

DISTRICT TECHNOLOGY RENOVATIONS

Technology Request for Bid



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DIVISION 00 – BIDDING & CONTRACT REQUIREMENTS

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SECTION 00 11 16
INVITATION TO BID

PART 1 - GENERAL

1.01 WORK INCLUDED: DISTRICT TECHNOLOGY RENOVATIONS

- A. Kentwood Public Schools (Owner) is seeking bids for Wireless Network Equipment for the district's transportation fleet and Multimedia Systems associated equipment and installation. Proposed systems shall be configured and installed to service Owner's classrooms across multiple instructional facilities, and as described herein.
- B. Project: DISTRICT TECHNOLOGY RENOVATIONS
- C. Owner: Kentwood Public Schools
5820 Eastern Ave SE
Kentwood, Michigan 49508
- D. Designer: Communications by Design, Inc.
- E. Sites of Work:
 - 1. East Kentwood Freshman Campus
6170 Valley Lane
Kentwood, Michigan 49508
 - 2. East Kentwood High School
6230 Kalamazoo Ave
Kentwood, Michigan 49508
 - 3. Hamilton Elementary and Early Childhood Center
3303 Breton SE
Kentwood, Michigan 49508
 - 4. Transportation Building/Bus Garage
6150 Valley Ln. Dr. SE
Kentwood, Michigan 49508
 - 5. Valleywood Middle School
1110 50th Street
Kentwood, Michigan 49508

1.02 GENERAL DESCRIPTION OF PROJECT SEQUENCE

- A. Sequences and dates specified herein are for information only and indicate the plan and intent of the Owner. Actual dates shall be established based on final award of project.
- B. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner as required to meet schedules.
- C. Schedule:
 - 1. Request for Bid Distributed: February 6, 2024
 - 2. Pre-Bid Meeting: February 19, 2024 at 10:00am
 - 3. Intent to Bids Due: February 20, 2024 by 5:00pm
 - 4. Question and Clarification Deadline: February 21, 2024 by 5:00pm
 - 5. Public Bids Due: March 6, 2024 at 10:00am

1.03 TYPES OF BIDS

- A. Bids shall be submitted in total and with required detail for each item bid and as is required herein, and include all portions of the work identified for the individual bid package as specified herein. Bids shall be made on unaltered bid forms as included herein. Bidder shall fill in all blank spaces and the bid shall be signed by a legal officer or agent authorized to bind the bidder to a contract.

1.04 PRE-BID CONFERENCE

- A. A pre-bid conference will be held. A discussion of the project and review of bid documents will be followed by a site review and an opportunity to ask questions. Attendance is highly encouraged for all contractors interested in bidding on any components or portions of this project. Attendance at the pre-bid conference will be a factor considered during evaluation of bids.
- B. Time:
- C. Location: Kentwood Public Schools Administration Office
Collaboration Room A
5820 Eastern Ave SE
Grand Rapids, MI 49508
- D. Any drawings identified in the table of contents herein will be distributed and reviewed at this conference.
- E. Physical building inspections of sites of work will be provided for at this time.

1.05 TIME AND PLACE OF BID RECEPTION

A. Physically sealed bids for the base bid work will be received at the district office and read aloud at a public opening. Bids arriving after the appointed time as determined by the Owner's representative conducting the public opening, shall be returned unopened. Bids will be accepted beginning forty-eight (48) hours prior to the appointed opening time provided they are in sealed packages and addressed as specified herein.

B. Bid Receipt Deadline:

C. Bid Opening Location: Kentwood Public Schools Administration Office
Collaboration Room A
5820 Eastern Ave SE
Grand Rapids, MI 49508

D. Faxed or electronically delivered bids will not be accepted.

1.06 EXAMINATION AND PROCUREMENT OF DOCUMENTS

A. Specifications and any relevant Drawings may be obtained from the Technology Designer. Contractors may obtain copies by documented request to Communications by Design, Attn: Rebecca Szilagy. Requests may be made by:

1. Writing – 4101 Sparks Drive, Grand Rapids, Michigan 49546
2. Email – rszilagy@cbdconsulting.com

1.07 BID SECURITY

- A. Bid security equal to five percent (5%) of the total bid amount, must accompany each base bid in accordance with the Instruction to Bidders.
- B. Bid security shall be either a Bid Bond issued by a company licensed in the State of Michigan to furnish bid security or Certified Check made payable to the Owner.

1.08 PERFORMANCE BOND COVERAGE

A. Selected Contractor(s) will be required to provide a performance bond and payment bond in an amount equal to one hundred percent (100%) of the bid amount including any accepted alternates at the Owner's discretion. Such bonds shall be issued by surety licensed by the State of Michigan and acceptable to the Owner.

1.09 UNIVERSAL SERVICE FUND (USF) CONDITIONS

- A. IDENTIFICATION NUMBER – the service provider’s USF Service Provider Identification Number (SPIN) must be included in the Bid. Direct all questions regarding the USF requirements in this document to the Universal Service Administrative Company (USAC), Schools and Libraries Division (SLD) at (888) 203-8100.
- B. FUNDING REQUESTS (FY24 E-rate) - The specified products and/or services are to be provided for FY24 (July 1, 2024-June 30, 2025) and qualify for universal service discounts under the FY24 universal service support mechanism, E-rate. No invoices will be dated or paid before July 1, 2024.
- C. UNIVERSAL SERVICE DISCOUNTS – The service provider contract may be conditional upon the Owner receiving universal service discounts under the FY24 universal service support mechanism, E-rate. The Owner reserves the unrestricted right to change the contract amount by adding to, and/or reducing the amount of services and/or products in order to meet budget requirements in the event the level of universal service discounts is changed. Any such adjustments to the contract amount will be taken prior to the start of the specific work being adjusted or eliminated on a given building and/or project.
- D. UNIVERSAL SERVICE DISCOUNT IMPLEMENTATION – The Owner reserves the unrestricted right to specify the filing option for the universal service discount for each product and/or service offered within the Bid: Billed Entity Applicant Reimbursement (BEAR) or Service Provider Invoice (SPI).
- E. ELIGIBLE PRODUCTS AND SERVICES – The USF eligible products and/or services identified on the USAC FY24 (2024-2025) Eligible Services List, which is incorporated herein by reference, must be identified separately from any and all “ineligible” products and/or services in the Bid. Bidder shall note eligibility of items on required Schedule of Values form(s).
- F. FUNDING AVAILABILITY – Owner may or may not elect to proceed with project in whole or, or in part based on multiple possible sources of funding. Approval of E-rate funding will not be the sole criteria for Owner approval to proceed with any/all/some implementation activity on or after July 1, 2024.

1.10 OWNER’S RIGHT TO REJECT BIDS

- A. The Owner reserves the right to reject any and/or all bids. The Owner reserves the right to accept a bid, or portion thereof by issuance of a valid purchase order within ninety (90) calendar days following the bid opening. No bids may be withdrawn during this time without the specific approval of the Owner.
- B. Withdrawal of any Bids after the opening time without specific approval by Owner may result in forfeiture of required bid security by Bidder.

1.11 DEFINITIONS

- A. "Owner" is intended to mean Kentwood Public Schools, a general powers school district.
- B. For purposes of this project, the terms "Architect", "Engineer" and "Designer" are used synonymously to refer to Communications by Design, Inc., a Michigan Corporation.
- C. The term "Bidder" refers to any organization properly and accurately submitting a complete "Intent to Bid Form" prior to the required time specified herein and subsequently properly submitting completed set of bid documents as specified herein.
- D. The term "Contractor" herein is a reference to the firm(s) eventually selected by the Owner to provide the intended system(s), or any portion thereof, and fulfill the terms of the contract.
- E. The term Contract is a reference to the collective set of documents, drawings, diagrams, Owner's Purchase Order, Addenda and all other materials as provided for herein defining arrangement between Owner and Contractor.
- F. The term Addenda (or Addendum) are that portion of the Contract consisting of modifications, amendments, deletions or substitutions to the contract documents issued prior to the execution of the Contract.

END OF SECTION

SECTION 00 40 00
BID FORMS

Intent to Bid Form

Complete and submit the following form if you have interest or intend to submit a Bid for this project. Unaltered and completed forms must be received on or before 5:00 PM on February 20, 2024. Only bidders returning a completed “Intent to Bid Form” will be notified of required addenda.

Company Information

Name: _____

Address Line1: _____

Address Line2: _____

City, State and Zip Code _____

Primary Contact Information

Name: _____

Phone No.: _____

Fax. No.: _____

E-Mail Address: _____

Portions of the bid for which you will be responding:

- ☐ Section 27 21 33 – Wireless Network (Transportation)
- ☐ Section 27 41 16 – Multimedia Equipment

Submit unaltered and completed form to:

Rebecca Szilagy

Communications by Design, Inc.

rszilagy@cbdconsulting.com

SEALED BID LABEL

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

BID TO: Kentwood Public Schools
Attention: Mr. Todd Bell
5820 Eastern Ave SE
Kentwood, Michigan 49508

BID FROM:

PROJECT: DISTRICT TECHNOLOGY RENOVATIONS
TECHNOLOGY BID #3032

INCLUDING Addendum No. _____ Dated _____
ADDENDA: Addendum No. _____ Dated _____

DUE: March 6, 2024 at 10:00am

BID FORM

BID TO: Kentwood Public Schools
Attention: Mr. Todd Bell
5820 Eastern Ave SE
Kentwood, Michigan 49508

BID FROM: _____

PROJECT: DISTRICT TECHNOLOGY RENOVATIONS
TECHNOLOGY BID #3032

The undersigned, having familiarized themselves with all local conditions affecting the cost of work, and having examined the site and all applicable Bidding Documents herein, and herein referenced, including, but not limited to, all addenda issued thereto, hereby propose to furnish all labor, material, equipment, applicable taxes and services required for proper completion of each of the following categories of this project for the sum of:

Bid Category _____ Title _____
_____ Dollars (\$) _____).

Said amount written above constituting the Base Bid

Bid Category _____ Title _____
_____ Dollars (\$) _____).

Said amount written above constituting the Base Bid

TAXES:

Bid sum includes all applicable taxes.

ALLOWANCES:

Base bid includes all applicable allowance cost(s) as set forth herein.

COST OF BONDS:

Bid sum includes cost of furnishing a Performance Bond and Labor and Material Payment Bond, each in the amount of one hundred percent (100%) of the bid.

ACKNOWLEDGEMENT OF ADDENDA:

The following addenda have been received, are hereby acknowledged, and their execution is included in both base bid and alternate bids herein.

Addendum No. _____ Dated _____ Addendum No. _____ Dated _____

ALTERNATES:

Based bid amount may be increased or decreased in accordance with each of the following alternate bids as may be selected, following procedures stated herein. Voluntary Alternates shown below are identified and described in detail on appropriate attachment(s) as referenced herein.

Voluntary Alternate A _____

Voluntary Alternate B _____

Voluntary Alternate C _____

Voluntary Alternate D _____

Voluntary Alternate E _____

Voluntary Alternate F _____

PRINCIPAL SUBCONTRACTORS

As required herein, the following Subcontractors are proposed to be used for this project:

Legal Name: _____ Work Proposed _____

Legal Name: _____ Work Proposed _____

Legal Name: _____ Work Proposed _____

BID SECURITY:

Accompanying this Bid, as required herein, is a bid security in the form of Certified Check/Cashier's Check/Bidder's Bond in the amount of:

_____ Dollars (\$ _____),

payable to the Owner, which it is agreed, shall be retained as liquidated damages, not as a penalty, by the Owner, if the undersigned fails to execute the Contract in conformity with the form of Contract incorporated and referenced herein and fails to furnish specified bonds within ten (10) days after date of issuance of a Letter of Intent to the undersigned.

If awarded the Contract, the undersigned agrees to commence work within ten (10) calendar days after date of issuance of a Purchase Order, which shall be considered as the notice to proceed, and agrees to complete the work in accordance with the schedule herein.

FAMILIAL DISCLOSURE:

Accompanying this Bid, as required herein, is a legally executed and notarized Michigan Familial Disclosure Statement.

EXCEPTIONS:

Bidder takes no exception to terms, conditions, specifications and/or any other requirements herein unless expressly noted, and specifically identified as provided for herein on unaltered Contract Exception form accompanying this Bid.

SIGNATORY AUTHORITY:

The undersigned certifies they are an authorized agent of the bidding entity, and legally able to bind the bidding entity to the terms, conditions and responsibilities of this, and all referenced bid documents. Furthermore, the undersigned acknowledges an understanding that non-compliance of this authority or any other bidding requirements may result in forfeiture of bid security, dismissal of consideration of bid submitted, and/or personal liability against the signatory.

AGREEMENT:

The undersigned agree(s) to provide the post-bid information required within ten (10) days after notification of a Letter of Intent and to execute an agreement for work covered by this Bid on the Owner's standard Purchase Order for which terms and conditions are expanded to include all Bidding Documents and subsequent addenda issued thereto.

In submitting this bid, it is understood that the Owner reserves the right to reject any or all bids. It is further agreed that this bid is binding for a period of Ninety (90) days from the opening thereof.

Respectfully submitted,

Date: _____

Firm Name: _____

By: _____

Signed: _____

Title: _____

Official Address: _____

Telephone Number: _____

Fax Number: _____

Primary Contact Email Address: _____

(If Corporation, affix Seal)

Michigan Familial Relationship Disclosure Statement

In accordance with Section 1267 of Michigan Revised School Code this sworn and notarized statement of an authorized representative, discloses any familial relationship between the owner and/or any employee of the Bidder, and any member of the project Owner's governing Board(s) or Superintendent(s).

If any conflict of interest is discovered subsequent to submission of bid, written disclosure shall be submitted to the project Owner within seven (7) days of discovery. The project Owner reserves the right to immediately terminate any contract with Bidder upon notification of a conflict of interest. Upon such termination, the project Owner shall compensate Bidder only for the value of any goods or services provided to the Owner prior to such termination as determined by Designer.

(Check only one Box Below)

☐ It is hereby acknowledged and certified by Bidder that no familial relationship exists between the owner or any employee of the Bidder and any member of the project Owner's governing Board(s) or Superintendent(s).

☐ A familial relationship exists between the owner or an employee of the Bidder and a member of the project Owner's governing Board(s) or Superintendent(s). The person(s) and the relationship(s) are as follows:

Bidder

Board or Superintendent

| | |
|-------|-------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Bidder Authorized Representative:

Bidder: _____

Representative's Signature: _____

Print or Type Name: _____

Representative's Title: _____

Subscribed and sworn this _____ day of _____, 2024

In the County of _____ State of _____

By _____
Notary Public Signature

Seal or Stamp:

My commission expires on: _____

REFERENCES

Customer name: _____
Address: _____
City/State/Zip: _____
Contact name: _____
Contact title: _____
Phone: _____
E-mail: _____
Scope of project: _____

Date of completion: _____

Customer name: _____
Address: _____
City/State/Zip: _____
Contact name: _____
Contact title: _____
Phone: _____
E-mail: _____
Scope of project: _____

Date of completion: _____

Customer name: _____
Address: _____
City/State/Zip: _____
Contact name: _____
Contact title: _____
Phone: _____
E-mail: _____
Scope of project: _____

Date of completion: _____

CONTRACT EXCEPTIONS

Check one Box

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

☐ Bidder proposes the following exceptions to the Contract Documents:

| <i>Paragraph Number</i> | <i>Explanation</i> |
|-------------------------|--------------------|
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NOTE:

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

SCHEDULE OF VALUES/BID FORM

Bidder may submit version of only this form with slight variation. All information in this form is required. Form submitted must materially match below both in content and format. Electronic version of this form is required with bid package as Microsoft Excel compatible spreadsheet on USB drive for each project section being bid. Failure to provide appropriate and complete SCHEDULE OF VALUES, as determined by the Owner and/or Designer, may result in disqualification of Bid.)

Bidder: _____

Bid Division:27 21 33

[illegible]

SCHEDULE OF VALUES/BID FORM

Bidder may submit version of only this form with slight variation. All information in this form is required. Form submitted must materially match below both in content and format. Electronic version of this form is required with bid package as Microsoft Excel compatible spreadsheet on USB drive for each project section being bid. Failure to provide appropriate and complete SCHEDULE OF VALUES, as determined by the Owner and/or Designer, may result in disqualification of Bid.)

Bidder:

Bid Division:27 41 16

[illegible]

END OF SECTION

SECTION 00 21 13
INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 OWNERSHIP

- A. Bidders prepare and provide bids without any cost to the Owner and/or Designer. Once opened, bids become the sole property of the Owner. Bidders have no claim to, or ownership of bids opened. Bids become subject to all legal statutes including, if applicable, United States and Michigan Freedom of Information Acts and related laws.

1.02 COMPLIANCE

- A. This document establishes the primary system(s) design configuration. The Bidder's bid response shall include all services, supplies, components and equipment required to provide a complete turnkey system(s) which meets or exceeds all specifications for each given bid item being proposed.
- B. Owner prefers to enter into a contract with a single bidder for all materials for completion of this project, but shall consider combinations of portions of bids from various bidders. The Owner reserves the right to award portions of the project to multiple bidders who will be required to cooperate with one another in order to complete the work.
- C. By their response, Bidders agree to comply with all sections, terms, conditions and/or requirements of the contract documents except as expressly noted, and specifically identified by paragraph number on the unaltered Contract Exceptions Bid Form. Exceptions to any bid sections, terms, conditions and/or requirements deemed excessive by the Owner and/or Bid Coordinator may disqualify Bid.
- D. In compliance with the Freedom of Information Act (FOIA), the Owner shall make bid documents available for public review after issuance of purchase order to the successful bidder/s.
- E. In connection with the execution of this Contract, Contractor and any Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, or national origin.
- F. Negligence in preparation, improper preparation, errors in, or omissions from Bids shall not relieve Bidder from fulfillment of any and all obligations and requirements of the Contract Documents.

- G. All Bid documents and worksheets must be completed in detail and submitted together on time.
- H. All documents constituting the entire present agreement shall be construed in accordance with and governed by the laws of the State of Michigan.
- I. Designer shall have authority for interpretation of Contract Documents. In the event terms, provisions or any other portion of the Contract Documents is/are in dispute, Designer shall have full and final authority to interpret the Contract Documents, and such interpretation shall be final and binding.
- J. In the event of a conflict between any terms or conditions in any of the documents comprising the entire present Agreement, the terms and conditions set forth in this document shall take precedence.

1.03 NOTICE AND RESPONSE

- A. Upon notification of Bidder being considered as a finalist, the Bidder shall provide to the Owner and Designer, within 48 hours, a current “Dunn and Bradstreet Supplier Evaluation Report” and other documentation as may be required of finalists herein and as requested by Owner and/or Bid Coordinator.
- B. Bidder shall provide timely response to all requests from Designer and/or Owner regarding clarification and/or elaboration concerning, but not limited to its Bid as may be deemed relevant by the Owner and/or Designer.

1.04 PROTECTION AND SAFETY

- A. Contractor shall continuously maintain adequate protection of all Work from damage and shall protect the Owner’s property from injury or loss arising in connection with the execution of the Contract. Contractor shall make good any such damage, injury or loss, except such as may be directly caused by agents or employees of the Owner. The Contractor shall adequately protect adjacent property as required by law, by the Contract Documents, or as otherwise required, to cause no damage to them during the execution of the Contract. This requirement shall also apply to structures above and below ground as conditions of the site require.
- B. Contractor shall be solely responsible for, and have control over means, methods, techniques, sequences and procedures for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the contract. Contractor shall take all necessary precautions for the safety of employees and visitors on the site of the Project and shall comply with applicable provisions of federal, state, and municipal safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the Work is being performed. Contractor shall erect and properly maintain at all times, as required by the conditions and

progress of the Work, all necessary safeguards for the protection of workers and the community.

- C. Contractor shall vigorously defend any and all suits that may be brought against the Owner by any person and/or entity, whether in the employ of the Contractor or not, for damage to property, and/or injury or death to persons alleged or claimed to have been caused by or through the performance of work.

1.05 DRAWINGS DIAGRAMS AND ILLUSTRATIONS

- A. Drawings, Diagrams and Illustrations are diagrammatic in nature and indicate general arrangement and nature of systems and work included.
- B. Floor plan drawings are provided to assist the contractor in preparing documentation and reports as required herein.

PART 2 - MATERIALS

2.01 VOLUNTARY ALTERNATES AND SUBSTITUTION OF SPECIFIED PRODUCTS

- A. This Request for Bid describes a particular implementation. All Bids must provide pricing on the “base bid” as described herein. Voluntary alternatives providing comparable functionality with significant cost reduction and/or performance enhancement may be proposed. Voluntary alternatives are encouraged, but must be identified as “Voluntary Alternates” and detailed on unaltered Bid Forms contained herein. Voluntary Alternates may be further detailed and/or explained in attachments to the unaltered Bid Forms contained herein. Exceptions to the Request for Bid specifications must be clearly noted and explained for each Voluntary Alternate proposed.
- B. No substitutions of specified products may be made without specific prior authorization by Designer and Owner. Individual bid divisions herein contain particular information related to acceptable manufacturer and product requirements.
- C. Trade-in, equipment/license exchanges or other return allowances may be provided as a voluntary alternate. Trade-in, exchange or other return equipment allowances shall not be included in base bid amount.

PART 3 - EXECUTION

3.01 EXAMINATION OF DOCUMENTS AND SITE

- A. Bidders shall carefully examine the Contract Documents and the construction site to obtain first-hand knowledge of existing conditions and requirements. No plea of ignorance of conditions that exist, or any other relevant matter

concerning work to be performed in the execution of work will be accepted as justification for failure to fulfill every detail of all requirements as described herein.

3.02 QUESTIONS, INTERPRETATIONS AND ADDENDA

- A. Any bidder finding discrepancies between Drawings, Specifications and/or Bid Documents, or be in doubt as to the exact meaning of any provision or detail shall notify the Designer at once, and before the deadline for Questions and Clarifications. The Designer may then, at their option, issue Addenda clarifying same. The Designer is not responsible for oral instructions, or Bidder's/Contractor's misinterpretations of Drawings, Specifications and/or Bid Documents.
- B. The Designer reserves the right to issue Addenda at any time up to thirty-six (36) hours prior to the scheduled bid opening. All such addenda shall become, upon issuance, an inseparable part of the Specification/Contract Documents. Each bidder shall incorporate within their bid all costs for items listed in any/all Addenda, and shall acknowledge receipt and identifying number of each Addendum on the Bid Form and on the outside of the sealed bid container.
- C. Addenda will be forwarded to each bidder who has received a copy of the Bidding Documents and has submitted "Intent to Bid Form".

3.03 BID SECURITY, BONDS AND INSURANCE

- A. Bid Security, Performance and Payment Bonds are required on this project.
 - 1. Bid security equal to five percent (5%) of the bid amount must accompany each bid in accordance with the Instruction to Bidders.
 - a. Bid security shall be either a Bid Bond issued by a company licensed in the State of Michigan to furnish bid security or Certified Check made payable to the Owner.
- B. The selected Contractor will be required to provide a performance bond and a payment bond each in an amount equal to one hundred percent (100%) of the bid amount including any accepted alternates at the Owner's discretion.
 - 1. The surety of the performance bond shall remain in effect until all acceptances and final contract close-out requirements herein have been executed by the Owner.
- C. Contractor shall provide, prior to beginning any work at the sites, certificate of insurance for delivery to Owner indicating all required insurance coverage is in force.

1. Workers' Compensation and Employer's Liability Insurance
 - a. Coverage A – Statutory
 - b. Coverage B - \$1,000,000 Per Accident
 2. Broad Form Comprehensive General Liability Insurance (including – Premises, Elevators, Contractor's Protective Liability, Contractual, Products & Completed Operations – including Broad Form Extensions).
 - a. Each Occurrence - \$1,000,000
 - b. General Aggregate - \$2,000,000
 - c. Products & Completed Operation Aggregate - \$2,000,000
 - d. Personal Injury & Advertising Injury - \$1,000,000
 - e. Fire Legal - \$100,000
 3. Sub-contractors Operations, Products – Completed Operations and Contractual Liabilities, plus such excess coverage as may be appropriate for the limits listed.
 4. Comprehensive Automobile Liability Insurance (owned, hired, and non-owned automobiles).
 - a. Bodily - \$1,000,000 each Person and \$1,000,000 each Occurrence
 - b. Property Damage - \$1,000,000
 5. Furnish Owner with Contingent Liability Insurance Policy with coverage and liability limits the same as for Public Liability Insurance specified herein. Designate on policy as assured, only the Owner.
 6. Furnish Owner with Contingent Property Damage Insurance Policy with coverage and liability limits the same as for Property Damage specified herein. Designate on policy as assured, only the Owner.
 7. Policies shall include notification clause requiring ninety (90) days written notice to Owner in the event of policy cancellation, expiration, non-renewal, coverage reduction or other material change.
 8. Contractor shall not commence work under the Contract until after all insurance required herein as been obtained and certificates for such are approved by Owner.
- D. All such bonds and/or insurance shall be issued by surety licensed by the State of Michigan and acceptable to the Owner.

1. Insurance certificate(s) shall be signed by insurance agent licensed in the state of Michigan or a representative of the insurance company.

E. Contractor agrees to indemnify and hold harmless the Owner and Designer, including their agents and employees, from and against all claims, damages, losses and expenses, including, but not limited to, attorney fees arising out of, or resulting from the performance of the work to the fullest extent allowed by law on a comparison basis of fault.

3.04 MODIFICATION AND WITHDRAWAL

A. Bids may be withdrawn and/or changed any time prior to the deadline for submission of bids. Bids may not be withdrawn or changed thereafter and shall be deemed a firm offer continuing for ninety (90) calendar days. Bids received after the deadline for submission will be returned unopened at the Owner's discretion.

B. Withdrawal of any Bid after the opening time without specific approval by Owner may result in forfeiture of required bid security by Bidder.

3.05 CODES, ORDINANCES, REGULATIONS AND RELATED

A. All labor and materials shall be furnished and installed in strict accordance with the latest applicable codes, ordinances and regulations of any governing body having jurisdiction over this project.

B. In the event the quality of labor and materials required by the Drawings and Specifications herein exceeds requirements of current applicable codes, ordinances and regulations, the Drawings and Specifications shall take precedence.

C. In the event the quality of labor and materials required by current applicable codes, ordinances and regulations having jurisdiction over this project exceeds that of the Drawings and Specifications herein, the applicable codes, ordinances and regulations shall take precedence.

D. The Contractor shall give all notices and comply with all codes, laws, ordinances, rules and regulations of any authority having jurisdiction, which bears on the performance of its work. This compliance includes, but is not limited to, the Michigan School Safety Initiative (PA129, PA130, PA131 and PA138) if applicable to work being performed.

E. The Contractor shall pay for all licenses, permits, taxes, and fees required for this project; and shall comply with all federal, state, local and Owner's codes, laws, ordinances, regulations and other requirements applicable to the work specified at no additional cost to the Owner. Contractor shall submit copies of all approved certificates and approvals to the Owner upon receipt.

3.06 SUB-CONTRACTOR AND MATERIAL SUPPLIER

- A. The successful Bidder shall submit to the Owner and Designer a complete list of all sub-contractors and all material suppliers proposed to engage on the work. Sub-contracts shall not be awarded until after they have been approved by the Designer and Owner.
- B. Finalist bidders may be required to submit additional details related to sub-contractors and suppliers within forty-eight (48) hours after the bid opening.
- C. Names of any principal sub-contractors must be listed on the Bid Form.
- D. All contracts made by the successful Bidder with Subcontractors shall be covered by the terms and conditions herein. The successful Bidder shall see to it that Subcontractors are fully informed in regard to these terms and conditions, and shall bind all subcontractors to the same terms and conditions. Failure to do so will absolve the Owner from any liability for additional cost due to subcontractor claims for additional cost, time or any claim(s) for additional cost by subcontractor(s).

3.07 BID RESPONSE FORMAT

- A. Bidder shall provide complete Bid copies in two formats as described herein.
 - 1. One (1) Hard copy format responses shall be in a bound tabulated format. Each response shall have tab indicators for each section.
 - 2. One (1) Electronic copy format responses shall be submitted on a USB Drive. Electronic media shall contain separate folders to organize response documentation as described herein. Files submitted electronically shall be *Adobe Acrobat* "PDF" format (SCHEDULE OF VALUES is additionally required to be on the disk in the appropriate folder as a spreadsheet and as described herein).
- B. All Bid Response formats shall be clearly externally marked to include, but not be limited to:
 - 1. Bidder identification.
 - 2. Project Owner identification.
 - 3. Project name.
 - 4. Bid submission date.
- C. Bid Responses shall include an index containing copies/PDF of a complete index of documents comprising Bid Response. Responses shall include, but not be limited to the following tabbed/folder sections:

1. Section 1 – Forms, which shall contain copies/PDF files of all required and completed bid forms.
 - a. BID FORM
 - b. Michigan Familial Relationship Disclosure Statement
 - c. Iranian Linked Business Disclosure Form
 - d. REFERENCES
 - e. CONTRACT EXCEPTIONS
 - f. SCHEDULE(s) OF VALUES
 - g. BID BOND
2. Section 2 – Overview, which shall contain copies/PDF files of cover letter and/or executive overview.
3. Section 3 – Submittals, which shall contain copies/PDF files of all required and voluntary submittals.
4. Section 4 – Appendices, which shall contain copies/PDF files of other reference materials Bidder wishes to, or is required to submit.

3.08 AWARD OF CONTRACT

- A. The material proposed to be used for the completion of work, and the competency, solvency and responsibility of bidders will receive due consideration before award of contract. In the reception of bids for this work, the Owner incurs no obligation to accept the lowest, or any bid submitted. The right to accept or reject any and all bids or portion thereof is reserved by the Owner. The Owner reserves the right to require testimonial, accounting or legal documents pertaining to the solvency of a Contractor, or any other decision factor the Owner deems appropriate, prior to award of contract.
- B. Owner reserves the right to select individual components from schedule of values independent of installation as may be determined in Owners best interest. Selected bidder may be required to install selected components provided by others.
- C. Issuance of a Purchase Order by Owner in response to a valid bid shall be a Notice to Proceed, and shall become part of, but not limited to, all terms, conditions and requirements herein. Notice to Proceed shall have the full effect of contract award, and shall make all terms, conditions, requirements and responsibilities of Bidder binding upon issuance. Notice to Proceed, once

issued, shall become an inseparable part of the contract documents herein, and constitute both Bidder and Owner's acceptance of contract.

3.09 TIME, SCHEDULES, PROJECT MANAGEMENT, MEETINGS AND PLANS

- A. Time is of the essence on this project. Award of contracts for this project will be contingent on the bidder's agreement to complete the work on or before the contract completion date stated herein.
- B. All Contractors will commence work in such a manner and at such a time as to expeditiously interface with the work of other Contractors, and will pursue the project diligently to completion. All Contractors will work in a cooperative manner with Owner and other Contractors.
- C. Contractor shall appoint an overall Project Manager acceptable to Owner, with skills and experience deemed appropriate by the Owner for the scope and size of the project. Project Manager shall be responsible for the scheduling of all Contractor resources and attending all project meetings. Upon notification of Bidder being considered a finalist, the Bidder shall submit professional resume of proposed Project Manager within forty-eight (48) hours.
 - 1. Project meetings shall be conducted at Owner's selected and identified location weekly and at Owner's and/or Designer's discretion.
 - 2. Within five (5) days of Notice to Proceed (issuance of a Purchase Order by the Owner), Contractor's Project Manager shall provide to the Owner a critical flow path in the form of a "Gantt Chart" (or equivalent) indicating the proposed sequence of events and approximate beginning and completion dates in accordance with, compliance to, and coordinated with requirements herein.
 - 3. Changes of the Project Manager during the project shall not be acceptable without prior written approval from the Owner.
 - 4. It is the responsibility of the Contractor's Project Manager to schedule work, work out issues, ensure that all required products and services are delivered according to schedule and attend to any other matters required by the Owner in the interest of professional and timely completion of the project.
 - 5. The appointed Project Manager, or a designee acceptable to the Owner, shall be in attendance of all project meetings throughout the term of the project. Failure to do so may be considered a material breach of contract.
 - 6. After a ten (10) business day notice, the Owner reserves the right to request a new Project Manager, when it appears that, in the Owner's sole discretion, the Project Manager is not fulfilling the full responsibilities of

the position. Failure by Contractor to provide adequate Project Manager meeting requirements of the Owner, may result in Contract termination.

3.10 CHANGES IN THE WORK

- A. No changes in work with the effect of either increasing or decreasing in the project value shall be made without specific and prior authorization by the Owner and Designer.
- B. Owner, without invalidating the contract and without notice to any surety, may at any time order extra work or make changes by altering, adding to or deducting from the work, the Contract Sum being adjusted accordingly. All such work shall be authorized by a written Change Order approved by Owner and Contract Designer. Upon receipt of such an order Contractor shall promptly proceed with the work involved. All such work shall be executed under the conditions of the original Contract. Owner authorized change order(s) may be issued at any time prior to Contract close out.
- C. When so directed, Contractor shall promptly submit an itemized estimate and a unit price for performing or deleting such extra or changed work as may be contemplated. Any extensions or reductions of the contract time associated with extra or changed work shall be identified at the time Contractor submits such documentation.
- D. At the Owner's discretion, adjustments in the Contract Sum shall be determined by one or more of the following methods:
 - 1. By mutual acceptance of a lump sum cost, including overhead and profit, itemized and supported by sufficient substantiating data to permit evaluation.
 - 2. By unit prices stated in the Contract Documents including, but not limited to, Schedule of Values.
 - 3. By unit prices mutually agreed upon.

3.11 PAYMENT REQUESTS AND PAYMENTS

- A. Contractor's invoices shall be submitted monthly in correlation with the Project Schedule indicating percentage of work completed.
- B. All contract and change order invoices shall be sent directly to Contract Designer.
- C. A 10% retainage shall be held back on all payment requests, including, but not limited to hardware, software, change orders and services, until final completion and close out of the project or project phase as determined by Owner and Designer.

- D. Contractors are required to submit all invoices on approved AIA Payment Request Forms or other billing format pre-approved by Contract Designer. Each AIA Payment Request Form shall be accompanied by a properly completed, executed and notarized Waiver of Lien which shall be in a format and contain verbiage approved by Owner.
- E. The Contract Designer and Owner shall process payment requests on a monthly schedule and in accordance with their respective established processes and procedures. Payments will be made by the Owner based only on AIA Request Forms having been previously certified, audited and approved by Contract Designer and accompanied by acceptable Waiver of Lien.

END OF SECTION

SECTION 00 65 00
CONTRACT CLOSE OUT

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide an orderly and efficient transfer of the completed work to Owner.
- B. Details affecting work of this Section includes, but is not limited to all other Sections herein and all related Contract Documents.
- C. Activities relative to Contract close-out are described in, but not limited to, this and other Sections of this document.

1.02 SUBSTANTIAL COMPLETION

- A. "Substantial Completion" shall be defined as:
 - 1. All responsibilities of Contractor for all provisions and requirements of all divisions and sections of complete Contract herein, and as amended, are properly and fully completed or properly, accurately and acceptably provisioned for.
 - 2. All systems, equipment, facilities, services, programming and/or components required by all divisions and sections of complete Contract are fully operational, acceptable and useful to the Owner for their intended purposes.
- B. Prior to requesting inspection by Designer to certify Substantial Completion, Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements and is ready for such inspection.

PART 2 - MATERIALS

2.01 NOT USED FOR THIS SECTION

PART 3 - EXECUTION

3.01 PROCEDURES

- A. Contractor shall submit a written request to Designer indicating they have achieved Substantial Completion of Work.
- B. Within a reasonable time after receipt of the request, Designer will inspect Work to determine status of completion.
- C. Should Designer determine the Work is not substantially complete:

1. Designer promptly will so notify Contractor, in writing giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.
2. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-inspection.
3. Designer will re-inspect the Work.
4. Excessive re-inspections of Work may result in fees being assessed Contractor.

D. Should Designer concur the Work is substantially complete:

1. Designer will prepare a letter of Substantial Completion.
2. Designer will submit the letter to Owner and Contractor.
3. Contract shall be deemed "Closed Out" for retainage purposes.
4. Final Acceptance of the system shall be deemed complete.

END OF SECTION

SECTION 27 21 33
WIRELESS COMMUNICATION NETWORK (TRANSPORATION)

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to transportation wireless Internet systems for the Kentwood Public Schools bus fleet.
- B. Owner intends the Wireless Communications System to provide for full coverage within each district bus.
 - 1. Owner's applications may include, but not be limited to:
 - a. High density workstation connectivity. This may include 1:1 student initiatives as well as student provided device connections.
 - b. Student and district owned mobile device connectivity.
 - c. Staff and/or administrator portable workstations.
- C. Contractor shall advise, coordinate and work cooperatively with Owner representatives related to any configuration changes required and/or proposed for Owner's Ethernet infrastructure (VLAN configuration, QoS mapping, routing, RADIUS Services, Firewall security provisions etc.).
- D. The Contractor shall design, engineer, configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant Bus Wireless Communication System, complete and with full functionality as specified herein.
- E. Contractor shall coordinate their installation with other communication systems, contractors, Designer and the Owner as is appropriate.

1.02 WARRANTY

- A. Complete installation shall be free from defect and/or failure for a period of five (5) years. Any replacement, upgrade or fix, including labor for any non-conforming, unsupportable or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.
- B. Manufacturer's warranty shall be provided for all components of the system.
 - 1. Any documents and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.

2. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.
- C. On-site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.
- D. Contractor shall provide the following response times for all malfunctioning equipment:
 1. Four (4) hours or less for matters that render twenty percent (20%) or more of the system users at any specific building or site unable to maintain normal productivity.
 2. Two (2) business days for matters not meeting the above criteria.
 3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.
- E. Bidder shall provide current annual maintenance contract pricing for recommended maintenance programs for all equipment following the specified and included period as a Voluntary Alternate. This information will be considered by Owner and Designer as part of the bid evaluation process.
- F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have no effect on Warranty or System Acceptance by Owner and/or Designer.
- G. Bidder shall provide annual maintenance contract cost for the system for the first year following the warranty period. This annual maintenance cost will be used as a factor in evaluation of the bids being considered by the Owner related to total cost of ownership given different life cycle scenarios.

1.03 STORAGE OF MATERIALS

- A. All materials shall be secured when not in use by the Contractor.
- B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.

- C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

1.04 SUBMITTALS

- A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid Proposals.
- B. Shop drawings and diagrams shall be submitted by Bidder for approval by Designer with Bid Proposals.
 - 1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.
 - 2. No work constituting final installation shall be commenced until after approval of shop drawings by Designer.
- C. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project with Bid Proposals.
- D. Equipment or material installed for this project that does not have an approved submittal associated with it, will be removed and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.
 - 1. The Owner and/or Designer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.
 - 2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due, or become due Contractor.
- E. The Contractor shall submit within ten (10) calendar days after the Notice to Proceed, a schedule that reflects the sequence of activities of the contractor's approach to the execution of and completion of the work. The schedule shall be broken into work areas to provide for a clear identification of the planned progress of the work. Included in the schedule will be a list of tasks with list of deliverables and the percentage of work completed. This schedule shall coincide with progress payments applications dates and projected amounts.

All durations shown will be in working days. Microsoft Project is the software of choice for this schedule. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing and executing the work required by the Contract Documents. Owner will rely on such schedules to coordinate and otherwise plan related work of Owner personnel, other separate contractors, or the Owner's routine daily work.

1.05 REFERENCE SPECIFICATIONS

- A. All work, products, and materials shall conform with the following standards as applicable for the intended use:
 - 1. EIA/TIA Commercial and Administration Standards
 - 2. NEC
 - 3. IEEE 802
 - 4. IETF RFCs
 - 5. FCC – All Applicable Rules and Regulations
 - 6. UL
 - 7. MOSHA Safety Standards

1.06 CONTRACTOR

- A. The Contractor shall accept complete responsibility for the installation, certification and support of the system. Contractor shall be an authorized vendor of all major components.
- B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install system and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods.
- C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.
- D. The Contractor shall have a proven track record in Wireless Communication Network System configuration and installation. This must be shown by the inclusion of references of at least three (3) projects involving the installation of similar systems completed by the Contractor in the prior two (2) years on unaltered forms with the sealed Bid Proposal as provided herein. Bid Proposal Form(s) may be duplicated as required in order to provide adequate space to

list required number of reference installations for each division Bidder is responding to.

PART 2 - PRODUCTS

2.01 Supply most current version of all products provided.

- A. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.
- B. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.

2.02 Furnish only new, first-class quality materials and equipment.

2.03 BUS WIRELESS DEVICES

A. Thirty-seven (37) Bus Wireless Devices shall be provided and installed.

B. MANUFACTURERS

1. Acceptable Manufacturer:

- a. CRADLEPOINT
- b. SIERRA WIRELESS
- c. Or Equal.

C. Bus Wireless Device units shall support the following features, standards and/or protocols:

- 1. Support for dual-5G cellular radios
- 2. 4x4 MU MIMO Wi-Fi 6
- 3. Four (4) 1 Gbps Ethernet Ports
- 4. IP64 Rated
- 5. Ruggedized metal construction
- 6. Rated for Transportation use.
- 7. Multiple simultaneous BSSIDs
- 8. DHCP

9. SNMP

- D. All devices shall be firmly and securely mounted in buses to allow maximum coverage and protection. Contractor shall supply all necessary parts, labor and accessories to make Bus Wireless Devices fully functional.
- E. Device shall be equipped with security features to allow only school issued devices to connect. Contractor shall fully configure Bus Wireless Devices to limit connectivity and ensure all devices are content filtered to adhere to the CIPA (Children's Internet Protection Act).
- F. Contractor shall supply management software to allow the remote configuration and monitoring of Bus Wireless Devices. Contractor shall supply necessary licensing for term of warranty.
 - 1. Remote management software shall allow include a comprehensive dashboard to monitor all Bus Wireless Devices.
 - 2. Remote management software shall allow for bulk configuration changes and firmware updates.
 - 3. Remote management software shall include live statistics regarding LAN/WAN connections.

2.04 WIRELESS INTERNET SERVICE

- A. Contractor shall supply 5G wireless Internet modem and services from one of the major wireless carriers for a term of five (5) years for all Bus Wireless Devices.

2.05 ALLOWANCES

- A. Contractor shall include allowances for equipment and/or other contract service reimbursements as required below in base bid lump sum amount(s). Equipment and/or contract services shall be provided and sourced at Owner's discretion and convenience with full cooperation by Contractor, and paid for from successful bidder's contract in the amount(s) provided for herein. Any allowance amount proving to be excessive for the intended equipment and/or contract services shall be credited to the Owner against contract payment requests.
 - 1. Allowance shall be made in the amount of \$5,000.00 for contract services related to Owner directed infrastructure upgrades.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Contractor shall conduct detailed walk-through examination with Designer and Owner verifying equipment and material locations as well as mounting and placement requirements prior to commencement of other installation activities.
- B. Contractor shall ensure all submittals and shop drawings have been provided to, and approval has been obtained from Designer prior to commencement of any final installation activities.

3.02 INSTALLATION

- A. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner's normal daily activities.
- B. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed and disposed of by Contractor off-site. No on-site disposal of any waste, packaging or related project materials will be permitted. All equipment and tools shall be removed from common areas and stored in approved, secure storage locations. Any work that may impede the general use of the space and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.
- C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.
- D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:
 - 1. Inventory receipt of all components and equipment.
 - 2. Storage of all equipment and components until such time those items are installed according to the specifications.
 - 3. Transport equipment to the Owner's installation location(s).
 - 4. Assemble, install, configure and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
 - 5. Collect all information necessary to accurately program all system devices to the Owner's intended use and need. This may include, but not be limited to VLAN configuration recommendation, SSID(s) broadcast coordination, user authentication requirements and security/encryption initiation.

6. Label all system devices as may be appropriate and required by Owner and Designer.
7. Complete end user and system administrator training programs as specified herein.
8. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment.
9. All work shall be compliant with industry and manufacturer best practices and meet all applicable statutory codes and standards.

E. Worksites include the following:

1. Transportation Building/Bus Garage
6150 Valley Ln. Dr. SE
Kentwood, Michigan 49508

F. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate or panel to the original condition.

1. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.
2. The building and work area shall be returned to its original condition prior to final sign off of the project.

G. Following installation and system “turn-up”, but prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.

1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.

3.03 TESTING

- A. In an effort to ensure a smooth “turn-up” of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over.
- B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified

requirements, meets the owner's specific application requirements and is ready for functionality and integrity testing.

C. Testing Procedures

1. Prior to system "turn-up", Contractor shall submit a written request to Designer indicating they have completed full and final configuration of the system, and are ready to have system integrity and functionality tested. Such request shall include a written proposed test plan for complete system functionality.
2. Within reasonable time after receipt of request and proposed test plan, Designer will provide amendment(s) to the proposed test plan, a test schedule and coordinate testing date(s) with Owner and Contractor.
3. Should Designer determine the Work is not acceptably configured or not of adequate integrity:
 - a. Designer promptly will so notify Contractor, giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.
 - b. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-testing.
 - c. Designer will schedule re-test of the Work.
 - d. Excessive re-testing of Work may result in fees being assessed Contractor.
4. Should Designer and Owner concur the Work is configured properly, and system integrity is as required:
 - a. Designer will review Contractors detailed "turn-up" plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system "turn-up" can proceed.

3.04 DOCUMENTATION

- A. Contractor shall provide Owner all necessary as-built drawings, owner's manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or Owner deem necessary for final documentation package
 1. All documentation shall be provided in both a physical and digital version.
 2. Format of all provided documentation shall be coordinated with Owner and Designer.

B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:

1. Equipment description.
2. Equipment make.
3. Model number.
4. Software release.
5. Date installed.
6. Manufacturer's warranty.
7. Maintenance contract terms.
8. Verification of maintenance contract engagement.
9. Telephone numbers for service and support.
10. Detailed technical support and service procedure instructions.
11. All product (hardware and software) manuals and manufacturer supplied documentation, including, but not limited to owner manuals, system administrator manuals and configuration guides. Where number of duplicate copies for particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.
12. Photocopy of original invoice listing make and model for all components and equipment from individual manufacturer(s), distribution source(s), or authorized agent(s) to establish manufacturer warranty start date for potential use after end of contract warranty provisions.
13. System Channel and Configuration Report.
14. Complete inventory of installed hardware and system software. Hardware inventory shall include, but not be limited to, AP and antenna types (model numbers), Ethernet MAC address, AP serial number, physical installation location and software options.

3.05 TRAINING

A. Contractor shall provide training for the Owner designated system administrator(s). Owner shall designate up to three (3) administrators to be trained. Training shall be a minimum of two (2), two (2) hour session(s) in

length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:

1. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.
 2. System back-up and restore functions and procedures for all system parameters and configurations.
 3. Component replacement procedure.
 4. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to, configuration changes, device and port status.
 5. Complete review and administration review and training for network management application provided.
- B. Contractor shall submit a written training plan, course description(s) and syllabus to Owner and Designer for approval. Owner and/or Designer may require amendments(s) to training plan, course description and syllabus prior to training being scheduled.

3.06 SCHEDULE, MEETINGS AND PLANS

- A. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner, documented herein, required by Designer, Architect and/or Construction Manager and as required to meet schedules.
- B. Schedule
1. Post bid Interviews: March 8, 2024
 2. Contractor Chosen: Week of March 11, 2024
 3. Work Commences: April 1, 2024
 4. Substantial Completion of Project: August 1, 2024
 5. Project Close-out: September 1, 2024
- C. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.
- D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended by Contractor as required by Owner and Designer.

END OF SECTION

SECTION 27 41 16
MULTIMEDIA INFRASTRUCTURE & EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to new multimedia infrastructure and equipment for Kentwood Public Schools.
- B. Contractors shall propose systems and/or components to be deployed using standard procedures and technology components and as specified herein. The system components shall be installed and connected to the owner's existing physical infrastructure and as specified herein.
- C. Contractor shall advise, coordinate and work cooperatively with Owner representatives or owner's designee related to any configuration changes required and/or proposed for Owner's existing physical infrastructure.
- D. The Contractor shall design, engineer, configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant system and/or component connection to the system complete and with full functionality as specified herein.
- E. Contractor shall provide all transportation and delivery services in a timely manner to individual work location(s) at each site of work in preparation for installation activity.
- F. Contractor shall coordinate their installation with other contractors, Designer and the Owner as is appropriate.

1.02 WARRANTY

- A. Complete installation shall be free from defect and/or failure for a period of warranty. Any replacement, upgrade or fix, including labor for any non-conforming or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.
- B. Manufacturer's warranty shall be provided for all components of the system.
 - 1. Any documents and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.
 - 2. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.

3. Standard manufacturer warranty duration and terms shall be identified for each component with bid as well as additional fee required for warranty duration election of each of the following terms:
 - a. Three (3) year parts and labor warranty
- C. On site services provided under the warranty shall be performed by personnel or representatives of manufacturer of individual components and/or appropriately trained and certified Contractor representatives as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.
- D. Contractor shall provide the following response times for all malfunctioning equipment:
 1. Twenty-four (24) hours or less for matters that render twenty percent (20%) or more of the system unable to maintain normal functionality.
 2. Two (2) business days for matters not meeting the above criteria.
 3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.
- E. Bidder shall provide current annual maintenance contract pricing, terms and conditions for recommended maintenance programs for all equipment following the specified and included warranty periods as a Voluntary Alternate. This information will be considered by Owner and Designer as part of the bid evaluation process.
- F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have no effect on Warranty or System Acceptance by Owner and/or Designer.

1.03 SUBMITTALS

- A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid Proposals.
- B. Shop drawings, data sheets and diagrams shall be submitted by Bidder for approval by Designer with Bid Proposals.

1. Shop drawings, data sheets and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.
 2. No work constituting final installation shall be commenced until after approval of shop drawings, data sheets and diagrams by Designer.
- C. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project with Bid Proposals.
- D. Equipment or material installed for this project that do not have an approved submittal associated with it, will be removed and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.
1. The Owner and/or Designer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.
 2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due, or become due Contractor.
- E. The Contractor shall submit within ten (10) calendar days after the Notice to Proceed, a schedule that reflects the sequence of activities of the contractor's approach to the execution of and completion of the work. The schedule shall be broken into work areas to provide for a clear identification of the planned progress of the work. Included in the schedule will be a list of tasks with list of deliverables and the percentage of work completed. This schedule shall coincide with progress payments applications dates and projected amounts. All durations shown will be in working days. Applications that generate Microsoft Project compatible files shall be management tools of choice. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing and executing the work required by the Contract Documents. The district will rely on such schedules to coordinate and otherwise plan the work of the District, other separate contractors, or the District's routine daily work.

1.04 REFERENCE SPECIFICATIONS

- A. All work, products, and materials shall conform with the following standards as applicable for the intended use:
1. EIA/TIA Commercial and Administration Standards

2. NEC
3. IEEE 802
4. IETF RFCs
5. FCC – All Applicable Rules and Regulations
6. UL
7. MIOSHA Safety Standards

1.05 CONTRACTOR

- A. The Contractor shall accept complete responsibility for the installation, certification and support of the system and/or components as required herein. Contractor shall be an authorized vendor of all major components.
- B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install specified equipment and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods and as required herein.
- C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.
- D. The Contractor shall have a proven track record in comparable system supply, configuration and installation. This must be shown by the inclusion of references of at least three (3) projects involving the supply and/or installation of similar systems completed by the Contractor in the prior two (2) years with the sealed Bid Proposal as provided herein.

PART 2 - PRODUCTS

2.01 Acceptable Manufacturers

- A. Acceptable manufacturers have been provided to comply with a standard for individual components associated with the specified system. Indicated components include particular models and makes currently installed and/or preferred by Owner.
- B. Any system bid shall be based only on acceptable manufacturer's components.

2.02 Supply most current version of all products provided.

- A. Manufacturer shall have five (5) years of experience and history manufacturing similar products to those specified.

- B. Proposed components shall have been field tested and proven in actual use.
 - C. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.
 - D. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.
- 2.03 Furnish only new, first-class quality materials and equipment.
- 2.04 SPECIAL CONDITION LOCATIONS

A. Configuration A

- 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. East Kentwood Freshman Campus Technology Office
 - 1. B101 Learning Commons – 1 (65”)
 - 2. B101 Learning Commons – 2 (65”)
 - 3. B101 Learning Commons – 3 (65”)
 - 4. B101 Learning Commons – 4 (65”)
 - 5. B113 Hall (55”)
 - b. Hamilton Elementary/Early Childhood
 - 1. Reception 233 – Elementary – (65”)
 - 2. Lobby/Reception 540 – ECC - (65”)
 - 3. Cafeteria Serverly – (65”)
- 2. One (1) LED Monitor(s)
 - a. Acceptable Manufacturer(s)
 - 1. LG
 - 2. SAMSUNG
 - a. QB55
 - b. QB65

- b. LED Monitor shall meet or exceed the following minimum requirements:
 1. 65” diagonal or 55” diagonal
 2. Brightness 350 cd/m
 3. Rated for 16/7 run-time
 4. 8ms refresh rate
 5. 3840 x 2160 resolution
 6. 16:9 aspect ratio
 7. Two (2) HDMI input ports
 8. RS232C In/out
- c. Contractor shall supply and install appropriate mounts for supplied LED monitors. Mounts shall be Peerless (SF660P, ST660P or SA771PU) or Chief equivalent.
 1. East Kentwood Freshman Campus Technology Office
 - a. B101 Learning Commons – 1 – Tilt Mount
 - b. B101 Learning Commons – 2 – Tilt Mount
 - c. B101 Learning Commons – 3 – Tilt Mount
 - d. B101 Learning Commons – 4 – Articulating Mount
 - e. B113 Hall – Flat Mount
 2. Hamilton Elementary/Early Childhood
 - a. Reception 233 – Elementary – Flat Mount
 - b. Lobby/Reception 540 – ECC - Flat Mount
 - c. Cafeteria Serverly – Tilt Mount
3. One (1) Digital Signage Device(s) shall be provided.
 - a. Acceptable Manufacturer(s)
 1. Brightsign

- a. HD225
- b. Digital Signage Device(s) shall meet or exceed the following requirements:
 - 1. Integrated Ethernet connection
 - 2. HDMI output capable of 4K resolution
- c. Contractor shall securely mount Digital Signage Device at LED monitor location using manufacturer recommended installation practices.
- d. Provide one (1) Pro license(s) for Carousel cloud digital signage platform (one for each unit). Cloud licensing term shall be for term of warranty.
- e. Contractor shall work collaboratively with Owner to configure Brightsign digital signage device for use with Owners Carousel Digital Signage platform.
- f. Contractor shall supply and install all necessary patch cables to connect equipment to network and in data closet location. Contractor shall cross connect equipment in data closet and report to Owner data closet, switch and port location for programming.

B. Configuration B

- 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. East Kentwood Freshman Campus Technology Office
 - 1. Conference Room B110 - (65")
 - b. Hamilton Elementary/Early Childhood
 - 1. Elementary Conference Room 241 – (75")
 - 2. ECC Conference Room – (65")
- 2. One (1) LED Monitor(s)
 - a. Acceptable Manufacturer(s)
 - 1. LG
 - 2. SAMSUNG

- a. QB65
 - b. QB75
- b. LED Monitor shall meet or exceed the following minimum requirements:
 - 1. 75” diagonal or 65” diagonal
 - 2. Brightness 350 cd/m
 - 3. Rated for 16/7 run-time
 - 4. 8ms refresh rate
 - 5. 3840 x 2160 resolution
 - 6. 16:9 aspect ratio
 - 7. Two (2) HDMI input ports
 - 8. RS232C In/out
- c. Contractor shall supply and install appropriate mounts for supplied LED monitors. Mounts shall be Peerless (SF660P, ST660P or SA771PU) or Chief equivalent.
 - 1. East Kentwood Freshman Campus Technology Office
 - a. Conference Room B110 – Tilt Mount
 - 2. Hamilton Elementary/Early Childhood
 - a. Elementary Conference Room 241 – Tilt Mount
 - b. ECC Conference Room – Tilt Mount
- 3. One (1) HDMI Transmission Device(s)
 - a. Acceptable Manufacturer(s)
 - 1. CRESTRON
 - 2. KRAMER
 - a. TP-580T/TP-580R
 - b. HDMI Transmission Device shall meet or exceed the following minimum requirements:

1. HDBaseT 1.0
2. 4K60 4:2:0 Up to 130'
3. HDCP 2.2
- c. Contractor shall install HDMI transmitter at conference table provided by Others and integrate into table pocket. HDMI pass through connector in table pocket provided by Others.
- d. Contractor shall securely and neatly mount HDMI transmission equipment at table and monitor locations.
- e. Contractor shall supply and install category 6 shielded cable for HDMI transmission.
- f. Contractor to supply 8' ultra-slim HDMI cable for device connection.

C. Configuration C

1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. East Kentwood Freshman Campus Technology Office
 1. Repair Area – B124 – (55")
2. One (1) LED Monitor(s)
 - a. Acceptable Manufacturer(s)
 1. LG
 2. SAMSUNG
 - a. QB55
 - b. LED Monitor shall meet or exceed the following minimum requirements:
 1. 55" diagonal
 2. Brightness 350 cd/m
 3. Rated for 16/7 run-time
 4. 8ms refresh rate
 5. 3840 x 2160 resolution

6. 16:9 aspect ratio
7. Two (2) HDMI input ports
8. RS232C In/out
- c. Contractor shall supply and install appropriate mounts for supplied LED monitors. Mounts shall be Peerless (SF660P, ST660P or SA771PU) or Chief equivalent.
 1. East Kentwood Freshman Campus Technology Office
 - a. Repair Area – B124 – Flat Mount
3. One (1) HDMI cable shall be installed from monitor to input location directly below. Contractor shall supply necessary faceplate and connectors to make input location fully functional.
 - a. Contractor to supply 8’ ultra-slim HDMI cable for device connection.
4. One (1) Wireless Presentation System
 - a. Acceptable Manufacturers (in alphabetical order):
 1. KRAMER
 - a. VIA GO 2
 - b. Wireless Presentation System shall meet or exceed the following requirements:
 1. HDMI output with support for up to 4K@30Hz.
 2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
 3. 4GB Memory
 4. 32GB Storage
 5. All other features currently a part of the manufacturer’s latest commercial release.
 6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system at monitor location.
 7. Contractor shall provide licensing for Kramer VIA Cloud management platform for term of warranty. Contractor shall work collaboratively with Owner to make all Kramer VIA devices fully functional in management software.

8. Contractor shall supply all necessary patch cables to connect Wireless Presentation Device to Owner supplied network cabling and switches. Contractor shall fully patch all devices and report back switch ports to Owner for programming.

D. Configuration D

1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. East Kentwood Freshman Campus Technology Office
 1. Directors Office – B106 - (65”)
2. One (1) LED Monitor(s)
 - a. Acceptable Manufacturer(s)
 1. LG
 2. SAMSUNG
 - a. QB65
 - b. LED Monitor shall meet or exceed the following minimum requirements:
 1. 65” diagonal
 2. Brightness 350 cd/m
 3. Rated for 16/7 run-time
 4. 8ms refresh rate
 5. 3840 x 2160 resolution
 6. 16:9 aspect ratio
 7. Three (3) HDMI input ports
 8. RS232C In/out
 - c. Contractor shall supply and install appropriate mounts for supplied LED monitors. Mounts shall be Peerless (SF660P, ST660P or SA771PU) or Chief equivalent.
 1. East Kentwood Freshman Campus Technology Office

- a. Directors Office – B106 – Articulating Mount
- 3. One (1) HDMI Transmission Device(s)
 - a. Acceptable Manufacturer(s)
 - 1. CRESTRON
 - 2. KRAMER
 - a. TP-580T/TP-580R
 - b. HDMI Transmission Device shall meet or exceed the following minimum requirements:
 - 1. HDBaseT 1.0
 - 2. 4K60 4:2:0 Up to 130'
 - 3. HDCP 2.2
 - c. Contractor shall install HDMI transmitter at conference table provided by Others and integrate into table pocket. HDMI pass through connector in table pocket provided by Others.
 - d. Contractor shall securely and neatly mount HDMI transmission equipment at table and monitor locations.
 - e. Contractor shall supply and install category 6 shielded cable for HDMI transmission.
 - f. Contractor to supply 8' ultra-slim HDMI cable for device connection.
- 4. One (1) HDMI cable shall be installed from monitor to input location directly below. Contractor shall supply necessary faceplate and connectors to make input location fully functional.
 - a. Contractor to supply 8' ultra-slim HDMI cable for device connection.
- 5. One (1) Wireless Presentation System
 - a. Acceptable Manufacturers (in alphabetical order):
 - 1. KRAMER
 - a. VIA GO 2
 - b. Wireless Presentation System shall meet or exceed the following requirements:

1. HDMI output with support for up to 4K@30Hz.
2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
3. 4GB Memory
4. 32GB Storage
5. All other features currently a part of the manufacturer's latest commercial release.
6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system at monitor location.
7. Contractor shall provide licensing for Kramer VIA Cloud management platform for term of warranty. Contractor shall work collaboratively with Owner to make all Kramer VIA devices fully functional in management software.
8. Contractor shall supply all necessary patch cables to connect Wireless Presentation Device to Owner supplied network cabling and switches. Contractor shall fully patch all devices and report back switch ports to Owner for programming.

E. Configuration E

1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. East Kentwood Freshman Campus Technology Office
 1. Open Office – B107 - (75")
2. Two (2) LED Monitor(s)
 - a. Acceptable Manufacturer(s)
 1. LG
 2. SAMSUNG
 - a. QB75
 - b. LED Monitor shall meet or exceed the following minimum requirements:
 1. 75" diagonal
 2. Brightness 350 cd/m

3. Rated for 16/7 run-time
 4. 8ms refresh rate
 5. 3840 x 2160 resolution
 6. 16:9 aspect ratio
 7. Two (2) HDMI input ports
 8. RS232C In/out
- c. Contractor shall supply and install appropriate mounts for supplied LED monitors. Mounts shall be Peerless (SF660P, ST660P or SA771PU) or Chief equivalent.
1. East Kentwood Freshman Campus Technology Office
 - a. Open Office – B107 – Flat Mount
3. Two (2) HDMI Transmission Device(s)
- a. Acceptable Manufacturer(s)
 1. CRESTRON
 2. KRAMER
 - a. TP-580T/TP-580R
 - b. HDMI Transmission Device shall meet or exceed the following minimum requirements:
 1. HDBaseT 1.0
 2. 4K60 4:2:0 Up to 130'
 3. HDCP 2.2
 - c. Contractor shall install HDMI transmitter at floor box location provided by Others. HDMI pass through connector in table pocket provided by Others.
 - d. Contractor shall securely and neatly mount HDMI transmission equipment at table and monitor locations.
 - e. Contractor shall supply and install category 6 shielded cable for HDMI transmission.

- f. Contractor to supply 8' ultra-slim HDMI cable for device connection.
- 4. One (1) Wireless Presentation System
 - a. Acceptable Manufacturers (in alphabetical order):
 - 1. KRAMER
 - a. VIA GO 2
 - b. Wireless Presentation System shall meet or exceed the following requirements:
 - 1. HDMI output with support for up to 4K@30Hz.
 - 2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
 - 3. 4GB Memory
 - 4. 32GB Storage
 - 5. All other features currently a part of the manufacturer's latest commercial release.
 - 6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system at monitor location.
 - 7. Contractor shall provide licensing for Kramer VIA Cloud management platform for term of warranty. Contractor shall work collaboratively with Owner to make all Kramer VIA devices fully functional in management software.
 - 8. Contractor shall supply all necessary patch cables to connect Wireless Presentation Device to Owner supplied network cabling and switches. Contractor shall fully patch all devices and report back switch ports to Owner for programming.

F. Configuration F

- 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. East Kentwood Freshman Campus Technology Office
 - 1. Training Room – B102
- 2. One (1) Projector
 - a. Acceptable Manufacturer(s)

1. EPSON
 - a. BRIGHTLINK 1485FI
 - b. Projectors shall include full functionality of the following feature sets and/or standards in projector management software and/or remote access capability and in conjunction with proposed projectors, and shall provide for all management, configuration and control features and/or standards from a management administrative interface:
 1. Administration access shall be protected by unique and secure log on (User ID and Password).
 2. System administrator shall be capable of complete system back-up and full system restoration from a previously saved configuration.
 3. Projector reporting shall include, but not be limited to:
 - a. Device power status (on/off).
 - b. Filter status management.
 - c. Source selection status.
 4. Projector Control shall include, but not be limited to:
 - a. Device power (on/off).
 - b. Source selection.
 - c. Internal or downloadable program schedule database for timed execution of projector control functions based on, but not limited to time of day and day of week.
 - c. Projector management software and/or access shall be installed on equipment provided at Owner discretion to be located at the owner's discretion and communicate over the existing installed infrastructure provided by others.
 - d. Projectors shall meet or exceed the following minimum output, port availability and other standards:
 1. Slim design touch module
 2. Laser display
 3. 5000 Lumens
 - a. 16:6 Resolution

4. +/- 3-degree keystone correction.
 5. Three (3) HDMI Inputs
 6. 7 second power-on to image.
 7. Bidirectional RS-232 serial control port.
 8. Operating volume level of less than 37dB (fan).
 9. Operating temperature range of 45 – 95 degrees Fahrenheit.
 10. Accessible top or front panel mechanical controls including, but not limited for the following functions:
 - a. Power on.
 - b. Power off.
 - c. Video input port selection.
 11. Mechanical keypad lock out to minimize tampering with device settings
 12. Ethernet connector for management, monitoring and control applications.
 13. User definable power on graphic to replace factory default or manufacturer logo
 14. Supplied projector control panel to be provided to Owner for shelf spare equipment.
 - e. In the event of a power failure, system shall automatically re-initialize and “become active” to the last configuration in use with no human intervention.
 - f. All other features currently a part of the manufacturer’s latest commercial release.
3. One (1) document camera shall be provided and installed.
 - a. Acceptable Manufacturer(s)
 1. IPEVO
 - a. V4K PRO ULTRA – Model CDVU-10IP

- b. Document cameras shall meet or exceed the following the following requirements:
 - 1. 8 MP Image Sensor
 - 2. Integral Microphone
 - 3. Integral LED Light
 - 4. USB connectivity and power
- 4. USB Extension Device
 - a. Contractor shall supply USB extension device to extend provided projector interactivity to teacher input location. Contractors shall supply all necessary cabling and transmission devices to make interactivity fully functional.
- 5. Two (2) LED Monitor(s)
 - a. Acceptable Manufacturer(s)
 - 1. LG
 - 2. SAMSUNG
 - a. QB75R
 - b. LED Monitor shall meet or exceed the following minimum requirements:
 - 1. 75” diagonal
 - 2. Brightness 350 cd/m
 - 3. Rated for 16/7 run-time
 - 4. 8ms refresh rate
 - 5. 3840 x 2160 resolution
 - 6. 16:9 aspect ratio
 - 7. Two (2) HDMI input ports
 - 8. RS232C In/out

- c. Contractor shall supply and install appropriate mounts for supplied LED monitors, one (1) flat mount Peerless ST660P or Chief equivalent shall be provided. See drawings for location.
 - d. All monitors shall be controlled through supplied control system. If expansion of controller IO is necessary Contractor shall provide necessary IO expansion units.
 - e. Contractor shall supply appropriate Q-SYS AV over IP equipment for discrete output for each monitor and projector concurrently for a fully functional system.
 - f. Supplied Q-SYS AV over IP equipment shall scale images to optimal projector resolution.
6. One (1) Multimedia Processor/DSP
- a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in building MDF location.
 - c. Contractor shall provide all control, communication, audio and video patch cables to connect input and output ports to all Contractor provided materials.
 - d. Contractor shall program Multimedia processor to integrate with Contractor provided monitors and projector. Contractor shall supply all necessary cabling and programming to fully enable integration with control system.
 - e. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - f. System shall be populated with necessary accessories for 8 line-level input audio channels.
 - g. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - h. Contractor shall supply all necessary labor to configure Mixer/DSP.

- i. Contractor shall integrate Multimedia Processor/DSP with provided touchscreen.
 - j. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - k. Contractor shall supply all cables and accessories for a fully functional system.
 - l. Contractor shall provide and install fully compliant shielded cabling and any other low voltage communication infrastructure needed to fully connect to the projection system from One (1) input plate(s) and one (1) wireless presentation system(s). Cable shall meet or exceed Q-SYS requirements for AV over IP systems.
7. One (1) Multimedia Input Location shall be provided.
- a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Wall input to be installed in provided double gang box (transmitter should be single gang), Contractor shall supply stainless steel plate for fully finished installation.
 - c. Contractor shall supply correct in-plate transmit and receive equipment to extend input location to supplied Q-SYS AV over IP encoder.
 - d. Contractor will supply all necessary Q-SYS AV over IP decoder equipment to connect supplied projector and monitors.
 - e. Valid video input into the system shall turn on system automatically.
 - f. System shall power down after ten (10) minutes of no video signal.
 - g. Q-SYS AV over IP units shall properly scale input image to projector to optimal resolution.
8. One (1) Touch Screen(s) shall be provided
- a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Touch Screen(s) shall be provided to control system operations.

1. Touchscreen shall be 7"
2. Black
3. Connect touch screens to supplied control system as per manufacturer installation instructions.
4. Provide all necessary cabling, mounts and accessories to securely mount touch screen in provided double gang box.
5. Control touch screen shall be provided in locations specified herein that shall provide the following functions but not limited to.
 - a. System Power On
 - b. System Power Off
 - c. Select Source, input 1 or wireless presentation system
 - d. Control Provided LED Panels and Projector.
 - e. Audio Level Increase
 - f. Audio Level Decrease
 - g. Image Freeze
 - h. Audio Mute
- c. Contractor shall provide all control, communication, audio and video patch cables, transmitters and receivers to connect input and output ports to all Contractor and Owner provided materials in the space.
9. One (1) Wireless Presentation System
 - a. Acceptable Manufacturers (in alphabetical order):
 1. KRAMER
 - a. VIA GO 2
 - b. Wireless Presentation System shall meet or exceed the following requirements:
 1. HDMI output with support for up to 4K@30Hz.
 2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
 3. 4GB Memory

4. 32GB Storage
 5. All other features currently a part of the manufacturer's latest commercial release.
 6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system in existing rack.
- c. Contractor shall integrate wireless presentation system with provided Crestron control system.
 - d. Contractor shall coordinate installation and configuration of Wireless Presentation System per manufacturer recommended guidelines. Contractor shall work collaboratively as necessary with Owner and network support resources for a complete and compliant installation.
 - e. Contractor shall provide licensing for Kramer VIA Cloud management platform for term of warranty. Contractor shall work collaboratively with Owner to make all Kramer VIA devices fully functional in management software.
 - f. Contractor shall supply all necessary patch cables to connect Wireless Presentation Device to Owner supplied network cabling and switches. Contractor shall fully patch all devices and report back switch ports to Owner for programming.
10. Four (4) Speakers shall be provided and installed
- a. Acceptable Manufacturer(s)
 1. HARMAN/JBL PRO
 - a. CONTROL 16C-T
 2. Or Equal
 - b. Recessed
 - c. Passive 2-way full range speaker
 - d. 6.5" Low Frequency Driver, 1-inch Voice Coil
 - e. 150W Continuous
 - f. 8 ohms
 - g. 94 dB sensitivity
 - h. 58Hz-18kHz +/- 3dB, -10dB @ 50Hz

- i. Contractor shall safely and securely mount speakers in acoustical ceiling tile using manufacturer recommended and industry best practices.
 - j. Contractor shall supply and install properly sized speaker cabling to support supplied speakers.
 - k. Speakers shall be white in color.
11. One (1) Amplification System shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. HARMAN/JBL PRO
 - a. CSA-180Z
 - 2. Or Equal
 - b. One (1) input channels
 - c. One (1) output channels
 - d. 80W maximum output per channel
 - e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB
12. One (1) Voice Amplification System shall be provided and installed.
- a. Acceptable Manufacturer(s)
 - 1. LIGHTSPEED
 - a. 975 ACCESS LINK
 - b. Major components of the Voice Amplification System shall be carefully installed at rack location.
 - c. Voice Amplification systems shall meet or exceed the following minimum standards:
 - 1. DECT (1.9 GHz) communication for complete classroom coverage of two (2) microphones simultaneously.
 - 2. Two (2) highly durable, rechargeable, battery powered, tamper resistant, impact resistant, lanyard based pendant microphones.
 - a. Two (2) Lightspeed volume control Flexmikes

- d. In the event of a power failure, system shall automatically re-initialize and “become active” to the last configuration in use with no human intervention.
- e. All other features currently a part of the manufacturer’s latest commercial release.
- f. Voice Amplification Systems shall be neatly and securely mounted at projector location. Contractor shall supply necessary shielded audio cable to extend output Lightspeed system to Multimedia Processor/DSP in building MDF location.

G. Configuration G

- 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. East Kentwood High School – East Cafeteria
- 2. One (1) Projector
 - a. Acceptable Manufacturer(s)
 - 1. Epson
 - a. EB-PU1008W
 - b. 8,500 Lumens
 - c. Projector shall be provided with appropriate lens for an approximate 25’ throw to fill a 13.5’ wide front projection system with a 16:9 ratio projected image.
 - d. Projector shall be securely installed and affixed to mounting system and downpipe that is structurally attached to finished ceiling. Contractor shall supply appropriate mount and downpipe to securely and safely extend projector to optimal location for projection onto screen.
 - e. Projector shall be connected to supplied Q-SYS control system to receive transmission of signal from supplied input locations.
- 3. Five (5) LED Monitor(s) shall be provided and installed.
 - 1. East Cafeteria 1 - (65”)
 - 2. East Cafeteria 2 - (65”)
 - 3. East Cafeteria 3 - (65”)

4. East Cafeteria 4 - (65")
5. East Cafeteria 5 - (75")
- b. Acceptable Manufacturer(s)
 1. LG
 2. SAMSUNG
 - a. QB75R
 - b. QB65R
- c. LED Monitor shall meet or exceed the following minimum requirements:
 1. 75" or 65" diagonal
 2. Brightness 350 cd/m
 3. Rated for 16/7 run-time
 4. 8ms refresh rate
 5. 3840 x 2160 resolution
 6. 16:9 aspect ratio
 7. Two (2) HDMI input ports
 8. RS232C In/out
- d. Contractor shall supply and install appropriate mounts for supplied LED monitors. Mounts shall be Peerless (SF660P, ST660P or SA771PU) or Chief equivalent.
 1. East Kentwood High School
 - a. East Cafeteria – 1 – Use Existing Mount
 - b. East Cafeteria – 2 – Use Existing Mount
 - c. East Cafeteria – 3 – Pole Mount Articulating
 - d. East Cafeteria – 4 – Tilt Mount
 - e. East Cafeteria – 5 – Flat Mount

- e. All monitors shall be controlled through supplied control system. If expansion of controller IO is necessary Contractor shall provide necessary IO expansion units.
 - f. Contractor shall supply appropriate Q-SYS AV over IP equipment for discrete output for each monitor and projector concurrently for a fully functional system.
 - g. Supplied Q-SYS AV over IP equipment shall scale images to optimal projector resolution.
4. One (1) Multimedia Processor/DSP
- a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in building MDF location.
 - c. Contractor shall provide all control, communication, audio and video patch cables to connect input and output ports to all Contractor provided materials.
 - d. Contractor shall program Multimedia processor to integrate with Contractor provided monitors and projector. Contractor shall supply all necessary cabling and programming to fully enable integration with control system.
 - e. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - f. System shall be populated with necessary accessories for 8 line-level input audio channels.
 - g. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - h. Contractor shall supply all necessary labor to configure Mixer/DSP.
 - i. Contractor shall integrate Multimedia Processor/DSP with provided touchscreen.
 - j. Contractor shall provide all system programming and operation software for a fully functional and operational system. All

programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.

- k. Contractor shall supply all cables and accessories for a fully functional system.
 - l. Contractor shall provide and install fully compliant shielded cabling and any other low voltage communication infrastructure needed to fully connect to the projection system from one (1) input plate(s), one (1) wireless presentation system(s) and one (1) digital signage player. Cable shall meet or exceed Q-SYS requirements for AV over IP systems.
5. One (1) Multimedia Input Location shall be provided.
- a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Wall input to be installed in provided double gang box (transmitter should be single gang), Contractor shall supply stainless steel plate for fully finished installation.
 - c. Contractor shall supply correct in-plate transmit and receive equipment to extend input location to supplied Q-SYS AV over IP encoder.
 - d. Contractor will supply all necessary Q-SYS AV over IP decoder equipment to connect supplied projector and monitors.
 - e. Valid video input into the system shall turn on system automatically.
 - f. System shall power down after ten (10) minutes of no video signal.
 - g. Q-SYS AV over IP units shall properly scale input image to projector to optimal resolution.
6. One (1) Touch Screen(s) shall be provided
- a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Touch Screen(s) shall be provided to control system operations.
 - 1. Touchscreen shall be 7”
 - 2. Black

3. Connect touch screens to supplied control system as per manufacturer installation instructions.
4. Provide all necessary cabling, mounts and accessories to securely mount touch screen in provided double gang box.
5. Control touch screen shall be provided in locations specified herein that shall provide the following functions but not limited to.
 - a. System Power On
 - b. System Power Off
 - c. Select Source, input 1, wireless presentation system, or digital signage
 - d. Control Provided LED Panels and Projector.
 - e. Audio Level Increase
 - f. Audio Level Decrease
 - g. Image Freeze
 - h. Audio Mute
- c. Contractor shall provide all control, communication, audio and video patch cables, transmitters and receivers to connect input and output ports to all Contractor and Owner provided materials in the space.
7. One (1) CD/Bluetooth Player shall be provided and installed
 - a. Acceptable Manufacturer(s)
 1. TASCAM
 - a. CD400U
 2. Or Equal.
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - c. Contractor shall provide all audio cables and accessories to integrate CD/Bluetooth player with provided DSP/Mixer system.
8. One (1) Amplification System shall be provided and installed
 - a. Acceptable Manufacturer(s)

1. HARMAN/JBL PRO
 - a. CSA2300Z
2. Q-SYS
3. Or Equal
- b. Two (2) input channels
- c. Two (2) output channels
- d. 300W maximum output per channel
- e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB
- f. Contractor shall use existing speakers. Contractors shall rework existing speaker cabling as necessary to integrate into new amplifier.
9. Two (2) Voice Amplification System(s) shall be provided and installed
 - a. Acceptable Manufacturer(s)
 1. SHURE – QLXD4
 2. Or Equal.
 - b. Handheld and Lavalier microphone combo
 - c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire cafeteria.
 - d. Contractor shall supply all mounting hardware to securely mount equipment into existing rack.
10. One (1) Digital Signage Device(s) shall be provided.
 - a. Acceptable Manufacturer(s)
 1. Brightsign
 - a. HD225
 - b. Digital Signage Device(s) shall meet or exceed the following requirements:
 1. Integrated Ethernet connection

2. HDMI output capable of 4K resolution
- c. Contractor shall securely mount Digital Signage Device at LED monitor location using manufacturer recommended installation practices.
- d. Provide one (1) Pro license(s) for Carousel cloud digital signage platform (one for each unit). Cloud licensing term shall be for term of warranty.
- e. Contractor shall work collaboratively with Owner to configure Brightsign digital signage device for use with Owners Carousel Digital Signage platform.
- f. Contractor shall supply and install all necessary patch cables to connect equipment to network and in data closet location. Contractor shall cross connect equipment in data closet and report to Owner data closet, switch and port location for programming.

H. Configuration H

1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. East Kentwood High School – E-Sports
2. Fifteen (15) LED Monitor(s) shall be provided and installed.
 1. East Kentwood High School – E-Sports - (65")
 2. East Kentwood High School – E-Sports - (65")
 3. East Kentwood High School – E-Sports - (65")
 4. East Kentwood High School – E-Sports - (65")
 5. East Kentwood High School – E-Sports - (65")
 6. East Kentwood High School – E-Sports - (65")
 7. East Kentwood High School – E-Sports - (65")
 8. East Kentwood High School – E-Sports - (65")
 9. East Kentwood High School – E-Sports - (65")
 10. East Kentwood High School – E-Sports - (65")
 11. East Kentwood High School – E-Sports - (86")

12. East Kentwood High School – E-Sports - (86”)
 13. East Kentwood High School – E-Sports - (75”)
 14. East Kentwood High School – E-Sports - (75”)
 15. East Kentwood High School – E-Sports - (75”)
- b. Acceptable Manufacturer(s)
1. LG
 - a. UH5F-H
- c. LED Monitor shall meet or exceed the following minimum requirements:
1. 86”, 75” or 65” diagonal
 2. Brightness 500 cd/m
 3. Rated for 24/7 run-time
 4. 8ms refresh rate
 5. 120Hz Refresh Rate
 6. 3840 x 2160 resolution
 7. 1,100:1 Contrast Ratio
 8. 16:9 aspect ratio
 9. Three (3) HDMI input ports
 10. RS232C In/out
 11. Internal speakers
- d. Contractor shall supply and install appropriate mounts for supplied LED monitors. Mounts shall be Peerless (SF660P, ST660P or SA771PU) or Chief equivalent.
1. East Kentwood High School – E-Sports – Use cart display stand provided by Others.
 2. East Kentwood High School – E-Sports – Use cart display stand provided by Others.

3. East Kentwood High School – E-Sports - Use cart display stand provided by Others.
 4. East Kentwood High School – E-Sports - Use cart display stand provided by Others.
 5. East Kentwood High School – E-Sports - Use cart display stand provided by Others.
 6. East Kentwood High School – E-Sports - Use cart display stand provided by Others.
 7. East Kentwood High School – E-Sports – Flat
 8. East Kentwood High School – E-Sports – Flat
 9. East Kentwood High School – E-Sports – Flat
 10. East Kentwood High School – E-Sports – Flat
 11. East Kentwood High School – E-Sports – Flat
 12. East Kentwood High School – E-Sports – Flat
 13. East Kentwood High School – E-Sports – Articulating
 14. East Kentwood High School – E-Sports – Articulating
 15. East Kentwood High School – E-Sports – Pole Mount Articulating
- e. Select monitors shall be controlled through supplied control system (monitors 11, 12, 13, 14 and 15 respectively). If expansion of controller IO is necessary Contractor shall provide necessary IO expansion units. Supplied control system components shall allow discrete output of either HDMI connection or wireless presentation system.
 - f. Contractor shall supply appropriate Q-SYS AV over IP equipment for discrete output for each monitor (11,12, 13, 14 and 15).
 - g. Supplied Q-SYS AV over IP equipment shall scale images to optimal projector resolution.
 - h. Contractor shall supply 8' HDMI cable for monitors 1-10 for gaming device connection.
 - i. Contractor shall supply in-wall HDMI cabling to raceway provided by Others for monitors 7-10 to device shelf location provided by Others.

MULTIMEDIA INFRASTRUCTURE & EQUIPMENT

Contractor shall supply necessary stainless steel faceplate and pass through connector for device connection.

3. One (1) Multimedia Processor/DSP

- a. Acceptable Manufacturer(s)
 1. Q-SYS
- b. Contractor shall supply all parts, cables and accessories to securely mount unit in building MDF location.
- c. Contractor shall provide all control, communication, audio and video patch cables to connect input and output ports to all Contractor provided materials.
- d. Contractor shall program Multimedia processor to integrate with Contractor provided monitors and projector. Contractor shall supply all necessary cabling and programming to fully enable integration with control system.
- e. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
- f. System shall be populated with necessary accessories for 8 line-level input audio channels.
- g. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
- h. Contractor shall supply all necessary labor to configure Mixer/DSP.
- i. Contractor shall integrate Multimedia Processor/DSP with provided touchscreen.
- j. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
- k. Contractor shall supply all cables and accessories for a fully functional system.

1. Contractor shall provide and install fully compliant shielded cabling and any other low voltage communication infrastructure needed to fully connect to the projection system from one (1) input plate(s) and one (1) wireless presentation system(s). Cable shall meet or exceed Q-SYS requirements for AV over IP systems.
4. One (1) Multimedia Input Location shall be provided.
 - a. Acceptable Manufacturer(s)
 1. Q-SYS
 - b. Wall input to be installed in provided double gang box (transmitter should be single gang), Contractor shall supply stainless steel plate for fully finished installation.
 - c. Contractor shall supply correct in-plate transmit and receive equipment to extend input location to supplied Q-SYS AV over IP encoder.
 - d. Contractor will supply all necessary Q-SYS AV over IP decoder equipment to connect supplied projector and monitors.
 - e. Valid video input into the system shall turn on system automatically.
 - f. System shall power down after ten (10) minutes of no video signal.
 - g. Q-SYS AV over IP units shall properly scale input image to projector to optimal resolution.
5. One (1) Touch Screen(s) shall be provided
 - a. Acceptable Manufacturer(s)
 1. Q-SYS
 - b. Touch Screen(s) shall be provided to control system operations.
 - c. Touchscreen shall be 7"
 - d. Black
 - e. Connect touch screens to supplied control system as per manufacturer installation instructions.
 - f. Provide all necessary cabling, mounts and accessories to securely mount touch screen in provided double gang box.
 - g. Control touch screen shall be provided in locations specified herein that shall provide the following functions but not limited to.

1. System Power On
 2. System Power Off
 3. Select Source, input 1 or wireless presentation system
 4. Control Provided LED Panels and Projector.
 5. Audio Level Increase
 6. Audio Level Decrease
 7. Image Freeze
 8. Audio Mute
 - h. Contractor shall provide all control, communication, audio and video patch cables, transmitters and receivers to connect input and output ports to all Contractor and Owner provided materials in the space.
6. One (1) Amplification System shall be provided and installed
- a. Acceptable Manufacturer(s)
 1. HARMAN/JBL PRO
 - a. CSA-2300Z
 2. Q-SYS
 3. Or Equal
 - b. Two (2) input channels
 - c. Two (2) output channels
 - d. 300W maximum output per channel
 - e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB
7. Eight (8) Speakers shall be provided and installed
- a. Acceptable Manufacturer(s)
 1. HARMAN/JBL PRO
 - a. JBL CONTROL 18C/T-BK
 2. Or Equal

- b. Black Color
 - c. Passive 2-way full range speaker
 - d. 8" Low Frequency Driver, 1-inch Voice Coil
 - e. 180W peak
 - f. 8 ohms
 - g. 94 dB sensitivity
 - h. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
 - i. Contractor shall safely and securely mount in E-Sports ceiling structure using manufacturer recommended and industry best practices.
 - j. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.
 - k. Contractor shall supply and install properly sized speaker cabling to support supplied speakers. Each speaker shall be independently wired back to provided rack. Contractor shall wire each side of E-Sports classroom discretely to allow independent volume control of each side.
8. One (1) Wireless Presentation System
- a. Acceptable Manufacturers (in alphabetical order):
 - 1. KRAMER
 - a. VIA GO 2
 - b. Wireless Presentation System shall meet or exceed the following requirements:
 - 1. HDMI output with support for up to 4K@30Hz.
 - 2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
 - 3. 4GB Memory
 - 4. 32GB Storage
 - 5. All other features currently a part of the manufacturer's latest commercial release.

6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system in existing rack.
- c. Contractor shall integrate wireless presentation system with provided Crestron control system.
- d. Contractor shall coordinate installation and configuration of Wireless Presentation System per manufacturer recommended guidelines. Contractor shall work collaboratively as necessary with Owner and network support resources for a complete and compliant installation.
- e. Contractor shall provide licensing for Kramer VIA Cloud management platform for term of warranty. Contractor shall work collaboratively with Owner to make all Kramer VIA devices fully functional in management software.
- f. Contractor shall supply all necessary patch cables to connect Wireless Presentation Device to Owner supplied network cabling and switches. Contractor shall fully patch all devices and report back switch ports to Owner for programming.

I. Configuration I

1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. Hamilton Elementary – Collaboration Center - 325
2. One (1) Projector
 - a. Acceptable Manufacturer(s)
 1. Epson
 - a. EB-PU1008W
 - b. 8,500 Lumens
 - c. Projector shall be provided with appropriate lens for an approximate 20' throw to fill a 13' wide front projection system with a 16:9 ratio projected image. Projector screen shall be provided by Others.
 - d. Projector shall be securely installed and affixed to mounting system and downpipe that is structurally attached to finished ceiling. Contractor shall supply appropriate mount and downpipe to securely and safely extend projector to optimal location for projection onto screen. Downpipe shall be white in color.

- e. Projector shall be connected to supplied Q-SYS control system to receive transmission of signal from supplied input locations.
3. One (1) Multimedia Processor/DSP
- a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in building MDF location.
 - c. Contractor shall provide all control, communication, audio and video patch cables to connect input and output ports to all Contractor provided materials.
 - d. Contractor shall program Multimedia processor to integrate with Contractor provided monitors and projector. Contractor shall supply all necessary cabling and programming to fully enable integration with control system.
 - e. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - f. System shall be populated with necessary accessories for 8 line-level input audio channels.
 - g. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - h. Contractor shall supply all necessary labor to configure Mixer/DSP.
 - i. Contractor shall integrate Multimedia Processor/DSP with provided touchscreen.
 - j. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - k. Contractor shall supply all cables and accessories for a fully functional system.

- l. Control system components shall be mounted in Hamilton MDF location.
 - m. Contractor shall provide and install fully compliant shielded cabling and any other low voltage communication infrastructure needed to fully connect to the projection system from one (1) input plate(s) and one (1) wireless presentation system(s). Cable shall meet or exceed Q-SYS requirements for AV over IP systems.
4. One (1) Multimedia Input Location shall be provided.
 - a. Acceptable Manufacturer(s)
 1. Q-SYS
 - b. Wall input to be installed in provided double gang box (transmitter should be single gang), Contractor shall supply stainless steel plate for fully finished installation.
 - c. Contractor shall supply correct in-plate transmit and receive equipment to extend input location to supplied Q-SYS AV over IP encoder.
 - d. Contractor will supply all necessary Q-SYS AV over IP decoder equipment to connect supplied projector and monitors.
 - e. Valid video input into the system shall turn on system automatically.
 - f. System shall power down after ten (10) minutes of no video signal.
 - g. Q-SYS AV over IP units shall properly scale input image to projector to optimal resolution.
 5. One (1) Touch Screen(s) shall be provided
 - a. Acceptable Manufacturer(s)
 1. Q-SYS
 - b. Touch Screen(s) shall be provided to control system operations.
 1. Touchscreen shall be 7"
 2. Black
 3. Connect touch screens to supplied control system as per manufacturer installation instructions.
 4. Provide all necessary cabling, mounts and accessories to securely mount touch screen in provided double gang box.

5. Control touch screen shall be provided in locations specified herein that shall provide the following functions but not limited to.
 - a. System Power On
 - b. System Power Off
 - c. Select Source, input 1 or wireless presentation system
 - d. Control Provided LED Panels and Projector.
 - e. Audio Level Increase
 - f. Audio Level Decrease
 - g. Image Freeze
 - h. Audio Mute
- c. Contractor shall provide all control, communication, audio and video patch cables, transmitters and receivers to connect input and output ports to all Contractor and Owner provided materials in the space.
6. One (1) Wireless Presentation System
 - a. Acceptable Manufacturers (in alphabetical order):
 1. KRAMER
 - a. VIA GO 2
 - b. Wireless Presentation System shall meet or exceed the following requirements:
 1. HDMI output with support for up to 4K@30Hz.
 2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
 3. 4GB Memory
 4. 32GB Storage
 5. All other features currently a part of the manufacturer's latest commercial release.
 6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system in existing rack.

- c. Contractor shall integrate wireless presentation system with provided Crestron control system.
 - d. Contractor shall coordinate installation and configuration of Wireless Presentation System per manufacturer recommended guidelines. Contractor shall work collaboratively as necessary with Owner and network support resources for a complete and compliant installation.
 - e. Contractor shall provide licensing for Kramer VIA Cloud management platform for term of warranty. Contractor shall work collaboratively with Owner to make all Kramer VIA devices fully functional in management software.
 - f. Contractor shall supply all necessary patch cables to connect Wireless Presentation Device to Owner supplied network cabling and switches. Contractor shall fully patch all devices and report back switch ports to Owner for programming.
7. One (1) document camera shall be provided and installed.
- a. Acceptable Manufacturer(s)
 - 1. IPEVO
 - a. V4K PRO ULTRA – Model CDVU-10IP
 - b. Document cameras shall meet or exceed the following the following requirements:
 - 1. 8 MP Image Sensor
 - 2. Integral Microphone
 - 3. Integral LED Light
 - 4. USB connectivity and power
8. One (1) Amplification System shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. HARMAN/JBL PRO
 - a. CSA2300Z
 - 2. Q-SYS
 - 3. Or Equal

- b. Two (2) input channels
 - c. Two (2) output channels
 - d. 300W maximum output per channel
 - e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB
 - f. Contractor shall use existing speakers. Contractors shall rework existing speaker cabling as necessary to integrate into new amplifier.
9. Eight (8) Speakers shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. HARMAN/JBL PRO
 - a. JBL CONTROL 18C/T
 - 2. Or Equal
 - b. White Color
 - c. Passive 2-way full range speaker
 - d. 8” Low Frequency Driver, 1-inch Voice Coil
 - e. 180W peak
 - f. 8 ohms
 - g. 94 dB sensitivity
 - h. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
 - i. Contractor shall safely and securely mount in collaboration center ceiling structure using manufacturer recommended and industry best practices.
 - j. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.
 - k. Contractor shall supply and install properly sized speaker cabling to support supplied speakers. Each speaker shall be independently wired back to MDF location.

J. Configuration J

1. Contractor shall supply one (1) of the specified configurations in the following locations.
 - a. Hamilton Gymnasium - 405
2. One (1) Rack System(s) shall be provided and installed.
 - a. Acceptable Manufacturer(s)
 1. Middle Atlantic
 - a. DWR-12-26PD
 2. Or Equal.
 - b. Wall Mount
 - c. 12U
 - d. Plexiglas Locking Door
 - e. Forward rackrail
 - f. UL Load Capacity 200 lbs
 - g. 26" usable depth
 - h. 21" usable height
 - i. Contractor to supply 8-Outlet PDU (Middle Atlantic PD-815R or Equal).
3. One (1) Voice Amplification System(s) shall be provided and installed
 - a. Acceptable Manufacturer(s)
 1. SHURE – QLXD4
 2. Or Equal.
 - b. Handheld and Lavalier microphone combo
 - c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire gymnasium.
 - d. Contractor shall supply all mounting hardware to securely mount equipment into Contractor supplied rack.

- e. Contractor shall supply 3U drawer to store microphone in Contractor supplied rack.
- 4. Eight (8) Speakers shall be provided and installed
 - a. Acceptable Manufacturer(s)
 - 1. Harman/JBL Pro
 - a. JBL CONTROL 321CT
 - 2. Or Equal
 - b. Passive 2-way full range speaker
 - c. 12" Low Frequency Driver, 2-inch Voice Coil
 - d. 1.75" High Frequency Driver
 - e. 200W AES, 600W peak
 - f. 8 ohms
 - g. 94 dB sensitivity
 - h. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
 - i. Contractor shall safely and securely mount speakers to gymnasium ceiling structure using manufacturer recommended and industry best practices.
 - j. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system.
 - k. Contractor shall supply and install properly sized speaker cabling to support supplied speakers. Each speaker shall be independently wired back to provided rack.
 - l. Speakers shall be white in color.
 - m. Proposed speaker quantities are based on the provided base speaker models. If alternate equipment is proposed, Contractor shall provide speaker analysis to verify even distribution of sound throughout the gymnasium for review.
- 5. One (1) Mixer(s) shall be provided and installed.
 - a. Acceptable Manufacturer(s)

1. HARMAN/JBL PRO
 - a. CSM14
 2. Or Equal
 - b. 4 Inputs – 1 Output
 - c. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - d. Contractor shall supply all cables and accessories for a fully functional system.
6. One (1) Amplification System shall be provided and installed.
- a. Acceptable Manufacturer(s)
 1. Harman/JBL Pro
 - a. CSA2300Z
 2. Or Equal
 - b. Two (2) input channels
 - c. Two (2) output channels
 - d. 300W maximum output per channel
 - e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB
7. One (1) CD/Bluetooth Player shall be provided and installed (one in gymnasium one in cafeteria).
- a. Acceptable Manufacturer(s)
 1. TASCAM
 - a. CD-400U
 2. Or Equal.
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - c. Contractor shall provide all audio cables and accessories to integrate CD/Bluetooth player with provided DSP/Mixer system.

8. One (1) Remote input location(s) shall be provided and installed (one in gymnasium one in cafeteria).
 - a. Remote input location shall provide XLR and 3.5mm connectivity in identified locations.
 - b. Contractor shall supply all cabling, faceplates and accessories for a complete installation.
 - c. Contractor shall integrate XLR and 3.5mm connection into provided Mixer system.

K. Configuration K

1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. Hamilton Elementary – Cafeteria
2. Two (2) Projector(s) shall be provided and installed.
 - a. Acceptable Manufacturer(s)
 1. Epson
 - a. EB-PU1008W
 - b. 8,500 Lumens
 - c. Each projector shall be provided with appropriate lens for an approximate 25' throw to fill a 13' wide front projection system with a 16:9 ratio projected image. Projector screen shall be provided by Others.
 - d. Projector shall be securely installed and affixed to mounting system and downpipe that is structurally attached to finished ceiling. Contractor shall supply appropriate mount and downpipe to securely and safely extend projector to optimal location for projection onto screen. Downpipe shall be white in color.
 - e. Projector shall be connected to supplied Q-SYS control system to receive transmission of signal from supplied input locations.
3. One (1) Rack System(s) shall be provided and installed.
 - a. Acceptable Manufacturer(s)
 1. Middle Atlantic

- a. DWR-12-26PD
- 2. Or Equal.
- b. Wall Mount
- c. 12U
- d. Plexiglas Locking Door
- e. Forward rackrail
- f. UL Load Capacity 200 lbs
- g. 26" usable depth
- h. 21" usable height
- i. Contractor to supply 8-Outlet PDU (Middle Atlantic PD-815R or Equal).
- 4. One (1) Multimedia Processor/DSP
 - a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in building MDF location.
 - c. Contractor shall provide all control, communication, audio and video patch cables to connect input and output ports to all Contractor provided materials.
 - d. Contractor shall program Multimedia processor to integrate with Contractor provided monitors and projector. Contractor shall supply all necessary cabling and programming to fully enable integration with control system.
 - e. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - f. System shall be populated with necessary accessories for 8 line-level input audio channels.

- g. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - h. Contractor shall supply all necessary labor to configure Mixer/DSP.
 - i. Contractor shall integrate Multimedia Processor/DSP with provided touchscreen.
 - j. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - k. Contractor shall supply all cables and accessories for a fully functional system.
 - l. Control system components shall be mounted in Hamilton MDF location.
 - m. Contractor shall provide and install fully compliant shielded cabling and any other low voltage communication infrastructure needed to fully connect to the projection system from one (1) input plate(s) and one (1) wireless presentation system(s). Cable shall meet or exceed Q-SYS requirements for AV over IP systems.
5. One (1) Multimedia Input Location shall be provided.
- a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Wall input to be installed in provided double gang box (transmitter should be single gang), Contractor shall supply stainless steel plate for fully finished installation.
 - c. Contractor shall supply correct in-plate transmit and receive equipment to extend input location to supplied Q-SYS AV over IP encoder.
 - d. Contractor will supply all necessary Q-SYS AV over IP decoder equipment to connect supplied projector and monitors.
 - e. Valid video input into the system shall turn on system automatically.
 - f. System shall power down after ten (10) minutes of no video signal.
 - g. Q-SYS AV over IP units shall properly scale input image to projector to optimal resolution.

6. One (1) Touch Screen(s) shall be provided
 - a. Acceptable Manufacturer(s)
 1. Q-SYS
 - b. Touch Screen(s) shall be provided to control system operations.
 1. Touchscreen shall be 7”
 2. Black
 3. Connect touch screens to supplied control system as per manufacturer installation instructions.
 4. Provide all necessary cabling, mounts and accessories to securely mount touch screen in provided double gang box.
 5. Control touch screen shall be provided in locations specified herein that shall provide the following functions but not limited to.
 - a. System Power On
 - b. System Power Off
 - c. Select Source, input 1 or wireless presentation system
 - d. Control Provided LED Panels and Projector.
 - e. Audio Level Increase
 - f. Audio Level Decrease
 - g. Image Freeze
 - h. Audio Mute
 - c. Contractor shall provide all control, communication, audio and video patch cables, transmitters and receivers to connect input and output ports to all Contractor and Owner provided materials in the space.
7. One (1) Amplification System shall be provided and installed
 - a. Acceptable Manufacturer(s)
 1. HARMAN/JBL PRO
 - a. CSA2300Z

- 2. Q-SYS
- 3. Or Equal
- b. Two (2) input channels
- c. Two (2) output channels
- d. 300W maximum output per channel
- e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB
- f. Contractor shall use existing speakers. Contractors shall rework existing speaker cabling as necessary to integrate into new amplifier.
- 8. Eight (8) Total Speakers shall be provided and installed
 - a. Acceptable Manufacturer(s)
 - 1. HARMAN/JBL PRO
 - a. JBL CONTROL 18C/T (Four (4) total)
 - b. JBL CONTROL 28-1 (Four (4) total)
 - 2. Or Equal
 - b. White Color
 - c. Passive 2-way full range speaker
 - d. 8" Low Frequency Driver, 1-inch Voice Coil
 - e. 180W peak
 - f. 8 ohms
 - g. 94 dB sensitivity
 - h. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
 - i. Contractor shall safely and securely mount in cafeteria ceiling and walls using manufacturer recommended and industry best practices.
 - j. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.

- k. Contractor shall supply and install properly sized speaker cabling to support supplied speakers. Each speaker shall be independently wired back to IDF location.
9. One (1) Voice Amplification System(s) shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. SHURE – QLXD4
 - 2. Or Equal.
 - b. Handheld and Lavalier microphone combo
 - c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire cafeteria.
 - d. Contractor shall supply all mounting hardware to securely mount equipment into existing rack.
10. One (1) CD/Bluetooth Player shall be provided and installed (one in gymnasium one in cafeteria).
- a. Acceptable Manufacturer(s)
 - 1. TASCAM
 - a. CD-400U
 - 2. Or Equal.
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - c. Contractor shall provide all audio cables and accessories to integrate CD/Bluetooth player with provided DSP/Mixer system.
11. One (1) Wireless Presentation System
- a. Acceptable Manufacturers (in alphabetical order):
 - 1. KRAMER
 - a. VIA GO 2
 - b. Wireless Presentation System shall meet or exceed the following requirements:

1. HDMI output with support for up to 4K@30Hz.
 2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
 3. 4GB Memory
 4. 32GB Storage
 5. All other features currently a part of the manufacturer's latest commercial release.
 6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system in Contractor provided rack.
- c. Contractor shall integrate wireless presentation system with provided Crestron control system.
 - d. Contractor shall coordinate installation and configuration of Wireless Presentation System per manufacturer recommended guidelines. Contractor shall work collaboratively as necessary with Owner and network support resources for a complete and compliant installation.
 - e. Contractor shall provide licensing for Kramer VIA Cloud management platform for term of warranty. Contractor shall work collaboratively with Owner to make all Kramer VIA devices fully functional in management software.
 - f. Contractor shall supply all necessary patch cables to connect Wireless Presentation Device to Owner supplied network cabling and switches. Contractor shall fully patch all devices and report back switch ports to Owner for programming.
12. One (1) Remote input location(s) shall be provided and installed (one in gymnasium one in cafeteria).
 - a. Remote input location shall provide XLR and 3.5mm connectivity in identified locations.
 - b. Contractor shall supply all cabling, faceplates and accessories for a complete installation.
 - c. Contractor shall integrate XLR and 3.5mm connection into provided Mixer system.

L. Hamilton ECC Gross Motor space

1. Contractor shall supply one (1) of the specified configurations in each of the following locations.

- a. Hamilton Early Childhood Center – Imagination Station - 554
- 2. Two (2) LED Monitor(s) shall be provided and installed.
 - a. Acceptable Manufacturer(s)
 - 1. LG
 - 2. SAMSUNG
 - a. QB86R
 - b. LED Monitor shall meet or exceed the following minimum requirements:
 - 1. 86” diagonal
 - 2. Brightness 350 cd/m
 - 3. Rated for 16/7 run-time
 - 4. 8ms refresh rate
 - 5. 3840 x 2160 resolution
 - 6. 16:9 aspect ratio
 - 7. Three (3) HDMI input ports
 - 8. RS232C In/out
 - c. Contractor shall supply and install appropriate mounts for supplied LED monitors. Mounts shall be Peerless SF660P or Chief equivalent.
 - d. Contractor shall supply appropriate Q-SYS AV over IP equipment for discrete output for each monitor.
 - e. Supplied Q-SYS AV over IP equipment shall scale images to optimal projector resolution.
 - f. Contractor shall supply 8” HDMI cable.
- 3. One (1) Multimedia Processor/DSP
 - a. Acceptable Manufacturer(s)
 - 1. Q-SYS

- b. Contractor shall supply all parts, cables and accessories to securely mount unit in building IDF location.
 - c. Contractor shall provide all control, communication, audio and video patch cables to connect input and output ports to all Contractor provided materials.
 - d. Contractor shall program Multimedia processor to integrate with Contractor provided monitors. Contractor shall supply all necessary cabling and programming to fully enable integration with control system.
 - e. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - f. System shall be populated with necessary accessories for 8 line-level input audio channels.
 - g. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - h. Contractor shall supply all necessary labor to configure Mixer/DSP.
 - i. Contractor shall integrate Multimedia Processor/DSP with provided touchscreen.
 - j. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - k. Contractor shall supply all cables and accessories for a fully functional system.
 - l. Contractor shall provide and install fully compliant shielded cabling and any other low voltage communication infrastructure needed to fully connect to the projection system from one (1) input plate(s) and one (1) wireless presentation system(s). Cable shall meet or exceed Q-SYS requirements for AV over IP systems.
4. One (1) Multimedia Input Location shall be provided.
- a. Acceptable Manufacturer(s)

1. Q-SYS

- b. Wall input to be installed in provided double gang box (transmitter should be single gang), Contractor shall supply stainless steel plate for fully finished installation.
- c. Contractor shall supply correct in-plate transmit and receive equipment to extend input location to supplied Q-SYS AV over IP encoder.
- d. Contractor will supply all necessary Q-SYS AV over IP decoder equipment to connect supplied projector and monitors.
- e. Valid video input into the system shall turn on system automatically.
- f. System shall power down after ten (10) minutes of no video signal.
- g. Q-SYS AV over IP units shall properly scale input image to projector to optimal resolution.

5. One (1) Touch Screen(s) shall be provided

- a. Acceptable Manufacturer(s)

1. Q-SYS

- b. Touch Screen(s) shall be provided to control system operations.
- c. Touchscreen shall be 7"
- d. Black
- e. Connect touch screens to supplied control system as per manufacturer installation instructions.
- f. Provide all necessary cabling, mounts and accessories to securely mount touch screen in provided double gang box.
- g. Control touch screen shall be provided in locations specified herein that shall provide the following functions but not limited to.
 1. System Power On
 2. System Power Off
 3. Select Source, input 1 or wireless presentation system
 4. Control Provided LED Panels and Projector.
 5. Audio Level Increase

- 6. Audio Level Decrease
 - 7. Image Freeze
 - 8. Audio Mute
 - h. Contractor shall provide all control, communication, audio and video patch cables, transmitters and receivers to connect input and output ports to all Contractor and Owner provided materials in the space.
6. One (1) Amplification System shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. HARMAN/JBL PRO
 - a. CSA-2300Z
 - 2. Q-SYS
 - 3. Or Equal
 - b. Two (2) input channels
 - c. Two (2) output channels
 - d. 300W maximum output per channel
 - e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB
7. Eight (8) Speakers shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. HARMAN/JBL PRO
 - a. JBL CONTROL 67 P/T
 - 2. Or Equal
 - b. Pendant style
 - c. Passive 2-way full range speaker
 - d. 6.5” Low Frequency Driver, 1-inch Voice Coil
 - e. 150W Continuous
 - f. 8 ohms

- g. 94 dB sensitivity
 - h. 58Hz-18kHz +/- 3dB, -10dB @ 50Hz
 - i. Contractor shall safely and securely mount speakers to large group space ceiling structure using manufacturer recommended and industry best practices.
 - j. Contractor shall supply and install properly sized speaker cabling to support supplied speakers.
 - k. Speakers shall be black in color.
8. One (1) Wireless Presentation System
- a. Acceptable Manufacturers (in alphabetical order):
 - 1. KRAMER
 - a. VIA GO 2
 - b. Wireless Presentation System shall meet or exceed the following requirements:
 - 1. HDMI output with support for up to 4K@30Hz.
 - 2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
 - 3. 4GB Memory
 - 4. 32GB Storage
 - 5. All other features currently a part of the manufacturer's latest commercial release.
 - 6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system in existing provided rack.
 - c. Contractor shall integrate wireless presentation system with provided Crestron control system.
 - d. Contractor shall coordinate installation and configuration of Wireless Presentation System per manufacturer recommended guidelines. Contractor shall work collaboratively as necessary with Owner and network support resources for a complete and compliant installation.
 - e. Contractor shall provide licensing for Kramer VIA Cloud management platform for term of warranty. Contractor shall work collaboratively

with Owner to make all Kramer VIA devices fully functional in management software.

- f. Contractor shall supply all necessary patch cables to connect Wireless Presentation Device to Owner supplied network cabling and switches. Contractor shall fully patch all devices and report back switch ports to Owner for programming.
9. One (1) Voice Amplification System(s) shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. SHURE – QLXD4
 - 2. Or Equal.
 - b. Handheld and Lavalier microphone combo
 - c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire cafeteria.
 - d. Contractor shall supply all mounting hardware to securely mount equipment into existing rack.
10. One (1) Remote input location(s) shall be provided and installed (one in gymnasium one in cafeteria).
- a. Remote input location shall provide XLR and 3.5mm connectivity in identified locations.
 - b. Contractor shall supply all cabling, faceplates and accessories for a complete installation.
 - c. Contractor shall integrate XLR and 3.5mm connection into provided Mixer system.

M. Configuration M

- 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. Valleywood Middle School - Auditorium
- 2. One (1) Projector
 - a. Acceptable Manufacturer(s)
 - 1. Epson

- a. EB-PU1008B
 - b. 8,500 Lumens
 - c. Projector shall be provided with appropriate lens for an approximate 10' throw to fill a 13.5' wide front projection system with a 16:9 ratio projected image.
 - d. Projector shall be securely installed and affixed to mounting system and downpipe that is structurally attached to finished ceiling. Contractor shall supply appropriate mount and downpipe to securely and safely extend projector to optimal location for projection onto screen.
 - e. Projector shall be connected to supplied Q-SYS control system to receive transmission of signal from supplied input locations.
 - f. Projector shall be Black in color
3. One (1) Multimedia Processor/DSP
- a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in building MDF location.
 - c. Contractor shall provide all control, communication, audio and video patch cables to connect input and output ports to all Contractor provided materials.
 - d. Contractor shall program Multimedia processor to integrate with Contractor provided monitors and projector. Contractor shall supply all necessary cabling and programming to fully enable integration with control system.
 - e. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - f. System shall be populated with necessary accessories for 8 line-level input audio channels.
 - g. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.

- h. Contractor shall supply all necessary labor to configure Mixer/DSP.
 - i. Contractor shall integrate Multimedia Processor/DSP with provided touchscreen.
 - j. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - k. Contractor shall supply all cables and accessories for a fully functional system.
 - l. Contractor shall provide and install fully compliant shielded cabling and any other low voltage communication infrastructure needed to fully connect to the projection system from two (2) input plate(s) and one (1) wireless presentation system(s). Cable shall meet or exceed Q-SYS requirements for AV over IP systems.
4. One (1) Powered Rollup Projection Screen
- a. Acceptable Manufacturer(s)
 - 1. DA-LITE
 - a. Tensioned Cosmopolitan Electrol
 - 2. DRAPER
 - b. Powered Rollup Projection Screen shall meet or exceed the following minimum requirements:
 - c. 92" x 164" – Wide (16:9) Format
 - d. Black powder coated finish
 - e. Surface mount
 - f. Matte white screen surface
 - g. Four (4) feet of additional screen drop
 - h. Low voltage control RS-232 capable
5. Two (2) Multimedia Input Location shall be provided.
- a. Acceptable Manufacturer(s)

1. Q-SYS
 - b. Wall input to be installed in provided double gang box (transmitter should be single gang), Contractor shall supply stainless steel plate for fully finished installation.
 - c. Contractor shall supply correct in-plate transmit and receive equipment to extend input location to supplied Q-SYS AV over IP encoder.
 - d. Contractor will supply all necessary Q-SYS AV over IP decoder equipment to connect supplied projector and monitors.
 - e. Valid video input into the system shall turn on system automatically.
 - f. System shall power down after ten (10) minutes of no video signal.
 - g. Q-SYS AV over IP units shall properly scale input image to projector to optimal resolution.
6. One (1) Touch Screen(s) shall be provided
 - a. Acceptable Manufacturer(s)
 1. Q-SYS
 - b. Touch Screen(s) shall be provided to control system operations.
 1. Touchscreen shall be 7”
 2. Black
 3. Connect touch screens to supplied control system as per manufacturer installation instructions.
 4. Provide all necessary cabling, mounts and accessories to securely mount touch screen in provided double gang box.
 5. Control touch screen shall be provided in locations specified herein that shall provide the following functions but not limited to.
 - a. System Power On
 - b. System Power Off
 - c. Select Source, input 1 or wireless presentation system
 - d. Control Provided LED Panels and Projector.
 - e. Audio Level Increase

- f. Audio Level Decrease
 - g. Image Freeze
 - h. Audio Mute
 - c. Contractor shall provide all control, communication, audio and video patch cables, transmitters and receivers to connect input and output ports to all Contractor and Owner provided materials in the space.
7. One (1) CD/Bluetooth Player shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. TASCAM
 - a. CD400
 - 2. Or Equal.
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - c. Contractor shall provide all audio cables and accessories to integrate CD/Bluetooth player with provided DSP/Mixer system.
8. Two (2) Amplification System shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - 2. Or Equal
 - b. Two (2) input channels
 - c. Two (2) output channels
 - d. 450W maximum output per channel
 - e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB
 - f. Contractor shall use existing speakers. Contractors shall rework existing speaker cabling as necessary to integrate into new amplifier.
9. Two (2) Voice Amplification System(s) shall be provided and installed
- a. Acceptable Manufacturer(s)

1. SHURE – QLXD4
 2. Or Equal.
- b. Handheld and Lavalier microphone combo
 - c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire auditorium.
 - d. Contractor shall supply all mounting hardware to securely mount equipment into existing rack.
10. Four (4) Remote input location(s) shall be provided and installed.
- a. Remote input location shall provide XLR connectivity in identified locations.
 - b. Contractor shall supply all cabling, faceplates and accessories for a complete installation.
 - c. Contractor shall integrate XLR connection into provided Mixer system.

11. DEMOLITION

- a. Contractor shall completely remove existing amplifiers, screen and unused speakers and properly dispose of.

2.05 ALLOWANCES

- A. Contractor shall include allowances for equipment and/or other contract service reimbursements as required below in base bid lump sum amount(s). Equipment and/or contract services shall be provided and sourced at Owner's discretion and convenience with full cooperation by Contractor, and paid for from successful bidder's contract in the amount(s) provided for herein. Any allowance amount proving to be excessive for the intended equipment and/or contract services shall be credited to the Owner against contract payment requests.
1. Allowance shall be made in the amount of \$10,000.00 for contract services related to Owner directed infrastructure upgrades, installation and configuration.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Contractor shall conduct detailed walk-through examination with Designer, Construction Manager and Owner verifying equipment and material locations as well as mounting and placement requirements prior to commencement of other installation activities.
 - 1. Contractor shall ensure all submittals and have been provided to, and approval has been obtained from Designer and Owner prior to commencement of any final installation activities. Submittals shall include, but not be limited to:
 - 2. Shop drawings, data sheets and system diagrams including specific cable connectors and types proposed to be installed.
 - 3. Asset tag format, composition, attachment method and location on each serialized component being provided.
 - 4. Firmware configuration template to be used for each component provided.
 - 5. Written installation, coordination and test procedure to be followed by installing technicians and engineers.
 - 6. Final documentation template.

3.02 INSTALLATION

- A. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner's or other contractor's activities.
 - 1. Appendices depicting general ceiling conditions for areas of buildings are included herein. Contractors shall field verify specific room conditions.
- B. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed and disposed of off premise. All equipment and tools shall be removed from common areas and stored in approved, secure storage locations.
 - 1. Owner shall not be responsible for disposal or transportation of any packaging materials or other waste items.
 - 2. Owner's waste containers including site dumpsters shall not be used for material disposal.
- C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.

- D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:
1. Inventory receipt of all components and equipment.
 2. Storage of all equipment and components until such time those items are installed according to the specifications.
 3. Transport equipment to the Owner's installation location(s).
 4. Assemble, install, configure and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
 5. Collect all information necessary to accurately program all system devices to the Owner's intended use and need.
 6. Label with asset tags and other markings provided by Owner all system devices as may be appropriate and required by Owner and Designer.
 7. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment. Work shall conform to "best practices" observed by industry professional installers and as required by Owner and Designer.
 8. Work shall include careful coordination and cooperation with others to ensure a timely, cost effective and proper installation for Owner's intended application. Such efforts shall include, but not be limited to, coordinating and cooperating with other contractors, Owner, Designer and Engineer.
 9. Where cables are to be routed through or on a finished wall, standard connectors must be used at the wall location to terminate call cables. All wall plates shall be stainless steel. Plastic or nylon plates shall not be acceptable. Cables routed out of a wall box on a finished wall without proper standard connection termination shall not be acceptable.
 10. All cables shall be proper and adequately supported using hooks or rings no more than eight feet (8') apart. Cables supported by structural steel, ceiling grid or hanger wires will not be acceptable. All cable routing shall be neat and orderly.
 11. Label all cable connections for intuitive user access and as directed by Owner and Designer.
 12. Work may include extending cables from installed equipment, and as required and/or specified herein, to Owner identified connection outlets.

- a. Work includes supply, connection and testing of any such cables.
- b. Cables for some devices may be routed in air plenum spaces, above finished ceilings, or in other ways require special care and suitable tools to complete. Where air plenum status is in question and/or may change, plenum rated cable shall be used.

13. DEMOLITION

- a. Contractor shall be responsible for removal and disposal of all abandoned audio-visual cabling, including all connectors, faceplates and connecting cables.
 - b. If faceplates are completely removed, a color matched blank plate shall be put in its places. Faceplates that remain must have proper color matched blanks installed for a finished professional installation.
 - c. Contractor shall be responsible for removal and disposal of all existing screens, brackets and excess materials as directed by Owner.
 - d. Contractor shall be responsible for removal and disposal of all projectors, mounting brackets and accessories.
- E. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate or panel to the original condition.
- 1. Repairs shall include, but not be limited to patching and painting.
 - 2. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.
 - 3. The building and work area shall be returned to its original condition prior to final sign off of the project.
- F. Following installation and system “turn-up”, but prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.
- 1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.
- G. All cable and device labels shall match existing standard.

H. Worksites include the following:

1. East Kentwood Freshman Campus
6170 Valley Lane
Kentwood, Michigan 49508
2. East Kentwood High School
6230 Kalamazoo Ave
Kentwood, Michigan 49508
3. Hamilton Elementary and Early Childhood Center
3303 Breton SE
Kentwood, Michigan 49508
4. Valleywood Middle School
1110 50th Street
Kentwood, Michigan 49508

3.03 TESTING

- A. In an effort to ensure a smooth “turn-up” of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over.
- B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements, meets the owner’s specific application requirements and is ready for functionality and integrity testing.
- C. Testing Procedures
 1. Prior to system “turn-up”, Contractor shall submit a written request and proposed test plan to Designer indicating they have completed full and final configuration of the system, and are ready to have system integrity and functionality tested.
 2. Within reasonable time after receipt of request, Designer will accept or revise the proposed test plan, provide a test schedule and coordinate testing date(s) with Owner and Contractor.
 3. Should Designer determine the Work is not acceptably configured or not of adequate integrity:
 - a. Designer promptly will so notify Contractor, giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.
 - b. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-testing.

- c. Designer will schedule re-test of the Work.
 - d. Excessive re-testing of Work may result in fees being assessed Contractor.
4. Should Designer and Owner concur the Work is configured properly and system integrity is as required:
- a. Designer will review Contractors detailed “turn-up” plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system “turn-up” can proceed.

3.04 DOCUMENTATION

- A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment, including if reasonably required, file drawers, folders, dividers, etcetera, to contain all as-built drawings, owner’s manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or Owner deem necessary. Documentation shall also be provided in a digital format in file formats and on media as specified by Owner and/or Designer.
- B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:
- 1. Equipment description.
 - 2. Equipment make.
 - 3. Model number.
 - 4. Software release.
 - 5. Date installed.
 - 6. Manufacturer's warranty.
 - 7. Maintenance contract terms.
 - 8. Verification of maintenance contract engagement.
 - 9. Telephone numbers for service and support.
 - 10. Detailed technical support and service procedure instructions.
 - 11. All product (hardware and software) manuals and manufacturer supplied documentation, including, but not limited to owner manuals, system

administrator manuals and configuration guides. Where number of duplicate copies for particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.

12. Photocopy of original invoice listing make and model for all components and equipment from individual manufacturer(s), distribution source(s), or authorized agent(s) to establish manufacturer warranty start date for potential use after end of contract warranty provisions.
13. CAD or Visio as built drawings/diagrams for each building.
14. System Configuration Report.
15. Complete inventory of installed hardware and system software including, but not be limited to, model numbers, Ethernet MAC address, serial numbers, physical installation location and software options.

3.05 TRAINING

- A. No training shall be conducted prior to training outline and/or syllabus being approved by Owner, Instructional or overview activities conducted without prior content approval with not be deemed contract training, and Contractor shall remain responsible for delivery of approved training.
- B. Contractor shall provide training for the Owner designated key personnel(s). Owner shall designate up to four (4) personnel to be trained per building gym audio system, cafeteria or scoring tower. Training shall be a minimum of one (1), two (2) hour sessions in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:
 1. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.
 2. Basic usage of the installed system including all major functions

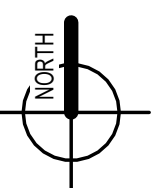
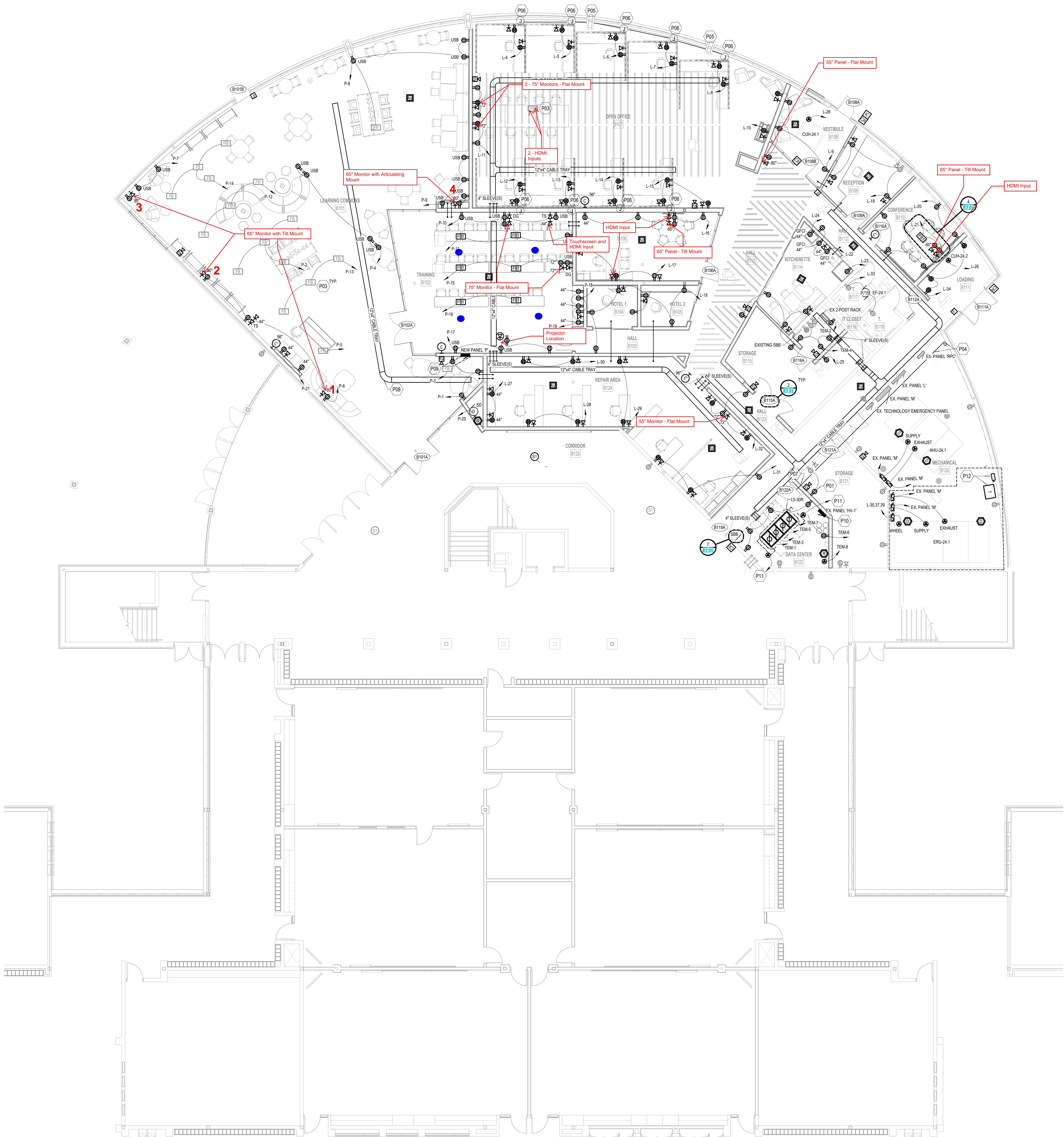
3.06 SCHEDULE, MEETINGS AND PLANS

A. Schedule

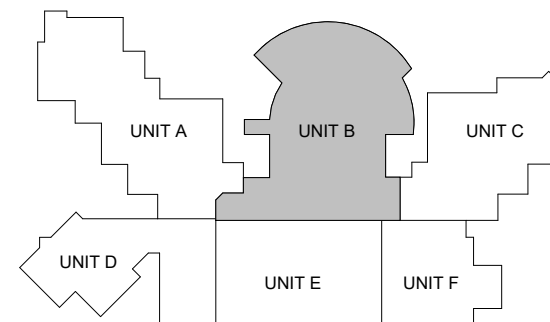
1. Post bid Interviews: March 8, 2024
2. Contractor Chosen: Week of March 11, 2024
3. Work Commences: April 1, 2024
4. Substantial Completion of Project: December 1, 2025

5. Project Close-out: January 1, 2026

- B. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.
- C. All work shall be coordinated with Owner's construction manager on site.
- D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.



UNIT 'B' FIRST FLOOR POWER & COMMUNICATIONS PLAN
1/8" = 1'-0"



KEYPLAN

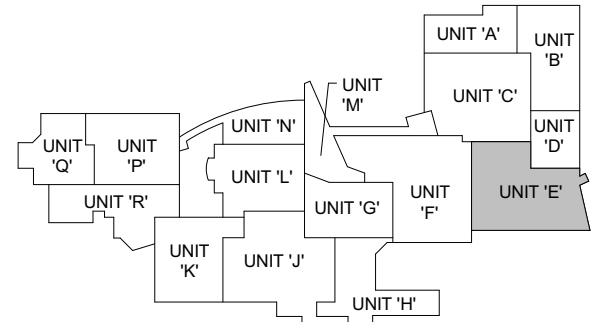
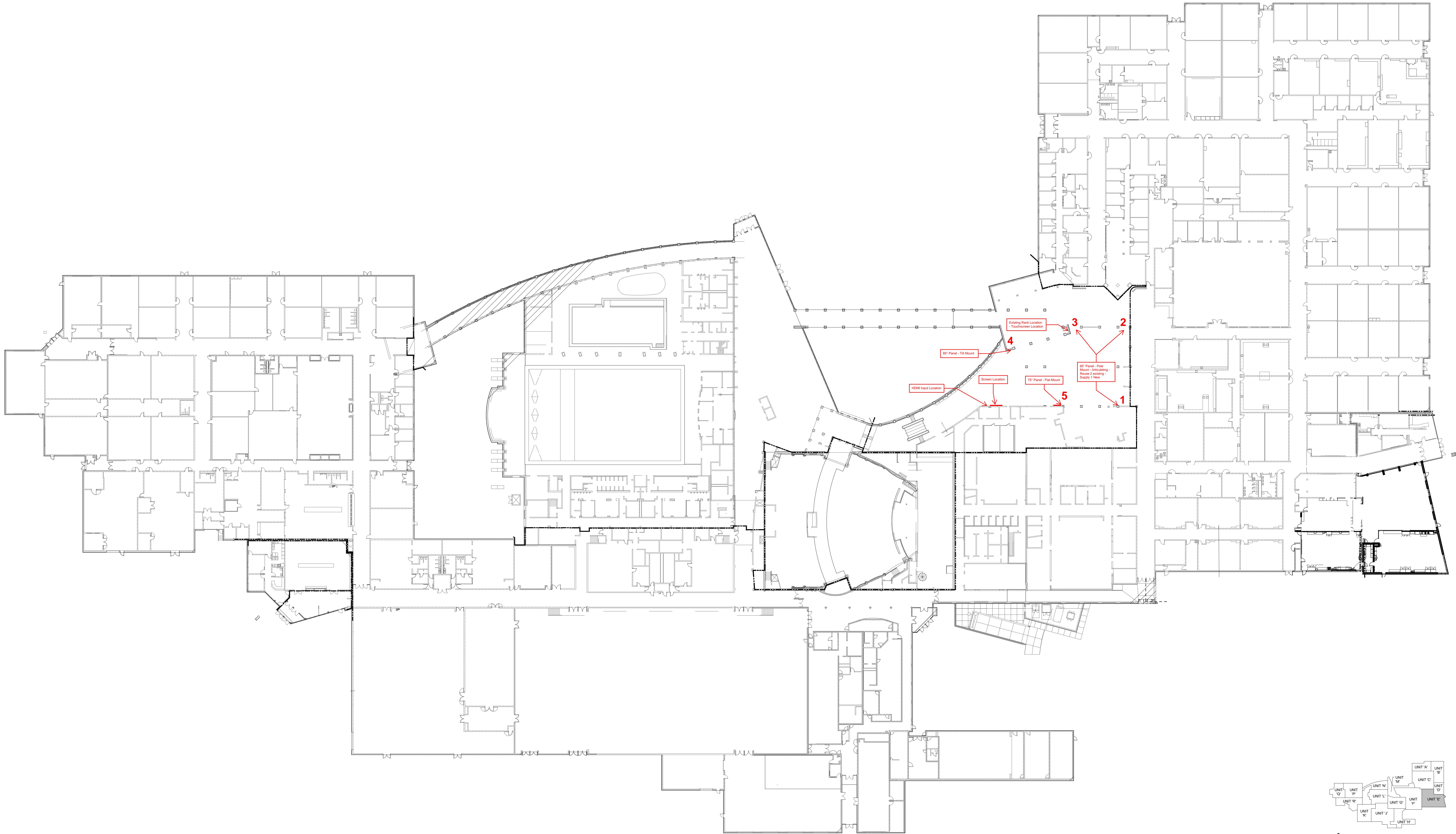
FRESHMAN CAMPUS RENOVATIONS
KENTWOOD PUBLIC SCHOOLS
KENTWOOD, MICHIGAN

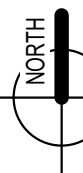
ISSUANCES

PROJECT NO.

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 NORTH
KEYPLAN





KINGSCOTT
KALAMAZOO | CHELSEA | GRAND RAPIDS | ROYAL OAK

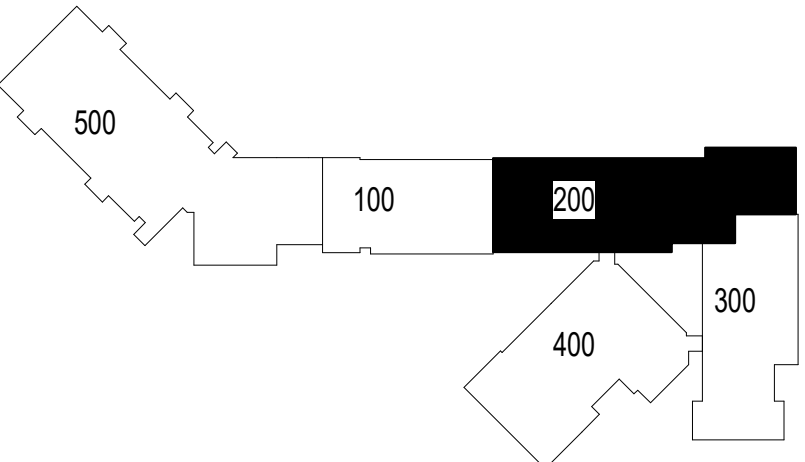
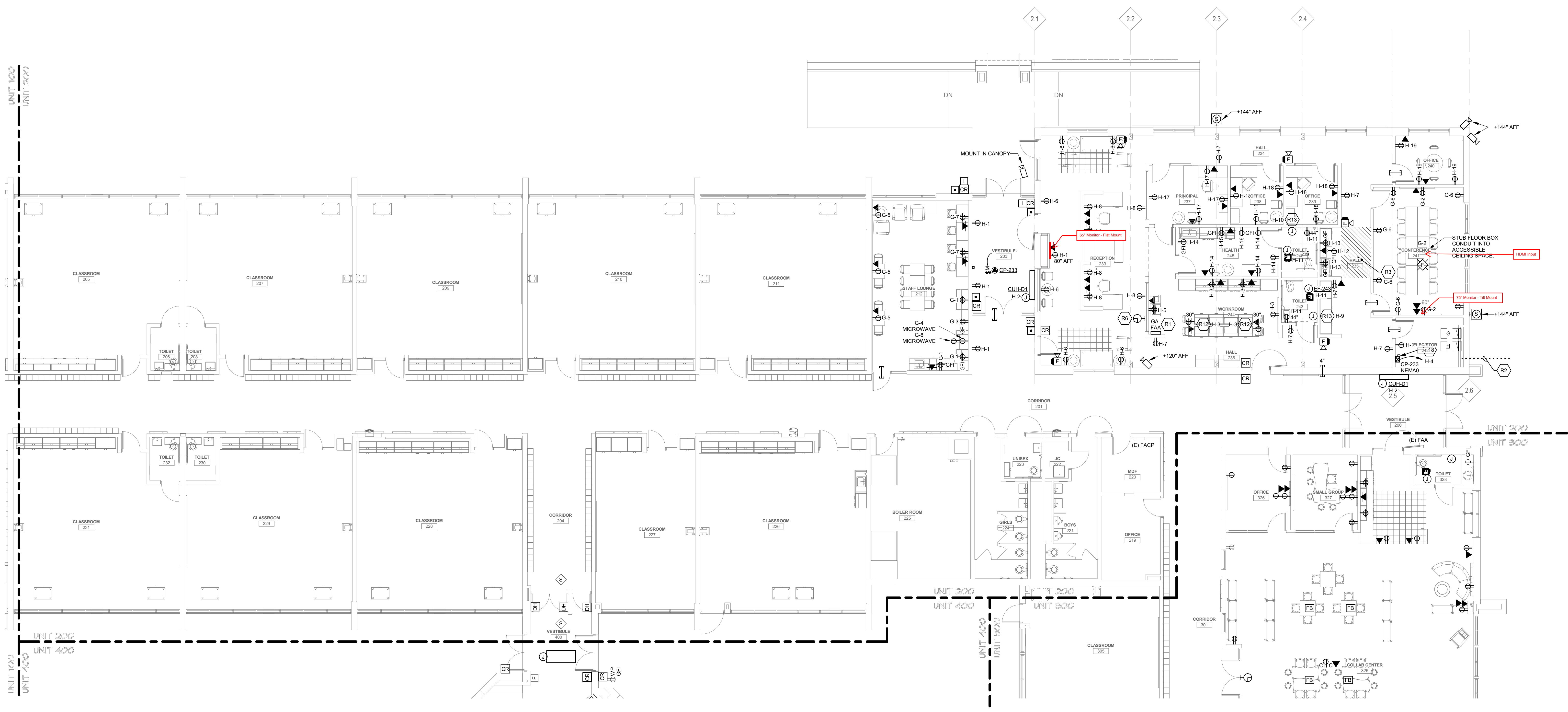
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SES Project # 22 0588 02

HAMILTON ELEMENTARY

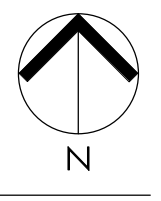
ADDITION

KENTWOOD PUBLIC SCHOOLS

3303 BRETON RD SE
KENTWOOD, MI 49512



KEY PLAN



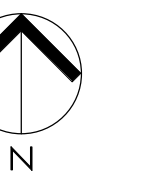
POWER PLAN
SCALE: 1/8" = 1'-0"

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4000 W. Eleven Mile Road Berkley, MI 48072
Phone 248.399.1900 Fax 248.399.1901
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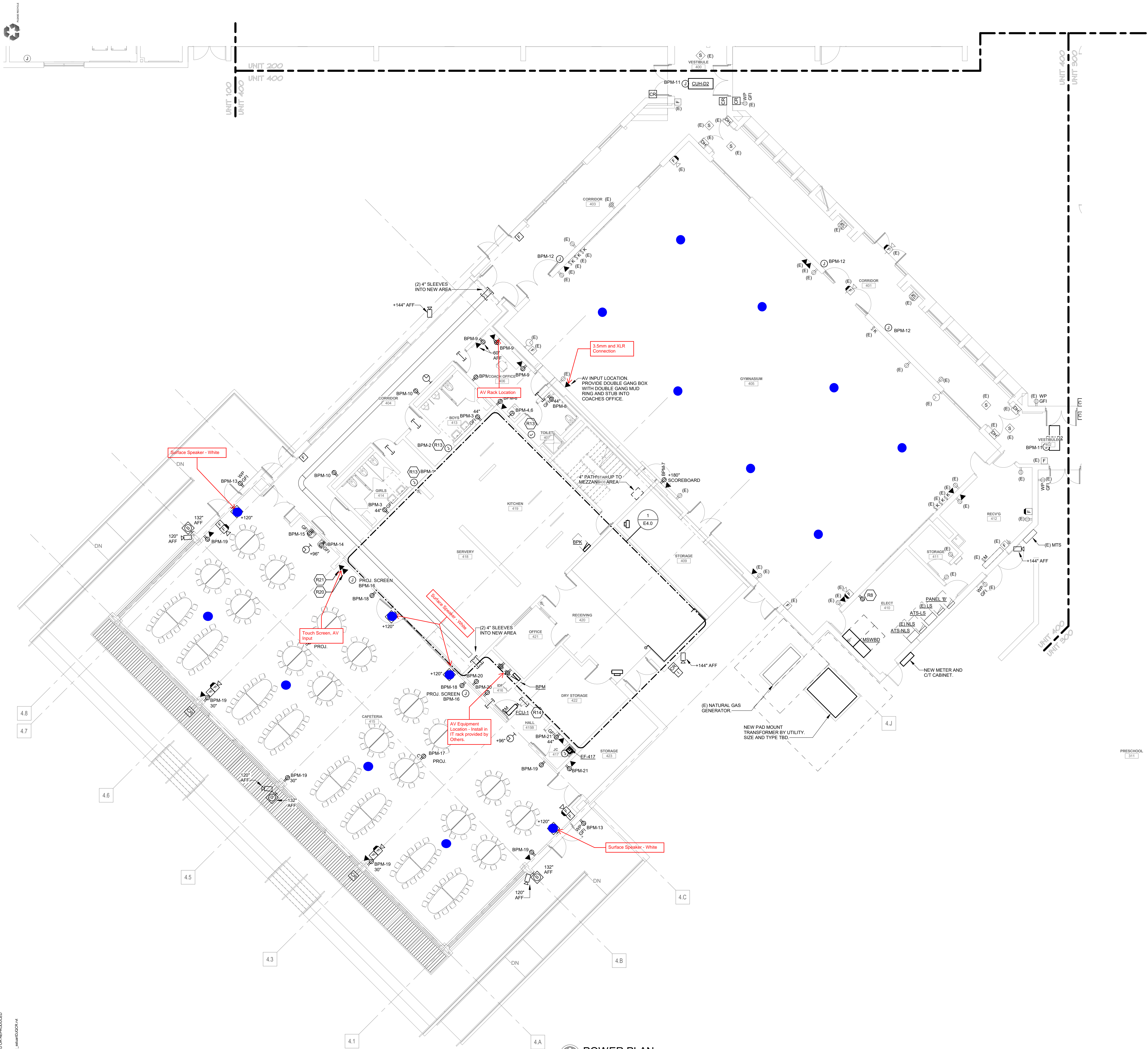
SHEET NO.

EP1.3

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POWER PLAN
SCALE: 1/8" = 1'-0"



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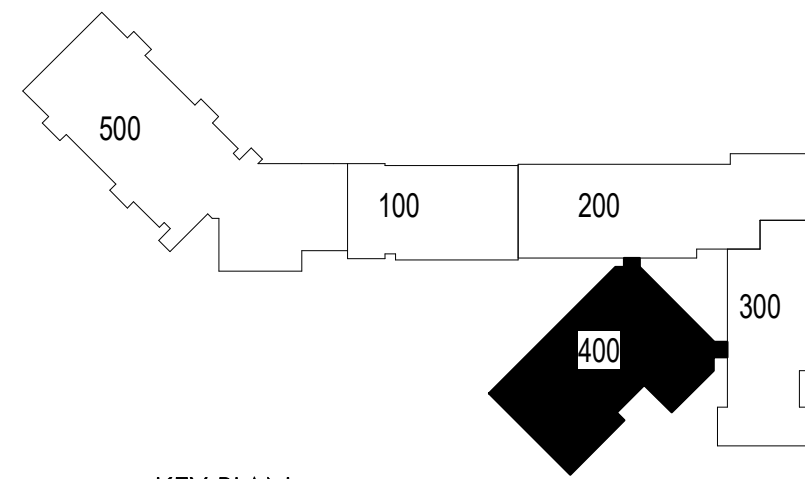
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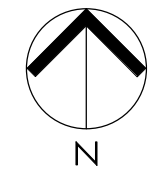
HAMILTON ELEMENTARY ADDITION

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KEY PLAN

JOB NO. 2395.72



SHEET NO.

EP1.4

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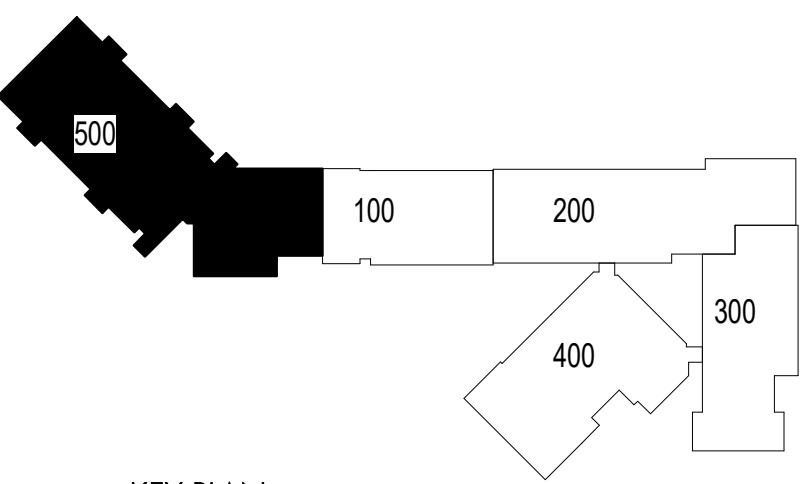
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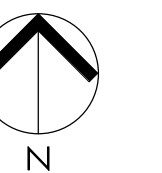
HAMILTON ELEMENTARY

ADDITION

KENTWOOD PUBLIC SCHOOLS
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KENTWOOD, MI 49512



KEY PLAN

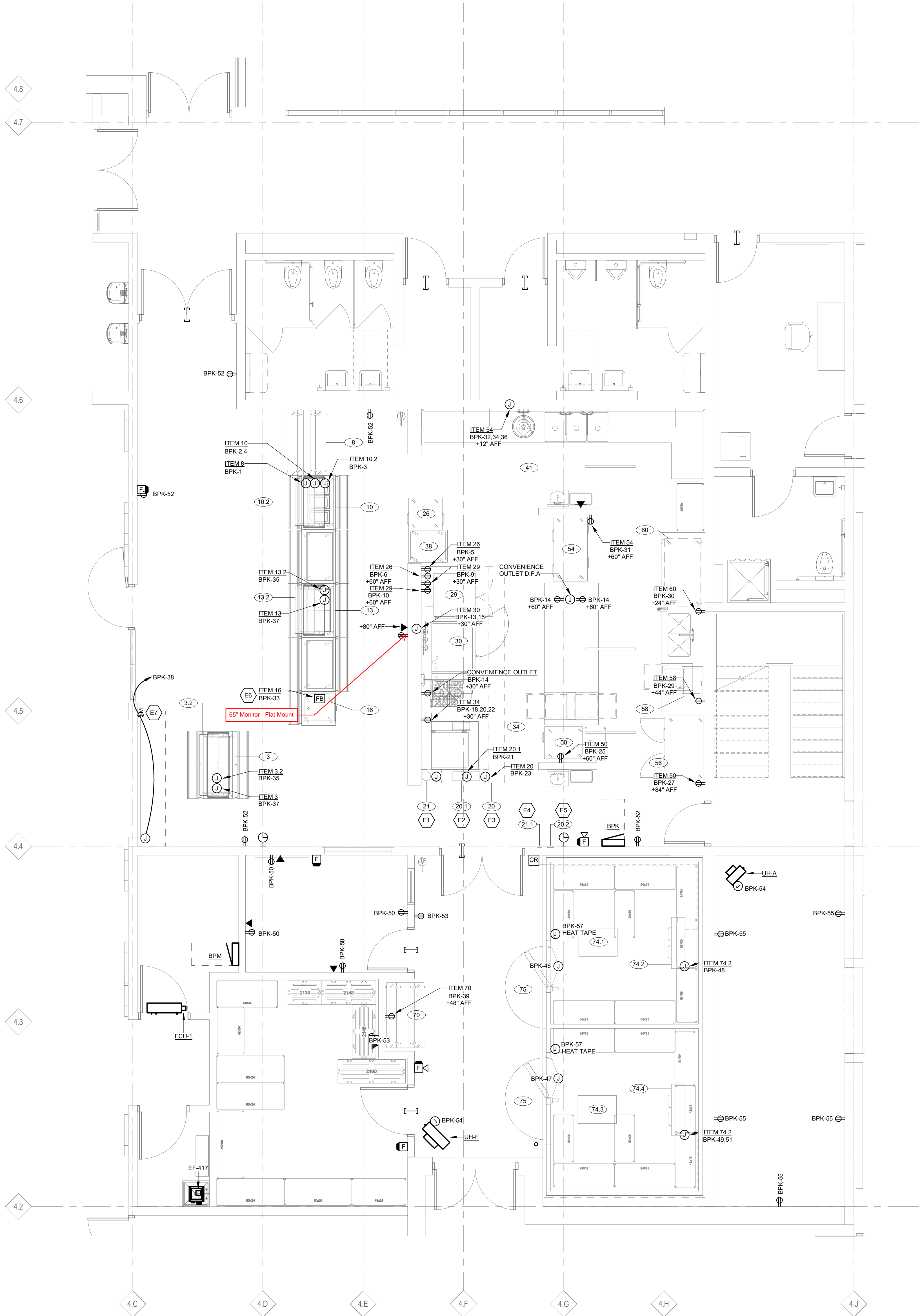


SHEET NO.

EP1.5

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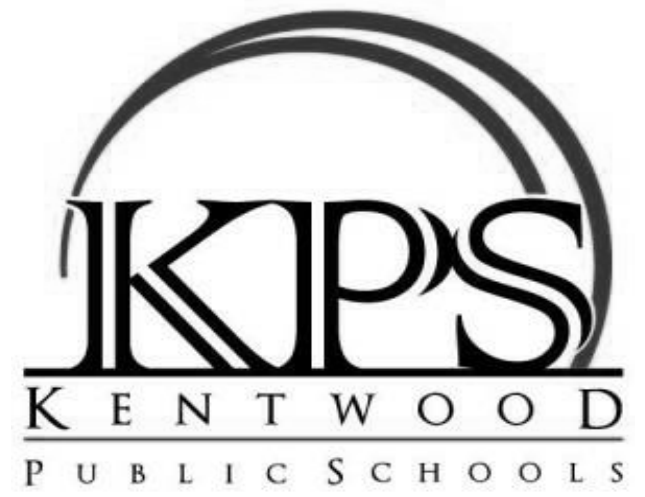
POWER PLAN
SCALE: 1/8" = 1'-0"2 POWER PLAN - UNIT 500 (STAFF LOUNGE 553)
EP1.5 SCALE: 1/4" = 1'-0"



1 ELECTRICAL KITCHEN PLAN
EP14 SCALE: 1/8" = 1'-0"



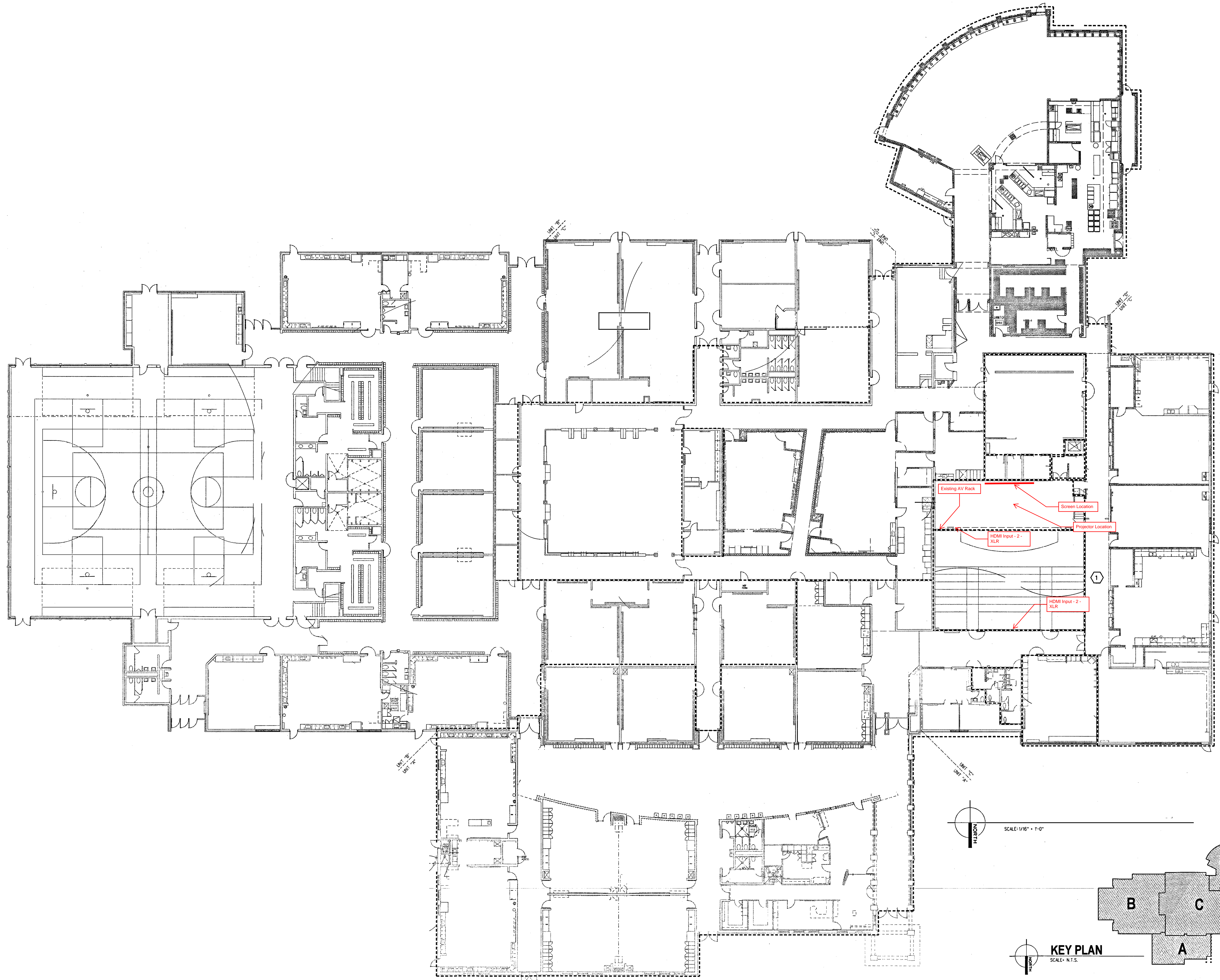
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KENTWOOD PUBLIC SCHOOLS
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KENTWOOD, MI 49512



JOB NO. 239572

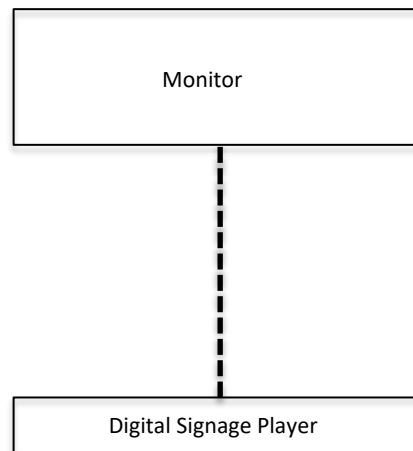
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E4.0



Appendix B – AV Connection Line Diagrams

Configuration A – Digital Signage

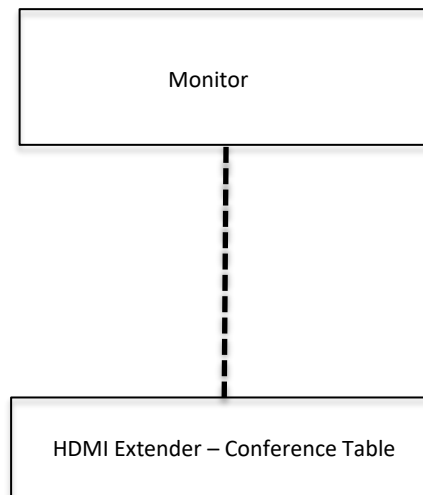


Legend

| | |
|-------------|---|
| Control |  |
| Audio |  |
| HDMI |  |
| Network PoE |  |

Appendix B – AV Connection Line Diagrams

Configuration B – Conference Room Type A

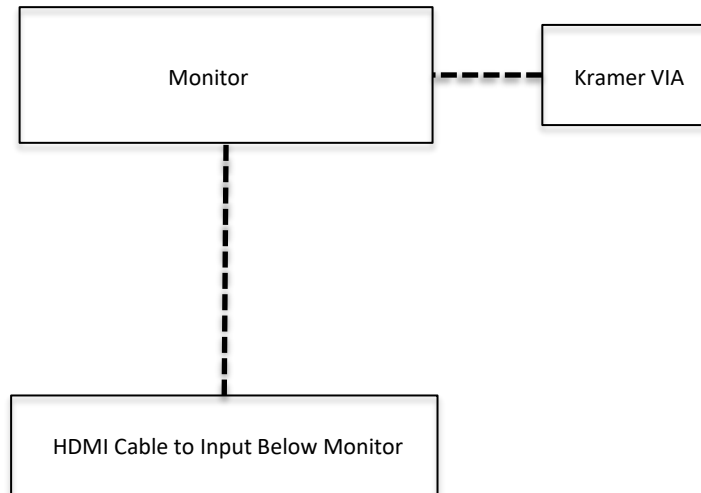


Legend

| | |
|-------------|---|
| Control |  |
| Audio |  |
| HDMI |  |
| Network PoE |  |

Appendix B – AV Connection Line Diagrams

Configuration C – Conference Room Type B

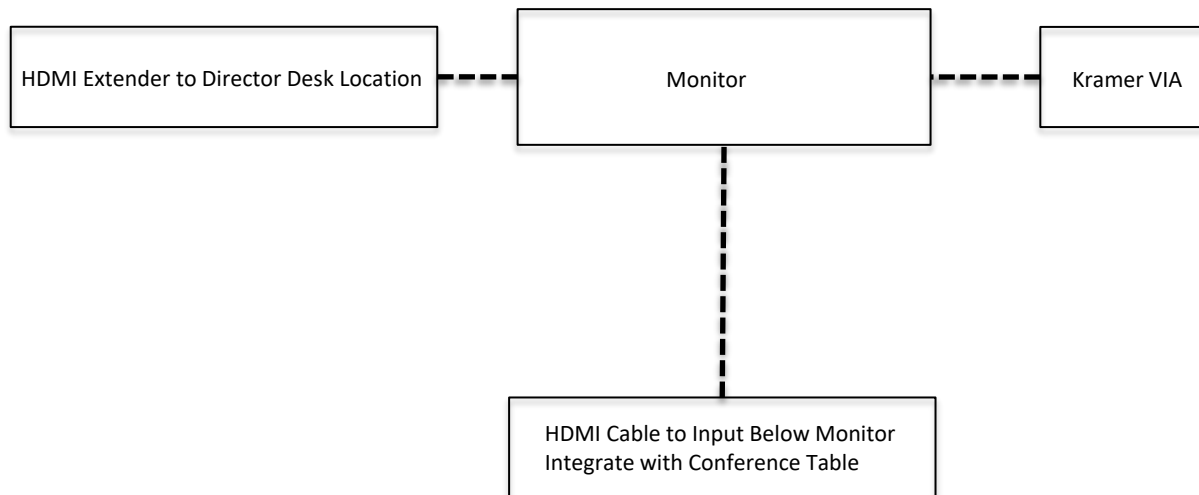


Legend

| | |
|-------------|---|
| Control |  |
| Audio |  |
| HDMI |  |
| Network PoE |  |

Appendix B – AV Connection Line Diagrams

Configuration D – Directors Office

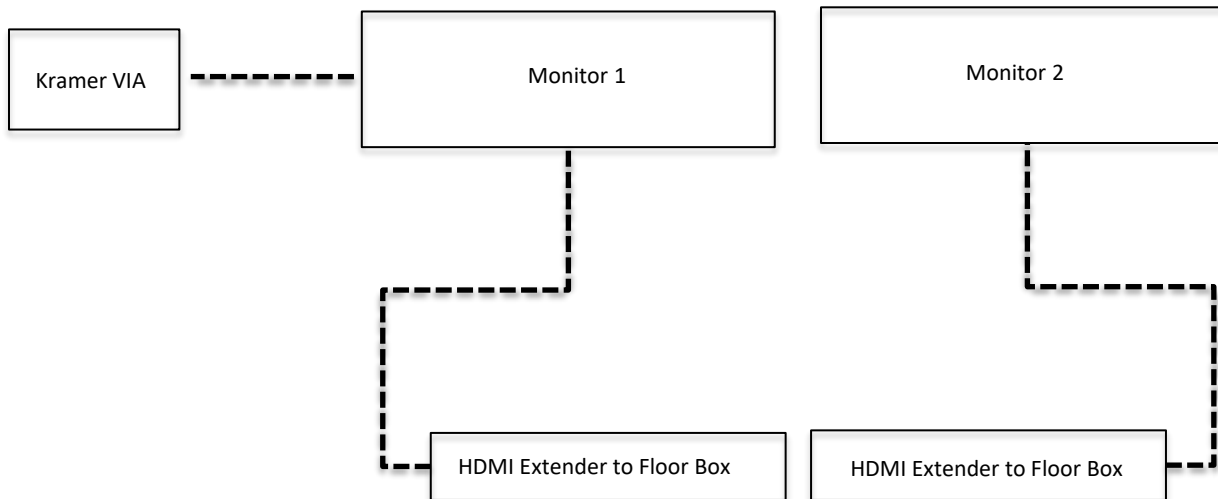


Legend

| | |
|-------------|---|
| Control |  |
| Audio |  |
| HDMI |  |
| Network PoE |  |

Appendix B – AV Connection Line Diagrams

Configuration E – Technology Open Office

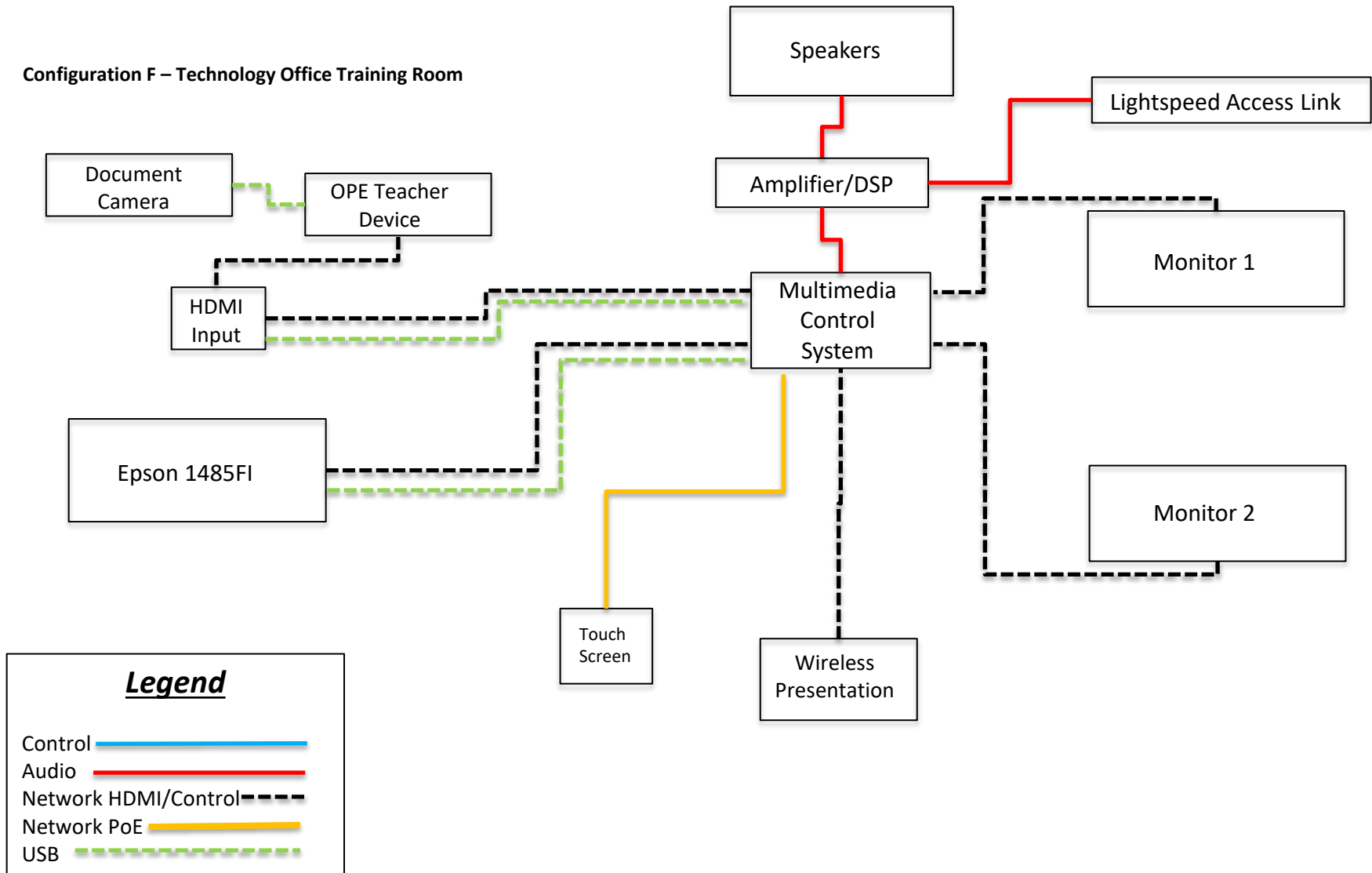


Legend

| | |
|-------------|---|
| Control |  |
| Audio |  |
| HDMI |  |
| Network PoE |  |

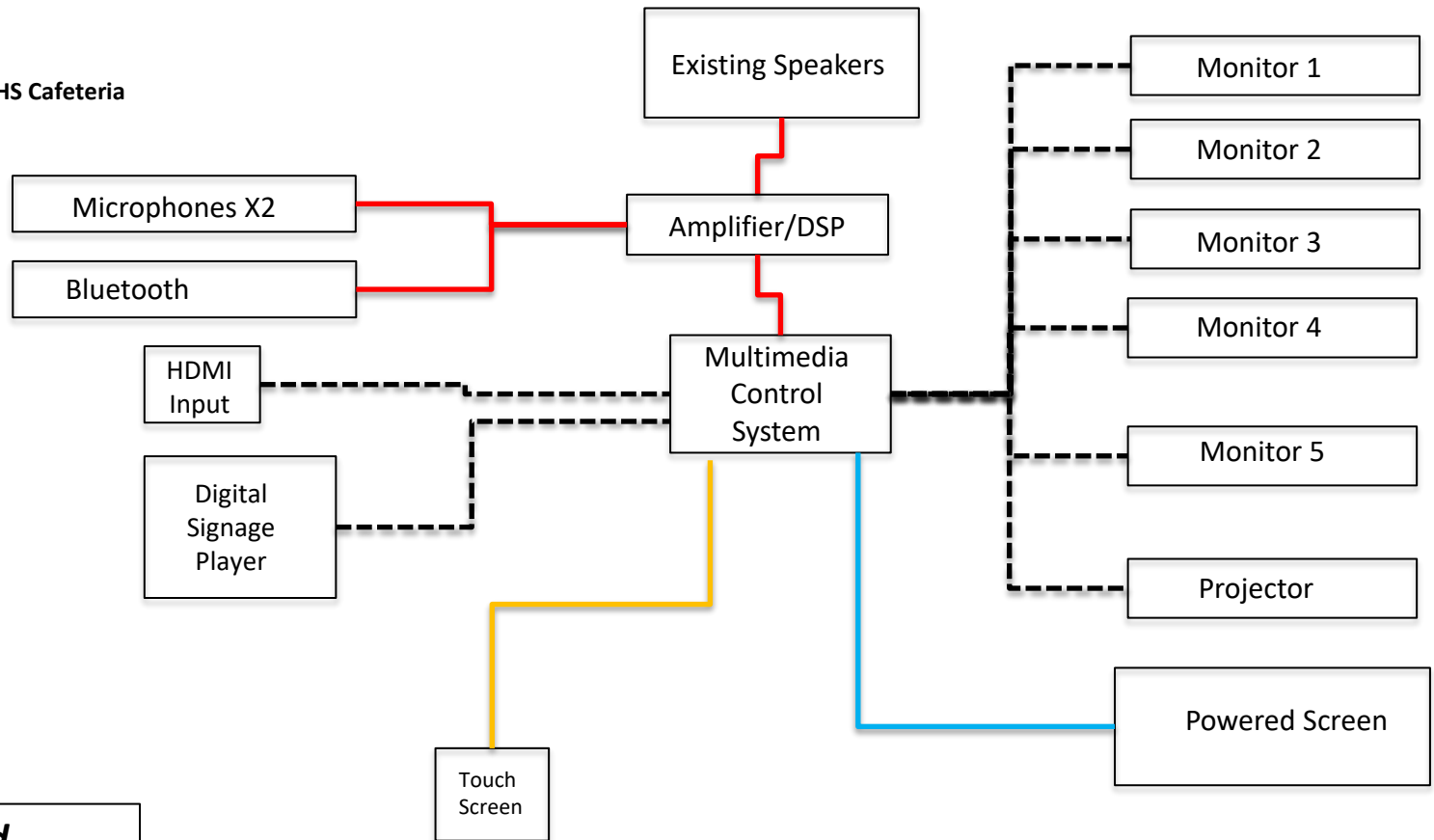
Appendix B – AV Connection Line Diagrams

Configuration F – Technology Office Training Room



Appendix B – AV Connection Line Diagrams

Configuration G – EKHS Cafeteria

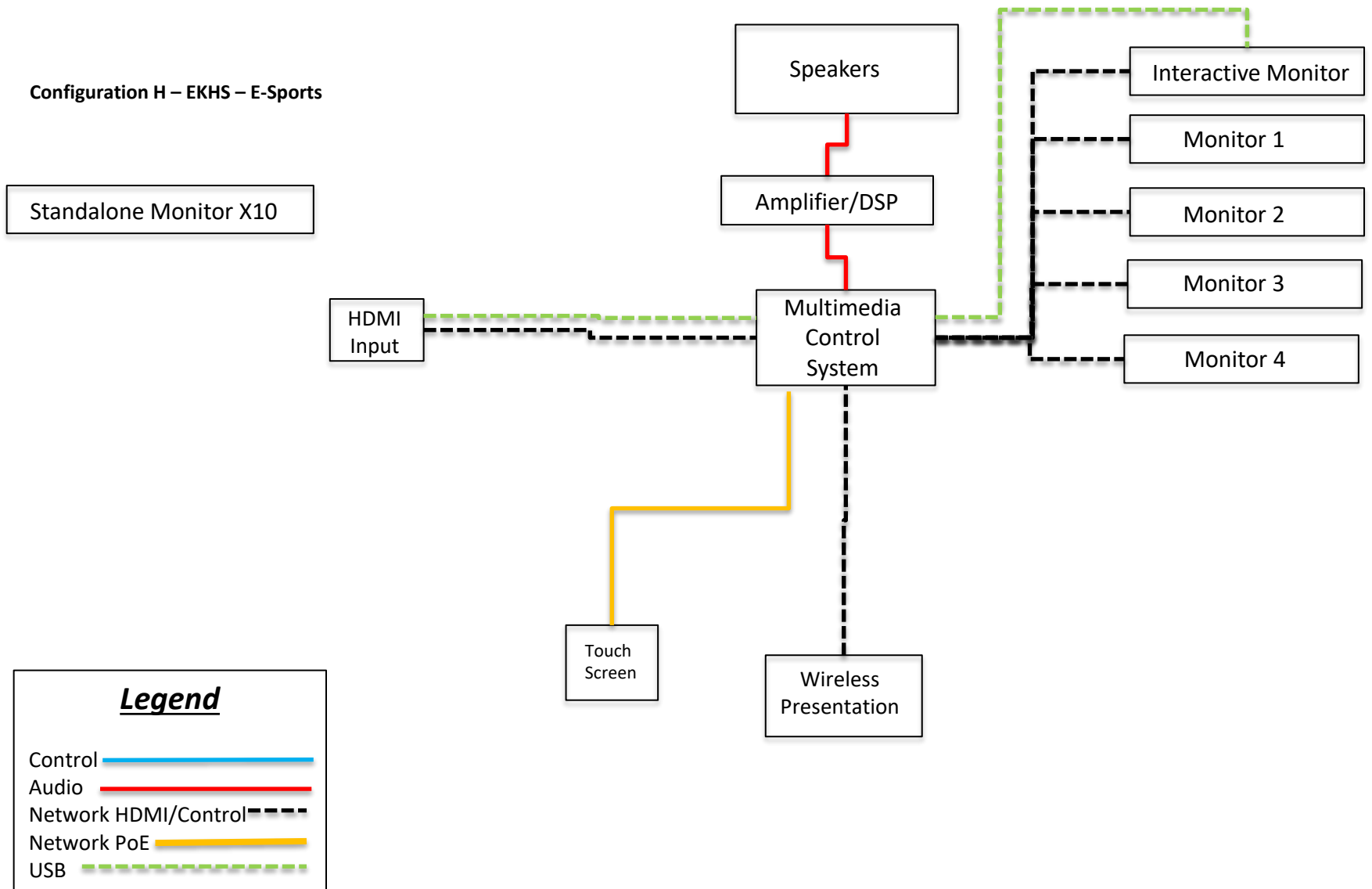


Legend

- Control —————
- Audio —————
- Network HDMI/Control - - - - -
- Network PoE —————
- USB - - - - -

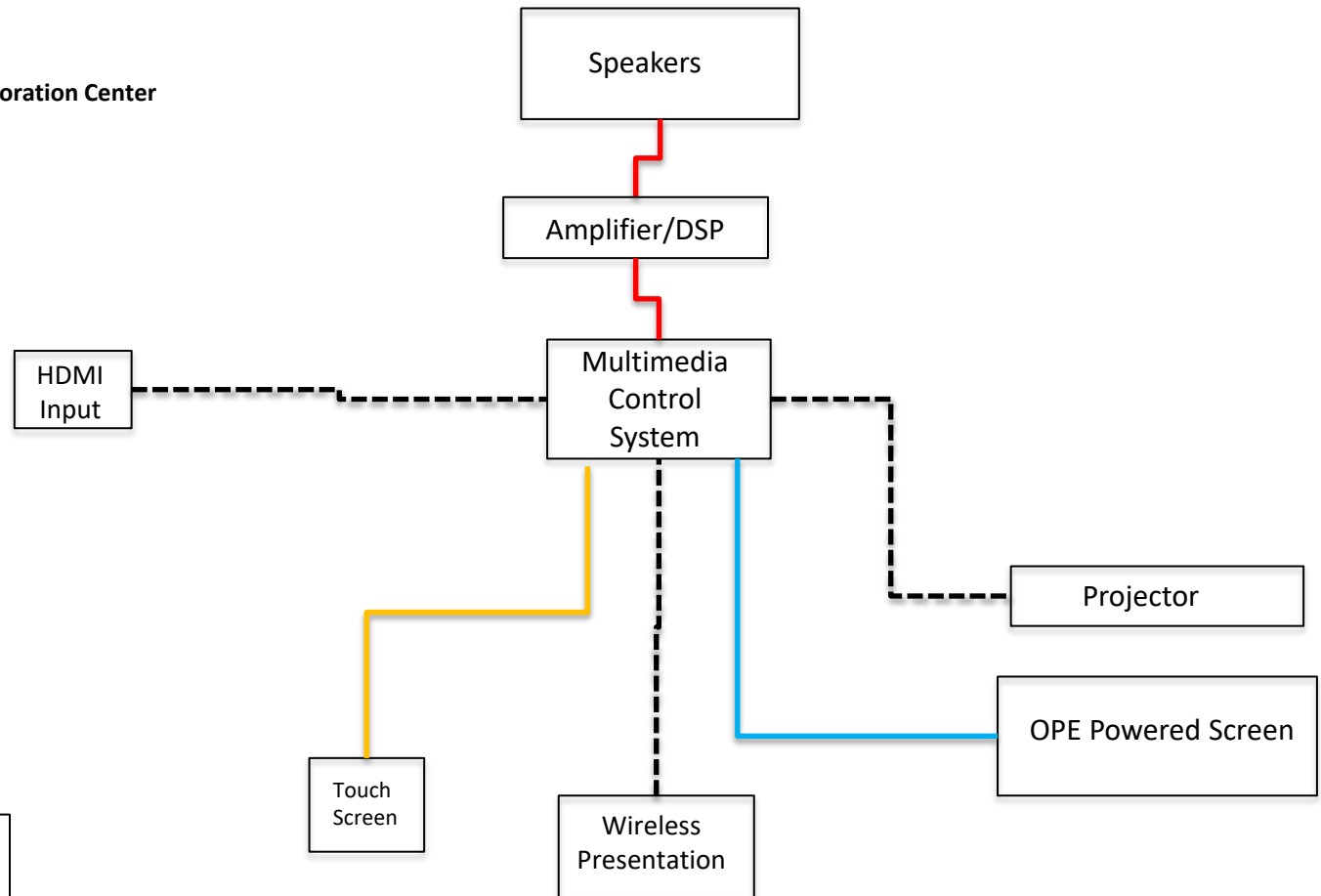
Appendix B – AV Connection Line Diagrams

Configuration H – EKHS – E-Sports



Appendix B – AV Connection Line Diagrams

Configuration I – Hamilton Collaboration Center

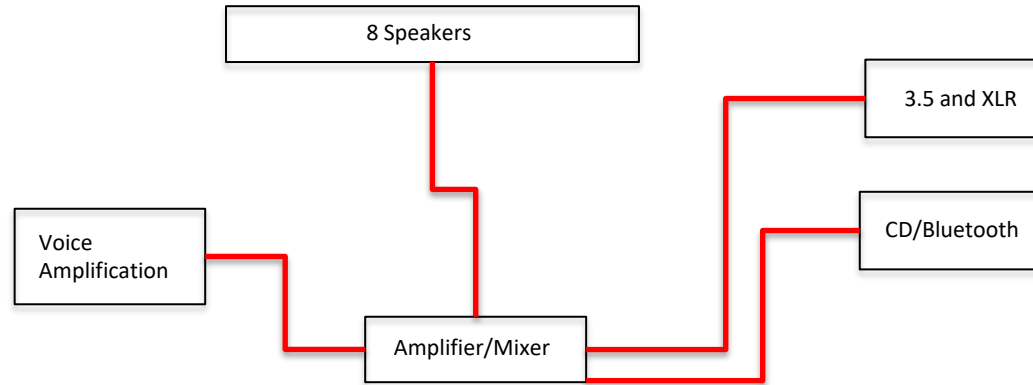


Legend





- Control —————
- Audio —————
- Network HDMI/Control - - - - -
- Network PoE —————
- USB - - - - -

Appendix B – AV Connection Line Diagrams

Configuration J – Hamilton Gymnasium

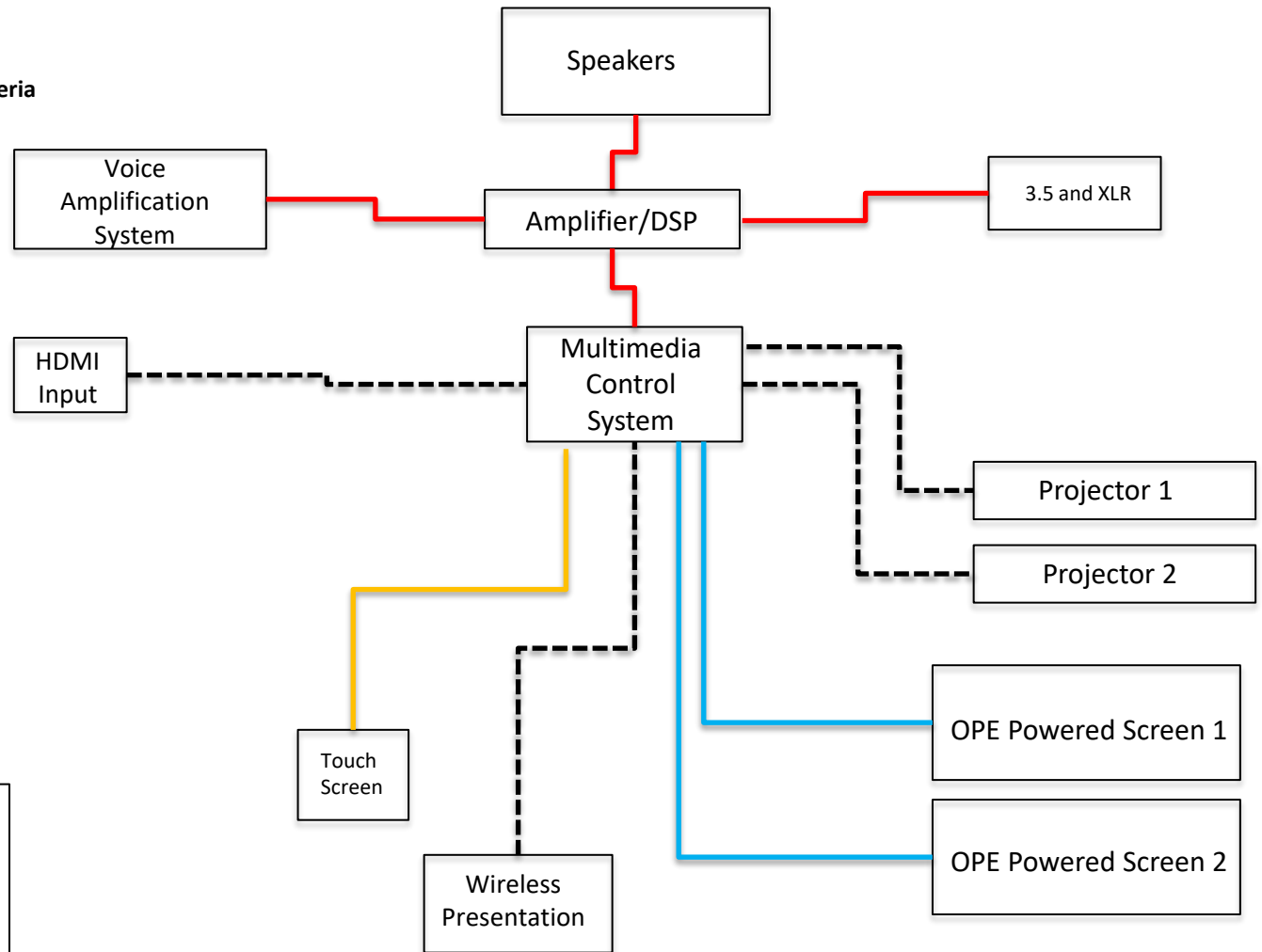


Legend

| | |
|--------------|---|
| Control |  |
| Audio |  |
| Network HDMI |  |
| Network PoE |  |

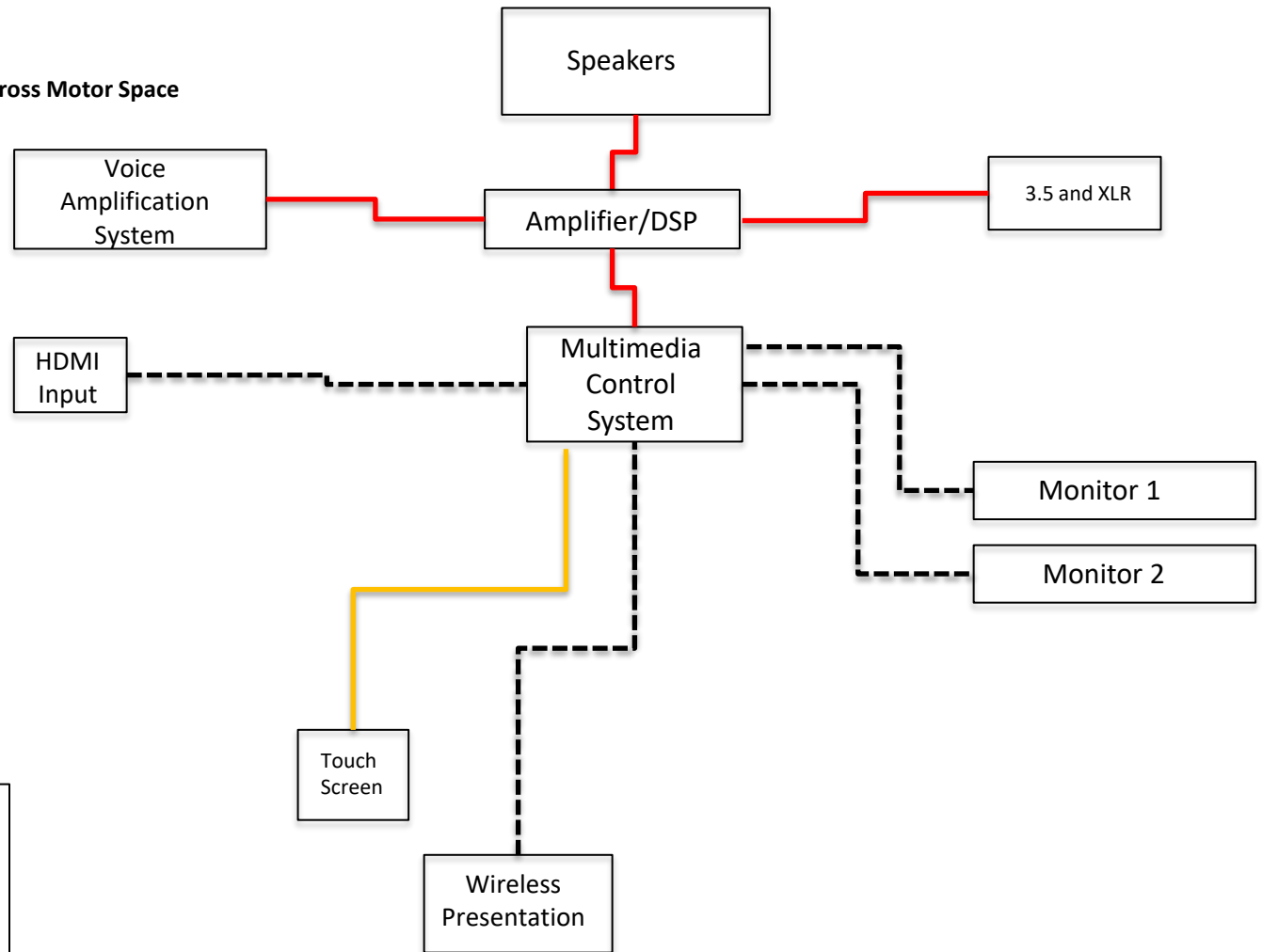
Appendix B – AV Connection Line Diagrams

Configuration K – Hamilton Cafeteria



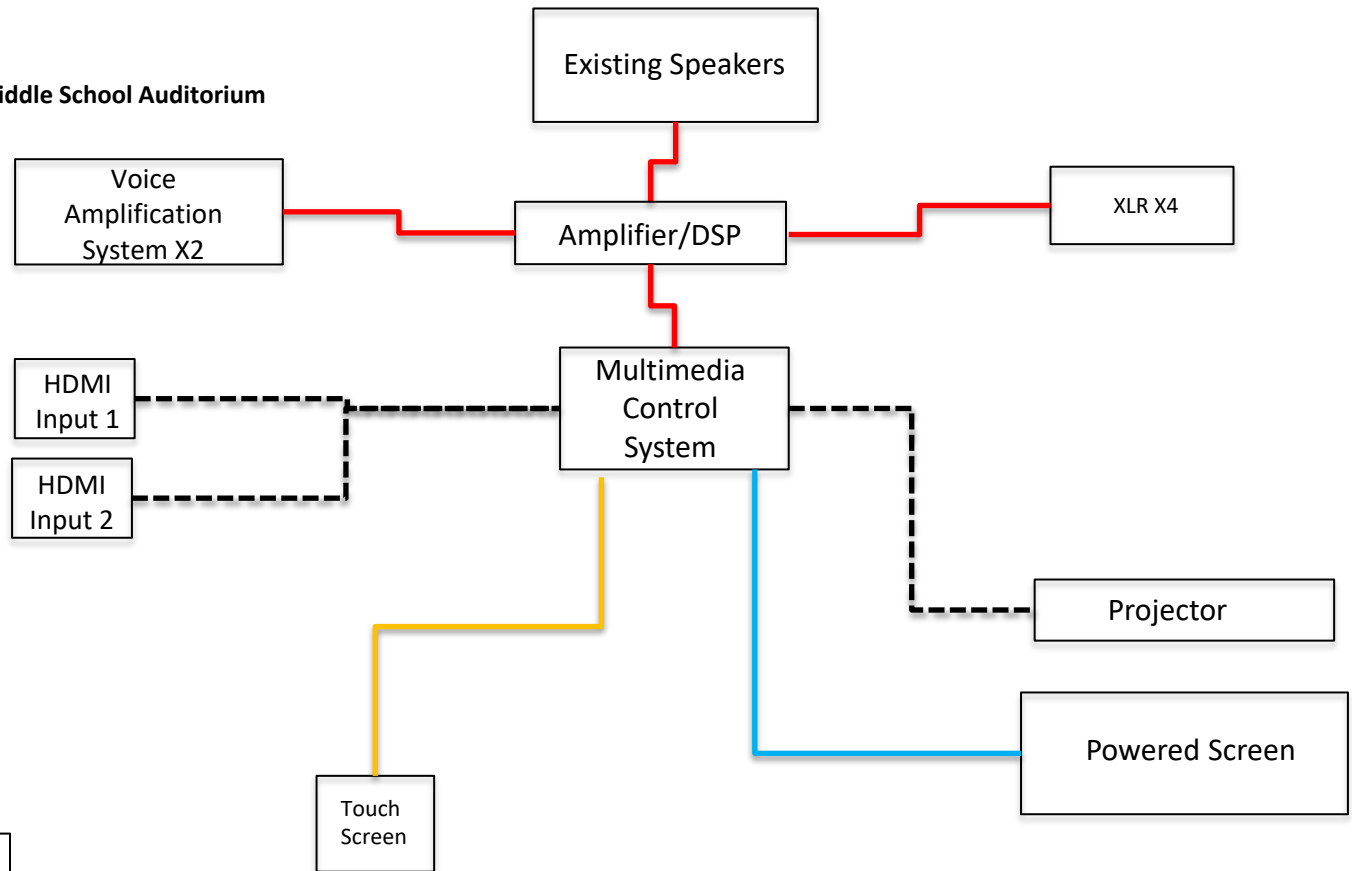
Appendix B – AV Connection Line Diagrams

Configuration L – Hamilton ECC Gross Motor Space



Appendix B – AV Connection Line Diagrams

Configuration M – Valleywood Middle School Auditorium



Appendix C - Bus Routes

