### Technology Request for Bid



Bid ID: 2751 Issue Date: December 9, 2022

### SECTION 00 01 10 TABLE OF CONTENTS

### **DIVISION 00 – BIDDING & CONTRACT REQUIREMENTS**

<u>Section</u>	<u>Description</u>
00 01 01	Cover Page
00 01 10	Table of Contents
00 01 15	List of Drawings
00 11 16	Invitation to Bid
00 40 00	Bid Forms
00 21 13	Instructions to Bidders
00 65 00	Contract Close-out

### **DIVISION 27 – TECHNOLOGY SYSTEMS**

Section	<u>Description</u>
27 10 00	Low Voltage Cabling
27 41 16	Multimedia Systems – Classrooms
27 41 17	Multimedia Systems – Large Venue

<b>APPENDICES</b>	
<u>Section</u>	<u>Description</u>
Appendix A	Low Voltage Cabling Diagrams
Appendix B	AV Equipment List
Appendix C	AV Connection Line Diagram
Appendix D	AV Building Diagrams

END OF SECTION

### SECTION 00 01 15 LIST OF DRAWINGS

<u>File/Name</u> <u>Description</u>

Not Used

END OF SECTION

### SECTION 00 11 16 INVITATION TO BID

#### PART 1 - GENERAL

# 1.01 WORK INCLUDED: LOW VOLTAGE CABLING & MULTIMEDIA UPGRADES

A. Kentwood Public Schools (Owner) is seeking bids for purchase and installation of associated equipment and installation related low voltage cabling and multimedia systems. Proposed systems shall be configured and installed to service Owner's classrooms, public spaces and common areas across multiple facilities, and as described herein.

B. Project: LOW VOLTAGE CABLING & MULTIMEDIA UPGRADES

C. Owner: Kentwood Public Schools

5820 Eastern SE Kentwood, MI 49508

D. Designer: Communications by Design, Inc.

E. Sites of Work:

 Bowen Elementary School 4453 Kalamazoo SE Kentwood, Michigan 49508

 Brookwood Elementary School 5465 Kalamazoo SE Kentwood, Michigan 49508

 Challenger Elementary School 2475 52<sup>nd</sup> Street SE Kentwood, Michigan 49508

 Crestwood Middle School 2674 44<sup>th</sup> Street Kentwood, Michigan 49512

 Crossroads Alternative High School and Community Education 28 60<sup>th</sup> SE Kentwood, Michigan 49508

 Discovery Elementary School 2461 60<sup>th</sup> Street Kentwood, Michigan 49508

- Early Childhood Center (New) 100 60<sup>th</sup> Street SE Kentwood, Michigan 49508
- 8. East Kentwood Freshman Campus 6170 Valley Lane Kentwood, Michigan 49508
- East Kentwood High School
   6230 Kalamazoo Ave
   Kentwood, Michigan 49508
- Endeavor Elementary School
   5757 East Paris SE
   Kentwood, Michigan 49508
- Explorer Elementary School
   2307 68<sup>th</sup> Street SE
   Kentwood, Michigan 49508
- 12. Glenwood Elementary School912 Silver Leaf SEKentwood, Michigan 49508
- Hamilton Early Childhood Center
   3303 Breton SE
   Kentwood, Michigan 49508
- 14. Meadowlawn Elementary School 4939 Burgis Street SE Kentwood, Michigan 49508
- Pinewood Middle School
   2100 60<sup>th</sup> Street
   Kentwood, Michigan 49508
- 16. Southwood Elementary School 630 66<sup>th</sup> SE Kentwood, Michigan 49508
- 17. Townline Elementary School 100 60<sup>th</sup> Street SE Kentwood, Michigan 49508
- Valleywood Middle School
   1110 50<sup>th</sup> 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: December 9, 2022
- 2. Pre-Bid Meeting: December 19, 2022 at 10:00am
- 3. Intent to Bids Due: December 20, 2022 by 5:00pm
- 4. Question and Clarification Deadline: December 21, 2022 by 5:00pm
- 5. Public Bids Due: January 11, 2023 at 1:00pm

#### 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 <u>highly encouraged</u> 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: December 19, 2022 at 10:00am
- C. Location: Kentwood Public Schools

Administration Building – Collaboration Rooms

5820 Eastern SE Kentwood, 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 fortyeight (48) hours prior to the appointed opening time provided they are in sealed packages and addressed as specified herein.

B. Bid Receipt Deadline: January 11, 2023 at 1:00pm

C. Bid Opening Location: Kentwood Public Schools

Administration Building – Collaboration Rooms

5820 Eastern SE Kentwood, 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 49456
  - 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 (FY23 E-rate) Select specified products and/or services are to be provided for FY23 (July 1, 2023-June 30, 2024) and qualify for universal service discounts under the FY23 universal service support mechanism, E-rate. No E-rate qualified invoices will be dated or paid before July 1, 2023. E-rate items are expected to be specific to Section 27 10 00 for qualified low voltage cabling.
- C. UNIVERSAL SERVICE DISCOUNTS The service provider contract may be conditional upon the Owner receiving universal service discounts under the FY20 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 FY23 (2023-2024) 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) for Section 27 10 00.
- 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, 2023.

#### 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 December 20, 2022. Only bidders returning a completed "Intent to Bid Form" will be notified of required addenda.

<u>Company Information</u> Name:	
Address Line1:	
Address Line2:	
City, State and Zip Code Primary Contact Information Name:	
Phone No.:	
Fax. No.:	
E-Mail Address:	
Section 27 41 16	u will be responding:  - Low Voltage Cabling  - Multimedia Systems - Classroom  - Multimedia Systems – Large Venue

rszilagy@cbdconsulting.com

Communications by Design, Inc.

Rebecca Szilagy

Submit unaltered and completed form to:

### 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 Avenue SE Kentwood, Michigan 49508
BID FROM:	
PROJECT:	LOW VOLTAGE CABLING AND MULTIMEDIA UPGRADES TECHNOLOGY BID #2751
INCLUDING	Addendum NoDated
ADDENDA:	Addendum NoDated
DUE:	January 11, 2023 at 1:00pm

BID FORMS 00 40 00 - 11

## BID FORM

BID TO:	Kentwood Pub Attention: Mr. 5820 Eastern A Kentwood, Mic	Todd Bell Avenue SE	
BID FROM:			_
PROJECT:	LOW VOLTA	GE CABLING & MULTIMEDIA UI	– PGRADES
work, and having ex referenced, includin labor, material, equi	kamined the site and a	emselves with all local conditions affecting all applicable Bidding Documents hereing all addenda issued thereto, hereby proposes and services required for proper computer for the sum of:	a, and herein ose to furnish all
Bid Category	Title		
		Dollars (\$	).
Said amount written above Bid Category	constituting the Base Bid Title		
		Dollars (\$	).
Said amount written above	constituting the Base Bid		
Bid Category	Title		
Said amount written above	constituting the Dogo Did	Dollars (\$	).
	constituting the Base Bid		
TAXES: Bid sum includes al	l applicable taxes.		
ALLOWANCES Base bid includes al		ee cost(s) as set forth herein.	
		rformance Bond and Labor and Material nt (100%) of the bid.	Payment Bond,
The following adde	GEMENT OF ADI nda have been receive se bid and alternate bi	ed, are hereby acknowledged, and their e	execution is
Addendum No	Dated	Addendum NoDated_	

#### **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.

Volutanry Alternate A		-
Voluntary Alternate B		-
Voluntary Alternate C		-
Voluntary Alternate D		
Voluntary Alternate E		
PRINCIPAL SUBCO		
As required herein, the fo	llowing Subcontractors are proposed to be used for this project:	
Legal Name:	Work Proposed	
Legal Name:	Work Proposed	
BID SECURITY:		
1 0	as required herein, is a bid security in the form of Certified idder's Bond in the amount of:	
	Dollars (\$	),
payable to the Owner, wh	ich 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 incorpor	rated and referenced herein and fails to furnish specified bonds within	

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.

ten (10) days after date of issuance of a Letter of Intent to the undersigned.

#### **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:**

(If Corporation, affix Seal)

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.

I	<b>-</b>
Date:	
Firm Name:	
Talanhana Numbar	
relephone Number.	
Primary Contact Email Address:	

Respectfully submitted.

#### 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 herby acknowledged and certified be exists between the owner or any employ project Owner's governing Board(s) or	yee of the Bidder and any member of the
A familial relationship exists between the and a member of the project Owner's go.  The person(s) and the relationship(s) are	overning Board(s) or Superintendent(s).
Bidder	Board or Superintendent
Bidder Authorized Representative:	
Bidder:	
Representative's Signature:	
Print or Type Name:	
Representative's Title:	
Subscribed and sworn this day of	, 2023.
In the County of State of	· · · · · · · · · · · · · · · · · · ·
Ву	Seal or Stamp:
Notary Public Signature	
My commission expires on:	

## **REFERENCES**

#### IRAN LINKED BUSINESS AFFIDAVIT

All Bids shall be accompanied by a sworn statement disclosing any Iran Linked Business relationship that exists within the owners, including its officers, directors and employees. authorized officer The undersigned, owner or of (the bidder), pursuant to Michigan Public Act No. 517 of 2012, the "Iran Linked Business" requirement provided in the Kentwood Public Schools Proposals hereby represents and warrants that the bidder, including its officers, directors and employees, is not an "Iran Linked Business" within the meaning of the applicable Public Act, and that in the event bidder is awarded a contract as a result of this RFB, the bidder will not become an "Iran Linked Business" at any time during the course of performing under the contract. The bidder further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than \$250,000.00 or 2 times the amount of the contract or proposed contract for which the false certification was made, whichever is greater, the cost of the District investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on future Requests for Bids for three (3) years from the date that it is determined that the person has submitted the false certification. There is not an "Iran Linked Business" that exists within the bidder and/or owner, officers, directors and employees. Bidder [Company Name] [Signature] [Title] This instrument was acknowledged before me, a Notary Public, in and for \_\_\_\_\_ County, \_\_\_\_\_ on this \_\_\_\_\_day of \_\_\_\_\_\_, 20 , [Notary Public Signature] My Commission expires:

Acting in the County of:

### **CONTRACT EXCEPTIONS**

Check one Box				
Bidder takes no exception to, and agrees to comply with all sections, terms, conditions and/or requirements of the Contract Documents.				
Bidder proposes the following exceptions to the Contract Documents:				
Paragraph Number		Explanation		

## 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 for each division/category of work being bid. Submit a completed separate form for each division/category of work clearly delineating on the form the division/category of work for that form. Form submitted must materially match below both in content and format. Electronic version of this form for each project section/division/category being bid is required with bid package as Microsoft Excel compatible spreadsheet on a USB drive. Failure to provide appropriate and complete SCHEDULE OF VALUES for each division/category of work, as determined by the Owner and/or Designer, may result in disqualification of Bid.)

Bidder:					Bid Division: 27 10 00			
ID	Qty	Part Number	Mfg and Description	Unit Cost	Unit Labor Cost	Total Proposed Cost		
			Cost per drop for adds (1-10)					
			Cost per drop for adds (10-50)					
			Cost per drop for adds (51+)					
			Annual rate increase per drop %					
			Material Net Cost Mark-up %					
			Labor Rate for add work (hourly)					
			Annual labor rate increase %					
			/ Hinda labor face mercase /0					
			PROJECT MANAGEMENT					
			TRAINING					
			BONDS AND INSURANCE					
			GRAND TOTAL					
			B GIVAND I CIAL			Ī		

(Must match base bid)

### **SCHEDULE OF VALUES/BID FORM**

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

Bidder: E					Bid Division: 27 41 16			
ID	Qty	Part Number	Mfg and Description	Unit Cost	Unit Labor Cost	Total Proposed Cost		
			Labor warranty on Owner					
			provided projectors					
			PROJECT MANAGEMENT					
			TRAINING					
			BONDS AND INSURANCE					
			GRAND TOTAL					

(Must match base bid)

### **SCHEDULE OF VALUES/BID FORM**

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

-	Bidder:		_ Bid Division: 2/41 1/			
ID	Qty	Part Number	Mfg and Description	Unit Cost	Unit Labor Cost	Total Proposed Cost
			PROJECT MANAGEMENT			
			TRAINING			
			BONDS AND INSURANCE			
			GRAND TOTAL			
			UNAND IUIAL			

(Must match base bid)

#### 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 <u>not</u> 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" in addition to being posted publicly.

#### 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 WITHDRAWL

- 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 form offer continuing for ninety (90) calendar days. Bids receive 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 subcontractors 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, readable by a standard Microsoft Windows 10 workstation. 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 USB drive 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 Affidavit
    - 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 10 00 LOW VOLTAGE CABLING

#### PART 1 - GENERAL

#### 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to structured cabling to support various types and styles of communications systems. Owner expects structured cable system shall be used to provide connectivity for items including, but not limited to, Access Points, Phones, Computers, Printers, Cameras and video displays.
- B. Structured cable system shall be compliant with EIA/TIA 568B.
- C. The Contractor shall configure, supply, install, connect, test, document and train Owner representatives and warrant a fully operational and compliant communications transport system, complete and with full functionality as specified herein including, but not limited to:
  - 1. Cables
  - 2. Jacks
  - 3. Cable support hardware
  - 4. Communication distribution racks
  - 5. Cross connect blocks and devices
- D. Contractor shall coordinate their installation with other contractors, Architect, Construction Manager, Architect/Engineer and the Owner as is appropriate.

#### 1.02 DRAWINGS

- A. Drawings show the location and general arrangement of data cabling in each building respectively. No work shall proceed without final approval of locations by Owner and/or Designer. Data cabling locations are identified for bidding purposes, final location of data cabling may be adjusted as necessary.
- B. Examine drawings of other trades and verify conditions of work sites. Arrange work accordingly.
- C. Deviations from final drawings, with the exception of minor changes in routing and other such incidental changes not affecting functionality or serviceability of systems, shall not be made without written approval of Architect/Engineer.

#### 1.03 WARRANTY

- A. Complete installation shall be free from defect and/or failure for a period of fifteen (15) years. 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 paperwork 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 paperwork, 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.
  - 1. Contractor shall provide response times for all malfunctioning equipment of two (2) business days or less.
  - 2. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.

### 1.04 SUBMITTALS

- A. Submittals shall consist of technical cut sheets and 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.
- B. Equipment or material installed for this project that does not have an approved submittal associated with it, shall be removed and replaced with acceptable equipment or material as defined by the Architect/Engineer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.
  - 1. The Owner and/or Architect/Engineer 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.

- C. Shop drawings and diagrams shall be submitted by Bidder for approval by Architect/Engineer with Bids.
  - 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 Architect/Engineer.
  - 2. No work constituting final installation shall be commenced until after approval of shop drawings by Architect/Engineer.

## 1.05 REFERENCE STANDARDS

- A. All work, products, and materials shall conform with the following standards as applicable for the intended use:
  - 1. ANSI/NFPA
  - 2. EIA/TIA Commercial and Administration Standards
  - 3. NECA
  - 4. BICSI
  - 5. UL
  - 6. MOSHA Safety Standards

### 1.06 CONTRACTOR

- A. The Contractor shall accept complete responsibility for the installation, certification and support of the system. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project. 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. Certification of such training shall promptly be provided if requested by Architect/Engineer.

D. The Contractor shall have a proven track record in structured cable 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 as provided herein.

### 1.07 CONTRACT TERM PRICING

- A. Owner intends to work exclusively with awarded Contractor during the contract period related to additions, changes and/or system modifications. All such work that is not applicable to the warranty specified herein shall be conducted at rates and pricing consistent with that provided for and documented herein.
  - 1. Such work shall be conducted in a professional and expeditious manner consistent with best practices and industry norms.
  - 2. Hourly rates, including travel charges, shall remain fixed for the term of the contract except as provided for herein.
- B. Contractors shall provide a consistent mark-up from net costs for all materials and products supplied to Owner as part of any contract work for the Owner's benefit.
  - 1. Consistent mark-up shall be provided for, but not limited to fiber, racks, accessories and other materials.
  - 2. Owner may, at its sole discretion, direct Designer to conduct an audit of Contractor costs, labor accounting, and mark-ups to verify compliance with contract provisions.
  - 3. In the event of any such audit, as directed by the Owner, Contractor shall fully comply with Designer requests for original cost documentation as the basis for pricing to the Owner as well as original time accounting documentation for the basis of labor pricing.
  - 4. Any such audit may only be ordered by the Owner if pricing being provided is not deemed consistent, or the Owner has reason to believe pricing from the contract is not being provided as required for in the costplus model of this contract.
  - 5. Any such audit will be provided for the Owner without any labor or material cost to the Owner and to the satisfaction of the Owner.

# PART 2 - PRODUCTS

## 2.01 MANUFACTURERS

- A. Manufacturer(s) of major components of the structured cable system shall be a known and leading entities in the communications field, and shall have been designing, manufacturing and installing similar systems for a period of no less than four (4) years.
- B. Acceptable Manufacturers (In alphabetical order):
  - 1. Belden
  - 2. Berk-Tek
  - 3. General Cable
  - 4. Hubbel
  - 5. Nordx-CDT
  - 6. Panduit
  - 7. Systimax
- C. System shall be built upon an open and standard platform, supporting industry standards. Systems that are deemed Proprietary in nature shall not be considered.

### 2.02 COPPER CABLE

- A. Station Cable shall meet or exceed:
  - 1. Four (4) pair Category 6 Unshielded Twisted Pair (UTP) cable.
  - 2. Rated and certified for installation in plenum air return spaces as may be required.
  - 3. Twenty-three gauge wires (23AWG)
  - 4. Compliant as per EIA/TIA-36 specifications
  - 5. Certified under UL's LAN Cable Certification Program
- B. All cables shall be terminated for T568B compliant connection.
- C. Coordinate cable color(s) with Owner requirements prior to installation.

# 2.03 CROSS CONNECT EQUIPMENT

- A. Cross Connect Equipment shall meet or exceed:
  - 1. Patch Panel for UTP Category 6 Cable Termination.

- a. Rack mounted category 6 compliant printed circuit board technology, patch panel with T568B compliant terminations on front of panel and 110 type terminations on rear of panel.
- b. Rack mounted patch panels shall be no larger than Forty-eight (48) ports each.
- 2. Furnish and install smear resistant, mechanically imprinted polyester or similar material labels to identify each port of all patch panels (fiber optic and copper) in compliance with EIA/TIA 606 standards or Owner required scheme. Labels shall be permanently affixed to patch panels.

### 2.04 WIRING DEVICES

- A. All station cable shall terminate on modular jacks that meet or exceed:
  - 1. Category 6 compliant
  - 2. 4 position T568B compliant modular female jack.
  - 3. Snap-in, high impact housing
  - 4. Field verify and coordinate insert color to match Owner requirements.
  - 5. Field verify and coordinate plates and/or outlet frame colors and materials to coordinate with electrical devices and Owner requirements.
  - 6. Where station cable is to terminate above finished ceiling or behind a finished wall for cameras, speakers, or other special station devices, modular jack may be surface mounted in appropriate high strength, impact resistant plastic enclosure.
  - 7. Furnish and install matching coordinating blank cover plates for all unused communications outlets in common raceway.
  - 8. Mount flush plates so all four edges are in continuous contact with finished surfaces.
  - 9. Furnish and install smear resistant, mechanically imprinted polyester or similar material labels to identify each connector at all station cables in compliance with EIA/TIA 606 standards or Owner required scheme. Labels shall be permanently affixed to patch panels.

### 2.05 OWNER STANDARDS

A. Contractor shall provide connectors in a color to match the Owner's existing standards.

- B. Contractor shall provide cover plates and any associated keystone inserts as may be required matching Owner's existing standards.
  - 1. Stainless Steel cover plates.
  - 2. Grey keystone inserts.
- C. Contractor shall provide connector identification and labels on all terminations matching Owner's existing standard. Field verify all label conditions per site prior to final installation.

### 2.06 PROJECT CABLE CONFIGURATIONS

#### A. Data Outlet

- 1. Contractor shall supply data locations in quantities and locations identified on provided Appendix A Low Voltage Cabling Diagrams.
  - a. Cabling quantity and locations is identified with the Xd identifier, the "X" showing the quantity of data activations.
- 2. Contractor shall provide data outlets including, but not limited to:
  - a. UTP station cable(s) terminated on compliant patch panel in nearest IDF and wire devices in a single box location.
  - b. In locations that terminate on wall locations, Contractor shall supply stainless steel faceplate compliant with Owner standards. Wire device(s) shall be installed in standard keystone insert with six (6) positions. All unused positions shall be blanked. Cabling locations in wall or floor box locations are identified in blue.
  - c. In locations that terminate above ceilings, Contractor shall supply surface mount device box. Box shall be bright in color and/or contain a permanently attached brightly colored reflective identification label to facilitate visual location of connection point behind finished surfaces. Cabling in above ceiling locations are identified in red.
  - d. Faceplate compliant with Owner standards shall be provided.
- 3. Outlet shall be provided in quantities indicated on Low Voltage Cabling Schedule noting the number of station cables to be terminated.

### 2.07 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 \$20,000.00 for contract services related to supply and installation of Owner directed infrastructure upgrades.

## **PART 3 - EXECUTION**

### 3.01 PREPARATION

- A. Contractor shall conduct detailed walk-through examination with Architect/Engineer 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 Architect/Engineer prior to commencement of any final installation activities.

## 3.02 INSTALLATION

- A. Contractor shall be familiar with the environment where work shall be done as specified herein.
- B. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed and disposed of in an approved container for the site. 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. All manufacturer recommended installation practices and standards shall be complied with.
- 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. Cables installed in a professional manner to prevent tangling and congestion and to facilitate installation or removal of cables in the future.

- 2. Cables installed without kinks (any bend with a radius less than manufacturer defined minimum).
- 3. All cable free of abrading or penetrating of cable jacketing.
- 4. In suspended ceiling where cable trays or conduit are not available, Contractor shall support wiring with "D rings", beam clamps or other approved cable support devices at appropriate distances (6 ft. minimum).
- 5. All information outlets shall be labeled according to the Owner's cable identification scheme. Labels shall be completed using pre-printed labels. Handwritten labels are <u>not</u> acceptable.
- 6. The Contractor shall label all cables, jacks, patch panel positions, faceplates and cross connects.
- 7. In-line cable splicing shall <u>not</u> be permitted.
- 8. Contractor shall provide 10' minimum service loop above accessible ceiling for each terminated cable in pole access for modular furniture to accommodate future changes.
- 9. Length of each individual run of horizontal cable from the MDF/IDF to the information outlet shall not exceed 90 meters (295 ft.).
- 10. IDF(s) and MDF locations have been identified in the appendices herein. Contractor shall calculate distances to ensure the adherence to the EIA/TIA 568 distance limitations. Contractor shall notify Architect/Engineer of cable length exceptions prior to installation in writing and request direction.
- 11. All copper data cabling shall terminate on Category 6 compliant connectors. Approximately 10 ft. of Category 6 and/or fiber cabling shall be coiled and stored at each cable distribution center in order to accommodate future change.
- 12. Wiring not installed in conduit shall not be routed within 18 inches of light fixture ballasts or within 36 inches of motors or transformers.
- 13. Coordinate cable colors with Owner requirements prior to installation.
- 14. Contractor shall include any sleeves where wall penetrations are needed. Sleeves shall me a minimum of 2" diameter and sized for cable being installed with a maximum fill rate of 25%. All installed sleeves shall be fully fire stopped with compliant fire stop material following cable installation.

- 15. Provide backboards, properly treated for fire retardation on single wall of MDF as required by site conditions.
- 16. Assemble, install, configure and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
- 17. Work shall be performed to meet local codes and industry standards, including, but not limited to:
  - a. Grounding and Bonding.

## E. Sites of Work:

- Bowen Elementary School 4453 Kalamazoo SE Kentwood, Michigan 49508
- Brookwood Elementary School 5465 Kalamazoo SE Kentwood, Michigan 49508
- Challenger Elementary School 2475 52<sup>nd</sup> Street SE Kentwood, Michigan 49508
- Crestwood Middle School 2674 44<sup>th</sup> Street Kentwood, Michigan 49512
- Crossroads Alternative High School and Community Education 28 60<sup>th</sup> SE Kentwood, Michigan 49508
- Discovery Elementary School 2461 60<sup>th</sup> Street Kentwood, Michigan 49508
- Early Childhood Center (New) 100 60<sup>th</sup> Street SE Kentwood, Michigan 49508
- 8. East Kentwood Freshman Campus 6170 Valley Lane Kentwood, Michigan 49508

- 9. East Kentwood High School 6230 Kalamazoo Ave Kentwood, Michigan 49508
- Endeavor Elementary School
   5757 East Paris SE
   Kentwood, Michigan 49508
- Explorer Elementary School 2307 68<sup>th</sup> Street SE Kentwood, Michigan 49508
- 12. Glenwood Elementary School912 Silver Leaf SEKentwood, Michigan 49508
- 13. Hamilton Early Childhood Center3303 Breton SEKentwood, Michigan 49508
- 14. Meadowlawn Elementary School 4939 Burgis Street SE Kentwood, Michigan 49508
- Pinewood Middle School
   2100 60<sup>th</sup> Street
   Kentwood, Michigan 49508
- Southwood Elementary
   630 66<sup>th</sup> SE
   Kentwood, Michigan 49508
- 17. Townline Elementary School 100 60<sup>th</sup> Street SE Kentwood, Michigan 49508
- 18. Valleywood Middle School 1110 50<sup>th</sup> Street 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.

### 3.03 DOCUMENTATION

- A. Contractor shall be responsible for providing thorough, timely documentation. Documentation shall include, but not be limited to both printed and electronic copies of:
  - 1. As-built drawings of each building.
  - 2. Copper station cable test results.
- B. In addition to the as-built drawings for the new data cabling in each building, Contractor shall document existing data drops in accessible ceilings in the vicinity of the project work. Contractor is not responsible for the testing or labeling of existing cabling. Contractors will only responsible for identifying existing cabling in locations where work is taking place. Contractor will be responsible for documenting the following information:
  - 1. Location and quantity of existing drops
  - 2. Data drop information on label (if exists)

### 3.04 TESTING

- A. End to end testing of UTP copper Category 6 cables shall be conducted at 350 Mhz to meet or exceed reference standards. 100% of all pairs shall be tested. Documentation of test results shall be provided including, but not limited to the following parameters:
  - 1. Attenuation.
  - 2. Near End Cross Talk (NEXT).
  - 3. Signal to noise ratio.
  - 4. continuity
  - 5. Pair integrity
  - 6. EMI interference.
  - 7. Any cable that does not meet EIA/TIA 568 specifications shall be repaired or replaced at the Contractor's expense.

8. Cable length.

### 3.05 TRAINING

A. Not Used.

# 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 Architect/Engineer, Architect and/or Construction Manager and as required to meet schedule.
- A. Contractor shall attend all construction progress meetings as may be required by Construction Manager and Owner. Such meetings shall aid in coordination and scheduling for field work and be held at the convenience of the Construction Manager.

### B. Schedule

- 1. Final Vendor Presentations: Week of January 16, 2023
- 2. Contractor Chosen: Week of February 13, 2023
- 3. Work Commences: April 1, 2023
- 4. Substantial Completion: February 28, 2026
- 5. Project Close-out: February 28, 2026
- 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. All work shall be coordinated with Owner's construction manager on site.
- E. 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.

**END OF SECTION** 

# SECTION 27 41 16 MULTIMEDIA SYSTEMS - CLASSROOMS

## PART 1 - GENERAL

### 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to new classroom multimedia infrastructure and instructional 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. Contractor shall work collaboratively with Owner and Designer. Work shall include but not be limited to installation of supplied equipment, removal of existing equipment and full operational capacity of system as specified herein.
- E. 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.
- F. 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.
- G. 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 All wiring not installed in conduit shall be plenum type cable and shall be so identified with continuous marking.
- 2.05 All connectors and accessories not installed in conduit and installed above finished ceiling shall be plenum rated.

## 2.06 MULTIMEDIA INFRASTRUCTURE CABLE

- A. All cable shall be factory manufactured with terminations and connector assemblies fully attached and integral to the cable to industry published quality standards and meet performance requirements specified herein.
- B. Infrastructure cable to connect projector to a teacher station wall plate shall be provided.
- C. Acceptable Cable:
  - 1. HD Base-T Digital Video Cable shall be of commercial first-class quality manufacture and meet or exceed the following requirements:
    - a. Cable shall meet or exceed Shielded Category 6a certification.
    - b. Cable shall be constructed of solid 23 AWG conductors.

- D. Cable shall be extended from Contractor provided faceplate to projector.
- E. All cables originating from wall plate shall terminate in a service loop eight (8) feet in length at projector location or above casework location. Service loop shall be carefully connected to j-hook or similar hanger to keep off of ceiling grid.
- F. Teacher workstation wall plate provided shall be constructed of commercial grade stainless steel.
  - 1. Wall plate shall contain connection points for all specified cables
  - 2. Two (2) data outlet locations.
  - 3. Unpopulated data connections shall all have blank covers installed.
  - 4. Any existing terminated category cabling should be securely locked into new plate and any existing labeling shall be transferred.
- G. Contractor shall supply a stainless-steel brush plate to transition HD-Base-T digital video cable from above finished ceiling location to projector. Cables shall be neatly wrapped with white split braid sleeving for a finished installation.
- H. Cable shall terminate in the following connector gender:
  - 1. HD-Base-T Digital Video (Category 6a STP)
    - a. Terminate into an active HD-Base-T input on projector.
    - b. Terminate in a 568-compliant type female jack located on the face plate.
- I. HD-Base-T Digital Video Cable shall be constructed using 23 AWG solid conductors and of a high-quality construction method for minimal loss characteristics, to maintain quality high-resolution video image and include support for 1080p video resolution for the installed distance plus a fifteen (15) foot extension for device attachment.

## 2.07 MULTIMEDIA CONNECTION CABLE

- A. Fully assembled infrastructure cable bundles for each classroom indicated to receive a projector shall be provided for final connection to components installed at Owner provided teacher station.
- B. Acceptable Manufacturer

- 1. Cable shall be of commercial first-class quality manufacture.
- C. All Cable shall be fifteen (15) feet in length and terminate in the following connector genders:
  - a. Male Shielded Category 6a cable to Contractor provided projector transmitter/control pad.
  - 2. Coordinate power cable relationship to connection bundle with Owner and Designer.

### 2.08 SURGE PROTECTOR

- A. All classrooms receiving new 1485Fi projection systems shall receive new surge protection power strips.
- B. Contractor shall supply surge suppressed power strip installed at teacher workstation location for connection of teacher devices. Power strip shall contain six (6) grounded AC power connectors.
  - 1. Tripp-Lite TLP615 or equal
  - 2. Power cord should be sufficient length to support the OPE desk attached with the 15' cable bundle and be elegantly mounted at teacher desk location.
  - 3. Coordinate power cable relationship to connection bundle for neat and fully functional installation.

## 2.09 WIRELESS PRESENTATION SYSTEM

- A. Wireless Presentation Systems shall be provided and installed in locations as indicated in Appendix B.
- B. Acceptable Manufacturers (in alphabetical order):
  - 1. KRAMER
    - a. VIA GO2
  - 2. HDMI output with support for up to 4K30Hz video streaming
  - 3. Gigabit LAN and dual-band 802.11ac Wireless connectivity
  - 4. 4GB Memory
  - 5. 32GB Storage

- 6. 3.5mm Audio Output
- 7. All other features currently a part of the manufacturer's latest commercial release.
- C. Contractor shall provide all necessary licensing for cloud management of all Kramer VIA GO2 wireless presentation system. Contractor shall fully configure all Kramer VIA GO2 wireless presentation devices to be connected to Owner provide network and configured in provided cloud management system.

## D. Cables and Accessories

- 1. All necessary mounting brackets and connectors to securely mount at projector location.
- 2. Work includes extending Ethernet Category 6a compliant patch cables from installed equipment, as required, to Owner identified connection ports at all locations.
  - a. Patch cables shall not exceed fifteen (15) feet in length.
- 3. Material and labor to cross connect wireless presentation systems in communication closets to PoE switches shall be provided by Contractor using provided Category 6a patch cables.
  - a. Cable lengths shall be appropriate for connections made, and not include excessive cable.
  - b. Coordinate all work with Owner, Designer and other contractors prior to installation.
- 4. 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.

# 2.10 ULTRA SHORT THROW INTERACTIVE PROJECTORS (INSTALLATION ONLY)

- A. Contractor shall install and fully configure Owner provided Epson 1485fi projectors for a fully functional system.
  - 1. Material and labor to cross connect Owner provided projectors in communication closets to Owner provided network switches shall be provided by Contractor using provided Category 6 patch cables.

- a. Cable lengths shall be appropriate for connections made, and not include excessive cable.
- b. Coordinate all work with Owner, Designer and other contractors prior to installation.
- c. Contractor shall fully configure and connect Owner supplied Epson 1485fi projectors to Epson management software.
- B. Contractor shall fully configure and calibrate projectors for use with Owner provided markerboards using manufacturer recommended installation procedures.

## 2.11 HDMI TRANSMISSION EQUIPMENT (INSTALLATION ONLY)

- A. Contractor shall install unit provided with projector.
- B. Contractor shall supply and install shielded Category 6a cable for connection to projector.
- C. Contractor shall neatly mount transmitter/control pad at teacher desk location.
- D. Contractor shall supply all other necessary cables, accessories and adaptors for a fully functional and compliant system.

### 2.12 VOICE AMPLIFICATION

- A. Voice Amplification Systems shall be provided and installed in locations as indicated in Appendix B.
- B. Acceptable Manufacturers
  - 1. LIGHTSPEED
    - a. 975 ACCESS
- C. Major components of Voice Amplification System shall be installed at projector location.
- D. 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
- E. Contractor shall provide one (1) shielded 3.5mm audio cable for connectivity from audio output of projector to voice amplification system installed in projector location to support a fully functional and compliant system.
- F. 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.
- G. All other features currently a part of the manufacturer's latest commercial release.
- H. Voice Amplification Systems shall be neatly and securely mounted at projector location. As indicated in the provided line diagram, Contractor shall supply and install audio cabling from projector output to connect to provided Voice Amplification Systems.
- I. Contractor shall supply sixteen (16) Flexmikes for Owner shelf spares.
- J. Contractor shall rework and reconfigure existing speaker cabling to connect to new voice lift systems. Contractor shall carefully extend existing speaker cabling to voice lift system at projector location for a fully functional system.

## 2.13 DOCUMENT CAMERAS

- A. Document cameras shall be provided and installed in locations as indicated in Appendix B.
  - 1. Acceptable Manufacturer(s)
    - a. IPEVO
      - 1. V4K PRO
  - 2. Document cameras shall meet or exceed the following the following requirements:
    - a. 8 MP Image Sensor
    - b. Integral Microphone
    - c. Integral LED Light
    - d. USB connectivity and power

## 2.14 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 Owner directed infrastructure upgrades.

## **PART 3 - EXECUTION**

### 3.02 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.
- B. 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:
  - 1. Shop drawings, data sheets and system diagrams including specific cable connectors and types proposed to be installed.
  - 2. Asset tag format, composition, attachment method and location on each serialized component being provided.
  - 3. Firmware configuration template to be used for each component provided.
  - 4. Written installation, coordination and test procedure to be followed by installing technicians and engineers.
  - 5. Final documentation template.

## 3.03 DEMOLITION

- A. Remove ALL abandoned AV cabling including VGA, Cable TV (in classroom only), unused speaker cables, shelfs, brackets and blank any open locations in all rooms receiving new AV equipment.
- B. Contractor shall remove any existing equipment and transport to Owner directed site for disposition. Any equipment not retained by Owner shall be properly disposed of by Contractor.

### 3.04 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. All cable connecting components mounted in/on Technology Cart, shall have adequate cable slack to provide for full system inspection and or service without the removal (intentional or inadvertent) of connecting cables, including items that will be placed on the keyboard tray of equipment carts.
- 12. Label all cable connections for intuitive user access and as directed by Owner and Designer.
- 13. 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.

## 14. ULTRA SHORT THROW INTERACTIVE PROJECTORS

- a. Install, configure and test approved firmware configuration template including, but not limited to:
  - 1. Power on Image.
  - 2. Lamp setting.
  - 3. Firmware based Device ID (Including parameters such as: TCP/IP settings, Host Name, etc.).
  - 4. Default port selection.

- b. Contractor shall install and fully configure Epson projector management software and enable projectors for management.
- c. Contractor shall install manufacturer recommended firmware during initial installation.
- d. Neatly configure all cables as directed by Owner.
- e. Attach projector to mount using manufacturer best practices.
- f. Connect AC power using cord provided to projector.
- g. Align projector with whiteboard provided by Others. Contractor shall install projector in relationship to the whiteboard to maximize the projected image and provide reliable interactive functionality.
- h. Set keystone adjustment(s) as required.
- i. Zoom and focus projector as required.
- j. Secure all adjustment points.

## 15. WIRELESS PRESENTATION SYSTEM

- a. Provide and connect all audio and video input and output device cables.
- b. Contractor shall install manufacturer recommended firmware during initial installation.
- c. Secure mounting location at projector location with provided mount to eliminate involuntary equipment movement.
- d. Neatly route all cabling and secure slack.
- e. Adjust balance levels for standard configuration.
- f. Neatly route all cabling and secure slack.
- g. Install, configure and test approved firmware configuration template including, but not limited to:
  - 1. Power on Image.
  - 2. Firmware based Device ID (Including parameters such as: TCP/IP settings, Host Name, etc.).

- h. Collaborate and coordinate with Owner or Others to fully configure wireless presentation system to function on Owner provided network equipment.
- i. Contractor shall supply, install and fully configure Kramer VIA cloud management software for a fully functional system.

## 16. VOICE AMPLIFICATION

- a. Provide and connect all audio input and output device cables.
- b. Secure mounting location at projector location with mounting screws or Velcro pads to eliminate involuntary equipment movement.
- c. Neatly route all cabling and secure slack.
- d. Adjust balance levels for standard configuration.
- e. Neatly route all cabling and secure slack.
- f. Provide and install connection from audio output on Contractor supplied projection units.

# 17. DOCUMENT CAMERAS

- a. Connect USB cable to Owner provided teacher computer or docking station.
- b. Fully cooperate with Owner for classroom workstation software installation.
- 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. Sites of Work:

- Challenger Elementary School 2475 52<sup>nd</sup> Street SE Kentwood, Michigan 49508
- Discovery Elementary School 2461 60<sup>th</sup> Street Kentwood, Michigan 49508
- Endeavor Elementary School 5757 East Paris SE Kentwood, Michigan 49508
- Glenwood Elementary School
   912 Silver Leaf SE
   Kentwood, Michigan 49508
- Meadowlawn Elementary School 4939 Burgis Street SE Kentwood, Michigan 49508
- Southwood Elementary School 630 66<sup>th</sup> SE Kentwood, Michigan 49508

## 3.05 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.

### 3.06 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 asbuilt 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.
- 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.

## 3.07 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 system administrator(s). Owner shall designate up to four (4) administrators to be

trained. Training shall be a minimum of two (2), 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. System back-up and restore functions and procedures for all system parameters and configurations.
- 3. Device additions, moves and changes as well as reconfiguration.
- 4. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to and system configuration changes.

# 3.08 SCHEDULE, MEETINGS AND PLANS

### A. Schedule

- 1. Final Vendor Presentations: Week of January 16, 2023
- 2. Contractor Chosen: Week of February 13, 2023
- 3. Work Commences: June 1, 2023
- 4. Substantial Completion: December 15, 2023
- 5. Project Close-out: January 1, 2024
- 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.

### **END OF SECTION**

# SECTION 27 41 17 MULTIMEDIA SYSTEMS – LARGE VENUE

## PART 1 - GENERAL

### 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to new multimedia infrastructure and instructional 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. Contractor shall work collaboratively with Owner and Designer. Work shall include but not be limited to installation of supplied equipment, removal of existing equipment and full operational capacity of system as specified herein.
- E. 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.
- F. 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.
- G. 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 All wiring not installed in conduit shall be plenum type cable and shall be so identified with continuous marking.
- 2.05 All connectors and accessories not installed in conduit and installed above finished ceiling shall be plenum rated.
- 2.06 SPECIAL CONFIGURATION LOCATIONS

## A. Configuration A

- 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
  - a. Bowen Elementary 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 16' 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 Crestron control system to receive transmission of signal from supplied input locations.
- 3. One (1) LED Monitor(s)
  - a. Acceptable Manufacturer(s)
    - 1. SAMSUNG
      - a. QB65R
  - 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. 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 SF660P 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 NVX equipment for discrete output for each monitor pair and projector concurrently for a fully functional system.
- f. Supplied Crestron NVX equipment shall scale images to optimal projector resolution.
- 4. One (1) Multimedia Processor
  - a. Acceptable Manufacturer(s)
    - 1. CRESTRON
      - a. CP4
    - 2. OSC
  - b. Contractor shall supply all parts, cables and accessories to securely mount unit in existing AV rack.
  - 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 powered roll-up screen, monitor 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. 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 plates and one (1) wireless presentation system. Cable shall meet or exceed Crestron requirements for NVX systems.
  - g. Contractor shall completely integrate control system and multimedia systems with provided audio system.
- 5. Two (2) multimedia input locations shall be provided.
  - a. Acceptable Manufacturer(s)

- 1. CRESTRON
  - a. DM-NVX
- 2. QSC
- b. Rack input location shall be installed in provided rack, wall input to be installed in provided double gang box, Contractor shall supply stainless steel plate for fully finished installation.
- c. Contractor will supply correct in-plate DM transmit and receive equipment to extend input location to supplied NVX encoder.
- d. Contractor will supply all necessary NVX decoder equipment to connect supplied projector.
- 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. NVX 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. CRESTRON
      - a. TSW-770-B-S
    - 2. QSC
  - b. Touch Screen(s) shall be provided to control system operations.
    - 1. Connect touch screens to supplied NVX control system as per manufacturer installation instructions.
    - 2. Provide all necessary cabling, mounts and accessories to securely mount touch screen in provided double gang box.
    - 3. 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, input 2 or wireless presentation system
- d. Control Provided LED Panels
- 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.
- d. Contractor shall program Multimedia Control System to integrate with Owner provided motorized electric screens.
- 7. 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. 108" x 192" Wide (16:9) Format
  - d. White case
  - e. Surface mount
  - f. Matte white screen surface
  - g. Low voltage control RS-232 capable
- 8. One (1) Rack System(s) shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. Middle Atlantic

- a. DWR-12-22PD
- 2. Or Equal.
- b. Wall Mount
- c. 12U
- d. Plexiglas Locking Door
- e. Forward rackrail
- f. UL Load Capacity 200 lbs
- g. 20" usable depth
- h. 21" usable height
- i. Contractor to supply 8-Outlet PDU (Middle Atlantic PD-815R or Equal)
- 9. One (1) Digital Signage Device(s) shall be provided.
  - a. Acceptable Manufacturer(s)
    - 1. Brightsign
      - a. HD224
  - b. Digital Signage Device(s) shall meet or exceed the following requirements:
    - 1. Integrated Ethernet connection
    - 2. HDMI output capable of 4K resolution
  - c. Contactor shall securely install signage player in Contractor provided rack for connection to Contractor supplied Crestron NVX Encoders.
  - d. Provide one (1) standard perpetual license(s) for Carousel digital signage platform (one for each unit). Licensing to be provided to Owner for installation and configuration.
  - 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.
- 10. 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 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.
- 11. One (1) Voice Amplification System(s) shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. SENNHEISER

- 2. SHURE
  - a. QLXD4
- 3. 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 Owner supplied rack.
- e. Contractor shall supply 3U drawer to store microphone in Contractor supplied rack.
- 12. 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. Passive 2-way full range speaker
  - c. 8" Low Frequency Driver, 1-inch Voice Coil
  - d. 180W peak
  - e. 8 ohms
  - f. 94 dB sensitivity
  - g. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
  - h. Contractor shall safely and securely mount speakers to cafeteria ceiling structure using manufacturer recommended and industry best practices.
  - i. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.

- j. Contractor shall supply and install properly sized speaker cabling to support supplied speakers. Each speaker shall be independently wired back to provided rack.
- k. Speakers shall be white in color.
- 13. One (1) Mixer/DSP shall be provided and installed.
  - a. Acceptable Manufacturer(s)
    - 1. Biamp/Community
    - 2. Peavey
    - 3. Symetrix
    - 4. QSC
    - 5. Or Equal
  - b. System shall be populated with necessary accessories for 4 line-level input audio channels.
  - c. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
  - d. Contractor shall supply all necessary labor to configure Mixer/DSP.
  - e. Contractor shall integrate DSP with provided Crestron touchscreen and control system
  - f. 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.
  - g. Contractor shall supply all cables and accessories for a fully functional system.
- 14. 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.  $S/N (20 \text{ Hz} 20 \text{kHz}) \approx 8 \text{ Ohms} > 97 \text{ dB}$
- 15. One (1) CD/Bluetooth Player shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. TASCAM
      - a. CD-400U
  - 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.
- 16. One (1) Remote input location(s) shall be provided and installed.
  - 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 DSP/Mixer system.

# B. Configuration B

- 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
  - a. EKHS Culinary Arts Addition Large Group Area
- 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 16' 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 Crestron control system to receive transmission of signal from supplied input locations.
- 3. One (1) LED Monitor(s)
  - a. Acceptable Manufacturer(s)
    - 1. 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) tilt 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 NVX equipment for discrete output for each monitor pair and projector concurrently for a fully functional system.
- f. Supplied Crestron NVX equipment shall scale images to optimal projector resolution.
- 4. One (1) LED Monitor(s)
  - a. Acceptable Manufacturer(s)
    - 1. SAMSUNG
      - a. OB65R
  - 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. 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 SF660P 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 NVX equipment for discrete output for each monitor pair and projector concurrently for a fully functional system.
- f. Supplied Crestron NVX equipment shall scale images to optimal projector resolution.
- 5. One (1) Multimedia Processor
  - a. Acceptable Manufacturer(s)
    - 1. CRESTRON
      - a. CP4
    - 2. OSC
  - b. Contractor shall supply all parts, cables and accessories to securely mount unit in existing AV rack.
  - 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 powered roll-up screen, 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. 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 plates and one (1) wireless presentation system. Cable shall meet or exceed Crestron requirements for NVX systems.
  - g. Contractor shall completely integrate control system and multimedia systems with provided audio system.
- 6. One (1) multimedia input location shall be provided.
  - a. Acceptable Manufacturer(s)

- 1. CRESTRON
  - a. DM-NVX
- 2. QSC
- b. Rack input location shall be installed in IT Rack Location, wall input to be installed in provided double gang box, Contractor shall supply stainless steel plate for fully finished installation.
- c. Contractor shall supply correct in-plate DM transmit and receive equipment to extend input location to supplied NVX encoder.
- d. Contractor will supply all necessary NVX decoder equipment to connect supplied projector.
- 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. NVX units shall properly scale input image to projector to optimal resolution.
- 7. One (1) Touch Screen(s) shall be provided
  - a. Acceptable Manufacturer(s)
    - 1. CRESTRON
      - a. TSW-770-B-S
    - 2. QSC
  - b. Touch Screen(s) shall be provided to control system operations.
    - 1. Connect touch screens to supplied NVX control system as per manufacturer installation instructions.
    - 2. Provide all necessary cabling, mounts and accessories to securely mount touch screen in provided double gang box.
    - 3. 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
- 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.
- d. Contractor shall program Multimedia Control System to integrate with Owner provided motorized electric screens.
- 8. 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. 108" x 192" Wide (16:9) Format
  - d. White case
  - e. Surface mount
  - f. Matte white screen surface
  - g. Low voltage control RS-232 capable
- 9. One (1) Digital Signage Device(s) shall be provided.
  - a. Acceptable Manufacturer(s)
    - 1. Brightsign

- a. HD224
- b. Digital Signage Device(s) shall meet or exceed the following requirements:
  - 1. Integrated Ethernet connection
  - 2. HDMI output capable of 4K resolution
- c. Contactor shall securely install signage player in Contractor provided rack for connection to Contractor supplied Crestron NVX Encoders.
- d. Provide one (1) standard perpetual license(s) for Carousel digital signage platform (one for each unit). Licensing to be provided to Owner for installation and configuration.
- 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.
- 10. 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 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.
- 11. Two (2) Voice Amplification System(s) shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. SENNHEISER
    - 2. SHURE QLXD4
    - 3. 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 Owner supplied rack.
- 12. Sixteen (16) 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.
- 13. One (1) Mixer/DSP shall be provided and installed.
  - a. Acceptable Manufacturer(s)
    - 1. Biamp/Community
    - 2. Peavey
    - 3. Symetrix
    - 4. QSC
    - 5. Or Equal
  - b. System shall be populated with necessary accessories for 4 line-level input audio channels.
  - c. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
  - d. Contractor shall supply all necessary labor to configure Mixer/DSP.
  - e. Contractor shall integrate DSP with provided Crestron touchscreen and control system
  - f. 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.
- g. Contractor shall supply all cables and accessories for a fully functional system.
- 14. 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 20 kHz @ 8 Ohms) > 97 dB
- 15. One (1) Remote input location(s) shall be provided and installed.
  - 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 DSP/Mixer system.

# C. Configuration C

- 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
  - a. EKHS Culinary Arts Addition Culinary Lab 1
  - b. EKHS Culinary Arts Addition Culinary Lab 2
- 2. Four (4) LED Monitor(s)
  - a. Acceptable Manufacturer(s)

- 1. SAMSUNG
  - a. QB55R
- 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, one (1) pole/tilt mount Peerless SmartMount PLCM-UNL-CP-AW 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 NVX equipment for discrete output for each monitor for a fully functional system.
- f. Supplied Crestron NVX equipment shall scale images to optimal projector resolution.
- 3. One (1) Multimedia Processor
  - a. Acceptable Manufacturer(s)
    - 1. CRESTRON
      - a. CP4
    - 2. QSC

- b. Contractor shall supply all parts, cables and accessories to securely mount unit in existing AV rack.
- 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. 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 plates, one (1) wireless presentation system and one (1) ceiling mounted document camera. Cable shall meet or exceed Crestron requirements for NVX systems.
- g. Contractor shall completely integrate control system and multimedia systems with provided audio system.
- 4. One (1) Multimedia Input Location(s) shall be provided.
  - a. Acceptable Manufacturer(s)
    - 1. CRESTRON
      - a. DM-NVX
    - 2. OSC
  - b. Wall input to be installed in provided double gang box, Contractor shall supply stainless steel plate for fully finished installation.
  - c. Contractor shall supply correct in-plate DM transmit and receive equipment to extend input location to supplied NVX encoder.
  - d. Contractor supply all necessary NVX decoder equipment to connect supplied projector.

- 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. NVX units shall properly scale input image to projector to optimal resolution.
- 5. One (1) Tabletop Touch Screen(s) shall be provided
  - a. Acceptable Manufacturer(s)
    - 1. CRESTRON
      - a. TS-770-W-S
    - 2. QSC
  - b. Touch Screen(s) shall be provided to control system operations.
    - 1. Connect touch screens to supplied NVX control system as per manufacturer installation instructions.
    - 2. Provide all necessary cabling, mounts and accessories to securely mount touch screen in provided double gang box.
    - 3. 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 overhead document camera
      - d. Select Destination, LED panel outputs 1-4.
      - e. Control Provided LED Panels
      - f. Audio Level Increase
      - g. Audio Level Decrease
      - h. Image Freeze
      - i. 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) Ceiling Mounted Document Camera shall be provided and installed.
  - a. Acceptable Manufacturer(s)
    - 1. Legrand/Vaddio
      - a. DocCAM 20 HDBT w/ OneLink HDMI System
  - b. Ceiling Mounted Document Camera shall meet or exceed the following requirements:
    - 1. 20x optical zoom
    - 2. HD 1080p/60fps resolution
    - 3. IR Remote
  - c. Contractor shall provide all control, communication and video patch cables, transmitters and receivers to connect Ceiling Mounted Projector to AV control system.
- 7. 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 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.
- 8. Eight (8) Speakers shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. HARMAN/JBL PRO
      - a. JBL CONTROL 16C/T
    - 2. Or Equal
  - b. Passive 2-way full range speaker
  - c. 6.5" Low Frequency Driver, 1-inch Voice Coil
  - d. 180W peak
  - e. 8 ohms
  - f. 94 dB sensitivity
  - g. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
  - h. Contractor shall safely and securely mount speakers to culinary arts labs lay in ceiling structure using manufacturer recommended and industry best practices.
  - i. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.
  - j. Contractor shall supply and install properly sized speaker cabling to support supplied speakers. Each speaker shall be independently wired back to provided rack.

- k. Speakers shall be white in color.
- 9. One (1) Voice Amplification System(s) shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. SENNHEISER
    - 2. SHURE QLXD4
    - 3. Or Equal.
  - b. Lavalier and SM35 Headworn microphones will be provided
  - c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for culinary lab.
  - d. Contractor shall supply all mounting hardware to securely mount equipment into Owner supplied IT rack.
- 10. One (1) Mixer/DSP shall be provided and installed.
  - a. Acceptable Manufacturer(s)
    - 1. Biamp/Community
    - 2. Peavey
    - 3. Symetrix
    - 4. QSC
    - 5. Or Equal
  - b. System shall be populated with necessary accessories for 4 line-level input audio channels.
  - c. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
  - d. Contractor shall supply all necessary labor to configure Mixer/DSP.
  - e. Contractor shall integrate DSP with provided Crestron touchscreen and control system
  - f. 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.

- g. Contractor shall supply all cables and accessories for a fully functional system.
- 11. 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.  $S/N (20 \text{ Hz} 20 \text{kHz}) \approx 8 \text{ Ohms} > 97 \text{ dB}$

# D. Configuration D

- 1. Contractor shall supply one (1) of the specified configurations in the following locations.
  - a. Bowen Gymnasium
- 2. One (1) Rack System(s) shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. Middle Atlantic
      - a. DWR-12-22PD
    - 2. Or Equal.
  - b. Wall Mount
  - c. 12U
  - d. Plexiglas Locking Door

- e. Forward rackrail
- f. UL Load Capacity 200 lbs
- g. 20" 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. SENNHEISER
    - 2. SHURE
      - a. QLXD4
    - 3. Or Equal.
  - b. Handheld, Lavalier and over the ear 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 Owner 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
- 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.
- 1. 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 (one in gymnasium one in cafeteria).
  - 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. Two (2) Amplification System shall be provided and installed (one in gymnasium
  - 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 20 kHz @ 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
  - 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) 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.

#### 2.07 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 Owner directed infrastructure upgrades.

### **PART 3 - EXECUTION**

### 3.09 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.
- B. 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:
  - 1. Shop drawings, data sheets and system diagrams including specific cable connectors and types proposed to be installed.
  - 2. Asset tag format, composition, attachment method and location on each serialized component being provided.
  - 3. Firmware configuration template to be used for each component provided.
  - 4. Written installation, coordination and test procedure to be followed by installing technicians and engineers.
  - 5. Final documentation template.

### 3.10 DEMOLITION

- A. Remove ALL abandoned AV cabling including VGA, Cable TV (in classroom only), unused speaker cables, shelfs, brackets and blank any open locations in all rooms receiving new AV equipment.
- B. Contractor shall remove any existing equipment and transport to Owner directed site for disposition. Any equipment not retained by Owner shall be properly disposed of by Contractor.

### 3.11 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. All cable connecting components mounted in/on Technology Cart, shall have adequate cable slack to provide for full system inspection and or service without the removal (intentional or inadvertent) of connecting cables, including items that will be placed on the keyboard tray of equipment carts.
- 12. Label all cable connections for intuitive user access and as directed by Owner and Designer.
- 13. 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.

## 14. PROJECTORS

- a. Install, configure and test approved firmware configuration template including, but not limited to:
  - 1. Power on Image.
  - 2. Lamp setting.
  - 3. Firmware based Device ID (Including parameters such as: TCP/IP settings, Host Name, etc.).
  - 4. Default port selection.

- b. Contractor shall install and fully configure Epson projector management software and enable projectors for management.
- c. Contractor shall install manufacturer recommended firmware during initial installation.
- d. Neatly configure all cables as directed by Owner.
- e. Attach projector to mount using manufacturer best practices.
- f. Connect AC power using cord provided to projector.
- g. Align projector with Contractor provided screen. Contractor shall install projector in relationship to the screen to maximize the projected image.
- h. Set keystone adjustment(s) as required.
- i. Zoom and focus projector as required.
- j. Secure all adjustment points.

### 15. WIRELESS PRESENTATION SYSTEM

- a. Provide and connect all audio and video input and output device cables.
- b. Contractor shall install manufacturer recommended firmware during initial installation.
- c. Secure mounting location at projector location with provided mount to eliminate involuntary equipment movement.
- d. Neatly route all cabling and secure slack.
- e. Adjust balance levels for standard configuration.
- f. Neatly route all cabling and secure slack.
- g. Install, configure and test approved firmware configuration template including, but not limited to:
  - 1. Power on Image.
  - 2. Firmware based Device ID (Including parameters such as: TCP/IP settings, Host Name, etc.).

- h. Collaborate and coordinate with Owner or Others to fully configure wireless presentation system to function on Owner provided network equipment.
- i. Contractor shall supply, install and fully configure Kramer VIA cloud management software for a fully functional system.

### 16. VOICE AMPLIFICATION

- a. Provide and connect all audio input and output device cables.
- b. Secure mounting location at projector location with mounting screws or Velcro pads to eliminate involuntary equipment movement.
- c. Neatly route all cabling and secure slack.
- d. Adjust balance levels for standard configuration.
- e. Neatly route all cabling and secure slack.
- 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. Sites of Work:

- Bowen Elementary School 4453 Kalamazoo SE Kentwood, Michigan 49508
- 2. East Kentwood High School 6230 Kalamazoo Ave Kentwood, Michigan 49508

### 3.12 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.

### 3.13 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 asbuilt 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.

### 3.14 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 system administrator(s). Owner shall designate up to four (4) administrators to be trained. Training shall be a minimum of two (2), 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. System back-up and restore functions and procedures for all system parameters and configurations.
  - 3. Device additions, moves and changes as well as reconfiguration.
  - 4. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to and system configuration changes.

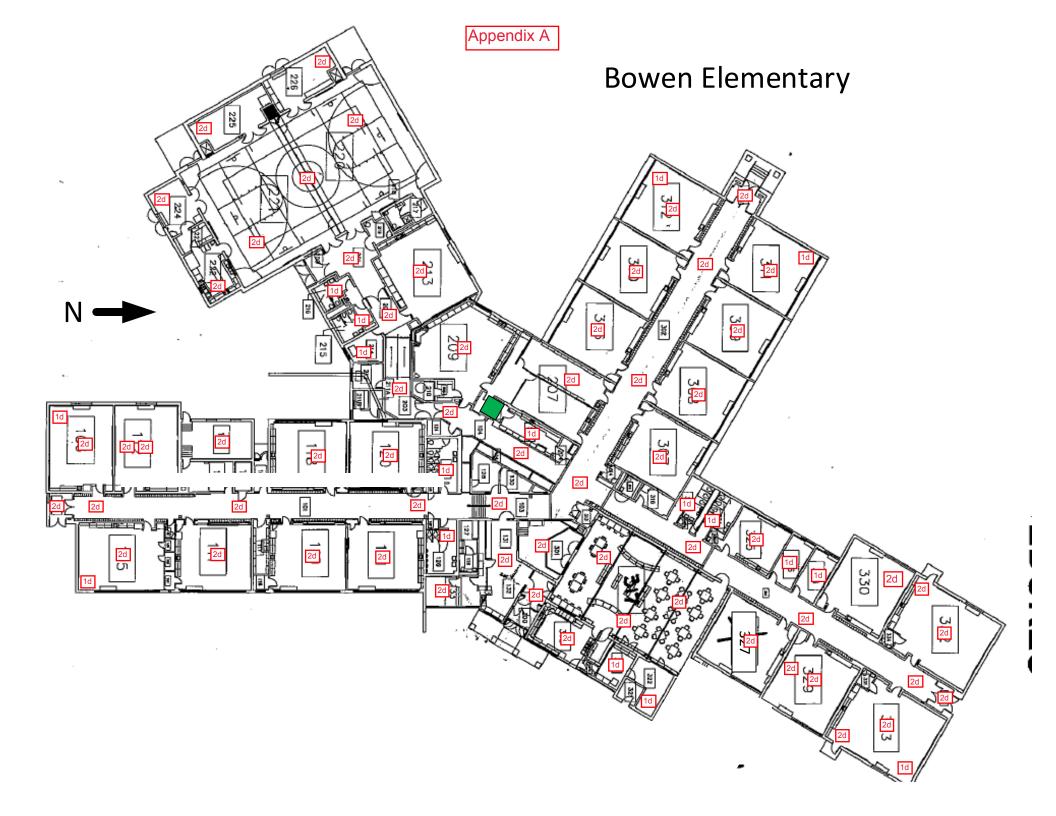
### 3.15 SCHEDULE, MEETINGS AND PLANS

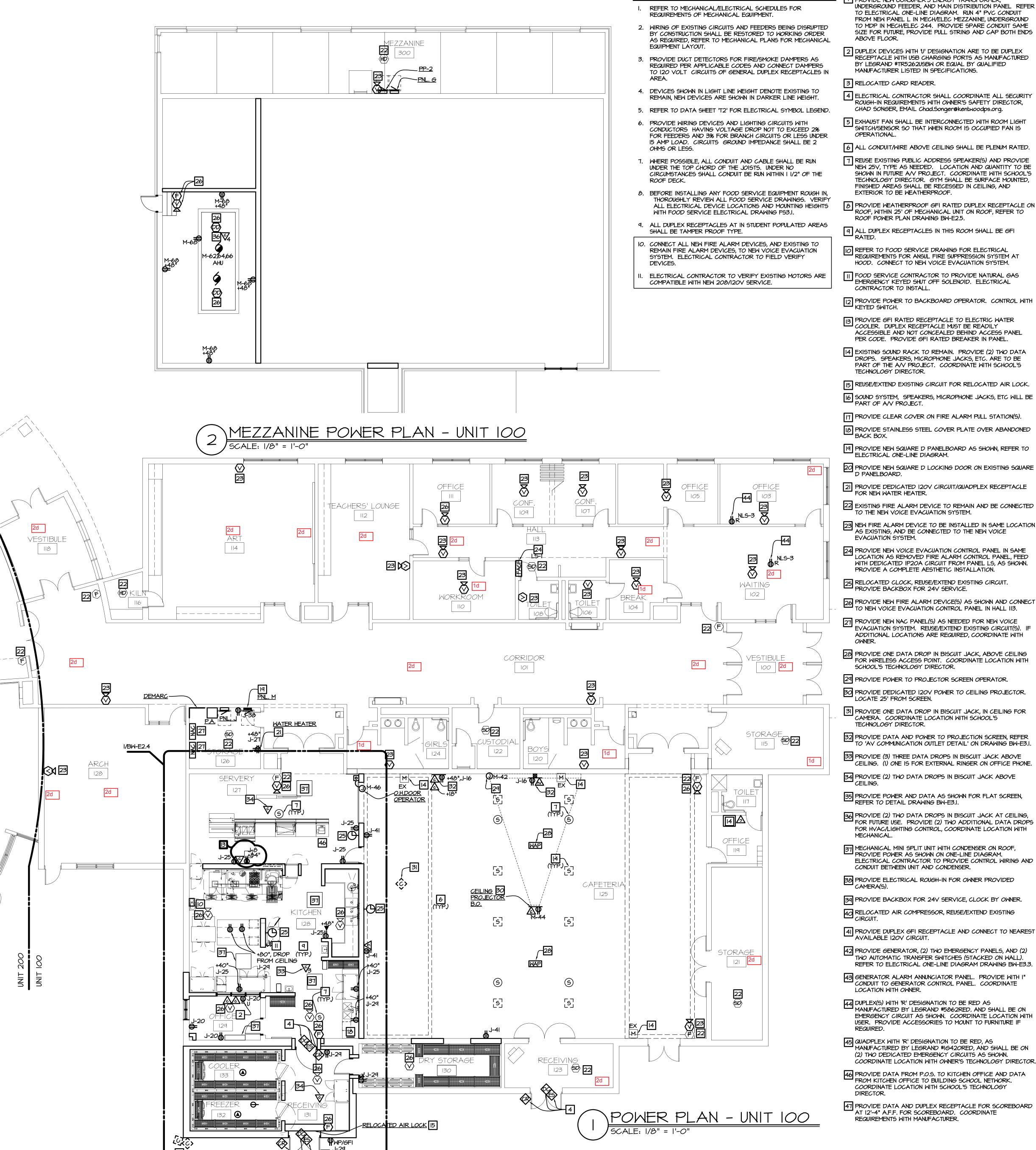
### A. Schedule

- 1. Final Vendor Presentations: Week of January 16, 2023
- 2. Contractor Chosen: Week of February 13, 2023
- 3. Work Commences: June 1, 2023
- 4. Substantial Completion: December 15, 2023

- 5. Project Close-out: January 1, 2024
- 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.

**END OF SECTION** 





GENERAL POWER NOTES:

### POWER NOTES

- PROVIDE NEW CONSUMER'S ENERGY TRANSFORMER, UNDERGROUND FEEDER, AND MAIN DISTRIBUTION PANEL REFER TO ELECTRICAL ONE-LINE DIAGRAM. RUN 4" PVC CONDUIT FROM NEW PANEL L IN MECH/ELEC MEZZANINE, UNDERGROUND TO MDP IN MECH/ELEC 244. PROVIDE SPARE CONDUIT SAME SIZE FOR FUTURE, PROVIDE PULL STRING AND CAP BOTH ENDS ABOVE FLOOR.
- 2 DUPLEX DEVICES WITH 'U' DESIGNATION ARE TO BE DUPLEX RECEPTACLE WITH USB CHARGING PORTS AS MANUFACTURED BY LEGRAND #TR5262USBW OR EQUAL BY QUALIFIED MANUFACTURER LISTED IN SPECIFICATIONS.
- 3 RELOCATED CARD READER.
- 4 ELECTRICAL CONTRACTOR SHALL COORDINATE ALL SECURITY ROUGH-IN REQUIREMENTS WITH OWNER'S SAFETY DIRECTOR, CHAD SONGER, EMAIL Chad.Songer@kentwoodps.org.
- 5 EXHAUST FAN SHALL BE INTERCONNECTED WITH ROOM LIGHT SWITCH/SENSOR SO THAT WHEN ROOM IS OCCUPIED FAN IS OPERATIONAL.
- 6 ALL CONDUIT/WIRE ABOVE CEILING SHALL BE PLENUM RATED.
- 7 REUSE EXISTING PUBLIC ADDRESS SPEAKER(S) AND PROVIDE INEW 25V, TYPE AS NEEDED. LOCATION AND QUANTITY TO BE SHOWN IN FUTURE ANY PROJECT. COORDINATE WITH SCHOOL'S TECHNOLOGY DIRECTOR. GYM SHALL BE SURFACE MOUNTED, FINISHED AREAS SHALL BE RECESSED IN CEILING, AND EXTERIOR TO BE WEATHERPROOF.
- B PROVIDE WEATHERPROOF OF RATED DUPLEX RECEPTACLE ON ROOF, WITHIN 25' OF MECHANICAL UNIT ON ROOF, REFER TO ROOF POWER PLAN DRAWING BW-E2.5.
- 4 ALL DUPLEX RECEPTACLES IN THIS ROOM SHALL BE GFI
- REFER TO FOOD SERVICE DRAWING FOR ELECTRICAL REQUIREMENTS FOR ANSUL FIRE SUPPRESSION SYSTEM AT HOOD. CONNECT TO NEW YOICE EVACUATION SYSTEM.
- FOOD SERVICE CONTRACTOR TO PROVIDE NATURAL GAS EMERGENCY KEYED SHUT OFF SOLENOID. ELECTRICAL CONTRACTOR TO INSTALL.
- PROVIDE POWER TO BACKBOARD OPERATOR. CONTROL WITH KEYED SWITCH.
- PROVIDE GFI RATED RECEPTACLE TO ELECTRIC WATER COOLER. DUPLEX RECEPTACLE MUST BE READILY ACCESSIBLE AND NOT CONCEALED BEHIND ACCESS PANEL PER CODE. PROVIDE GFI RATED BREAKER IN PANEL.
- 14 EXISTING SOUND RACK TO REMAIN. PROVIDE (2) TWO DATA DROPS. SPEAKERS, MICROPHONE JACKS, ETC. ARE TO BE PART OF THE AN PROJECT. COORDINATE WITH SCHOOL'S TECHNOLOGY DIRECTOR.
- 15 REUSE/EXTEND EXISTING CIRCUIT FOR RELOCATED AIR LOCK. 6 SOUND SYSTEM, SPEAKERS, MICROPHONE JACKS, ETC WILL BE PART OF AVY PROJECT.
- 17 PROVIDE CLEAR COVER ON FIRE ALARM PULL STATION(S).
- PROVIDE STAINLESS STEEL COVER PLATE OVER ABANDONED BACK BOX. 19 PROVIDE NEW SQUARE D PANELBOARD AS SHOWN, REFER TO
- ELECTRICAL ONE-LINE DIAGRAM. 20 PROVIDE NEW SQUARE D LOCKING DOOR ON EXISTING SQUARE
- 21 PROVIDE DEDICATED 120V CIRCUIT/QUADPLEX RECEPTACLE FOR NEW WATER HEATER. 22 EXISTING FIRE ALARM DEVICE TO REMAIN AND BE CONNECTED
- TO THE NEW YOICE EVACUATION SYSTEM. 23 NEW FIRE ALARM DEVICE TO BE INSTALLED IN SAME LOCATION
- AS EXISTING, AND BE CONNECTED TO THE NEW VOICE EVACUATION SYSTEM.
- 24 PROVIDE NEW VOICE EVACUATION CONTROL PANEL IN SAME LOCATION AS REMOVED FIRE ALARM CONTROL PANEL, FEED WITH DEDICATED IP20A CIRCUIT FROM PANEL LS, AS SHOWN. PROVIDE A COMPLETE AESTHETIC INSTALLATION.
- RELOCATED CLOCK, REUSE/EXTEND EXISTING CIRCUIT. PROVIDE BACKBOX FOR 24V SERVICE.
- PROVIDE NEW FIRE ALARM DEVICE(S) AS SHOWN AND CONNECT TO NEW VOICE EVACUATION CONTROL PANEL IN HALL IIS.
- 27 PROVIDE NEW NAC PANEL(S) AS NEEDED FOR NEW VOICE EVACUATION SYSTEM. REUSE/EXTEND EXISTING CIRCUIT(S). IF ADDITIONAL LOCATIONS ARE REQUIRED, COORDINATE WITH
- 28 PROVIDE ONE DATA DROP IN BISCUIT JACK, ABOVE CEILING FOR WIRELESS ACCESS POINT. COORDINATE LOCATION WITH SCHOOL'S TECHNOLOGY DIRECTOR.
- 29 PROVIDE POWER TO PROJECTOR SCREEN OPERATOR. PROVIDE DEDICATED 120V POWER TO CEILING PROJECTOR. LOCATE 25' FROM SCREEN.
- 31 PROVIDE ONE DATA DROP IN BISCUIT JACK, IN CEILING FOR CAMERA. COORDINATE LOCATION WITH SCHOOL'S TECHNOLOGY DIRECTOR.
- 32 PROVIDE DATA AND POWER TO PROJECTION SCREEN, REFER
- TO 'AV COMMUNICATION OUTLET DETAIL' ON DRAWING BW-E3.I. 33 PROVIDE (3) THREE DATA DROPS IN BISCUIT JACK ABOVE
- PROVIDE (2) TWO DATA DROPS IN BISCUIT JACK ABOVE CEILING.
- PROVIDE POWER AND DATA AS SHOWN FOR FLAT SCREEN, REFER TO DETAIL DRAWING BW-E3.I.
- MECHANICAL. 37 MECHANICAL MINI SPLIT UNIT WITH CONDENSER ON ROOF, PROVIDE POWER AS SHOWN ON ONE-LINE DIAGRAM. ELECTRICAL CONTRACTOR TO PROVIDE CONTROL WIRING AND CONDUIT BETWEEN UNIT AND CONDENSER.
- PROVIDE ELECTRICAL ROUGH-IN FOR OWNER PROVIDED
- 39 PROVIDE BACKBOX FOR 24V SERVICE, CLOCK BY OWNER. RELOCATED AIR COMPRESSOR, REUSE/EXTEND EXISTING CIRCUIT.
- PROVIDE DUPLEX 6FI RECEPTACLE AND CONNECT TO NEAREST AVAILABLE 120V CIRCUIT.
- 42 PROVIDE GENERATOR, (2) TWO EMERGENCY PANELS, AND (2) TWO AUTOMATIC TRANSFER SWITCHES (STACKED ON WALL). REFER TO ELECTRICAL ONE-LINE DIAGRAM DRAWING BW-E3.3.
- 43 GENERATOR ALARM ANNUNCIATOR PANEL. PROVIDE WITH I" CONDUIT TO GENERATOR CONTROL PANEL. COORDINATE LOCATION WITH OWNER.
- DUPLEX(S) WITH 'R' DESIGNATION TO BE RED AS MANUFACTURED BY LEGRAND #5862RED. AND SHALL BE ON EMERGENCY CIRCUIT AS SHOWN. COORDINATE LOCATION WITH USER. PROVIDE ACCESSORIES TO MOUNT TO FURNITURE IF
- 45 QUADPLEX WITH 'R' DESIGNATION TO BE RED, AS MANUFACTURED BY LEGRAND #1G420RED, AND SHALL BE ON (2) TWO DEDICATED EMERGENCY CIRCUITS AS SHOWN. COORDINATE LOCATION WITH OWNER'S TECHNOLOGY DIRECTOR.
- PROVIDE DATA FROM P.O.S. TO KITCHEN OFFICE AND DATA FROM KITCHEN OFFICE TO BUILDING SCHOOL NETWORK. COORDINATE LOCATION WITH SCHOOL'S TECHNOLOGY DIRECTOR.
- 47 PROVIDE DATA AND DUPLEX RECEPTACLE FOR SCOREBOARD AT 12'-4" A.F.F. FOR SCOREBOARD. COORDINATE REQUIREMENTS WITH MANUFACTURER.

KALAMAZOO | GRAND RAPIDS | CHELSEA 259 East Michigan Ave., Suite 308 Kalamazoo, MI 49007-6403

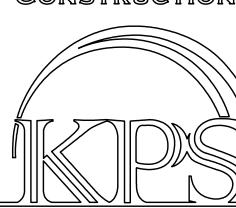
P: 269.381.4880 | F: 269.381.9110

www.kingscott.com

### 世 --- ( )

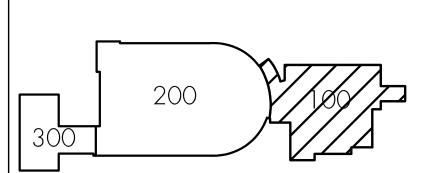


FRITZ WAHLFIELD CONSTRUCTION



Kentwood Public Schools

revisions/review	DATE
PROPOSAL REQUEST NO. 3	07/16/2021
CONSTRUCTION DOCUMENTS	07/16/2021
PROPOSAL REQUEST NO. 11	11/09/2021
PROPOSAL REQUEST NO. 13	11/17/2021





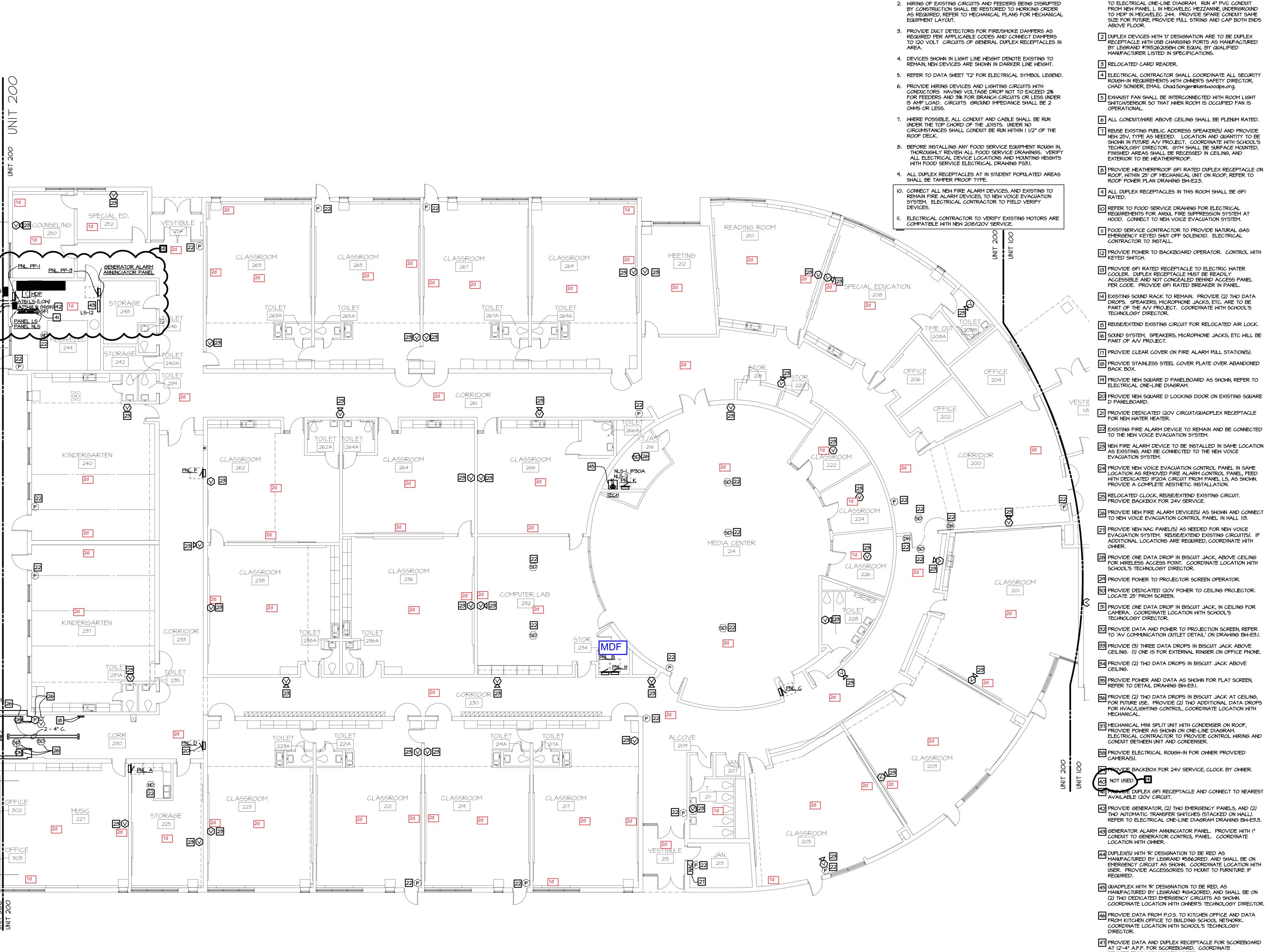
SHEET TITLE

SHEET NO.

POWER PLAN - UNIT 100

) KINGSCOTT ASSOCIATES INC.

NORTH



GENERAL POWER NOTES:

REFER TO MECHANICAL/ELECTRICAL SCHEDULES FOR REQUIREMENTS OF MECHANICAL EQUIPMENT.

> HOOD. CONNECT TO NEW VOICE EVACUATION SYSTEM. FOOD SERVICE CONTRACTOR TO PROVIDE NATURAL GAS EMERGENCY KEYED SHUT OFF SOLENOID. ELECTRICAL

POWER NOTES

ABOVE FLOOR.

OPERATIONAL.

PROVIDE NEW CONSUMER'S ENERGY TRANSFORMER,

UNDERGROUND FEEDER, AND MAIN DISTRIBUTION PANEL REFER TO ELECTRICAL ONE-LINE DIAGRAM. RUN 4" PVC CONDUIT

FROM NEW PANEL L IN MECH/ELEC MEZZANINE, UNDERGROUND

TO MDP IN MECH/ELEC 244. PROVIDE SPARE CONDUIT SAME SIZE FOR FUTURE, PROVIDE PULL STRING AND CAP BOTH ENDS

RECEPTACLE WITH USB CHARGING PORTS AS MANUFACTURED

ROUGH-IN REQUIREMENTS WITH OWNER'S SAFETY DIRECTOR,

NEW 25V, TYPE AS NEEDED. LOCATION AND QUANTITY TO BE SHOWN IN FUTURE ANY PROJECT. COORDINATE WITH SCHOOL'S

TECHNOLOGY DIRECTOR. GYM SHALL BE SURFACE MOUNTED,

FINISHED AREAS SHALL BE RECESSED IN CEILING, AND

EXTERIOR TO BE WEATHERPROOF.

ROOF POWER PLAN DRAWING BW-E2.5.

BY LEGRAND #TR5262USBW OR EQUAL BY QUALIFIED

CHAD SONGER, EMAIL Chad.Songer@kentwoodps.org.

MANUFACTURER LISTED IN SPECIFICATIONS.

- CONTRACTOR TO INSTALL. PROVIDE POWER TO BACKBOARD OPERATOR. CONTROL WITH KEYED SWITCH.
- PROVIDE GFI RATED RECEPTACLE TO ELECTRIC WATER COOLER. DUPLEX RECEPTACLE MUST BE READILY ACCESSIBLE AND NOT CONCEALED BEHIND ACCESS PANEL
- 14 EXISTING SOUND RACK TO REMAIN. PROVIDE (2) TWO DATA DROPS. SPEAKERS, MICROPHONE JACKS, ETC. ARE TO BE PART OF THE ANY PROJECT. COORDINATE WITH SCHOOL'S TECHNOLOGY DIRECTOR.

PER CODE. PROVIDE GFI RATED BREAKER IN PANEL.

- 15 REUSE/EXTEND EXISTING CIRCUIT FOR RELOCATED AIR LOCK. 16 SOUND SYSTEM, SPEAKERS, MICROPHONE JACKS, ETC WILL BE PART OF ANY PROJECT.
- 17 PROVIDE CLEAR COVER ON FIRE ALARM PULL STATION(S). PROVIDE STAINLESS STEEL COVER PLATE OVER ABANDONED BACK BOX.
- 19 PROVIDE NEW SQUARE D PANELBOARD AS SHOWN, REFER TO ELECTRICAL ONE-LINE DIAGRAM.
- PROVIDE NEW SQUARE D LOCKING DOOR ON EXISTING SQUARE D PANELBOARD.
- 21 PROVIDE DEDICATED 120V CIRCUIT/QUADPLEX RECEPTACLE FOR NEW WATER HEATER.
- 22 EXISTING FIRE ALARM DEVICE TO REMAIN AND BE CONNECTED TO THE NEW YOICE EVACUATION SYSTEM.
- 23 NEW FIRE ALARM DEVICE TO BE INSTALLED IN SAME LOCATION AS EXISTING, AND BE CONNECTED TO THE NEW VOICE EVACUATION SYSTEM.
- PROVIDE NEW VOICE EVACUATION CONTROL PANEL IN SAME LOCATION AS REMOVED FIRE ALARM CONTROL PANEL, FEED WITH DEDICATED IP20A CIRCUIT FROM PANEL LS, AS SHOWN. PROVIDE A COMPLETE AESTHETIC INSTALLATION.
- RELOCATED CLOCK, REUSE/EXTEND EXISTING CIRCUIT. PROVIDE BACKBOX FOR 24V SERVICE.
- PROVIDE NEW FIRE ALARM DEVICE(S) AS SHOWN AND CONNECT TO NEW VOICE EVACUATION CONTROL PANEL IN HALL 113.
- 27 PROVIDE NEW NAC PANEL(S) AS NEEDED FOR NEW VOICE EVACUATION SYSTEM. REUSE/EXTEND EXISTING CIRCUIT(S). IF ADDITIONAL LOCATIONS ARE REQUIRED, COORDINATE WITH
- 28 PROVIDE ONE DATA DROP IN BISCUIT JACK, ABOVE CEILING FOR WIRELESS ACCESS POINT. COORDINATE LOCATION WITH SCHOOL'S TECHNOLOGY DIRECTOR.
- 29 PROVIDE POWER TO PROJECTOR SCREEN OPERATOR.
- BO PROVIDE DEDICATED 120V POWER TO CEILING PROJECTOR. LOCATE 25' FROM SCREEN.
- 31 PROVIDE ONE DATA DROP IN BISCUIT JACK, IN CEILING FOR CAMERA. COORDINATE LOCATION WITH SCHOOL'S TECHNOLOGY DIRECTOR.
- PROVIDE DATA AND POWER TO PROJECTION SCREEN, REFER TO 'AV COMMUNICATION OUTLET DETAIL' ON DRAWING BW-E3.I.
- 33 PROVIDE (3) THREE DATA DROPS IN BISCUIT JACK ABOVE CEILING. (1) ONE IS FOR EXTERNAL RINGER ON OFFICE PHONE.
- PROVIDE (2) TWO DATA DROPS IN BISCUIT JACK ABOVE CEILING.
- PROVIDE POWER AND DATA AS SHOWN FOR FLAT SCREEN, REFER TO DETAIL DRAWING BW-E3.I.
- PROVIDE (2) TWO DATA DROPS IN BISCUIT JACK AT CEILING, FOR FUTURE USE. PROVIDE (2) TWO ADDITIONAL DATA DROPS FOR HVAC/LIGHTING CONTROL, COORDINATE LOCATION WITH MECHANICAL.
- MECHANICAL MINI SPLIT UNIT WITH CONDENSER ON ROOF, PROVIDE POWER AS SHOWN ON ONE-LINE DIAGRAM. ELECTRICAL CONTRACTOR TO PROVIDE CONTROL WIRING AND CONDUIT BETWEEN UNIT AND CONDENSER.
- 38 PROVIDE ELECTRICAL ROUGH-IN FOR OWNER PROVIDED
- TROVIDE BACKBOX FOR 24V SERVICE, CLOCK BY OWNER.
- THE DUPLEX GFI RECEPTACLE AND CONNECT TO NEAREST AVAILABLE 120V CIRCUIT.
- 42 PROVIDE GENERATOR, (2) TWO EMERGENCY PANELS, AND (2) TWO AUTOMATIC TRANSFER SWITCHES (STACKED ON WALL). REFER TO ELECTRICAL ONE-LINE DIAGRAM DRAWING BW-E3.3.
- GENERATOR ALARM ANNUNCIATOR PANEL. PROVIDE WITH I"
  CONDUIT TO GENERATOR CONTROL PANEL. COORDINATE LOCATION WITH OWNER.
- DUPLEX(S) WITH 'R' DESIGNATION TO BE RED AS MANUFACTURED BY LEGRAND #5862RED. AND SHALL BE ON EMERGENCY CIRCUIT AS SHOWN. COORDINATE LOCATION WITH USER. PROVIDE ACCESSORIES TO MOUNT TO FURNITURE IF REQUIRED.
- 45 QUADPLEX WITH 'R' DESIGNATION TO BE RED, AS MANUFACTURED BY LEGRAND #1G420RED, AND SHALL BE ON (2) TWO DEDICATED EMERGENCY CIRCUITS AS SHOWN. COORDINATE LOCATION WITH OWNER'S TECHNOLOGY DIRECTOR.
- PROVIDE DATA FROM P.O.S. TO KITCHEN OFFICE AND DATA FROM KITCHEN OFFICE TO BUILDING SCHOOL NETWORK. COORDINATE LOCATION WITH SCHOOL'S TECHNOLOGY DIRECTOR.
- PROVIDE DATA AND DUPLEX RECEPTACLE FOR SCOREBOARD AT 12'-4" A.F.F. FOR SCOREBOARD. COORDINATE REQUIREMENTS WITH MANUFACTURER.



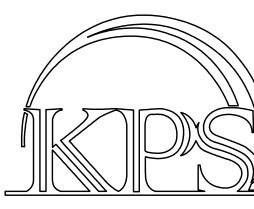
KALAMAZOO | GRAND RAPIDS | CHELSEA 259 East Michigan Ave., Suite 308 Kalamazoo, MI 49007-6403 P: 269.381.4880 | F: 269.381.9110

www.kingscott.com

### 世 --- ( 1)

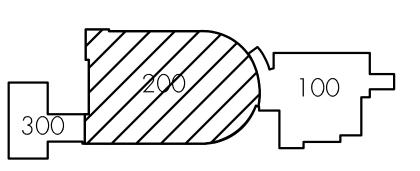


CONSTRUCTION



Public Schools

PROPOSAL REQUEST NO. 3	07/16/2021
CONSTRUCTION DOCUMENTS	07/16/2021
Proposal request no. 11	11/09/2021
Proposal request no. 14	12/09/202





SHEET TITLE

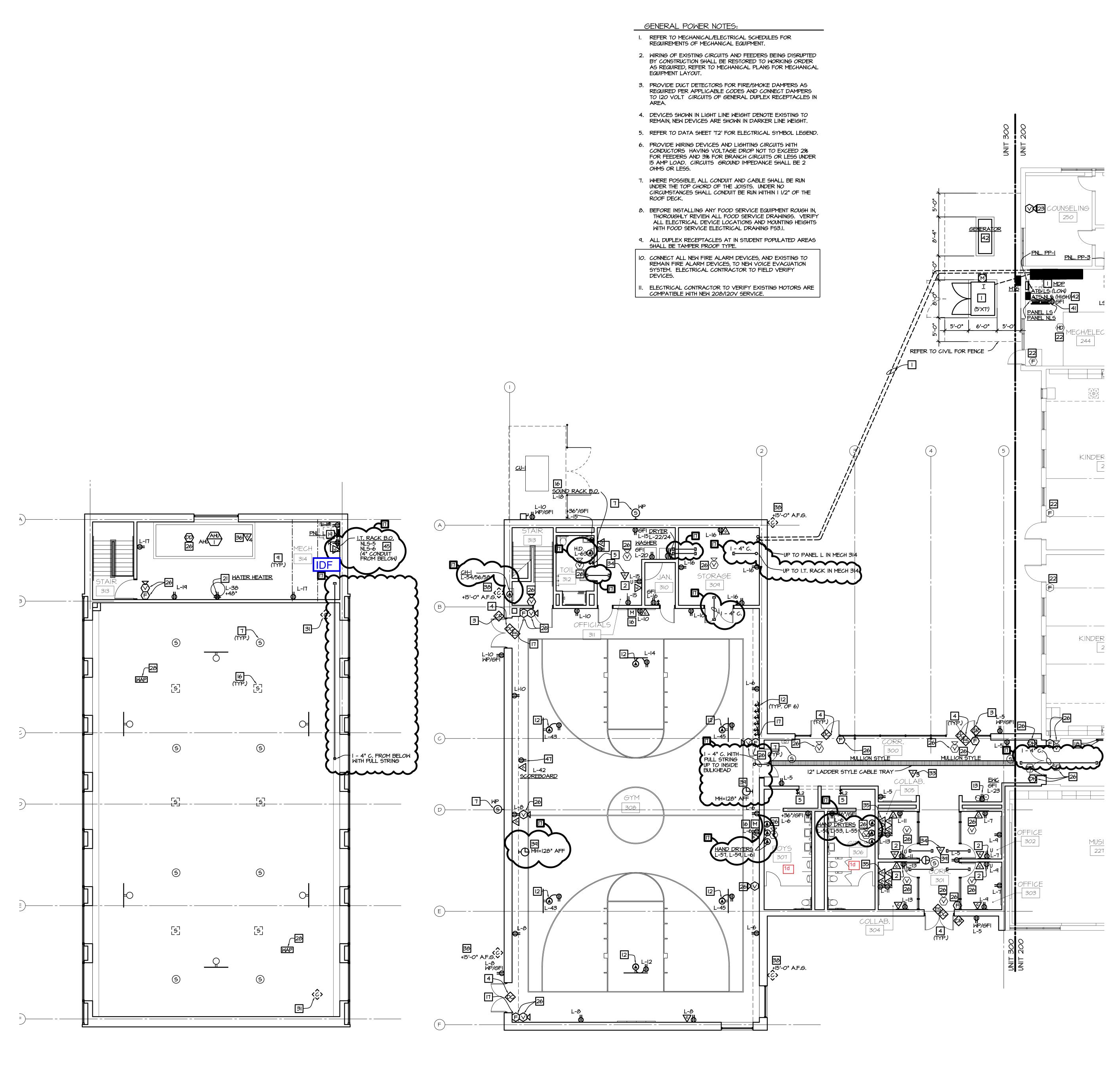
POWER PLAN - UNIT 200

NORTH



) KINGSCOTT ASSOCIATES INC.





POWER NOTES

PROVIDE NEW CONSUMER'S ENERGY TRANSFORMER,
UNDERGROUND FEEDER, AND MAIN DISTRIBUTION PANEL REFER
TO ELECTRICAL ONE-LINE DIAGRAM. RUN 4" PVC CONDUIT
FROM NEW PANEL L IN MECH/ELEC MEZZANINE, UNDERGROUND
TO MDP IN MECH/ELEC 244. PROVIDE SPARE CONDUIT SAME
SIZE FOR FUTURE, PROVIDE PULL STRING AND CAP BOTH ENDS
ABOVE FLOOR.

2 DUPLEX DEVICES WITH 'U' DESIGNATION ARE TO BE DUPLEX RECEPTACLE WITH USB CHARGING PORTS AS MANUFACTURED BY LEGRAND #TR5262USBW OR EQUAL BY QUALIFIED MANUFACTURER LISTED IN SPECIFICATIONS.

MANUFACTURER LISTED IN SPECIFICATIONS

RELOCATED CARD READER.

4 ELECTRICAL CONTRACTOR SHALL COORDINATE ALL SECURITY ROUGH-IN REQUIREMENTS WITH OWNER'S SAFETY DIRECTOR, CHAD SONGER, EMAIL Chad.Songer@kentwoodps.org.

5 EXHAUST FAN SHALL BE INTERCONNECTED WITH ROOM LIGHT SWITCH/SENSOR SO THAT WHEN ROOM IS OCCUPIED FAN IS OPERATIONAL.

6 ALL CONDUIT/WIRE ABOVE CEILING SHALL BE PLENUM RATED.

REUSE EXISTING PUBLIC ADDRESS SPEAKER(S) AND PROVIDE NEW 25V, TYPE AS NEEDED. LOCATION AND QUANTITY TO BE SHOWN IN FUTURE AV PROJECT. COORDINATE WITH SCHOOL'S TECHNOLOGY DIRECTOR. GYM SHALL BE SURFACE MOUNTED, FINISHED AREAS SHALL BE RECESSED IN CEILING, AND EXTERIOR TO BE WEATHERPROOF.

PROVIDE WEATHERPROOF 6FI RATED DUPLEX RECEPTACLE ON ROOF, WITHIN 25' OF MECHANICAL UNIT ON ROOF, REFER TO ROOF POWER PLAN DRAWING BW-E2.5.

ALL DUPLEX RECEPTACLES IN THIS ROOM SHALL BE GFI RATED.

REFER TO FOOD SERVICE DRAWING FOR ELECTRICAL REQUIREMENTS FOR ANSUL FIRE SUPPRESSION SYSTEM AT HOOD. CONNECT TO NEW VOICE EVACUATION SYSTEM.

FOOD SERVICE CONTRACTOR TO PROVIDE NATURAL GAS EMERGENCY KEYED SHUT OFF SOLENOID. ELECTRICAL CONTRACTOR TO INSTALL.

PROVIDE POWER TO BACKBOARD OPERATOR. CONTROL WITH KEYED SWITCH. LABEL COVERPLATES TO AVOID CONFUSION.

PROVIDE GFI RATED RECEPTACLE TO ELECTRIC WATER COOLER. DUPLEX RECEPTACLE MUST BE READILY ACCESSIBLE AND NOT CONCEALED BEHIND ACCESS PANEL PER CODE. PROVIDE GFI RATED BREAKER IN PANEL.

EXISTING SOUND RACK TO REMAIN. PROVIDE (2) TWO DATA DROPS. SPEAKERS, MICROPHONE JACKS, ETC. ARE TO BE PART OF THE AV PROJECT. COORDINATE WITH SCHOOL'S TECHNOLOGY DIRECTOR.

15 REUSE/EXTEND EXISTING CIRCUIT FOR RELOCATED AIR LOCK.

16 SOUND SYSTEM, SPEAKERS, MICROPHONE JACKS, ETC WILL BE PART OF ANY PROJECT.

17 PROVIDE CLEAR COVER ON FIRE ALARM PULL STATION(S).

PROVIDE STAINLESS STEEL COVER PLATE OVER ABANDONED BACK BOX.

19 PROVIDE NEW SQUARE D PANELBOARD AS SHOWN, REFER TO ELECTRICAL ONE-LINE DIAGRAM.

ELECTRICAL ONE-LINE DIAGRAM.

20 PROVIDE NEW SQUARE D LOCKING DOOR ON EXISTING SQUARE

21 PROVIDE DEDICATED 120V CIRCUIT/QUADPLEX RECEPTACLE FOR NEW WATER HEATER.

22 EXISTING FIRE ALARM DEVICE TO REMAIN AND BE CONNECTED TO THE NEW VOICE EVACUATION SYSTEM.

NEW FIRE ALARM DEVICE TO BE INSTALLED IN SAME LOCATION AS EXISTING, AND BE CONNECTED TO THE NEW VOICE EVACUATION SYSTEM.

PROVIDE NEW VOICE EVACUATION CONTROL PANEL IN SAME LOCATION AS REMOVED FIRE ALARM CONTROL PANEL, FEED WITH DEDICATED IP20A CIRCUIT FROM PANEL LS, AS SHOWN. PROVIDE A COMPLETE AESTHETIC INSTALLATION.

RELOCATED CLOCK, REUSE/EXTEND EXISTING CIRCUIT. PROVIDE BACKBOX FOR 24V SERVICE.

PROVIDE NEW FIRE ALARM DEVICE(S) AS SHOWN AND CONNECT TO NEW YOICE EVACUATION CONTROL PANEL IN HALL IIS.

PROVIDE NEW NAC PANEL(S) AS NEEDED FOR NEW VOICE EVACUATION SYSTEM. REUSE/EXTEND EXISTING CIRCUIT(S). IF ADDITIONAL LOCATIONS ARE REQUIRED, COORDINATE WITH OWNER.

PROVIDE ONE DATA DROP IN BISCUIT JACK, ABOVE CEILING FOR WIRELESS ACCESS POINT. COORDINATE LOCATION WITH SCHOOL'S TECHNOLOGY DIRECTOR.

29 PROVIDE POWER TO PROJECTOR SCREEN OPERATOR.

PROVIDE DEDICATED 120V POWER TO CEILING PROJECTOR.
LOCATE 25' FROM SCREEN.

31 PROVIDE ONE DATA DROP IN BISCUIT JACK, IN CEILING FOR CAMERA. COORDINATE LOCATION WITH SCHOOL'S TECHNOLOGY DIRECTOR.

PROVIDE DATA AND POWER TO PROJECTION SCREEN, REFER TO 'AV COMMUNICATION OUTLET DETAIL' ON DRAWING BW-E3.I.

PROVIDE (3) THREE DATA DROPS IN BISCUIT JACK ABOVE CEILING. (1) ONE IS FOR EXTERNAL RINGER ON OFFICE PHONE.

34 PROVIDE (2) TWO DATA DROPS IN BISCUIT JACK ABOVE CEILING.

PROVIDE POWER AND DATA AS SHOWN FOR FLAT SCREEN, REFER TO DETAIL DRAWING BW-E3.I.

PROVIDE (2) TWO DATA DROPS IN BISCUIT JACK AT CEILING, FOR FUTURE USE. PROVIDE (2) TWO ADDITIONAL DATA DROPS FOR HYAC/LIGHTING CONTROL, COORDINATE LOCATION WITH MECHANICAL.

MECHANICAL MINI SPLIT UNIT WITH CONDENSER ON ROOF, PROVIDE POWER AS SHOWN ON ONE-LINE DIAGRAM.
ELECTRICAL CONTRACTOR TO PROVIDE CONTROL WIRING AND CONDUIT BETWEEN UNIT AND CONDENSER.

PROVIDE ELECTRICAL ROUGH-IN FOR OWNER PROVIDED CAMERA(S).

39 PROVIDE BACKBOX FOR 24V SERVICE, CLOCK BY OWNER.
40 NOT USED.

PROVIDE DUPLEX GFI RECEPTACLE AND CONNECT TO NEAREST AVAILABLE 120Y CIRCUIT.

PROVIDE GENERATOR, (2) TWO EMERGENCY PANELS, AND (2)
TWO AUTOMATIC TRANSFER SWITCHES (STACKED ON WALL).
REFER TO ELECTRICAL ONE-LINE DIAGRAM DRAWING BW-E3.3.

43 GENERATOR ALARM ANNUNCIATOR PANEL. PROVIDE WITH I"

CONDUIT TO GENERATOR CONTROL PANEL. COORDINATE

LOCATION WITH OWNER.

DUPLEX(S) WITH 'R' DESIGNATION TO BE RED AS
MANUFACTURED BY LEGRAND #5862RED. AND SHALL BE ON
EMERGENCY CIRCUIT AS SHOWN. COORDINATE LOCATION WITH

USER. PROVIDE ACCESSORIES TO MOUNT TO FURNITURE IF REQUIRED.

45 QUADPLEX WITH 'R' DESIGNATION TO BE RED, AS MANUFACTURED BY LEGRAND #IG420RED, AND SHALL BE ON (2) TWO DEDICATED EMERGENCY CIRCUITS AS SHOWN.

COORDINATE LOCATION WITH OWNER'S TECHNOLOGY DIRECTOR.

PROVIDE DATA FROM P.O.S. TO KITCHEN OFFICE AND DATA FROM KITCHEN OFFICE TO BUILDING SCHOOL NETWORK. COORDINATE LOCATION WITH SCHOOL'S TECHNOLOGY DIRECTOR.

PROVIDE DATA AND DUPLEX RECEPTACLE FOR SCOREBOARD AT 12'-4" A.F.F. FOR SCOREBOARD. COORDINATE REQUIREMENTS WITH MANUFACTURER.



KALAMAZOO | GRAND RAPIDS | CHELSEA

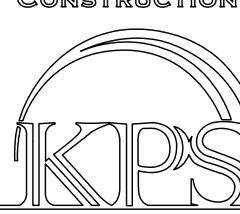
259 East Michigan Ave., Suite 308
Kalamazoo, MI 49007-6403
P: 269.381.4880 | F: 269.381.9110

www.kingscott.com

# Kentwood Michigan Kentwood Michigan Kentwood Michigan

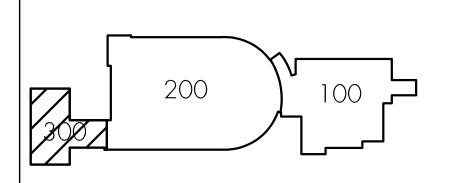


Fritz Wahlfield Construction



Kentwood
Public Schools

revisions/review	DATE
PROPOSAL REQUEST NO. 3	07/16/2021
CONSTRUCTION DOCUMENTS	07/16/2021
PROPOSAL REQUEST NO. 11	11/09/2021
Proposal request no. 15	01/20/2022
PROPOSAL REQUEST NO. 16	03/03/2022
PROPOSAL REQUEST NO. 17	03/25/2022



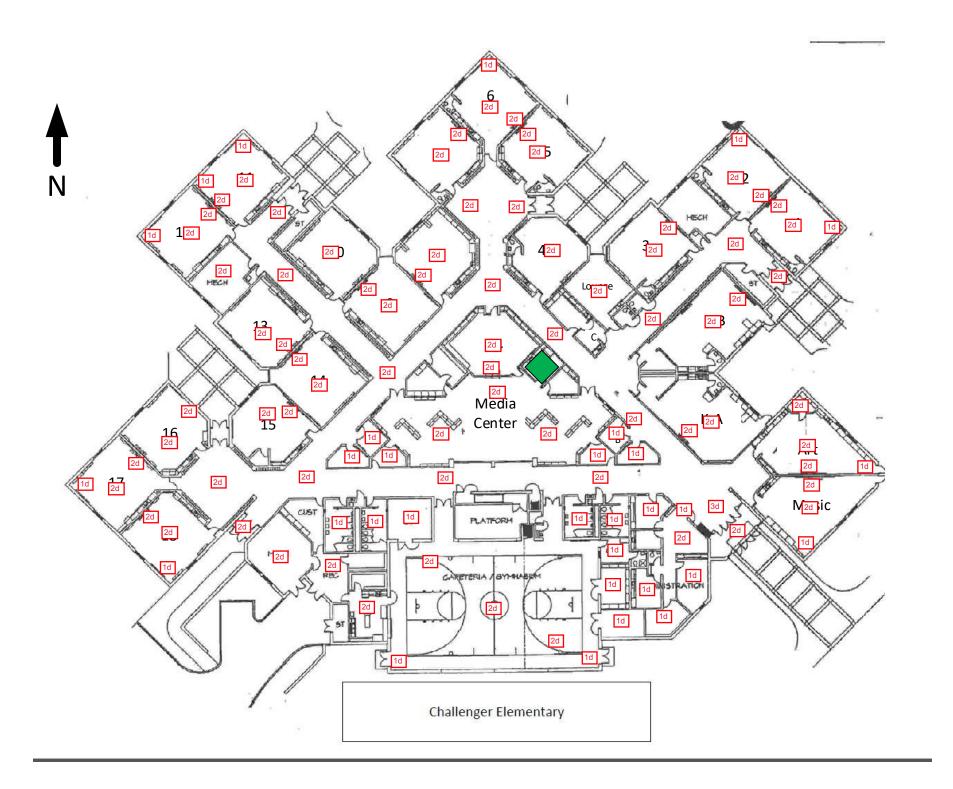


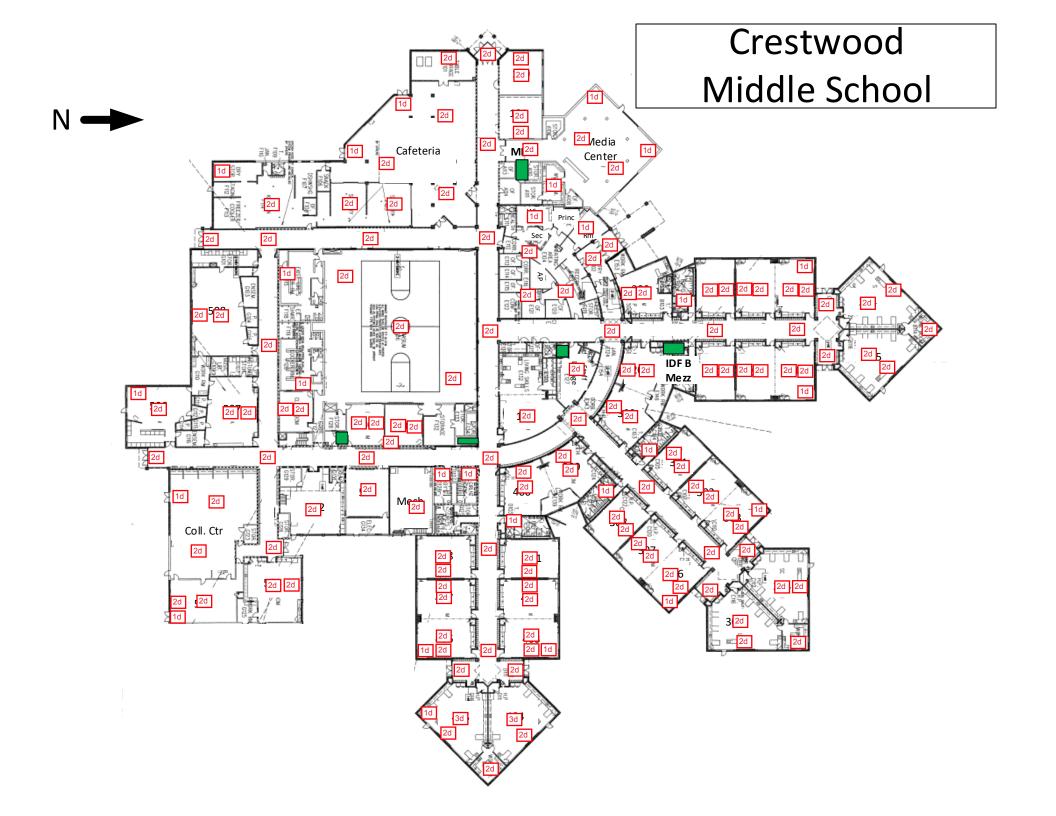
NORTH

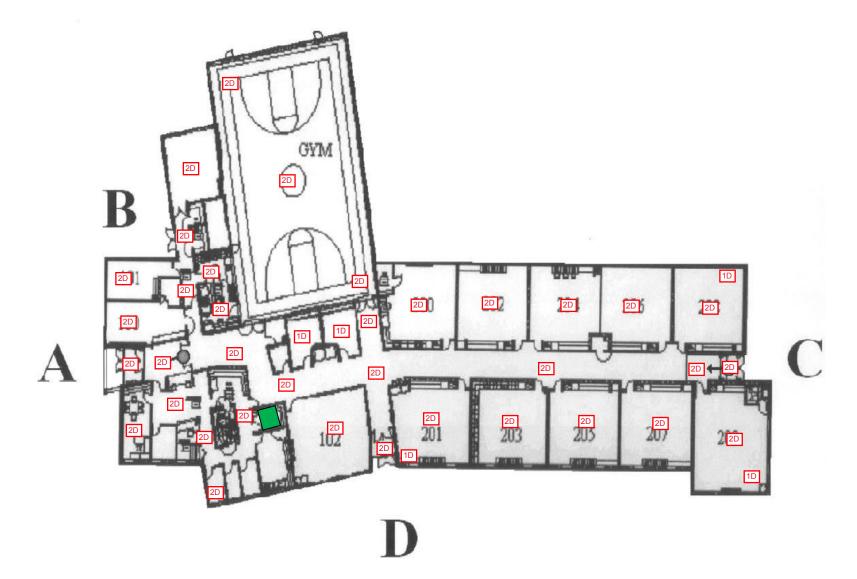
POWER PLAN - UNIT 300

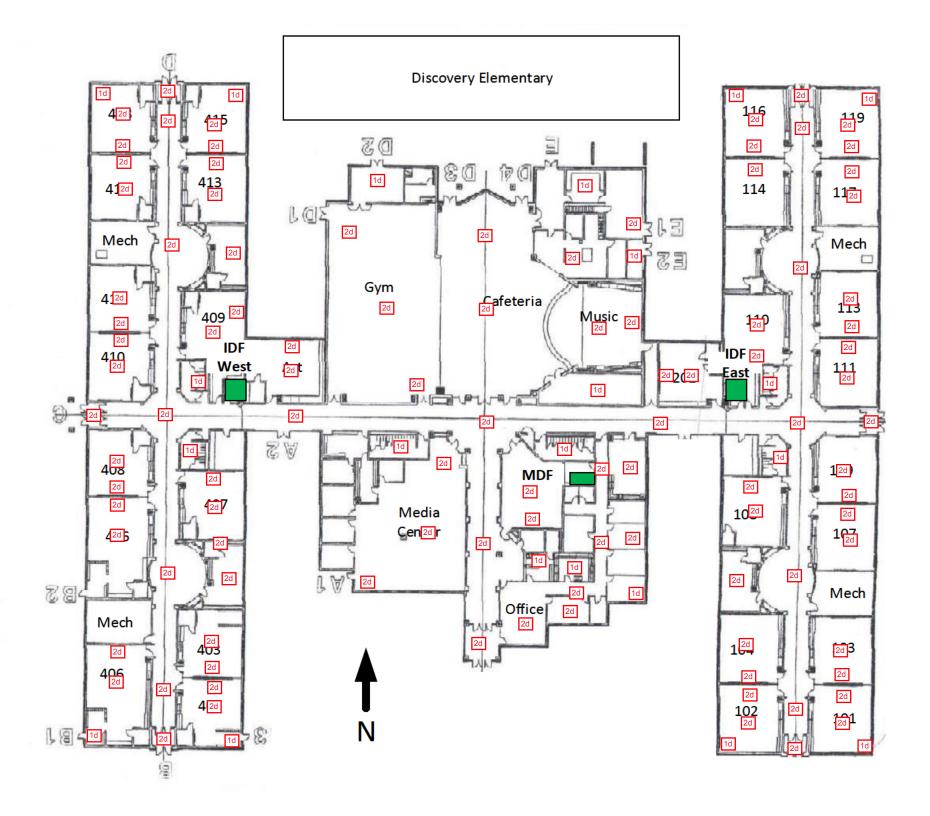
KINGSCOTT ASSOCIATES INC.

SHEET NO.

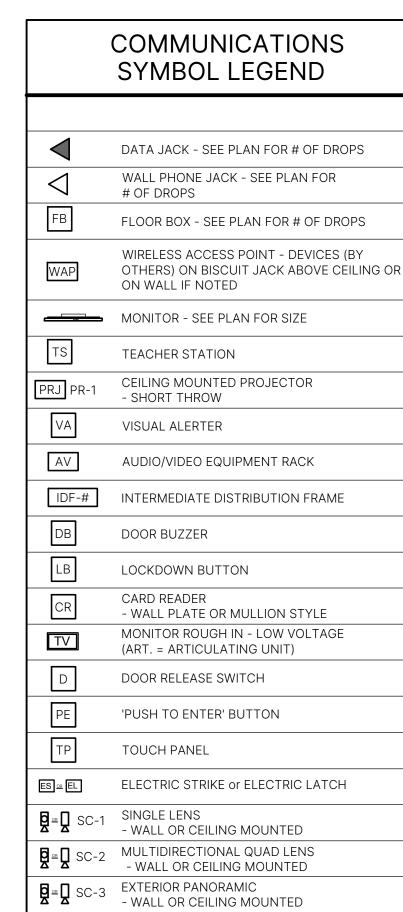








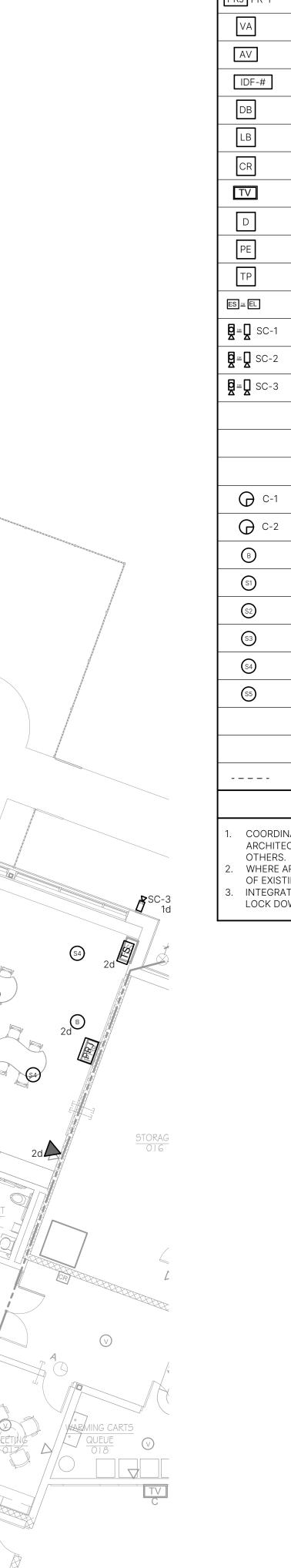




COMMUNICATIONS by DESIGN 4101 SPARKS DR. SE

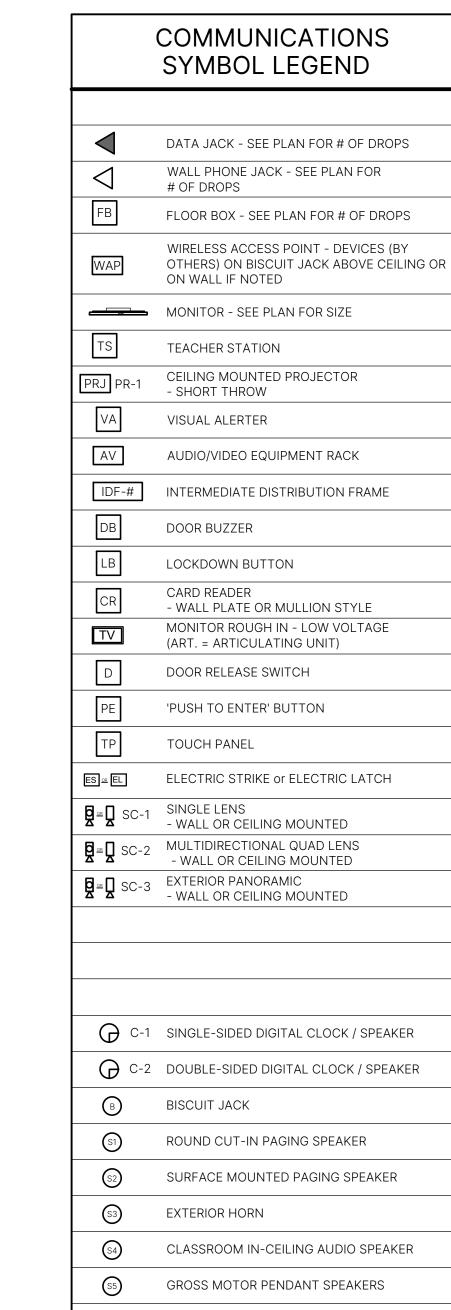
GRAND RAPIDS, MI 49546 WWW.CBDCONSULTING.COM

| CONSULTING, LLC | (616) 915-2768 JCHRISTOPHERAC.COM



UNIT B FLOOR PLAN

1/8" = 1'-0"



entwo(

COMMUNICATIONS by DESIGN

4101 SPARKS DR. SE

GRAND RAPIDS, MI 49546 WWW.CBDCONSULTING.COM

J. CHRISTOPHER

| CONSULTING, LLC | (616) 915-2768 JCHRISTOPHERAC.COM

SSUED: 1/23/2022 FINAL F

11/23/2022 FINAL RE

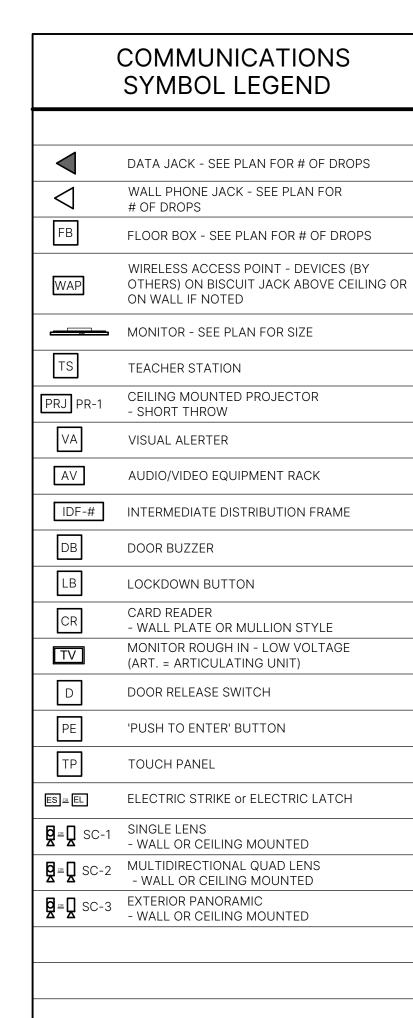
DRAWING TITLE:

UNIT B

COMMUNICATIONS
PLAN

T102





COMMUNICATIONS by DESIGN 4101 SPARKS DR. SE

GRAND RAPIDS, MI 49546 WWW.CBDCONSULTING.COM

J. CHRISTOPHER

| CONSULTING, LLC | (616) 915-2768 JCHRISTOPHERAC.COM

COORDINATE LOCATION OF ALL DEVICES WITH ARCHITECTURAL & ELECTRICAL DRAWINGS BY

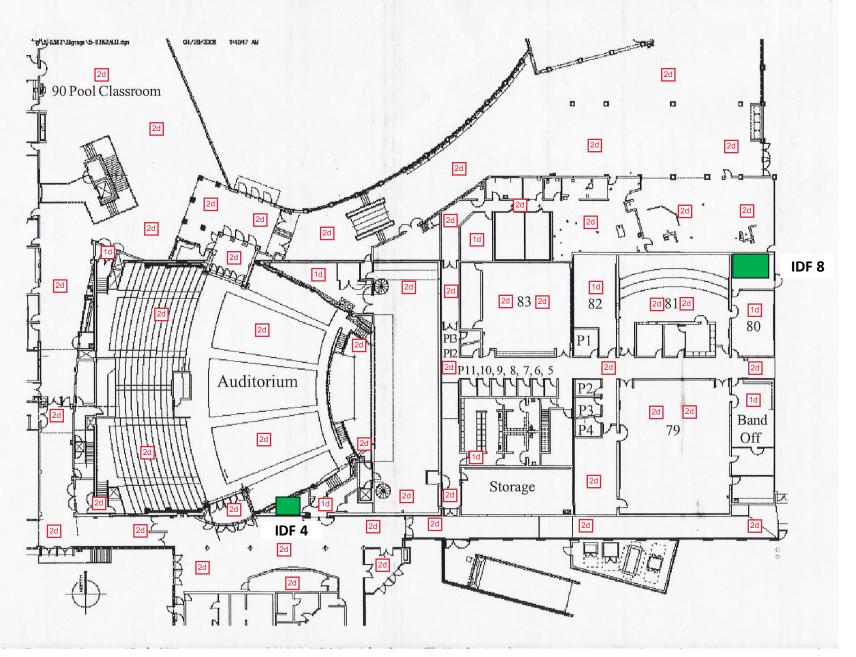
OTHERS.

2. WHERE APPLICABLE, COORDINATE THE RELOCATION OF EXISTING DEVICES WITH DEMOLITION PLAN.

3. INTEGRATE MAGNETIC HOLD OPEN DEVICES WITH LOCK DOWN BUTTONS.

T103

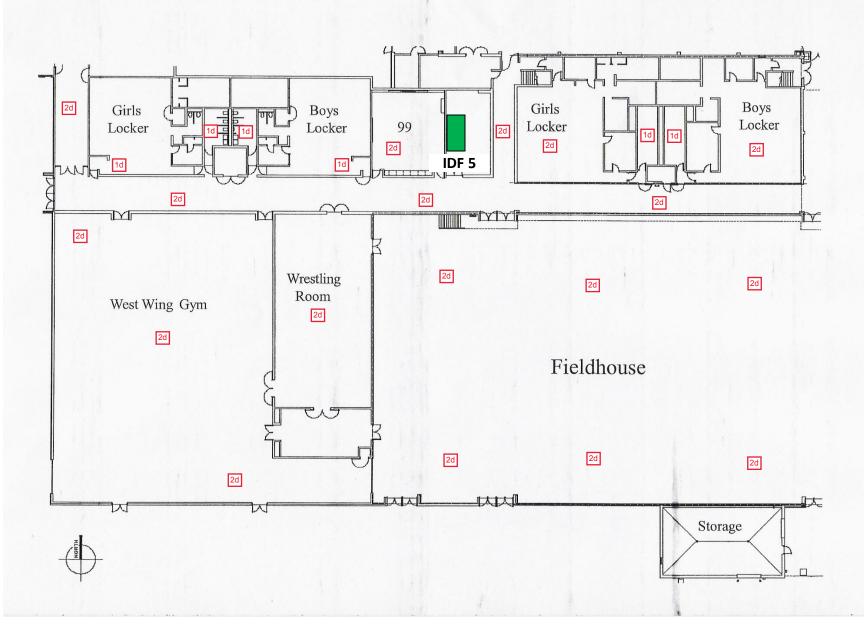
### East Kentwood High School-Auditorium/Music





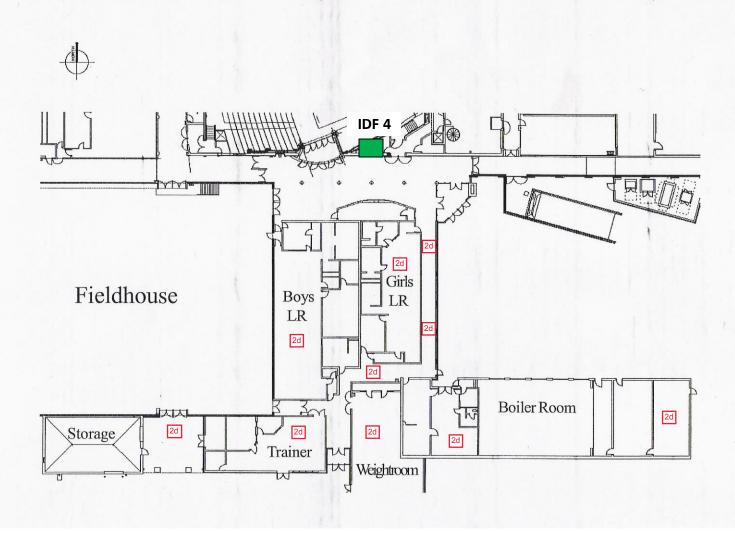
### East Kentwood High School-Fieldhosue West/WW Gym





### East Kentwood High School-Fieldhosue East/Weight





### East Kentwood High School – West Wing





### East Kentwood High School – East Wing (North)

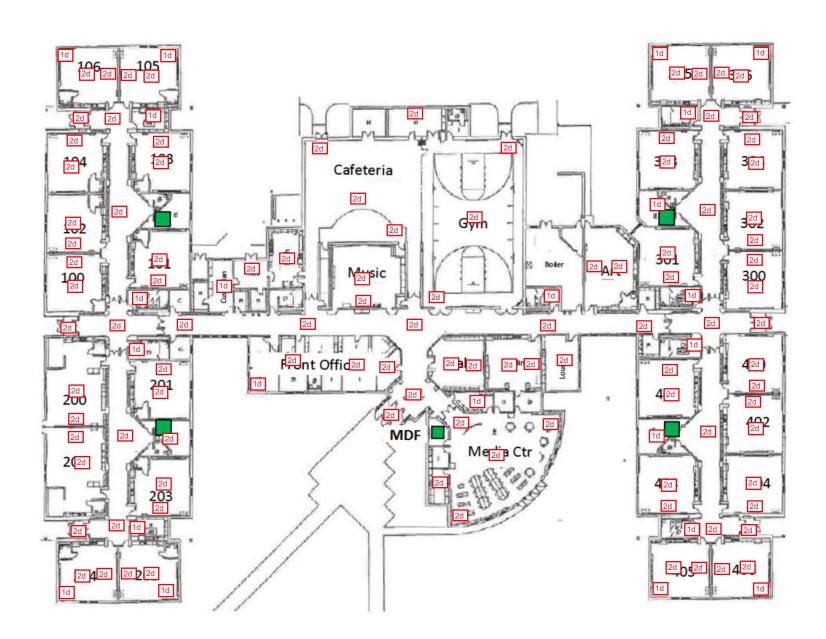




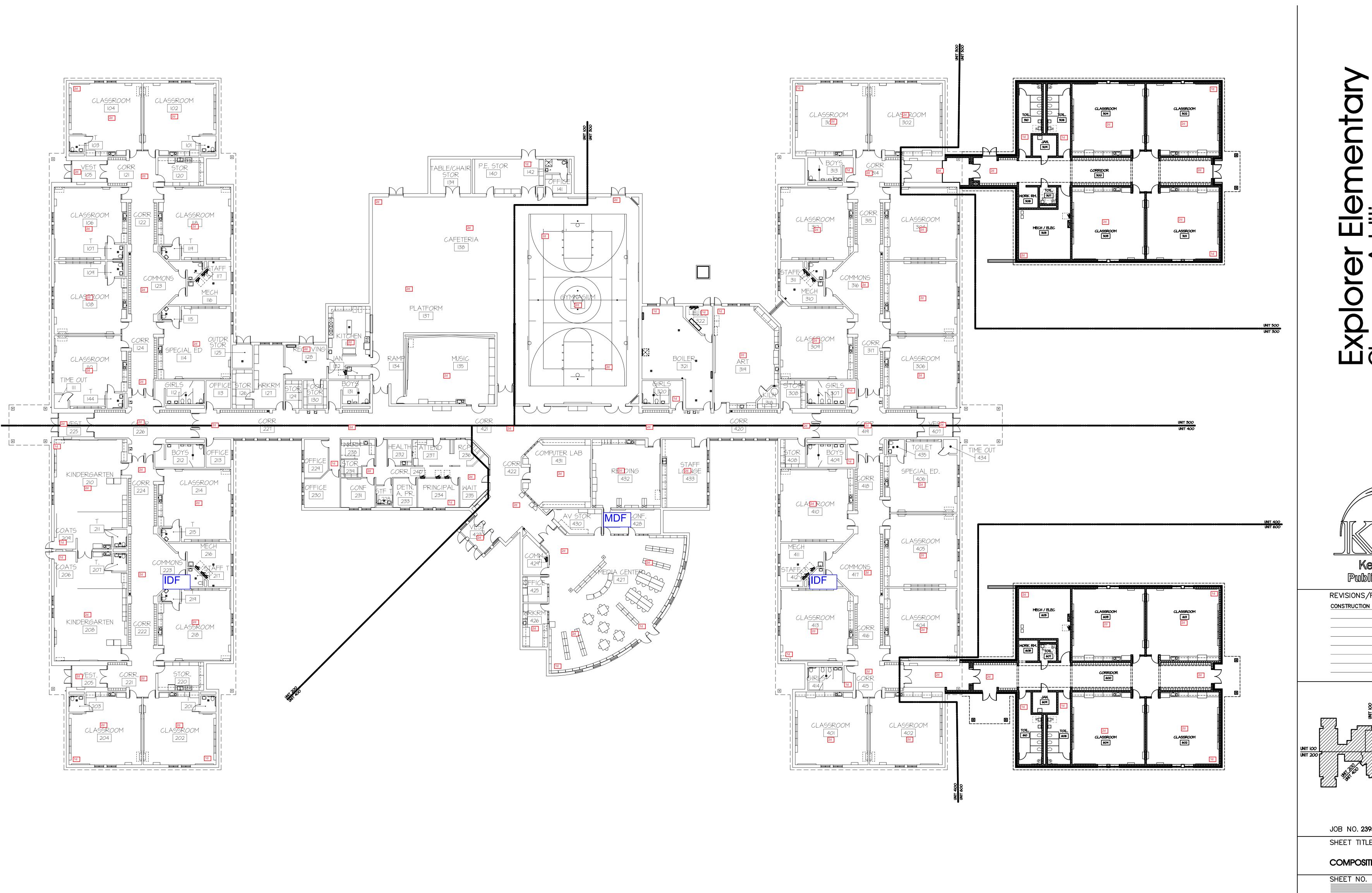
### East Kentwood High School – East Wing (South)



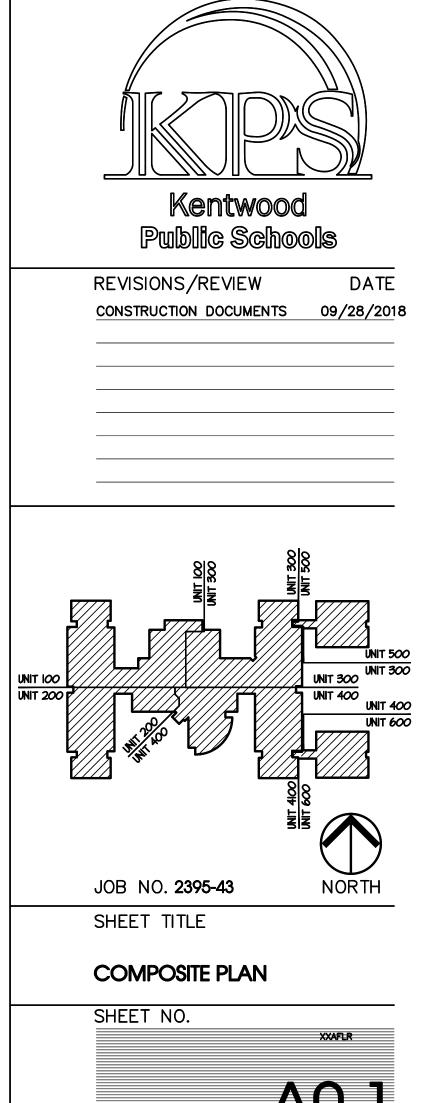








### Explorer Elementary Classroom Addition Kentwood Public Schools



C KINGSCOTT ASSOCIATES INC.

2d 2d

2d 2d



KALAMAZOO | GRAND RAPIDS | CHELSEA

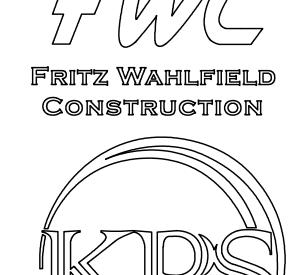
259 East Michigan Ave., Suite 308
Kalamazoo, MI 49007-6403
P: 269.381.4880 | F: 269.381.9110
www.kingscott.com

PROJECT DATA:

CODE REGULATION:

MICHIGAN BUILDING CODE - 2015 2012 NFPA IOI LIFE SAFETY CODE

## CAFETERIA REMODELING East Kentwood Freshman Campus Kentwood Public Schools

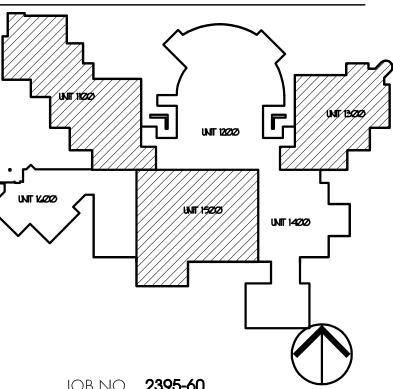


Kentwood Public Schools

REVISIONS/REVIEW

BIDS AND CONSTRUCTION C

DATE



JOB NO. **2395-60** SHEET TITLE

COMPOSITE PLAN - FIRST FLOOR





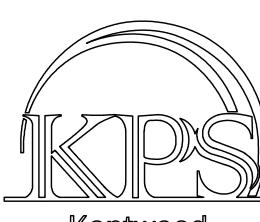
PROJECT DATA:

KALAMAZOO | GRAND RAPIDS | CHELSEA

259 East Michigan Ave., Suite 308
Kalamazoo, MI 49007-6403
P: 269.381.4880 | F: 269.381.9110
www.kingscott.com

## CAFETERIA REMODELING East Kentwood Freshman Campus Centwood Public Schools



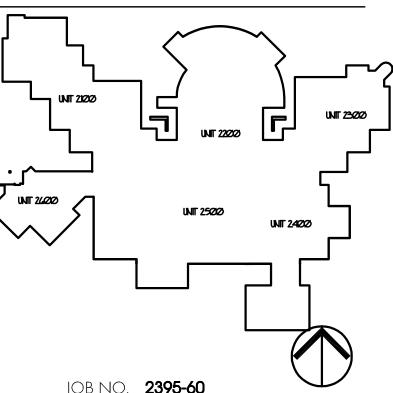


Kentwood
Public Schools

REVISIONS/REVIEW

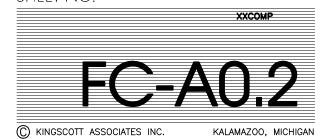
BIDS AND CONSTRUCTION

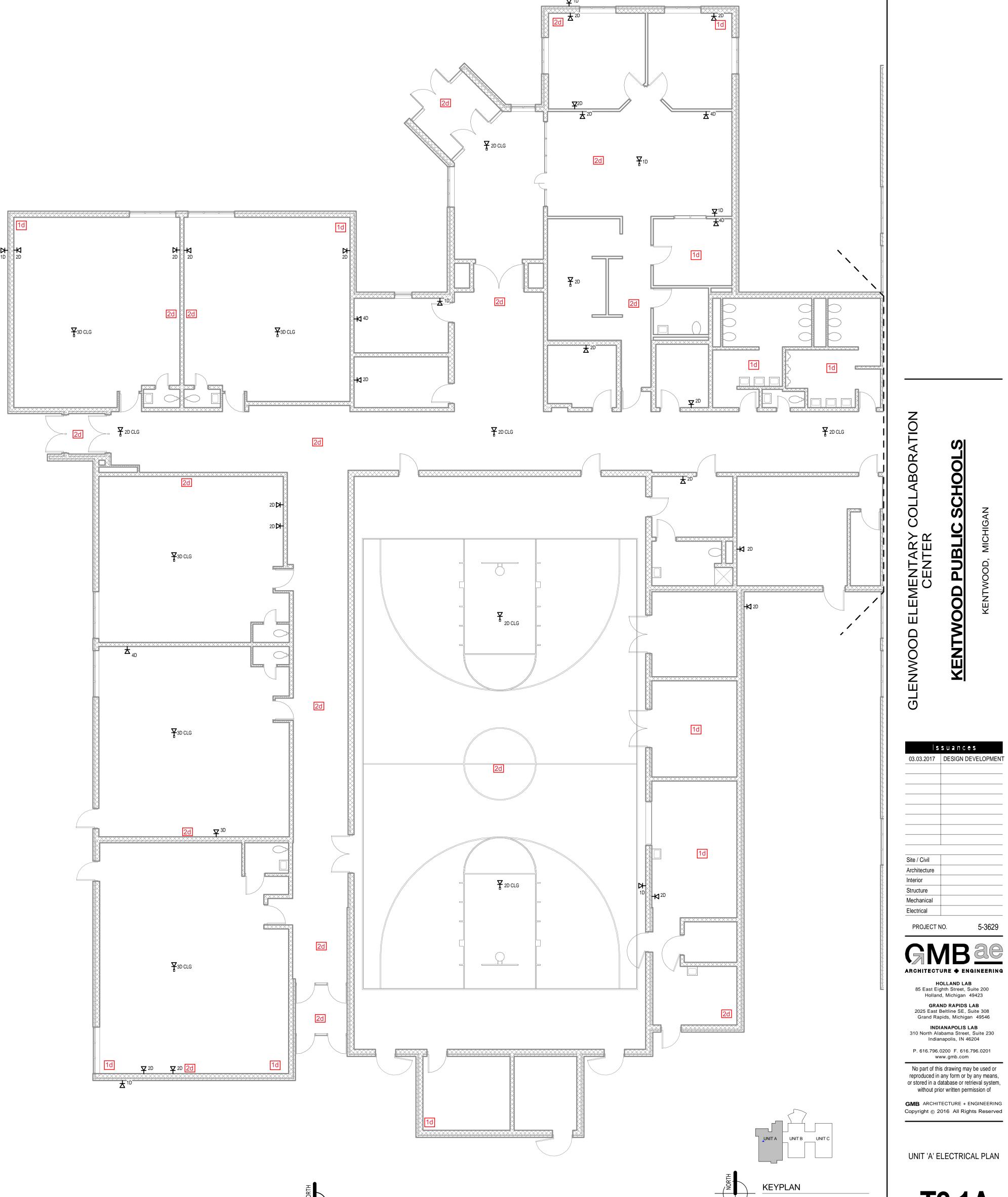
DATE



JOB NO. **2395-60** SHEET TITLE

COMPOSITE PLAN - SECOND FLOOR





UNIT 'A' FIRST FLOOR COMMUNICATION PLAN
1/8" = 1'-0"

Issuances 03.03.2017 DESIGN DEVELOPMENT ARCHITECTURE • ENGINEERING

HOLLAND LAB 85 East Eighth Street, Suite 200 Holland, Michigan 49423 2025 East Beltline SE, Suite 308 Grand Rapids, Michigan 49546 INDIANAPOLIS LAB 310 North Alabama Street, Suite 230 Indianapolis, IN 46204 P. 616.796.0200 F. 616.796.0201 www.gmb.com No part of this drawing may be used or reproduced in any form or by any means, or stored in a database or retrieval system, without prior written permission of

UNIT 'A' ELECTRICAL PLAN

ELECTRICAL KEYNOTES TECH

HOLLAND LAB 85 East Eighth Street, Suite 200 Holland, Michigan 49423

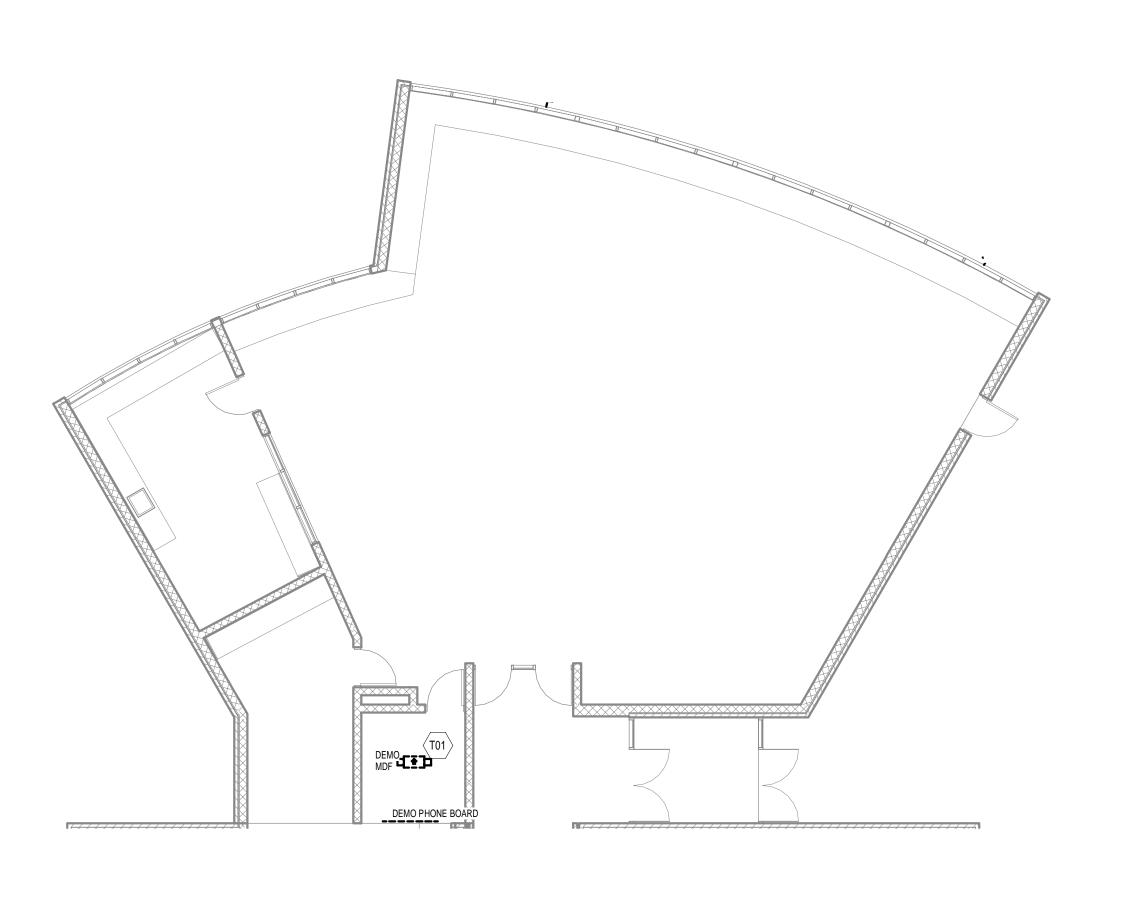
2025 East Beltline SE, Suite 308 Grand Rapids, Michigan 49546 INDIANAPOLIS LAB 310 North Alabama Street, Suite 230

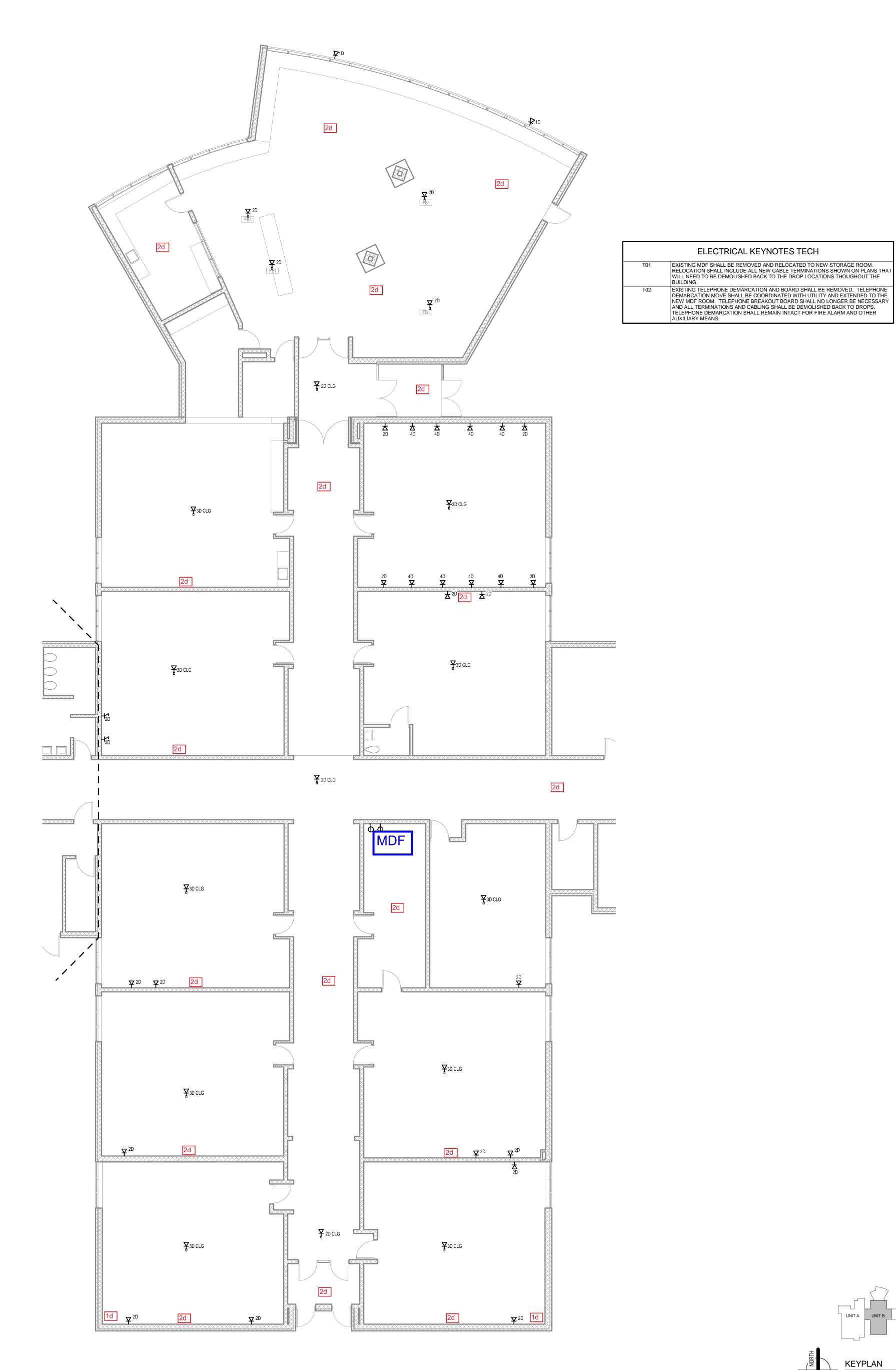
Indianapolis, IN 46204 P. 616.796.0200 F. 616.796.0201 www.gmb.com

No part of this drawing may be used or reproduced in any form or by any means, or stored in a database or retrieval system, without prior written permission of GMB ARCHITECTURE + ENGINEERING Copyright © 2016 All Rights Reserved

UNIT 'B' ELECTRICAL PLAN

KEYPLAN





ELEMENTARY COLL CENTER

Issuances 03.03.2017 DESIGN DEVELOPMENT Site / Civil Architecture

HOLLAND LAB 85 East Eighth Street, Suite 200 Holland, Michigan 49423 2025 East Beltline SE, Suite 308 Grand Rapids, Michigan 49546 INDIANAPOLIS LAB 310 North Alabama Street, Suite 230 Indianapolis, IN 46204

P. 616.796.0200 F. 616.796.0201 www.gmb.com No part of this drawing may be used or reproduced in any form or by any means, or stored in a database or retrieval system, without prior written permission of GMB ARCHITECTURE + ENGINEERING Copyright © 2016 All Rights Reserved

UNIT 'C' ELECTRICAL PLAN

KEYPLAN

UNIT 'C' FIRST FLOOR COMMUNICATION PLAN
1/8" = 1'-0"

259 East Michigan Ave., Suite 308 Kalamazoo, MI 49007-6403 P: 269.381.4880 | F:269.382.9110 800.632.7815

P U B L I C S C H O O L S

400

**KEY PLAN** 

JOB NO. 2395-72

SHEET TITLE

FIRST FLOOR POWER PLAN – UNIT

200 SHEET NO.

Strategic Energy Solutions® 4000 W. Eleven Mile Road Berkley, MI 48072 Phone 248.399.1900 Fax 248.399.1901 www.sesnet.com © 2022 SES, INC.

SES Project # 22 0588 05

(C) KINGSCOTT ASSOCIATES INC. KALAMAZOO, MICHIGAN



FIRST FLOOR POWER PLAN

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

259 East Michigan Ave., Suite 308 Kalamazoo, MI 49007-6403 P: 269.381.4880 | F:269.382.9110 800.632.7815

KENTWOOD P U B L I C S C H O O L S

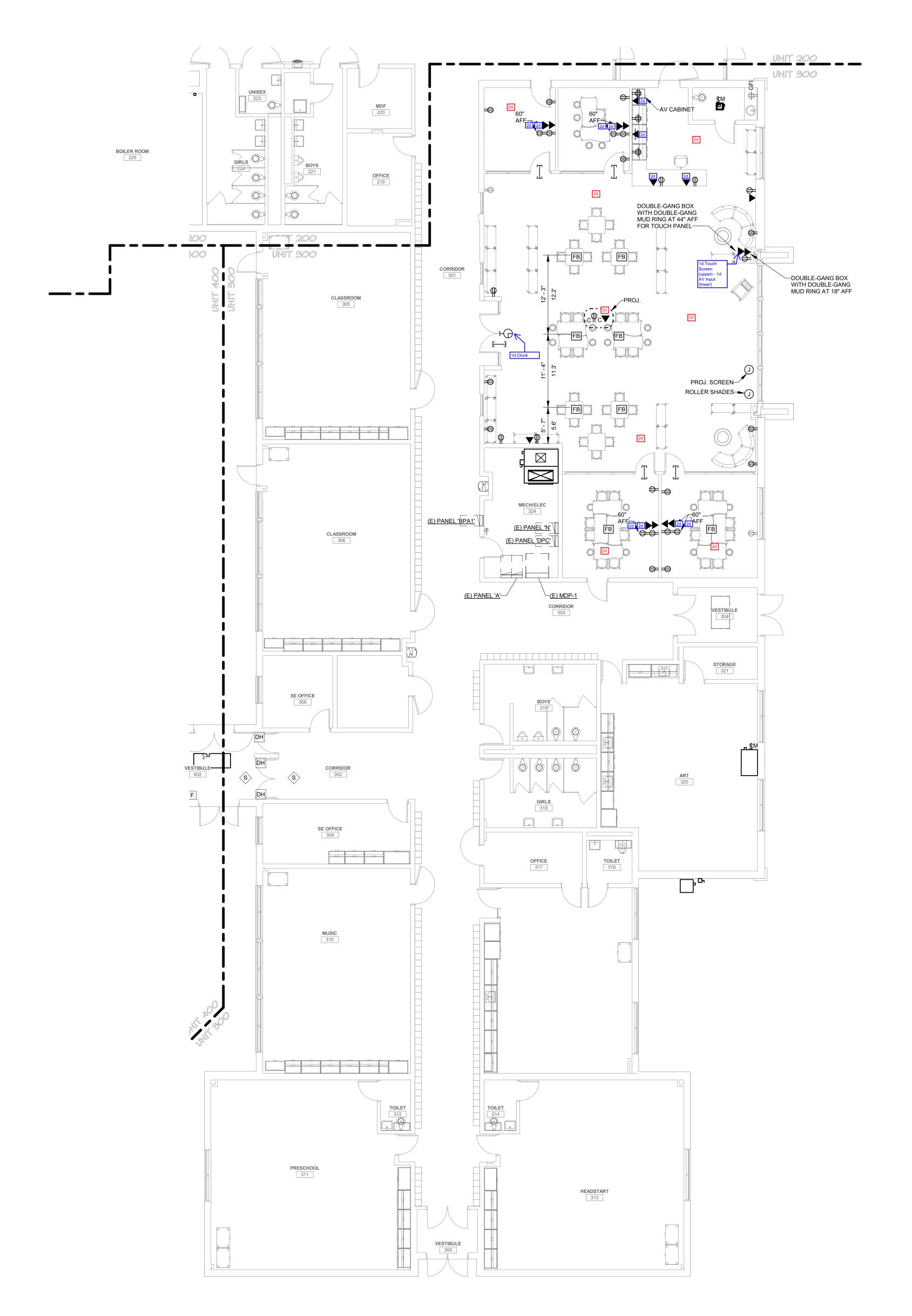
**KEY PLAN** 

JOB NO. 2395-72 SHEET TITLE FIRST FLOOR POWER PLAN – UNIT

300

SES Project # 22 0588 05

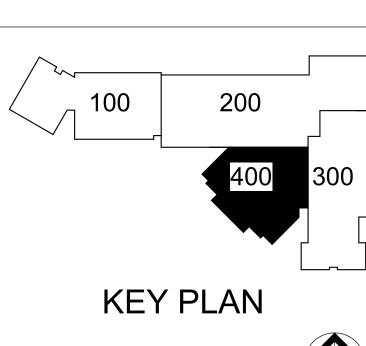






KALAMAZOO | GRAND RAPIDS | CHELSEA | ROYAL OAK

259 East Michigan Ave., Suite 308 Kalamazoo, MI 49007-6403 P: 269.381.4880 | F:269.382.9110 800.632.7815

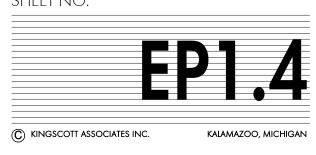


JOB NO. 2395-72

SHEET TITLE FIRST FLOOR POWER PLAN – UNIT

400

SHEET NO.



SES Project # 22 0588 05

259 East Michigan Ave., Suite 308 Kalamazoo, MI 49007-6403 P: 269.381.4880 | F:269.382.9110 800.632.7815

P U B L I C S C H O O L S

**KEY PLAN** 

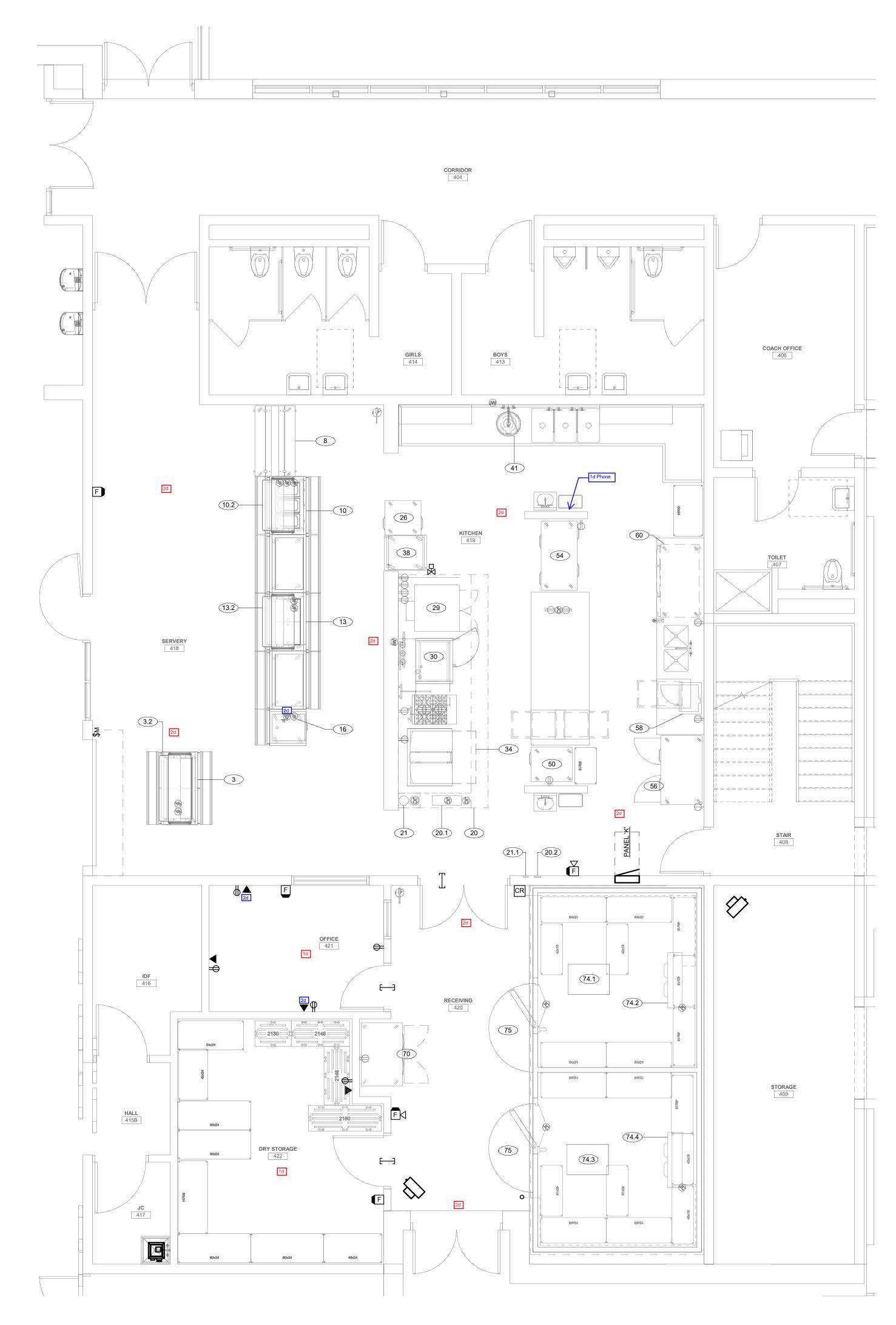
JOB NO. 2395-72

SHEET TITLE ENLARGED ELECTRICAL PLANS

SES Project # 22 0588 05

SHEET NO.

(C) KINGSCOTT ASSOCIATES INC. KALAMAZOO, MICHIGAN



1 EP1.4 ELECTRICAL KITCHEN PLAN SCALE: 1/4" = 1'-0"

GMB

616.796.0200

WWW.GMB.COM

11.17.2022 BIDS & CONSTRUCTION

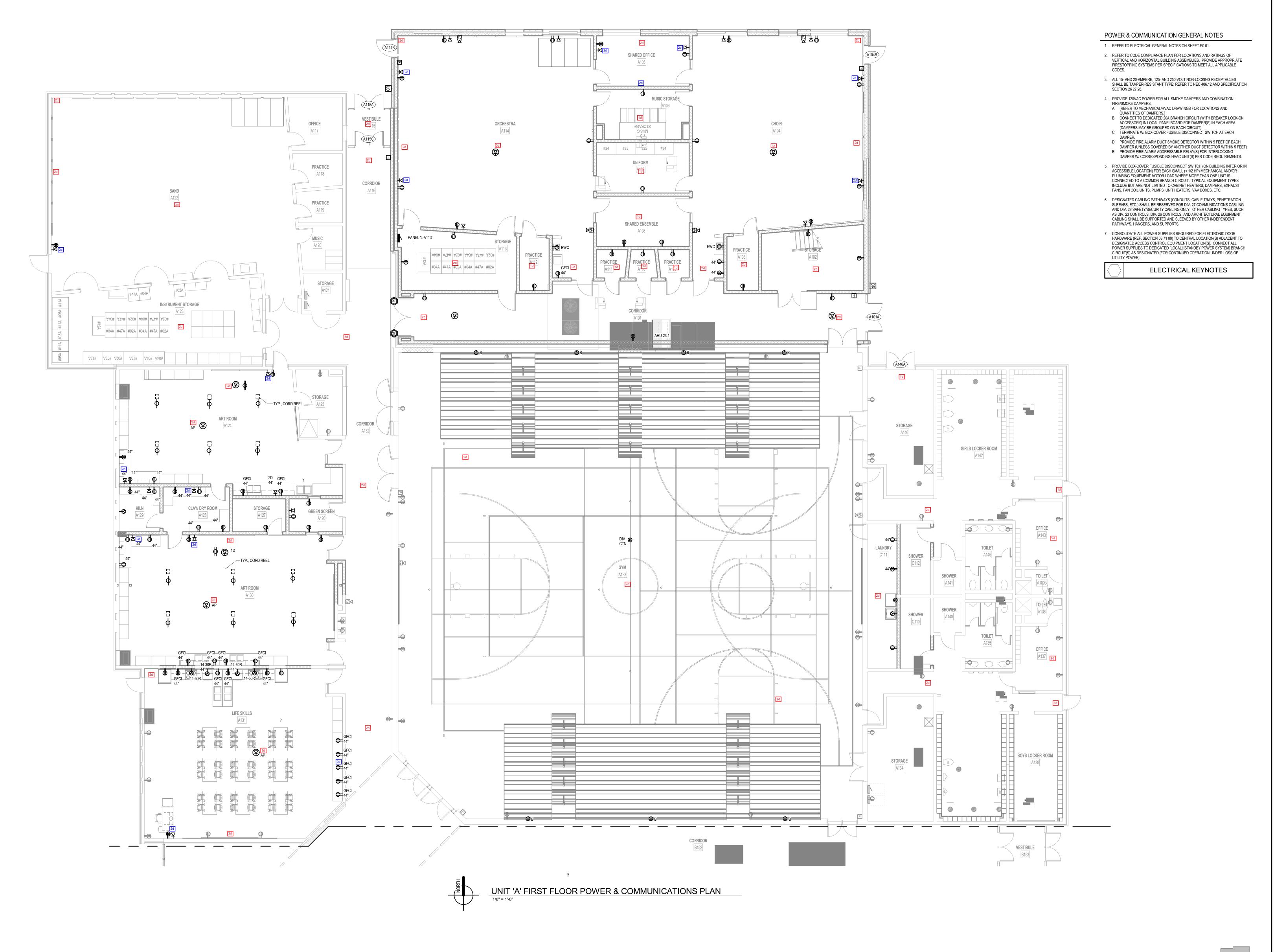
PROJECT NO. 5-5522

NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY FORM OR BY ANY MEANS, OR STORED IN A DATA BASE OR RETRIEVAL SYSTEM, WITHOUT PRIOR WRITTEN PERMISSION OF

GMB COPYRIGHT © 2022 ALL RIGHTS RESERVED

UNIT 'A' FIRST FLOOR POWER & COMMUNICATIONS PLAN

E2.1A





11.17.2022 BIDS & CONSTRUCTION

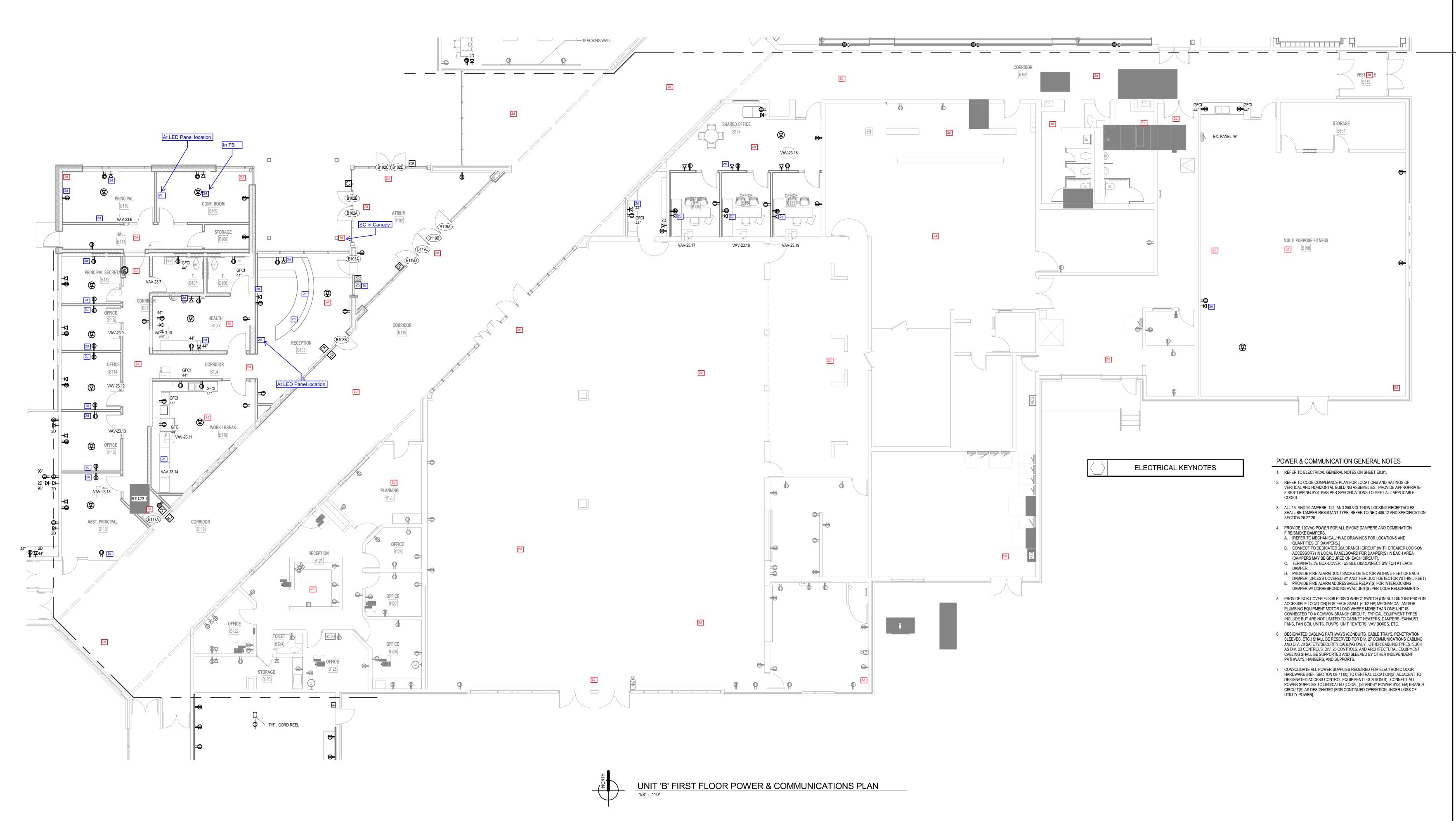
PROJECT NO. 5-5522

NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY FORM OR BY ANY MEANS, OR STORED IN A DATA BASE OR RETRIEVAL SYSTEM, WITHOUT PRIOR WRITTEN

UNIT 'B' FIRST FLOOR POWER & COMMUNICATIONS PLAN

GMB COPYRIGHT® 2022 ALL RIGHTS RESERVED

E2.1B



UNIT E UNIT D KEYPLAN

ELECTRICAL KEYNOTES



GMB

616.796.0200 WWW.GMB.COM

11.17.2022 BIDS & CONSTRUCTION

UNIT A

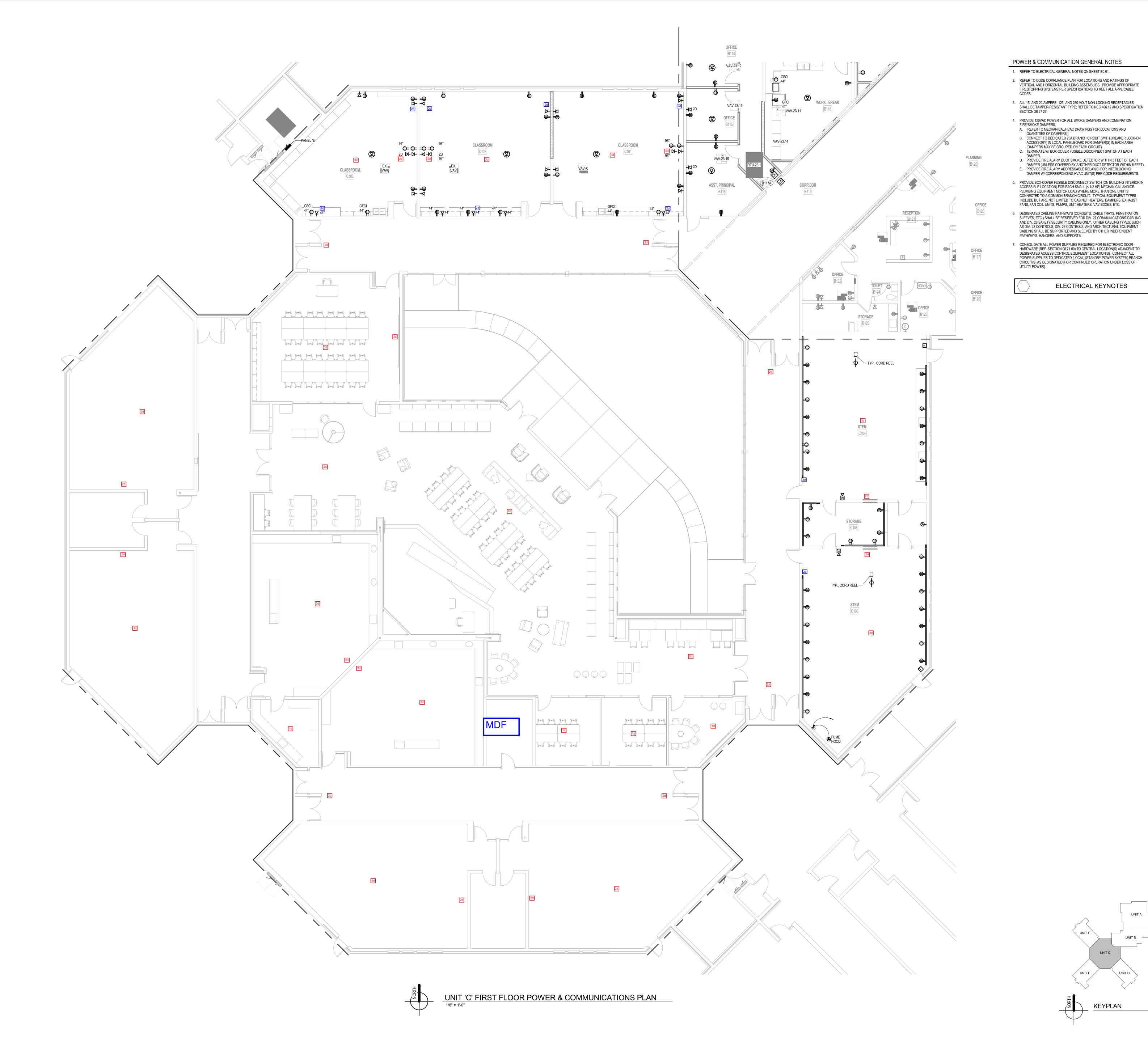
KEYPLAN

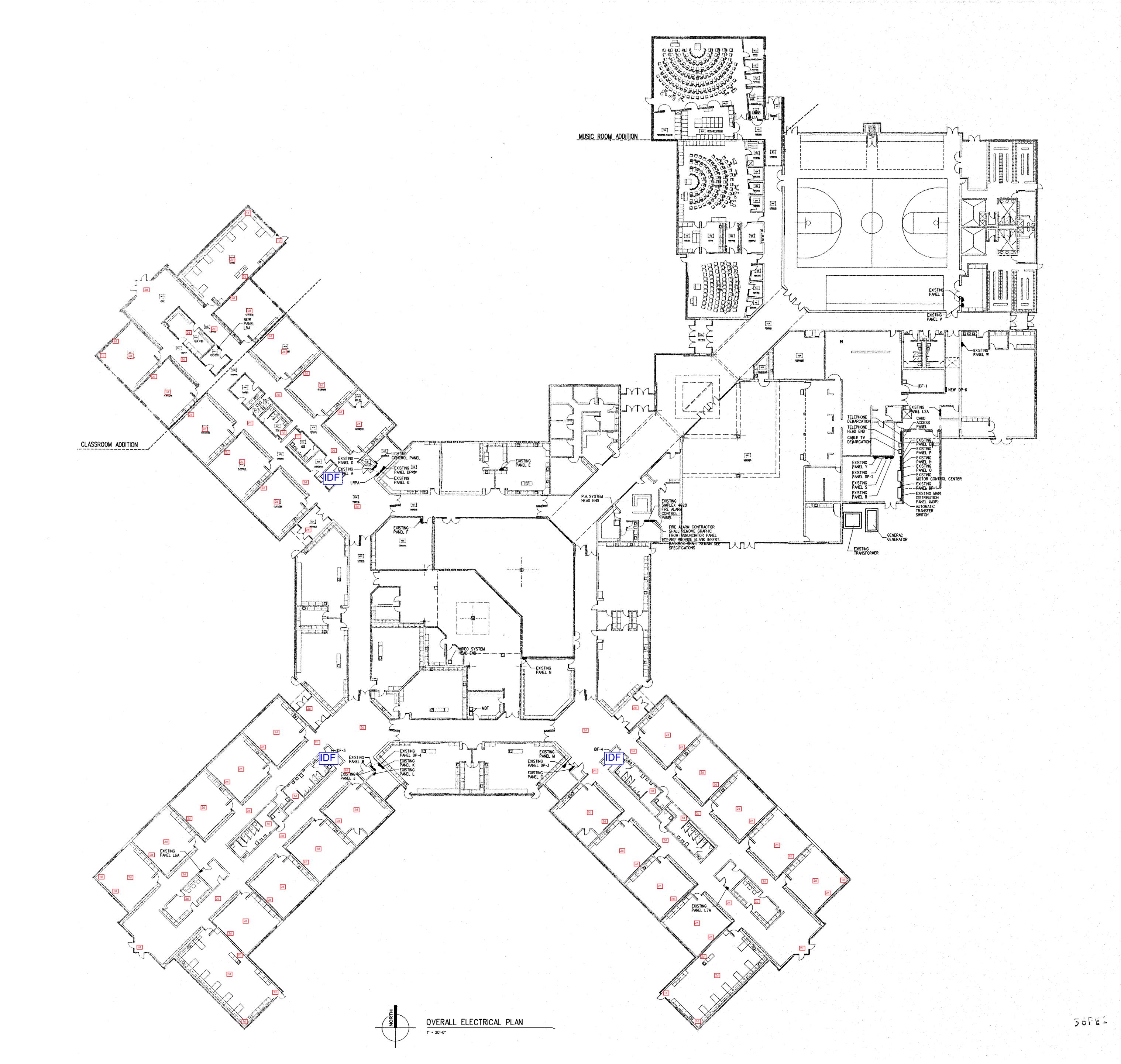
DRAWN BDD PROJECT NO. NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY FORM OR BY ANY MEANS, OR STORED IN A DATA BASE OR RETRIEVAL SYSTEM, WITHOUT PRIOR WRITTEN

GMB COPYRIGHT® 2022 ALL RIGHTS RESERVED

UNIT 'C' FIRST FLOOR POWER & COMMUNICATIONS PLAN

**E2.1C** 

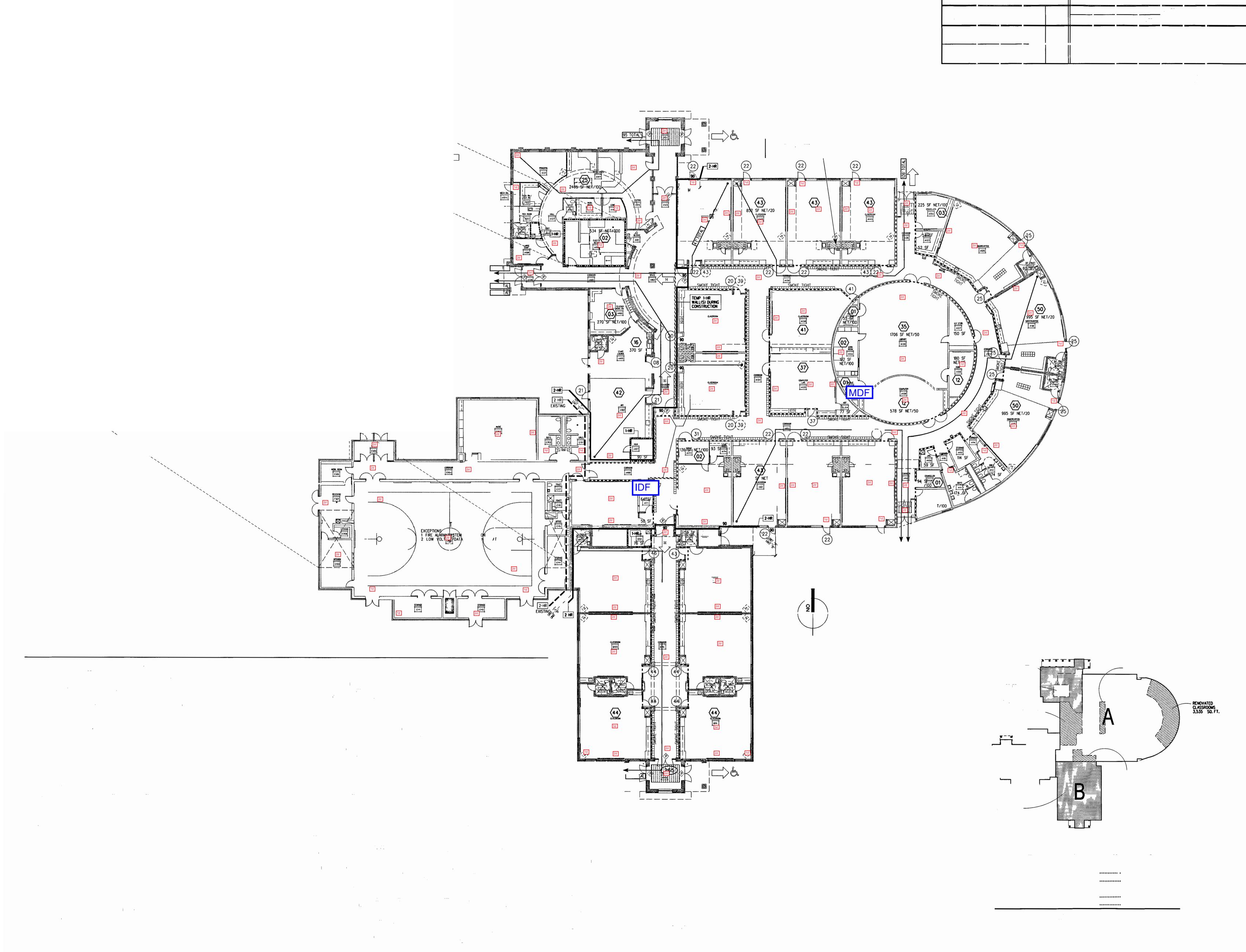




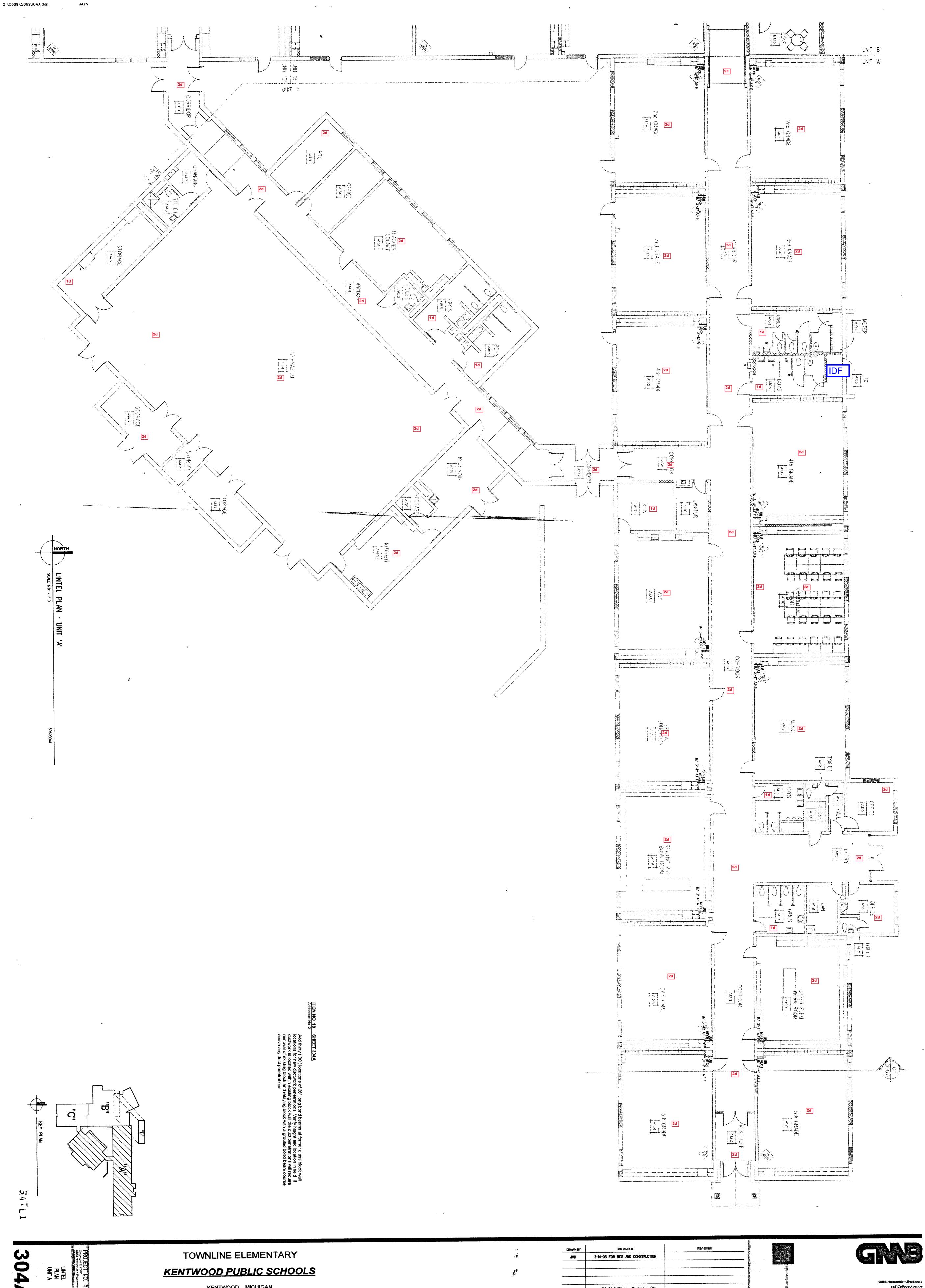
Drawings shall not be reproduced without written authorization from GMB Architects-Engineers

PROJECT NO. 5144

Copyright © 2003
GMB Architects - Engineers OVERALL ELECTRICAL

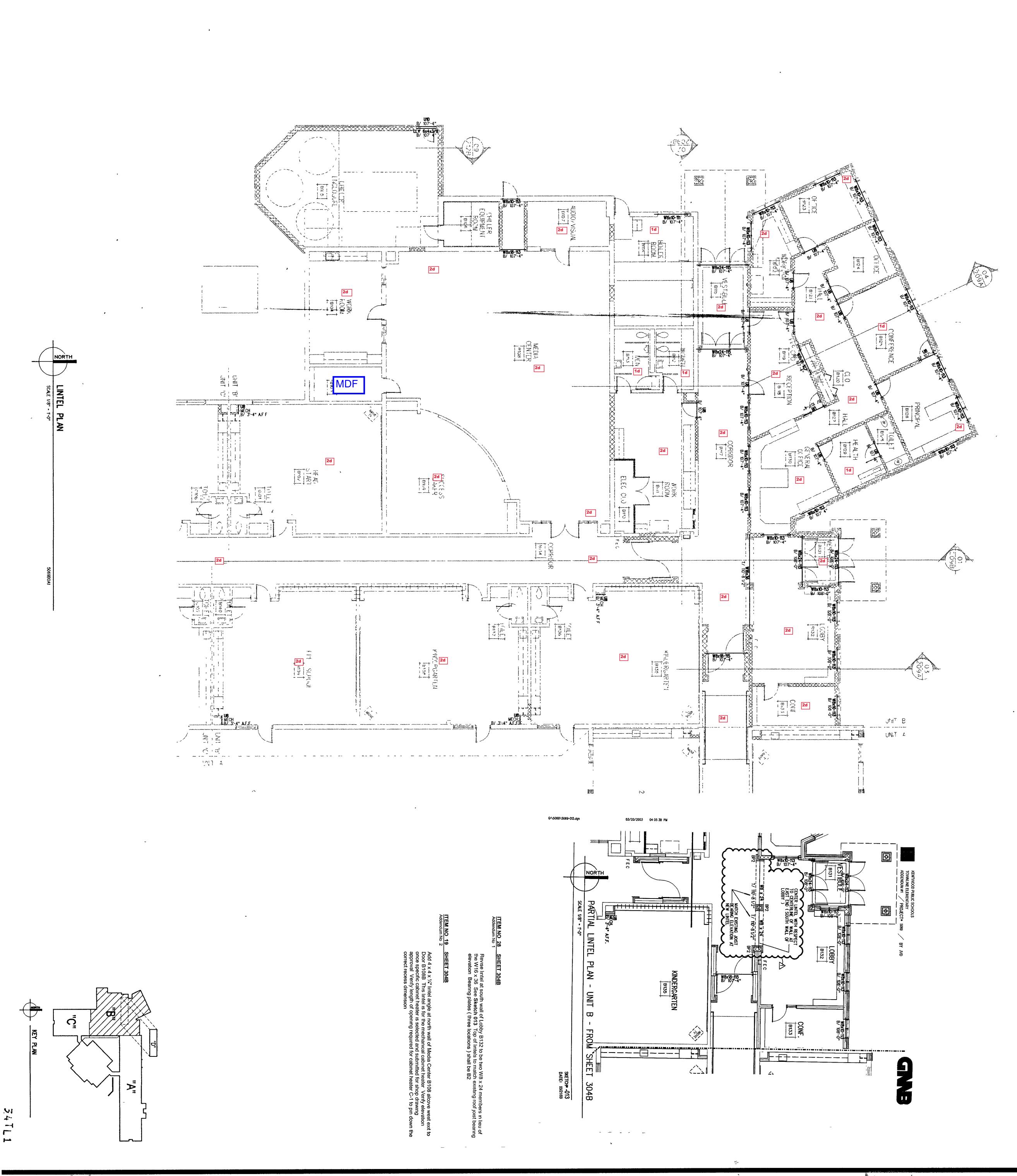






KENTWOOD, MICHIGAN 03/14/2003 10 46 27 PM

145 College Avenue Holland MI 49423-2921



SOA FIAN

TOWNLINE ELEMENTARY

KENTWOOD, MICHIGAN

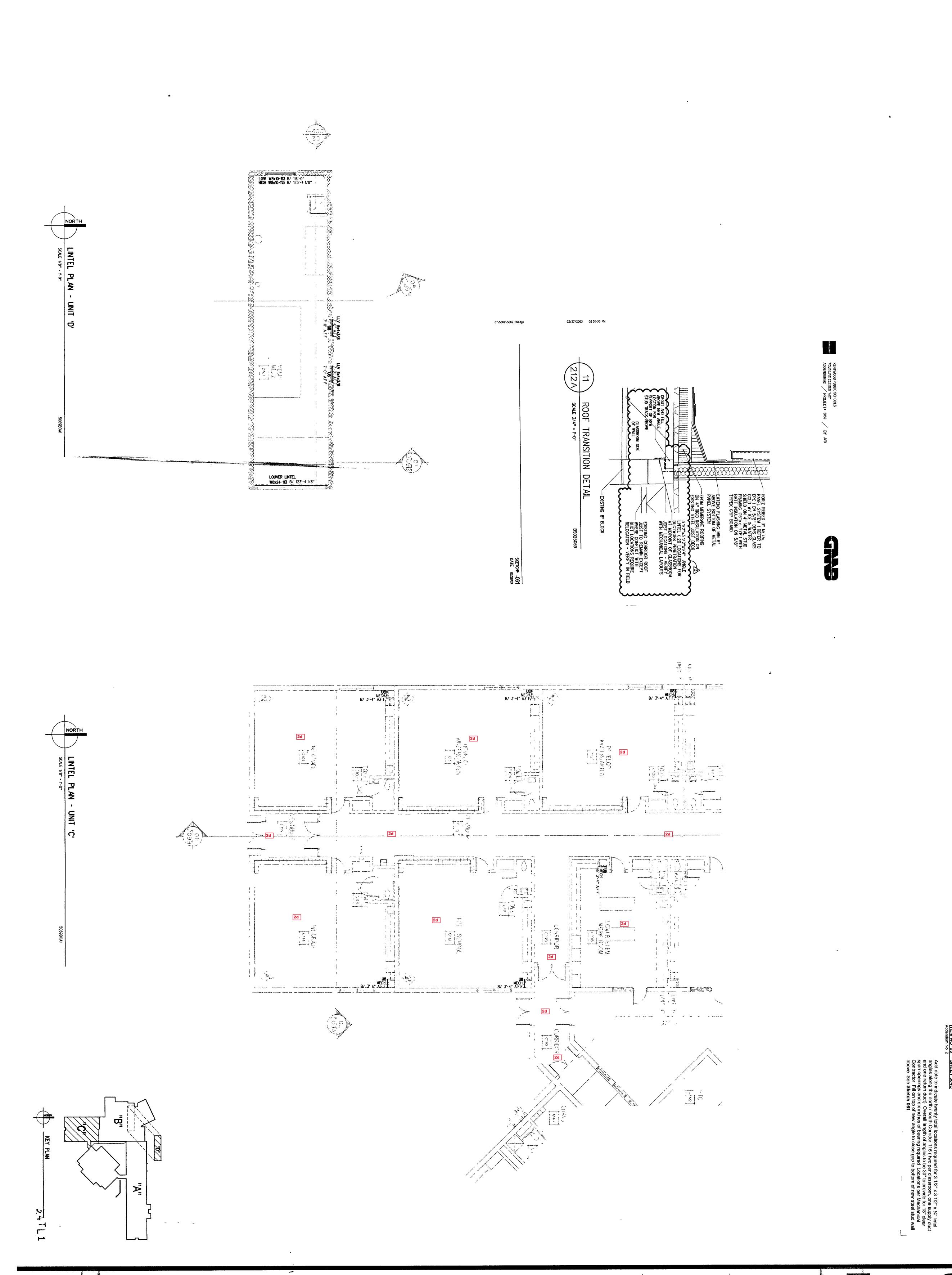
DRAWN BY ISSUANCES REVISIONS

JVD 3-14-03 FOR BIDS AND CONSTRUCTION

03/14/2003 10 48 58 PM

GMB Architects • Engine

GMB Architects • Engineers 145 College Avenue Holland MI 49423-2921



GMB Architects • Engineers
145 College Avenue
Holland MI 49423-2921

TOWNLINE ELEMENTARY

KENTWOOD PUBLIC SCHOOLS

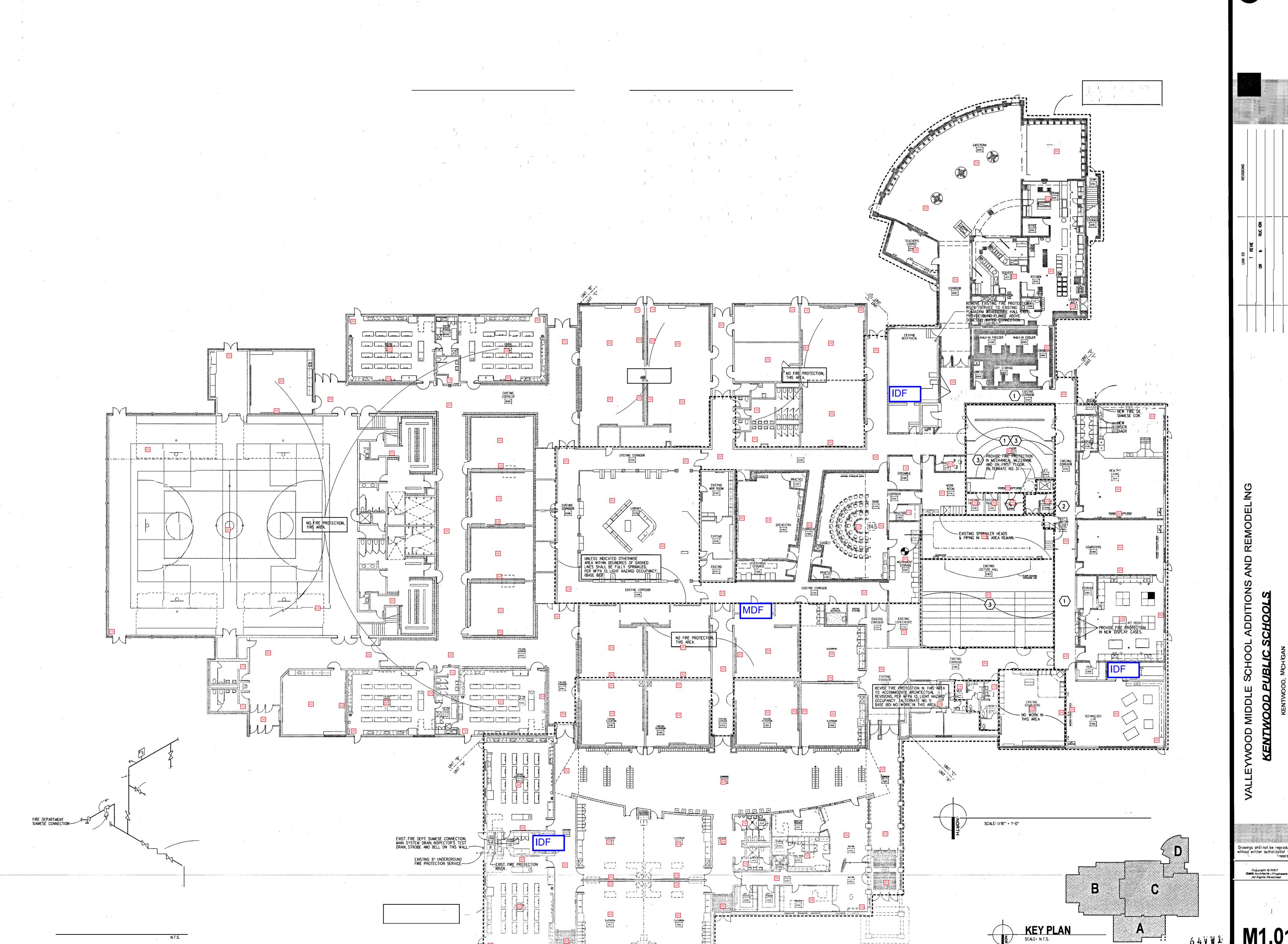
KENTWOOD, MICHIGAN

PRAWN BY ISSUANCES REVISIONS

JVD 3-14-03 FOR BIDS AND CONSTRUCTION

03/14/2003 10 52 54 PM

G \5069\5069304C dgn



۔ مد بیر نے سو سے سے سے سے اس بود سے سے سے ا

Drowings shall not be reproduced without written authorization from I neers Copyright © 2007 GMB Architects - Engineers All Rights Reserved

## **Kentwood Public Schools**

# Multimedia Technology Renovations - Appendix B Equipment List

	Ultra Short Throw Interactive Projector - (INSTALLATIO N ONLY)	Wireless Presentation System	Voice Amplification	Document Camera
Meadowlawn Elementary	18	18	18	18
Discovery Elementary	34	34	34	34
Challenger Elementary	23	23	23	23
Endeavor Elementary	31	31	31	31
Glenwood Elementary	34	34	34	34
Southwood Elementary	23	23	23	23
TOTALS	163	163	163	163

Meadowlawn Elementary							
KPS Room Number	Architectural Drawing Room Number	Ultra Short Throw Interactive Projector (INSTALLATIO N ONLY)	Wireless Presentation System	Voice Amplification	Document Camera		
1	D144	1	1	1	1		
2	D140	1	1	1	1		
3	D139	1	1	1	1		
4	D136	1	1	1	1		
5	D131	1	1	1	1		
6	D126	1	1	1	1		
7	D120	1	1	1	1		
8	D107	1	1	1	1		
9	D116	1	1	1	1		
10	B105	1	1	1	1		
12/Lab		0	0	0	0		
13	C119	1	1	1	1		
14	C110	1	1	1	1		
15/Music	B114	1	1	1	1		
16	B121	1	1	1	1		
17	B118	1	1	1	1		
18	B124	1	1	1	1		
19	B102	1	1	1	1		
20/Storage	B126	0	0	0	0		
28/Art	A117	1	1	1	1		
New Room	D127	0	0	0	0		
New Room	D130	0	0	0	0		
	Building Totals	18	18	18	18		

Г

Discovery Elementary				
KPS Room Number	Ultra Short Throw Interactive Projector (INSTALLATIO N ONLY)	Wireless Presentation System	Voice Amplification	Document Camera
102	1	1	1	1
103	1	1	1	1
104	1	1	1	1
107	1	1	1	1
108	1	1	1	1
110	1	1	1	1
111	1	1	1	1
113	1	1	1	1
114	1	1	1	1
116	1	1	1	1
117	1	1	1	1
118	1	1	1	1
119	1	1	1	1
121	1	1	1	1
201	1	1	1	1
Music/204	1	1	1	1
Art/214	1	1	1	1
320A	1	1	1	1
320B	1	1	1	1
401	1	1	1	1
402	1	1	1	1
403	1	1	1	1
406	1	1	1	1
407	1	1	1	1
408	1	1	1	1

409	1	1	1	1
410	1	1	1	1
412	1	1	1	1
413	1	1	1	1
415	1	1	1	1
416	1	1	1	1
417	1	1	1	1
418	1	1	1	1
420	1	1	1	1
Building Totals	34	34	34	34

Challenger Elementary				
KPS Room Number	Ultra Short Throw Interactive Projector (INSTALLATIO N ONLY)	Wireless Presentation System	Voice Amplification	Document Camera
1	1	1	1	1
2	1	1	1	1
3	1	1	1	1
4	1	1	1	1
5	1	1	1	1
6	1	1	1	1
7	1	1	1	1
8	1	1	1	1
9	1	1	1	1
10	1	1	1	1
11	1	1	1	1
12	1	1	1	1
13	1	1	1	1
14	1	1	1	1
15	1	1	1	1
16	1	1	1	1
17	1	1	1	1
18	1	1	1	1
Art/26	1	1	1	1
KA/27	1	1	1	1
KA/28	1	1	1	1
24/LAB	1	1	1	1
25/Music	1	1	1	1
	23	23	23	23

Endeavor Elementary				
KPS Room Number	Ultra Short Throw Interactive Projector (INSTALLATIO N ONLY)	Wireless Presentation System	Voice Amplification	Document Camera
100	1	1	1	1
101	1	1	1	1
102	1	1	1	1
103	1	1	1	1
104	1	1	1	1
105	1	1	1	1
106	1	1	1	1
200	1	1	1	1
201	1	1	1	1
202	1	1	1	1
203	1	1	1	1
204	1	1	1	1
205	1	1	1	1
300	1	1	1	1
301	1	1	1	1
302	1	1	1	1
303	1	1	1	1
304	1	1	1	1
305	1	1	1	1
306	1	1	1	1
400	1	1	1	1
401	1	1	1	1
402/LAB	1	1	1	1
403	1	1	1	1
404	1	1	1	1

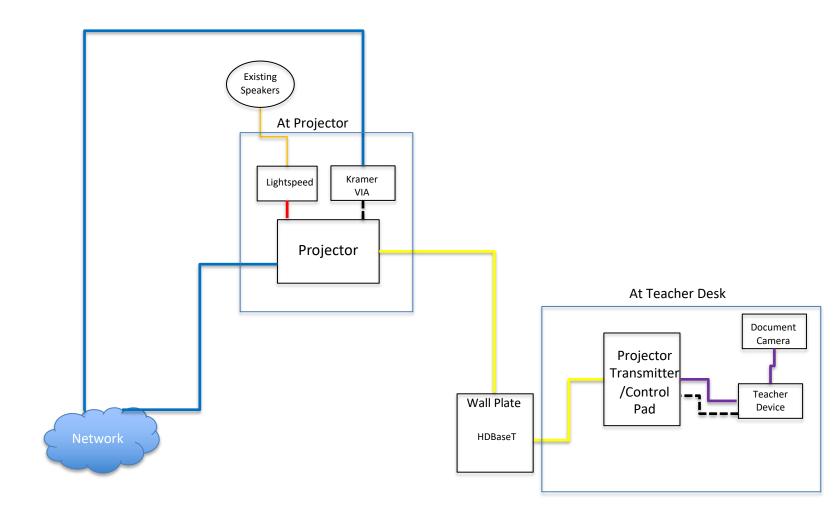
405	1	1	1	1
406	1	1	1	1
LMC/LAB	1	1	1	1
Art	1	1	1	1
Music	1	1	1	1
Reading	1	1	1	1
	31	31	31	31

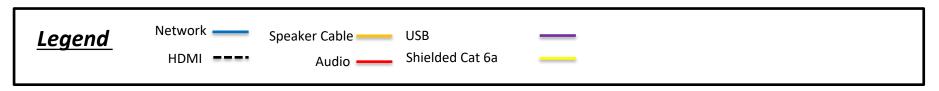
Glenwood Elementary				
KPS Room Number	Ultra Short Throw Interactive Projector (INSTALLATIO N ONLY)	Wireless Presentation System	Voice Amplification	Document Camera
101	1	1	1	1
102	1	1	1	1
103	1	1	1	1
104	1	1	1	1
105	1	1	1	1
301	1	1	1	1
302	1	1	1	1
303	1	1	1	1
304	1	1	1	1
305	1	1	1	1
306/LAB	1	1	1	1
307	1	1	1	1
308	1	1	1	1
310	1	1	1	1
311	1	1	1	1
401	1	1	1	1
402	1	1	1	1
403	1	1	1	1
404	1	1	1	1
405	1	1	1	1
406	1	1	1	1
407	1	1	1	1
408	1	1	1	1
409	1	1	1	1
410	1	1	1	1
501	1	1	1	1

502	1	1	1	1
503	1	1	1	1
504	1	1	1	1
505	1	1	1	1
506	1	1	1	1
507	1	1	1	1
508	1	1	1	1
509	1	1	1	1
Building Total	34	34	34	34

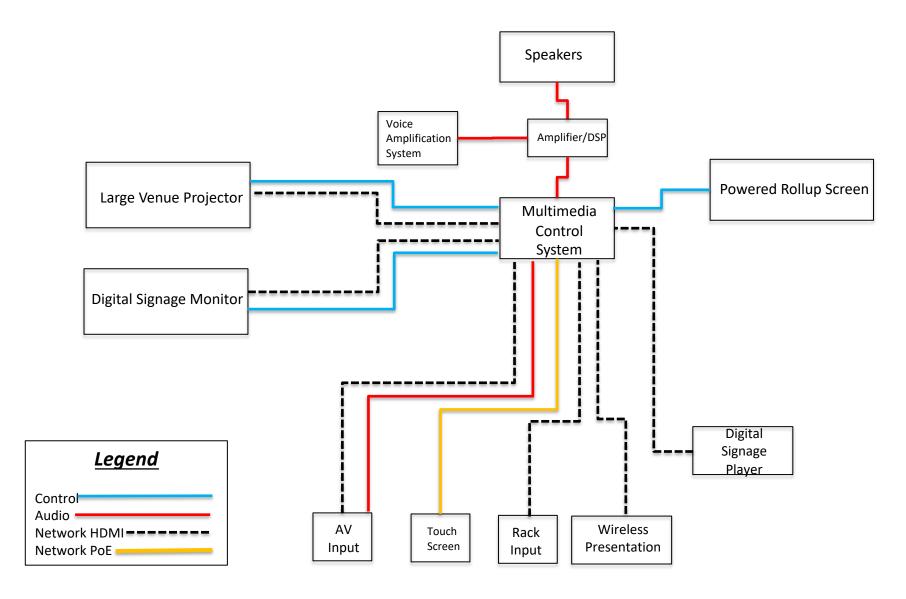
Southwood Elementary				
KPS Room Number	Ultra Short Throw Interactive Projector (INSTALLATIO N ONLY)	Wireless Presentation System	Voice Amplification	Document Camera
101	1	1	1	1
102	1	1	1	1
103	1	1	1	1
104	1	1	1	1
105	1	1	1	1
106	1	1	1	1
108	1	1	1	1
109	1	1	1	1
110	1	1	1	1
113	1	1	1	1
114	1	1	1	1
115	1	1	1	1
117/LAB	1	1	1	1
118	1	1	1	1
119/Art	1	1	1	1
120	1	1	1	1
121	1	1	1	1
122	1	1	1	1
123	1	1	1	1
124	1	1	1	1
125	1	1	1	1
126	1	1	1	1
127/Music	1	1	1	1
Building Total	23	23	23	23

# Appendix C - KPS Classroom Multimedia Connection Line Diagram

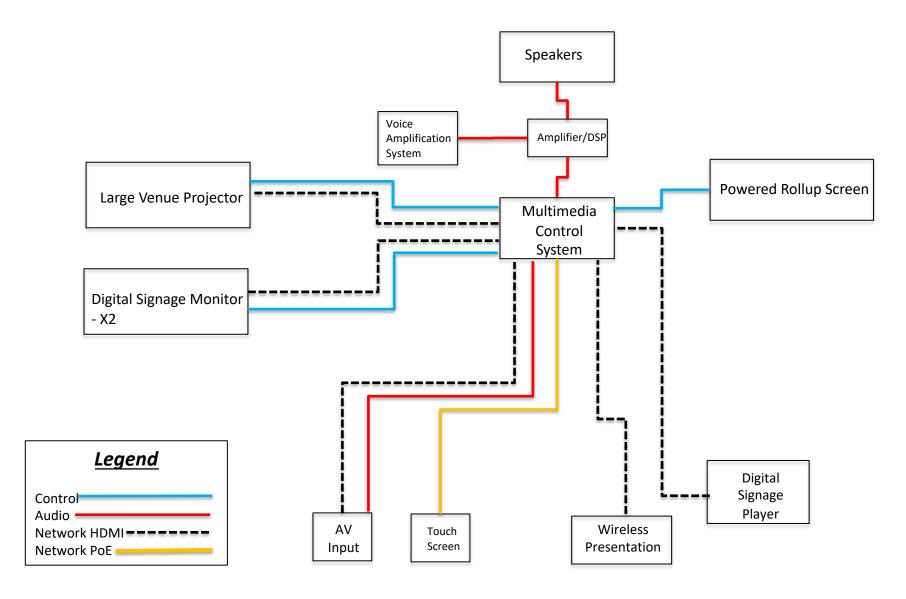




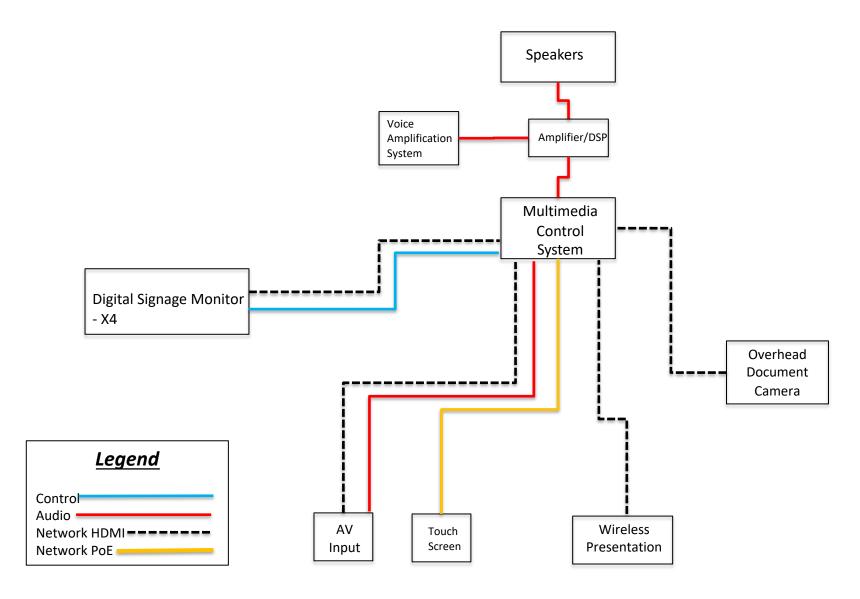
# Appendix C – Bowen Café Connection Line Diagram



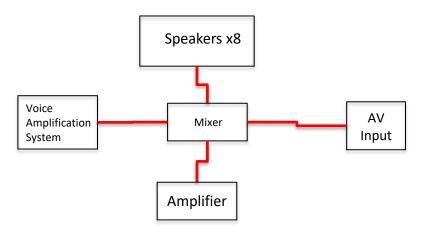
# Appendix C – Culinary Arts Café Connection Line Diagram

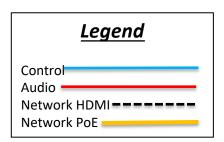


# Appendix C – Culinary Arts Labs Connection Line Diagram



# Appendix C – Bowen Gym Connection Line Diagram





GMB

P U B L I C S C H O O L S

PROJECT NO. 5-5521

NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY FORM OR BY ANY MEANS, OR STORED IN A DATABASE OR RETRIEVAL SYSTEM, WITHOUT PRIOR WRITTEN

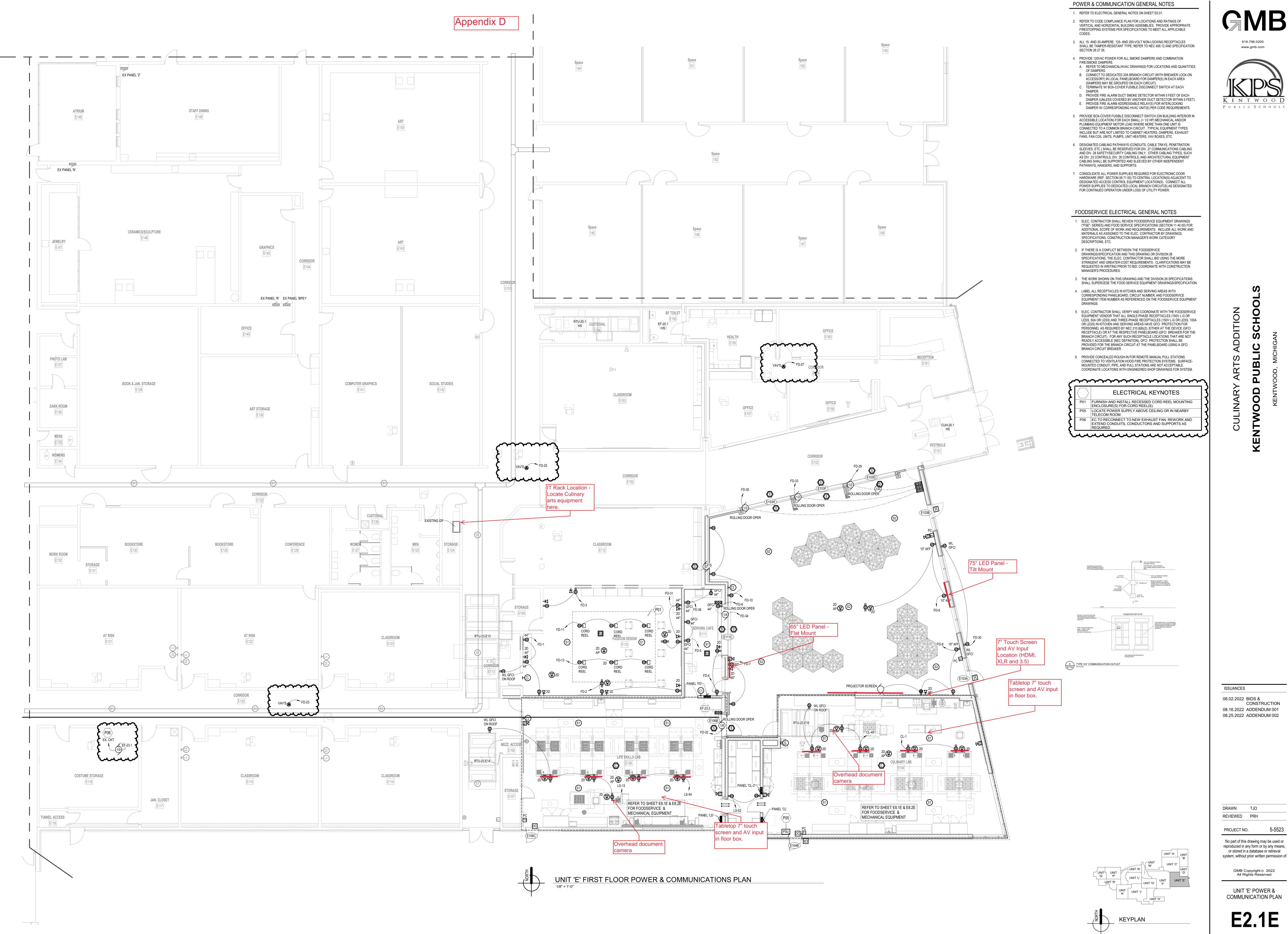
GMB COPYRIGHT© 2021 ALL RIGHTS RESERVED

UNIT 'B' FIRST FLOOR POWER & COMMUNICATIONS PLAN

KEYPLAN







ISSUANCES

08.02.2022 BIDS & CONSTRUCTION 08.16.2022 ADDENDUM 001 08.25.2022 ADDENDUM 002

616.796.0200

www.gmb.com

SCHO

DRAWN TJO REVIEWED PRH

PROJECT NO. No part of this drawing may be used or reproduced in any form or by any means, or stored in a database or retrieval

GMB Copyright⊚ 2022 All Rights Reserved

UNIT 'E' POWER & COMMUNICATION PLAN

**E2.1E**