

## REQUEST FOR QUOTE

### **Carmel Clay Schools Life & Learning Center Remodel**

Notice is hereby given that Quotes for the Project referenced herein will be received:

By: *Carmel Clay Schools*  
*5201 E. Main Street*  
*Carmel, IN 46033*

For: Carmel Clay Schools Life & Learning Center Remodel

At: *Carmel Clay Schools*  
*5201 E. Main Street*  
*Carmel, IN 46033*

Until: 2:00 PM, (local time), July 17, 2019

All work for the complete construction of the project will be under one prime contract with the Owner based on proposals received and on combinations awarded. The Project will be managed by The Skillman Corporation, Construction Manager for *Carmel Clay Schools*.

Construction shall be in full accordance with the Proposal Documents which are on file with the Owner and may be examined by prospective proposers at the following locations:

Office of the Construction Manager  
The Skillman Corporation  
3834 S. Emerson Avenue, Building A  
Indianapolis, IN 46203

Office of the Owner  
Carmel Clay Schools  
5185 E. Main Street  
Carmel, IN 46033

Office of the Architect  
Fanning/Howey Associates, Inc.  
9025 N. Meridian Street, Suite 100  
Indianapolis, IN 46240

[www.skillmanplanroom.com](http://www.skillmanplanroom.com)

Contractors submitting RFP for the performance of any Work as specified in this building project should make such proposals to ***Carmel Clay Schools***.

The Owner reserves the right to accept or reject any proposal and to waive any irregularities. All proposals may be held for a period not to exceed 30 days before awarding contracts.

A pre-proposal meeting will be held on July 10, 2019 at 12:00 PM at 515 E. Main Street, Carmel, IN 46032.

## **SCOPE OF WORK:**

- A. *Per the Plans and specs.*

*Specification Section 27 51 16 Public Address*

*Plan Sheets: 03A1-02, 04A1-03, 05A7-01, 06A9-01, 10E1-2, 11ED-1, 12ED-2, 13E4-1, 14E5-1*

## **SCHEDULE:**

- A. *Start July 29, 2019*  
B. *Substantial Completion is October 16, 2019*  
C. *Complete Construction is November 1, 2019*

## **PROJECT ADMINISTRATION**

- A. Points of Contact
- a. *Carmel Clay Schools, Ron Farrand*
  - b. *Fanning/Howey Associates, Chuck Tyler*
  - c. *The Skillman Corporation:*
    - i. *Eli Miller, Project Manager*
    - ii. *Patrick Kirby, Site Manager*
    - iii. *Michael Hendershot, Project Engineer*
    - iv. *Connie Patton, Administrative Assistant*

- B. Meetings

Each Contractor shall be required to have present at each of the following project meetings a representative acceptable to the Construction Manager. The designated representative shall have sufficient authority and knowledge to make decisions for the Contractor he is representing on matters affecting this Project.

- a. *(Preconstruction)*
- b. *(Progress)*
- c. *(Coordination)*
- d. *(Closeout)*

- C. Administrative Responsibilities Of Contractors

- a. Contractor shall read the Specifications and Drawings for other separate Contracts for fixed equipment and the like to be incorporated or attached or built in to the Work; and familiarize himself with the requirements and responsibilities of other Contracts to enable the required coordination and supervision.
- b. Contractor shall also familiarize himself with other items to be incorporated into the Work including equipment and Work by the Owner.
- c. Contractor shall cooperate with the Construction Manager in notifying him when the Work is at a stage to require the services of other Contractors and shall notify the Construction Manager in the event that such other Contractors do not carry out their responsibilities in connection with such notification.

- D. Contractors shall cooperate with and assist the Construction Manager in the preparation of construction progress and procedures, schedule of product deliveries, and their effect on the overall project progress and completion. Other Contractors shall cooperate in getting their Work and the Work of their subcontractors completed according to the schedule as prepared and maintained by the Construction Manager. Each Contractor shall immediately notify the Construction Manager of a delay in delivery of products or the scheduled date of completion that may affect the total progress of construction.
- E. Contractors required to make connections to existing utilities, shall notify the Construction Manager of circumstances which would adversely affect the operation of the facility.
- F. All contractors shall subscribe to PlanGrid for use on this project. Number of users is up to the contractor, however, at a minimum your site personnel will be required to use this product to facilitate communication. PlanGrid will be used for the current construction documentation to include, current set, addenda, ASI, As Built Conditions, QA/QC, and Punch List. Visit the [www.PlanGrid.com](http://www.PlanGrid.com) to determine subscription pricing. It is recommended that you have an office administrator to assist your field personnel. PlanGrid is a tool for the construction phase and will not be used for bidding. Visit [www.skillmanplanroom.com](http://www.skillmanplanroom.com) for bid documents.

#### **PRIME CONTRACTORS USE OF PREMISES**

- A. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.
  - 1. Owner Occupancy: Allow for Owner occupancy and use by the public.
  - 2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
- C. Use of the Existing Building: Maintain the existing building in a weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

#### **OWNERS RIGHT TO MAINTAIN OPERATIONS**

- A. During the course of this Project, normal and customary functions and operations must be maintained. The Contract Documents are intended to define a strict separation between the school activities of students and staff from the activities of the construction project.
- B. The Construction Manager, Architect, and Owner will not tolerate any visible or audible actions initiated or responded to by any employees of Contractors on this Project toward any students, teachers, or staff members at the school system. Violators shall be promptly removed from the site.

- C. The Owner intends to instruct students, teachers, and staff to refrain from communications with Contractor's personnel working on this Project. All communication with Owner and staff shall be through the Construction Manager.
- D. Contractors must expend their best effort toward protection of the health, safety, and welfare of occupants on the Owner's property during the course of Work on this Project.
- E. Contractors and Subcontractors shall be subject to such rules and regulations for the conduct of the Work as the Owner may establish. Employees shall be properly and completely clothed while working. Bare torsos, legs and feet will not be allowed. Possession or consumption of alcoholic beverages or drugs, tobacco or other noxious behavior on the site is strictly prohibited. Violators shall be promptly removed from the site. Smoking is not permitted on school property or within school buildings.

## **OCCUPANCY REQUIREMENTS**

- A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with the Owner's operations.
- B. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.
  - 1. The Construction Manager will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner occupancy.
  - 2. Party which obtained general building permit shall obtain a Certificate of Occupancy from local building officials prior to Owner occupancy.
  - 3. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy, the Owner will operate and maintain mechanical and electrical systems serving occupied portions of the building.
  - 4. Upon occupancy, the Owner will assume responsibility for maintenance and custodial service for occupied portions of the building.

## **WORK BY OWNER**

- A. The Owner intends to complete the following items of Work outside the provisions of these Contract Documents. Contractors shall not restrict or interfere with the Owner's right to the Project to accomplish this Work.
  - 1. Equipment and furniture except as scheduled and specified.
  - 2. Items which may be deleted from Contracts for Work as required by the Contract Documents.
  - 3. Existing school maintenance work.
  - 4. The purchase and supplying of certain materials as noted
  - 5. The Owner, under separate contract, shall provide removal of identified asbestos containing materials from the existing structure. The asbestos report is available through the Construction Manager upon request.

## **PERMITS, FEES, AND NOTICES**

- A. If required, the Construction Manager will secure the general building permit for the Owner. Each Contractor shall secure and pay for other permits, governmental fees, and licenses necessary for the proper execution and completion of his Work, which are applicable at the time the bids are also received. Fees to relocate utilities on Owner's property shall be included in the bid of the Contractor doing the relocation.
  - 1. State filing fees for plan approval are the responsibility of the Owner and will be paid by the Owner.
- B. Utility Tie-Ins: Shall be arranged with local utility company and other involved parties for minimum interruption of service.
- C. Shutdowns of existing systems shall be limited to minimum time required and scheduled with other involved parties. Provide 2 days' written notice of shutdown to Construction Manager and Owner.
- D. Inspections of installed work shall be performed by the governing authority as arranged for by the Contractor. Work shall not be covered until approved.
- E. Each Contractor shall give notices and comply with laws, ordinances, rules, regulations, and orders of public authorities bearing on the performance of his Work. If a Contractor observes that the Contract Documents are at variance therewith, he shall promptly notify the Construction Manager in writing, and necessary changes shall be adjusted by appropriate notification. If a Contractor performs Work knowing it to be contrary to such laws, ordinances, rules, and regulations, and without such notice to the Construction Manager, he shall assume full responsibility therefore and shall bear the costs attributable thereto.

## **LABOR AND MATERIALS**

- A. Unless otherwise specifically noted, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of his Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.
- B. Each Contractor shall enforce strict discipline and good order among his employees or other persons carrying out Work of his Contract and shall not permit employment of unfit person or persons or anyone not skilled in the task assigned to them.
- C. Contractors and Subcontractors shall be subject to such rules and regulations for the conduct of the Work as the Owner may establish. Employees shall be properly and completely clothed while working. Bare torsos, legs and feet will not be allowed. Possession or consumption of alcoholic beverages or drugs, tobacco or other noxious behavior on the site is strictly prohibited. Violators shall be promptly removed from the site. Smoking is not permitted on school property or within school buildings.

- D. Contractors will conduct criminal background checks (extent of and/or service to be used will be established by the Owner) on every employee assigned to work on the Project and clear them through the National Sex Offender Registry prior to their assignment to Project. Contractors will require the same of sub-contractors.
- E. ID Badges will be issued by The Skillman Corporation upon receipt of verification from the Contractor that the employee/subcontractor employee or independent contractor has a satisfactory record to work on the Project.
- F. E-Verify Compliance: Pursuant to I.C. 22-5-1.7, Contractor shall enroll in and verify the work eligibility status of all newly hired employees of Contractor through the E-Verify Program (Program). Contractor is not required to verify the work eligibility status of all newly hired employees through the Program if the Program no longer exists. Also, pursuant to I.C. 22-5-1.7, Contractor must execute an affidavit affirming that the Contractor does not knowingly employ an unauthorized alien and confirming Contractor's enrollment in the Program, unless the Program no longer exists, shall be filed with the Owner prior to the execution of this contract. This contract shall not be deemed fully executed until such affidavit is delivered to the Owner.

Contractor and its subcontractors shall not knowingly employ or contract with an unauthorized alien or retain an employee or contract with a person that contractor or its subcontractor subsequently learns is an unauthorized alien. If Contractor violates this provision the Owner shall require Contractor to remedy the violation not later than thirty (30) days after the Owner notifies Contractor. If Contractor fails to remedy the violation within the thirty (30) day period, the Owner shall terminate the contract for breach of contract. If Owner terminates the contract, Contractor shall be liable to the Owner for actual damages in addition to any other contractual remedies. There is a rebuttable presumption that Contractor did not knowingly employ an unauthorized alien if Contractor verified the work eligibility status of the employee through the Program.

Prior to performing any work, Contractor shall require each subcontractor to certify to Contractor that the subcontractor does not knowingly employ or contract with an unauthorized alien and has enrolled in the Program. Contractor shall maintain on file a certification from each subcontractor throughout the duration of this contract or project which is the subject of this contract. If Contractor determines that a subcontractor is in violation of this provision, Contractor may terminate its contract with the subcontractor for such violation. In Accordance with I.C. 5-16-13 Contractor must provide the E-Verify Case Number of every employee that works on the project. This requirement includes the contractor's subs and suppliers to the fourth (4<sup>th</sup>) tier.

- G. The Owner is requiring that all contractors' personnel and their onsite employees (trade employees) and subcontractors submit an expanded history check through Safe Hiring Solutions, P.O. Box 295, Danville, IN 46122, 1-888-215-8296. (Contractor is responsible for the cost of this background check). This should meet with the Owner's approval prior to the employee starting work on the

project. All contractors' personnel and employees, once cleared for work will be issued a project identification badge that must be worn at all times while on site. All contractors will be expected to provide the required name, address, picture state driver's license or picture state identification card information to The Skillman Corporation Site Manager no later than 24 hours in advance of the employee coming to work at the project site.

- H. The new Public Works Law pursuant to Indiana Code 5-16-13 Requirements for Contractors on Public Works Projects enacted by the Indiana Legislator requires, in addition to requirements already in effect, contractors to comply with the following:
1. Tier 1 –General/Prime Contractors to self-perform 15% of their total Contract.
  2. Qualification thru the Department of Administration or INDOT. For the bidders on State Projects and on State Projects more than \$150,000 Qualification is required prior to bidding per IC 4-13.6-4. For work on Local Unit Government Projects qualification is only required on contracts of \$300,000 or more and only on projects awarded after December 31, 2016.
  3. Include Written Drug Testing Plan that covers all employees of the bidder who will perform work on the public work project and meets or exceeds the requirements set in IC 4-13-18-5 or IC 4-13-18-6 with Bid.
  4. Minimum Insurance Requirements \$1M/occurrence \$2M/aggregate. However, check your bidding requirements as the Owners may have higher limit requirements.
  5. Mandatory enrollment in E-Verify by all contractors down to the 4th Tier Sub Contracts and must provide the case verification number of all employees working on the project.
  6. Prohibits contractors down to the 4th Tier Sub Contract from paying employees in cash.
  7. Requirement to retain payroll records for 3 years
  8. All contractors down to the 4th Tier Sub Contract must comply with Fair Labor Act, Indiana's Workers Compensation and Unemployment Compensation Insurance.
  9. Mandatory Training Requirements based upon number of employees.

Failure to comply may result in debarment from public works projects for up to 4 years.

All contractors down to the 4<sup>th</sup> Tier Sub Contract must maintain general liability insurance in at least the following amounts: Each Occurrence Limit of \$1,000,000 and General Aggregate Limit of \$2,000,000. Other requirements and limits may apply see specification section 00 08 20 Schedule of Insurance Requirements.

## REQUIRED PRICING ITEMIZATION AND ALLOWABLE MARK UP

- A. For each change over \$1,000.00, the Contractor shall furnish a detailed, written proposal itemized according to the pricing guidelines set forth below as a condition precedent to the Owner's consideration of a Change Order request. Any Subcontractor, sub-subcontractor and supplier pricing shall also be itemized according to these guidelines. All proposals shall be prepared in the categories and in the order listed below.
- .1 Labor – All field labor shall be priced in compliance with the Schedule of Wages for this Project, excluding labor burden which is covered under clause .2 below. The payroll is to be based on straight time only and is to include number of hours and rate of pay for each classification of work. If overtime is approved, the Contractor shall list only the straight time portion in this item.
  - .2 Labor burden – All established payroll taxes, assessments and fringe benefits on the labor under clause 1 above. This may include, but is not limited to, FICA, Federal and State Unemployment, Health and Welfare, Pension Funds, Worker's Compensation and Apprentice Fund. Each of the fringes shall be listed as a separate line item.
  - .3 Equipment rentals – All charges for non-owned heavy or specialized equipment at up to 100% of the documented rental cost. No rental charges will be allowed for hand tools, minor equipment, scaffolds, etc. Downtime due to repairs, maintenance and weather delays will not be allowed.
  - .4 Owned equipment – All charges for owned, heavy or specialized equipment at up to 100% of the cost listed by the Associated Equipment Dealers Blue Book. No recovery will be allowed for hand tools, minor equipment, scaffolds, etc. Downtime due to repairs, maintenance and weather delays will not be allowed.
  - .5 Trucking – A reasonable delivery charge or per mile trucking charge for delivery of required materials or equipment. Charges for use of a pickup truck will not be allowed.
  - .6 Overhead – Includes telephone, telephone charges, facsimile, telegrams, postage, photos, photocopying, hand tools, scaffolds (one level high), tool breakage, tool repairs, tool replacement, tool blades, and bits, home office estimating, clerical and account support, home office labor, travel and parking expenses.
  - .7 Materials – All materials purchased by the Contractor and incorporated into the changed Work, showing costs, quantities, or Unit Prices of all items, as appropriate. Reimbursement for material costs shall only be allowed in the amount of the Contractor's actual cost including any and all discounts, rebates and related credits.



- B. The following items are allowable with no overhead and profit:
- .1 The cost of extending the Bond and the cost of extending commercial general liability, builder's risk and specialty coverage insurance.
  - .2 The premium portion only for approved overtime (labor and labor burden). The straight time portion is included in clauses .1 and .2 above.
  - .3 Fees for permits, licenses, inspections, tests, etc.
- C. Costs which shall not be reimbursed for changed Work include the following:
- .1 Employee Retirement and Profit-Sharing Plans, regardless of how defined or described.
  - .2 Voluntary Employee Deductions.
- D. The cost of the Contractors' overhead and profit on Change Orders shall be:
- .1 For extra Work completed by the Contractor with his own labor, 10 percent shall be added to Items .1, .2, .3, .4, .5, and .7 of Subparagraph 1.09 as an allowance for overhead and profit.
  - .2 For extra Work completed by Subcontractors of the Contractor, 5 percent shall be added to Items .1, .2, .3, .4, .5, and .7 of Subparagraph 1.09 as an allowance for overhead and profit.

## **CUTTING AND PATCHING**

- A. Do not cut and patch structural work in a manner that would result in a reduction of load-carrying capacity or of load-deflection ratio.
- B. Before cutting and patching the following categories of work, obtain the Architect/Engineer's approval to proceed with cutting and patching as described in the procedural proposal for cutting and patching:
1. Structural steel.
  2. Miscellaneous structural metals, including lintels, equipment supports, stair systems and similar categories of work.
  3. Structural concrete.
  4. Foundation construction.
  5. Timber and primary wood framing.
  6. Bearing and retaining walls.
  7. Structural decking.
  8. Piping, ductwork, vessels and equipment.
  9. Structural systems of special construction, as specified by Division-13 Sections.
- C. Operational and Safety Limitations: Do not cut and patch operational elements or safety related components in a manner that would result in a reduction of their capacity to perform in the manner intended, including energy performance, or that would result in increased maintenance, or decreased operational life or decreased safety.

- D. Visual Requirements: Do not cut and patch work exposed on the building's exterior or in its occupied spaces, in a manner that would, in the Architect/Engineer's opinion result in lessening the building's aesthetic qualities. Do not cut and patch work in a manner that would result in substantial visual evidence of cut and patch work. Remove and replace work judged by the Architect/Engineer to be cut and patched in a visually unsatisfactory manner at no additional cost to the Owner.

## **VERIFICATIONS OF EXISTING DIMENSIONS**

- A. When verification of existing dimensions is required, the Contractor requiring said verification for the construction or fabrication of his material shall be the Contractor responsible for the procurement of the field information.

## **PROJECT SECURITY**

- A. Each Prime Contractor shall take all reasonable precautions to prevent injury, damage or loss to people and property in, on and adjacent to the project. This shall include not only their own work or property but that of other contractors and the Owner.
- B. If deemed necessary by The Construction Manager a project wide security program may be developed for the purpose of preventing damage or loss at the project site or property adjacent thereto. Once accepted by the Owner, contractors shall comply.

## **COORDINATION OF WORK**

- A. Each Contractor is responsible to coordinate his Work with the Work of other trades and other Contractors and requirements of the school system. The Contractor must make space allowances for Work of other Contractors; provide necessary openings where indicated or implied by the Drawings and Specifications. Each Contractor is responsible to protect his own Work.

## **PAYMENT TERMS**

- A. Applications for Payment shall be made no later than the 1st day of the month through the Construction Manager to the Owner. Payments to the Contractor will not be made until final approval by the Owner. Applications made by the 1st of the month, if approved, will be paid approximately 45 days later. The Contractor shall submit to the Construction Manager, an itemized Application for Payment, supported by such data, such invoices, substantiating the Contractor's right to payment as the Owner, Architect, or Construction Manager may require. The form of Application for Payment shall be AIA Document G732 - 2009 - Application and Certification for Payment, support by AIA Document G703 - Continuation Sheet. Continuation Sheet (G703) shall be prepared the same as the Schedule of Values submitted by the Contractor and as approved.
- a. Contractors shall prepare a pencil copy of the Application for Payment to the Construction Manager at the site ten (10) days prior to date for submission of Application of Payment. After review by the Construction Manager and Architect a corrected copy will be returned to the Contractor within five (5) working days.

- B. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
- i. Completion of Project closeout requirements.
  - ii. Completion of items specified for completion after Substantial Completion.
  - iii. Ensure that unsettled claims will be settled.
  - iv. Ensure that incomplete Work is not accepted and will be completed without undue delay.
  - v. Transmittal of required Project construction records to the Owner.
  - vi. Certified property survey.
  - vii. Proof that taxes, fees, and similar obligations were paid.
  - viii. Removal of temporary facilities and services.
  - ix. Removal of surplus materials, rubbish, and similar elements.
  - x. Change of door locks to Owner's access.
- C. Release of Retainage: Documents to be submitted with the final Pay Application requesting release of retainage to include:
1. AIA G732 - 2009 – Application and Certification for Payment
  2. AIA G703 – Continuation Sheet
  3. Final Waiver of Lien
  4. AIA G706 – Contractor's Affidavit of Payment of Debts and Claims
  5. AIA G706a – Contractor's Affidavit of Release of Liens
  6. AIA G707 – Consent of Surety to Final Payment
  7. "No Asbestos" Letter
  8. Approved Certificate of Substantial Completion

## **PROJECT DOCUMENTATION**

- A. *(Product Information – Submittals)*
- B. *(RFI)*
- C. *(Changes to the Work)*
- D. *(Closeout)*
- a. *(Punch list sign off)*
  - b. *(Record Drawings)*
  - c. *(O&M)*
  - d. *(Owner Training)*
  - e. *(Extra Stock)*
  - f. *(Warranty)*

## **CERTIFICATE OF INSURANCE:**

- A. Provide Certificate of Insurance naming Carmel Clay Schools, Fanning/Howey Associates, Inc. and The Skillman Corporation as Additional Insured's. See attached, Exhibit A

***Carmel Clay Schools***  
Ron Farrand, Director of Facilities & Transportation

## PROPOSAL FORM

Base Proposal:

\$ \_\_\_\_\_

The undersigned agrees to perform the services set forth in this proposal. The undersigned also covenants that he/she is fully empowered to execute and deliver this proposal on behalf of the proposer and that, if accepted by the (*Owner Name*); this proposal shall represent a lawful and binding obligation of the Proposer.

Firm Name \_\_\_\_\_ Prices Firm Through \_\_\_\_\_

Address \_\_\_\_\_ Payment Terms \_\_\_\_\_

City, State and Zip \_\_\_\_\_ Delivery Date \_\_\_\_\_

Phone # \_\_\_\_\_ Fax# \_\_\_\_\_

Email Address \_\_\_\_\_

By: \_\_\_\_\_  
(Representative Signature)

\_\_\_\_\_  
(Representative Typewritten Name)

**SECTION 00 82 00 – SCHEDULE OF INSURANCE REQUIREMENTS**

PRODUCER

**THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.**

INSURERS AFFORDING COVERAGE

INSURER A

INSURER B

INSURER C

INSURER D

INSURED

**COVERAGES**

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

| INSR LTR | ADD'L NSRD | TYPE OF INSURANCE                                                                                             | POLICY NUMBER | POLICY EFFECTIVE DATE (MM/DD/YY) | POLICY EXPIRATION DATE (MM/DD/YY) | LIMITS                                     |             |
|----------|------------|---------------------------------------------------------------------------------------------------------------|---------------|----------------------------------|-----------------------------------|--------------------------------------------|-------------|
|          |            |                                                                                                               |               |                                  |                                   |                                            |             |
|          | X          | GENERAL LIABILITY                                                                                             |               |                                  |                                   | EACH OCCURRENCE                            | \$1,000,000 |
|          |            | COMMERCIAL GENERAL LIABILITY                                                                                  |               |                                  |                                   | DAMAGE TO RENTED PREMISES (Ea. occurrence) | \$50,000    |
|          |            | CLAIMS MADE <input checked="" type="checkbox"/> OCCUR                                                         |               |                                  |                                   | MED EXP (Any one person)                   | \$5,000     |
|          |            |                                                                                                               |               |                                  |                                   | PERSONAL & ADV. INJURY                     | \$1,000,000 |
|          |            | GEN'L AGGREGATE LIMIT APPLIES PER                                                                             |               |                                  |                                   | GENERAL AGGREGATE                          | \$2,000,000 |
|          |            | POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC <input type="checkbox"/>                |               |                                  |                                   | PRODUCTS-COMP/OP AGG                       | \$2,000,000 |
|          |            |                                                                                                               |               |                                  |                                   |                                            |             |
|          | X          | AUTOMOBILE LIABILITY                                                                                          |               |                                  |                                   | COMBINED SINGLE LIMIT (Ea. accident)       | \$1,000,000 |
|          |            | <input checked="" type="checkbox"/> ANY AUTO                                                                  |               |                                  |                                   | BODILY INJURY (Per person)                 | \$500,000   |
|          |            | ALL OWNED AUTOS                                                                                               |               |                                  |                                   | BODILY INJURY (Per accident)               | \$500,000   |
|          |            | SCHEDULE AUTOS                                                                                                |               |                                  |                                   | PROPERTY DAMAGE (Per accident)             | \$500,000   |
|          |            | HIRED AUTOS                                                                                                   |               |                                  |                                   |                                            |             |
|          |            | NON-OWNED AUTOS                                                                                               |               |                                  |                                   |                                            |             |
|          |            | GARAGE LIABILITY                                                                                              |               |                                  |                                   | Auto only – ea. accident                   | \$          |
|          |            | ANY AUTO                                                                                                      |               |                                  |                                   | Other than auto only: EA ACC               | \$          |
|          |            |                                                                                                               |               |                                  |                                   | AGG                                        | \$          |
|          | X          | EXCESS/UMBRELLA LIABILITY                                                                                     |               |                                  |                                   | EACH OCCURRENCE                            | \$2,000,000 |
|          |            | OCCUR <input type="checkbox"/> CLAIMS MADE <input type="checkbox"/>                                           |               |                                  |                                   | AGGREGATE                                  | \$2,000,000 |
|          |            |                                                                                                               |               |                                  |                                   |                                            | \$          |
|          |            | DEDUCTIBLE                                                                                                    |               |                                  |                                   |                                            | \$          |
|          |            | RETENTION                                                                                                     |               |                                  |                                   |                                            | \$          |
|          |            | WORKER'S COMPENSATION AND EMPLOYERS' LIABILITY                                                                |               |                                  |                                   | WC STATUTORY LIMITS                        | \$          |
|          |            | ANY PROPRIETARY/PARTNER/EXECUTIVE OFFICER MEMBER EXCLUDED?<br>If yes, describe under SPECIAL PROVISIONS below |               |                                  |                                   | E.L. EACH ACCIDENT                         | \$500,000   |
|          |            |                                                                                                               |               |                                  |                                   | E.L. DISEASE – EA EMPLOYEE                 | \$500,000   |
|          |            |                                                                                                               |               |                                  |                                   | E.L. DISEASE – POLICY LIMIT                | \$500,000   |
|          |            | OTHER                                                                                                         |               |                                  |                                   |                                            |             |

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS

**Project: 218129 – Carmel Clay Schools Life & Learning Center Remodel - The Skillman Corporation & all parties required by contract are added as add'l ins on GL including completed operations & add'l ins on Auto Liab but only w/respects to liability arising out of the work performed by/on behalf of named ins for above project with coverage being primary & noncontributory. Waiver of Subrogation is added to GL, Auto & WC in favor of add'l insureds. Umbrella is follow form to add'l ins/primary & noncontributory on GL and Waiver of Subrogation on GL & WC. WC applies in Indiana.**

**CERTIFICATE HOLDER**

**CANCELLATION**

|                                                                                                         |                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Carmel Clay Schools<br>c/o The Skillman Corporation<br>3834 S. Emerson Avenue<br>Indianapolis, IN 46203 | SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATED THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. |
|                                                                                                         | AUTHORIZED REPRESENTATIVE (Signed or stamped signature)                                                                                                         |

## SECTION 27 51 16 - PUBLIC ADDRESS AND MASS NOTIFICATION SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes but is not limited to the following:
  - 1. Ceiling speakers.
  - 2. Subwoofer.
  - 3. Program sources and recorders.
  - 4. Power amplifiers.
  - 5. Mic/line mixers.
  - 6. Video Switcher
  - 7. Audio/Video/Lighting Control system
  - 8. Wireless microphones.
  - 9. Sound system equipment cabinets and its accessories.
  - 10. Miscellaneous sound equipment, cables, hardware, etc.
- B. Related section includes the following:
  - 1. Division 01 – General Requirements
  - 2. Division 26 – Electrical
  - 3. Division 27 – Communications Sections.
  - 4. Division 28 – Electronic Safety and Security

#### 1.3 SECTION DEFINITIONS

- A. CD: Compact disc.
- B. HF: High frequency.
- C. IR: Infrared.
- D. LAN: Local area network.
- E. LF: Low frequency.
- F. SPL: Sound Pressure Level.
- G. VU: Volume unit.
- H. Channels: Separate parallel signal paths, from sources to loudspeakers or loudspeaker zones, with separate amplification and switching that permit selection between paths for speaker alternative program signals.
- I. Zone: Separate group of loudspeakers and associated supply wiring that may be arranged for selective switching between different channels.

#### 1.4 SUBMITTALS

- A. Shop Drawings: Signed and sealed by a qualified sound system engineer.
  - 1. Design Calculations: Calculate requirements for selecting seismic restraints for central control cabinets.
  - 2. Equipment Details: Detail equipment assemblies and indicate dimensions, weights, required clearances, method of field assembly, components, and location of each field connection.

3. Console layouts.
  4. Control panels.
  5. Rack arrangements.
  6. Wiring Diagrams: Power, signal, and control wiring. Include the following:
    - a). Identify terminals to facilitate installation, operation, and maintenance.
    - b). Single-line diagram showing interconnection of components.
    - c). Cabling diagram showing cable routing.
  7. Loudspeakers mounting details.
  8. Loudspeakers locations and aiming details.
- B. Quality Assurance/Control Submittals:
1. Product Data: For each item specified.
  2. Calculations: For sizing backup battery.
  3. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
    - a). Ceiling-mounted items including lighting fixtures, diffusers, grilles,
- C. Closeout Submittals:
1. Operation and Maintenance Data: For public address and music equipment to include in emergency, operation, and maintenance manuals.
  2. Extra Materials: Receipt for extra materials.
  3. Loose Equipment: Receipt for loose materials not fastened in place.
- D. See Common Work Results For Communications section 270500 for more submittal requirements.

## 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
1. Maintenance Proximity: Not more than 2 hours' normal travel time from Installer's place of business to Project site.
  2. Cable installer must have on staff a registered communication distribution designer certified by Building Industry Consulting Service International.
  3. Installation shall be by personnel certified by National Institute for Certification in Engineering Technologies as audio systems Level III technician.
- B. Source Limitations: Obtain public address and music equipment through a single source authorized by manufacturer to distribute each product.
- C. 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.
- D. Comply with NFPA 70 – National Electrical Code.
- E. Comply with UL 50.
- F. TIA/EIA-607 Telecommunications grounding.
- G. Latest edition of BISCI – TDMM – manual
- H. Americans with Disabilities Act (ADA)
- I. Federal Communications Commission, Part 15
- J. Sound System Engineering (Davis and Patronics) 3<sup>rd</sup> Edition 2006.
- K. NSCA – Certified Systems Installer, C-SI

- L. InfoComm International – Certified Technology Specialist, CTS.
  - M. Provide labeling per ANSI/EIA/TIA-606 requirement and in accordance with the Owner and Technology Consultant.
- 1.6 COORDINATION
- A. Coordinate layout and installation of system components and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.
- 1.7 WARRANTY
- A. The public address and mass notifications system shall carry a warranty as specified in Section "Demonstration and Training of Communications Systems".
- 1.8 TRAINING
- A. Provide training per Section "Demonstration and Training of Communications Systems".
- 1.9 RECORD DRAWINGS/OPERATION AND MAINTENANCE MANUALS
- A. Provide record drawings and operation and maintenance manuals as described in Sections "Operation and Maintenance of Communications" and "Common Works Results for Communication Systems".

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. The following manufacturers' and their products are approved products to be used, shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
  1. AKG Acoustics; A Harman International Company (AKG).
  2. AMK
  3. Atlas Sound; Atlas Sound (Atlas).
  4. Audio Technica, U.S., Inc.
  5. Bogen Communications International, Inc. (Bogen)
  6. Crown Audio, Inc.; A Harman International Company (Crown).
  7. D & M Professional; Denon Professional products (Denon).
  8. D & M Professional; Marantz Professional products (Marantz).
  9. Dukane Corporation; Communications Systems Div. (Dukane).
  10. Eastern Acoustic Works (EAW).
  11. Electro-Voice, Inc.; Telex Communications, Inc. (EV).
  12. Federal Signal Corporation; Electrical Products Division (Federal Signal).
  13. Gentner ALS; A Starin Company (Gentner).
  14. Intelix, LLC (Intelix).
  15. JBL Professional; A Harman International Company (JBL).
  16. Lab Gruppen
  17. Listen Technologies Corporation.
  18. LOUD Technologies, Inc.; Mackie products (Mackie).
  19. Lowell Manufacturing Company (Lowell).
  20. Meyer Sound Laboratories Inc. (Meyer).
  21. Midas U.S.A.; Telex Communications, Inc. (Midas).
  22. Peavey Electronics Corporation; Architectural Acoustics by Peavey products. (Peavey).
  23. ONE Systems
  24. QSC Audio Products, Inc. (QSC).
  25. Quam Nichols Company (Quam).
  26. Rane Corporation (Rane).
  27. Rauland-Borg Corporation (Rauland).
  28. Renkus-Heinz, Inc.
  29. Sennheiser Electronic Corporation.
  30. Shure Incorporated (Shure).



31. Soundcraft; A Harman International Company (Soundcraft).
32. Symetrix, Inc. (Symetrix).
33. TASCAM; a division of TEAC America, Inc. (TASCAM).
34. Telex Communications, Inc. (Telex).
35. TOA Electronics, Inc. (TOA).
36. Yamaha Corporation of America (Yamaha).

## 2.2 EQUIPMENT AND MATERIALS

- A. Coordinate features to form an integrated system. Match components and interconnections for optimum performance of specified functions.
- B. Equipment: Modular type using solid-state components, fully rated for continuous duty, unless otherwise indicated. Select equipment for normal operation on input power usually supplied at 110 to 130 V, 60 Hz.
- C. Waterproof Equipment: Listed and labeled for outdoor use.

## 2.3 AUDIO/VIDEO/LIGHTING CONTROL SYSTEM

- A. Provide a control system to control all audio/video devices and lighting (3-zones) as shown on drawings.
  1. 3.5" Diagonal Color LCD Touch Screen
  2. Serial Ports as necessary
  3. IR Ports as necessary
  4. Relay modules as necessary
  5. IP Port as necessary
  6. Built In Clock / Calendar with Scheduler
  7. Multi Command Scripting Conditionality
  8. "Power over Ethernet capability" on models with an Ethernet port
- B. Provide all cabling as necessary for a complete and working system.
- C. Program control system as completed in existing spin room and per owner requirements.
- D. Approved Manufacture:
  1. FSR Flex-LT with specific mud ring, relay modules, I/O ports, etc.

## 2.4 NOT USED

## 2.5 CEILING LOUDSPEAKERS

- A. 6.5-Inch Ceiling Loudspeaker System.
  1. Approved Manufacturer:
    - a). JBL Professional, Control 47C/T.
  2. Provide 6.5-inch coaxial ceiling loudspeaker system with ported bass reflex enclosure as follows:
    - a). Frequency Range (-10 dB)<sup>1</sup>: 55 Hz - 20 kHz
    - b). Frequency Response ( $\pm 3$  dB)<sup>1</sup>: 75 Hz - 17 kHz
    - c). Power Capacity<sup>2</sup>: 150 Watts Continuous Program Power
    - d). 75 Watts Continuous Pink Noise
    - e). Nominal Sensitivity: 91 dB
    - f). Nominal Coverage Angle<sup>3</sup>: 120° conical coverage
    - g). Directivity Factor (Q)<sup>3</sup>: 6.5
    - h). Directivity Index (DI)<sup>3</sup>: 7.9 dB
    - i). Rated Maximum SPL: 110 dB @ 1 m (3.3 ft) average, 116 dB peak
    - j). Rated Impedance: 8 ohms (in bypass mode)
    - k). Transformer Taps: 60 W, 30 W, 15 W, (& 7.5 W @ 70 V)
    - l). Transformer Insertion Loss: 0.76 dB @ 60 W, 0.70 dB @ 30 W, 0.61 dB @ 15 W, 0.58 dB @ 7.5 W

- m). Transducers: LF Driver: 165 mm (6.5 in) with polypropylene cone, butyl rubber surround, copper-clad coil, vented aluminum former.  
HF Driver: 25 mm (1 in) soft dome w/ dampening, ferrofluid-cooled.
- n). Input Connectors: Two removable locking 2-pin connectors with screw down terminals. Max wire 12 AWG (2.5 mm).
- o). Knockouts: Two (top and side)
- p). Safety Agency: Suitable for use in air handling spaces per UL1480, UL2043, NFPA90 & NFPA 70. S7232/UL Listed, Signaling Speaker. Transformer UL registered per UL1876. In accordance with IEC60849/EN60849.
- q). Dimensions: 305 mm Diameter x 259 mm Depth from back of baffle (12 in x 10.2 in)
- r). Cutout Size: 282 mm Diameter (11.1 in)
- s). Ceiling Thickness Range: Accommodates tiles/drywall up to 70 mm (2.75 in) thick
- t). Suspension Points: Three, on top surface
- u). Weight: 5 kg (11 lb)
- v). C-ring support backing plate, 2 tile support rails (fits both 2 x 4 ft or 600 x 1200 mm tiles), knockout strain relief, cutout template, paint shield, 2 removable locking multipin connectors.
- w). MTC-47NC New Construction Bracket

B. CEILING SUBWOOFER

- 1. Approved Manufacturer: JBL Professional, Control 40SC/T.
- 2. Provide ceiling mounted subwoofer as follows:
  - a). Frequency Range (-10 dB)<sup>1</sup>: 32 Hz - 300 Hz
  - b). Frequency Response ( $\pm 3$  dB)<sup>1</sup>: 50 Hz - 180 Hz
  - c). Power Capacity<sup>2</sup>: 200 Watts Continuous Program Power
  - d). 100 Watts Continuous Pink Noise
  - e). Nominal Sensitivity (2.83V/1m)<sup>1</sup>: 95 dB (near corner), 89 dB (center of ceiling)
  - f). Rated Maximum SPL: 109 dB @ 1 m (3.3 ft) average, 115 dB peak (center of ceiling)
  - g). 115 dB @ 1 m (3.3 ft) average, 121 dB peak (near corner)
  - h). Rated Impedance: 8 ohms (in bypass mode)
  - i). Transformer Taps: 80 W 40 W, 20 W, (& 10 W @ 70V)
  - j). Driver: 200 mm (8 in) with polypropylene cone, butyl rubber surround, copper-clad coil, vented aluminum former.
  - k). Input Connectors: Six removable locking 2-pin connectors with screw down terminals. Max wire 12 AWG (2.5 mm)
  - l). Knockouts: Two (top and side)
  - m). Safety Agency: Suitable for use in air handling spaces per UL1480, UL2043, NFPA90 & NFPA 70. S7232/UL Listed, Signaling Speaker. Transformer UL registered per UL1876. In accordance with IEC60849/EN60849.
  - n). Dimensions: 332 mm Diameter x 338 mm Depth from back of baffle (13.1 in x 13.3 in)
  - o). Cutout Size: 307 mm Diameter (12.1 in)
  - p). Ceiling Thickness Range: Accommodates tiles/drywall up to 70 mm (2.75 inches) thick
  - q). Weight: 8.1 kg (17.9 lbs)
  - r). Included Accessories: C-ring support backing plate, 2 tile support rails (fits both 2 x 4 ft or 600 x 1200 mm tiles), knockout strain relief, cutout template, paint shield.

2.6 POWER AMPLIFIERS

- A. Approved Manufacturers:
  - 1. Crown Audio, Inc. Ct or Cdi- series.
  - 2. Electro-Voice, Inc. Q- series

3. JBL Drivecore

B. Provide power amplifiers, as shown, that meets to the following requirements:

1. Comply with TIA/EIA SE-101-A.
2. Mounting: TIA/EIA-310-D, standard 19-inch rack mounted.
3. Output Power: As indicated on the system riser diagram, balanced lines (minimum 120 watts).
4. Frequency Response: 20 – 20KHz +1dB / -3dB
5. Minimum Signal-to-Noise Ratio: 60 dB, at rated output.
6. Total Harmonic Distortion: Less than 3 percent at rated power output from 50 to 12,000 Hz.
7. Output Regulation: Less than 2 dB from full to no load.
8. Controls: On/off, input levels, and low-cut filter.
9. Outputs: 8 ohms at 25 / 70V balanced
10. Input Sensitivity: Matched to preamplifier and providing full-rated output with sound-pressure level of less than 10 dynes/sq. cm impinging on speaker microphone or handset transmitter.

C. Accessories

1. Rack-mount kit
2. Power cable

D. Rack Spaces

1. Up to 1200 watt – 2U

2.7 NOT USED

2.8 NOT USED

2.9 4-INPUT AUDIO MIC/LINE MIXER

A. Approved Manufacturer:

1. FSR IT-AS411

B. Provide 4 channel automatic mic/line mixer, as follows:

1. Program Audio Input
  - a). Program Inputs: 4, Stereo balanced/unbalanced
  - b). Microphone Inputs: 1
  - c). Connector Type: Pluggable screw terminal
  - d). Maximum Input Level: 7.5dBV
  - e). Input Impedance: 20k $\Omega$  balanced/unbalanced
2. "Voice-in type" Input
  - a). Connector Type: Pluggable screw terminal
  - b). 'Voice in' Type: Microphone/Line
  - c). Maximum input level: 1dBV
  - d). Microphone Sensitivity: -43dB/-35dB
  - e). Low cutoff: 200Hz
  - f). Phantom power: 24V
3. Preamp Audio Output
  - a). Number of outputs: 1 Stereo or 2 Mono (L + R program audio input summed)
  - b). Signal output: Balanced/unbalanced
  - c). Frequency response: 20Hz – 20kHz (+/- 0.5dB)
  - d). THD + N: <0.09% @ 11dBV with 600 $\Omega$  load (balanced)
  - e). Signal to Noise ratio: 80dB
  - f). Output impedance: 50 $\Omega$
4. Power 24 VDC 0.5A
5. Dimensions: Half Rack x 1U
6. Shipping Weight: 3.5 lbs.

## 2.10 UHD 4K HDMI Digital Switcher

### A. Approved Manufacturer:

1. DV-HSW4K-41

### B. Provide HDMI Digital Switcher as follows:

1. Input 4 x HDMI
2. Output 1 x HDMI
3. Input/output Signal Type HDMI: HDMI with HDCP 1.4
4. Input/output Resolution Support HDMI: 480i, 576i, 480p, 576p, 720p@50, 720p@60, 1080p@24, 1080i@25,
5. 1080i@30, 1080p@30, 1080p@50, 1080p@60,
6. UHD 4K 2160P (3840 x 2160)@60Hz (4:2:0)
7. Maximum Pixel Clock 297 MHz
8. Input Video Signal 0.5~1.5 volts p-p
9. Video Impedance 100 ohms
10. Power Supply 12V 0.3A DC
11. Power Consumption 4.1 Watts Max
12. Control Method Front Panel Buttons, RS232 control
13. Operating Temperature 32°F to 113°F (0°C to 45° C) — 10% to 90%, non-condensing
14. Storage Temperature -4°F to 140°F (-20°C to 70° C) — 10% to 90%, non-condensing
15. ESD Protection Human-body Model:±kV (Contact discharge)
16. Dimensions (L x W x H) 7.5 in. (190.2mm) x 3.25 in. (82.7mm) x 1 in. (26.2mm)
17. Weight 1.00 lb (0.45kg)

## 2.11 NOT USED

## 2.12 NOT USED

## 2.13 PROGRAM SOURCES AND RECORDERS

### A. Blu-ray Player.

1. Approved Manufacturer:
  - a). TASCAM Model BD-01U
2. Provide 1-disc CD/MP3 player as follows:
  - a). CD-R/RW playback, including 12 cm and 8 cm CDs.
  - b). MP3 playback.
  - c). 20-second RAM buffer for shock protection.
  - d). RCA unbalanced analog outputs.
  - e). S/PDIF optical digital output.
  - f). Slot-loading CD transport.
  - g). Repeat, single-play and program playback modes.
  - h). Plus or minus 12.5 percent pitch control.
  - i). Key original mode allows you to change the speed without changing the pitch.
  - j). Call function returns to last play start point.
  - k). Auto ready and auto cue.
  - l). Fade in/out function (up to 10 seconds in 1/2 second steps.)
  - m). Eject block function.
  - n). Serial control via RS-232C.
3. Accessories
  - a). Rack-Mount Bracket: TIA/EIA-310-D, standard 19-inch. (1U rack space)
  - b). Wireless remote control.

### B. CD/MP3/Bluetooth

1. Approved Manufacturer:
  - a). TASCAM CD-200BT.
  - b). Denon DN-500CB
  - c). Marantz PMD-526C
2. Provide as follows:
  - a). Rack mountable.

- b). Connect up to 8 Bluetooth devices simultaneously
  - c). Play CD, CD-R, CD-RW, WAV, MP2, MP3, Data CD
  - d). Multiple playback modes, continuous, single, programmed, random
  - e). Shock/skip prevention memory buffer.
  - f). Pitch control.
  - g). ¼ inch stereo headphone output.
  - h). Wireless remote control.
3. Accessories
- a). Rack-Mount Bracket: TIA/EIA-310-D, standard 19-inch.

2.14 NOT USED

2.15 WIRELESS MICROPHONES

A. Approved Manufacturer:

- 1. AKG SR470 (Presenter Set)

B. General Specifications

- 1. Switching bandwidth 30.5 MHz (depending on local regulations)
- 2. Modulation FM
- 3. Sensitivity 6 dBµV / -100 dBm
- 4. Receiver type Super heterodyne
- 5. Diversity system µC controlled space diversity
- 6. Audio bandwidth 35 to 20,000 Hz
- 7. THD at 1 kHz <0.3%
- 8. Signal-to-noise 120 dB(A)
- 9. Audio outputs balanced XLR, switchable to -30 or 0 dBm ; unbalanced TS 1/4" jack
- 10. Audio output level +9 dBu (max.)
- 11. Antenna inputs 2x 50-ohm BNC female connectors
- 12. Transmitter battery indication low battery
- 13. Power supply 12 V / 500 mA DC
- 14. Dimensions 200 x 44 x 190 mm (7.8 x 1.7 x 7.4 in.)
- 15. Weight 972 g (2.2 lbs.)

2.16 NOT USED

2.17 WALL-MOUNTED HINGED SECTIONAL CABINET

- A. All communications equipment shall be housed in steel wall-mounted hinged sectional protective cabinets.
- B. The equipment cabinets shall have solid sides, plexi-glass front doors and vented rear doors. Doors shall be lockable with all locks keyed alike.
- C. The wall-mounted hinged sectional equipment cabinets shall be 24-1/4 inches wide by 26 inches deep and sized for height with dual pivoting system.
- D. The wall-mounted hinged sectional equipment cabinets shall be steel construction with fully welded corners.
- E. The wall-mounted hinged sectional equipment cabinets shall have powder coat finish, finish shall be black.
- F. Provide ultra quiet fans with 100 CFM in each wall-mounted hinged sectional equipment cabinet , fan shall have less than 27 dBA noise rating.
- G. Provide vertical power strip with 20 amp receptacles in each cabinet.
- H. At each wall-mounted hinged sectional equipment cabinet provide wire management devices between each patch panel. Horizontal and vertical slotted openings and plastic wire holding clips.

- I. Provide wire management panels as shown on the drawing. Provide two (2) extra wire management units in each wall hinged cabinet.
- J. Provide copper bus bar (1/8 inch thick and threaded 10-32, 2 inch wide x 12 space).
- K. Provide 100 spare mounting screws/cage nuts for each equipment cabinet.
- L. Wall-mounted hinged sectional equipment cabinet shall be UL listed.
- M. Provide mounting rails.
- N. Provide blocking in the walls as needed or mount unit on painted 3/4" thick plywood.

2.18 NOT USED

2.19 MISCELLANEOUS COMPONENTS

- A. Conductors and Cables: Jacketed, twisted pair and twisted multi-pair, untinned solid copper.
  - 1. Insulation for Wire in Conduit: Thermoplastic, not less than 1/32 inch thick.
  - 2. Microphone Cables: Neoprene jacketed, not less than 2/64 inch thick, over shield with filled interstices. Shield No. 34 AWG tinned, soft-copper strands formed into a braid or approved equivalent foil. Shielding coverage on conductors is not less than 60 percent.
  - 3. Plenum Cable: Listed and labeled for plenum installation.

2.20 UNIVERSAL POWER SEQUENCE/POWER MODULAR GROUNDING OUTLETS

- A. Unit shall be rack mounted.
- B. Unit shall operate on 120 volt AC, 60Hz.
- C. Unit shall LED indicator.
- D. Unit shall have on/off master switch.
- E. Provide modular raceway system.
- F. Unit shall be connected to 20 amp circuits for 6.20 amp circuits.
- G. Approved manufacturers:
  - 1. Middle Atlantic USC-6R universal sequence with MPR6-R-20 (quantity of 6) modular raceway system.

2.21 NOT USED

2.22 POWER STRIPS

- A. Provide vertical power strip in each sound system cabinet, as follows:
  - 1. 12 – 20 amp receptacles, 120 volts.
  - 2. Cord with NEMA 5 – 20P plug.
  - 3. 50 to 60 inches long.
  - 4. Single circuit.
  - 5. UL listed 1363.
- B. Provide horizontal power strip in each sound system cabinet.
  - 1. 6 – 20 amp receptacles
  - 2. Cord with NEMA 5 – 20 plug
  - 3. Single circuit
  - 4. UL listed 1419
- C. Unit shall be rack or cabinet mounted.

- D. Approved manufacturers:
1. Middle Atlantic PD-2020C-NS (Vertical).
  2. Hubbell PR20620 (Vertical)
  3. Panduit CMRPSVD20 (Vertical)
  4. Middle Atlantic PDS-620R (Horizontal).
  5. Hubbell PR1020 (Horizontal)
  6. Panduit CMRPSHD20 (Horizontal)

2.23 NOT USED

2.24 NOT USED

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Wiring Method: Install wiring in raceways unless otherwise noted.
- B. Wiring Method: Install wiring in raceways except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces where cable wiring method may be used. Use plenum cable in environmental air spaces including plenum ceilings.
- C. Install exposed cables in finished areas parallel and perpendicular to surfaces or exposed structural members, and follow surface contours. Secure and support cables by straps, staples, or similar fittings so designed and installed to avoid damage to cables. Secure cable at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, or fittings.
- D. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess. Use lacing bars in cabinets.
- E. Control-Circuit Wiring: Install number and size of conductors as recommended by system manufacturer for control functions indicated.
- F. Separation of Wires: Separate speaker-microphone, line-level, speaker-level, and power wiring runs. Install in separate raceways or, where exposed or in same enclosure, separate conductors at least 12 inches for speaker microphones and adjacent parallel power and telephone wiring. Separate other intercommunication equipment conductors as recommended by equipment manufacturer.
- G. Splices, Taps, and Terminations: Arrange on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.
- H. Match input and output impedances and signal levels at signal interfaces. Provide matching networks where required.
- I. Identification of Conductors and Cables: Color-code conductors and apply wire and cable marking tape to designate wires and cables so they identify media in coordination with system wiring diagrams.
- J. Wall-Mounting Outlets: Flush mounted.
- K. Floor-Mounting Outlets: Conceal in floor and install cable nozzles through outlet covers. Secure outlet covers in place. Trim with carpet in carpeted areas.
- L. Conductor Sizing: Unless otherwise indicated, size speaker circuit conductors from racks to loudspeaker outlets not smaller than No. 18 AWG and conductors from microphone receptacles to amplifiers not smaller than No. 22 AWG.

- M. Weatherproof Equipment: For units that are mounted outdoors, in damp locations, or where exposed to weather, install consistent with requirements of weatherproof rating.
- N. Speaker-Line Matching Transformer Connections: Make initial connections using tap settings indicated on Drawings.
- O. Connect wiring according to local and national codes.

### 3.2 GROUNDING

- A. Ground cable shields and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.
- B. Signal Ground Terminal: Locate at main equipment cabinet. Isolate from power system and equipment grounding.
- C. Install grounding electrodes as specified in Division 26 Section "Grounding and Bonding for Electrical Systems."

### 3.3 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  1. Schedule tests with at least seven days' advance notice of test performance.
  2. After installing public address and music equipment and after electrical circuitry has been energized, test for compliance with requirements.
  3. Operational Test: Perform tests that include originating program and page messages at microphone outlets, preamplifier program inputs, and other inputs. Verify proper routing and volume levels and that system is free of noise and distortion.
  4. Signal-to-Noise Ratio Test: Measure signal-to-noise ratio of complete system at normal gain settings as follows:
    - a). Disconnect microphone at connector or jack closest to it and replace it in the circuit with a signal generator using a 1000-Hz signal. Replace all other microphones at corresponding connectors with dummy loads, each equal in impedance to microphone it replaces. Measure signal-to-noise ratio.
    - b). Repeat test for each separately controlled zone of loudspeakers.
    - c). Minimum acceptance ratio is 50 dB.
  5. Distortion Test: Measure distortion at normal gain settings and rated power. Feed signals at frequencies of 50, 200, 400, 1000, 3000, 8000, and 12,000 Hz into each preamplifier channel. For each frequency, measure distortion in the paging and all-call amplifier outputs. Maximum acceptable distortion at any frequency is 3 percent total harmonics.
  6. Acoustic Coverage Test: Feed pink noise into system using octaves centered at 500 and 4000 Hz. Use sound-level meter with octave-band filters to measure level at five locations in each zone. For spaces with seated audiences, maximum permissible variation in level is plus or minus 2 dB. In addition, the levels between locations in the same zone and between locations in adjacent zones must not vary more than plus or minus 3 dB.
  7. Power Output Test: Measure electrical power output of each power amplifier at normal gain settings of 50, 1000, and 12,000 Hz. Maximum variation in power output at these frequencies must not exceed plus or minus 1 dB.
  8. Signal Ground Test: Measure and report ground resistance at public address equipment signal ground. Comply with testing requirements specified in Division 26 Section "Grounding and Bonding for Electrical Systems."
- B. Retesting: Correct deficiencies, revising tap settings of speaker-line matching transformers where necessary to optimize volume and uniformity of sound levels, and retest. Prepare a written record of tests.
- C. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified. Prepare a list of final tap settings of paging speaker-line matching transformers.



### 3.4 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
- B. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements.
- C. Complete installation and startup checks according to manufacturer's written instructions.

### 3.5 ADJUSTING

- A. On-Site Assistance: Engage a factory-authorized service representative to provide on-site assistance in adjusting sound levels, resetting transformer taps, and adjusting controls to meet occupancy conditions.
- B. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to site outside normal occupancy hours for this purpose, without additional cost.

END OF SECTION 27 51 16