New Elementary Technology Systems

Technology Request for Bid



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

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- 00 11 16 Invitation to Bid
- 00 40 00 Bid Forms
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SectionDescription26 33 53Uninterruptable Power Supplies

## **DIVISION 27 – TECHNOLOGY SYSTEMS**

<u>Section</u>	<u>Description</u>
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27 13 23	Fiber Optic Cable Network
27 21 19	Network Electronics
27 21 33	Wireless Network
27 41 16	Multimedia Systems
27 51 16	Public Address System
27 53 13	Clocks & Timers

## **DIVISION 28 – ELECTRONIC SAFETY & SECURITY**

<u>Section</u>	<u>Description</u>
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28 23 00	Video Monitoring System

## **APPENDICES**

<u>Section</u>	<u>Description</u>
А	Communication Drawings
В	Multimedia System Room Schedule
С	Rack, UPS and Network Switch Schedule
D	Multimedia Equipment Line Diagram
E	Door Equipment Schedule

END OF SECTION

## SECTION 00 01 15 LIST OF DRAWINGS

*File/Name Description* 

#### NOTE:

Other coordination drawings may be obtained from the Owner's Construction Manager or may be reviewed on site at the field office at the worksite. Such drawings may include electrical plans, reflected ceiling plans or other plans as may be updated due to issuance of bulletins or field changes.

END OF SECTION

LIST OF DRAWINGS 00 01 15 - 2

## SECTION 00 11 16 INVITATION TO BID

#### PART 1 - GENERAL

## 1.01 WORK INCLUDED: NEW ELEMENTARY TECHNOLOGY SYSTEMS

- A. Shelby Public Schools (Owner) is seeking bids for purchase and installation of new low voltage cabling, UPS, network, wireless classroom multimedia, public address, clock, building access systems, and video monitoring systems and associated equipment and installation. Proposed systems shall be configured and installed as described herein.
- B. Project: New Elementary Technology Systems
- C. Owner: Shelby Public Schools 525 North State Street Shelby, MI 49455
- D. Designer: Communications by Design, Inc.
- E. Sites of Work:
  - New Shelby Elementary School North State Street Shelby, MI 49455

#### 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: October 24, 2022
  - 2. Pre-Bid Meeting: November 9, 2022 at 3:30pm
  - 3. Intent to Bids Due: November 10, 2022 at 5:00 PM
  - 4. Question and Clarification Deadline: November 11, 2022 at 5:00 PM
  - 5. Public Bids Due: November 22, 2022 at 1:00pm

6. Public Bid Opening: November 22, 2022 at 1:30pm

#### 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: November 9, 2022 at 3:30pm
- C. Location: Shelby High School Media Center 641 North State Street Shelby, MI 49455
- D. Any drawings identified in the table of contents herein will be distributed and reviewed at this conference.
- E. Physical building inspections of sites of work will be provided for at this time.

#### 1.05 TIME AND PLACE OF BID RECEPTION

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

B.	Bid Receipt Deadline:	1:00pm on November 22, 2022
C.	Bid Receipt Location:	Shelby Public Schools Administration Building 525 North State Street Shelby, MI 49455

D. Bid Opening Time: 1:30pm on November 22, 2022

- E. Bid Opening Location: Shelby High School Media Center
   641 North State Street Shelby, MI 49455
- F. Faxed or electronically delivered bids will not be accepted.

## 1.06 EXAMINATION AND PROCUREMENT OF DOCUMENTS

- A. Specifications and any relevant Drawings may be obtained from the Technology Designer. Contractors may obtain copies by documented request to Communications by Design, Attn: Rebecca Szilagy. Requests may be made by:
  - 1. Writing 4101 Sparks Drive Grand Rapids, Michigan 49546
  - 2. Email <u>rszilagy@cbdconsulting.com</u>

## 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 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) The specified products and/or services are to be provided for FY23 (April 1, 2023-June 30, 2024) and qualify for universal service discounts under the FY23 universal service support mechanism, E-rate.
- C. UNIVERSAL SERVICE DISCOUNTS The service provider contract may be conditional upon the Owner receiving universal service discounts under the FY23 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).
- 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 April 1, 2024.

## 1.09 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.

## 1.10 DEFINITIONS

- A. "Owner" is intended to mean Shelby 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

BID FORMS 00 40 00 - 8

## 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 November 10, 2022. Only bidders returning a completed "Intent to Bid Form" will be notified of required addenda.

Company Information	
Name:	
Address Line1:	
Address Line2:	
City, State and Zip Code	
<u>Primary Contact Information</u> Name:	
Phone No.:	
Fax. No.:	
E-Mail Address:	

Portions of the bid for which you will be responding:

Section 26 33 53 - Uninterruptable Power Supplies
Section 27 10 00 - Low Voltage Cabling
Section 27 13 23 – Fiber Optic Cable Network
Section 27 21 19 – Network Electronics
Section 27 21 33 – Wireless Network
Section 27 41 16 - Multimedia Systems
Section 27 51 16 - Public Address System
Section 27 53 13 - Clock System
Section 28 13 00 - Building Access System
Section 28 23 00 - Video Monitoring System

Submit unaltered and completed form to:

Rebecca Szilagy Communications by Design, Inc. <u>rszilagy@cbdconsulting.com</u>

#### 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:	Shelby Public Schools Attention: Mark Olmstead 525 North State Street Shelby, MI 49455
BID FROM:	
PROJECT:	New Elementary Technology Systems TECHNOLOGY BID #2752
INCLUDING ADDENDA:	Addendum No. Dated   Addendum No. Dated
DUE:	November 22, 2022 at 1:00pm

#### **BID FORM**

BID TO:	Shelby Public Schools Attention: Mark Olmstead 525 North State Street Shelby, MI 49455	
BID FROM:		
PROJECT:	New Elementary Building Technology Systems TECHNOLOGY BID #2752	
The undersigned, havin work, and having exam- referenced, including, b labor, material, equipme of the following categor	g familiarized themselves with all local conditions affecting ined the site and all applicable Bidding Documents herein, a ut not limited to, all addenda issued thereto, hereby propose ent, applicable taxes and services required for proper comple- ries of this project for the sum of:	the cost of nd herein to furnish all tion of each

Bid Category	Title		
		Dollars (\$	).
Said amount written above cons	tituting the Base Bid		/
Bid Category	Title		
		Dollars (\$	).
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Bid Category	Title		
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Bid Category	Title		
		Dollars (\$	).
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Said amount written above constituting the Base Bid

## TAXES:

Bid sum includes all applicable taxes.

## **ALLOWANCES:**

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

## **COST OF BONDS:**

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

#### **ACKNOWLEDGEMENT OF ADDENDA:**

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

Addendum No. \_\_\_\_ Dated \_\_\_\_\_ Addendum No. \_\_\_\_ Dated \_\_\_\_\_

Addendum No. \_\_\_\_Dated\_\_\_\_\_ Addendum No. \_\_\_\_Dated\_\_\_\_\_

## **ALTERNATES:**

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

Alternate A	
Alternate B	
Alternate C	
Alternate D	
Alternate E	
Alternate F	

Alternate G

## PRINCIPAL SUBCONTRACTORS

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

Legal Name:	Work Proposed
Legal Name:	Work Proposed
Legal Name:	Work Proposed

## **BID SECURITY:**

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

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

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

## FAMILIAL DISCLOSURE:

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

## **EXCEPTIONS:**

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

## **SIGNATORY AUTHORITY:**

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

**<u>AGREEMENT:</u>** 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.

Resp	Respectfully submitted,			
Date:				
Firm Name:				
By:				
Signed:				
Title:				
Official Address:				
Telephone Number:				
Fax Number:				
Primary Contact Email Address:				

(If Corporation, affix Seal)

## Michigan Familial Relationship Disclosure Statement

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

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

(Check only	one Box	Below)
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It is hereby acknowledged and certified by Bidder that <u>no</u> familial relationship exists between the owner or any employee of the Bidder and any member of the project Owner's governing Board(s) or Superintendent(s).

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

Bidder

**Board or Superintendent** 

Bidder Authorized Representative:		
Bi	dder:	
Representative's Signation	ature:	
Print or Type N	Jame:	
Representative's	Title:	
bubscribed and sworn this da	ıy of	, 2022.
n the County of	State of	
Зу		Seal or Stamp:
Notary Public Signature		
My commission expires on:		

## BID FORMS 00 40 00 - 15

## **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.

The undersigned, owner or authorized officer of

(bidder), pursuant to Michigan Public Act No. 517 of 2012, the "Iran Linked Business" requirement provided in the Shelby 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.

# <u>There is not an "Iran Linked Business" that exists within the bidder and/or owner, officers, directors and employees.</u>

Bidder:	Notary:
[Company Name]	This instrument was acknowledged before me, a Notary Public in and for
[Signature]	County, on this
[Title]	day of, 20
	[Notary Public Signature]
	My Commission expires:
	Acting in the County of:

## **REFERENCES**

Customer name:	
Address:	
City/State/Zin <sup>·</sup>	 
Contact name:	
Contact fitle:	 
Phone:	 
E-mail:	 
Scope of project:	 
Date of completion:	 
Customer name:	 
Address:	 
City/State/Zip:	 
Contact name:	 
Contact title:	 
Phone:	
F-mail <sup>.</sup>	
Scope of project:	
Date of completion:	 
Customer name:	
Address:	
City/State/Zin <sup>.</sup>	
Contact name:	 
Contact title:	 
Dhono:	 
Scope of project:	 
Date of completion:	 

## **CONTRACT EXCEPTIONS**

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

(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 <u>Microsoft Excel</u> 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:26 33 53

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			TRAINING			
			BONDS AND INSURANCE			
			GRAND TOTAL (Must match base bid)			

(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 <u>Microsoft Excel</u> 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

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			TRAINING			
			BONDS AND INSURANCE			
			GRAND TOTAL			

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Bidder: \_\_\_\_\_

Bid Division:27 13 23

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Bidder: \_\_\_\_\_

Bid Division:27 21 19

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Bidder: \_\_\_\_\_

Bid Division:27 21 33

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Bidder: \_\_\_\_\_

Bid Division:27 41 16

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ID				Unit	Labor	<i>Total</i>
ID	Qty	Part Number	Mfg and Description	Cost	Cost	Proposed Cost
			PROJECT MANAGEMENT			
			TRAINING			
			BONDS AND INSURANCE			
			GRAND TOTAL			
			(Must match base bid)			

(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 <u>Microsoft Excel</u> 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 51 16

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Bidder: \_\_\_\_\_

Bid Division:27 53 13

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			BONDS AND INSURANCE			
			GRAND TOTAL (Must match base bid)			

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Bidder: \_\_\_\_\_

Bid Division:28 13 00

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(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 <u>Microsoft Excel</u> 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:28 23 00

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## END OF SECTION

BID FORMS 00 40 00 - 29

## 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".

## 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
- 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 has 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 11 workstation. Electronic media shall contain separate folders to organize response documentation as described herein. Files submitted electronically shall be *Adobe Acrobat* "PDF" format (<u>SCHEDULE OF VALUES</u> is additionally required to be on the disk in the appropriate folder as a Microsoft Excel compatible 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. REFERENCES
    - d. CONTRACT EXCEPTIONS
    - e. SCHEDULE(s) OF VALUES
    - f. 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 26 33 53 UNINTERRUPTABLE POWER SUPPLIES

## PART 1 - GENERAL

## 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to supply and installation of new uninterruptable power supply (UPS) units for the new Shelby Public Schools Elementary School.
- B. Contractor shall advise, coordinate and work cooperatively with Owner representatives and/or owner's designee related to any installation or special security provisions.
- C. Contractor shall configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant system, complete and with full functionality as specified herein.
- D. Contractor shall coordinate installation with other contractors, Architect and the Owner as is appropriate.
- E. Contractor shall provide service rates for additional services not specified herein for Owner consideration. Rates shall be provided for the duration of the warranty period. Owner will consider rate structures for additional services outside of the base contract as a factor in determining contract award.

## 1.02 WARRANTY

- A. Complete installation shall be free from defect and/or failure for a period of three (3) years. Any replacement, upgrade or fix, including labor for any non-conforming, unsupportable or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.
- B. Manufacturer's warranty shall be provided for all components of the system.
  - 1. Any documents and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.
  - 2. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.

- C. On site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.
- D. System Warranty shall commence on date of substantial completion as certified by Architect 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 <u>no</u> effect on Warranty or System Acceptance by Owner and/or Architect.
- E. Alternate Warranty
  - 1. Bidder shall provide alternate to include 5-year warranty for which all terms and conditions shall remain the same, but the term is 5 years rather than the base bid term of 3 years.

# 1.03 STORAGE OF MATERIALS

- A. All materials shall be secured when not in use by the Contractor.
- B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.
- C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

## 1.04 SUBMITTALS

- A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid Proposals.
- B. Shop drawings and diagrams shall be submitted by Bidder for approval by Architect with Bid Proposals.
  - 1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Architect.
  - 2. No work constituting final installation shall be commenced until after approval of shop drawings by Architect.

- C. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project with Bid Proposals.
- D. Equipment or material installed for this project that does not have an approved submittal associated with it, will be removed and replaced with acceptable equipment or material as defined by the Architect. 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 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.

# 1.05 REFERENCE SPECIFICATIONS

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

## 1.06 CONTRACTOR

- A. The Contractor shall accept complete responsibility for the installation, certification and support of the system. Contractor shall be an authorized vendor of all major components.
- B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install system and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods.

- C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.
- D. The Contractor shall have a proven track record in relevant similar system configuration and installation. This must be shown by the inclusion of references of at least three (3) projects involving the installation of similar systems completed by the Contractor in the prior two (2) years on unaltered forms with the sealed Bid Proposal as provided herein. Bid Proposal Form(s) may be duplicated as required in order to provide adequate space to list required number of reference installations for each division Bidder is responding to.

## PART 2 - PRODUCTS

- 2.01 Supply most current version of all products provided.
  - A. 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 Architect 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 Architect on which version is to be used.
- 2.02 Acceptable Manufactures (in alphabetical order)
  - A. APC
  - B. EATON
  - C. LIEBERT/EMERSON
  - D. Or Equal.
- 2.03 Furnish only new, first-class quality materials and equipment.
- 2.04 Administration access shall be protected by unique and secure log on.
- 2.05 In the event of a power failure, complete system shall automatically re-initialize and "become active" to the last configuration in use with no human intervention.
- 2.06 UNINTERUPTABLE POWER SUPPLIES (UPS) UNITS -TYPE A

- A. Uninterruptable Power Supplies shall be provided, meeting or exceed the following required feature sets, specifications and/or standards. See Appendix C for quantities and locations:
  - 1. APC SMT2200RM2UC
    - a. Or Equal
  - 2. Each unit shall include specific rack mount kit
  - 3. Units shall protect all active components from power surges, sags and/or spikes in the power system.
- B. NEMA 5-20P Input
- C. Each unit shall attach to Owner's existing Ethernet network using standard 10/100/1000 port and provide alerting and management tools.
- D. Where individual units cannot be installed in Owner racks, units shall be securely and permanently mounted on walls in communication closets by Contractor. Contractor shall supply all materials and labor for a safe, Secure and permanent wall mounting of UPS unit adjacent to wall mounted communication cabinet or rack.
- E. UPS equipment shall be SNMP manageable and be connected to a dedicated Ethernet port in each wire center (IDF/MDF).
- F. UPS equipment shall be installed and mounted as space, location details, and Owner standards dictate.
- G. Full UPS monitoring and management software shall be included providing, but not limited to, the following features:
  - 1. Battery Condition
  - 2. Power Quality
  - 3. All other features currently a part of the manufacturer's latest commercial release.

# 2.07 UNINTERUPTABLE POWER SUPPLIES (UPS) UNITS – TYPE B

- A. Uninterruptable Power Supplies shall meet or exceed the following required feature sets, specifications and/or standards. See Appendix C for quantities and locations:
  - 1. APC SMT1500RM2U
    - a. Or Equal

- 2. Each unit shall include specific rack mount kit
- 3. Units shall protect all active components from power surges, sags and/or spikes in the power system.
- B. NEMA 5-15P Input
- C. Each unit shall attach to Owner's existing Ethernet network using standard 10/100/1000 port and provide alerting and management tools.
- D. Where individual units cannot be installed in Owner racks, units shall be securely and permanently mounted on walls in communication closets by Contractor. Contractor shall supply all materials and labor for a safe, Secure and permanent wall mounting of UPS unit adjacent to wall mounted communication cabinet or rack.
- E. UPS equipment shall be SNMP manageable and be connected to a dedicated Ethernet port in each wire center (IDF/MDF).
- F. UPS equipment shall be installed and mounted as space, location details, and Owner standards dictate.
- G. Full UPS monitoring and management software shall be included providing, but not limited to, the following features:
  - 1. Battery Condition
  - 2. Power Quality
  - 3. All other features currently a part of the manufacturer's latest commercial release.

### 2.08 ALLOWANCES

- A. Contractor shall include allowances for contract service reimbursements as required in base bid lump sum amount(s).
  - 1. Allowance shall be made in the amount of \$1,000.00 for power renovations necessary to support new uninterruptable power supply units.
- B. Contract services shall be provided and sourced at Owner's discretion, direction and convenience with full cooperation by Contractor, and paid for from successful bidder's contract in the amount(s) provided for herein.
- C. 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.

D. No material or labor charges and/or mark-ups or margins will be permitted on allowance expenditures approved by Owner and Designer.

## PART 3 - EXECUTION

## 3.01 PREPARATION

- A. Contractor shall conduct detailed system overview and examination with Architect 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 prior to commencement of any final installation activities.

# 3.02 INSTALLATION

- A. Installation work shall take place after school hours. 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.
- B. Contractor shall conduct an initial programming meeting with the Owner and designer to review content available and planned, as well as establish schedule for project completion.
- C. 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.
- D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. Such materials shall include all items necessary for full and final operation of the system. 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.

- 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.
- F. Worksites include the following:
  - New Shelby Elementary School North State Street Shelby, MI 49455

## 3.03 TESTING

- A. In an effort to ensure a smooth "turn-up" of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over.
- B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the work is completed in accordance with the specified requirements, meets the owner's specific application requirements and is ready for functionality and integrity testing.
- C. Testing Procedures
  - 1. Prior to system "turn-up", Contractor shall submit a written request to Architect 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, Architect will provide a test schedule and coordinate testing date(s) with Owner and Contractor.
  - 3. Should Architect determine the Work is not acceptably configured or not of adequate integrity:
    - a. Architect 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 Architect in writing when ready for re-testing.
    - c. Architect will schedule re-test of the Work.
    - d. Excessive re-testing of Work may result in fees being assessed Contractor.
  - 4. Should Architect and Owner concur the Work is configured properly and system integrity is as required:

a. Architect will review Contractors detailed "turn-up" plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system "turn-up" can proceed.

### 3.04 DOCUMENTATION

- A. Contractor shall provide Owner as-built drawings and manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Architect 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 Architect.
- 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 Architect.
  - 12. Photocopy of original invoice listing make and model for all components and equipment from individual manufacturer(s), distribution source(s), or authorized agent(s) to establish manufacturer warranty start date for potential use after end of contract warranty provisions.
  - 13. System Configuration Report.

- 14. Complete inventory of installed hardware and system software. Hardware inventory shall include, but not be limited to, model numbers, serial number, physical installation location and software/firmware options.
- 15. Complete record of all system and administrative passwords for full operation and administration of all system components and operations.

# 3.05 TRAINING

- A. Contractor shall provide physical on-site training for the Owner designated system administrator(s). Owner shall designate up to two (2) system administrators to be trained. Training shall be a minimum of one (1), one (1) hour session(s) in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:
  - 1. Basic configuration and system administration of the installed system
  - 2. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.
  - 3. System back-up and restore functions and procedures for all system parameters and configurations.
  - 4. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to, configuration changes and device status.
  - 5. System database updates and maintenance.
  - 6. Review standard system reports

## 3.06 SCHEDULE, MEETINGS AND PLANS

- A. Planed 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.
- B. Schedule
  - 1. Post bid Interviews: Week of December 5, 2022
  - 2. Contractor Chosen: Week of December 19, 2022
  - 3. Work Commences: July 1, 2023
  - 4. Substantial Completion of Project: August 15, 2023

- 5. Project Close-out: September 1, 2023
- 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 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 equipment, systems and related items. They shall be followed as closely as elements of construction permit.
- B. Examine drawings of other trades and verify conditions of work sites. Arrange work accordingly.
- C. Deviations from 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.
- D. Determination of acceptance of proposed equal equipment is at the sole discretion of the Designer/Owner.

## 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.

## 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. AT&T / Systimax
  - 2. Belden
  - 3. Berk-Tek
  - 4. Corning/Siecor
  - 5. General Cable
  - 6. Hubbell
  - 7. Nordx-CDT
  - 8. Panduit
- 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. All wiring not installed in conduit shall be plenum type cable and shall be so identified with continuous marking.

- 3. Twenty-three (23) AWG
- 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.
    - c. Rack mounted patch panels shall be flat.
  - 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. 8 position T568B compliant modular female jack.
  - 3. Modular jacks that terminate above finished ceiling will be plenum rated.
  - 4. Snap-in, high impact housing
  - 5. Field verify and coordinate insert color to match Owner requirements.
  - 6. Field verify and coordinate plates and/or outlet frame colors and materials to coordinate with electrical devices and Owner requirements.
  - 7. 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 plenum rated plastic enclosure.

- 8. Furnish and install matching coordinating blank cover plates for all unused communications outlets indicated on drawings.
- 9. Mount flush plates so all four edges are in continuous contact with finished surfaces.
- 10. 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 modular jack.

## 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. See Appendix A Communication Drawings for cable locations and quantity.
- B. Wall Data Outlet
  - 1. 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. Wire device(s) shall be installed in standard keystone insert with six(6) positions. All unused positions shall be blanked.
    - c. Faceplate compliant with Owner standards shall be provided.
  - 2. Outlet shall be provided at each location indicated on drawings, noting the number of station cables to be terminated.

- 3. Raceway shall be existing or provided by Others.
- C. Above Ceiling Outlet
  - 1. Contractor shall provide above ceiling outlets including, but not limited to:
    - a. UTP station cable(s) terminated on compliant patch panel in nearest IDF and wire device with a single surface mounted biscuit jack.
    - b. Device location shall be as indicated on drawings and above finished ceiling/surface, but accessible for station connection.
    - c. Surface mount device 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.
  - 2. Outlet shall be provided at each location indicated on drawings, noting the number of station cables to be terminated.
- D. Floor Box, Raceway and Furniture Outlets
  - 1. Contractor shall provide floor box, raceway and furniture outlets including, but not limited to:
    - a. UTP station cable(s) terminated on compliant patch panel in nearest IDF and wire device with appropriate frame and plate for a compliant installation.
    - b. Wire device(s) shall be installed in standard keystone insert with necessary positions. All unused positions shall be blanked.
    - c. Faceplate compliant with Owner standards shall be provided.
  - 2. Outlet shall be provided at each location indicated on drawings, noting the number of station cables to be terminated.

## 2.07 EQUIPMENT RACKS

- A. Acceptable Manufacturer(s)
  - 1. APC
  - 2. Middle Atlantic
  - 3. Tripp Lite
  - 4. Or Equal.
- B. ENCLOSED FLOOR STANDING RACK(S)

- 1. One (1) Enclosed Floor Standing Rack Enclosure(s) shall be provided in the following locations and as indicated on drawings:
  - a. IDFB B124
- 2. Rack enclosures shall meet or exceed the following requirements:
  - a. Middle Atlantic SNE24D-4242-P1 or Equal.
  - b. Rack shall be constructed of heavy-gauge steel for maximum strength and durability.
  - c. 42 RU
  - d. 24" width and 42" depth
  - e. Vented locking, removable, reversible front and rear doors.
  - f. Locking, removable side panels keyed alike with doors.
  - g. Leveling feet.
  - h. Adjustable mounting rails.
  - i. Cage nut style rack rails.
  - j. Top trough with waterfall to create pathway above rack
  - k. Cable ladder to extend from wall to support cabling from wall to provided rack
  - l. Grounding kit.
- 3. One (1) Vertical Power Distribution Unit shall be provided and installed in each location.
  - a. 15' power cord with NEMA 5-20P plug.
  - b. PDU shall distribute power the entire length of the rack.
  - c. Mounting brackets included for secure installation in provided rack.

### C. WALL MOUNTED RACK(S)

- 1. One (1) Wall Mounted Rack Enclosure(s) shall be provided in the following locations and as indicated on drawings:
  - a. IDFA A118

- $b. \quad IDFC-C120$
- 2. Rack enclosures shall meet or exceed the following requirements:
  - a. Middle Atlantic DWR-24-26PD or Equal.
  - b. Rack shall be constructed of heavy-gauge steel for maximum strength and durability.
  - c. 24 RU
  - d. 26" depth
  - e. Vented locking, removable, reversible front and rear doors.
  - f. Leveling feet.
  - g. Adjustable mounting rails.
  - h. Cage nut style rack rails.
  - i. All necessary accessories to properly route cabling neatly and securely in to rack enclosure.
  - j. Grounding kit.
- 3. One (1) Vertical Power Distribution Unit shall be provided and installed in each location.
  - a. 15' power cord with NEMA 5-15P plug.
  - b. PDU shall distribute power the entire length of the rack.
  - c. Mounting brackets included for secure installation in provided rack.

#### 2.08 ALLOWANCES

- A. Contractor shall include allowances for contract service reimbursements as required in base bid lump sum amount(s).
  - 1. Allowance shall be made in the amount of \$3,500.00 for Owner directed infrastructure upgrades.
- B. Contract services shall be provided and sourced at Owner's discretion, direction and convenience with full cooperation by Contractor, and paid for from successful bidder's contract in the amount(s) provided for herein.

- C. 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.
- D. No material or labor charges and/or mark-ups or margins will be permitted on allowance expenditures approved by Owner and Designer.

# 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.
- 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 <u>not</u> exceed 90 meters (295 ft.).
- 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 as identified on provided communications drawings. Sleeves shall be a minimum of 2". All installed sleeves shall be fully fire stopped with compliant fire stop material following cable installation. If other wall penetrations are required to complete work but are not identified on provided drawings, contractor shall supply 1 2" sleeve.
- 15. Provide backboards, properly treated for fire retardation in locations with new racks and required by site conditions.
- 16. WALL MOUNTED RACK(S)

- a. Wall mounted racks shall be securely attached to walls in locations identified, if backboard is necessary, Contractor shall supply and install backboard for a fully secure and manufacturer recommended installation.
- b. Contractor shall connect rack to building ground bar, if provided, using provided grounding kit.
- E. Sites of Work:
  - New Shelby Elementary School North State Street Shelby, MI 49455
- 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. CAD as-built drawings of each building.
  - 2. Copper station cable test results.

# 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. 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.
- B. Schedule
  - 1. Post bid Interviews: Week of December 5, 2022
  - 2. Contractor Chosen: Week of December 19, 2022
  - 3. Work Commences: April 1, 2023
  - 4. Substantial Completion of Project: June 1, 2023
  - 5. Project Close-out: September 1, 2023
- 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.
- E. 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.

## END OF SECTION

# SECTION 27 13 23 FIBER OPTIC CABLE NETWORK

### PART 1 - GENERAL

## 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to internal and external plant fiber optic network backbone upgrades of the Caledonia Community Schools private fiber optic network infrastructure.
- B. The Owner has identified MDF/IDF locations in selected buildings to receive new and reworked fiber optic cabling. New internal and external single mode fiber optic cable shall be installed to connect new and existing internal data cabinets. Additionally, existing private single mode WAN fiber shall be rerouted and reworked to new MDF at Caledonia Administration Office location as described and provided for herein.
- C. Sites of Work:
  - New Shelby Elementary School North State Street Shelby, MI 49455
  - Shelby High School 641 North State Street Shelby, MI 49455

## 1.02 WORK INCLUDED

- A. Work includes, but is not limited to, the following:
- B. A single indoor rated twelve (12) strand OS2 single mode (SMF) fiber optic cable installed between IDF B and each IDF identified in this document and in provided communication drawings in facilities for which work is included as indicated herein.
  - 1. New Shelby Elementary School
    - a. IDF A
    - b. IDF C
  - 2. New OS2 fiber optic cables shall be terminated on Contractor supplied enclosure shelf with LC connectors.
  - 3. All 12 strands are to be terminated and tested.

- C. A single outdoor rated twelve (12) strand OS1 single mode (SMF) armored fiber optic cable installed between Shelby High School MDF and New Shelby Elementary School IDF B identified in this document and as identified on provided drawings.
  - 1. Contractor shall provide pricing for any one or all of the following connectivity options: Leased Lit Fiber, Dark Fiber or Self-Provisioned Fiber.
    - a. Shelby High School
      - 1. New Shelby Elementary School
    - b. Work includes, but is not limited to, the following:
    - c. Contractor shall carefully pull exterior single mode cable to buildings in pathway provided by Others.
    - d. New OS1 fiber optic cables shall be terminated on Contractor supplied enclosure shelf with LC connectors.
    - e. All 12 strands are to be terminated and tested.
  - 2. All options can include special construction or one-time E-rate eligible non-recurring costs as well as E-rate eligible recurring circuit costs. Based on the bids and both a short term and long-term cost effectiveness analysis, Shelby Public Schools will determine which district option is acceptable. The specifications related to each solution option are as follows.
  - 3. Shelby Public Schools must have guaranteed transport bandwidth to this end point throughput (upload and download) of 10 gbps, upgradeable to 40 gbps with Service Level Agreement (SLA) guarantees. The minimum 500 mbps designates the current State Educational Technology Directors Association (SETDA) bandwidth standard for schools. The transport circuit endpoints school end point to the school district hub and if necessary, from the school district hub to the nearest Internet Access Point.
  - 4. The following service level agreement standards will be met.
    - a. Circuit uptime of 99.999%
    - b. Lit and Operations proposals only: Frame/packet loss .25% commitment
    - c. Lit and Operations proposals only: 25 ms Network Latency Commitment

- d. Lit and Operations proposals only: 10 ms Network Jitter Commitment
- e. There is no right of provider to limit or throttle the capacity of the circuit at any time for any reason
- f. Mean Time-To-Repair for outages <4 hours
- 5. This section in no way is meant to prevent any vendor from bidding or is geared toward only one solution. E-rate rules specify that bidding out a solution to connect two buildings so that data can be sent between the two must be bid out several different ways on the Form 470. All bids will be accepted, and no solution will be disqualified for any reason. We will consider standalone data transmission services, leased dark fiber, leased lit fiber, self-provisioned network (applicant owned and operated network), and/or services provided over third-party networks for a solution to this RFP. Services provided over third-party network solutions that guarantee the uptime, jitter, packet loss, latency specifications outlined in the proposed service level agreements for the district are preferred. For fully managed coax, fixed wireless, copper solutions, other non-fiber based service and leased lit fiber service, it is preferred that the respondent provide a service report from an existing service that displays that the service can meet the Service Level Agreement standards outlined in this RFP over a period of at least 6 months.
- D. Connectors and couplers.
- E. Adequate cable support in existing or new raceway system as may be required for efficient and effective cable routing.
- F. Rack mounted termination enclosure shelves.
- G. Storage Loops
  - 1. Installed prior to cable entry to cabinet or rack where termination is completed with fifteen (15) feet of stored cable.
- 1.03 The Contractor shall design, engineer, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant backbone fiber network connections, complete as specified herein.
- 1.04 Contractor shall coordinate their installation with other communication systems, contractors, Designer and the Owner as is appropriate.

## 1.05 DRAWINGS

A. Drawings show the location and general arrangement of equipment, systems and related items. They shall be followed as closely as elements of construction permit.

- B. Examine drawings of other trades and verify conditions of work sites. Arrange work accordingly.
- C. Deviations from 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.

## 1.06 REFERENCE STANDARDS

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

# 1.07 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.

Contractor shall provide response times for all malfunctioning equipment of two (2) business days or less.

- 1. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter
- D. 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 <u>no</u> effect on Warranty or System Acceptance by Owner and/or Designer.

# 1.08 STORAGE OF MATERIALS

- A. All materials shall be secured when not in use by the Contractor.
- B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.
- C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

## 1.09 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.
- B. Shop drawings and diagrams shall be submitted by Bidder for approval by Designer with Bid.
  - 1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.
  - 2. No work constituting final installation shall be commenced until after approval of shop drawings by Designer.
- C. Equipment or material installed for this project that does not have an approved submittal associated with it, will be removed and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.
  - 1. The Owner and/or Designer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.
  - 2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due, or become due Contractor.
- D. The Contractor shall submit within five (5) 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. <u>Microsoft Project</u> is the software of choice for this schedule. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing and executing the work required by the Contract Documents. 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.
- E. Determination of acceptance of proposed equal equipment is at the sole discretion of the Designer/Owner.

# 1.10 CONTRACTOR

- A. The Contractor shall accept complete responsibility for the installation, certification and support of the system. Contractor shall be an authorized vendor of all major components.
- B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install Fiber Optic Communication System Components and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods.
- C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.

D. The Contractor shall have a proven track record in Fiber Optic Cable Network 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.

### PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Manufacturer of major components of the Fiber Optic Network shall be a known and leading entity in the cabling and/or connector field, and shall have been designing, manufacturing and installing similar components for a period of no less than four (4) years.
- B. Acceptable Manufacturers (In alphabetical order):
  - 1. Belden
  - 2. Berk-Tek
  - 3. CommScope
  - 4. Hubbell
  - 5. Lucent
  - 6. Siecor / Corning Cable Systems
- C. Network shall be constructed using industry standards and as specified herein.
- D. Contractor shall provide all dielectric fiber optic cable and termination components. All provided and installed fiber components shall comply with ANSI/TIA/EIA 568C specifications.
- E. All indoor single mode fiber optic cables shall meet or exceed the following specifications or performance requirements:
  - 1. Installed cable shall be single mode graded index glass fiber.
  - 2. All materials in the cable are to be dielectric.
  - 3. 8.3-micron core diameter size
  - 4. 125-micron cladding diameter
  - 5. Maximum Attenuation
    - a. 1310nm: 0.5 dB/km

- b. 1550nm: 0.5 dB/km
- 6. Tight buffered
- 7. EIA/TIA 598 color coding for fiber optic cable
- 8. Indoor plenum rated
- 9. Capable of bend radius as small as 20 x outside cable diameter (under installation load) and 10 x outside cable diameter (long term load).
- F. All outdoor single mode fiber optic cables shall meet or exceed the following specifications or performance requirements:
  - 1. Cable shall be armored.
  - 2. Installed cable shall be single mode graded index glass fiber.
  - 3. All materials in the cable are to be dielectric.
  - 4. 8.3-micron core diameter size
  - 5. 125-micron cladding diameter
  - 6. Maximum Attenuation
    - a. 1310nm: 0.5 dB/km
    - b. 1550nm: 0.5 dB/km
  - 7. Tight buffered
  - 8. EIA/TIA 598 color coding for fiber optic cable
  - 9. Rated for outdoor use.
  - 10. Capable of bend radius as small as 20 x outside cable diameter (under installation load) and 10 x outside cable diameter (long term load).
- G. All indicated fibers shall be terminated on high quality IEC 61754 compliant LC connectors at head end locations (MDF). Total optical attenuation through the cross connect from any terminated fiber to any other terminated fiber shall not exceed .5 dB. All optical fiber shall be handled, installed, and supported as per manufacturer recommendations.
- 2.02 Contractor shall supply new fiber patch cables for MDF and IDF locations.
  - A. Two (2) 3-meter, OS1 LC to LC single mode fiber patch cables shall be provided for connection to network equipment provided by Others.

- B. Four (4) 3-meter, OS2 LC to LC single mode fiber patch cables shall be provided for connection to network equipment provided by Others.
- 2.03 Contractor shall provide termination shelves to support newly installed optical fiber. Fiber termination shelves shall meet or exceed the following specifications:
  - A. Rack mountable 1U
    - 1. Where fiber densities are greater than can be accommodated in 1U, larger enclosures will be permitted.
  - B. Provide security and protection.
  - C. Be accessible from both front and rear.
  - D. Provide adequate strain relief for cables.
- 2.04 Contractor shall supply non-metallic flexible innerduct for all fiber optic paths and install provided cabling within. Armored cable will be considered equivalent in lieu of fiber optic cabling with innerduct. All other specifications identified herein will still be required.
- 2.05 Supply most current version of all products provided.
  - A. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.
  - B. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.
- 2.06 Furnish only new, first-class quality materials and equipment.
- 2.07 System shall be comprised of interoperable components.

### PART 3 - EXECUTION

#### 3.01 PREPARATION

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

- A. Contractor shall be familiar with the environment where work will be done as specified herein.
- 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.
- D. Work shall be conducted during hours when network disruptions created by intentional or unintentional efforts by Contractor will not impact normal Owner operations.
  - 1. Work shall be conducted during second or third shift, weekends and other times the Owner is not conducting normal operations.
  - 2. Special provisions may be, at the Owner's sole discretion made from time to time to allow work to be conducted during "normal" operational hours.
- E. 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. Work shall be performed to meet local codes and industry standards, including, but not limited to:
    - a. Adequate electrical and lightning protection.
    - b. Grounding and Bonding.
    - c. Contractor shall properly restore all areas affected by the installation of conduit/backbone cabling.

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- d. All interior cable installed shall be installed in one-inch (1") PVC yellow colored fiber optic inner duct with suitable couplings when joining ends of inner duct.
  - 1. Alternately, fiber optic cable may be armored cable with yellow colored exterior. If used, armored cable shall be properly and neatly terminated with armor properly grounded and finished at all end points of the link per the manufacturer installation guides.
- e. All exterior cable installed shall be armored. Armored cable shall be properly and neatly terminated with armor properly grounded and finished at all end point of the link per manufacturer installation guidelines.
- f. Contractor shall install spider fan-out kits on fiber optic cable prior to termination.
- g. All fiber optic cables shall all be terminated on fiber optic LC connectors on rack mounted patch panels provided by contractor.
- h. All fiber optic cable terminations shall be clearly labeled at each end with computer generated labels, designations as approved by Owner.
  - 1. Labeling should be consistent in all buildings and carefully coordinated with owner.
- i. Contractor shall be responsible for all required coring. All cores are to be fitted with sleeves, bushings, and fire stopping and must comply with EIA/TIA standards.
- j. Any firewall penetrated to facilitate the routing of communication wiring shall be fire stopped using approved methods as outlined in the current National Electric Code (NEC) and all applicable State, County and Local ordinances.
- k. Where cable tray or raceway is not provided Contractor shall provide and install cable supports of intervals not more than five (5) feet.
- 1. Cables shall not be laid on ceiling grid structure or any structure not specifically designed to support cable.
- F. Contractor shall be responsible for ensuring cable and components are not damaged during installation and the manufacturer's recommended pulling ratings are not exceeded.
- G. 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

FIBER OPTIC CABLE NETWORK 27 13 23 - 77 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 TESTING

- A. All fiber optic cable shall be factory tested on a reel basis with performance data for each cable supplied to Owner.
  - 1. Tests shall be conducted at both 1310nm and 1550nm wavelengths utilizing an Optical Time Domain Reflectometer (OTDR). Attenuation will be recorded for each fiber.
  - 2. Continuity testing shall be performed on each fiber of each cable reel prior to installation.
- B. Contractor shall review all end faces of field terminated connectors with a fiber inspection scope following final polish. Connector end faces with hackles, scratches, cracks, chips and/or surface pitting shall be rejected and repolished or replaced if re-polishing will not remove defects. The minimum viewing magnification for connector end inspections shall be 200x.
- C. Contractor shall conduct and document OTDR traces from head end location(s) for baseline documentation on each strand.
- D. All fiber optic cable (system) shall be tested in both directions by Contractor following installation, and prior to acceptance.
- E. All fiber optic strands shall be tested end-to-end for bi-directional attenuation, 1310 nm / 1550 nm. Tests shall be conducted in compliance with EIA/TIA-526-14 or OFSTP 14, Method B and according to the manufacturer's instructions for the test set being utilized.
- F. Tests must certify the measured link loss for each strand does not exceed the "worst case" allowable loss defined as the sum of connector loss (based on the number of mated connector pairs at EIA/TIA-568B maximum allowable loss of .75 dB per mated pair) and optical loss (based on the performance standard specified herein).
  - 1. The maximum allowable attenuation for any splice or termination is 0.3 dB.

- 2. Contractor shall perform Optical Test Set consisting of an Optical Source (transmitter) and Optical Meter (receiver) to determine end-to-end attenuation and fiber length. All testing will be done in accordance with EIA/TIA 526-14.
- 3. The procedure shall be completed in three steps.
  - a. Reference set-up
  - b. Jumper test
  - c. Standard test
- 4. Final test shall be the successful operation of the network utilizing the transfer of at least one ten-megabyte (10Mb) file from computers located in each building to and from a computer located at the other end of each link. All pairs of fiber shall be tested in this step.
- 5. Test results shall be submitted on both 8.5" x 11" paper and a USB formatted to be read by a standard Windows 10 workstation.
- G. Upon receipt of test documentation, Designer shall verify particular and specific test results by means of independent re-testing.
  - 1. Prior to submitting testing to Designer, Contractor shall use adequate means to assure the work is completed in accordance with the specified requirements, meets the owner's specific application requirements.

### 3.04 DOCUMENTATION

- A. 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. Manufacturer's warranty.
  - 3. Maintenance contract terms.
  - 4. Verification of maintenance contract engagement.
  - 5. Telephone numbers for service and support.
  - 6. Detailed technical support and service procedure instructions.
  - 7. 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

FIBER OPTIC CABLE NETWORK 27 13 23 - 79 duplicate copies for particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.

- 8. Photocopy of original invoice listing make and model for all material 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.
- 9. CAD as built drawings for each building.

### 3.05 TRAINING

A. Not Used

# 3.06 SCHEDULE, MEETINGS AND PLANS

- A. 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.
- B. All work shall be coordinated with Owner's construction manager on site.
- C. 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 21 29 NETWORK ELECTRONICS

### PART 1 - GENERAL

## 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to Ethernet switch infrastructure equipment for the Shelby Public Schools New Elementary School.
- B. System shall be comprised of a network core switch at the district head end, building core consolidation switches in each remote building end and distribution switches (stackable) in distribution closets for connection to end devices as described herein. Switches shall be installed, configured and connected to the existing building cable plant at the Owner's discretion.
- C. Contractor shall coordinate their delivery and 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 five (5) 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 and/or extended warranty shall be provided for all components of the system.
  - 1. Any documents and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.
  - 2. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.
- C. On-site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.
- D. Contractor shall provide the following response times for all malfunctioning equipment:

- Next business day (NBD) or less for matters that render twenty percent (20%) or more of the system unable to maintain normal functionality. Replacement parts for any item determined to be functioning below full design capacity shall be replaced promptly. Replacement components shall be shipped to Owner in order to arrive on the next business. Replacement components shall be shipped in advance of Owner return of non-functional components (Advance Replacement).
- 2. Two (2) business days for matters not meeting the above criteria.
- 3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.
- E. Bidder shall provide current annual maintenance contract pricing for recommended maintenance programs for all equipment following the specified and included three (3) year period as a Voluntary Alternate. This information will be considered by Owner and Designer as part of the bid evaluation process.
- F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have <u>no</u> effect on Warranty or System Acceptance by Owner and/or Designer.

# 1.03 STORAGE OF MATERIALS

- A. All materials shall be secured when not in use by the Contractor.
- B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.
- C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

### 1.04 SUBMITTALS

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

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

### 1.05 REFERENCE SPECIFICATIONS

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

- 3. NEC
- 4. FCC All Applicable Rules and Regulations
- 5. UL
- 6. MOSHA Safety Standards

#### 1.06 CONTRACTOR

- A. Contractor shall be an authorized vendor of all major components.
- B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install system and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods.
- C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.
- D. Contractor shall have offices or primary work locations for related personnel in physical proximity to sites of work that can reasonably be expected to allow service response times required for warranty and as described herein.
- E. The Contractor shall have a proven track record. This must be shown by the inclusion of references of at least three (3) projects involving similar systems completed by the Contractor in the prior two (2) years on unaltered forms with the sealed Bid as provided herein. Bid Form(s) may be duplicated as required in order to provide adequate space to list required number of reference installations for each division Bidder is responding to.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
  - 1. HP/ARUBA
  - 2. CISCO/MERAKI
  - 3. Or Equal.
- 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 Individual switches shall be capable of being fully administered from any web browser attached to the network.
- 2.05 Administration access shall be protected by unique and secure log on (User ID and Password).
- 2.06 System administrator shall be capable of complete switch back-up and full switch restoration from a previously saved configuration.
- 2.07 In the event of a power failure, complete system shall automatically re-initialize and "become active" to the last configuration in use with no human intervention.

### 2.08 DISTRICT CORE SWITCH MODULE EXPANSION

- A. Acceptable Manufacturer(s):
  - 1. HP/ARUBA
    - a. 8-port 10GBE SFP+ MACsec v3 zl2 Module
  - 2. Or Equal
- B. District Core Switch Module Expansion kit shall be provided in in quantity and locations in Appendix C. Core expansion module shall be installed to facilitate connection of Shelby Elementary School Fiber connection.
  - 1. Eight (8) SFP+ Modules
- C. Contractor shall supply all necessary licensing and labor to enable and make functional new District Core Switch Module into existing Aruba 5400R ZL2 core switch.

### 2.09 DEVICE DISTRIBUTION SWITCHES

- A. Acceptable Manufacturer(s):
  - 1. HP/ARUBA

- a. 2930f 48G PoE+ 4SFP 740W
- 2. CISCO/MERAKI
  - a. MS225-48FP
- 3. Or Equal.
- B. Stackable Device Distribution Switches shall be provided in quantity and locations identified in Appendix C. Switches shall be installed to facilitate cross connection of all station cables in the district. Switches provided shall meet or exceed the following.
  - 1. Forty-eight (48) 10/100/1000 UTP Ethernet ports.
  - 2. Four (4) SFP+ Ports
  - 3. All cables/connectors to facilitate switches being installed in Three (3) separate logical and physical stacks.
  - 4. Switches shall support uplink trunking across the stack
  - 5. IEEE 802.1p QoS with 4 ques per port.
  - 6. SNMPv1/v2c/v3
  - 7. 802.1X and Protocol based VLAN support.
  - 8. IEEE 802.3ad Link Aggregation (LACP).
  - 9. Broadcast, Unicast and Multicast traffic suppression.
  - 10. IGMP Snooping
  - 11. DHCP Helper
  - 12. IEEE 802.1X Port Based Network Access Control
  - 13. Power over Ethernet (PoE)
    - a. All Device Distribution switches provided shall be 802.3at PoE+ compliant.
    - b. Total 740W PoE power budget.

#### 2.10 OPTICS AND CONNECTIVITY

A. Two (2) 10GBE SFP+ based optics packages for SMF connectivity of switch stack to Shelby HS MDF.

B. Four (4) 10GBE SFP+ based optics packages for SMF connectivity of switch stack uplink of switches as described herein.

#### PART 3 - EXECUTION

#### 3.01 PREPARATION

- A. Contractor shall conduct a detailed walk through of all facilities to verify mounting and physical installation requirements.
- B. Contractor shall conduct a preliminary installation and configuration meeting at the convenience of the Owner to discuss Owner plans for network applications and device attachments to ensure proper final configuration for all parameters including, but not limited to:
  - 1. VLAN and routing configuration
  - 2. Security configuration
  - 3. Physical layout and connection schemes and configurations
  - 4. PoE applications intended devices.
  - 5. Confirm switch and device naming and identification scheme.
    - a. Physical labeling
    - b. Electronic / configuration management information.
  - 6. Management and problem diagnostic options.
- C. Contractor shall ensure all submittals and shop drawings have been provided to, and approval has been obtained from Designer prior to commencement of any final installation activities.
  - 1. Additionally, a detailed installation plan shall be provided for Owner and Designer approval prior to the commencement of any final installation activities. This plan shall include, but not be limited to the following:
    - a. Switch software configuration(s).
    - b. Physical layout and connection schemes and configurations

### 3.02 INSTALLATION

A. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner's or other contractor's activities.

- B. All equipment provided by contractor shall be fully configured and installed for the Owner's applications based on an installation plan provided by Contractor and meeting approval of Owner and Designer prior to the commencement of work.
- C. 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/or other contractor's work and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.
- D. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.
- E. The Contractor shall furnish, set in place, and physically install all equipment necessary for a fully compliant and operational system as specified herein.
- F. Contractor shall fully cooperate with Owner for detailed switch software/firmware configuration and system integration activities.
- G. 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 at Owner designated and provided until such time those items are installed according to the specifications.
  - 3. Transport equipment to the Owner's installation location(s).
  - 4. Physically assemble, install, configure and test based on an approved test plan all equipment and components, maintaining accurate inventory records and status documents and discarding packaging as may be directed by Owner.
  - 5. Label all system devices as may be appropriate and required by Owner and Designer using approved Brady labels.
  - 6. Work includes physical installation and configuration of switching gear for a fully functional system.
  - 7. Work includes extending connection and interconnection cables from equipment, as required, to Owner identified connection ports at all locations.

- a. Work includes supply and installation of new connection/patch cables to all devices for a fully functional and compliant system. Some devices may require special care and suitable tools to complete such connection or re-connection of cables.
- b. Patch cables shall not exceed ten (10) feet in length unless otherwise specified.
- c. Coordinate all patching plans and specific cable lengths used with Owner and Designer. Patch cables shall not be excessive in length for the connections made, and as such multiple lengths of cable will be required in each closet to properly and acceptably complete this portion of the work.
- d. Patch cables shall be Category 6 cable.
- e. Coordinate all patch cable color with Owner and Designer. Multiple colors shall be used to differentiate particular device types.
- f. Install all patch cable in neat workman like manner including, but not limited to dressing all cable routes and slack with .5" velcro straps.
- g. One compliant patch cable shall be provided for each device distribution port provided under this contract.
- 8. Complete system administrator training programs as specified herein.
- 9. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment.
- 10. Work includes the programming and configuration of network switches to integrate with existing
- H. Sites of Work:
  - New Shelby Elementary School North State Street Shelby, MI 49455
  - Shelby High School 641 North State Street Shelby, MI 49455
- I. 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.
- J. Contractor shall fully install and configure all network infrastructure for complete, compliant and final Owner applications and requirements including all physical labeling for asset management.

### 3.03 TESTING

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

- 4. Should Designer and Owner concur the Work is configured properly and system integrity is as required:
- D. Designer will review Contractors detailed "turn-up" plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system "turn-up" can proceed.

#### 3.04 DOCUMENTATION

- A. Contractor shall 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. Manufacturer's warranty.
  - 6. Maintenance contract terms.
  - 7. Verification of maintenance contract engagement.
  - 8. Telephone numbers for service and support.
  - 9. Detailed technical support and service procedure instructions.
  - 10. 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.
  - 11. 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.
  - 12. Complete inventory of installed hardware and system software. Hardware inventory shall include, but not be limited to, model numbers, serial number, physical installation location and software/firmware options.

#### 3.05 TRAINING

- A. Contractor shall provide training for the Owner designated system administrator(s). Owner shall designate up to Two (2) administrators to be trained. Training shall be a minimum of two (2), four (2) hour session(s) in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:
  - 1. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.
  - 2. System back-up and restore functions and procedures for all system parameters and configurations.
  - 3. Component replacement procedure.
  - 4. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to, configuration changes, device and port status.
  - 5. Complete review and administration review and training for network management application provided.
- B. Contractor shall submit a written training plan, course description(s) and syllabus to Owner and Designer for approval. Owner and/or Designer may require amendments(s) to training plan, course description and syllabus prior to training being scheduled.

### 3.06 SCHEDULE, MEETINGS AND PLANS

- A. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner, documented herein, required by Designer, Architect and/or Construction Manager and as required to meet schedules.
- B. Schedule
  - 1. Post bid Interviews: Week of December 5, 2022
  - 2. Contractor Chosen: Week of December 19, 2022
  - 3. Work Commences: April 1, 2023
  - 4. Substantial Completion of Project: June 1, 2023
  - 5. Project Close-out: September 1, 2023
- C. Planed sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.

D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.

## END OF SECTION

### SECTION 27 21 33 WIRELESS COMMUNICATION NETWORK

#### PART 1 - GENERAL

### 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to wireless systems expansion for Shelby Public Schools.
- B. Owner intends to replace an existing IEEE 802.11 based Wireless Communications Network System currently covering several sections of some buildings with new technology, improved areas of RF coverage and provisions for high density connections. Owner intends the Wireless Communications System to provide for full coverage within facilities and at the sites indicated for data communications applications.
  - 1. Owner's applications may include, but not be limited to:
    - a. High density workstation connectivity. This may include 1:1 student initiatives as well as student provided device connections.
      - 1. Thirty to sixty (30-60) connections are anticipated as typical per classroom in other buildings many of which may be streaming latency sensitive information.
      - 2. All other areas of facilities covered by system provided are anticipated to contain similar densities of connections, based on physical size and ability to contain persons equipped with connectable devices.
    - b. Student owned device connectivity.
    - c. Staff and/or administrator portable workstations.
    - d. Guest workstation connectivity.
- C. Contractor shall propose a System to be deployed using IEEE 802.11ac wireless technology foundation. The system shall be installed and connected to Ethernet infrastructure by others. System shall be compliant with "wireless switch" architecture using "thin" or "fit" Access Points (APs) and centrally located Wireless Controllers.
  - 1. Owner will provide adequate Ethernet PoE compliant switch ports for the number of devices specified herein.
- D. Any physical centralized Wireless Control equipment shall be installed in the Owner's existing Network Operations Center (NOC) if applicable.

- E. Contractor shall advise, coordinate and work cooperatively with Owner representatives related to any configuration changes required and/or proposed for Owner's Ethernet infrastructure (VLAN configuration, QoS mapping, routing, RADIUS Services, Firewall security provisions etc.).
- F. Power for all APs shall be provided by way of standard IEEE Power over Ethernet (PoE) installed in appropriate distribution frames by others throughout sites of work.
- G. The Contractor shall design, engineer, configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant Wireless Communication System, complete and with full functionality as specified herein.
- H. Contractor shall coordinate their installation with other communication systems, contractors, Designer and the Owner as is appropriate.
- I. Work includes the removal of existing wireless AP units and controller for disposition as directed by Owner.

# 1.02 WARRANTY

- A. Complete installation shall be free from defect and/or failure for a period of three (3) years. Any replacement, upgrade or fix, including labor for any non-conforming, unsupportable or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.
- B. Manufacturer's warranty shall be provided for all components of the system.
  - 1. Any documents and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.
  - 2. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.
- C. On-site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.
- D. Contractor shall provide the following response times for all malfunctioning equipment:
  - 1. Four (4) hours or less for matters that render twenty percent (20%) or more of the system users at any specific building or site unable to maintain normal productivity.

- 2. Two (2) business days for matters not meeting the above criteria.
- 3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.
- E. Bidder shall provide current annual maintenance contract pricing for recommended maintenance programs for all equipment following the specified and included five (5) year period as a Voluntary Alternate. This information will be considered by Owner and Designer as part of the bid evaluation process.
- F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have <u>no</u> effect on Warranty or System Acceptance by Owner and/or Designer.

### 1.03 STORAGE OF MATERIALS

- A. All materials shall be secured when not in use by the Contractor.
- B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.
- C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

#### 1.04 SUBMITTALS

- A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid Proposals.
- B. Shop drawings and diagrams shall be submitted by Bidder for approval by Designer with Bid Proposals.
  - 1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.

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

### 1.05 REFERENCE SPECIFICATIONS

- A. All work, products, and materials shall conform with the following standards as applicable for the intended use:
  - 1. EIA/TIA Commercial and Administration Standards
  - 2. NEC
  - 3. IEEE 802
  - 4. IETF RFCs

- 5. FCC All Applicable Rules and Regulations
- 6. UL
- 7. MOSHA Safety Standards

### 1.06 CONTRACTOR

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

### PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Acceptable Manufacturers are provided for bidder reference related to Owners prior determination of an acceptable level of quality, performance and feature set expected. Bidders proposing products not listed herein, shall be subject to Owner review, at the Owner's sole discretion, which shall be final determination of product, service or other equivalency for project related matters.
- B. Acceptable Manufacturer:
  - 1. EXTREME
  - 2. Or Equal.
- 2.02 Supply most current version of all products provided.

- A. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.
- B. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.
- 2.03 Furnish only new, first-class quality materials and equipment.
- 2.04 System shall be comprised of interoperable components including, but not limited to, centrally located Wireless Controllers, 802.11 Access Points, management software, antennae, power injectors/switches and battery/power conditioning equipment, integrated into a common working system.
- 2.05 WIRELESS CONTROLLER SOFTWARE
  - A. Contractor shall supply ExtremeCloud IQ licensing for all supplied wireless access points for term of provided warranty. Contractor shall fully configure ExtremeCloud IQ software to make all supplied Extreme AP410C wireless access points fully functional.
- 2.06 WIRELESS ACCESS POINTS (APs)
  - A. Acceptable Manufacturer(s)
    - 1. EXTREME
      - a. AP410C
    - 2. Or Equal.
  - B. Forty-five (45) Wireless Access Points shall be provided.
  - C. APs shall properly and acceptably communicate over, and attach to, Owner's standard, existing, installed Ethernet communications network provided by others.
  - D. AP units shall support the following features, standards and/or protocols:
    - 1. IEEE 802.11ax
    - 2. IEEE 802.3at
    - 3. IEEE 802.11 MIMO
    - 4. Multiple simultaneous BSSIDs
    - 5. DHCP

- 6. SNMP
- E. APs shall meet or exceed the following:
  - 1. All antennae shall be integrated into Access Point enclosure or otherwise included with AP hardware cost.
  - 2. Tri-radio 4x4 MIMO compliance with four (4) spatial streams
  - 3. Transmit and receive 2.4Ghz and 5Ghz bands simultaneously using a minimum of two independent radios.
  - 4. 2.4 Ghz/5 GHz/Sensor radio
  - 5. 10/100/1000 PoE+ Compliant (802.3at).
- F. All APs shall be firmly and securely mounted to finished ceiling, wall, or other surfaces to maximize wireless coverage and minimize tampering potential.

### 2.07 CONNECTION AND POWER OVER ETHERNET (PoE)

- A. All equipment for system bid shall connect to Owner's Ethernet distribution system including standard IEEE 802.3at PoE by others. Proprietary power distribution shall not be acceptable.
- B. All other features currently a part of the manufacturer's latest commercial release.

### PART 3 - EXECUTION

### 3.01 PREPARATION

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

# 3.02 INSTALLATION

A. Contractor shall conduct complete RF Propagation Site Survey for all relevant IEEE 802.11 frequency bands throughout the Owner sites. Survey shall be to determine and verify specific and appropriate installation and programming standards for specific proposed AP units including, but not limited to mounting, final antennae orientation/selection and channel selection.

- 1. RF Propagation Site Survey shall be fully documented (Report) by Contractor and submitted to Owner and Designer including, informational presentation, for written approval prior to any physical arrangement or accommodation for installation of system.
- 2. RF Propagation Site Survey shall include, but not be limited to:
  - a. Recommended physical AP placement.
  - b. Recommended physical AP mounting configurations.
  - c. Recommended AP channel selections.
  - d. Recommended AP antennae configuration.
- 3. Owner and Designer shall require up to two weeks to complete review(s) of RF Propagation Site Survey and provide written approval. Approval will be dependent upon acceptable and timely response to answers Owner and Designer may require of Contractor after the presentation of the RF Propagation Site Survey Report.
  - a. If Owner and Designer are unable to approve Report, Contractor may be provided reasonable opportunity to amend, complete or correct Report.
  - b. If Contractor is unable to provide Report acceptable to Owner and Designer after a reasonable duration is extended to do so, Owner reserves the right to terminate Contract.
- B. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner's normal daily activities.
- C. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed and disposed of by Contractor off-site. No on-site disposal of any waste, packaging or related project materials will be permitted. All equipment and tools shall be removed from common areas and stored in approved, secure storage locations. Any work that may impede the general use of the space and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.
- D. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.
- E. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:

- 1. Inventory receipt of all components and equipment.
- 2. Storage of all equipment and components until such time those items are installed according to the specifications.
- 3. Transport equipment to the Owner's installation location(s).
- 4. Assemble, install, configure and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
- 5. Collect all information necessary to accurately program all system devices to the Owner's intended use and need. This may include, but not be limited to VLAN configuration recommendation, SSID(s) broadcast coordination, user authentication requirements and security/encryption initiation.
- 6. Label all system devices as may be appropriate and required by Owner and Designer.
- 7. Complete end user and system administrator training programs as specified herein.
- 8. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment.
- 9. Work includes extending Ethernet Category 6 compliant patch cables from installed equipment, as required, to Owner identified connection ports at all locations.
  - a. Work included to connect patch cables for some APs may be in air plenum spaces, above finished ceilings, or in other ways require special care and suitable tools to complete.
  - b. Patch cables shall not exceed thirty (30) feet in length.
- 10. Material and labor to cross connect APs in communication closets to PoE switches shall be provided by Contractor using 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.
- 11. Contractor shall coordinate all patch cable colors with Owner in order to match existing standards for device and connection types.

- 12. All work shall be compliant with industry and manufacturer best practices and meet all applicable statutory codes and standards.
- F. Contractor shall remove all existing wireless AP units, related patch cables and controller equipment from sites of work. All equipment removal shall be coordinated with Owner and provide for uninterrupted functional wireless operation of the districts information systems. Existing equipment removed from sites shall be transported to a designated location within the district for disposition at Owner's discretion.
- G. Worksites include the following:
  - New Shelby Elementary School North State Street Shelby, MI 49455
- H. 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.
- I. Following installation and system "turn-up", but prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.
  - 1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.

### 3.03 TESTING

- A. In an effort to ensure a smooth "turn-up" of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over.
- B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements, meets the owner's specific application requirements and is ready for functionality and integrity testing.
- C. Testing Procedures

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

# 3.04 DOCUMENTATION

- A. Contractor shall provide Owner all necessary as-built drawings, owners manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or Owner deem necessary for final documentation package
  - 1. All documentation shall be provided in both a physical and digital version.
  - 2. Format of all provided documentation shall be coordinated with Owner and Designer.
- B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:
  - 1. Equipment description.

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

### 3.05 TRAINING

- A. Contractor shall provide training for the Owner designated system administrator(s). Training shall be a minimum of one (1), two (2) hour session 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.
- B. Contractor shall submit a written training plan, course description(s) and syllabus to Owner and Designer for approval. Owner and/or Designer may require amendments(s) to training plan, course description and syllabus prior to training being scheduled.

### 3.06 SCHEDULE, MEETINGS AND PLANS

- A. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner, documented herein, required by Designer, Architect and/or Construction Manager and as required to meet schedules.
- B. Schedule
  - 1. Post bid Interviews: Week of December 5, 2022
  - 2. Contractor Chosen: Week of December 19, 2022
  - 3. Work Commences: April 1, 2023
  - 4. Substantial Completion of Project: June 1, 2023
  - 5. Project Close-out: September 1, 2023
- C. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.
- D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended by Contractor as required by Owner and Designer.

# END OF SECTION

### SECTION 27 41 16 MULTIMEDIA SYSTEMS

### 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 Shelby Public Schools' new elementary school.
- 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.
- 4. 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 <u>no</u> 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 <u>Microsoft Project</u> 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 MULTI-MEDIA INFRASTRUCTURE CABLE

- A. All classrooms receiving new projection systems shall receive new multimedia infrastructure cable. Please refer to Appendix B for quantities and locations.
- B. 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.
- C. Infrastructure cable to connect projector to a teacher station wall plate shall be provided.
- D. Acceptable Cable:
  - 1. Active HDMI Digital Video Cable 1 shall be of commercial first-class quality manufacture and meet or exceed the following requirements:
    - a. Active Optical Cable
    - b. Supports 4K@60Hz
    - c. CMP Plenum Rated
    - d. Rated for in wall use

- 2. Active HDMI Digital Video Cable 2 shall be of commercial first-class quality manufacture and meet or exceed the following requirements:
  - a. Active Optical Cable
  - b. Supports 4K@60Hz
  - c. CMP Plenum Rated
  - d. Rated for in wall use
- E. 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.
  - 5. HDMI inputs in faceplate shall be positioned at the bottom of the plate, side by side in double gang plate so both connections will be able to utilize right angle connectors for umbilical cables. Contractor to supply necessary HDMI passthrough pig tails to support tight bend radius mounting.
- F. All cables originating from wall plate connectors, except speaker cables, shall terminate in a service loop eight (8) feet in length at projector location.
- G. Cable shall terminate in the following connector gender:
  - a. Active HDMI Digital Video Cable 1 HDMI Type A 19 pin plug connector to display device.
  - b. Active HDMI Digital Video Cable 2 HDMI Type A 19 pin plug connector to display device.

## 2.05 MULTIMEDIA CONNECTION CABLE

- A. All classrooms receiving new projection systems shall receive new multimedia connection cable bundles. Please refer to Appendix B for quantities and locations.
- B. Fully assembled infrastructure cable bundles for each classroom indicated to receive a projector shall be provided for final connection to components and classroom plate by others.

- C. Acceptable Manufacturer
  - 1. Cable shall be of commercial first-class quality manufacture.
  - 2. All Cable shall be fifteen (15) feet in length and terminate in the following connector genders:
  - 3. HDMI Cable 1 (M/M) Cable shall have right angle connector in wall plate locations and straight connector on teacher device input location.
  - 4. HDMI Cable 2 (M/M) Cable shall have right angle connector in wall plate locations and straight connector on teacher device input location.
  - 5. Phone Cable Category 6 (M/M) Cable shall terminate on data jack location provided by Others.
- D. Contractor shall fully disassemble existing multimedia cable bundle and leave category cables for computer and phone connection. Existing HDMI cables shall be provided to Owner for disposition.
- E. 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.

## 2.06 SHORT THROW VIDEO PROJECTORS

- A. Short Throw Video Projectors each with accompanying projector specific mounts shall be provided and installed by selected Contractor. Please refer to Appendix B for quantities and locations.
- B. Acceptable Manufacturers (In alphabetical order):
  - 1. EPSON
    - a. Brightlink 725W
- C. Projectors shall include full functionality of the following feature sets and/or standards in projector management software and/or remote access capability and in conjunction with proposed projectors, and shall provide for all

management, configuration and control features and/or standards from a management administrative interface:

- 1. Administration access shall be protected by unique and secure log on (User ID and Password).
- 2. System administrator shall be capable of complete system back-up and full system restoration from a previously saved configuration.
- 3. Projector reporting shall include, but not be limited to:
  - a. Device power status (on/off).
  - b. Filter status management.
  - c. Source selection status.
- 4. Projector Control shall include, but not be limited to:
  - a. Device power (on/off).
  - b. Source selection.
  - c. Internal or downloadable program schedule database for timed execution of projector control functions based on, but not limited to time of day and day of week.
- D. Projector management software and/or access shall be installed on equipment provided at Owner discretion to be located at the owner's discretion and communicate over the existing installed infrastructure provided by others.
- E. Projectors shall meet or exceed the following minimum output, port availability and other standards:
  - 1. 4000 ANSI Lumens
  - 2. WXGA resolution
  - 3. +/- 3-degree keystone correction.
  - 4. 7 second power-on to image.
  - 5. 1.2x optical zoom lens.
  - 6. Bidirectional RS-232 serial control port.
  - 7. 3 HDMI Inputs
  - 8. RGB WXGA port.

- 9. Operating volume level of less than 40dB (fan).
- 10. Operating temperature range of 45 95 degrees Fahrenheit.
- 11. Accessible top or front panel mechanical controls including, but not limited for the following functions:
  - a. Power on.
  - b. Power off.
  - c. Video input port selection.
- 12. Mechanical keypad lock out to minimize tampering with device settings
- 13. Ethernet connector for management, monitoring and control applications.
- 14. User definable power on graphic to replace factory default or manufacturer logo
- 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.

## 2.07 DOCUMENT CAMERA

- A. A Document Camera shall be provided and installed in locations as indicated in Appendix B.
- B. Acceptable Manufacturers
  - 1. IPEVO
    - a. VZ-R HDMI/USB Dual Mode Document Camera
- C. Document cameras shall include full functionality of the following feature sets and/or standards in workstation software and in conjunction with proposed devices, and shall provide for all management, configuration and control features and/or standards from a workstation administrative interface:
  - 1. Software Control shall include, but not be limited to:
    - a. Zoom.
    - b. Focus.
    - c. Brightness.

- d. White Balance.
- e. Video capture.
- D. Document camera software shall be installed by Owner on standard classroom workstations provided by Owner.
- E. Document cameras shall meet or exceed the following minimum standards:
  - 1. 8.0 Megapixel (3264 x 2448)
  - 2. Full autofocus lens
  - 3. 25 frames per second video capture rate
  - 4. HDMI and USB output
- 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. Contractor shall supply 8' HDMI cable for document camera connection.
- H. All other features currently a part of the manufacturer's latest commercial release.

#### 2.08 AMPLIFICATION EQUIPMENT

- A. Amplification Systems shall be provided and installed in locations as indicated in Appendix B.
- B. Acceptable Manufacturers
  - 1. ATLONA
    - a. AT-PA100-G2
  - 2. KRAMER
  - 3. Or Equal
- C. Major components of Amplification System shall be at projector location.
- D. Amplification systems shall meet or exceed the following minimum standards:
  - 1. 20 watts per channel output
- E. Contractor shall supply all necessary cabling to connect de-embedded audio from projector to Amplification 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. Amplification Systems where indicated shall be neatly and securely mounted at projector location.

### 2.09 AUDIO SPEAKERS

- A. Classroom speakers shall be installed in/on finished ceiling surfaces in each room as indicated in Appendix B.
- B. Acceptable Manufacturer:
  - 1. ATLASIED
  - 2. LIGHTSPEED
  - 3. QUAM
  - 4. Or Equal.
- C. Where classroom speakers are to be installed in drop ceilings, they shall be near flush mount and cleanly cut into available tiles for optimal and uniform audio fill of the relevant classroom space. Speakers shall meet or exceed the following minimum standard requirements:
  - 1. 6" driver; 1" horn per speaker
  - 2. Frequency response: 40 Hz 20 kHz
  - 3. Impedance of 8 Ohms
  - 4. Power handling of 30 watts
  - 5. Speakers shall be mounted in fully enclosed, acoustically appropriate, metallic back boxes and fully supported by appropriate tile bridges.
- D. Where flush mounting is not possible or practical, Contractor shall install surface mounted speakers meeting or exceeding all requirements above.
- E. Where specific speaker location is in question, obtain Owner approval prior to any final installation activity.
- F. All speakers shall include attractive finished white grill.
- G. All speaker wire shall be 16 AWG high quality cable.

H. All speaker cable shall be connected to audio amplifier at the projector location.

#### 2.10 SPECIAL CONFIGURATION SPACES

- A. SPECIAL CONFIGURATION A
  - 1. Contractor shall supply one (1) of the specified configuration in the following locations:
    - a. New Shelby Elementary Conference Room B141
  - 2. One (1) LED Monitor(s)
    - a. Acceptable Manufacturer(s)
      - 1. SAMSUNG
        - A QBB65
      - 2. Or Equal.
    - 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) tilt Peerless ST660P or Chief equivalent shall be provided.
  - 3. One (1) HDMI Transmission Device(s)
    - a. Acceptable Manufacturer(s)

- 1. CRESTRON
- 2. KRAMER
  - A TP-580T/TP-580R
- 3. Or Equal.
- b. HDMI Transmission Device shall meet or exceed the following minimum requirements:
  - 1. HDBaseT 1.0
  - 2. 4K60 4:2:0 Up to 130'
  - 3. HDCP 2.2
- c. Contractor shall install HDMI transmitter at conference table provided by Others and integrate into table pocket. HDMI pass through connector in table pocket provided by Others.
- d. Contractor shall securely and neatly mount HDMI transmission equipment at table and monitor locations.
- e. Contractor shall supply and install shielded cable and passthrough connector to integrate with floor box.
- f. Contractor to supply 8' ultra-slim HDMI cable for device connection.
- 4. One (1) Wireless Presentation System
  - a. Acceptable Manufacturers (in alphabetical order):
    - 1. KRAMER
      - A VIA GO 2
      - B Or Equal.
  - b. Wireless Presentation System shall meet or exceed the following requirements:
    - 1. HDMI output with support for up to 4K@30Hz.
    - 2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
    - 3. 4GB Memory
    - 4. 32GB Storage

- 5. All other features currently a part of the manufacturer's latest commercial release.
- 6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system at projector location.
- c. Contractor shall securely mount wireless presentation system device at monitor location.
- 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.

#### **B. SPECIAL CONFIGURATION B**

- 1. Contractor shall supply one (1) of the specified configuration in the following locations.
  - a. Cafeteria A119
  - b. Reception B144
- 2. One (1) LED Monitor(s)
  - a. Acceptable Manufacturer(s)
    - 1. SAMSUNG
      - A QBB55
    - 2. Or Equal.
  - b. LED Monitor shall meet or exceed the following minimum Standards:
  - c. 55" diagonal in size
  - d. 60Hz refresh rate
  - e. Rated for 16/7 run-time
  - f. 8ms refresh rate
  - g. 3840 x 2160 resolution

- h. 16:9 aspect ratio
- i. Two (2) HDMI input ports
- j. RS232C capable
- k. Contractor shall supply and install appropriate mounts for supplied LED monitors, one (1) tilt Peerless ST660P or Chief equivalent shall be provided. See drawings for locations.
- 3. One (1) Digital Signage Device(s) shall be provided and installed.
  - a. Acceptable Manufacturer(s)
    - 1. Intel
      - A NUC
    - 2. Or equal.
  - b. Digital Signage Device(s) shall meet or exceed the following requirements:
    - 1. Intel Core i3 processor or better
    - 2. 128gb SSD
    - 3. 8 GB RAM
    - 4. Integrated Ethernet connection
    - 5. HDMI output capable of 4K resolution
  - c. Contactor shall securely install Intel NUC Digital Signage device at LED panel location for connection to Owner supplied digital signage software.
  - d. Contractor shall work collaboratively with Owner to configure Intel NUC Digital Signage device for use with Owners supplied digital signage software.
  - 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.
- C. SPECIAL CONFIGURATION C

- 1. Contractor shall supply one (1) of the specified configuration(s) in the following locations:
  - a. Gymnasium B129
- 2. One (1) Rack System(s) shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. Middle Atlantic
      - A DWR-12-26PD
    - 2. Or Equal.
  - b. Wall Mount
  - c. 12U
  - d. Plexiglas Locking Door
  - e. Forward rackrail
  - f. UL Load Capacity 200 lbs
  - g. 26" usable depth
  - h. 21" usable height
  - i. Contractor to supply 8-Outlet PDU (Middle Atlantic PD-815R or Equal).
- 3. One (1) Voice Amplification System(s) shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. SHURE QLXD4
    - 2. Or Equal.
  - b. Handheld and Lavalier microphone combo
  - c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire gymnasium.
  - d. Contractor shall supply all mounting hardware to securely mount equipment into Contractor supplied rack.

- e. Contractor shall supply 3U drawer to store microphone in Contractor supplied rack.
- 4. One (1) Mixer shall be provided and installed.
  - a. Acceptable Manufacturer(s)
    - 1. BIAMP/COMMUNITY
    - 2. HARMAN/JBL PRO
      - A CSM-28
    - 3. POWERSOFT
    - 4. QSC
    - 5. Or Equal.
  - b. System shall be populated with necessary accessories for 2 line-level output audio channels.
  - c. System shall be populated with necessary accessories for 8 line-level input audio channels.
  - d. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
  - e. Contractor shall supply all necessary labor to configure Mixer/DSP.
  - f. Contractor shall supply all necessary labor to configure Mixer/DSP system for even audio reproduction throughout the gymnasium.
  - g. Contractor shall supply all cables and accessories for a fully functional system.
- 5. One (1) Amplification System shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. BIAMP/COMMUNITY
    - 2. HARMAN/JBL PRO
      - A CSA2300Z
    - 3. POWERSOFT
    - 4. QSC

- 5. Or Equal.
- b. Two (2) input channels
- c. Two (2) output channels
- d. Input sensitivity @ 8 Ohms 26 dB Gain 5.03 Vrms
- e. 300W maximum output per channel at 8 Ohms
- f. S/N (20 Hz 20kHz @ 8 Ohms) > 111 dB
- 6. Two (2) Speaker(s) in One (1) zones shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. BIAMP/COMMUNITY
    - 2. ELECTROVOICE
    - 3. HARMON/JBL PRO
    - 4. QSC
    - 5. Or Equal
  - b. Passive 2-way full range speaker
  - c. 12" Low Frequency Driver, 2.5-inch Voice Coil
  - d. 1.75" High Frequency Driver
  - e. 300W AES, 1200W peak
  - f. 8 ohms
  - g. 94 dB sensitivity
  - h. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
  - i. Contractor shall safely and securely mount speakers to cafeteria ceiling structure using manufacturer recommended and industry best practices.
  - j. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.

- k. Contractor shall supply and install properly sized speaker cabling to support supplied speakers. Each speaker shall be independently wired back to provided rack.
- 7. One (1) CD/Bluetooth Player shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. DENON
      - A DN-300Z
    - 2. Or Equal.
  - b. Extended range Bluetooth antenna
  - c. AM/FM Radio Tuner
  - d. USB media player connectivity
  - e. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
  - f. Contractor shall provide all audio cables and accessories to integrate CD/Bluetooth player with provided mixer/DSP system.
- 8. One (1) Remote input location(s) shall be provided and installed in location identified on drawing.
  - a. Remote input location shall provide XLR and 3.5mm connectivity in identified location.
  - 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.

## D. SPECIAL CONFIGURATION D

- 1. Contractor shall supply one (1) of the specified configuration(s) in the following locations:
  - a. Cafeteria A119
- 2. One (1) Projector
  - a. Acceptable Manufacturer(s)

- 1. EPSON
  - A L630U
- b. 6,300 Lumens
- c. Projector shall be installed and positioned for the projected image to completely fill Contractor provided powered rollup screen.
- 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 Contractor provided screen.
- e. Provided white projector downpipe shall allow routing of projector cabling internally.
- 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.
- g. Contractor shall supply appropriate 4K60 4:4:4 decoder device to integrate with provided control system.
- 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 IT Rack provided by Others.
  - 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 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 one (1) 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.
- h. Contractor to supply 8-Outlet PDU (Middle Atlantic PD-815R or Equal).
- 4. One (1) Multimedia Input Locations shall be provided.
  - a. Acceptable Manufacturer(s)
    - 1. CRESTRON

A DM-NVX

- 2. QSC
- b. Contractor shall supply correct in-plate DM transmit and receive equipment to extend input location to supplied NVX encoder.
- c. Contractor supply all necessary NVX decoder equipment to connect supplied projector.
- d. Valid video input into the system shall turn on system automatically.
- e. System shall power down after ten (10) minutes of no video signal.
- f. NVX units shall provide 4K60 4:4:4 resolution.
- g. NVX units shall properly scale input image to projector to optimal resolution.
- 5. One (1) Touch Screen(s) shall be provided
  - a. Acceptable Manufacturer(s)
    - 1. 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. Contractor shall provide protective plexiglass, lockable enclosure.
  - 4. 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 Contractor provided motorized electric screens.
- 6. One (1) Powered Rollup Projection Screen
  - a. Acceptable Manufacturer(s)
    - 1. DA-LITE
      - A Cosmopolitan Electrol
    - 2. DRAPER

- b. Powered Rollup Projection Screen shall meet or exceed the following minimum requirements:
- c. 78" x 139" Wide (16:9) Format
- d. White case
- e. Surface mount
- f. Matte white screen surface
- g. Low voltage control RS-232 capable
- 7. One (1) Wireless Presentation System shall be provided and installed.
  - a. 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.
  - b. Cables and Accessories
    - 1. 3' HDMI cable for connectivity to encoder
    - 2. All necessary mounting brackets and connectors to securely mount at teacher input location.
    - 3. Work includes extending Ethernet Category 6 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.

- 4. Material and labor to cross connect wireless presentation systems in communication closets to PoE 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.
- 5. 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.
- 8. One (1) Voice Amplification System(s) shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. SHURE QLXD4
    - 2. Or Equal.
  - b. Handheld and Lavalier microphone combo
  - c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire gymnasium.
  - d. Contractor shall supply all mounting hardware to securely mount equipment into Contractor supplied rack.
  - e. Contractor shall supply 3U drawer to store microphone in Contractor supplied rack.
- 9. 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. 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 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.
- k. Speakers shall be white in color.
- 10. One (1) Mixer/DSP shall be provided and installed.
  - a. Acceptable Manufacturer(s)
    - 1. CRESTRON
    - 2. BIAMP/COMMUNITY
    - 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. 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
- 12. One (1) CD/Bluetooth Player shall be provided and installed
  - a. Acceptable Manufacturer(s)
    - 1. DENON
      - A DN300Z
    - 2. Or Equal.
  - b. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
  - c. Contractor shall provide all audio cables and accessories to integrate CD/Bluetooth player with provided DSP/Mixer system.
- 13. 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.

# E. SPECIAL CONFIGURATION E

- 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
  - a. Media Center
- 2. One (1) Projector(s)
  - a. Acceptable Manufacturer(s)
    - 1. Epson
      - A L630U
  - b. 6200 Lumens
  - c. Horizontal and vertical lens shift
  - d. Full HD WUXGA support
  - e. Projector shall be installed and positioned for the projected image to maximize image on existing manual rollup screen.
  - f. 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 extend projector securely and safely to optimal location for projection onto existing screen.
  - g. Provided white projector downpipe shall allow routing of projector cabling internally.
  - h. 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.
  - i. Contractor shall supply all labor and materials to integrate projector audio with existing classroom mixing board/audio system.
- 3. One (1) Manual Rollup Projection Screen
  - a. Acceptable Manufacturer(s)
    - 1. DA-LITE

- A Model C with CSR
- 2. DRAPER
- b. Manual Rollup Projection Screen shall meet or exceed the following minimum requirements:
- c. 96" x 116" 16:9
- d. Black case
- e. Matte white screen surface with black border
- 4. One (1) Multi-media Infrastructure Cable and Faceplate
  - 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 wall plate shall be provided.
  - c. Acceptable Cable:
    - 1. Active HDMI Digital Video Cable 1 shall be of commercial firstclass quality manufacture and meet or exceed the following requirements:
      - A Monoprice 4K SlimRun HDMI Active Optical Cable or Equal
      - B Supports 4K@60Hz
      - C CMP Plenum Rated
      - D Rated for in wall use
    - 2. Active HDMI Digital Video Cable 2 shall be of commercial firstclass quality manufacture and meet or exceed the following requirements:
      - A Monoprice 4K SlimRun HDMI Active Optical Cable or Equal
      - B Supports 4K@60Hz
      - C CMP Plenum Rated

- D Rated for in wall use
- d. 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.
- e. All cables originating from wall plate connectors, except speaker cables, shall terminate in a service loop eight (8) feet in length at projector location.
- f. Cable shall terminate in the following connector gender:
  - A Active HDMI Digital Video Cable 1 HDMI Type A 19 pin plug connector to display device.
  - B Active HDMI Digital Video Cable 2 HDMI Type A 19 pin plug connector to display device.
- g. Extra deep, double gang, surface mount box shall be provided for integration with contractor supplied stainless-steel faceplate.
- 5. One (1) Amplification System shall be provided and installed.
  - a. Acceptable Manufacturer(s)
    - 1. ATLONA
      - A AT-PA100-G2
    - 2. CRESTRON
    - 3. JBL PRO
    - 4. KRAMER
    - 5. CRESTRON
  - b. Major components of Audio Amplification System shall be carefully installed at projector location.

- c. Audio Amplification systems shall meet or exceed the following minimum standards:
  - 1. 40 Watts (20W/Channel)
- d. Contractor shall provide one (1), three (3) foot audio patch cables to connect input ports on amplifier to audio output on projector.
- e. In the event of a power failure, system shall automatically re-initialize and "become active" to the last configuration in use with no human intervention.
- f. All other features currently a part of the manufacturer's latest commercial release.
- 6. Eight (8) Audio Speakers shall be provided.
  - a. Acceptable Manufacturer:
    - 1. ATLAS
    - 2. BOGEN
    - 3. LIGHTSPEED
    - 4. QUAM
    - 5. Or equal.
  - b. Where speakers are to be installed in drop ceilings, they shall be near flush mount and cleanly cut into available tiles for optimal and uniform audio fill of the relevant classroom space. Speakers shall meet or exceed the following minimum standard requirements:
    - 1. 6" driver; 1" horn per speaker
    - 2. Frequency response: 40 Hz 20 kHz
    - 3. Impedance of 8 Ohms
    - 4. Power handling of 30 watts
    - 5. Speakers shall be mounted in fully enclosed, acoustically appropriate, metallic back boxes and fully supported by appropriate tile bridges.
  - c. Where flush mounting is not possible or practical, Contractor shall install surface mounted speakers meeting or exceeding all requirements above.

- d. Where specific speaker location is in question, obtain Owner approval prior to any final installation activity.
- e. All speakers shall include attractive finished white grill.
- f. All speaker wire shall be 16 AWG high quality plenum rated cable.
- g. All speaker cable shall be terminated at amplification system mounted at or near projectors.
- h. All speaker cable shall be protected in existing owner raceway.
- 7. One (1) Wireless Presentation System
  - a. Acceptable Manufacturers (in alphabetical order):
    - 1. KRAMER
      - A VIA GO 2
      - B Or Equal.
  - b. Wireless Presentation System shall meet or exceed the following requirements:
    - 1. HDMI output with support for up to 4K@30Hz.
    - 2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
    - 3. 4GB Memory
    - 4. 32GB Storage
    - 5. All other features currently a part of the manufacturer's latest commercial release.
    - 6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system at provided projector location.
  - c. 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.
  - d. 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.

# 2.11 ALLOWANCES

- A. Contractor shall include allowances for equipment and/or other contract service reimbursements as required below in base bid lump sum amount(s). Equipment and/or contract services shall be provided and sourced at Owner's discretion and convenience with full cooperation by Contractor and paid for from successful bidder's contract in the amount(s) provided for herein. Any allowance amount proving to be excessive for the intended equipment and/or contract services shall be credited to the Owner against contract payment requests.
  - 1. Allowance shall be made in the amount of \$5,000 for contract services related to supply, installation, and connection of Owner directed infrastructure upgrades.

# PART 3 - EXECUTION

# 3.01 PREPARATION

- A. Contractor shall conduct detailed walk-through examination with Designer, Construction Manager and Owner verifying equipment and material locations as well as mounting and placement requirements prior to commencement of other installation activities.
- B. Contractor shall completely cooperate with Owner's Construction Manager for all site access, site safety and related matters. Contractor shall obtain current drawings, specifications and plans from Owner's Construction Manager and make field adjustments as required to correctly and reasonably coordinate with other trades. Contractor will attend all CM field coordination and schedule meetings and cooperate with project timelines as directed.
- C. 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.

## 3.02 INSTALLATION

- A. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner's or other contractor's activities.
  - 1. Appendices depicting general ceiling conditions for areas of buildings are included herein. Contractors shall field verify specific room conditions.
- B. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed, and disposed of off premise. All equipment and tools shall be removed from common areas and stored in approved, secure storage locations.
  - 1. Owner shall not be responsible for disposal or transportation of any packaging materials or other waste items.
  - 2. Owner's waste containers including site dumpsters shall not be used for material disposal.
- C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.
- D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:
  - 1. Inventory receipt of all components and equipment.
  - 2. Storage of all equipment and components until such time those items are installed according to the specifications.
  - 3. Transport equipment to the Owner's installation location(s).
  - 4. Assemble, install, configure, and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
  - 5. Collect all information necessary to accurately program all system devices to the Owner's intended use and need.
  - 6. Label with asset tags and other markings provided by Owner all system devices as may be appropriate and required by Owner and Designer.
  - 7. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment. Work

shall conform to "best practices" observed by industry professional installers and as required by Owner and Designer.

- 8. Work shall include careful coordination and cooperation with others to ensure a timely, cost effective and proper installation for Owner's intended application. Such efforts shall include, but not be limited to, coordinating, and cooperating with other contractors, Owner, Designer and Engineer.
- 9. Where cables are to be routed through or on a finished wall, standard connectors must be used at the wall location to terminate call cables. All wall plates shall be stainless steel. Plastic or nylon plates shall not be acceptable. Cables routed out of a wall box on a finished wall without proper standard connection termination shall not be acceptable.
- 10. All cables shall be proper and adequately supported using hooks or rings no more than eight feet (6') 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.
  - b. Work includes neatly routing all cables and securing cables with Velcro straps as may be reasonably required to keep cables in position during normal operating, service, and inspection operations.
  - c. Cables for some devices may be routed in air plenum spaces, above finished ceilings, or in other ways require special care and suitable tools to complete. Where air plenum status is in question and/or may change, plenum rated cable shall be used.
- E. All installation and configuration activity shall fully comply with both the manufacturer's recommended procedures as well as industry best practices.
- F. VIDEO PROJECTORS

- 1. Install, configure, and test approved firmware configuration template including, but not limited to:
  - a. Power on Image.
  - b. Lamp setting.
  - c. Firmware based Device ID (Including parameters such as: TCP/IP settings, Host Name, etc.).
  - d. Default port selection.
- 2. Neatly configure all cables as directed by Owner.
- 3. Attach projector to mount using projector security mounting plate provided by others.
- 4. Connect AC power using cord provided to projector.
- 5. Align projector with screen.
- 6. Set keystone adjustment(s) as required.
- 7. Zoom and focus projector as required.
- 8. Properly and completely secure all adjustment points.
- 9. Provide for low voltage power from projector electrical outlet to the remote input/switcher mounted above the input plate. Securely mount transformer with the projector.
- 10. Coordinate with Owner and Designer markerboard location adjustments.
- 11. Remove and dispose of all excess materials, and packaging as directed by Owner.
- 12. Physically connect to Owner network and enable in Epson management software on Owner provided server.

## G. DOCUMENT CAMERAS

- 1. Develop with Owner and Designer an approved firmware configuration template for all physical and programmatic settings available on the product.
- 2. Install, configure, and test approved firmware configuration template in all spaces as indicated on schedules herein.
- H. WIRELESS PRESENTATION DEVICES

- 1. Develop with Owner and Designer an approved firmware configuration template for all physical and programmatic settings available on the product.
- 2. Install, configure, and test approved firmware configuration template in all spaces as indicated on schedules herein.
- I. VOICE AMPLIFICATION SYSTEM
  - 1. Connect all audio input and output device cables.
  - 2. Secure mounting location with mounting screws or Velcro pads to eliminate involuntary equipment movement.
  - 3. Neatly route all cabling and secure slack.
  - 4. Adjust balance levels for standard configuration.
  - 5. Verify target volume level in space with sound meter and record level at installation.
- J. 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.
- K. 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.
- L. All cable and device labels shall match existing standard.
- M. Worksites include the following:

 New Shelby Elementary School North State Street Shelby, MI 49455

### 3.03 TESTING

- A. In an effort to ensure a smooth "turn-up" of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over.
- B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements, meets the owner's specific application requirements and is ready for functionality and integrity testing.
- C. Testing Procedures
  - 1. Prior to system "turn-up", Contractor shall submit a written request and proposed test plan to Designer indicating they have completed full and final configuration of the system and are ready to have system integrity and functionality tested.
  - 2. Within reasonable time after receipt of request, Designer will accept or revise the proposed test plan, provide a test schedule and coordinate testing date(s) with Owner and Contractor.
  - 3. Should Designer determine the Work is not acceptably configured or not of adequate integrity:
    - a. Designer promptly will so notify Contractor, giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.
    - b. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-testing.
    - c. Designer will schedule re-test of the Work.
    - d. Excessive re-testing of Work may result in fees being assessed Contractor.
  - 4. Should Designer and Owner concur the Work is configured properly, and system integrity is as required:
    - a. Designer will review Contractors detailed "turn-up" plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system "turn-up" can proceed.

#### 3.04 DOCUMENTATION
- A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment, including if reasonably required, file drawers, folders, dividers, etcetera, to contain all 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. Location installed.
  - 7. Manufacturer's warranty.
  - 8. Maintenance contract terms.
  - 9. Verification of maintenance contract engagement.
  - 10. Telephone numbers for service and support.
  - 11. Detailed technical support and service procedure instructions.
  - 12. 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.
  - 13. 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.
  - 14. CAD or Visio as built drawings/diagrams for each building.

- 15. System Configuration Report.
- 16. Complete inventory of installed hardware and system software including, but not be limited to, model numbers, Ethernet MAC address, serial numbers, physical installation location and software options.

# 3.05 TRAINING

- A. No training shall be conducted prior to training outline and/or syllabus being approved by Owner, Instructional or overview activities conducted without prior content approval with not be deemed contract training, and Contractor shall remain responsible for delivery of approved training.
- B. Contractor shall provide training for the Owner designated system administrator(s). Training shall be a minimum of one (1), one (1) hour session 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.
- C. Contractor shall provide end user training for classroom instructors district wide via the development of video training segments to be posted on an internal website for distribution. Training shall be available prior to substantial completion. End user video training segments shall include, but not limited to the following:
  - 1. System power up and power down.
  - 2. Source selection.
  - 3. Volume control.
  - 4. Voice amplification use.
  - 5. Document camera operation.
  - 6. System care and classroom maintenance best practices.
  - 7. Equipment cart relocation and adjustments.

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- 8. Screen operation and care.
- 9. Problem reporting.
- D. "First day" training support shall be provided for all buildings (district wide) during a day agreed upon by the Owner. This training support shall provide users with assistance in problem diagnostics and "first day" operations of installed equipment. Adequate numbers of qualified support trainers shall be deployed to provide users with thirty (30) minute or less response on all support training requests. Owner will designate the appropriate day for this training to take place.

# 3.06 SCHEDULE, MEETINGS AND PLANS

- A. Schedule
  - 1. Post bid Interviews: Week of December 5, 2022
  - 2. Contractor Chosen: Week of December 19, 2022
  - 3. Work Commences: April 1, 2023
  - 4. Substantial Completion of Project: June 1, 2023
  - 5. Project Close-out: September 1, 2023
- 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 51 16 PUBLIC ADDRESS SYSTEM

#### PART 1 - GENERAL

#### 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to Public Address and Intercom System expansion for Shelby Public Schools. Work shall include, but not be limited to, head-end equipment, cabling, ceiling and/or wall speakers, interface units and all other components and services required for a full and operational system.
- B. Owner desires to add to systems currently in operation and serving indicated locations.
  - New Shelby Elementary School North State Street Shelby, MI 49455
- C. The Contractor shall design, engineer, configure, supply, connect, test, document, and warrant a fully operational and compliant system, complete and with full functionality as specified herein.
- D. Contractor shall coordinate their installation with other communication systems, contractors, Designer, and the Owner as is appropriate.

#### 1.02 WARRANTY

- A. Complete installation shall be fully functional and free from defect and/or failure for a period of three (3) 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.
  - 1. Owner shall be provided full operation of system functions and features during the complete warranty period incurring absolutely no costs during that time.
- 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.
- D. Contractor shall provide the following response times for all malfunctioning equipment:
  - 1. Four (4) hours or less for matters that render twenty percent (20%) or more of the system users unable to maintain normal productivity.
  - 2. Two (2) business days for matters not meeting the above criteria.
  - 3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.
- E. Bidder shall provide current monthly maintenance/service contract pricing for recommended programs for all equipment following the specified and included period as additional information. 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, connection of circuits, turn-up of system, 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 <u>no</u> effect on Warranty or System Acceptance by Owner and/or Designer.

### 1.03 STORAGE OF MATERIALS

- A. All materials shall be secured when not in use by the Contractor.
- B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.
- C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

### 1.04 SUBMITTALS

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

- B. Shop drawings and diagrams shall be submitted by Bidder for approval by Designer with Bid Proposals.
  - 1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.
  - 2. No work constituting final installation shall be commenced until after approval of shop drawings by Designer.
- C. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project with Bid Proposals.
- D. Equipment or material installed for this project that does not have an approved submittal associated with it, will be removed, and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.
  - 1. The Owner and/or Designer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.
  - 2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due or become due Contractor.
- E. The Contractor shall submit within five (5) 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. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing and executing the work required by the Contract Documents. Owner will rely on such schedules to coordinate and otherwise plan related work of Owner personnel, other separate contractors, or the Owner's routine daily work.

### 1.05 REFERENCE SPECIFICATIONS

A. All work, products, and materials shall conform with the following standards as applicable for the intended use:

- 1. EIA/TIA Commercial and Administration Standards
- 2. NEC
- 3. IEEE 802
- 4. IETF RFCs
- 5. FCC Emissions Ratings
- 6. UL
- 7. MOSHA Safety Standards

### 1.06 CONTRACTOR

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

#### PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Manufacturer of major components of the included Public Address / Intercom system shall be known and leading entity in the relevant communications field, and shall have been designing, manufacturing, and installing similar systems for a period of no less than three (3) years.
  - 1. Acceptable Manufacturers
    - a. VALCOM
    - b. Or Equal

- 2.02 Supply most current version of all products provided.
  - A. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.
  - B. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.
- 2.03 Furnish only new, first-class quality materials and equipment.

#### 2.04 PUBLIC ADDRESS AND INTERCOM SYSTEM HEAD END

- A. Contractor shall supply, install, and configure all necessary materials for a fully IP PoE Paging/Intercom system. System shall fully integrate new speakers and intercom devices as specified herein for a fully working and compliant system.
- B. Acceptable manufacturer:
  - 1. VALCOM
    - a. IP 6000
  - 2. Or Equal.
- C. System shall reside on a Contractor provided server that shall be installed in the building MDF.
- D. System shall provide for, but not be limited to the following:
  - 1. Building wide paging
  - 2. Program bells and alerts for normal school operation, configurable by simple calendar-based user interface.
  - 3. Individual volume control of each IP speaker.
  - 4. Full SIP compliance for communication between devices.
  - 5. All other features and functions that are part of the manufacturer's current release of the product offering.
  - 6. System shall provide four (4) additional contact closures for integration with lockdown buttons which when activated result in broadcast of predefined alarm tone(s) to predefined zone(s).
  - 7. Central Controller and all attached devices shall be installed and configured to meet or exceed all of the following requirements:

- a. Interface to Voice Communication system (phone system) as primary voice input connection.
  - 1. Specific coded authorization shall be required to authenticate any user attempting to broadcast on the system. Codes shall originate by DTMF from voice terminals and shall be up to four (4) tones (keys) in length.
  - 2. Capable of integrating with existing phone system over SIP protocol.
- 8. Paging system zones shall be customizable to allow complete control over paging zone output. Zones shall be easily modified using the web browser interface to add or eliminate individual classrooms, hallway speakers, and large venue spaces from zone lists.
- 9. System shall contain one (1) physical external interface in addition to telephone (SIP primary voice interface) for connection to any one of a variety of music sources (including, but not limited to MP3, tuner, etc.) to be broadcast to designated zones or groups of zones. This interface shall be 3.5mm audio jack and located in building central office to provide for building administrator convenient access.
- E. The Owner has preference for software licensing based on a persistent or perpetual model. Monthly or annual subscription licensing will not be as favorably considered as the preferred model.

## 2.05 COMMON INTERIOR SPEAKERS

- A. One (1) Common Interior Speaker shall be installed in/on finished ceiling surfaces in corridor as indicated on drawings as **S1**.
- B. Contractor shall provide and install PoE Speakers as indicated herein:
  - 1. Valcom VIP-402A
  - 2. Or equal.
- C. Final speaker placement shall be adjusted as needed for appropriate audio intelligibility, volume levels and ceiling obstructions and/or conditions and shall remain the responsibility of the contractor.
- D. Speakers shall provide balanced intelligible sound that is free of distortion, free from noise and evenly dispersed.
- E. 2'x2' lay in speaker with 8" cone speaker complete and assembled shall be installed.

- 1. Capable of >96 dB at 4'.
- 2. Frequency range is 45-18,000Hz.
- F. All speakers shall be field firmware changeable to support multiple other SIP based software systems.
- G. Any speaker baffles shall be installed with hardware matching the color of the baffle. Baffle color shall match finished ceiling color.
  - 1. All baffles shall be flush against the ceiling and enclosures shall be fully supported. All speakers shall include a back-box.
- H. All devices shall be mounted square and plumb and as recommended by the manufacturer and required by Owner and Architect.
- I. Each speaker shall be connected to central equipment PoE+ compliant cabling provided by Others and provide for system wide broadcast and/or zone-specific broadcast.
- J. Each speaker shall be volume adjustable at installation to accommodate specific acoustical properties of the intended coverage area.
- K. Where 2x2 lay-in speaker installation is not possible contractor shall supply appropriate and compatible speakers:
  - 1. Where ceilings are open Valcom VIP-415 or equal shall be used
  - 2. Where ceilings are hard-lid Valcom VIP-120 or equal shall be used complete with backbox and all supporting components as recommended by manufacturer.
- L. Coordinate final placement of speakers with Designer and/or Architect.
  - 1. Area of coverage will be such that calls will be clearly audible in the operating area and surrounding space.
- M. System shall produce audio at a peak level of approximately eighty-five (85) dBA at probable listener's positions.

## 2.06 SURFACE MOUNT SPEAKERS

- A. One (1) Surface Mount Speakers shall be installed in/on finished ceiling and wall surfaces as indicated on drawings as **S2**.
- B. Contractor shall provide and install PoE Speakers as indicated herein:
  - 1. Valcom VIP-410A-IC

- 2. Or equal.
- C. Final speaker placement shall be adjusted as needed for appropriate audio intelligibility, volume levels and ceiling obstructions and/or conditions and shall remain the responsibility of the contractor.
- D. Speakers shall provide balanced intelligible sound that is free of distortion, free from noise and evenly dispersed.
- E. 8" cone speaker complete and assembled shall be installed.
  - 1. Capable of >96 dB at 4'.
  - 2. Frequency range is 45-18,000Hz.
- F. All speakers shall be field firmware changeable to support multiple other SIP based software systems.
- G. Any speaker baffles shall be installed with hardware matching the color of the baffle. Baffle color shall match finished ceiling color.
  - 1. All speakers shall include a back-box.
- H. All devices shall be mounted square and plumb and as recommended by the manufacturer and required by Owner and Architect.
- I. Each speaker shall be connected to central equipment PoE+ compliant cabling provided by Others and provide for system wide broadcast and/or zone-specific broadcast.
- J. Each speaker shall be volume adjustable at installation to accommodate specific acoustical properties of the intended coverage area.
- K. Coordinate final placement of speakers with Designer and/or Architect.
  - 1. Area of coverage will be such that calls will be clearly audible in the operating area and surrounding space.
- L. System shall produce audio at a peak level of approximately eighty-five (85) dBA at probable listener's positions.

# 2.07 INDOOR/OUTDOOR HORN SPEAKER

- A. One (1) Indoor/Outdoor Horn Speaker (one way audio) shall be installed in/on finished ceiling and wall surfaces as indicated on drawings as **S3**.
- B. Contractor shall provide and install PoE Speakers as indicated herein:
  - 1. Valcom VIP-480AL

- 2. Or equal.
- C. Final speaker placement shall be adjusted as needed for appropriate audio intelligibility, volume levels and ceiling obstructions and/or conditions and shall remain the responsibility of the contractor.
- D. Speakers shall provide balanced intelligible sound that is free of distortion, free from noise and evenly dispersed.
- E. 3.5-inch speaker element, .85 dia Voice Coil
  - 1. Capable of >108 dB at 4'.
  - 2. Frequency range is 400-10,000Hz.
- F. All speakers shall be field firmware changeable to support multiple other SIP based software systems.
- G. All devices shall be mounted square and plumb and as recommended by the manufacturer and required by Owner and Architect.
- H. Each speaker shall be connected to central equipment PoE+ compliant cabling provided by Others and provide for system wide broadcast and/or zone-specific broadcast.
- I. Each speaker shall be volume adjustable at installation to accommodate specific acoustical properties of the intended coverage area.
- J. Coordinate final placement of speakers with Designer and/or Architect.
  - 1. Area of coverage will be such that calls will be clearly audible in the operating area and surrounding space.
- K. System shall produce audio at a peak level of approximately eighty-five (85) dBA at probable listener's positions.
- L. Contractor shall supply surface mount vandal-resistant enclosure Valcom V-9809 or equal in all locations.

#### 2.08 COMPONENT INTERCONNECTION

- A. All wiring not installed in conduit shall be plenum type cable and shall be so identified with continuous marking.
- B. No wiring installed shall be visible unless specifically and individually approved by Owner and Designer. All wire that traverses open areas shall be installed in metal raceway of appropriate size for the number of wires installed plus twenty percent more.

- 1. All metal raceway shall be ordered in standard colors to as closely match the environment in which it is being installed as possible.
- 2. Metal raceway shall be carefully and neatly installed, to meet manufacturer recommendations and standards for professional installation.
- 3. Sharp edges, gaps in the covering or corners or other unprofessional workmanship characteristics of installation will not be acceptable.
- C. Wiring color shall remain the same throughout the system. Colors used for coding shall be as directed by the system manufacturer, Owner, and Architect.
- D. Wire shall be copper.

#### 2.09 MANDATORY ALTERNATE CONFIGURATION

- A. Contractor shall supply mandatory alternate pricing for an equivalent analog paging speaker system.
  - 1. Pricing shall include analog speaker equivalent in all speaker styles and form factors.
  - 2. Contractor shall supply all necessary cabling and amplification to enable five (5) discrete speaker zones (6 including all call):
    - a. Classrooms
    - b. Hallways
    - c. Gymnasium
    - d. Cafeteria
    - e. Exterior
    - f. All Call
  - 3. All other requirements are to be maintained.

#### 2.10 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 \$2,500.00 for contract services related to supply, installation, and connection of contingency upgrades.

### PART 3 - EXECUTION

#### 3.01 PREPARATION

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

#### 3.02 INSTALLATION

- A. Contractor shall be familiar with the environment where work will be done as specified herein.
- 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.
- 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 sets and/or system devices to the Owner's intended use and need.
- 6. Complete end user and system administrator training programs as specified herein.
- 7. Work shall be performed to meet local codes and industry standards, including, but not limited to:
  - a. Adequate gas tube protection for outside plant cable connections.
  - b. Grounding and Bonding.
- 8. Work includes extending cable bundles, as required, to Owner identified equipment installation locations at all locations.
- 9. Owner will provide contractor with permanent asset tags for each system component that exceeds \$100.00 in value. Equipment installed in wiring closets will have district asset tags installed in a prominent location. Assets installed in public areas, such as staff desktop devices, will have asset tags installed in discreet but consistent area of each asset.
  - a. Asset number, device/component description, serial number, make, model, part-number, site, room number/name and any other critical asset information shall be recorded for Owner.
- E. Worksites include the following:
  - New Shelby Elementary School North State Street Shelby, MI 49455
- F. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks, or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate, or panel to the original condition.
  - 1. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.
  - 2. The building and work area shall be returned to its original condition prior to final sign-off of the project.
- G. Following installation and 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.
- H. Contractor shall collect, consolidate and otherwise prepare for shipping or disposal Owner's existing telecommunications system components, including, but not limited to stations, processors, cards, options, and application servers in a manner acceptable to, and consistent with, Owner's intended disposition of the items.

#### 3.03 TESTING

- A. In an effort to ensure a smooth "turn-up" of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over. Testing shall include, but not be limited to the following:
- 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. PROCEDURES

- 1. Prior to system "turn-up", Contractor shall submit a written request to Designer indicating they have completed full and final configuration of the system and are ready to have system integrity and functionality tested.
- 2. Within reasonable time after receipt of request, Designer will 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 cut-over plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system cut-over can proceed.

### 3.04 DOCUMENTATION

- A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment (file drawers, folders, dividers, etc.), to contain all as-built drawings, owner's manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or Owner deem necessary.
- 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 as built drawings for each building.

#### 3.05 TRAINING

- A. No training shall be conducted prior to training outline and/or syllabus being approved by Owner. Instructional or overview activities conducted without prior content approval with not be deemed contract training, and Contractor shall remain responsible for delivery of approved training.
- B. Contractor shall provide training for the Owner designated system administrator(s). Training shall be a minimum of two (2), one (1) hour session 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.
  - 5. System power-up and power down process.
  - 6. Recording and playing pre-recorded content.
  - 7. System update process
  - 8. System maintenance procedures.
  - 9. Problem reporting.
- C. Contractor shall provide in-person end user training for building office staff. Training shall be available at substantial completion. Training shall include, but not limited to the following:
  - 1. System functionality overview.
  - 2. Bell schedule programming and changes.
  - 3. Paging zone controls.

- 4. Intercom function use incoming and outgoing.
- 5. System operation best practices.
- 6. Building wide all page.
- 7. Recording and playing pre-recorded content.
- 8. Problem reporting.

# 3.06 SCHEDULE, MEETINGS AND PLANS

- A. Schedule
  - 1. Post bid Interviews: Week of December 5, 2022
  - 2. Contractor Chosen: Week of December 19, 2022
  - 3. Work Commences: April 1, 2023
  - 4. Substantial Completion of Project: June 1, 2023
  - 5. Project Close-out: September 1, 2023
- 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 53 13 CLOCK SYSTEM

#### PART 0 - GENERAL

#### 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section specification section pertains to Clock System expansion for Shelby Public Schools. Work shall include, but not be limited to, head-end equipment, cabling, single and dual sided wall clocks, and all other components and services required for a full and operational system.
- B. Contractor shall advise, coordinate, and work cooperatively with Owner representatives and/or owner's designee related to any installation or special security provisions.
- C. The Contractor shall design, engineer, configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant system, complete and with full functionality as specified herein.
- D. 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 three (3) 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 documents and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.
  - 2. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.
- C. On site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.

- D. Contractor shall provide the following response times for all malfunctioning equipment:
  - 1. Eight (8) 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 for recommended maintenance programs for all equipment following the specified and included one (1) year period as a Voluntary Alternate. This information will be considered by Owner and Designer as part of the bid evaluation process.
- F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have <u>no</u> effect on Warranty or System Acceptance by Owner and/or Designer.

## 1.03 STORAGE OF MATERIALS

- A. All materials shall be secured when not in use by the Contractor.
- B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.
- C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

### 1.04 SUBMITTALS

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

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

## 1.05 REFERENCE SPECIFICATIONS

- A. All work, products, and materials shall conform with the following standards as applicable for the intended use:
  - 1. IEEE

- 2. EIA/TIA Commercial and Administration Standards
- 3. NEC
- 4. FCC All Applicable Rules and Regulations
- 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 be an authorized vendor of all major components.
- B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install system and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods.
- C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.
- D. The Contractor shall have a proven track record in security system configuration and installation. This must be shown by the inclusion of references of at least three (3) projects involving the installation of similar systems completed by the Contractor in the prior two (2) years on unaltered forms with the sealed Bid Proposal as provided herein. Bid Proposal Form(s) may be duplicated as required in order to provide adequate space to list required number of reference installations for each division Bidder is responding to.

#### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
  - 1. VALCOM
  - 2. Or Equal
- 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 In the event of a power failure, complete system shall automatically re-initialize and "become active" to the last configuration in use with no human intervention.
- 2.05 Contractor shall be responsible for final and working system. Use of existing components and materials provided by others during new construction shall be integral to system configuration and cost-effective installation. Bidders are encouraged to use all compatible and working components in system solution. See schedule(s) and reference files for additional detail.

### 2.06 CLOCK SYSTEM

A. Contractor shall supply, install, and configure all necessary materials to install a fully compliant PoE Clock System attached to Owner supplied NTP server as directed by Owner to fully integrate new clock devices as specified herein.

### 2.07 SINGLE SIDED CLOCK

- A. Single sided factory assembled digital clocks shall be provided and installed in classrooms and/or other instructional areas as indicated in associated drawings. Single sided clocks are identified as C1 on provided drawings.
- B. Clocks shall meet or exceed the following:
  - 1. Valcom VIP-D440A
  - 2. Or equal.
- C. Digital 4-digit clock.
- D. Contractor shall supply protective cages in gym location(s).

## 2.08 DOUBLE SIDED CLOCK

- A. Double sided factory assembled digital clocks shall be provided and installed on wall or ceiling surfaces in corridor and as indicated in associated drawings. Double sided clocks are identified as C2 on provided drawings.
- B. Clocks shall meet or exceed the following:

- 1. Valcom VIP-D440ADS
- 2. Or Equal.
- C. Digital 4-digit clock.

## PART 3 - EXECUTION

#### 3.01 PREPARATION

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

#### 3.02 INSTALLATION

- A. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner's or other contractor's activities.
- 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/or other contractor's work and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.
- C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.
- D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:
  - 1. Inventory receipt of all components and equipment.
  - 2. Storage of all equipment and components until such time those items are installed according to the specifications.
  - 3. Transport equipment to the Owner's installation location(s).

- 4. Assemble, install, configure, and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
- 5. Collect all information necessary to accurately program all system devices to the Owner's intended use and need.
- 6. Label all system devices as may be appropriate and required by Owner and Designer.
- 7. Complete end user and system administrator training programs as specified herein.
- 8. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment.
- E. Worksites include the following:
  - New Shelby Elementary School North State Street Shelby, MI 49455
- F. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks, or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate or panel to the original condition.
  - 1. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.
  - 2. The building and work area shall be returned to its original condition prior to final sign-off of the project.
- G. Following installation and system "turn-up", but prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.
  - 1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.

### 3.03 TESTING

A. In an effort to ensure a smooth "turn-up" of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over.

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

### 3.04 DOCUMENTATION

A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment, including if reasonably required, file drawers, folders, dividers, etcetera, to contain all 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. As built drawings for each building.
  - 14. System Configuration Report.
  - 15. Complete inventory of installed hardware and system software. Hardware inventory shall include, but not be limited to, model numbers, serial
- 3.05 TRAINING
  - A. Not used.
- 3.06 SCHEDULE, MEETINGS AND PLANS
  - A. Schedule

- 1. Post bid Interviews: Week of December 5, 2022
- 2. Contractor Chosen: Week of December 19, 2022
- 3. Work Commences: April 1, 2023
- 4. Substantial Completion of Project: June 1, 2023
- 5. Project Close-out: September 1, 2023
- 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 28 13 00 BUILDING ACCESS CONTROLS

### PART 1 - GENERAL

## 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section specification section pertains to Building Access Control System expansion for Shelby Public Schools (Owner). Work shall include, but not be limited to, head-end equipment, cabling, door control equipment, and all other components and services required for a full and operational system. Owner currently is licensed for an S2 system on the Owner's existing hardware platform.
- B. Contractor shall advise, coordinate, and work cooperatively with Owner representatives and/or owner's designee related to any installation or special security provisions.
- C. The Contractor shall design, engineer, configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant system, complete and with full functionality as specified herein.
- D. Contractor shall coordinate their installation with other contractors, Designer and the Owner as is appropriate.
- E. Contractor shall fully coordinate and cooperate with door hardware vendor supplying the balance of items identified in section 08 71 00 as identified herein. All final connections, component integration, configuration, testing and programming functions to provide for a fully operational and functional system as specified shall remain the responsibility of Contractor selected for work in this section/division.

### 1.02 WARRANTY

- A. Complete installation shall be free from defect and/or failure for a period of three (3) year. 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.

- C. On site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.
- D. Contractor shall provide the following response times for all malfunctioning equipment:
  - 1. Eight (8) 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 for recommended maintenance programs for all equipment following the specified and included one (1) year period as a Voluntary Alternate. This information will be considered by Owner and Designer as part of the bid evaluation process.
- F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have <u>no</u> effect on Warranty or System Acceptance by Owner and/or Designer.

### 1.03 STORAGE OF MATERIALS

- A. All materials shall be secured when not in use by the Contractor.
- B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.
- C. Formal receipt of the materials shall not be completed by the Owner until completion of project closeout. The Contractor shall be responsible for all equipment until time of closeout as provided for herein.

# 1.04 SUBMITTALS

A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be

installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid Proposals.

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

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#### 1.05 REFERENCE SPECIFICATIONS

- A. All work, products, and materials shall conform with the following standards as applicable for the intended use:
  - 1. IEEE
  - 2. EIA/TIA Commercial and Administration Standards
  - 3. NEC
  - 4. FCC All Applicable Rules and Regulations
  - 5. UL
  - 6. MOSHA Safety Standards
- B. Bidder shall be responsible for supply, configuration and installation of components identified in Section 087100 - Door Hardware, Part 5 "Hardware Schedule".

#### 1.06 CONTRACTOR

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

### PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Manufacturer of major components of the included Building Access Control system shall be known and leading entity in the relevant communications field, and shall have been designing, manufacturing, and installing similar systems for a period of no less than three (5) years.
  - 1. Acceptable Manufacturers:
    - a. S2 (Lenel)
- 2.02 Supply most current version of all products provided.
  - A. Proposed components shall have been field tested and proven in actual use.
  - B. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.
  - C. 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 System shall be comprised of interoperable components including, but not limited to, controller, credential sensors, and management software integrated into a common working system.
- 2.05 System administrator shall be capable of complete system back-up and full system restoration from a previously saved configuration.
- 2.06 System shall be of a distributed processing design with a fully distributed database including, but not limited to time, date, valid codes, access levels and related data so that each Controller makes access control decisions for that location. If communications with central station equipment is lost, all transactions shall be buffered until the restoration of a connection to the central station.
- 2.07 In the event of a power failure, complete system shall automatically re-initialize and "become active" to the last configuration in use with no human intervention.
- 2.08 Contractor shall be responsible for final and working system. Use of existing components and materials provided by others during new construction shall be integral to system configuration and cost-effective installation. Bidders are encouraged to use all compatible and working components in system solution. See schedule(s) and reference files for additional detail.
- 2.09 BUILDING ACCESS CONTROL SYSTEM

A. Contractor shall supply, install, and configure all necessary licensing, materials and labor to expand the Owner's existing S2 Security system to fully integrate new building access devices as specified herein.

# 2.10 DOOR CONTROLLER

- A. An adequate number of controllers to support the quantity of credential readers shall be provided. Door controller devices shall be provided and installed in a lockable enclosure in IT closet locations as identified in provided drawings.
- B. Acceptable Manufacture(s)
  - 1. S2
    - a. Network Node
- C. Controller(s) shall meet or exceed the following requirements:
  - 1. Support for door contacts, card readers and PIR REX devices as specified.
  - 2. Adequate ports to support all door hardware and devices on provided door schedule.
  - 3. Adequate contact closure relays to support lockdown button capability as specified herein.

# 2.11 CREDENTIALS

- A. One hundred (100) credentials shall be provided.
- B. Credentials shall be HID 13.56 MHz cards compatible with specified credential readers.

### 2.12 CREDENTIAL READERS

- A. Credential Readers shall be provided and installed as indicated herein. Credential Reader provided shall meet or exceed the following requirements:
  - 1. HID Corporation
    - a. <u>HID® Miniport® 5365</u>
    - b. <u>HID® Proximity ProxPoint® Plus 6005</u>
    - c. Reader model based on installation location (as shown on drawings) and space provided by other trades.
  - 2. Powered from associated Controller.

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- 3. Response time for passage requests of 800ms.
- 4. Sealed weatherproof shell enclosure rated for outdoor operation.
- 5. Surface mounted on exterior surface of structure.
- 6. LED or other type of visual indicator indicating request status.
- 7. Audible status indicator upon user prompt.
- 8. Range of four inches (4").
- B. See associated schedule(s) and or Drawings herein for location and quantity.

### 2.13 HIDDEN DOOR RELEASE SWITCHES

- A. Door release switches are to be provided in locations identified on provided drawings as specified herein.
  - 1. Door release switches shall meet or exceed the following requirements:
    - a. ALLEGION 660-PB or ASSA ABLOY equivalent.
- B. Hidden door release switches shall be programmed to provide door release capabilities for doors identified on provided drawings. Contractors shall supply all necessary cabling, labor and accessories to integrate hidden door release switches with Contractor provided door controllers.

### 2.14 DOOR STATIONS

- A. A Door Station shall be provided, installed, provisioned, licensed and configured at each location indicated herin.
  - 1. Door stations shall be Axis A8105-E or equal.
  - 2. Devices shall be powered by Ethernet PoE as described herein.
  - 3. Sealed weatherproof shell enclosure rated for outdoor operation.
  - 4. Surface mounted on exterior surface of structure.
  - 5. See associated schedule(s) and or Drawings herein for location and quantity.

### 2.15 LOCKDOWN BUTTONS

A. Lockdown button(s) shall be provided and installed as indicated herein and shall meet or exceed the following requirements:
- 1. Buttons shall be located near the front entrance desk(s).
- 2. New buttons shall be wall mounted and prominently located in an area promoting easy access by staff that may reasonably be required to initiate a lock down.
- 3. New lockdown buttons shall be SS2242LD-EN STI Yellow Indoor/Outdoor Flush or approved equal.
- 4. Contractor shall supply all necessary contact closure devices to integrate provided door access system with lockdown button capability.
- 5. Lockdown buttons shall be programmed to provide all functionality defined by Owner, including, but not limited to the integration via contact closure with PA/program system. Such integration shall include both a lockdown and all clear integration.
- 6. See associated schedule(s) and or Drawings herein for location and quantity.

#### 2.16 DOOR INTERFACE HARDWARE (INTEGRATED COMPONENTS)

- A. All controllers shall be PoE Mercury door controllers and shall be mounted above the secure side of each entry requiring a controller. Where new door controllers are to be provided, the door interface hardware provided by others shall meet or exceed the following:
  - 1. 12v PoE+ controller compliant strikes will be provided by others as part of Section 08700 work and shall be integrated into the door controller installation by Contractor.
  - 2. Where new door controllers are to be provided, each door controlled by the system shall be equipped with PIR REX device provided by others and shall be integrated into the door controller installation by Contractor.
  - 3. Where new door controllers are to be provided, each door shall be equipped with magnetic DPI sensors by others and shall be integrated into the door controller installation by Contractor.
  - 4. All door strike, REX and DPI cables shall of a sufficient length to be neatly routed by Contractor supplying material, to a location suitable to reach inside controller enclosure for door(s).
  - 5. Where power supplies are required, as specified in provided door schedule, Contractor shall be responsible for mounting power supply for connection by electrical contractor.

#### 2.17 INTEGRATION

- A. Provided Credential Readers/Door Controllers shall be integrated with door handicap operators where applicable. Contractor shall supply all labor and accessories to integrate Credential reader with handicap operators for a safe and fully functional system. Contractor shall work collaboratively with handicap operator installers to verify the following functionality:
  - 1. External operator buttons shall only be functional in the event of a successful card read or remote door unlatch. Door operator motor should only be operable in the event of a successful card read.
  - 2. Internal operator buttons shall be functional at all times, the door should unlock automatically.
  - 3. Contractor to supply all hardware necessary including accessories and installation to enable this capability
- B. Provided Credential Readers/Door Controllers shall be integrated with mag hold opens provided by others.
  - 1. Mag hold open devices shall be released in the event of a lockdown.
  - 2. Contractor shall supply all necessary licensing, cabling and installation to tie lockdown buttons with fire panel system to release mag hold open doors.

#### 2.18 COMPONENT INTERCONNECTION

- A. All wiring not installed in conduit shall be plenum type cable and shall be so identified with continuous marking.
- B. Wiring color shall remain the same throughout the system. Colors used for coding shall be as directed by the system manufacturer, Owner and Designer.
- C. Wire shall be copper.
- D. Contractor shall coordinate with all relevant building trades subcontractors as well as Owner's Construction Manager to integrate and interconnect all relevant equipment, components, devices, connections and wires that may be provided by others. Refer to construction documents provided for reference.

#### 2.19 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

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contract services shall be credited to the Owner against contract payment requests.

1. Allowance shall be made in the amount of \$3,500.00 for contract services related to supply, installation, and connection of contingency upgrades.

#### PART 3 - EXECUTION

#### 3.01 PREPARATION

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

#### 3.02 INSTALLATION

- A. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner's or other contractor's activities.
- 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/or other contractor's work and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.
- C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.
- D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:
  - 1. Inventory receipt of all components and equipment.
  - 2. Storage of all equipment and components until such time those items are installed according to the specifications.
  - 3. Transport equipment to the Owner's installation location(s).

- 4. Assemble, install, configure, and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
- 5. Collect all information necessary to accurately program all system devices to the Owner's intended use and need.
  - a. It is intended that work performed, and configurations made by contractor shall include, but is not limited to:
    - 1. All door control functionality and configurations shall be reviewed with the Owner and Designer prior to final configuration work.
    - 2. A door position switch shall be provided and installed on all new entrances and configured in the system for door position monitoring and alarming. Refer to provided door schedule for work and components that may be provided by others.
    - 3. Two lockdown buttons in the Main Office shall be configured to activate locks for doors that provide entry into the building.
    - 4. Coordination with both hardware and scheduling to program momentary deactivation of magnetic hold opens associated with academic wing access doors. This may be associated with normal schedules as well as special situations including, but not limited to building lockdown.
    - 5. Lock/Unlock schedules configured for doors as desired by owner.
- 6. Label all system devices as may be appropriate and required by Owner and Designer.
- 7. Complete end user and system administrator training programs as specified herein.
- 8. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment.
- E. Worksites include the following:
  - New Shelby Elementary School North State Street Shelby, MI 49455
- F. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks, or misplaces any surfaces or

access plates/panels the Contractor shall repair and/or replace the surface, plate or panel to the original condition.

- 1. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.
- 2. The building and work area shall be returned to its original condition prior to final sign-off of the project.
- G. Following installation and system "turn-up", but prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.
  - 1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.

#### 3.03 TESTING

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

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

#### 3.04 DOCUMENTATION

- A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment, including if reasonably required, file drawers, folders, dividers, etcetera, to contain all 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

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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 as built drawings for each building.
- 14. System Configuration Report.
- 15. Complete inventory of installed hardware and system software. Hardware inventory shall include, but not be limited to, model numbers, serial number, physical installation location and software/firmware options.

#### 3.05 TRAINING

- A. Training shall be conducted at the Owner's discretion and at times and places convenient to Owner personnel. Prior to any training being conducted, Contractor shall provide Owner and Designer with detailed training syllabus and schedule for proposed training event. Compliant syllabus and schedule shall be provided at least ninety-six 96 hours in advance. Owner reserves the right to postpone training if syllabus and/or schedule submitted are deemed inadequate. Training shall not be conducted until such time a syllabus and schedule submitted by Contractor are found to be acceptable to Owner.
- B. Contractor shall provide training for the Owner designated system administrator(s). Training shall be a minimum of one (1), one (1) hour session(s) in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:
  - 1. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.
  - 2. System back-up and restore functions and procedures for all system parameters and configurations.
  - 3. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to, configuration changes and device status.

#### 3.06 SCHEDULE, MEETINGS AND PLANS

- A. Schedule
  - 1. Post bid Interviews: Week of December 5, 2022

- 2. Contractor Chosen: Week of December 19, 2022
- 3. Work Commences: April 1, 2023
- 4. Substantial Completion of Project: June 1, 2023
- 5. Project Close-out: September 1, 2023
- 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 28 20 00 VIDEO MONITORING SYSTEM

#### PART 1 - GENERAL

#### 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to a Video Monitoring System upgrade for Shelby Public Schools.
- B. Contractor shall propose a System to be deployed using IEEE Ethernet technology. The system components shall be installed and connected to the owner's Ethernet infrastructure and as specified herein. System shall be of a "network" architecture using Ethernet cameras and centrally located Ethernet server(s).
  - 1. Owner will provide adequate IEEE 802.3at 10/100/1000 Ethernet switch ports for the number of devices specified herein on existing Cisco switch infrastructure.
- C. The centralized server recording equipment shall be installed in the Owner's existing district administration building Main Distribution Frame (MDF) and as required.
- D. 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 Ethernet infrastructure (VLAN configuration, QoS mapping, routing, Firewall security provisions etc.).
- E. The Contractor shall design, engineer, configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant network video monitoring system, complete and with full functionality as specified herein.
- F. Contractor shall coordinate their installation with other contractors, Designer and the Owner as is appropriate.

#### 1.02 WARRANTY

- A. Complete installation shall be free from defect and/or failure for a period of Three (3) 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. System integrator or local vendor warranty, without underlying manufacturer's warranty/extended warranty will not be considered an acceptable base bid.
- 2. 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.
- 3. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.
- C. On site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner and without additional charge for any offending components.
- 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. System Warranty shall commence on date of acceptance by Owner. 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 <u>no</u> effect on Warranty or System Acceptance by Owner and/or Designer.
- F. Bidder shall provide current annual maintenance contract pricing for recommended maintenance programs for all equipment following the specified and included period as an alternate. This information will be considered by Owner and Designer as part of the bid evaluation process.

#### 1.03 STORAGE OF MATERIALS

- A. All materials shall be secured when not in use by the Contractor.
- B. It shall be the Contractor's responsibility to secure all equipment including material to be installed as part of the contract. No changes shall be made to the

contract due to loss or theft of equipment and/or materials not officially accepted by the Owner.

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

#### 1.04 SUBMITTALS

- A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid.
- B. Shop drawings and diagrams shall be submitted by Bidder for approval by Designer with Bid.
  - 1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.
  - 2. No work constituting final installation shall be commenced until after approval of shop drawings by Designer.
- C. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project with Bid.
- D. Equipment or material installed for this project that does not have an approved submittal associated with it, will be removed and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.
  - 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. <u>Microsoft Project</u> is the software of choice for this schedule. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing and executing the work required by the Contract Documents. Owner will rely on such schedules to coordinate and otherwise plan related work of Owner personnel, other separate contractors, or the Owner's routine daily work.

#### 1.05 REFERENCE SPECIFICATIONS

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

#### 1.06 CONTRACTOR

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

forms with the sealed Bid as provided herein. Bid Form(s) may be duplicated as required in order to provide adequate space to list required number of reference installations for each division Bidder is responding to.

#### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Acceptable Manufacturers (In alphabetical order):
  - 1. PANASONIC
- 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 System shall be comprised of fully interoperable components including, but not limited to, camera licenses (which shall be installed on Owner's existing centrally located servers), Ethernet attached cameras, camera mounting brackets and housings, patch cords and all other necessary components integrated into a common working system.
- 2.05 CENTRAL VIDEO MONITORING CONTROL SOFTWARE
  - A. Contractor shall supply all necessary licensing and installation to integrate provided camera devices into existing Panasonic Video Insight VMS software.
  - B. System shall be capable of and licensed to support the specified configuration.
  - C. Central control software shall be installed on Owner supplied server environment.
  - D. System shall be capable of being fully administered from any web browser attached to the network.

- E. System shall provide full functionality of the following feature sets and/or standards either in the Central Control software and in conjunction with proposed camera equipment, and shall provide for all management, configuration and control of features and/or standards from Central Control software administrative interface:
  - 1. Administration access shall be protected by unique and secure log on (User ID and Password).
  - 2. System administrator shall be capable of complete system back-up and full system restoration from a previously saved configuration.
  - 3. System reporting shall include, but not be limited to:
    - a. Real time camera status.
    - b. Historical camera utilization for administrator defined period.
    - c. Status of all system components.
    - d. Digital Zoom of streaming and stored images.
    - e. Ad hoc access to streaming and stored video from any properly authenticated device with network access.
    - f. H.264 Decoding.
    - g. Motion detection and alarm-based recording.
    - h. Video client support for the following:
      - 1. Web Browser (Internet Explorer/Firefox/Safari/Chrome)
      - 2. Apple Macintosh (OSX)
      - 3. iOS
      - 4. Android OS
      - 5. Windows 10
- F. System shall be configured to provide standard acceptable Ethernet Quality of Service (QoS) identification at both layer two (2) and layer three (3) to Owner's network infrastructure so as to ensure end-to-end priority delivery of video traffic across the network.
  - 1. IPSec
  - 2. IEEE 802.3p

- G. 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.
- H. All other features currently a part of the manufacturer's latest commercial release.

#### 2.06 CAMERAS

- A. Ethernet cameras shall be provided as indicated herein. Cameras shall meet or exceed the following specified capabilities:
  - 1. Interior Standard Camera (SC1)
    - a. Axis M3085-V or equal
    - b. Cameras shall be installed in mechanical flush mounted, integrated, tamper and impact resistant dome enclosure mount adapter to facilitate installation either directly on walls, to a ceiling or to a single gang electrical box providing 10/100/1000 PoE+ UTP connection for installed camera. Domes shall also meet or exceeding the following requirements:
      - 1. Mini Dome
      - 2. 2MP-1080P Resolution
      - 3. Optically correct polycarbonate lower dome with light loss not greater than 11.5 f-stops.
      - 4. Dust and water protection based.
      - 5. Puncture resistant with capability to withstand a pointed impact force of 35 foot-pounds without creating an internal depression greater than .2 inches.
      - 6. Impact resistant with capability to withstand repeated multiple blunt impact forces up to 100 foot-pounds.
      - 7. Camera shall include all necessary mounting hardware and accessories for a fully supported installation.
      - 8. Cameras in cafeteria area shall include appropriate length white downpipes to extend below ceiling surface.
  - 2. Interior Multidirectional Dual Sensor (SC2)
    - a. P3715-PLVE

- b. Cameras shall be installed in integrated, tamper and impact resistant, environmentally controlled dome enclosure meeting or exceeding the following requirements:
  - 1. Optically correct acrylic or polycarbonate lower dome with integral UV protection.
  - 2. Dust and water protection based on EN60529 standard of IP66.
  - 3. Integral sun shroud where installed outdoors
  - 4. Available integrated enclosure or "Gooseneck" and "Corner" wall mount adapter to comply with installation either directly on exterior walls or to a single gang electrical box and as identified herein, providing 10/100/1000 PoE+ UTP connection for installed camera.
  - 5. Impact resistant with capability to withstand repeated multiple blunt impact forces up to 100 foot-pounds.
  - 6. Gym locations shall include appropriate protective cage.
- B. Ethernet cameras shall properly and acceptably communicate over, and attach to, Owner's standard Ethernet communications network provided by others and be powered by use of IEEE 802.3at compliance.
- C. Cameras shall conform to and/or support the following certifications, features, standards and/or protocols:
  - 1. Secure network access incorporating user ID and password protection
  - 2. NTP
  - 3. SNMP
  - 4. FCC Part 15 Subpart B Class B
  - 5. Underwriters Laboratories Listed
- D. IEEE 802.3 (Ethernet) UTP eight (8) pin modular connector.
- E. Each camera shall be provided with an appropriate license for operation with the Central Video Monitoring and Control Software system and include the warranty provisions for continual operation and support for the period described herein.
- F. All cameras and/or camera enclosures shall be firmly and securely mounted to finished ceiling, wall, or other surfaces as required and/or specified herein to

maximize coverage and minimize tampering potential. Bidder shall provide, in base bid, all mounting materials and labor to comply with mounting conditions documented herein.

#### 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 \$2,000.00 for contract services related to renovation and configuration of necessary infrastructure upgrades at the Owner's sole discretion.

#### PART 3 - EXECUTION

#### 3.01 PREPARATION

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

#### 3.02 INSTALLATION

- A. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner's or other contractor's activities.
- 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/or other contractor's work and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.

- C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.
- D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:
  - 1. Inventory receipt of all components and equipment.
  - 2. Storage of all equipment and components until such time those items are installed according to the specifications.
  - 3. Transport equipment to the Owner's installation location(s).
  - 4. Assemble, install, configure and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
  - 5. Carefully aim and focus each system camera to meet Owner's required views and focal points.
  - 6. Collect all information necessary to accurately program all system devices to the Owner's intended use and need.
  - 7. Label all system devices as may be appropriate and required by Owner and Designer.
    - a. Owner will provide appropriate asset tags for all cameras in the project. Contractor shall ensure the tags are permanently affixed to the cameras in/on locations coordinated with the Owner. Tag numbers along with other inventory records for the installation shall be documented as specified herein.
  - 8. Complete end user and system administrator training programs as specified herein.
  - 9. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment.
  - 10. Work includes extending Ethernet from installed equipment, as required, to Owner identified connection outlets at all locations.
    - a. Work includes supply and connection of Category 6 Ethernet patch cables. Cables for some cameras may be in air plenum spaces, above finished ceilings, or in other ways require special care and suitable tools to complete.

- b. Patch cables at camera location shall not exceed twenty-five (25) feet in length.
- c. Patch cables at wire closets for cross connection to Owner's existing Ethernet switching infrastructure shall not be excessive in length, but be installed and routed to efficiently reach each connection point with reasonable and adequate slack for efficient "clean" access and ongoing maintenance.
- d. Contractor shall cross connect and report back switch port locations back to Owner for programming as necessary.
- e. Patch cables color shall be green in color.
- 11. Camera mounting and penetrations:
  - a. Where cameras will be mounted on interior or exterior walls, Video Monitoring Contractor shall be responsible for making final penetration to extend existing data cabling or data cabling provided by Others if penetration does not exist.
  - b. Where penetrations are made through fire rated walls, Contractor shall be responsible for supplying appropriate fire stop material.
- E. Additional and Specific Requirements:
  - 1. Contractor shall install all new cameras in locations indicated on appendices and detailed in related installation sections herein, and/or as directed by Owner and Designer. New equipment shall be installed and mounted to facilitate desired views and focal points.
  - 2. Contractor shall use care and employ best industry practices to ensure mounting of new equipment is professional and appropriate.
  - 3. Contractor shall use care and employ best industry practices to ensure installation of Owner provided repair materials, which may include, but not be limited to, ceiling tiles/pads, block/brick filler, and paint professionally and appropriately restores the surface and location vacated by prior equipment to the best possible condition.
  - 4. Contractor shall supply and install stainless steel faceplates in all abandoned wall locations.
  - 5. All cabling shall be removed to source including all accessories, housings, brackets and connectors.
- F. Sites of Work:

- New Shelby Elementary School North State Street Shelby, MI 49455
- G. 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.
- H. Following installation and system "turn-up", but prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.
  - 1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.

#### 3.03 TESTING

- A. In an effort to ensure a smooth "turn-up" of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over.
- B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements, meets the owner's specific application requirements and is ready for functionality and integrity testing.
- C. Testing Procedures
  - 1. Prior to system "turn-up", Contractor shall submit a written request to Designer indicating they have completed full and final configuration of the system, and are ready to have system integrity and functionality tested.
  - 2. Within reasonable time after receipt of request, Designer will 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 "turnup" can proceed.

#### 3.04 DOCUMENTATION

- A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment, including if reasonably required, file drawers, folders, dividers, etcetera, to contain all asbuilt drawings, Owner 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. Serial Number
  - 5. MAC Address
  - 6. Asset Tag Number
  - 7. Software release.

- 8. Date installed.
- 9. Manufacturer's warranty.
- 10. Maintenance contract terms.
- 11. Verification of maintenance contract engagement.
- 12. Telephone numbers for service and support.
- 13. Detailed technical support and service procedure instructions.
- 14. 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.
- 15. 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.
- 16. CAD as built drawings for each building.
- 17. System Configuration Report.
- 18. Complete inventory of installed hardware and system software.

#### 3.05 TRAINING

- A. Training shall be conducted at the Owner's discretion and at times and places convenient to Owner personnel. Prior to any training being conducted, Contractor shall provide Owner and Designer with detailed training syllabus and schedule for proposed training event. Compliant syllabus and schedule shall be provided at least ninety-six 96 hours in advance. Owner reserves the right to postpone training if syllabus and/or schedule submitted are deemed inadequate. Training shall not be conducted until such time a syllabus and schedule submitted by Contractor are found to be acceptable to Owner.
- B. Contractor shall provide User/Operator Level Training for the Owner designated system operator(s). Owner shall designate up to four (4) operators to be trained. Training shall be a minimum of one (1), two (2) hour sessions in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:

- 1. View live video from camera(s) identified to be of interest.
- 2. View stored video from camera(s) identified to be of interest, from a range of time in history.
- 3. Zoom stored video to better identify or better review visual details of portions of video of interest.
- 4. Review historical video to watch a historical event such as damage to property after normal hours of operation.
- C. Contractor shall provide physical on-site training for the Owner designated system administrator(s). Owner shall designate up to Four (4) system administrators to be trained. Training shall be a minimum of one (1), four (4) hour session(s) in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:
  - 1. Add, remove and reconfigure cameras on system.
  - 2. Basic configuration and system administration of the installed system
  - 3. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.
  - 4. System back-up and restore functions and procedures for all system parameters and configurations.
  - 5. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to, configuration changes and device status.
  - 6. System database updates and maintenance.
  - 7. Review standard system reports

#### 3.06 SCHEDULE, MEETINGS AND PLANS

- 1. Post bid Interviews: Week of December 5, 2022
- 2. Contractor Chosen: Week of December 19, 2022
- 3. Work Commences: April 1, 2023
- 4. Substantial Completion of Project: June 1, 2023
- 5. Project Close-out: September 1, 2023

- 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



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unit 'C' upper level technology plan T2.1C







### ENLARGED KITCHEN EQUIPMENT ELECTRICAL PLAN





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ENLARGED KITCHEN EQUIPMENT ELECTRICAL PLAN E8.1A

ISSUANCES



AV Equipment Schedule									
Room #	Short Throw Projector	Amplifier	Speakers	Document Camera	Notes				
A101	1	1	4	1					
A103	1	1	4	1					
A104	1	1	4	1					
A105	1	1	4	1					
A106	1	1	4	1					
A108	1	1	4	1					
A109	1	1	4	1					
A110	1	1	4	1					
A111 - Resource	1	1	2	1					
A112 - RTI	1	1	2	1					
A114 - Staff Planning									
A119 - Cafeteria	0	0	0	0					
A130 - Media Center	0	0	0	0					
B101	1	1	4	1					
B103	1	1	4	1					
B106	1	1	4	1					
B108	1	1	4	1					
B109	1	1	4	1					
B112	1	1	4	1					
B113	1	1	4	1					
B114	1	1	4	1					
B115 - Resource	1	1	2	1					
B116 - ESL	1	1	2	1					
B129 - Gym	0	0	0	0					
B141 - Conference	0	0	0	0					
C101	1	1	4	1					
C104	1	1	4	1					
C107	1	1	4	1					
C110	1	1	4	1					

		AV E	quipment Scł	nedule	
Room #	Short Throw Projector	Amplifier	Speakers	Document Camera	Notes
C111	1	1	4	1	
C114	1	1	4	1	
C115	1	1	4	1	
C118	1	1	4	1	
C119 - Staff Planning					
C123 - Resource	1	1	2	1	
C124 - RTI	1	1	2	1	
C128 - STEAM	1	1	4	1	
C129 - STEAM	1	1	4	1	
C130 - Music	1	1	4	1	
	33	33	120	33	

Rack and UPS Equipment Schedule								
Room #	Wall Mount Rack	Enclosed Floor Standing Rack	2200KVA UPS	1500KVA UPS	District Core Switch Expansion	Device Distribution Switch	Notes	
IDFA - A118	1	0	0	1	0	2		
IDFB - B124	0	1	1	0	0	4		
IDFC - C120	1	0	0	1	0	2		
Shelby HS MDF	0	0	0	0	1	0		
	2	1	1	2	1	8		





#### **Conference Room**



Legend Network Cable (To LAN) — HDMI – – – Communications by Design

#### **Digital Signage**



 Legend
 Network Cable (To LAN)
 HDMI
 --- 

 Communications by Design

#### Gymnasium





Communications by Design
# Appendix D – Multimedia Equipment Line Diagram

Cafeteria



*Communications by Design* 

# Appendix D – Multimedia Equipment Line Diagram





# SECTION 08 71 00 DOOR HARDWARE

### PART 1 - GENERAL

## 1.1 SUMMARY

- A. Scope of Work: This Section describes all finish hardware required to complete the work as indicated on the Drawings and specified herein. Provide all trim attachments and fastening specified or required for proper and complete installation.
- B. Related Sections:
  - 1. Section 08 11 13: Hollow Metal Doors and Frames
  - 2. Section 08 14 16: Flush Wood Doors
  - 3. Section 08 41 13: Aluminum Framed Entrances and Storefronts

### **1.2 SUBMITTALS**

- A. Product Data, Shop Drawings, Samples:
  - 1. General: Comply with the provisions of Section 01 33 00.
  - 2. Product Data: Within 15 calendar days after award of the Contract, submit:
    - a. Complete materials list of all items proposed to be furnished and delivered under this Section.
      - 1) Identify each hardware item by manufacturer, the manufacturer's catalog number, and the location of the item in the work.
      - 2) Make the list in form suitable for ready checking by the Architect.
    - b. Manufacturer's specifications, catalog cuts, and other data required to demonstrate compliance with specified requirements.
      - 1) Approval of the hardware list by the Architect/Engineer shall not relieve the Contractor from the responsibility for furnishing all required finish hardware.
  - 3. Samples: Within 15 calendar days after being so requested by the Architect/Engineer, deliver to the Architect/Engineer samples of each finish hardware item.
  - 4. Templates: In a timely manner to ensure orderly progress of the work, deliver templates or physical samples of the approved finish hardware items to pertinent manufacturers of interfacing items such as door and frame.

# **1.3 QUALITY ASSURANCE**

- A. Qualifications:
  - 1. Qualifications of Manufacturers: Products used in the work of this Section shall be produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production acceptable to the Architect/Engineer.
  - 2. Qualification of Suppliers: The supplier shall have a qualified representative readily available to the Architect/Engineer, and/or Owner on short notice for consultation and service during the execution of this work and the warranty period.
  - 3. Qualification of Installers: Use adequate numbers of skilled workmen who are trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of this Section.
- B. Regulatory Requirements & References: Fire Rated Openings: Comply with the requirements of Underwriter's Laboratories, Inc.
- C. Pre-Installation Conference: Prior to the installation of hardware, manufacturer's representatives for locksets, closers, and exit devices shall arrange and hold a jobsite meeting to instruct the installing contractor's personnel on the proper installation of their respective



products. A letter of compliance, indicating when this meeting is held and who is in attendance, shall be sent to the Architect and Owner.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping: Individually package each units of finish hardware, complete with proper fastening and appurtenances, clearly marked on the outside to indicate the contents and specific locations in the work.
- B. Protection: Use all means necessary to protect materials of this Section before, during, and after delivery to the job site and to protect the work and materials of all other trades.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect/Engineer and at no additional cost to the owner.
- D. Deliveries:
  - 1. Stockpile all items sufficiently in advance to ensure their availability and make all necessary deliveries in a timely manner to ensure orderly progress of the total work.
  - 2. All hardware shall be delivered to a destination as directed by the Construction Manager with sufficient time in advance for proper inspection in order not to delay the scheduled completion date.
  - 3. The General Contractor / Construction Manager shall provide a lockable room with ample shelving for the storage of hardware. Upon receipt of the hardware, the Finish Hardware supplier shall unpack and place on the shelves all hardware in order of item and/or door numbers.

### 1.5 SEQUENCING AND SCHEDULING

A. Coordinate all work with job site superintendent and all applicable trades.

### 1.6 WARRANTY

- A. Provide a written warranty in approved form in compliance with the related requirements of the General Conditions, covering all Finish Hardware furnished under this Section against defects in manufacturing and workmanship for a minimum of two (2) years from the final acceptance of the building.
- B. Any material failing to comply with the above guarantee shall be removed and replaced with satisfactory material at the Finish Hardware supplier's expense, including the necessary labor for removing and replacing.
- C. During the Warranty Period, the Finish Hardware supplier shall, upon request, make prompt adjustments, repairs or replacements as required to any hardware installed under this contract, other than normal maintenance service.

# PART 2 - PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

Product	Specified	Acceptable Alternates
Continuous Hinges Hinge	lves lves	Select McKinney, Stanley
Flush Bolts Coordinator Locks (Mortise)	ives Ives Schlage L-Series (03A	Burns, Rockwood Burns, Rockwood Corbin Russwin ML2000
Keys and Cylinders	Lever) Corbin-Russwin	Owners Standard Key
Exit Devices	Von Duprin 98 Series	Corbin Russwin 5000S Series
Electric Strikes	Von Duprin 6000 Series	HES 1006/9500 Series



Door Closers	LCN 4010/4110 Series	Corbin-Russwin DC8000
Auto Operators	LCN 4600 Series	Norton 6000 Series, Besam Power Swing
Push/Pull & Kick Plates	lves	Burns, Rockwood
Wall Stops	lves	Burns, Rockwood
Overhead Stops	Glynn-Johnson	Rixon, ABH
Seals and Thresholds	Zero	NGP, Reese
Power Supplies	Von Duprin PS900 Series	Securitron BPS Series
Fire/Life Wall Magnet	LCN 7800 Series	Rixson, ABH
MATERIALS		

A. General:

2.2

- 1. Proprietary Products: References to specific proprietary products are used to establish minimum standards of utility and quality. Unless otherwise approved by the Architect/Engineer, provide only the specific products. Design is based on the materials specified. Other materials may be considered by the Architect/Engineer in accordance with the provisions of Section 01 33 00.
- 2. Fasteners:
- 3. Finishes of all hardware shall match the finish of the locksets. Take special care to coordinate all of the various manufactured items furnished under this Section, to ensure acceptably uniform finish.
- 4. Through-bolt door closers on all wood doors.
  - a. Furnish all finish hardware with all necessary screws, bolts, and other fasteners of suitable size and type to anchor the hardware in position for long life under hard use.
  - b. Furnish fastenings where necessary with expansion shields, toggle bolts, sex bolts, and other anchors approved by the Architect/Engineer, according to the materials to which the hardware is to be applied and the recommendations of the hardware manufacturer.
  - c. All fastenings shall harmonize with the hardware as to materials and finish.
- B. Keying: All cylinders/cores and keying to be purchased from Architectural Hardware, Muskegon, MI and included in base bid. Supply 3 keys per lock, 6 master keys for each master key group and 3 grand master keys. Conduct keying meeting with Owner to determine keying requirements.
- C. Tools and Manuals: With the delivery of permanent keys, deliver to the Owner one complete set of adjustment tools and one set of maintenance manuals for locksets, latchsets, closers, and panic devices.

# **PART 3 - EXECUTION**

# 3.1 INSTALLATION

- A. Install the materials in strict accordance with the manufacturer's recommendations and schedules.
- B. All doors should swing as far as conditions allow. When mounting door closers, use the mounting that allows doors to swing to the wall or floor bumper. Do not stop the door with the closer arm unless the arm is designed specifically to stop the door. when mounting closers designed with arms to stop the door or overhead door stops, always mount them to allow the door to swing as far as conditions will permit.
- C. Anchor all screws with Loc-Tite to assure permanence of attachment.
- D. All doors and hardware to be left in proper working order and cleaned.
- E. Special Hardware Instructions:



- 1. Wall stops WS33 are to be mounted on the wall up at the top of the door and as far out on the latch edge as conditions allow. The sloped side is to face up, preventing anyone or anything to hang on them.
- 2. Wall stop & holds WH45 are to be mounted the same as the WS33.

## 3.2 ADJUSTING AND CLEANING

- A. Final inspections shall be made by the Architect and Finish Hardware Supplier. They shall report any installation adjustments that are to be made to have all hardware in perfect working order. The Finish Hardware Supplier shall verify the keying to the Architect to insure proper location of locksets and cylinders. All closers shall be checked and adjusted for closing.
- B. Prior to final acceptance of the installation, the Finish Hardware Supplier shall make a final inspection to verify that all corrections have been made and that all hardware items are in good working condition.

### PART 4 - HARDWARE SCHEDULE

Hardw	are Gro	up No. 01						
For us	e on Do	or #(s):						
C102	2A	C105A	C106C	C109A	C112A		C113A	
C116	6A	C117A						
Each t	o have:							
QTY		DESCRIPTION		CATALOG NUMBER			FINISH	MFR
3	EA	HINGE		5BB1HW 4.5 X 4.5			652	IVE
1	EA	PRIVACY W/DEA	DBOLT	L9440 03A 09-544			626	SCH
1	EA	WALL STOP		WS406/407CVX			630	IVE
1	EA	GASKETING		488S			BK	ZER
Hardw	are Gro	up No. 02						
For us	e on Do	or #(s):						
A129	)A	B134A	B135A	B136A	B137A		B138A	
B139	)A	B140A	B141A					
Each t	o have:							
QTY		DESCRIPTION		CATALOG NUMBER			FINISH	MFR
3	EA	HINGE		5BB1HW 4.5 X 4.5			652	IVE
1	EA	OFFICE/ENTRY I	LOCK	L9050L 03A 09-544		626	SCH	
1	EA	MORTISE CYLIN	DER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B			626	C-R
1	EA	WALL STOP		WS406/407CVX			630	IVE
3	EA	SILENCER		SR64			GRY	IVE
Hardw For us B127	are Grou e on Do 7A	up No. 03 or #(s):						
	u nave.						EINIQU	
2						e	650	
1						E	606	
1							020	
I	EA	MORTISE CTLIN	DER	- REFER TO SECTION	N 2.2.B		020	0-R
1	EA	OH STOP		100S			630	GLY
3	EA	SILENCER		SR64			GRY	IVE

SHELBY PUBLIC SCHOOLS NEW ELEMENTARY SCHOOL A/E PROJECT 5-5491

# GMB

Hardwa For use B143	are Grou e on Doo BA	up No. 04 or #(s):						
Each to	b have:							
QTY		DESCRIPTION		CATALOG NUMBER			FINISH	MFR
3	EA	HINGE		5BB1HW 4.5 X 4.5			652	IVE
1	EA	COBRIDOR LOCK		L9456L 03A 09-544			626	SCH
1	EA	MORTISE CYLINDE	R	MATCH OWNERS STAN - REFER TO SECTION 2	IDARD 2.2.B		626	C-R
1	EA	WALL STOP		WS406/407CVX			630	IVE
1	EA	GASKETING		488S			BK	ZER
Hardwa	are Grou	up No. 05						
For use	e on Do	or #(s):		DUCA			<b>B</b> / <b>a</b> a A	
A128	SA	B104A	B105A	B110A	B111A		B130A	
_C122	2A							
Each to	o have:							
QIY		DESCRIPTION				P	FINISH	
3	EA			5BB1HW 4.5 X 4.5			652	IVE
1	EA		-	L9456L 03A 09-544			626	SCH
1	EA	MORTISE CYLINDE	K	- REFER TO SECTION 2	idard 2.2.B		626	C-R
1	EA	SURFACE CLOSER		4011			689	LCN
1	EA	KICK PLATE		8400 10" X 2" LDW B-CS	6		630	IVE
1	EA	WALL STOP		WS406/407CVX			630	IVE
1	EA	GASKETING		488S			BK	ZER
Hardwa	are Grou	up No. 06						
For USE		or #(s):						
AI36	A A havat	B142A						
	o nave.						EINIQU	
2	E٨			5881HW / 5 Y / 5		E	652	
1			,			E	606	SCU
1					חסאחו		020 626	
I	EA	MORTISE GTLINDE	n	- REFER TO SECTION 2	2.2.B		020	0-R
1	EA	WALL STOP		WS406/407CVX			630	IVE
3	EA	SILENCER		SR64			GRY	IVE
Hardwa	are Grou	up No. 07						
FOR USE		or #(S):						
AI25		A125B						
	o nave.						EINIQU	
עוז ג	E۸	HINGE				E	652	
3 1			·	100701 024			626	
1					חסעחו		626	
I	EA	WURNEEUTLINDE	ń	- REFER TO SECTION 2	2.2.B		020	С-К
1	EA	OH STOP		100S			630	GLY



QTY		DESCRIPTION		CATALOG NUMBER			FINISH	MFR
3	EA	SILENCER		SR64			GRY	IVE
Hardw	are Grou	ıp No. 08						
For us	e on Do	or #(s):						
A131	A	A132A						
Each te	o have:							
QTY		DESCRIPTION		CATALOG NUMBER			FINISH	MFR
3	EA	HINGE		5BB1HW 4.5 X 4.5			652	IVE
1	EA	STOREROOM LOC	K	L9080L 03A			626	SCH
1	EA	MORTISE CYLINDE	ĒR	MATCH OWNERS STAN	IDARD 2.2.B		626	C-R
1	FA	WALL STOP		WS406/407CVX			630	IVF
3	EA	SILENCER		SR64			GRY	IVE
Hardw	are Grou	up No. 09						
		or #(S):						
AII/ Each t	A A hava:	ATTOA						
	u nave.						EINIQU	
3	ΓΛ					E	652	
1			ĸ			Ē	626	SCU
1					חסאחו		626	
I	LA	MORTISE OTLINDE	-n	- REFER TO SECTION 2	2.2.B		020	0-n
1	EA	SURFACE CLOSEF	3	4011			689	LCN
1	EA	KICK PLATE		8400 10" X 2" LDW B-CS	5		630	IVE
1	EA	WALL STOP		WS406/407CVX			630	IVE
3	EA	SILENCER		SR64			GRY	IVE
	0							
Hardw For us	are Grol e on Dou	JP NO. 10 or #(s):						
A111		A112A	A116A	A133A	A134A		B115A	
B116	SA	B119A	B125A	C121A	C123A		C124A	
Each te	o have:	2110/1	D120/1	01217	0.20/1		012.01	
QTY		DESCRIPTION		CATALOG NUMBER			FINISH	MFR
3	EA	HINGE		5BB1HW 4.5 X 4.5			652	IVE
1	EA	STOREROOM LOC	к	L9080L 03A			626	SCH
1	EA	MORTISE CYLINDE	ĒR	MATCH OWNERS STAN	IDARD		626	C-R
1	EA	SURFACE CLOSEF	3	4011		Ē	689	LCN
1	EA	KICK PLATE	-	8400 10" X 2" I DW B-CS	5		630	IVF
1	EA	WALL STOP/HOLD	ER	WS45(X)			626	IVF
3	EA	SILENCER		SR64			GRY	IVE
-	-			-				_

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Hardwa	are Grou	up No. 11							
For use	e on Doo	or #(s):	01101		0.4.00.0				
A123	SD.	B131A	C119A		C120A				
Each to	o have:	DECODIDEION							
QIY		DESCRIPTION		CATALC				FINISH	MFR
3	EA	HINGE		5BB1HW	/ 4.5 X 4.5			652	IVE
1	EA	STOREROOM LOC	K	L9080L (	03A			626	SCH
1	EA	MORTISE CYLIND	ĒR	MATCH	OWNERS STAN			626	C-R
1	FA	OH STOP			TO SECTION 2	2.2.D	Ē	630	GI Y
1	FΔ		2	4011 ST	-1544		Ē	689	
1				4020-18	1044			689	
1				9400 10		2	E	630	
1 0					XZ LDW B-OU	5	P		
3	EA	SILENCER		5R64				GRY	IVE
Hardwa	are Grou	up No. 12							
For use	e on Doo	or #(s):							
A114	IA.	B120A							
Each to	o have:	DECODIDEION							
QIY		DESCRIPTION		CATALC				FINISH	MFR
3	EA	HINGE		5BB1HW	/ 4.5 X 4.5 NRP			652	IVE
1	EA	STOREROOM LOC	K	L9080L (	03A			626	SCH
1	EA	MORTISE CYLINDER		MATCH - REFER	- REFER TO SECTION 2.2.B			626	C-R
1	EA	SURFACE CLOSEF	7	4111 EDA			689	LCN	
1	EA	KICK PLATE		8400 10'	' X 2" LDW B-CS	S		630	IVE
1	EA	WALL STOP		WS406/4	407CVX			630	IVE
3	EA	SILENCER		SR64				GRY	IVE
Hardw	aro Grou	in No. 13							
For use	e on Doo	or #(s):							
A101	A	A103A	A104A		A105A	A106A		A108A	
A109	Δ	A110A	R101A		B103A	R106A		R108A	
R100	20	R110A	B113A		B11//A	C101A		C104A	
C103	7 1	C110A	01114		C114A	01154		C1104A	
0107		CTICA	UIIIA		UTI4A	UTISA		GIIOA	
	o nave.			CATALC					
							P		
3								002	
1	EA	STOREROOM LOC	к 	L9080L (	J3A			626	SCH
1	EA	MORTISE CYLINDE	ER	MATCH - REFER	OWNERS STAN TO SECTION 2	NDARD 2.2.B		626	C-R
1	EA	SURFACE CLOSE	7	4111 ED	A			689	LCN
1	EA	KICK PLATE		8400 10'	' X 2" LDW B-CS	5		630	IVE
1	EA	WALL STOP/HOLD	ER	WS45(X)	)			626	IVE
3	EA	SILENCER		SR64				GRY	IVE

# GMB

Hardw	are Grou	up No. 14			
For us	e on Do	or #(s):			
Each t	+A o havo:				
	o nave.	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	FΔ	HINGE	5BB1HW 4 5 X 4 5 NBP	652	IVE
1	FA	STOBEBOOM LOCK		626	SCH
1	ΕA	MOBTISE CYLINDER	MATCH OWNERS STANDARD	626	C-R
	L/		- REFER TO SECTION 2.2.B	020	011
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
Hardw	are Grou	up No. 15			
For us	e on Do	or #(s):			
_A127	7A	A137A A138A	A		
Each t	o have:				
QIY		DESCRIPTION		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/FB61P (AS REQ'D)	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080L 03A	626	SCH
1	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B	626	C-R
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4111 SCUSH	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	SILENCER	SR64	GRY	IVE
Hardw	are Grou	up No. 16			
For us	e on Do	or #(s):			
_B126	SA				
Each t	o have:	DECODIDITION			
QIY	<b>- ^</b>	DESCRIPTION			
6	EA		5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/FB61P (AS REQ'D)	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080L 03A	626	SCH
1	EA	MORTISE CYLINDER	- REFER TO SECTION 2.2.B	626	C-R
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
2	EA	SURFACE CLOSER	4111 SHCUSH	689	LCN
2	EA	ARMOR PLATE	8400 36" X 1" LDW B-CS	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

Hardw	are Grou	up No. 17						
For use	e on Doo	or #(s):	01054					
A113	SA a havat	B11/A	C125A					
	o nave.						EINIIGH	
2					E		652	
1					E		626	SCH
1							626	C_R
I			_11	- REFER TO SECTION 2.2.B			020	0-11
1	EA	SURFACE CLOSEF	{	4011			689	LCN
1	EA	KICK PLATE		8400 10" X 2" LDW B-CS			630	IVE
1	EA	WALL STOP		WS406/407CVX			630	IVE
1	EA	GASKETING		488S			BK	ZER
Hardwa For use B144	are Grou e on Doo A	up No. 18 or #(s):						
Each to	o have:							
QTY		DESCRIPTION		CATALOG NUMBER	_		FINISH	MFR
3	EA	HINGE		5BB1HW 4.5 X 4.5 NRP			652	IVE
1	EA	STOREROOM LOC	K	L9080L 03A			626	SCH
1	EA	MORTISE CYLINDE	R	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B			626	C-R
1	EA	ELECTRIC STRIKE		6400 FSE		N	630	VON
1	EA	SURFACE CLOSEF	3	4111 SCUSH			689	LCN
1	EA	CUSH SHOE SUPP	ORT	4110-30 (AS REQ'D)			689	LCN
1	EA	BLADE STOP SPAC	CER	4110-61 (AS REQ'D)			689	LCN
1	EA	INTERCOM SYSTE	М	PROVIDED BY SECURITY CONTRACTOR		×		
1	EA	CARD READER		PROVIDED BY SECURITY CONTRACTOR		×		
1	EA	DESK MOUNT BUT	TON	660-PB		N	628	SCE
1	EA	POWER SUPPLY		PS904 900-4RL		N		VON
				WEATHERSTRIP BY DOOR/FRAME MANUFACTURER				

NOTES:

1) POWER SUPPLY SHARED W/DOORS B132A AND B144B.

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

DOOR NORMALLY CLOSED AND LOCKED. PRESENTING A VALID CREDENTIAL TO THE READER OR PRESSING DESK MOUNT BUTTON AT RECEPTION DESK WILL MOMENTARILY UNLOCK THE ELECTRIC STRIKE ALLOWING ACCESS. DOOR TO REMAIN LOCKED UPON LOSS OF POWER OR ACTIVATION OF THE LOCKDOWN SYSTEM. FREE EGRESS AT ALL TIMES.



Hardware Group No. 19	
For use on Door #(s):	
B132A	
Each to have:	

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	INSTITUTION LOCK	L9082L 03A		626	SCH
2	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B		626	C-R
1	EA	ELECTRIC STRIKE	6400 FSE	N	630	VON
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
3	EA	SILENCER	SR64		GRY	IVE
2	EA	CARD READER	PROVIDED BY SECURITY CONTRACTOR	×		

NOTES:

1) POWER SUPPLY LISTED W/DOOR B144A.

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

DOOR NORMALLY CLOSED AND LOCKED. PRESENTING A VALID CREDENTIAL TO EITHER READER WILL MOMENTARILY UNLOCK THE ELECTRIC STRIKE ALLOWING ACCESS. DOOR TO REMAIN LOCKED UPON LOSS OF POWER OR ACTIVATION OF THE LOCKDOWN SYSTEM.

Hardware Group No. 20

For use on Door #(s):

B144B Fach to have:

L		nave.					
	QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
	3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
	1	EA	INSTITUTION LOCK	L9082L 03A		626	SCH
	2	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B		626	C-R
	1	EA	ELECTRIC STRIKE	6400 FSE	×	630	VON
	1	EA	OH STOP	100S		630	GLY
	1	EA	SURFACE CLOSER	4011 ST-1544		689	LCN
	1	EA	MOUNTING PLATE	4020-18		689	LCN
	2	EA	CARD READER	PROVIDED BY SECURITY CONTRACTOR	N		
	1	EA	PUSH BUTTON	621GR NS	×	626	SCE
	1	EA	DESK MOUNT BUTTON	660-PB	×	628	SCE

NOTES:

1) POWER SUPPLY LISTED W/DOOR B144A.

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

UNLOCKED HOURS: DOOR NORMALLY CLOSED AND LOCKED AND PUSH BUTTON ON SCHOOL

# GMB

CORRIDOR SIDE SHALL BE ENABLED BY ACCESS CONTROL SYSTEM. PRESSING PUSH BUTTON ON SCHOOL CORRIDOR SIDE WILL MOMENTARILY UNLOCK THE ELECTRIC STRIKE ALLOWING ACCESS FROM SCHOOL CORRIDOR INTO OFFICE. OFFICE SIDE ALWAYS LOCKED PREVENTING FREE PASSAGE FROM OFFICE INTO THE SCHOOL. PRESENTING A VALID CREDENTIAL TO THE READER ON SCHOOL OFFICE SIDE, OR PRESSING DESK MOUNT BUTTON LOCATED AT RECEPTION DESK, WILL MOMENTARILY UNLOCK THE ELECTRIC STRIKE ALLOWING ACCESS FROM OFFICE INTO SCHOOL. DOOR TO REMAIN LOCKED UPON LOSS OF POWER OR ACTIVATION OF LOCKDOWN SYSTEM.

LOCKED HOURS: DOOR NORMALLY CLOSED AND LOCKED AND PUSH BUTTON ON SCHOOL CORRIDOR SIDE SHALL BE DISABLED BY ACCESS CONTROL SYSTEM, THUS LOCKED IN BOTH DIRECTIONS. PRESENTING A VALID CREDENTIAL TO THE READER ON EITHER SIDE OR PRESSING DESK MOUNT BUTTON LOCATED AT RECEPTION DESK, WILL MOMENTARILY UNLOCK THE ELECTRIC STRIKE ALLOWING ACCESS. DOOR TO REMAIN LOCKED UPON LOSS OF POWER OR ACTIVATION OF LOCKDOWN SYSTEM.

Hardware Group No. 21 For use on Door #(s):

A127B

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	STOREROOM LOCK	LV9080L 03A	626	SCH
1	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B	626	C-R
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	BLADE STOP SPACER	4110-61 (AS REQ'D)	689	LCN
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	DOOR SWEEP	39A	А	ZER
1	EA	THRESHOLD	655A	А	ZER
1	EA	DOOR CONTACT	679-05HM	🗡 BLK	SCE
			WEATHERSTRIP BY DOOR/FRAME MANUFACTURER		

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

DOOR CONTACT MONITORS WHETHER THE DOOR IS OPENED, CLOSED OR HELD OPEN TOO LONG.

Hardwa	re Grou	p No. 22			
For use	on Doo	r #(s):			
C128/	4	C129A			
Each to	have:				
QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	LD-98-L-NL-03	626	VON
1	EA	FSIC RIM CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B	626	C-R
1	EA	SURFACE CLOSER	4111 EDA	689	LCN



QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP/HOLDER	WS45(X)		626	IVE
3	EA	SILENCER	SR64		GRY	IVE
Hardwa	are Gro	up No. 23				
For use	e on Do	or #(s):				
_B129	B	B129C				
Each to	o have:	DECODIDITION				
				F		
2					020	
1	EA		4954 STAB		689	VON
1	EA	PANIC HARDWARE	CD-98-D1		626	VON
1	EA	PANIC HARDWARE	CD-98-NL		626	VON
2	ΕA	MORTISE CYLINDER	ATCH OWNERS STANDARD - REFER TO SECTION 2.2.B		626	C-R
1	EA	FSIC RIM CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B		626	C-R
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
2	EA	SILENCER	SR64		GRY	IVE
Hardwa	are Gro	up No. 24 or #(s):				
B129	A					
Each to	b have:					
QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	224HD		628	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
1	EA	PANIC HARDWARE	CD-98-DT		626	VON
1	EA	PANIC HARDWARE	CD-98-NL		626	VON
3	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD		626	C-R
1	EA	FSIC RIM CYLINDER	MATCH OWNERS STANDARD		626	C-R
0			- REFER TO SECTION 2.2.B	F	<u> </u>	
2					689	
2	EA EA	SILENCER	8400 10" X 2" LDW B-CS SR64		GRY	IVE
Hardwa	are Gro	up No. 25				
For use A119	e on Do A	or #(s):				
Each to	b have:					
QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	224HD		628	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
1	EA	PANIC HARDWARE	CD-98-DT		626	VON
1	EA	PANIC HARDWARE	CD-98-NL		626	VON
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1

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QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B			626	C-R
1	EA	FSIC RIM CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B			626	C-R
2	EA	SURFACE CLOSER	4111 SHCUSH			689	LCN
2	EA	KICK PLATE	8400 8" X 2" LDW B-CS			630	IVE
2	EA	SILENCER	SR64			GRY	IVE
Hardwa	are Grou	ıp No. 26					
For use A130	e on Doo A	or #(s):					
Each to	have:						
QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	224HD			628	IVE
1	EA	PANIC HARDWARE	CD-9827-L-DT-LBR-03			626	VON
1	EA	PANIC HARDWARE	CD-9827-L-NL-LBR-03			626	VON
2	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B			626	C-R
1	EA	FSIC RIM CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B			626	C-R
2	EA	SURFACE CLOSER	4111 SCUSH			689	LCN
2	EA	KICK PLATE	8400 8" X 1" LDW B-CS			630	IVE
2	EA	SILENCER	SR64			GRY	IVE
Hardwa	are Grou	ıp No. 27					
For use	e on Doo	or #(s):					
A107	A	B107A C108A					
	o nave.						
2	E۸			E		628	
2			2241D 9849-1-E-03-1 BI	E		626	
2						626	
۷	LA		- REFER TO SECTION 2.2.B			020	0-11
2	EA	SURFACE CLOSER	4111 EDA			689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS			630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850 (COORDINATE VOLTAGE AS REQ'D)		×	689	LCN
1	EA	GASKETING	488S			BK	ZER

MEETING STILE 8217S OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

THE WALL MAGNETS SHALL BE WIRED TO THE FIRE ALARM PANEL THROUGH A SET OF NORMALLY-CLOSED, DRY CONTACTS (SUPPLIED BY THE FIRE ALARM CONTRACTOR) AND LOCKDOWN SYSTEM.

MAGNETIC HOLD OPENS ARE CONTINUOUSLY ENERGIZED ALLOWING THE DOORS TO BE HELD OPEN UNDER NORMAL BUILDING CONDITIONS. WHEN THE FIRE ALARM OR LOCKDOWN SYSTEM IS ACTIVATED, POWER TO THE MAGNETIC HOLD OPENS IS DISCONNECTED CAUSING

ZER

ΒK



THE DOOR CLOSERS TO CLOSE THE DOORS. DOORS CAN ALSO BE MANUALLY RELEASED FROM THE MAGNETS.

Hardwa	are Grou	ıp No. 28							
For use	e on Doo	or #(s):			-			-	
A102	С	A102D	A115C	A115D	B102C			B102D	
_C103	C	C103D	C126C	C126D					
Each to	o have:	DECODIDEION							
QIY		DESCRIPTION						FINISH	MFR
1	EA	CONT. HINGE		112HD				628	IVE
1	EA	DUMMY PUSH BAF	ł	350-DT-990				626	VON
1	EA	OH STOP		100S				630	GLY
1	EA	SURFACE CLOSEF	2	4111 EDA				689	LCN
1	EA	BLADE STOP SPAC	ER	4110-61 (AS REQ'D)				689	LCN
				WEATHERSTRIP BY					
				MANUFACIURER					
Hardwa	are Grou	in No. 29							
For use	e on Doc	or #(s):							
B123	B								
Each to	have:								
QTY		DESCRIPTION		CATALOG NUMBER				FINISH	MFR
2	EA	CONT. HINGE		112HD				628	IVE
2	EA	DUMMY PUSH BAF	{	350-DT-990				626	VON
2	EA	OH STOP & HOLDE	R	100H				630	GLY
2	EA	SURFACE CLOSEF	2	4111 EDA				689	LCN
2	EA	BLADE STOP SPAC	ER	4110-61 (AS REQ'D)				689	LCN
				WEATHERSTRIP BY					
				DOOR/FRAME					
				MANUFACTURER					
	-	NL 00							
Hardwa	are Grou	ip No. 30							
R1/6		JF #(S).							
Each to	have.								
OTY	nave.	DESCRIPTION		CATALOG NUMBER				FINISH	MFR
1	FA	CONT HINGE		112HD				628	IVE
1	FA		:	CD-98-DT		Ē		626	
1	FΔ		B	MATCH OWNERS STAN				626	C-B
	LA			- REFER TO SECTION 2	2.2.B			020	011
1	EA	ELECTRIC STRIKE		6300 FSE			N	630	VON
1	EA	OH STOP		1005			-	630	GLY
1	EA	SURFACE CLOSEF	{	4111 EDA				689	
1	FA	BLADE STOP SPAC	CFR	4110-61 (AS REO'D)				689	
		DERECTOR OF AC		WEATHERSTRIP RV				000	LUN
				DOOR/FRAME					
				MANUFACTURER					



NOTES:

1) POWER SUPPLY LISTED W/DOOR B146B.

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

UNLOCKED HOURS: DOOR ELECTRONICALLY UNLOCKED VIA ACCESS CONTROL SYSTEM, THUS IN PUSH/PULL MODE.

LOCKED HOURS: DOOR NORMALLY CLOSED AND LOCKED VIA ACCESS CONTROL SYSTEM.

DOOR TO REMAIN LOCKED WITH LOSS OF POWER OR ACTIVATION OF THE LOCKDOWN SYSTEM. FREE EGRESS AT ALL TIMES.

Hardware Group No. 31

For use on Door #(s):

B146D

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112HD		628	IVE
1	EA	PANIC HARDWARE	CD-98-NL		626	VON
1	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B		626	C-R
1	EA	FSIC RIM CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B		626	C-R
1	EA	ELECTRIC STRIKE	6300 FSE	×	630	VON
1	EA	OH STOP	100S		630	GLY
1	EA	SURF. AUTO OPERATOR	4642 WMS	×	689	LCN
1	EA	ACTUATOR, JAMB MOUNT	8310-818T - CORRIDOR SIDE	×	630	LCN
1	EA	FLUSH MOUNT BOX	8310-819F			LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853T - VESTIBULE SIDE	×	630	LCN
1	EA	FLUSH MOUNT BOX	8310-867F			LCN
1	EA	CARD READER	PROVIDED BY SECURITY CONTRACTOR WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	*		

NOTES:

1) POWER SUPPLY LISTED W/DOOR B146B.

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

UNLOCKED HOURS: DOOR ELECTRONICALLY UNLOCKED VIA ACCESS CONTROL SYSTEM, THUS IN PUSH/PULL MODE. PUSHING EITHER AUTO OPERATOR ACTUATOR WILL SIGNAL AUTO OPERATOR TO MOMENTARILY OPEN THE DOOR.

LOCKED HOURS: DOOR NORMALLY CLOSED AND LOCKED VIA ACCESS CONTROL SYSTEM. PRESENTING A VALID CREDENTIAL TO THE READER WILL MOMENTARILY UNLOCK THE



ELECTRIC STRIKE (ALLOWING ACCESS) AND ACTIVATE EXTERIOR AUTO OPERATOR ACTUATOR. PUSHING EXTERIOR AUTO OPERATOR ACTUATOR AT THIS TIME WILL SIGNAL AUTO OPERATOR TO MOMENTARILY OPEN THE DOOR. PUSH INTERIOR ACTUATOR AT ANY TIME WILL MOMENTARILY UNLOCK THE ELECTRIC STRIKE AND SIGNAL AUTO OPERATOR TO MOMENTARILY OPEN THE DOOR.

DOOR TO REMAIN LOCKED WITH LOSS OF POWER OR ACTIVATION OF THE LOCKDOWN SYSTEM. FREE EGRESS AT ALL TIMES.

Hardware Group No. 32

For use on Door #(s):

B146B

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112HD		628	IVE
1	EA	PANIC HARDWARE	CD-98-NL		626	VON
1	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B		626	C-R
1	EA	FSIC RIM CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B		626	C-R
1	EA	ELECTRIC STRIKE	6300 FSE	×	630	VON
1	EA	OH STOP	100S		630	GLY
1	EA	SURF. AUTO OPERATOR	4642 WMS	×	689	LCN
1	EA	WEATHER RING	8310-801			LCN
1	EA	ACTUATOR, JAMB	8310-818T	×	630	LCN
		MOUNT	- VESTIBULE SIDE			
1	EA	FLUSH MOUNT BOX	8310-819F			LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853T - EXTERIOR SIDE	N	630	LCN
1	EA	FLUSH MOUNT BOX	8310-867F			LCN
1	EA	DOOR SWEEP	39A		А	ZER
1	EA	THRESHOLD	655A		А	ZER
1	EA	INTERCOM SYSTEM	PROVIDED BY SECURITY CONTRACTOR	×		
1	EA	CARD READER	PROVIDED BY SECURITY CONTRACTOR	×		
1	EA	DOOR CONTACT	679-05HM	×	BLK	SCE
1	EA	MOTION SENSOR	SCANII	×	BLK	SCE
1	EA	POWER SUPPLY	PS904 900-4RL	×		VON
			WEATHERSTRIP BY			
			DOOR/FRAME			
			MANUFACTURER			

NOTES:

1) MOTION SCANNER SHARED W/DOOR B146A.

2) POWER SUPPLY SHARED W/DOOR B146A, 146C, AND146D.

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

UNLOCKED HOURS: DOOR ELECTRONICALLY UNLOCKED VIA ACCESS CONTROL SYSTEM,



THUS IN PUSH/PULL MODE. PUSHING EITHER AUTO OPERATOR ACTUATOR WILL SIGNAL AUTO OPERATOR TO MOMENTARILY OPEN THE DOOR.

LOCKED HOURS: DOOR NORMALLY CLOSED AND LOCKED VIA ACCESS CONTROL SYSTEM. PRESENTING A VALID CREDENTIAL TO THE READER WILL MOMENTARILY UNLOCK THE ELECTRIC STRIKE (ALLOWING ACCESS) AND ACTIVATE EXTERIOR AUTO OPERATOR ACTUATOR. PUSHING EXTERIOR AUTO OPERATOR ACTUATOR AT THIS TIME WILL SIGNAL AUTO OPERATOR TO MOMENTARILY OPEN THE DOOR. PUSH INTERIOR ACTUATOR AT ANY TIME WILL MOMENTARILY UNLOCK THE ELECTRIC STRIKE AND SIGNAL AUTO OPERATOR TO MOMENTARILY OPEN THE DOOR.

THE MOTION SENSOR TO SHUNT THE ALARM OUTPUT OF THE DOOR CONTACT DURING VALID EGRESS. DOOR CONTACT MONITORS WHETHER THE DOOR IS OPENED, CLOSED OR HELD OPEN TOO LONG. DOOR TO REMAIN LOCKED WITH LOSS OF POWER OR ACTIVATION OF THE LOCKDOWN SYSTEM. FREE EGRESS AT ALL TIMES.

Hardware Group No. 33 For use on Door #(s):

A102	В	A115A	B102B	C103B	C126B			
Each to	have:							
QTY		DESCRIPTION		CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE		112HD			628	IVE
1	EA	PANIC HARDWAR	E	CD-98-NL			626	VON
1	EA	MORTISE CYLIND	ER	MATCH OWNERS ST - REFER TO SECTIO	TANDARD N 2.2.B		626	C-R
1	EA	FSIC RIM CYLIND	ĒR	MATCH OWNERS S	TANDARD N 2.2.B		626	C-R
1	EA	ELECTRIC STRIKE	-	6300 FSE		×	630	VON
1	EA	OH STOP		100S			630	GLY
1	EA	SURFACE CLOSE	R	4111 EDA			689	LCN
1	EA	BLADE STOP SPA	CER	4110-61 (AS REQ'D)			689	LCN
1	EA	RAIN DRIP		142AA			AA	ZER
1	EA	DOOR SWEEP		39A			А	ZER
1	EA	THRESHOLD		655A			А	ZER
1	EA	CARD READER		PROVIDED BY SECU CONTRACTOR	JRITY	×		
1	EA	DOOR CONTACT		679-05HM		×	BLK	SCE
1	EA	MOTION SENSOR		SCANII		N	BLK	SCE
1	EA	POWER SUPPLY		PS902 900-2RS - COORDINATE POV SUPPLY REQUIREN W/SECURITY PROV WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	VER IENTS IDER	×		VON

### NOTES:

MOTION SCANNER FOR DOOR A102B SHARED W/DOOR A102A.
MOTION SCANNER FOR DOOR A115A SHARED W/DOOR A115B.
MOTION SCANNER FOR DOOR B102B SHARED W/DOOR B102A.
MOTION SCANNER FOR DOOR B103B SHARED W/DOOR B103A.
MOTION SCANNER FOR DOOR B103B SHARED W/DOOR B103A.

5) MOTION SCANNER FOR DOOR B126B SHARED W/DOOR B126A.



OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

DOOR NORMALLY CLOSED AND LOCKED. PRESENTING A VALID CREDENTIAL TO THE READER WILL MOMENTARILY UNLOCK THE ELECTRIC STRIKE ALLOWING ACCESS. THE MOTION SENSOR TO SHUNT THE ALARM OUTPUT OF THE DOOR CONTACT DURING VALID EGRESS. DOOR CONTACT MONITORS WHETHER THE DOOR IS OPENED, CLOSED OR HELD OPEN TOO LONG. DOOR TO REMAIN LOCKED UPON LOSS OF POWER OR ACTIVATION OF THE LOCKDOWN SYSTEM. FREE EGRESS AT ALL TIMES.

Hardware Group No. 34

For use on Door #(s):

B146A

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112HD		628	IVE
1	EA	PANIC HARDWARE	CD-98-DT		626	VON
1	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B		626	C-R
1	EA	ELECTRIC STRIKE	6300 FSE	×	630	VON
1	EA	OH STOP	100S		630	GLY
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	BLADE STOP SPACER	4110-61 (AS REQ'D)		689	LCN
1	EA	DOOR SWEEP	39A		А	ZER
1	EA	THRESHOLD	655A		А	ZER
1	EA	DOOR CONTACT	679-05HM	×	BLK	SCE
			WEATHERSTRIP BY DOOR/FRAME MANUFACTURER			

NOTES:

1) MOTION SCANNER LISTED W/DOOR B146B.

2) POWER SUPPLY LISTED W/DOOR B146B.

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

UNLOCKED HOURS: DOOR ELECTRONICALLY UNLOCKED VIA ACCESS CONTROL SYSTEM, THUS IN PUSH/PULL MODE.

LOCKED HOURS: DOOR NORMALLY CLOSED AND LOCKED VIA ACCESS CONTROL SYSTEM.

THE MOTION SENSOR TO SHUNT THE ALARM OUTPUT OF THE DOOR CONTACT DURING VALID EGRESS. DOOR CONTACT MONITORS WHETHER THE DOOR IS OPENED, CLOSED OR HELD OPEN TOO LONG. DOOR TO REMAIN LOCKED WITH LOSS OF POWER OR ACTIVATION OF THE LOCKDOWN SYSTEM. FREE EGRESS AT ALL TIMES.

# GMB

Hardwa	are Grou	ıp No. 35				
For use	e on Doo	or #(s):				
A120	A	B122A	B128A	C127A		
Each to	have:					
QTY		DESCRIPTION		CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE		112HD	628	IVE
1	EA	PANIC HARDWARE		LD-98-NL	626	VON
1	EA	FSIC RIM CYLINDE	R	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B	626	C-R
1	EA	OH STOP		100S	630	GLY
1	EA	SURFACE CLOSER	1	4111 EDA	689	LCN
1	EA	BLADE STOP SPAC	ER	4110-61 (AS REQ'D)	689	LCN
1	EA	RAIN DRIP		142AA	AA	ZER
1	EA	DOOR SWEEP		39A	А	ZER
1	EA	THRESHOLD		655A	А	ZER
1	EA	DOOR CONTACT		679-05HM WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	🖋 BLK	SCE

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

DOOR CONTACT MONITORS WHETHER THE DOOR IS OPENED, CLOSED OR HELD OPEN TOO LONG.

Hardware Group No. 36 For use on Door #(s): A138B Each to have: QTY CATALOG NUMBER DESCRIPTION FINISH MFR 1 EA CONT. HINGE 112HD 628 IVE 1 EA 626 VON PANIC HARDWARE LD-98-L-NL-03 1 EΑ FSIC RIM CYLINDER MATCH OWNERS STANDARD 626 C-R - REFER TO SECTION 2.2.B E OH STOP 100S 630 GLY 1 EA 1 EA SURFACE CLOSER 4111 EDA 689 LCN 1 EA **BLADE STOP SPACER** 4110-61 (AS REQ'D) 689 LCN E 1 EA **RAIN DRIP** 142AA AA ZER 1 EΑ DOOR SWEEP 39A А ZER E 1 EA THRESHOLD 655A А ZER E 🖊 BLK 1 EA DOOR CONTACT 679-05HM SCE WEATHERSTRIP BY DOOR/FRAME MANUFACTURER

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

DOOR CONTACT MONITORS WHETHER THE DOOR IS OPENED, CLOSED OR HELD OPEN TOO LONG.

SHELBY PUBLIC SCHOOLS NEW ELEMENTARY SCHOOL A/E PROJECT 5-5491

# GMB

Hardware	Group	No.	37
-	-		

For use on Door #(s):

A123A Each to have:

OTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	FA	CONT HINGE	112HD	628	IVE
1	EA	PANIC HARDWARE	CD-98-L-NL-03	626	VON
1	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B	626	C-R
1	EA	FSIC RIM CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B	626	C-R
1	EA	OH STOP & HOLDER	100H	630	GLY
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	BLADE STOP SPACER	4110-61 (AS REQ'D)	689	LCN
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	DOOR SWEEP	39A	А	ZER
1	EA	THRESHOLD	655A	А	ZER
1	EA	VIEWER	698	626	IVE
1	EA	DOOR CONTACT	679-05HM WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	🖋 BLK	SCE

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

DOOR CONTACT MONITORS WHETHER THE DOOR IS OPENED, CLOSED OR HELD OPEN TOO LONG.

Hardware Group No. 38 For use on Door #(s):

	$\pi(3)$ .						
A	A115B	B102A	C103A	C126A			
have:							
	DESCRIPTION		CATALOG NUMBE	R		FINISH	MFR
EA	CONT. HINGE		112HD			628	IVE
EA	PANIC HARDWAR	E	CD-98-DT			626	VON
EA	MORTISE CYLIND	ER	MATCH OWNERS - REFER TO SECT	STANDARD ION 2.2.B		626	C-R
EA	OH STOP		100S			630	GLY
EA	SURFACE CLOSE	R	4111 EDA			689	LCN
EA	BLADE STOP SPA	CER	4110-61 (AS REQ'[	D)		689	LCN
EA	RAIN DRIP		142AA			AA	ZER
EA	DOOR SWEEP		39A			А	ZER
EA	THRESHOLD		655A			А	ZER
EA	DOOR CONTACT		679-05HM WEATHERSTRIP E DOOR/FRAME	3Y		N BLK	SCE
	A have: EA EA EA EA EA EA EA EA EA EA	A A115B have: DESCRIPTION EA CONT. HINGE EA PANIC HARDWAR EA MORTISE CYLIND EA OH STOP EA SURFACE CLOSE EA BLADE STOP SPA EA RAIN DRIP EA DOOR SWEEP EA THRESHOLD EA DOOR CONTACT	A A115B B102A have: DESCRIPTION EA CONT. HINGE EA PANIC HARDWARE EA MORTISE CYLINDER EA OH STOP EA SURFACE CLOSER EA BLADE STOP SPACER EA BLADE STOP SPACER EA RAIN DRIP EA DOOR SWEEP EA THRESHOLD EA DOOR CONTACT	A A115B B102A C103A have: DESCRIPTION CATALOG NUMBE EA CONT. HINGE 112HD EA PANIC HARDWARE CD-98-DT EA MORTISE CYLINDER MATCH OWNERS - REFER TO SECT EA OH STOP 100S EA SURFACE CLOSER 4111 EDA EA BLADE STOP SPACER 4110-61 (AS REQ'I EA RAIN DRIP 142AA EA DOOR SWEEP 39A EA THRESHOLD 655A EA DOOR CONTACT 679-05HM WEATHERSTRIP E DOOR/FRAME MANUEACTURER	AA115BB102AC103AC126AAA115BB102AC103AC126Ahave:DESCRIPTIONCATALOG NUMBEREACONT. HINGE112HDEAPANIC HARDWARECD-98-DTEAMORTISE CYLINDERMATCH OWNERS STANDARD - REFER TO SECTION 2.2.BEAOH STOP100SEASURFACE CLOSER4111 EDAEABLADE STOP SPACER4110-61 (AS REQ'D)EARAIN DRIP142AAEADOOR SWEEP39AEATHRESHOLD655AEADOOR CONTACT679-05HMWEATHERSTRIP BY DOOR/FRAMEMANUEACTURER	A A115B B102A C103A C126A have: DESCRIPTION CATALOG NUMBER EA CONT. HINGE 112HD E EA PANIC HARDWARE CD-98-DT E EA MORTISE CYLINDER MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B EA OH STOP 100S E EA SURFACE CLOSER 4111 EDA E EA BLADE STOP SPACER 4110-61 (AS REQ'D) EA RAIN DRIP 142AA E EA DOOR SWEEP 39A EA THRESHOLD 655A E EA DOOR CONTACT 679-05HM E WEATHERSTRIP BY DOOR/FRAME MANUEACTURER	A A115B B102A C103A C126A have: DESCRIPTION CATALOG NUMBER FINISH EA CONT. HINGE 112HD E 628 EA PANIC HARDWARE CD-98-DT E 626 EA MORTISE CYLINDER MATCH OWNERS STANDARD 626 - REFER TO SECTION 2.2.B EA OH STOP 100S E 630 EA SURFACE CLOSER 4111 EDA E 689 EA BLADE STOP SPACER 4110-61 (AS REQ'D) 689 EA RAIN DRIP 142AA E AA EA DOOR SWEEP 39A A A EA THRESHOLD 655A A A EA DOOR CONTACT 679-05HM A KEATHERSTRIP BY DOOR/FRAME MANUEACTUREB

NOTES:

1) MOTION SCANNER FOR DOOR A102A LISTED W/DOOR A102B.



MOTION SCANNER FOR DOOR A115B LISTED W/DOOR A115A.
MOTION SCANNER FOR DOOR B102A LISTED W/DOOR B102B.
MOTION SCANNER FOR DOOR B103A LISTED W/DOOR B103B.
MOTION SCANNER FOR DOOR B126A LISTED W/DOOR B126B.

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

THE MOTION SENSOR TO SHUNT THE ALARM OUTPUT OF THE DOOR CONTACT DURING VALID EGRESS. DOOR CONTACT MONITORS WHETHER THE DOOR IS OPENED, CLOSED OR HELD OPEN TOO LONG. FREE EGRESS AT ALL TIMES.

Hardware Group No. 39

For use on Door #(s):

B123A

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112HD	628	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	PANIC HARDWARE	CD-98-DT	626	VON
1	EA	PANIC HARDWARE	CD-98-NL	626	VON
3	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B	626	C-R
1	EA	FSIC RIM CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B	626	C-R
2	EA	OH STOP & HOLDER	100H	630	GLY
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	BLADE STOP SPACER	4110-61 (AS REQ'D)	689	LCN
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	MULLION SEAL	8780N	BK	ZER
2	EA	DOOR SWEEP	39A	А	ZER
1	EA	THRESHOLD	655A	А	ZER
2	EA	DOOR CONTACT	679-05HM WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	₩ BLK	SCE

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

DOOR CONTACTS MONITOR WHETHER THE DOORS ARE OPENED, CLOSED OR HELD OPEN TOO LONG.

Hardwar For use A119E Each to	re Grou on Doc 3 have:	ıp No. 40 or #(s):			
QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112HD	628	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
2	EA	PANIC HARDWARE	LD-98-EO	626	VON



QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	MORTISE CYLINDER	MATCH OWNERS STANDARD - REFER TO SECTION 2.2.B	626	C-R
2	EA	OH STOP & HOLDER	100H	630	GLY
2	EA	SURFACE CLOSER	4111 EDA	689	LCN
2	EA	BLADE STOP SPACER	4110-61 (AS REQ'D)	689	LCN
1	EA	MULLION SEAL	8780N	BK	ZER
2	EA	DOOR SWEEP	39A	А	ZER
1	EA	THRESHOLD	655A	А	ZER
2	EA	DOOR CONTACT	679-05HM	💉 BLK	SCE
			WEATHERSTRIP BY		
			DOOR/FRAME		
			MANUFACTURER		

OPERATIONAL DESCRIPTION: COORDINATE SYSTEM OPERATION AND COMPONENT LOCATIONS WITH THE OWNER, THE ARCHITECT, AND ALL RELATED TRADES.

DOOR CONTACTS MONITOR WHETHER THE DOORS ARE OPENED, CLOSED OR HELD OPEN TOO LONG.

Hardware G	Group No. 41				
For use on	Door #(s):				
A111B	A123B	A123C	A123E	B115B	C123B
C128B					
Each to hav	re:				
QTY	DESCRIPTION	CA	CATALOG NUMBER		
		HA	RDWARE BY DO	OR	
		MA	NUFACTURER		
		END	OF SECTION		