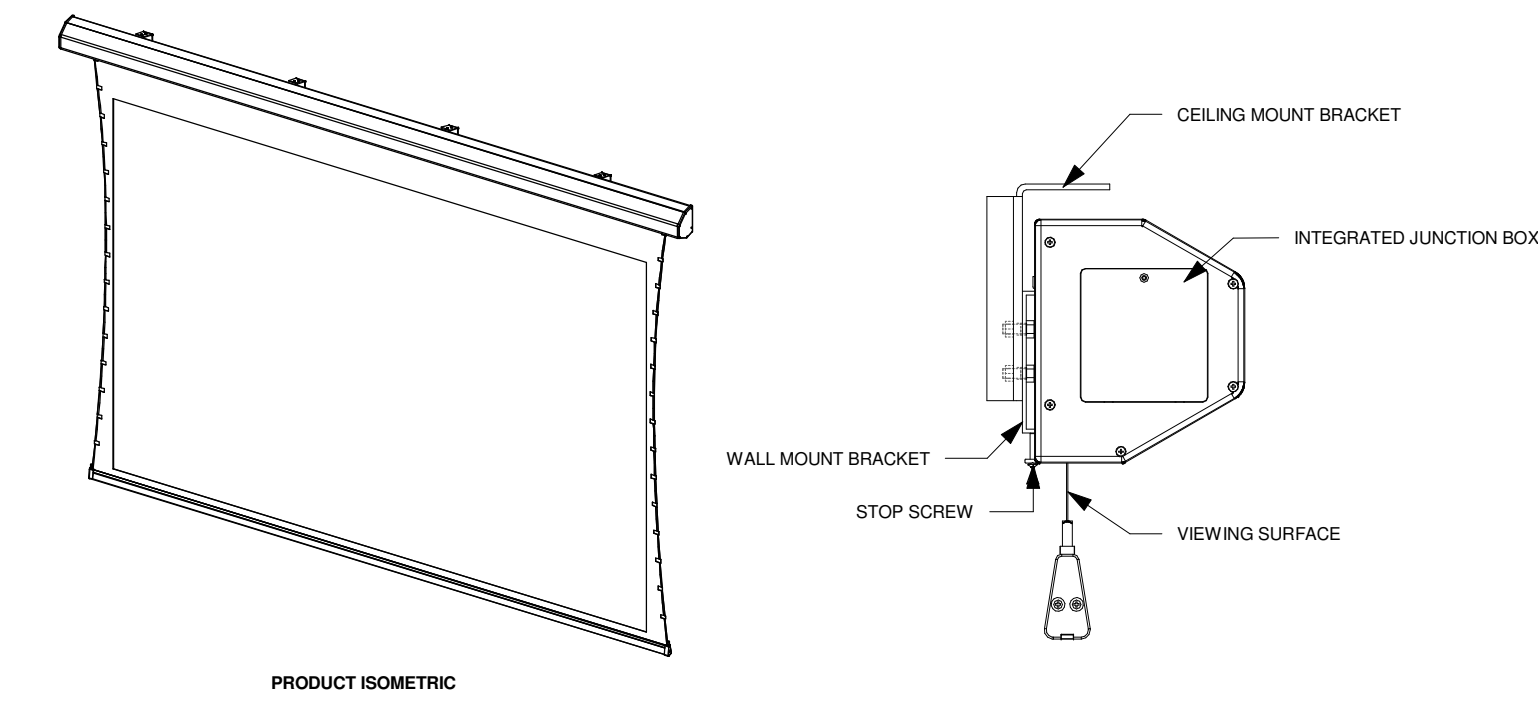
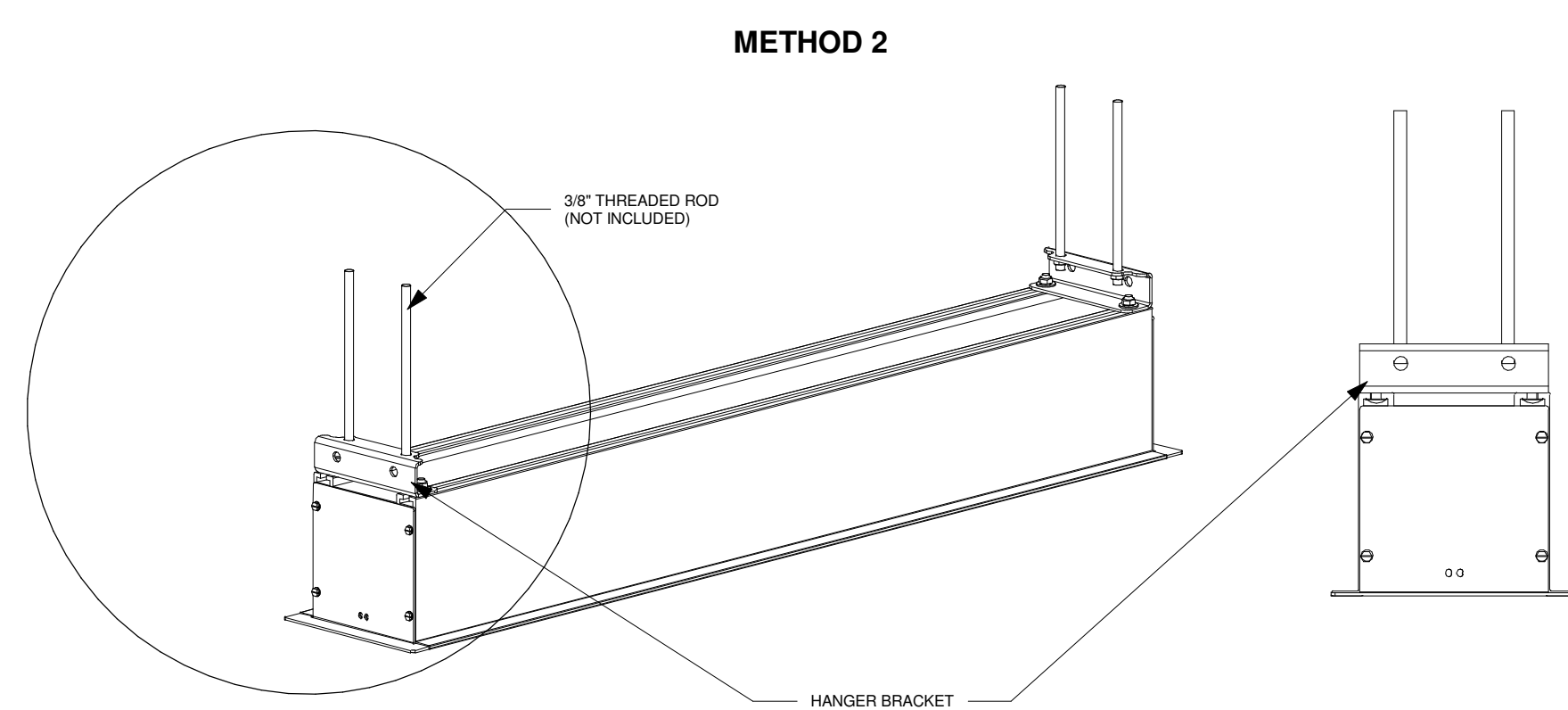
AVR

1. INSTALL RACK RAILS AT APPROPRIATE DISTANCE FROM BACK OF EQUIPMENT FOR LACER BARS.
2. ALL WIRING IN BACK OF RACKS SHOULD BE SECURED TO THE LACER BAR.
3. WIRING TO AND FROM THE RACK SHALL BE RUN ON THE LEFT HAND SIDE OF THE RACK AS YOU FACE THE REAR OF THE RACK.
4. ALL POWER CONNECTIONS AND WIRING SHALL BE RUN ON THE RIGHT HAND SIDE OF THE RACK AS YOU FACE THE REAR OF THE RACK.
5. ALL WIRING SHALL BE CONTAINED IN PANDUIT FINGER TRAY OR SIMILAR.
6. WIRING SHALL BE SEPARATED IN FINGER TRAY(S) ACCORDING TO SIGNAL AND WIRE TYPE.
7. ALL WIRES TERMINATING IN THE EQUIPMENT RACK MUST HAVE A UNIQUE LABEL. SEE DRAWINGS FOR LABELING DETAILS.
8. ALL EQUIPMENT SHALL HAVE A LABEL ON THE FRONT INDICATING THE EQUIPMENT FUNCTION AND SCHEMATIC DESIGNATION.
9. ALL NETWORKED DEVICES SHALL BE CLEARLY LABELED WITH THE NETWORK IP ADDRESS.
10. ALL NETWORKED DEVICES SHALL HAVE STATIC IP ADDRESSES. COORDINATE WITH THE SCHOOL IT DEPARTMENT FOR RESERVATION.
11. PROGRAM AMPLIFIERS FOR SLEEP MODE WHEN THE SYSTEM IS POWERED OFF.

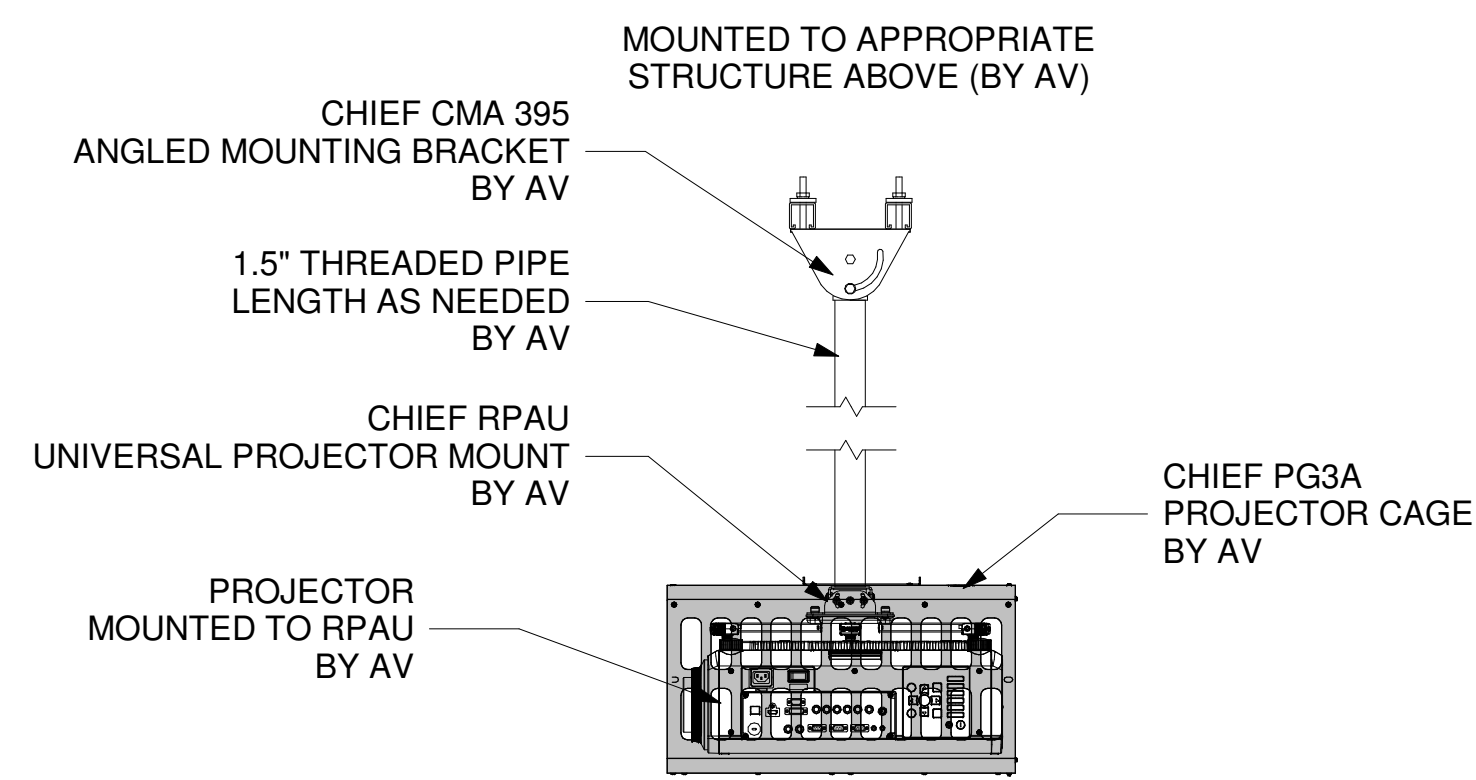
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3/31/2025 4:51:36 PM



① PROJECTION SCREEN DETAIL - TENSIONED ADVANTAGE - RECESSED CEILING (TYP. OF 1)  
NOT TO SCALE

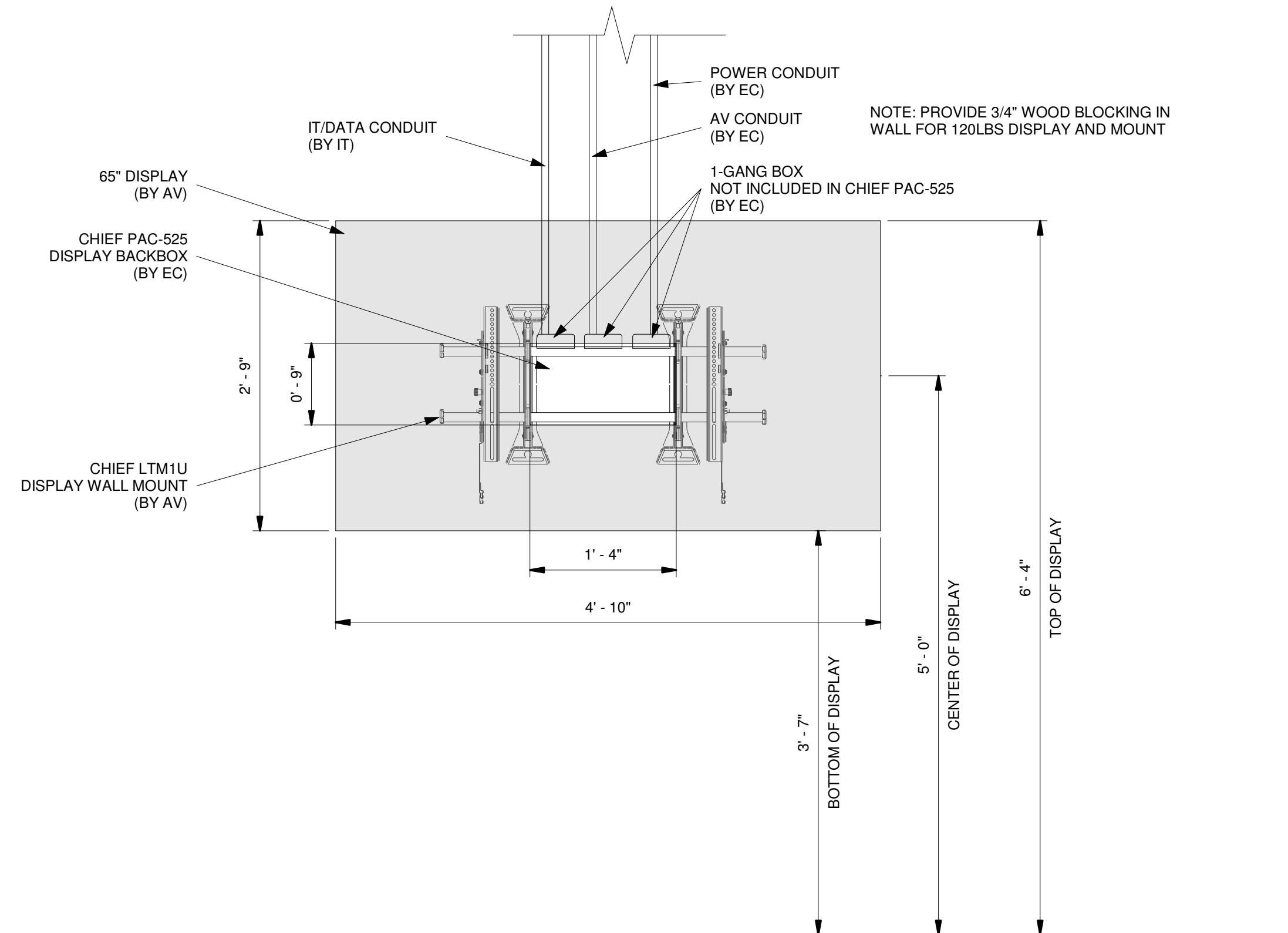


② PROJECTION SCREEN DETAIL - TENSIONED COSMOPOLITAN (TYP. OF 1)  
NOT TO SCALE

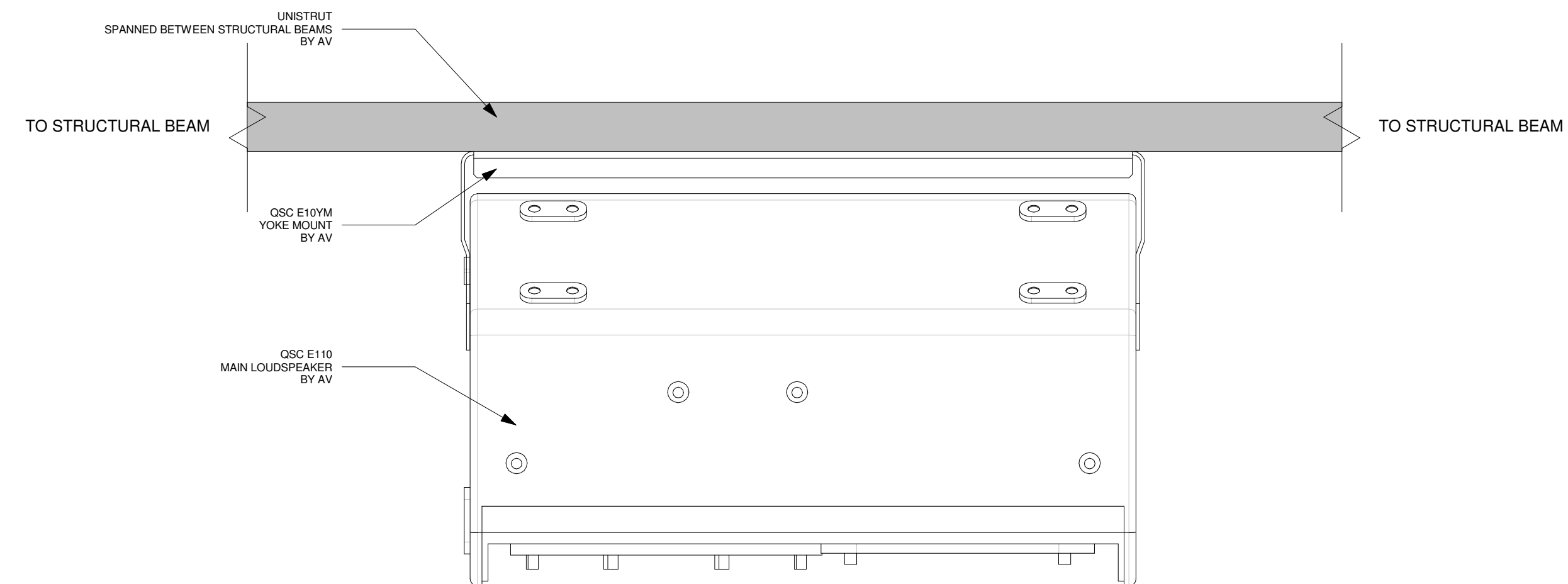


③ PROJECTOR MOUNTING DETAIL - GYMNASIUM, CAFETERIA (TYP. OF 2)  
NOT TO SCALE

## 65" DISPLAY



④ DISPLAY MOUNTING DETAIL - 65" - LTM1U (TYP. OF 1)  
1" = 1'-0"



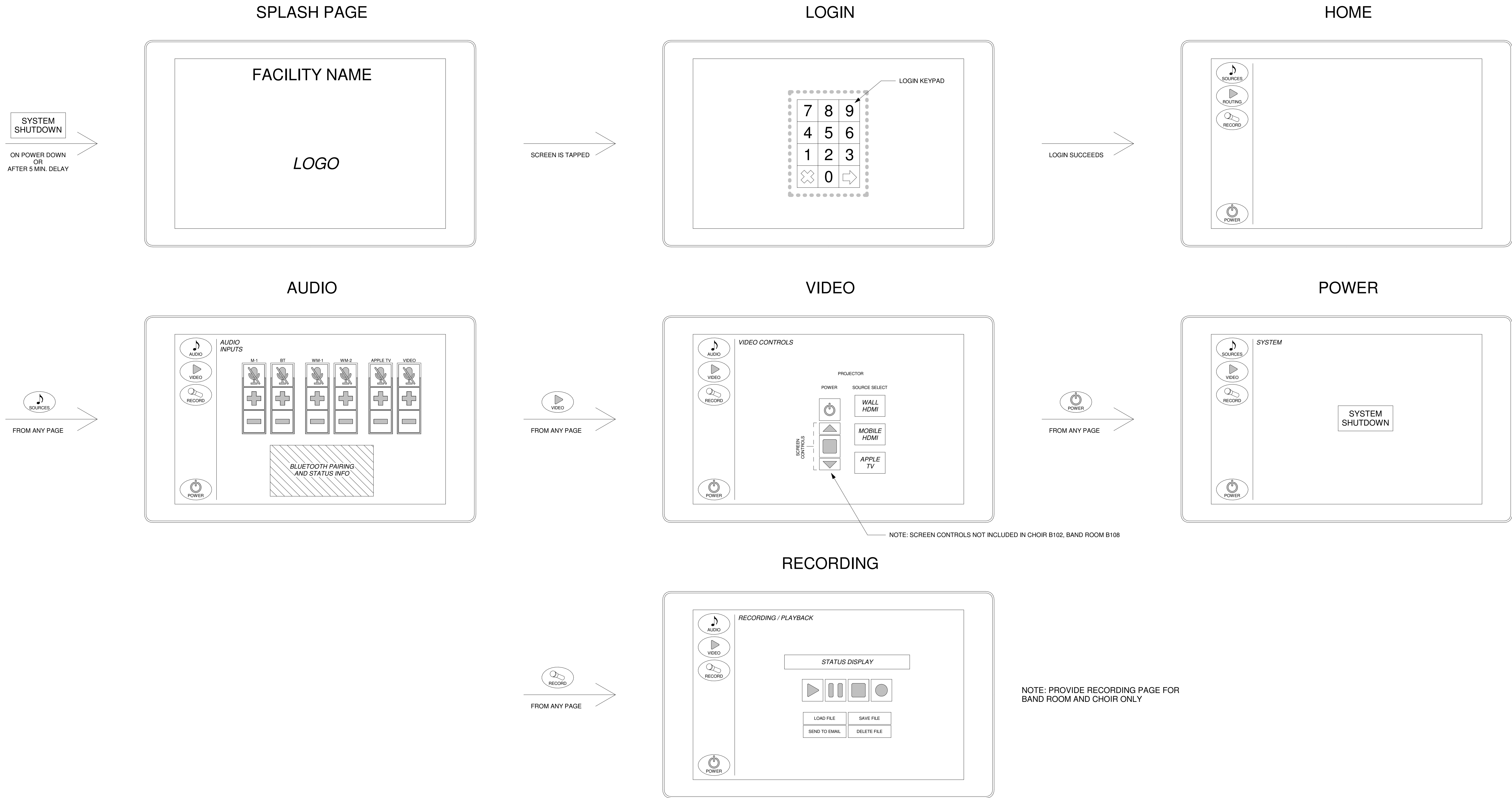
⑤ AV DETAIL - LOUDSPEAKER RIGGING - QSC E110 - GYMNASIUM  
3" = 1'-0"

ISSUANCES		
02.03.2025	100 CD	
03.28.2025	AV BIDS	

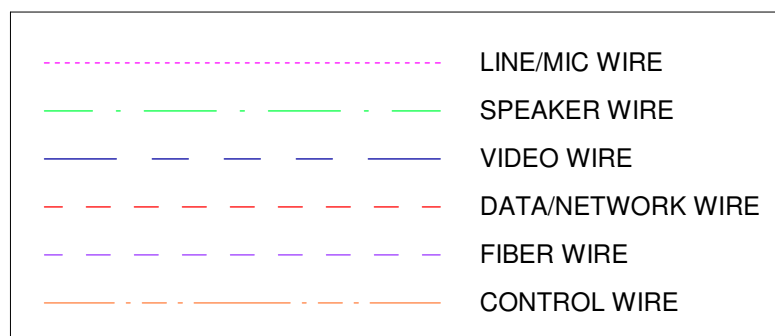
DRAWN	Author
REVIEWED	Approver

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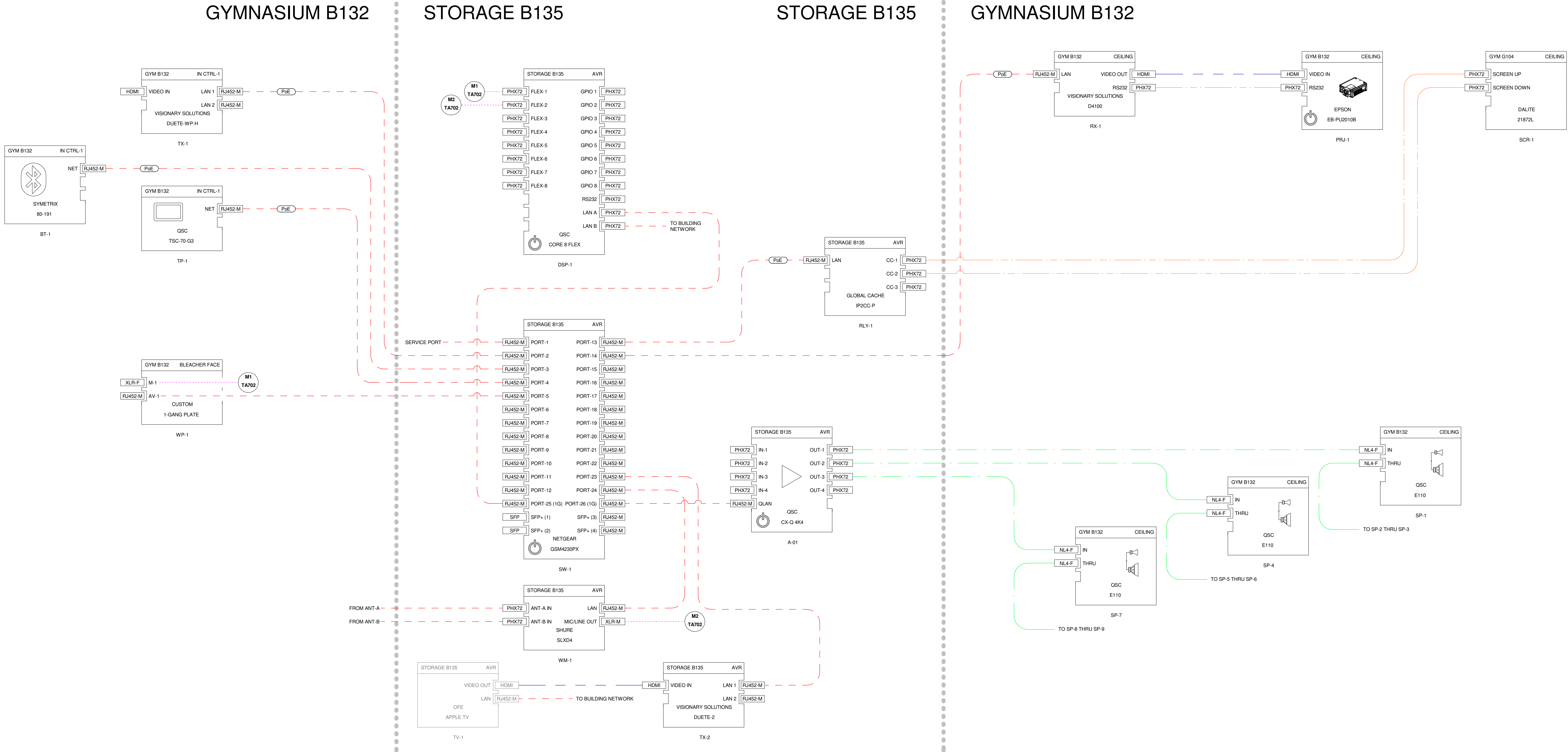




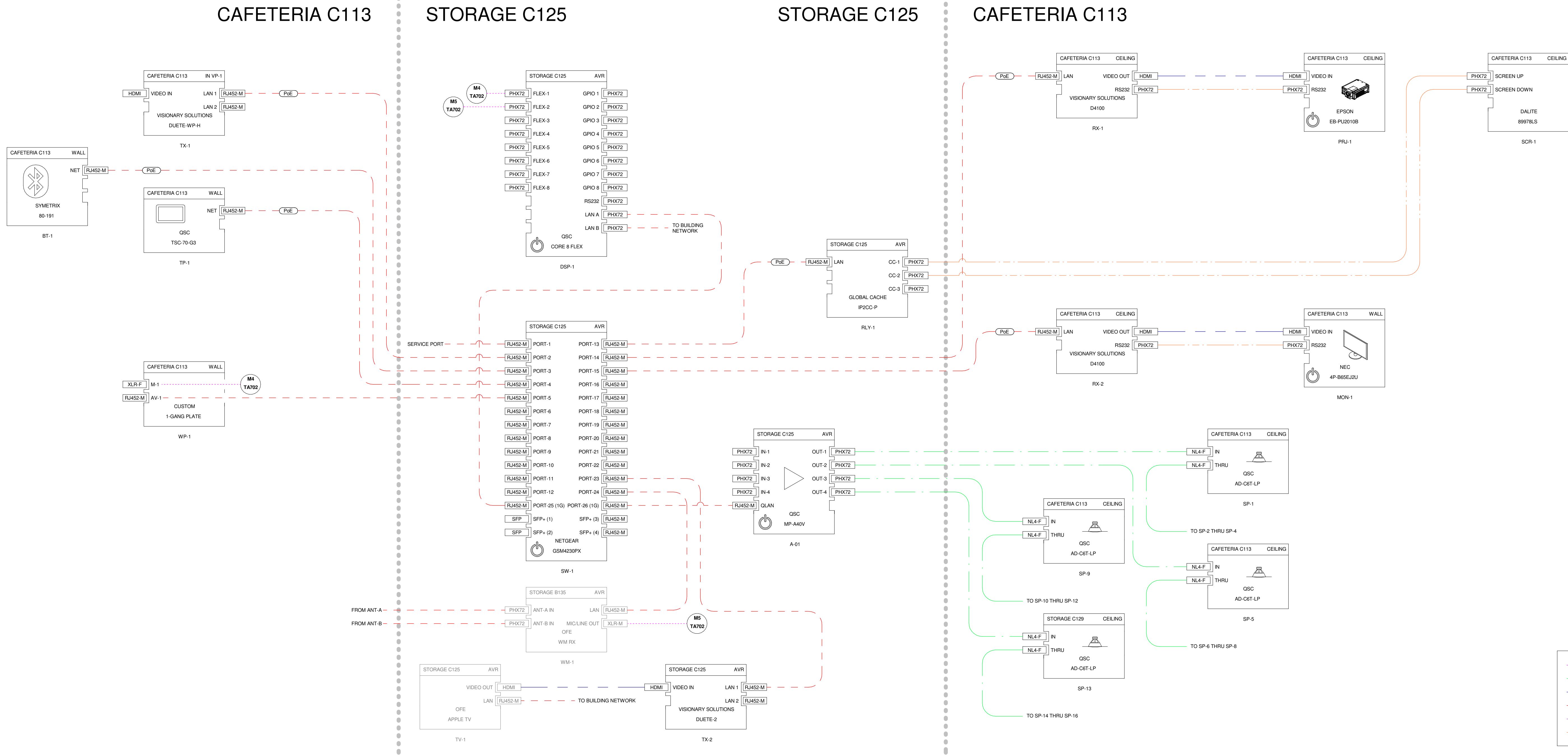
1 AV TOUCHPANEL STORYBOARD - TSC-70-G3 (TYP. OF 4)  
12" = 1'-0"







1 AV SCHEMATIC - GYMNASIUM B132  
NOT TO SCALE



2 AV SCHEMATIC - CAFETERIA C113  
NOT TO SCALE

LINE/MIC WIRE
SPEAKER WIRE
VIDEO WIRE
DATA/NETWORK WIRE
FIBER WIRE
CONTROL WIRE

SCHEMATIC LINE TYPES - AV