

**ALCY ELEMENTARY  
PUBLIC ADDRESS AND VIDEO PROJECTOR  
SYSTEM INSTALLATION PROJECT**



**Division of Facilities and Maintenance  
Department of Major Construction**

Project Manager  
Scott Steen

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SECTION 01000 - GENERAL REQUIREMENTS

PART 1 - GENERAL

- 1.1 GENERAL INTENT. It is the declared and acknowledged intention and meaning to provide materials and labor to complete all work, described and set forth in these specifications and attached drawings.
- 1.2 PRE-BID REQUIREMENTS.
- A. Pre-Bid Conference. There will be a mandatory Pre-Bid Conference at the work site a minimum of 10 work days prior to the bid due date. This Pre-Bid Conference date will be posted in the Notice to Bidders. **All attendees are required to be in attendance at the time stated on Procurement Service's "Notice to Bidders". Persons arriving after the stated time will not be allowed to sign in or to submit a bid on the project.**
1. The site is available to prospective bidders for the inspection and examination of the area and conditions under which the work is to be performed. Prior to the bid, the prospective bidders will notify the Owner of any conditions detrimental to the timely and proper accomplishment of the work. **Lines shown on plans are for bidding purposes only. The successful bidder shall be responsible for taking of all field measurements for the proper installation of all materials.**
2. Errors and Omissions. The prospective bidder shall not be allowed to take advantage of any errors or omissions in these specifications and attached drawings. Where errors or omissions occur in the specifications and drawings, the bidder shall promptly notify the contact person listed in the "Notice to Bid", and report the identified errors or omissions. Inconsistencies in the specifications or drawings are to be reported in a timely manner before the bids are submitted to Shelby County Schools.
- 1.3 BID REQUIREMENTS.
- A. Required Items at Bid Opening.
1. Standard bid documents in accordance with the "Notice to Bidders".
2. Submittal cut-sheets for equipment and major components.
- 1.4 BID EVALUATION. All submitted bids will be reviewed and evaluated for content of required bid documents, cost, and compliance with local and state required licensing requirements, federal regulations, and the bidder's past performance of work completion and workmanship with Shelby County Schools.
- 1.5 PRE-CONSTRUCTION REQUIREMENTS.
- A. After the Owner's issuance of the Purchase Order to the Contractor, the Contractor shall provide the Owner with an acceptable sequence of work which

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must be approved by the Owner prior to the scheduling of the Pre-Construction Conference.

- B. After the Owner's approval of the sequence of work, the Owner shall schedule a Pre-Construction Conference, to be held at the work site, to discuss the work requirements.
- C. The Contractor shall provide the date that the work is to start at the Pre-Construction Conference.

**1.6 PROJECT REQUIREMENTS.**

- A. The Contractor shall comply with Tennessee Code Annotated, Section 49-5-413, which requires that all of their employees and their subcontractors' employees, who will be on Shelby County Schools' properties, have a State approved Background Check and Fingerprinting. When each employee has complied with the above and received approval from Authorities Having Jurisdiction, an identification badge will be issued to that employee. All contractors' employees shall wear this badge at shirt pocket height, at all times while on the Shelby County Schools' property.
- B. Shelby County Schools' Board Policy No. 1.803 "Tobacco-Free Environment" restricts the use of any and all tobacco products on all of its properties. The Contractor shall make each of their employees aware of this policy. See attached policy.
- C. The contractor shall comply with the Civil Rights Act of 1964, as amended, prohibits discrimination on the basis of race, color, national origin or sex.
- D. Asbestos.
  - 1. Asbestos in Schools - Formal Notification See Attachment "A".
  - 2. Asbestos-Containing Materials.
    - a. The Contractor shall avoid disturbing any asbestos or suspected asbestos-containing materials. Refer to the Attachment "B" statement regarding asbestos-containing materials report.
    - b. If the Contractor encounters asbestos or suspected asbestos-containing materials that are not shown on the attached drawing, or if a method of installation to avoid asbestos areas cannot be determined, the Contractor shall request guidance from the Owner's representative as to how to proceed.
    - c. The Contractor is advised that current regulations require all work and/or abatement on asbestos containing materials be accomplished under the direction of the SCS asbestos abatement personnel. In the event disturbance of any asbestos containing building material is necessary, the Contractor shall contact Owner's representative and request an asbestos

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control specialist to make the penetration. Provide at least a 72-hours advance notice if this is required. The Contractor shall avoid disturbing any asbestos or suspected asbestos-containing materials.

- d. The school has an asbestos plan, showing probable asbestos problem locations and the Contractor will be made aware of these locations during the Pre-Bid Conference. If the Contractor encounters asbestos or suspected asbestos-containing materials that are not shown on the asbestos plans or not made known to him during the Pre-Bid Conference, he shall request guidance from the Owner's representative as to how to proceed.
- E. Compliance with all local, state and federal codes, ordinances, regulations and laws applicable to the work to be done shall be considered as minimum requirements, and everything shown or specified in excess of these minimum requirements shall be installed in excess thereof. No instructions given in the contract documents shall be construed as an authorization to violate any code, ordinance, regulation or law.
- F. Design, Permits, and Fees.
1. If required by code or the Authorities Having Jurisdiction, the Contractor shall provide design and necessary design documents for all work in these specifications and indicated on the attached drawings. Design documents must be prepared and stamped by the appropriate professional designer as required by state and local codes. All designs shall incorporate all code requirements and the special requirements set forth in the appropriate sections of this document. All costs associated with these requirements shall be the responsibility of the Contractor.
    - a. The design and design documents must be submitted to and approved by the Owner prior to submittal to the Authorities Having Jurisdiction.
  2. If required by code or the Authorities Having Jurisdiction, the Contractor shall be responsible for obtaining all licenses and permits, and the payment of all required fees. Copies of all permit applications shall be submitted to the Owner's representative prior to the start of the project. Copies or proof of all final inspection approvals by the Authorities Having Jurisdiction shall be furnished to the Owner's representative prior to final acceptance.
  3. ***It shall be the responsibility of the contractor to provide personnel to meet the perspective code-enforcement inspectors on-site for all required code inspections. When the inspector's access to the project's area, that must be inspected, is not continually manned by the owner's personnel during regular business hours, it is the contractor's responsibility to notify the owner's representative, in advance, to gain access.***
- G. Work once started shall be diligently carried out toward completion. All work shall be done in a workmanship-like manner in accordance with standard practices,

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- local codes and ordinances, applicable statutes and in accordance with manufacturer's recommendations, where applicable.
- H. The Contractor is required to perform this work within the precepts of OSHA/TOSHA guidelines for a safe working environment. The Contractor shall erect and maintain, as required by conditions and progress of the work, all reasonable safeguards for safety and protection, including signs, dust barriers, barricades, temporary lights and warning lights. Further, the job site will be continuously kept clear of hazardous conditions. Conditions, which in the opinion of the Owner's representative are unsafe and correctable, shall be immediately corrected. Failure to do so will result in a job stoppage until the situation has been cleared.
  - I. The Owner may, at his discretion, engage the services of a testing laboratory to ensure that all materials and workmanship are in accordance with the plans and specifications. The testing expense will revert to the Contractor should the material or workmanship fail to comply with requirements.
  - J. The Contractor shall provide entire copies of these specifications and plans to the installing lead craftsman. The specifications and plans' copy shall be kept on the job site for referral by the installing craftsmen and the Owner's representative.
  - K. If no storage space is available on site, the Contractor shall provide adequately sized, on-site storage trailer(s) to store and protect all materials, equipment and tools. The principal or their representative shall determine the location of the storage trailer(s).
  - L. All materials demolished and salvaged, unless otherwise directed by the Owner's representative, are to become the property of the Contractor and will be promptly removed from the site.
  - M. The Contractor shall provide an adequate size trash container on site during the duration of the project. The trash container shall not be allowed to overflow and shall be dumped regularly. Demolished materials and trash shall not be placed on the ground around or about the trash container. The principal or their representative shall determine the location of the trash container. The school's trash containers shall not be used for disposal.
  - N. Tennessee Hazardous Chemical Right to Know Law. The Owner will provide the Contractor, at his request, with a list of chemicals that have been identified as being present in the areas involved in this contract.
  - O. The Contractor will be expected to protect all existing amenities currently incorporated into or adjacent to the facility, including Public and Owner's utility services, shrubbery, sidewalks, etc. Any and all damage to the facility shall be the responsibility of the Contractor and shall be restored by him at no additional expense to the Owner.

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P. Water and toilet facilities are available, with the assignment by the facility's Principal or Supervising Building Engineer (SBE). The Contractor may use available 120VAC, 20 Amp electrical power in the operation of their hand tools.

END OF SECTION 01000

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SECTION 01100 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Work covered by the Contract Documents.
  2. Time of Completion
  3. Work under other contracts.
  4. Use of premises.
  5. Owner's occupancy requirements.
  6. Specification formats and conventions.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Public Address and Video Projection System Installation
- B. Project Location: AlcyElementary School 1750 Alcy Rd. Memphis, TN. Note: All Bidders shall meet in the Main Office of Alcy Elementary 1750 Alcy Rd., Memphis TN 38114 at the designated date and time as stated on the Notification for Bidders form.
- C. Owner: Shelby County Schools, Board of Education (SCS). Memphis, Tennessee.
- D. Owner's Representative. The Owner will designate, at the time the purchase order is issued to the Contractor, the names and telephone numbers of its representatives. These will serve as the point of contact between the Contractor and Owner.
- E. The Work included within this Specification is not necessarily limited to the following work elements:
1. The Contractor shall provide and install a new public address system and video projection system for the Cafeteria, Media Center and Gymnasium (Multi-purpose Pavilion) and a projector screen for the Gymnasium. See Section 081061 of these specifications for requirements. The Contractor shall be responsible for providing and installing complete and "turnkey" system(s). These areas shall be identified at the pre-construction meeting.
  2. The Contractor shall be expected to coordinate work activities with the on-site general contractor. Coordination with the site superintendent shall be required in order to minimize any conflicts. Contractor shall protect existing finishes and



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restore at their cost any damage to existing finishes that could occur during the installation process. Areas of work shall be cleaned daily before leaving job-site.

3. A three-hour training session with school staff shall be provided by installer upon completion for school staff and SCS technical representatives The training session shall be scheduled by Owners Representative.
  4. The installation(s) shall meet all codes having jurisdiction.
  5. The Contractor shall be responsible for all applicable permits and fees associated with the project.
  6. No food or beverages shall be allowed in the facility as the project is currently in the finishing stages.
- F. Project will be constructed under a single contract.

**1.3 TIME OF COMPLETION**

- A. The work shall be completed within **35** work days after an “executed contract” is issued. Work can be performed on-site from 6AM thru 3:30 PM 5 days a week. Should the completion date elapse, the contractor may be assessed \$500.00 in agreed damages per day until the projects are completed.
- B. Owner’s Representative shall issue the “Notice to Proceed” at the time of an executed contract. The total amount of working days of project has been designed to include lead time for manufacturing materials, ordering equipment, professional design, and all aspects to satisfy the Time of Completion.

**1.4 WORK UNDER OTHER CONTRACTS**

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

**1.5 USE OF PREMISES**

- A. Work on Shelby County Schools facilities may be conducted as follows:
  1. Work can be performed on-site from 6AM thru 3:30PM 5 days a week.
- B. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
- C. Owner Occupancy: Allow for Owner occupancy of Project site.
  1. Driveways and Entrances: Keep driveways, loading areas and entrances serving premises clear and available to Owner, Owner's employees, and

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emergency vehicles at all times. Do not use these areas for parking or storage of materials.

2. Schedule deliveries to minimize use of driveways and entrances.
  3. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- D. Use of Existing Building: Maintain existing building in a weather-tight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

**1.6 OWNER'S OCCUPANCY REQUIREMENTS**

A. Owner Occupancy: Owner will occupy site and existing buildings during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with the educational process. Maintain existing exits, unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.

B. Contractor shall obtain approval from authorities having jurisdiction for each specific portion of the Work to be occupied before Owner occupancy.

1. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed.
2. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

**1.7 SPECIFICATION FORMATS AND CONVENTIONS**

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "Master Format" numbering system.

B. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.

END OF SECTION 01100

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SECTION 01250 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

1.2 MINOR CHANGES IN THE WORK

- A. Owner will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: When requested by the Owner, the Contractor will draft a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests by Owner are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include costs of labor and supervision directly attributable to the change.
    - b. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Owner.
  - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include costs of labor and supervision directly attributable to the change.

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3. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

1.4 CHANGE ORDER PROCEDURES

- A. A Change Order will be issued upon the Owner's approval of a Proposal Request, Owner

END OF SECTION 01250

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SECTION 01290 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES.

- A. The Contractor shall prepare and use AIA document G702-1992 application for certification of payment and AIA document G703-1992 continuation sheets for all projects equal or in excess of \$25,000.00.
- B. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
- C. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
- D. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports.
  - 1. Each item in the Schedule of Values and Applications for Payment shall be completed. Include total cost and proportionate share of general overhead and profit for each item.
    - a. Temporary facilities and other major cost items i.e., Bid Performance Bonding Fees, that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
    - b. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
- E. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.
- F. Submit the Schedule of Values to Owner at earliest possible date but no later than ten (10) days before the date scheduled for submittal of initial Applications for Payment.

1.3 APPLICATIONS FOR PAYMENT.

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- A. Include the following Project identification on the Applications for Payment:
1. Project name and Purchase Order Number.
  2. Contractor's name and address.
  3. Contractor's Invoice number
  4. Date of submittal.
- C. **All applications for payments shall be made to the attention of the Owner's Representative**, Shelby County Schools' Division of Facilities Management, 1364 Farmville Rd., Memphis TN 38122.
- D. Payment Application Times.
1. Partial payments up to 95% of the total contract amount will be approved based on which of the following (a) or (b) applies to this project.
    - a. Schedule of Values.
    - b. Amount of work completed.
  2. A final payment of 5% of the total contract amount will be approved when the Contractor has presented the Owner with evidence of completion of Project closeout requirements as in Section 01770 "Closeout Procedures".

PART 2 - (Not applicable)

PART 3 - (Not applicable)

END OF SECTION 01290

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SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Pre-Bid Conference
2. Pre-Construction Conference.
3. Project meetings.

1.2 PROJECT MEETINGS

A. General: Owner will schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Owner shall notify all invited attendees of scheduled meeting dates and times.
2. Agenda: Owner will prepare the meeting agenda and distribute the agenda to all invited attendees.
3. Minutes: Owner will record significant discussions and agreements achieved, distribute the meeting minutes to everyone concerned, within three (3) days of the meeting.

B. Pre-Bid Meeting: Refer to Section 01000 – General Requirements, Part 1.2 of these documents.

C. Preconstruction Meeting: Refer to Section 01000 – General Requirements, Part 1.5 of these documents, and to items below.

1. Attendees: Authorized representatives of Owner and Contractor and its major subcontractors and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Project will not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

C. Progress Meetings will be established at the Pre-Construction Conference.

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1. Attendees: Authorized representatives of Owner and Contractor and its major subcontractors and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
  - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - 1) Review schedule for next period.

END OF SECTION 01310



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SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. See Division 1 Section "Closeout Procedures" for submitting warranties.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals as noted in Division 2 through Division 16.
- B. Processing Time: Allow enough time for submittal review, including time for re-submittals, as follows. Time for review shall commence on Owner's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including re-submittals.
  - 1. Submittals: Submittals will be reviewed by Owner and returned to Contractor within five (5) work days.
- C. Identification: Place a permanent label or title block on each submittal for identification.

Include the following information on label for processing and recording action taken:

- 1. Project name.
- 2. Date.
- 3. Name and address of Contractor.
- 4. Name and address of subcontractor.
- 5. Name and address of supplier.
- 6. Name of manufacturer.
- 7. Submittal number or other unique identifier, including revision identifier.
- 8. Number and title of appropriate Specification Section.
- 9. Drawing number and detail references, as appropriate.

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10. Location(s) where product is to be installed, as appropriate.
  11. Other necessary identification.
- C. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- D. Additional Copies: Unless additional copies are required for final submittal, and unless Owner observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
1. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.
- E. Re-submittals: Make re-submittals in same form and number of copies as initial submittal.
- F. Distribution: Contractor shall furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- G. Use for Construction: Use only final submittals with mark indicating Owner's approval.

1.4 CONTRACTOR'S USE OF OWNER'S CAD FILES

- A. General: At Contractor's written request, copies of Owner's CAD files will be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:
1. Limitation of CAD system formats.
  2. Cost of providing files in various Medias.
  3. Delivery time.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.

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3. Include the following information, as applicable:
    - a. Manufacturer's written recommendations.
    - b. Manufacturer's product specifications.
    - c. Manufacturer's installation instructions.
    - d. Manufacturer's catalog cuts.
    - e. Compliance with specified referenced standards.
    - f. Testing by recognized testing agency.
  4. Number of Copies: Submit two copies of Product Data, unless otherwise indicated. Owner will return one copy. Mark up and retain one returned copy as a Project Record Document.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal of Owner's CAD Drawings is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Dimensions.
    - b. Identification of products.
    - c. Fabrication and installation drawings.
    - d. Roughing-in and setting diagrams.
    - e. Shop work manufacturing instructions.
    - f. Templates and patterns.
    - g. Schedules.
    - h. Notation of coordination requirements.
    - i. Notation of dimensions established by field measurement.
    - j. Relationship to adjoining construction clearly indicated.
    - k. Seal and signature of professional engineer if required.
  2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches .

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3. Number of Copies: Submit two opaque (bond) copies of each submittal. Owner will return one copy.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of appropriate Specification Section.
  3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
  4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Owner will return submittal with options selected.
  5. Samples for Verification: Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
    - a. Number of Samples: Submit two sets of Samples. Owner will retain one Sample set; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
- E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location.
1. Number of Copies: Submit two copies of product schedule or list, unless otherwise indicated. Architect will return one copy.

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**2.2 INFORMATIONAL SUBMITTALS**

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
  - 1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Owner will not return copies.
- B. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- C. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- D. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- E. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- F. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.
- G. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
  - 1. Statement on condition of substrates and their acceptability for installation of product.
  - 2. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  - 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
- H. Material Safety Data Sheets (MSDSs): Submit information directly to Owner.

**2.3 DELEGATED DESIGN**

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. Refer to Division 1, Section 01000, Part 1.6.

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- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit two copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01330

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SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. See Division 1 Section 1770 "Closeout Procedures" for submitting warranties for Contract closeout.
- C. See Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.
- D. The contractor is to supply all materials required to complete the work. All materials are to be new and of top quality.

1.2 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

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- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Contractor shall make all Substitution Requests on the Contractor's letterhead.
  2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified material or product cannot be provided.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
    - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
    - j. Cost information, including a proposal of change, if any, in the Contract Sum.



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- k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
          - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
      - 3. Owner's Action: If necessary, Owner will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Owner will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
        - a. Use product specified if Owner cannot make a decision on use of a proposed substitution within time allocated.
    - B. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
      - 1. Owner's Action: If necessary, Owner will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Owner will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
        - a. Form of Approval: As specified in Division 1 Section 1330 "Submittal Procedures."
        - b. Use product specified if Owner cannot make a decision on use of a comparable product request within time allocated.
    - C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section 1330 "Submittal Procedures." Show compliance with requirements.
- 1.4 QUALITY ASSURANCE
  - A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project; product selected shall be compatible with products previously selected, even if previously selected products were also options.

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1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. All equipment used at the job site shall be in first-class condition and incorporate all safety appliances required by TOSHA. Adequate means shall be taken to lock, secure or otherwise safeguard the equipment from misuse or vandalism when not being used. Equipment not meeting these requirements will be removed from the job site.
- C. All construction materials delivered to the site shall be subject to inspection by the owner's representative, who shall have the right to examine the supplier's documentation to establish compliance with these specifications.
- D. Delivery and Handling:
  - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- E. Storage:
  - 1. Store products to allow for inspection and measurement of quantity or counting of units.
  - 2. Store materials in a manner that will not endanger Project structure.
  - 3. Store products that are subject to damage by the elements, under cover in a weather-tight enclosure above ground, with ventilation adequate to prevent condensation.
  - 4. Store cementitious products and materials on elevated platforms.
  - 5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
  - 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
  - 7. Protect stored products from damage and liquids from freezing.

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1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
  4. Where products are accompanied by the term "as selected," Owner will make selection.
  5. Where products are accompanied by the term "match sample," sample to be matched is Owner's.
  6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
- B. Product Selection Procedures:
1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
  2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
  3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
  4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.

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5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration.
6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration.
7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration.
8. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of a product by the other named manufacturers.
9. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Owner's sample. Owner's decision will be final on whether a proposed product matches.
  - a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.
10. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
  - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Owner will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
  - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Owner will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

**2.2 PRODUCT SUBSTITUTIONS**

- A. Timing: Owner will consider requests for substitution if received within 7 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Owner.

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- B. Conditions: Owner will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Owner will return requests without action, except to record noncompliance with these requirements:
1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
  2. Requested substitution does not require extensive revisions to the Contract Documents.
  3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  4. Substitution request is fully documented and properly submitted.
  5. Requested substitution will not adversely affect Contractor's Construction Schedule.
  6. Requested substitution has received necessary approvals of authorities having jurisdiction.
  7. Requested substitution is compatible with other portions of the Work.
  8. Requested substitution has been coordinated with other portions of the Work.
  9. Requested substitution provides specified warranty.

**2.3 COMPARABLE PRODUCTS**

- A. Conditions: Owner will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Owner will return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
  2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  3. Evidence that proposed product provides specified warranty.
  4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
  5. Samples, if requested.

END OF SECTION 01600

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SECTION 01731 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. See Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
- C. See Division 7 Section "Through-Penetration Fire-stop Systems" for patching fire-rated construction.

1.2 QUALITY ASSURANCE

- A. Structural Elements: Prior to project commencement, the Contractor shall provide designed, stamped drawings and calculations by a licensed, professional engineer, competent in structural design. There shall not be any saw cutting, drilling, etc. that will disrupt the existing structure.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
  - 1. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
- C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Owner's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.3 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.

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- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

**PART 3 - EXECUTION**

**3.1 EXAMINATION**

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
  - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
  - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

**3.2 PREPARATION**

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

**3.3 PERFORMANCE**

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to

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size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
  5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
  4. Ceilings: Patch, repair, or re-hang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 01731



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SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Inspection procedures.
  - 2. Warranties.
  - 3. Final cleaning.
- B. See Division 1 Section 1290 "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
- C. See Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
  - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Advise Owner of pending insurance changeover requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  - 6. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  - 7. Complete startup testing of systems.
  - 8. Submit test/adjust/balance records. Submit as-built drawings, two (2) hard copies and one (1) digital copy in Auto-Cad 2014 or later.

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9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  10. Advise Owner of changeover in heating/cooling and other utilities.
  11. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
  12. Complete final cleaning requirements, including touchup painting.
  13. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will approve the Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Owner, that must be completed or corrected before approval will be given.
1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
  2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
  2. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
  3. Completion shall be subject to a final inspection by the owner's representative.
  4. Copies or proof of final inspection approvals by the authorities having jurisdiction shall be delivered to the owner's representative.
  5. The Contractor shall provide a written guarantee that all products, materials and workmanship will be free from inherent defects for a period of one year from the date of acceptance by the Owner. This written guarantee shall be made on the Contractor's letterhead. Defects arising during this period shall be promptly corrected by the Contractor, at his own expense, upon notice from the Owner. This guarantee shall include all materials and labor. The Contractor shall describe the project as titled in these documents, including

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the contract's purchase order number and stating the specific warranty date(s) in the body of this guarantee statement.

6. The Contractor shall supply a written statement, on company letterhead, to the owner, stating that no asbestos-containing building materials were used in this work. The Contractor shall describe the project as titled in these documents, including the contract's purchase order number in the body of this statement.
7. All items on the Owner's punch list shall be addressed and completed.

NOTE: Final payment will not be approved until all of the above requirements are completed.

- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

**1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)**

- A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Contractor's Punch List shall be submitted to Owner on the Contractor's letterhead.
  1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

**1.5 WARRANTIES**

- A. Submittal Time: Submit written warranties to Owner for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

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2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- C. Provide Owner with three copies of each warranty, including Operation and Maintenance manuals.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

**PART 3 - EXECUTION**

**3.1 FINAL CLEANING**

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for approval of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - d. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

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- e. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- f. Sweep concrete floors broom clean in unoccupied spaces.
- g. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
- h. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
- i. Remove labels that are not permanent.
- j. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
- k. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
- l. Leave Project clean and ready for occupancy.

**3.2 WARRANTY WORK**

- A. Defects arising during the warranty period shall be promptly corrected by the Contractor, at his own expense, upon notice from the Owner. All warranty work shall be scheduled with the Owner's Representative.

END OF SECTION 01770

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SECTION 081061 SOUND AND VIDEO PROJECTOR SYSTEM

1.00 DESCRIPTION

The Contractor shall deliver, erect, connect, and furnish all: Material, Appliances, and Furnishings as detailed herein. The Contractor shall completely assemble all equipment in the System and perform all necessary wiring in order to effect complete interconnection of the components in the system. The Contractor shall provide all incidental material, appliances, hardware tools, etc., required to complete the sound reinforcement system described herein. The Contractor shall be responsible for providing and installing complete and "turnkey" system(s). The Contractor shall also perform all tests and calibrations necessary in order to show that the installed system is in proper and complete working order as specified herein. 1.01 SUBMITTALS

Submittals: Shop drawings shall be furnished detailing the proposed equipment installation in AutoCAD format on 30x42 sheets using 1/8 scale.

Equipment List:

1. Full equipment manifest that details all components of the proposed system.
2. Manufacturer's cut sheets or brochures shall be provided for all components in the system.
3. Reference List. - Sound contractor shall provide a list of similar and recent installation references for verifications of past quality of work and customer satisfaction. Include a contact name and phone number for each installation.
4. Submit detailed speaker support drawings showing exact mounting techniques for the speaker systems. Shop drawings showing proposed layout of equipment and any custom or or altered devices.
5. A system schematic including the items described below:
  - a. Nomenclature of components and cables written on schematic.
  - b. Wire designations and/or color codes.
  - c. Terminal block designation All documentation of electronic and acoustical tests. Manufacturer's instruction manuals and warranties for each component in the system including 2 sets of as-built drawings and 2 copies of all equipment manuals, operating instructions, service manuals and test documentation.

QUALIFICATIONS OF THE AV CONTRACTOR

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- A. The AV Contractor shall be a contractor normally and primarily engaged in the business of Audio Video system installation for not less than five (5) years. The AV Contractor shall also be an authorized dealer for all products furnished and installed in Shelby County and should have a State of Tennessee Contractors License in the name that the contractor is doing business as, and should be a Member of National System Contractor Association (NSCA).
- B. The contractor must employ technically competent personnel who is capable of providing complete service and technical assistance for all of the products installed. Employees must also be experienced in complex engineering techniques associated with specified equipment Sub-Contracting for installation and service will not be permitted without owner approval of sub -contractor.
- C. The contractor must maintain a service facility within 60 miles of Shelby School system at all times and should have office staff to takes service calls to prevent delays from receiving messages through answer machines or answering services. The contractor should-provide service within 24 hours of all calls received.

**2.00 SOUND, SYSTEM DESIGN SPECIFICATIONS**

- A. The intent of this section of the specification is to secure a complete and satisfactory operating system to provide natural sound amplification for speech and music or other sound source (Tape Deck, CD, etc.) within the Cafeteria, Media Center and Gymnasium.
  - 1. The system shall be equalized for naturalness and preset for ease of operation and minimum adjustment.
  - 2. The system shall be of modular design to facilitate both-system expansion and service, and shall be completely solid state.
  - 3. The Main Loudspeaker systems for the Cafeteria shall be mounted as left/right/center.

**2.01 PERFORMANCE OBJECTIVES**

- A. Provide even distribution of the reinforced sound throughout the designated areas, typically plus or minus 3dB SPL (Sound Pressure Level) front to back and side to side for one octave band pink noise centered at 2000Hz. Total variation shall not exceed plus or minus +/- 3dB SPL.
- B. Provide uniform frequency response throughout the designated areas. Typically, plus or minus 3dB across the areas with J/3 octave-bands of pink noise from 80Hzto15,000 Hz.

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- C. Provide adequate dynamic range at an acoustic distortion level sufficiently low to reproduce a SPL in excess of 96 dB with no more than .5 total harmonic distortion . The system shall be capable of delivering 96 dB average program level with an additional 10 dB-SPL peaking margin at an acoustic distortion level below 3 THz to all areas at the designated bandwidth.
- D. System shall be: free of short circuits, ground loops, parasitic oscillations, noticeable noise, hum, and instability of any form, including RF interference.

## 2.02 STRUCTURES

- A. The microphone mixer, tape decks, signal processing and amplifiers are to be installed in the equipment racks as designated. Any unused spaces in the racks are to be filled with blank panels; taking care to install vents or blank panels between all digital processor and amplifiers. Owner will furnish any millwork, counter tops or tables.

## 2.03 EQUIPMENT

- A. All wire and equipment supplied by the contractors shall be new, and be custom designed components or control circuitry shall be assembled with new parts.
- B. All materials and equipment will be new and will conform to the applicable requirements of the Underwriters Laboratories and the American National Standards Institute.
- C. All references in this document to specific brands or models of equipment are made to set a standard of quality. This standard is based upon product history, budget limitations, Owner's preferences and compatibility with other systems currently installed within the complex or school system.
- D. The following equipment items listed from 3.01 thru 4.03 are designated for the Cafeteria/stage areas. See Part 7.00 for Media Center sound/video projector system requirements and Part 14.00 for the Gymnasium sound/video projector system requirements.

## 3.01 CONNECTORS AND CONTROLS

- A. All microphone receptacles shall be Neutrik or approved equal.  
In-line microphone or balanced line connectors shall be Neutrik or approved equal.



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**3.02 MICROPHONES**

A. Furnish and Install:

Qty Two (2) Shure SLX24/58 Wireless HH Sys w/SM58

Qty Four (4) Shure SLX24/58 Wireless HH Sys w/SM58 Qty Two (2) Shure

Qty Four (4) Vu MST100-30B Microphone Stand with Telescopic Boom Arm

**3.03 CD PLAYERS / I-POD DOCK**

A. Furnish and Install:

Qty one (1) Denon DN-C615CD Player with MP3 playback or equal

**3.04 AUDIO MIXERS**

A. Furnish and Install:

Qty one (1) Behringer X32 PRODUCER 32-Channel Digital Mixing Console with Midas Preamps

**3.05 POWER AMPLIFIERS**

A. Furnish and Install the following type power amplifiers, All amplifiers shall be from same manufacture:

Qty 2 Dynacord C2800FDi DSP Power Amplifier 2x1400W, Install or equal by QSC with dsp on board amp.

**3.06 LOUDSPEAKER SYSTEM**

A. Furnish and install the following:

Qty 3 Electro-Voice EVC-1152-95B 15" Indoor Speaker, BLACK with all hanging hardware. Mount horizontally, rotate horn before installation to restore proper horn pattern.

Qty 2 Electro-Voice Live X ELX112 Speaker

**3.07 EQUIPMENT RACKS**

A. Furnish and install the following:

1. Qty One (1) shall Lowell LWBR-4022 40RU, 22" Deep Wall-Mount Rack with Support Base Or Equal by Middle Atlantic
2. Lowell LFD-40 40 RU Solid Steel Rack Front Door with Lock
3. Lowell ASCP-SCS2009-RT2 Power Sequencer
4. Lowell RPC1 Remote Power Control 15amp
5. SDR4k Drawer Sliding drawer 4 space RAXXES

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3.08 INPUT/OUTPUT JACK PLATES AND BOXES

A. Furnish and install the following:

Custom Built Jack Plates for floor boxes installed by electrician. These are to contain microphone inputs, monitor speaker outputs, auxiliary input, and HDMI input to projector

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3.09 CABLES

A. Furnish and install the following cables with permanent heat Shrink labels that state the owner name and each location that cables are used.

1. Qty Four (4) Whirlwind MKQ~25 25ft Microphone cables or equal
2. Permanent Installation Cable

a. Furnish all microphones, line level, in floor outlets using West Penn 452 shield pair or equal in Belden, pre-made multi-pair snakes will not be allowed.

b. A11 Med, High frequency, Monitors speakers shall be West Penn 226 or equal in Belden.

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4.01 PROJECTION

A. Furnish and install the following;

1. Da-Lite 99932 Professi Da-Lite 99932 Professional Electrol Projection Screen 108 x 192"
2. Epson POWERLITE-G7200W Pro G7200W Projector
3. A State of Tennessee Structural engineered letter stating means of support is satisfactory shall be provided to Owner upon completion of project.

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4.02 VIDEO PROCESSING

A. Furnish and install the following;

1. Kramer VP728 Scaler/Switcher

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4.03 PROJECTOR MOUNT

A. Furnish and install the following;

1. RPAU Projector Mount
2. CMA105-Ceiling Plate

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4.04 WIRING

A. Furnish and install the following;

1. Kramer BC-UNIKat/LSHF-305M 1000 ft CAT6a U/FTP Video & LAN

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Cable

Wiring Practices:

1. All wiring shall be executed in strict adherence to standard broadcast practices. Care shall be exercised in order to avoid damage to the cables and equipment.
2. Cable runs through the conduit system, in the equipment racks, and mixer console assemblies shall be routed in four (4) different groups according to circuit level and function. These groups shall be microphone level circuits (level below ~ 20 dbm), line level circuits (up to +30 dbm), loudspeaker circuits (above +30 dbm), and electrical power circuits. Keep wires of different power levels separated by as much physical distance as possible. Any crossing of different circuit levels must be made at a ninety (90) degree angle to the other circuit level. All cables shall be neatly arranged with plastic cable ties or in white metal finish Wiremold Raceways.
3. The contractor shall observe proper circuit polarity and loudspeaker wiring polarity. Clearly label all cables at connections as to function. Connectors shall be wired by mc 268 standard as follows:

WIRE

Red or White  
Black  
Shield Of Drain Wire

XLRCOONN

Pin #2  
Pin #3  
Pin #1

TRS 1/411 COONN

Tip  
Ring  
Sleeve

POLARITY

Positive (+)  
Negative (M)  
Common

4. All cables and wires will have suitable cross sections to provide safe current carrying capacity and intrinsic strength for the purposes for which they will be used.

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5. All cables, wires and equipment will be firmly held in place. Fastenings and support must be adequate to carry twice the anticipated load, or a safety factor of 100.
6. All cables shall be continuous lengths without splices. All system wire, after being cut and stripped, shall have the wire strands twisted back to their original lay and be terminated by approved soldered or mechanical means. Except where noted otherwise in the specifications, NO BARE WIRE TERMINATION'S WILL BE ACCEPTED. Heat-shrink tubing shall be used to insulate the ground or drain wire. Unused wires at the end of a cable shall remain unstripped and shall be laid back and held in place with wire ties. Any system wiring terminations shall be kept in equipment cabinets or junction boxes adjacent to the equipment racks only. Once again, all wiring runs to remote locations shall be continuous and splice free. Signal cables shall be of a high quality, low loss, low capacitance type.
7. All solder connection shall be made with rosin-core solder. Care shall be taken to avoid cold or cracked solder joints. Any solder connections that do not appear to be clean and shiny or which show signs of cracking shall be resoldered by the contractor before final acceptance of the system.

All mechanical connections shall be made with insulated, crimp-on type connectors. The wire shall be bonded to the connector by soldering the wire to the metal part of the connector. The only exception to this shall be for the connections to speaker components.

The wire ends that connect to the speaker terminals shall be tinned and shall not be stripped more than 1/2 inch. Connections of the bare wires to the terminals shall then be made in the conventional manner.

ALL SPEAKER DEVICES SHALL HAVE HOME RUNS TO THEIR RESPECTIVE TERMINAL BLOCKS WITHIN OR ADJACENT TO THE AMPLIFIER RACKS IN A DEDICATED METALLIC RACEWAY.

**B. Grounding Scheme:**

1. The grounding point for all rack-mounted equipment shall be the right rack rail. To accommodate this, all paint must be removed from the front of the right rack rail where the equipment is mounted. A #4 stranded insulated ground wire must be firmly bonded to each grounding rack rail. The connection point on each rack rail must be a bare metal area free from any corrosion.

For locations where multiple equipment racks exist, the grounding rack rail in each rack shall be connected by a #6 stranded insulated wire to any Isolated Ground Bus bar (IGB) at the rack location. The IGB may be located in one of the equipment racks or in a "J" box outside the racks.

- A. #4 ground wire shall be connected to this IGB to complete rack grounding.

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- B. The sound contractor shall make the chassis ground connection for each piece of equipment the right rack ear.
  - C. All paint must be removed from the back of the right rack ear that mounts against the grounding rack rail.
- 

All adjacent equipment racks shall be bolted very tightly together. Casual contact is not acceptable. All conduit feeding equipment racks MUST be totally insulated from the racks as the equipment racks must be electrically isolated from all conduits, raceways) ventilation ducts. and metallic objects excluding other equipment racks. This may be done with items such as Carlon PV -Duit, The shields of all balanced interconnecting circuits in the audio signal path shall be lifted only at the signal input of each piece of equipment The shields at the other end of those wires for circuit levels below +30 dbm must be terminated. Microphone circuits between patch bays and splitters shall have 'shield connected at both ends.

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General Installation Practices:

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1. All equipment shall be held firmly in place with proper types of mounting hardware. The sound contractor shall assume responsibility for verifying there is ventilation for~ all enclosed equipment items which produce heat. , The installation must appear neat and organized in all areas
  2. The work space in and around the audio equipment shall be free of debris of any kind. Care shall be taken to remove all metal shavings, stripped Insulation, etc. from the racks and consoles.
- Installation of materials and equipment must meet REA industry standards in all respects with specific attention given top methods employed for wiring, cabling, terminations, cable dressing, cable and wire labeling, documentation, equipment room layout, general appearance, equipment operation and performance, The successful bidder must remove from the premises all packing, crates and other litter associated with the installation.

5.01 Speaker Installation:

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The speakers shall be installed via rated and approved medium. All hardware and parts used shall have a working load rating of at least five (5) times the weight of any unit that it is supporting and meet standard rigging requirements. All components shall be mounted with mounting devices that allow ample flexibility in rotation, azimuth, and elevation. All components shall have safety cables or rods attached for additional security as needed.

NOTE: The actual speaker suspension and rigging shall meet all methods of approval by a licensed structural engineer.

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**6.01 LABELING**

A. All nomenclature on labels, plates, and designation strips shall be done in capital letters M typically in 1/8" white block letters.

B. Clearly and permanently label all jacks, microphone receptacles, equipment controls and patch bays. This is to be done with an engraved plastic laminate approved equal permanently affixed to each unit. Contractor should use different color strips for each signal level or type of circuit identified. This color code shall be approved by the owner.

Sound contractor shall use approved designations. He shall logically label any devices not having a designation in order to coincide with the designations used elsewhere in the system.

C. All patch panels shall be labeled with an engraved plastic laminate trip or approved all patch panels shall be labeled with an engraved plastic laminate trip or approved equal permanently affixed to each unit. Letters shall be 1/8<sup>11</sup> white block. Care shall be taken in layout of labeling to avoid confusion between adjacent jack labels. All rack mounted equipment shall be labeled on front and rear as outline in A, B, and C above. Labels shall be of a uniform size and layout for each type of equipment as follows: .

1. Line 1: Generic name of device such as POWER AMPLIFIER
2. Line 2: Designation of device such as P A-IA
3. Line 3: Control area of device such as STAGE RIGHT HORN F.

All wiring should be permanently labeled at both ends with corresponding numbering or lettering noted on the "as built" drawings.

Subsequent to the date of final system testing the sound contractor shall perform and document the following measurements. Copies of these test reports shall be available for review by the consultant and owner 14 days before the date of final system testing. Coordinate with Owner and Consultant scheduling of final tests and adjustments. Provided two (2) technicians familiar with system during final testing.

1. Measure and record the AC. impedance of each speaker line at 50.0., 1000, and 4,00.0 Hz before connecting it to its respective amplifier. The load impedance shall be greater than or equal to the amplifier's rated impedance at the intended operating frequency. Record results.

2. Measure the output of each amplifier with an oscilloscope using a sine-wave oscillator having less than 0.5 THD as an input. The signal level shall be adjusted to produced IOdB less than the intended maximum SPL of each driver. This measurement shall be done with 'speakers connected using a frequency which

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the amplifier will be called upon to reproduce. Inspect the output sine-wave appearing on the oscilloscope for complete freedom from hum, noise parasitic oscillations, and RF interference. Record results.

Prior to the dates of the final system testing the sound contractor shall perform the following:

1. Burn in and test all electronics to insure proper operation and stability. Check all mic jacks, speaker jacks, inputs and outputs on all equipment for proper installation and operation.
2. Set the gain structure, adjust power levels and equalize all systems.
3. Verify all phases of system installation for accuracy and stability.

## 6.02 ACCEPTANCE OF SYSTEM

- A. After completion of all initial test and adjustments by the contractor to ensure a fully operational and complete system, the Owner/Engineer is to be notified in writing that the system is ready for final inspection, testing, setting of gain structure and equalization. This is to be done prior to any use of the system other than for testing purposes.
- B. Should the need for further adjustments or work become necessary during final testing, sound contractor will continue his work until system is acceptable at no addition to the contract price. If approval is delayed because of defective equipment or failure of equipment or installation to meet these specifications, the contractor will pay for any additional time and expenses of the consultant during any extension of the testing period.

Final acceptance of the system by Owner/Engineer will be forthcoming upon the following:

Delivery of all contracted equipment.  
Completion of the Sound System. as specified.  
Final check of the system by owner.  
Delivery of all specified documentation.  
Completion of training period for facility technical crew.  
One-year warranty on parts and labor upon completion  
END OF SECTION

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**MEDIA CENTER SPECS**

**7.00 SOUND, SYSTEM DESIGN SPECIFICATIONS**

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- B. The intent of this section of the specification is to secure a complete and satisfactory operating system to provide natural sound amplification for speech and music or other sound source ( Tape Deck, CD, etc.) within the Media Center.
  - 4. The system shall be equalized for naturalness and preset for ease of operation and minimum adjustment.
  - 5. The system shall be of modular design to facilitate both-system expansion and service, and shall be completely solid state.
  - 6. The Main Loudspeaker systems for the Media Center shall mbe ceiling mounted
  - 7. All cable should be installed in conduit system furnished and installed by Division 16 contractor.
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**7.01 PERFORMANCE OBJECTIVES**

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- C. Provide even distribution of the reinforced sound throughout the designated areas, typically plus or minus 3dB SPL (Sound Pressure Level) front to back and side to side for one octave band pink noise centered at 2000Hz. Total variation shall not exceed plus or minus +/- 3dB SPL.
  - D. Provide uniform frequency response throughout the designated areas. Typically, plus or minus 3dB across the areas with J/3 octave-bands of pink noise from 80Hzto15,000 Hz.
  - C. Provide adequate dynamic range at an acoustic distortion level sufficiently low to reproduce a SPL in excess of96 dB with no more than .5 total harmonic distortion . The system shall be capable of delivering 96 dB average program level with an additional 10 dB-SPL peaking margin at an acoustic distortion level below 3 TIm to all areas at the designated bandwidth.
  - D. System shall be: free of short circuits, ground loops, parasitic oscillations, noticeable noise, hum, and instability of any form, including RF interference.
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**7.02 STRUCTURES**

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- B. The microphone mixer, tape decks, signal processing and amplifiers are to be installed in the equipment racks as designated. Any unused spaces in the racks are to be filled with blank panels; taking care to install vents or blank panels between all digital processor and amplifiers. Owner will furnish any millwork, counter tops or tables.

**7.03 EQUIPMENT**

- D. All wire and equipment supplied by the contractors shall be new, and be custom designed components or control circuitry shall be assembled with new parts.
- E. All materials and equipment will be new and will conform to the applicable requirements of the Underwriters Laboratories and the American National Standards Institute.
- F. All references in this document to specific brands or models of equipment are made to set a standard of quality. This standard is based upon product history, budget limitations, Owner's preferences and compatibility with other systems currently installed within the complex or school system.

**8.01 CONNECTORS AND CONTROLS**

- A. All microphone receptacles shall be Neutrik or approved equal.  
In-line microphone or balanced line connectors shall be Neutrik or approved equal.

**8.02 MICROPHONES**

- A. Furnish and Install:  
Qty One (1) Shure SM58

**8.03 AUDIO MIXERS**

- A. Furnish and Install:  
Qty one (1) Symetrix JUPITER 4 DSP Processor 4 Inputs x 4 Outputs  
Qty one (1) Symetrix ARC-2E-SYMNET Adaptive Remote for Symnet

**8.04 POWER AMPLIFIERS**

- A. Furnish and Install the following type power amplifiers, All amplifiers shall be from same manufacture:  
Qty One(1) Dynacord C1300FDi C-Series FIR-Drive Power Amplifier 1300W

**8.05 LOUDSPEAKER SYSTEM**

- A. Furnish and install the following:  
Qty 4 Electro-Voice EVID-P6.2 White Pendant Speaker

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**8.06 EQUIPMENT RACKS**

A. Furnish and install the following:

1. One (1) Middle Atlantic DWR-18-26 26" Deep, 18-Space Wall Rack5. SDR4k Drawer Sliding drawer 4 space RAXXES
2. One (1) Furman PS8R-II Power Conditioner & Sequencer, 15 Amp
3. Equipment rack to be installed in location designated by Owners representative and identified at the pre-bid meeting.

**8.07 INPUT/OUTPUT JACK PLATES AND BOXES**

A. Furnish and install the following:

1. Qty One (1) Wall Plate for Microphone Connection, Neutrik
2. Qty One (1) Wall Plate for HDMI Connection, Kramer
3. Qty One (1) Wall Plate for Aux Audio Connection

**8.08 CABLES**

A. Furnish and install the following cables with permanent heat Shrink labels that state the owner name and each location that cables are used.

1. Qty One (1) Whirlwind MKQ~25 25ft Microphone cables or equal
2. Permanent Installation Cable
  - a. Furnish all microphones, line level, in floor outlets using West Penn 452 shield pair or equal in Belden, pre-made multi-pair snakes will not be allowed.
  - b. A11 Med, High frequency, Monitors speakers shall be West Penn 226 or equal in Belden.

**9.01 PROJECTION**

A. Furnish and install the following;

1. Middle Atlantic DWR-18-26 26" Deep, 28-Space Wall Rack
2. Optoma WU515TST 5500 Lumens WUXGA DLP Short Throw Projector

**9.02 PROJECTOR MOUNT**

A. Furnish and install the following;

1. RPAU Projector Mount
2. CMA105-Ceiling Plate

**10.1 WIRING**

Wiring Practices:

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2. All wiring shall be executed in strict adherence to standard broadcast practices. Care shall be exercised in order to avoid damage to the cables and equipment.
2. Cable runs through the conduit system, in the equipment racks, and mixer console assemblies shall be routed in four (4) different groups according to circuit level and function. These groups shall be microphone level circuits (level below ~ 20 dbm), line level circuits (up to +30 dbm), loudspeaker circuits (above +30 dbm), and electrical power circuits. Keep wires of different power levels separated by as much physical distance as possible. Any crossing of different circuit levels must be made at a ninety (90) degree angle to the other circuit level. All cables shall be neatly arranged with plastic cable ties or in Pundit Wiremold Raceways.
3. The contractor shall observe proper circuit polarity and loudspeaker wiring polarity. Clearly label all cables at connections as to function. Connectors shall be wired by mc 268 standard as follows:

WIRE

Red or White

Black

Shield Of Drain Wire

XLRCONN

Pin #2

Pin #3

Pin #1

TRS 1/411 CONN

Tip

Ring

Sleeve

POLARITY

Positive (+)

Negative (M)

Common

4. All cables and wires will have suitable cross sections to provide safe current carrying capacity and intrinsic strength for the purposes for which they will be used.
5. All cables, wires and equipment will be firmly held in place. Fastenings and support must be adequate to carry twice the anticipated load, or a safety factor of 100.

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6. All cables shall be continuous lengths without splices. All system wire, after being cut and stripped, shall have the wire strands twisted back to their original lay and be terminated by approved soldered or mechanical means. Except where noted otherwise in the specifications, **NO BARE WIRE TERMINATION'S WILL BE ACCEPTED.** Heat-shrink tubing shall be used to insulate the ground or drain wire. Unused wires at the end of a cable shall remain unstripped and shall be laid back and held in place with wire ties. Any system wiring terminations shall be kept in equipment cabinets or junction boxes adjacent to the equipment racks only. Once again, all wiring runs to remote locations shall be continuous and splice free. Signal cables shall be of a high quality, low loss, low capacitance type.
7. All solder connection shall be made with rosin-core solder. Care shall be taken to avoid cold or cracked solder joints. Any solder connections that do not appear to be clean and shiny or which show signs of cracking shall be resoldered by the contractor before final acceptance of the system.

All mechanical connections shall be made with insulated, crimp-on type connectors. The wire shall be bonded to the connector by soldering the wire to the metal part of the connector. The only exception to this shall be for the connections to speaker components.

The wire ends that connect to the speaker terminals shall be tinned and shall not be stripped more than 1/2 inch. Connections of the bare wires to the terminals shall then be made in the conventional manner.

**ALL SPEAKER DEVICES SHALL HAVE HOME RUNS TO THEIR RESPECTIVE TERMINAL BLOCKS WITHIN OR ADJACENT TO THE AMPLIFIER RACKS IN A DEDICATED METALLIC RACEWAY.**

**B. Grounding Scheme:**

1. The grounding point for all rack-mounted equipment shall be the right rack rail. To accommodate this, all paint must be removed from the front of the right rack rail where the equipment is mounted. A #4 stranded insulated ground wire must be firmly bonded to each grounding rack rail. The connection point on each rack rail must be a bare metal area free from any corrosion.

For locations where multiple equipment racks exist, the grounding rack rail in each rack shall be connected by a #6 stranded insulated wire to any Isolated Ground Bus bar (IGB) at the rack location. The IGB may be located in one of the equipment racks or in a "J" box outside the racks.

- A. #4 ground wire shall be connected to this IGB to complete rack grounding.
- B. The sound contractor shall make the chassis ground connection for each piece of equipment the right rack ear.
- C. All paint must be removed from the back of the right rack ear that

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mounts against the grounding rack rail.

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All adjacent equipment racks shall be bolted very tightly together. Casual contact is not acceptable. All conduit feeding equipment racks MUST be totally insulated from the racks as the equipment racks must be electrically isolated from all conduits, raceways) ventilation ducts. and metallic objects excluding other equipment racks. This may be done with items such as Carlon PV -Duit, The shields of all balanced interconnecting circuits in the audio signal path shall be lifted only at the signal input of each piece of equipment The shields at the other end of those wires for circuit levels below +30 dbm must be terminated. Microphone circuits between patch bays and splitters shall have 'shield connected at both ends.

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### General Installation Practices:

---

1. All equipment shall be held firmly in place with proper types of mounting hardware. The sound contractor shall assume responsibility for verifying there is ventilation for~ all enclosed equipment items which produce heat. ,

The installation must appear neat and organized in all areas

2. The work space in and around the audio equipment shall be free of debris of any kind. Care shall be taken to remove all metal shavings, stripped Insulation, etc. from the racks and consoles.

Installation of materials and equipment must meet REA industry standards in all respects with specific attention given top methods employed for wiring, cabling, terminations, cable dressing, cable and wire labeling, documentation, equipment room layout, general appearance, equipment operation and performance, The successful bidder must remove from the premises all packing, crates and other litter associated with the installation.

### 11.01 Speaker Installation:

---

The speakers shall be installed via rated and approved medium. All hardware and parts used shall have a working load rating of at least five (5) times the weight of any unit that it is supporting and meet standard rigging requirements. All components shall be mounted with mounting devices that allow ample flexibility in rotation, azimuth, and elevation.

All components shall have safety cables or rods attached for additional security as needed.

NOTE: The actual speaker suspension and rigging shall meet all methods of approval by a licensed structural engineer.

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### 12.01 LABELING

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A. All nomenclature on labels, plates, and designation strips shall be done in capital letters M typically in 1/8" white block letters.

B. Clearly and permanently label all jacks, microphone receptacles, equipment controls and patch bays. This is to be done with an engraved plastic laminate approved equal permanently affixed to each unit. Contractor should use different color strips for each signal level or type of circuit identified. This color code shall be approved by the owner.

Sound contractor shall use approved designations. He shall logically label any devices not having a designation in order to coincide with the designations used elsewhere in the system.

C. All patch panels shall be labeled with an engraved plastic laminate trip or approved all patch panels shall be labeled with an engraved plastic laminate trip or approved equal permanently affixed to each unit. Letters shall be 1/8<sup>11</sup> white block. Care shall be taken in layout of labeling to avoid confusion between adjacent jack labels. All rack mounted equipment shall be labeled on front and rear as outline in A, B, and C above. Labels shall be of a uniform size and layout for each type of equipment as follows: .

1. Line 1: Generic name of device such as POWER AMPLIFIER
2. Line 2: Designation of device such as P A-IA
3. Line 3: Control area of device such as STAGE RIGHT HORN F.

All wiring should be permanently labeled at both ends with corresponding numbering or lettering noted on the "as built" drawings.

Subsequent to the date of final system testing the sound contractor shall perform and document the following measurements. Copies of these test reports shall be available for review by the consultant and owner 14 days before the date of final system testing. Coordinate with Owner and Consultant scheduling of final tests and adjustments. Provided two (2) technicians familiar with system during final testing.

1. Measure and record the AC. impedance of each speaker line at 50.0., 1000, and 4,00.0 Hz before connecting it to its respective amplifier. The load impedance shall be greater than or equal to the amplifier's rated impedance at the intended operating frequency. Record results.

2. Measure the output of each amplifier with an oscilloscope using a sine-wave oscillator having less than 0.5 THD as an input. The signal level shall be adjusted to produced IOdB less than the intended maximum SPL of each driver. This measurement shall be done with 'speakers connected using a frequency which the amplifier will be called upon to reproduce. Inspect the output sine-wave appearing on the oscilloscope for complete freedom from hum, noise parasitic oscillations, and RF interference. Record results.

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Prior to the dates of the final system testing the sound contractor shall perform the following:

1. Burn in and test all electronics to insure proper operation and stability.  
Check all mic jacks, speaker jacks, inputs and outputs on all equipment for proper installation and operation.
2. Set the gain structure, adjust power levels and equalize all systems.
3. Verify all phases of system installation for accuracy and stability.

### 13.02 ACCEPTANCE OF SYSTEM

- A. After completion of all initial test and adjustments by the contractor to ensure a fully operational and complete system, the Owner/Engineer is to be notified in writing that the system is ready for final inspection, testing, setting of gain structure and equalization. This is to be done prior to any use of the system other than for testing purposes.
- B. Should the need for further adjustments or work become necessary during final testing, sound contractor will continue his work until system is acceptable at no addition to the contract price. If approval is delayed because of defective equipment or failure of equipment or installation to meet these specifications, the contractor will pay for any additional time and expenses of the consultant during any extension of the testing period.

Final acceptance of the system by Owner/Engineer will be forthcoming upon the following:

Delivery of all contracted equipment.  
Completion of the Sound System. as specified.  
Final check of the system by owner.  
Delivery of all specified documentation.  
Completion of training period for facility technical crew.  
One-year warranty on parts and labor upon completion  
END OF SECTION

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**GYMNASIUM SPECIFICATIONS**

**14.00 SOUND, SYSTEM DESIGN SPECIFICATIONS**

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- C. The intent of this section of the specification is to secure a complete and satisfactory operating system to provide natural sound amplification for speech and music or other sound source ( Tape Deck, CD, etc.) within the Gymnasium.
  - 8. The system shall be equalized for naturalness and preset for ease of operation and minimum adjustment.
  - 9. The system shall be of modular design to facilitate both-system expansion and service, and shall be completely solid state.
  - 10. The Main Loudspeaker systems for the Auditorium shall be mounted as left/right/center.
  - 11. All cable should be installed in conduit system furnished and installed by Division 16 contractor.
- 

**14.01 PERFORMANCE OBJECTIVES**

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- E. Provide even distribution of the reinforced sound throughout the designated areas, typically plus or minus 3dB SPL (Sound Pressure Level) front to back and side to side for one octave band pink noise centered at 2000Hz. Total variation shall not exceed plus or minus +/- 3dB SPL.
  - F. Provide uniform frequency response throughout the designated areas. Typically, plus or minus 3dB across the areas with J/3 octave-bands of pink noise from 80Hz to 15,000 Hz.
  - C. Provide adequate dynamic range at an acoustic distortion level sufficiently low to reproduce a SPL in excess of 96 dB with no more than .5 total harmonic distortion. The system shall be capable of delivering 96 dB average program level with an additional 10 dB-SPL peaking margin at an acoustic distortion level below 3 THD to all areas at the designated bandwidth.
  - D. System shall be: free of short circuits, ground loops, parasitic oscillations, noticeable noise, hum, and instability of any form, including RF interference.
- 

**14.02 STRUCTURES**

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- C. The microphone mixer, tape decks, signal processing and amplifiers are to be installed in the equipment racks as designated. Any unused spaces in the racks are to be filled with blank panels; taking care to install vents or blank panels between all digital processor and amplifiers. Owner will furnish any millwork, counter tops or tables.

**14.03 EQUIPMENT**

- G. All wire and equipment supplied by the contractors shall be new, and be custom designed components or control circuitry shall be assembled with new parts.
- H. All materials and equipment will be new and will conform to the applicable requirements of the Underwriters Laboratories and the American National Standards Institute.
- I. All references in this document to specific brands or models of equipment are made to set a standard of quality. This standard is based upon product history, budget limitations, Owner's preferences and compatibility with other systems currently installed within the complex or school system.

**15.01 CONNECTORS AND CONTROLS**

- A. All microphone receptacles shall be Neutrik or approved equal.  
In-line microphone or balanced line connectors shall be Neutrik or approved equal.

**15.02 MICROPHONES**

- A. Furnish and Install:  
Qty One (1) Shure SLX24/58 Wireless HH Sys w/SM58

**15.03 AUDIO MIXERS**

- A. Furnish and Install:  
Qty one (1) Symetrix JUPITER 4 DSP Processor 4 Inputs x 4 Outputs  
Qty one (1) Symetrix ARC-2E-SYMNET Adaptive Remote for Symnet

**15.04 POWER AMPLIFIERS**

- A. Furnish and Install the following type power amplifiers, All amplifiers shall be from same manufacture:  
Qty One (1) Dynacord L3600FD DSP Power Amplifier 2 x 1800W

**15.05 LOUDSPEAKER SYSTEM**

- A. Furnish and install the following:

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Qty Two (2) Electro-Voice EVC-1152-95B 15" Indoor Speaker. Mount horizontally, rotate horn before installation to restore proper horn pattern.

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**15.06 EQUIPMENT RACKS**

A. Furnish and install the following:

1. Qty One (1) MIDDLE ATLANTIC EWR16-17SD Sectional Wall Rack, 16 sp MIDDLE ATLANTIC
  2. Furman PS8R-II Power Conditioner & Sequencer, 15 Amp
  3. Equipment rack to be installed in location designated by Owners representative and identified at the pre-bid meeting.
- 

**15.07 INPUT/OUTPUT JACK PLATES AND BOXES**

A. Furnish and install the following:

1. Qty One (1) Wall Plate for Microphone Connection, Neutrik
  2. Qty One (1) Wall Plate for HDMI Connection, Kramer
  3. Qty One (1) Wall Plate for Aux Audio Connection
- 

**15.08 CABLES**

A. Furnish and install the following cables with permanent heat Shrink labels that state the owner name and each location that cables are used.

1. Permanent Installation Cable
    - a. Furnish all microphones, line level, in floor outlets using West Penn 452 shield pair or equal in Belden, pre-made multi-pair snakes will not be allowed.
    - b. A11 Med, High frequency, Monitors speakers shall be West Penn 226 or equal in Belden.
- 

**16.01 PROJECTION**

A. Furnish and install the following;

1. Da-Lite 96391L 106" x 188" Large Cosmopolitan Electrol® Matte White Screen with LVC
  2. Epson PowerLite Pro G7905U Projector V11H749120
  3. Epson ELPLM11 Middle Zoom Lens #4 for Pro G7000 and L1000 Series 4.84 - 7.39.
  4. A State of Tennessee Structural engineered letter stating means of support is satisfactory shall be provided to Owner upon completion.
-

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16.02 PROJECTOR MOUNT

A. Furnish and install the following;

1. RPAU Projector Mount
2. CMA105-Ceiling Plate
3. Protective Cage for Projector, PG3A Projector Guard, Extra Large

16.03 WIRING

A. Furnish and install the following;

1. Kramer CP-AOCH-98 Fiber Optic Plenum Rated High Speed HDMI Cable (98')

Wiring Practices:

3. All wiring shall be executed in strict adherence to standard broadcast practices. Care shall be exercised in order to avoid damage to the cables and equipment.
2. Cable runs through the conduit system, in the equipment racks, and mixer console assemblies shall be routed in four (4) different groups according to circuit level and function. These groups shall be microphone level circuits (level below ~ 20 dbm), line level circuits (up to +30 dbm), loudspeaker circuits (above +30 dbm), and electrical power circuits. Keep wires of different power levels separated by as much physical distance as possible. Any crossing of different circuit levels must be made at a ninety (90) degree angle to the other circuit level. All cables shall be neatly arranged with plastic cable ties or in Pundit Wiremold Raceways.
3. The contractor shall observe proper circuit polarity and loudspeaker wiring polarity. Clearly label all cables at connections as to function. Connectors shall be wired by mc 268 standard as follows:

WIRE

Red or White

Black

Shield Of Drain Wire

XLRCOONN

Pin #2

Pin #3

Pin #1

TRS 1/411 CONN

Tip

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Ring  
Sleeve

---

POLARITY  
Positive (+)  
Negative (M)  
Common

---

4. All cables and wires will have suitable cross sections to provide safe current carrying capacity and intrinsic strength for the purposes for which they will be used.
5. All cables, wires and equipment will be firmly held in place. Fastenings and support must be adequate to carry twice the anticipated load, or a safety factor of 100.
6. All cables shall be continuous lengths without splices. All system wire, after being cut and stripped, shall have the wire strands twisted back to their original lay and be terminated by approved soldered or mechanical means. Except where noted otherwise in the specifications, **NO BARE WIRE TERMINATION'S WILL BE ACCEPTED.** Heat-shrink tubing shall be used to insulate the ground or drain wire. Unused wires at the end of a cable shall remain unstripped and shall be laid back and held in place with wire ties. Any system wiring terminations shall be kept in equipment cabinets or junction boxes adjacent to the equipment racks only. Once again, all wiring runs to remote locations shall be continuous and splice free. Signal cables shall be of a high quality, low loss, low capacitance type.
7. All solder connection shall be made with rosin-core solder. Care shall be taken to avoid cold or cracked solder joints. Any solder connections that do not appear to be clean and shiny or which show signs of cracking shall be resoldered by the contractor before final acceptance of the system.

All mechanical connections shall be made with insulated, crimp-on type connectors. The wire shall be bonded to the connector by soldering the wire to the metal part of the connector. The only exception to this shall be for the connections to speaker components.

The wire ends that connect to the speaker terminals shall be tinned and shall not be stripped more than 1/2 inch. Connections of the bare wires to the terminals shall then be made in the conventional manner.

**ALL SPEAKER DEVICES SHALL HAVE HOME RUNS TO THEIR RESPECTIVE TERMINAL BLOCKS WITHIN OR ADJACENT TO THE AMPLIFIER RACKS IN A DEDICATED METALLIC RACEWAY.**

**B. Grounding Scheme:**

1. The grounding point for all rack-mounted equipment shall be the right rack rail. To accommodate this, all paint must be removed from the front of the right rack rail where the equipment is

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mounted. A #4 stranded insulated ground wire must be firmly bonded to each grounding rack rail. The connection point on each rack rail must be a bare metal area free from any corrosion.

For locations where multiple equipment racks exist, the grounding rack rail in each rack shall be connected by a #6 stranded insulated wire to any Isolated Ground Bus bar (IGB) at the rack location. The IGB may be located in one of the equipment racks or in a "J" box outside the racks.

- A. #4 ground wire shall be connected to this IGB to complete rack grounding.
- B. The sound contractor shall make the chassis ground connection for each piece of equipment the right rack ear.
- C. All paint must be removed from the back of the right rack ear that mounts against the grounding rack rail.

All adjacent equipment racks shall be bolted very tightly together. Casual contact is not acceptable. All conduit feeding equipment racks MUST be totally insulated from the racks as the equipment racks must be electrically isolated from all conduits, raceways) ventilation ducts, and metallic objects excluding other equipment racks. This may be done with items such as Carlon PV -Duit, The shields of all balanced interconnecting circuits in the audio signal path shall be lifted only at the signal input of each piece of equipment The shields at the other end of those wires for circuit levels below +30 dbm must be terminated. Microphone circuits between patch bays and splitters shall have shield connected at both ends.

**General Installation Practices:**

1. All equipment shall be held firmly in place with proper types of mounting hardware. The sound contractor shall assume responsibility for verifying there is ventilation for~ all enclosed equipment items which produce heat.

The installation must appear neat and organized in all areas

2. The work space in and around the audio equipment shall be free of debris of of any kind. Care shall be taken to remove all metal shavings, stripped Insulation, etc. from the racks and consoles.

Installation of materials and equipment must meet REA industry standards in all respects with specific attention given top methods employed for wiring, cabling, terminations, cable dressing, cable and wire labeling, documentation, equipment room layout, general appearance, equipment operation and performance, The

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successful bidder must remove from the premises daily all packing, crates and other litter associated with the installation.

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17.01 Speaker Installation:

The speakers shall be installed via rated and approved medium. All hardware and parts used shall have a working load rating of at least five (5) times the weight of any unit that it is supporting and meet standard rigging requirements. All components shall be mounted with mounting devices that allow ample flexibility in rotation, azimuth, and elevation.

All components shall have safety cables or rods attached for additional security as needed.

NOTE: The actual speaker suspension and rigging shall meet all methods of approval by a licensed structural engineer.

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18.01 LABELING

A. All nomenclature on labels, plates, and designation strips shall be done in capital letters M typically in 1/8" white block letters.

B. Clearly and permanently label all jacks, microphone receptacles, equipment controls and patch bays. This is to be done with an engraved plastic laminate approved equal permanently affixed to each unit. Contractor should use different color strips for each signal level or type of circuit identified. This color code shall be approved by the owner.

Sound contractor shall use approved designations. He shall logically label any devices not having a designation in order to coincide with the designations used elsewhere in the system.

C. All patch panels shall be labeled with an engraved plastic laminate trip or approved all patch panels shall be labeled with an engraved plastic laminate trip or approved equal permanently affixed to each unit. Letters shall be 1/8<sup>11</sup> white block. Care shall be taken in layout of labeling to avoid confusion between adjacent jack labels. All rack mounted equipment shall be labeled on front and rear as outline in A, B, and c above. Labels shall be of a uniform size and layout for each type of equipment as follows:

1. Line 1: Generic name of device such as POWER AMPLIFIER
  2. Line 2: Designation of device such as P A-IA
  3. Line 3: Control area of device such as STAGE RIGHT HORN F.
-

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All wiring should be permanently labeled at both ends with corresponding numbering or lettering noted on the "as built" drawings.

Subsequent to the date of final system testing the sound contractor shall perform and document the following measurements. Copies of these test reports shall be available for review by the consultant and owner 14 days before the date of final system testing. Coordinate with Owner and Consultant scheduling of final tests and adjustments. Provided two (2) technicians familiar with system during final testing.

1. Measure and record the AC impedance of each speaker line at 50.0., 1000, and 4,000 Hz before connecting it to its respective amplifier. The load impedance shall be greater than or equal to the amplifier's rated impedance at the intended operating frequency. Record results.

2. Measure the output of each amplifier with an oscilloscope using a sine-wave oscillator having less than 0.5 THD as an input. The signal level shall be adjusted to produce 10dB less than the intended maximum SPL of each driver. This measurement shall be done with speakers connected using a frequency which the amplifier will be called upon to reproduce. Inspect the output sine-wave appearing on the oscilloscope for complete freedom from hum, noise parasitic oscillations, and RF interference. Record results.

Prior to the dates of the final system testing the sound contractor shall perform the following:

1. Burn in and test all electronics to insure proper operation and stability. Check all mic jacks, speaker jacks, inputs and outputs on all equipment for proper installation and operation.
2. Set the gain structure, adjust power levels and equalize all systems.
3. Verify all phases of system installation for accuracy and stability.

## 19.02 ACCEPTANCE OF SYSTEM

- A. After completion of all initial test and adjustments by the contractor to ensure a fully operational and complete system, the Owner/Engineer is to be notified in writing that the system is ready for final inspection, testing, setting of gain structure and equalization. This is to be done prior to any use of the system other than for testing purposes.
- B. Should the need for further adjustments or work become necessary during

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final testing, sound contractor will continue his work until system is acceptable at no addition to the contract price. If approval is delayed because of defective equipment or failure of equipment or installation to meet these specifications, the contractor will pay for any additional time and expenses of the consultant during any extension of the testing period.

---

Final acceptance of the system by Owner/Engineer will be forthcoming upon the following:

Delivery of all contracted equipment.

Completion of the Sound System. as specified.

Final check of the system by owner.

Delivery of all specified documentation.

Completion of training period for facility technical crew.

One-year warranty on parts and labor upon completion

END OF SECTION

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SECTION 16060 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes methods and materials for grounding systems and equipment.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with current NEC and Shelby county standards for grounding and bonding .

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
  - 1. Solid Conductors
  - 2. Stranded Conductors
  - 3. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

2.2 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- B. All junction and outlet boxes shall be bonded to ground with # 10 bolt (not mounting screw).

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**PART 3 - EXECUTION**

**3.1 EQUIPMENT GROUNDING**

- A. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
  - 1. Feeders and branch circuits.
  - 2. Lighting circuits.
  - 3. Receptacle circuits.
  - 4. Single-phase motor and appliance branch circuits.
  - 5. Three-phase motor and appliance branch circuits.
  - 6. Flexible raceway runs.
  
- B. A grounding conductor shall be installed with all branch-circuit conductors.

END OF SECTION 16060



**1364 Farmville Rd., Memphis, Tennessee 38122**  
(901) 416-1681

Reply to the Office of:  
Gene Sides, Manager  
Office of Major Construction

DATE: Tuesday, October 15, 2019

FROM: Gene Sides, Manager  
Office of Major Construction

SUBJECT: Asbestos in Schools – Formal Notification

REFERENCE: U.S. Environmental Protection Agency Regulations 40 CFR, Part 763 –  
Asbestos Containing Materials in Schools, Final Rule and Notice (Federal  
Register Volume 52, No. 210, Friday, October 30, 1987)

The Environmental Protection Agency issued a final rule under Section 203 of Title II of the Toxic Substances Control Act (TSCA), 15 U.S.C. 2643, and effective December 14, 1987, to require all educational agencies to identify Asbestos Containing Materials in their school buildings and take the appropriate actions to control release of Asbestos Fibers. The local educational agencies are required to describe their activities in management plans which must be made available to all concerned persons and submitted to State Governors. This final rule requires that local educational agencies use specially trained and certified persons to conduct inspections for asbestos, develop management plans, and design or conduct major actions to control asbestos.

The Division of Facilities and Real Estate Management, Memphis City Schools, has developed a plan for each school facility that shows where Asbestos Containing Materials or suspected Asbestos Containing Materials are to be found therein. This plan is available in the main office at each of our schools or facilities.

Therefore, any short-term worker/vendor/contractor installing services/equipment or making repairs in any facility of Shelby County Schools will be responsible for determining whether or not their work will be in an area with Asbestos Containing Materials, it will be imperative that Shelby County Schools, Division of Facilities and Real Estate Management, Office of Facilities Support, be advised and approve performance of such work before it is started.

## ATTACHMENT "A"

MEMO, Tuesday, October 15, 2019

FROM:

TO: Contractors/Vendors Accomplishing Maintenance/Repairs or Installing Equipment in  
Shelby County Schools Facilities

SUBJECT: Asbestos in Schools – Formal Notification

The aforementioned regulations are extremely important. Violations of Title I of TSCA by persons other than local education agencies can result in civil penalties to you of up to \$25,000.00 per day. In addition, criminal penalties may be assessed to individuals who knowingly and willfully commit such violations.

Prior to completing any work in any Shelby County School Facility, you must complete Attachment A Form No. I (Certification of Receipt of Asbestos Notification), and return it to the Office of Procurement Services.

If your work will require the penetration of Asbestos Containing Material or the disturbance of Asbestos Containing Material in any school facility, please complete Attachment A Form No. II (Request of Approval to Disturb Asbestos) and forward it immediately to the Office of Procurement Services. Do not proceed until you have been contacted by the Asbestos Designated Person for Shelby County Schools.

wew

Attachment A Forms:

- I. Certification of Receipt of Asbestos Notification
- II. Request for Approval to Disturb Asbestos

**ATTACHMENT "A" FROM I**

**Certification of Receipt of Asbestos Notification**

In accordance with the requirements of Environmental Protection Agency Regulations, Shelby County Schools has notified my company of the location of the Asbestos Information Folders/Asbestos Management Plans in each of Shelby County Schools Facilities in which I may be required to work. I understand that specially trained and certified persons are required to conduct inspections for asbestos, develop management plans, and design or conduct any action that might result in the disturbance of asbestos. All personnel in my firm who may be required to do work in Shelby County Schools have been instructed as to the possible locations of the asbestos containing materials in school buildings and of the location of the Asbestos Information Folders/Management Plans. No worker who has not received the proper and required training will disturb or remove any asbestos from and Shelby County Schools facility (this certification will be completed and forwarded to Shelby County Schools).

VENOR COMPANY NAME:

---

Authorized signature (Must be an Officer of the Company)

---

DATE

**ATTACHMENT "A" FORM I**

**ATTACHMENT "A" FORM II**

**Request for Approval to Disturb Asbestos**

If your work will require the penetration of asbestos containing material or disturb any asbestos containing material in a school facility, please complete the information below and send it to the Office of Procurement Services. You will be advised on the approval to do said work and of any precautions necessary. After your request is reviewed, you will receive a written approval to proceed.

**Brief description of work to be performed**

School/Facility Name:

---

Address of School/Facility:

---

Specific Areas or Room Numbers:

---

Complete Description of Work Required and Asbestos to be disturbed:

---

---

---

Qualified Personnel (Included Name(s) and Training Received):

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**VENDER COMPANY NAME**

---

**AUTHORIZED SIGNATURE**

---

**DATE**



Policy  
Effective Date: 07/10/06

## 1.803 Tobacco-Free Environment

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Original Adoption: 06/01/87 Effective Date: 07/10/06  
Revision Dates: 03/18/91, 04/19/93, 07/01/93; 07/10/06

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### I. PURPOSE

To provide a safe and healthy environment for all employees, students, and visitors and to serve as a positive example to all students concerning the use of tobacco.

### II. SCOPE

This policy applies to all employees, students, and visitors.

### III. POLICY STATEMENT

The Board of Education recognizes that smoking represents a major health and safety hazard which can have serious consequences for the smoker and nonsmoker alike. The Board believes that the health and wellness of employees, students, and visitors are of primary importance; therefore, smoking and/or the use of all tobacco products, including smokeless tobacco, are prohibited in all Board of Education buildings<sup>1</sup> (schools and other facilities); in any public seating areas, including but not limited to, bleachers used for sporting events, or public restrooms<sup>2</sup>; and in all vehicles, owned, leased or operated by the district at all times.

Signs will be posted throughout the district's facilities to notify students, employees and all other persons visiting the school that the use of tobacco and tobacco products is forbidden.<sup>1</sup> A **Smoking is prohibited by law in seating areas and in restrooms** sign shall be prominently posted for elementary or secondary school sporting events (including at each ticket booth).<sup>2</sup>

Any student who possesses tobacco products shall be issued a citation by the school principal.<sup>3</sup> Parents and students shall be notified of this citation requirement at the beginning of each school year.

### IV. RESPONSIBILITY

- A. Employees, students, and visitors are responsible for abiding by the provisions of this policy.
- B. Senior management and supervisors are responsible for ensuring that areas over which they have control are aware of the policy and are in compliance.
- C. Principals are responsible for notifying parents and students of this policy.
- D. The Superintendent or designee, in cooperation with the juvenile court and the local police/sheriff's department, is responsible for developing procedures for issuance of citations.
- E. The Superintendent is responsible for ensuring that this policy is followed.

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Legal Reference:

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Cross Reference:

- 1. Section 1042 of the Environmental Tobacco Smoke/Pro-Children Act of 1994
- 2. TCA 39-17-1604(6)(10); TCA 39-17-1605; TCA 39-17-1606
- 3. TCA 39-17-1505