TCAPS INNOVATION & MANUFACTURING CENTERS

Technology Package Request for Proposals



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SECTION 00 11 16 INVITATION TO BID

PART 1 - GENERAL

1.01 WORK INCLUDED: DISTRICT TECHNOLOGY RENOVATIONS

- A. Traverse City Area Public Schools (Owner) is seeking bids for new internal fiber cabling, multimedia and security equipment and installation for the IMC currently in construction at West Senior High School and Central High School. Proposed systems shall be configured and installed to service Owner's needs across multiple instructional facilities, and as described herein.
- B. Project: DISTRICT TECHNOLOGY RENOVATIONS
- C. Owner: Traverse City Area Public Schools 2075 Cass Road Traverse City, Michigan 49684 Evan Obranovic - obranoviev@tcaps.net
- D. Designer: Communications by Design, Inc. 4101 Sparks Dr. SE Grand Rapids, Michigan 49546 Doug Ransom – dransom@cbdconsulting.com
- E. Sites of Work:
 - Traverse City Central High School 1150 Milliken Drive Traverse City, Michigan 49686
 - Traverse City West High School 5376 N. Long Lake Road Traverse City, Michigan 49685

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 and must be coordinated with ongoing construction schedule(s).
- B. The Owner has determined that this job does **not** require the administration of prevailing wage.
- C. Installation and configuration of provided equipment shall be coordinated with construction efforts. Contractor shall be responsible for attending

Construction Manager project update meetings as necessary to complete the work. Contractor shall coordinate and collaborate with other trade Contractors to complete work as described herein.

- D. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner as required to meet schedules.
- E. Schedule:
 - 1. Request for Bid Distributed: March 25, 2024
 - 2. Pre-Bid Meeting: April 3, 2024 at 2:00pm
 - 3. Intent to Bids Due: April 4, 2024 by 5:00pm
 - 4. Question and Clarification Deadline: April 5, 2024 by 5:00pm
 - 5. Public Bids Due: April 17, 2024 at 2:00pm

1.03 TYPES OF BIDS

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

1.04 PRE-BID CONFERENCE

- A. A pre-bid conference will be held. A discussion of the project and review of bid documents will be followed by a site review and an opportunity to ask questions. Attendance is <u>highly encouraged</u> for all contractors interested in bidding on any components or portions of this project. Attendance at the pre-bid conference will be a factor considered during evaluation of bids.
 - 1. Date: April 3, 2024 at 2:00pm
 - 2. Location: Traverse City Area Public Schools Sabin Data Center 2075 Cass Road Traverse City, Michigan 49684
 - 3. Virtual: Video call link: <u>https://meet.google.com/ivx-drns-ytd</u> Or dial: (US) +1 570-818-2109 PIN: 539 977 096#
- B. Any drawings identified in the table of contents herein are included in this bid document will be reviewed at this conference.

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 or electronic document and addressed as specified herein.
 - 1. Date: April 17, 2024 at 2:00pm
 - Location: Traverse City Area Public Schools Sabin Data Center
 2075 Cass Road Traverse City, Michigan 49684
- B. Bids may be submitted electronically to <u>bids@tcaps.net</u>.
- C. 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 SE Grand Rapids, MI 49546
 - 2. Email rszilagy@cbdconsulting.com
 - 3. Any printing costs shall be at bidders expense.

1.07 BID SECURITY

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

1.08 PERFORMANCE BOND COVERAGE

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

bonds shall be issued by surety licensed by the State of Michigan and acceptable to the Owner.

1.09 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 Traverse City Area 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 00300 BID FORMS

Intent to Bid Form

Complete and submit the following form if you have interest or intend to submit a Bid for this project. Unaltered and completed forms must be received on or before 5:00 PM on April 4, 2024. Only bidders returning a completed "Intent to Bid Form" will be directly notified of required addenda.

<u>Company Information</u> 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 27 13 23 Fiber Optic Cable Network
- □ Section 27 21 00 Low Voltage Cabling
- □ Section 27 41 16 Multimedia Systems
- □ Section 28 13 00 Building Access System
- □ Section 28 20 00 Video Monitoring System

<u>Submit unaltered and completed form to:</u> 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:	Traverse City Area Public Schools Attention: Evan Obranovic 2075 Cass Road Traverse City, Michigan 49685
BID FROM:	
PROJECT:	DISTRICT TECHNOLOGY RENOVATIONS TECHNOLOGY BID #3033
INCLUDING ADDENDA:	Addendum No. Dated Addendum No. Dated
DUE:	April 17, 2024 at 2:00pm

BID FORM

BID TO:	Traverse City Area Pub Attention: Evan Obrano 412 Webster Street Traverse City, Michigar	ic Schools vic 149686	
BID FROM:			
PROJECT:	DISTRICT TECHNOL TECHNOLOGY BID #	OGY RENOVATIONS 3033	
The undersigned, ha work, and having ex referenced, includin labor, material, equi of the following cat	aving familiarized themselves we camined the site and all applica g, but not limited to, all addence pment, applicable taxes and se egories of this project for the so	with all local conditions affecting the ble Bidding Documents herein, and la issued thereto, hereby propose to f rvices required for proper completion um of:	cost of herein furnish all n of each
Bid Category	Title		
		Dollars (\$).
Said amount written above	constituting the Base Bid		
Bid Category	Title		
		Dollars (\$).
Said amount written above	constituting the Base Bid	2 child (¢):
Bid Category	Title		
		Dollars (\$)
Said amount written above	constituting the Base Bid).
Bid Category	Title		
<i>c</i> , <u> </u>			
C 1 4 1		Dollars (\$).
Bid Category	Titla		
		Dollars (\$).

Said amount written above constituting the Base Bid

TAXES: Bid sum includes all applicable taxes.

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

COST OF BONDS:

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

ACKNOWLEDGEMENT OF ADDENDA:

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

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

ALTERNATES:

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

Voluntary Alternate A	
Voluntary Alternate B	
Voluntary Alternate C	

PRINCIPAL SUBCONTRACTORS

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

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 and/or dismissal of consideration of bid submitted.

AGREEMENT:

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

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

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

(If Corporation, affix Seal

<u>Michigan Familial Relationship Disclosure Statement</u>

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

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

(Check only one Box Below)

It is hereby acknowledged and certified by Bidder that <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:

Roard or Superintendent

Riddar

Dittiter	Doura of Superimenaem
Bidder Authorized Representative:	
Bidder:	
Representative's Signature:	
Print or Type Name:	
Representative's Title:	
Subscribed and sworn this day of	, 2024.
In the County of State of	f
By	Seal or Stamp:
Notary Public Signature	
My commission expires on:	

<u>AFFIDAVIT OF COMPLIANCE – IRAN ECONOMIC SANCTIONS ACT</u> <u>Michigan Public Act No. 517 of 2012</u>

The undersigned, the owner or authorized officer of the below named contractor (the "Contractor"), pursuant to the compliance certification requirement provided in the <u>TRAVERSE CITY AREA</u> <u>PUBLIC SCHOOLS</u> (the "School District") Request For Proposals for District Technology Renovations_ (the "RFP"), hereby certifies, represents and warrants that the Contractor (including its officers, directors and employees) is not an "Iran linked business" within the meaning of the Iran Economic Sanctions Act, Michigan Public Act No. 517 of 2012 (the "Act"), and that in the event Contractor is awarded a contract as a result of the aforementioned RFP, the Contractor will not become an "Iran linked business" at any time during the course of performing the Work or any services under the contract.

The Contractor 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 School District's investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on a request for proposal for three (3) years from the date the it is determined that the person has submitted the false certification.

CONTRACTOR:

BIDDER'S FIRM NAME		
BY (SIGNATURE)		
PRINTED NAME AND TITLE		
OT A TE OF MICHICAN	λ.	
STATE OF MICHIGAN)	
COUNTY OF)	
Subscribe and sworn before me	on this	Seal:
day of	_, 20, a Notary Public	
in and for	County,	
Notary Public		
My Commission expires		

REFERENCES

Customer name:		
Address:		
City/State/Zin [·]		
Contact name:		
Contact title:	 	
Phone [.]	 	
E mail:	 	
Conno of project:		
Scope of project.	 	
Date of completion:		
Customer name:		
Address:	 	
City/State/Zin		
Contact name:		
Contact title:	 	
Phone [.]		
F-mail:	 	
Scope of project:	 	
Date of completion [.]	 	
Customer name:		
Address:	 	
City/State/7in [.]	 	
Contact name:	 	
Contact title:	 	
Dhone [.]		
F-mail	 	
Scope of project	 	
Date of completion		

CONTRACT EXCEPTIONS

	Check one Box	
Bidder takes no exception to, and agrees to comply with all sections, terms, conditions and/or requirements of the Contract Documents.		
Bidder proposes the following exceptions to the Contract Documents:		
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 <u>this</u> form with slight variation. All information in this form is required. Form submitted must materially match below both in content and format. Electronic version of this form is required with bid package as <u>Microsoft Excel</u> compatible spreadsheet on USB Drive for each project section being bid. Failure to provide appropriate and complete SCHEDULE OF VALUES, as determined by the Owner and/or Designer, may result in disqualification of Bid.)

Bidder:

Bid Division: 27 13 23

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

Bidder:

Bid Division: 27 21 00

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

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

Bidder:

Bid Division: 27 41 16

				Unit	Unit Labor	Total
ID	Oty	Part Number	Mfg and Description	Onii Cost	Cost	I UIUI Proposed Cost
ID	Qıy	1 uni 1 uniber		Cost	COSI	Troposeu Cosi
			PROJECT MANAGEMENT			
			IKAINING DONDS AND DISUBANCE			
			BUNDS AND INSUKANCE			
			GRAND TOTAL (Must match base bid)			

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

Bidder:

Bid Division:28 13 00

				T Tax * 4	Unit	Takal
ID	04	David Marcal an	MC	Unit	Labor	Total Deserved Cost
ID	Qty	Part Number	MJg and Description	Cost	Cost	Proposed Cost
			PROJECT MANAGEMENT			
			TRAINING			
			BONDS AND INSURANCE			
			GRAND TOTAL (Must match base bid)			

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

Bidder:

Bid Division: 28 20 00

				T T •4	Unit	
ID	04	David Marcal an	MC	Unit	Labor	Total Durana Cont
ID	Qty	Part Number	MJg and Description	Cost	Cost	Proposea Cost
	-					
			PROJECT MANAGEMENT			
			TRAINING			
			BONDS AND INSURANCE			
			GRAND TOTAL (Must match base bid)			

END OF SECTION

SECTION 00 21 13 INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 OWNERSHIP

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

1.02 COMPLIANCE

- A. This document establishes the primary system(s) design configuration. The Bidder's bid response shall include all services, supplies, components and equipment required to provide a complete turnkey system(s) which meets or exceeds all specifications for each given bid item being proposed.
- B. Owner prefers to enter into a contract with a single bidder for all materials for completion of this project, but shall consider combinations of portions of bids from various bidders. If portions of separate bids are deemed compatible and compliant with the intent of the project, and a combination of partial bids is deemed to be in the Owner's best interest, and the Owner reasonably expects willing and compliant bidders will cooperate with others for the benefit of the Owner during implementation of the system, the Owner reserves the right to award portions of the project to multiple bidders which will cooperate 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 WORK RESTRICTIONS

- A. Noise, Vibration, and Odors: Coordinate activities that may result in high levels of noise and vibration, odors, or other disruptions to owner occupancy with Owner.
- B. Non-Smoking, non-Vaping Campus: Smoking, tobacco use of any kind or vaping is prohibited in the buildings and on the grounds of any TCAPS facility.
- C. <u>Employee Identification</u>: TCAPS requires all Contractor personnel to wear identification badges at all times.

1. Badges are issued by the Human Resources Department in the Administration Building at 412 Webster Street, Traverse City, MI 29686, 231-933-1710.

2. **TCAPS Fingerprint Background Check Process** must be completed before badges are issued. Forms shall be provided to awarded Contractor.

3. Provide the Owner's PM with a list of personnel to be badged.

4. Personnel will be fingerprinted and are subject to FBI and State of Michigan background checks.

5. An approximate fee of \$65:00 is charged for each background check per badge issued. Contractor shall include any costs for badging in base bid.

6. Identification tags are numbered. Distribution of ID tags will include the recording of the tag number and the Contractor it is issued to.

7. Lost identification tags will be replaced at a cost of \$6.00 and billed to the Contractor the tag is assigned to.

- D. Parking: Contractor vehicles must be parked in legal parking areas or will be subject o towing, unless specific consent has been given by the Owner for the purposes of loading or unloading tools, equipment, materials, etc. Parking of vehicles on sidewalks, landscape or other areas is prohibited.
- E. Trash disposal: Contractor is responsible for the removal of all trash, debris, excess material, etc. The use of TCAPS dumpsters is not permitted. Failure to abide by this may render Contractor subject to back charges.
- F. Use of TCAPS owned equipment, lifts, ladders, tools, custodial equipment or supplies, etc. is specifically prohibited. Contractor shall supply all necessary tools, equipment and materials necessary to complete the work.

1.05 ACCESS TO SITE

- A. Use of Site: Limit use of Project site to areas within the Contract limits. Do not disturb portions of the site beyond areas in which the Work is indicated. Contractor to protect all adjacent building materials, surfaces, Owner furnishings, etc. and is responsible for any repair/restoration/replacement required as a result of any damage caused by the Contractor's operations.
- B. Area of Work: Contractor must keep the area of work clean throughout the duration of the work.
- C. Security: Contractor is responsible for barricades, signage, etc. necessary to secure the area of work during construction.
- D. Driveways, Walkways, Entrances, Doors: Keep all means of access and egress servicing premises clear and available to Owner, Owner's staff, student, and emergency vehicles at all times. Do not use these areas for

parking or storage of materials. Do not restrict, close or obstruct access to premises unless given specific written permission from the Owner's PM.

- E. Deliveries: Schedule deliveries to minimize use of driveways and entrances by construction operations and to minimize space and time requirements for storage of materials and equipment on-site.
- F. Storage: Staging of Contractor equipment, materials, tools or other project related items in data closets, janitorial closets, penthouses, tunnels or areas other than those specifically directed by the Owner is prohibited. Contractor shall safeguard their materials, tools and equipment. TCAPS is not responsible for vandalism and/or theft of the same.

1.06 ADDITIONAL TERMS AND CONDITIONS

- A. The Contractor, and the agents and employees of the Contractor, in the performance of this agreement, shall act in an independent capacity and not as officers, employees, or agents of TCAPS.
- B. Upon request, Contractor will provide TCAPS with Material Safety Data Sheets [MSDS] for all chemicals, glues, cleaning solvents, etc. used in the building prior to, during or following the work to be performed. Such sheets shall be submitted to the following address:
 - Traverse City Area Public Schools Sabin Data Center
 2075 Cass Road Traverse City, Michigan 49685
- C. Contractors who must access a confined space or permit-required confined space to fulfill the service they provide to TCAPS must submit a current confined space training program, and/or a permit [for permit-required confined space entry] to the Owner's PM.
- D. Access to confined spaces and permit-required confined spaces will only be given after a notice to enter has been given to the Owner's Project Manager, and only then after [s]he has confirmed receipt of the contractor's current confined space training program and/or permit.
- E. Owner will not pay for any information requested herein, nor is it liable for any costs incurred by the Contractor in responding to this request. Submitted proposals will not be returned and may be subject to the Freedom of Information Act.
- F. The Contractor agrees to indemnify, defend and hold harmless TCAPS, its officers, agents and employees from any and all claims and losses accruing or resulting to any and all Contractors, subcontractors, material persons, laborers and any other person, firm or corporation furnishing or supplying work,

services, materials or supplies in connection with the performance of this contract; from any and all claims and losses accruing or resulting to any person, firm or corporation who may be injured or damaged by the Contractor in the performance of this agreement; or from any misrepresentation or breach of warranty by the Contractor.

- G. The contractor shall be responsible for maintaining satisfactory standards of employees' competency, conduct, courtesy, language, appearance, honesty, and integrity, and shall be responsible for taking such disciplinary action with respect to any employee, as may be necessary. TCAPS may request the contractor to immediately remove from this assignment any employee found unfit to perform duties due to one or more of the following reasons:
 - 1. Neglect of duty

2. Disorderly conduct, use of abusive or offensive language, quarreling, intimidation by words or actions or fighting

3. Theft, vandalism, immoral conduct or any other criminal action.

4. Selling, consuming, possessing, or being under the influence of intoxicants, including alcohol, or illegal substances while on assignment for TCAPS

- H. The Contractor shall be responsible to TCAPS for the acts and omissions of all his/her employees and all Subcontractors, their agents and employees, and all other persons performing any of the work under a contract with the Contractor.
- I. TCAPS shall have the right to terminate the award with the Contractor without penalty pursuant to thirty (30) days written notice of termination to the Contractor under the following circumstances:

1. Default of Contractor – It shall be considered a default whenever the Contractor shall:

- a) Disregard or violate the material provisions of the contract documents, violate applicable law, regulation or guidance of any governmental authority; present an unreasonable risk of personal injury or property damage; or failure to execute the work according to the agreed schedule of completion and/or time of completion specified, including extensions thereof or fail to reach agreed upon performance results.
- b) Declare bankruptcy, become insolvent, or assign company assets for the benefit of credits.

2. Lack of funds of TCAPS – Lack of funds shall be construed to mean when TCAPS, in the judgement of its Chief Financial Officer, determines that it

cannot continue the funding of its contract services without undue hardship on TCAPS.

3. Termination of contract services will be rendered if it is construed by TCAPS to be in its best interests for serving the community and its students, faculty, and staff.

J. Any different or additional terms and conditions contained in the Contractor's acknowledgement forms or documents furnished by the Contractor are rejected by the Owner and are not part of the agreement between the parties unless otherwise agreed to.

1.07 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.

1.08 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 is 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 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.

3.04 MODIFICATION AND WITHDRAWL

A. Bids may be withdrawn and/or changed any time prior to the bid opening. Bids may not be withdrawn or changed after the bid opening, and shall be deemed a firm offer continuing for ninety (90) calendar days. Bids received after the time and date for the public opening will be returned unopened at the Owner's discretion.

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

3.05 CODES, ORDINANCES, REGULATIONS AND RELATED

- A. All labor and materials shall be furnished and installed in strict accordance with the latest applicable codes, ordinances and regulations of any governing body having jurisdiction over this project.
- B. In the event the quality of labor and materials required by the Drawings and Specifications herein exceeds requirements of current applicable codes, ordinances and regulations, the Drawings and Specifications shall take precedence.
- C. In the event the quality of labor and materials required by current applicable codes, ordinances and regulations having jurisdiction over this project exceeds that of the Drawings and Specifications herein, the applicable codes, ordinances and regulations shall take precedence.
- D. The Contractor shall give all notices and comply with all codes, laws, ordinances, rules and regulations of any authority having jurisdiction, which bears on the performance of its work. This compliance includes, but is not limited to, the Michigan School Safety Initiative (PA129, PA130, PA131 and PA138) if applicable to work being performed.
- E. The Contractor shall pay for all licenses, permits, taxes, and fees required for this project; and shall comply with all federal, state, local and Owner's codes, laws, ordinances, regulations and other requirements applicable to the work specified at no additional cost to the Owner. Contractor shall submit copies of all approved certificates and approvals to the Owner upon receipt.

3.06 SUB-CONTRACTOR AND MATERIAL SUPPLIER

- A. The successful Bidder shall submit to the Owner and Designer a complete list of all sub-contractors and all material suppliers proposed to engage on the work. Sub-contracts shall not be awarded until after they have been approved by the Designer and Owner.
- B. Finalist bidders may be required to submit additional details related to subcontractors and suppliers within forty-eight (48) hours after the bid opening.
- C. Names of any principal sub-contractors must be listed on the Bid Form.

D. All contracts made by the successful Bidder with Subcontractors shall be covered by the terms and conditions herein. The successful Bidder shall see to it that Subcontractors are fully informed in regard to these terms and conditions, and shall bind all subcontractors to the same terms and conditions. Failure to do so will absolve the Owner from any liability for additional cost due to subcontractor claims for additional cost, time or any claim(s) for additional cost by subcontractor(s).

3.07 BID RESPONSE FORMAT

- A. Bidder shall provide complete Bid copies in two formats as described herein.
 - 1. One (1) Hard copy format responses shall be in a bound tabulated format. Each response shall have tab indicators for each section.
 - 2. One (1) Electronic copy format responses shall be submitted on a USB Drive, readable by a standard Microsoft Windows 10 workstation. Electronic media shall contain separate folders to organize response documentation as described herein. Files submitted on USB Drive 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 spreadsheet and as described herein).
- B. All Bid Response formats shall be clearly externally marked to include, but not be limited to:
 - 1. Bidder identification.
 - 2. Project Owner identification.
 - 3. Project name.
 - 4. Bid submission date.
- C. Bid Responses shall include an index containing copies/PDF of a complete index of documents comprising Bid Response. Responses shall include, but not be limited to the following tabbed/folder sections:
 - 1. Section 1 Forms, which shall contain copies/PDF files of all required and completed bid forms.
 - a. BID FORM
 - b. Michigan Familial Relationship Disclosure Statement
 - c. Iranian Economic Sanctions Form
 - d. **REFERENCES**

e. CONTRACT EXCEPTIONS

f. SCHEDULE(s) OF VALUES

- g. BID BOND
- 2. Section 2 Overview, which shall contain copies/PDF files of cover letter and/or executive overview.
- 3. Section 3 Submittals, which shall contain copies/PDF files of all required and voluntary submittals.
- 4. Section 4 Appendices, which shall contain copies/PDF files of other reference materials Bidder wishes to, or is required to submit.

3.08 AWARD OF CONTRACT

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

3.09 TIME, SCHEDULES, PROJECT MANAGEMENT, MEETINGS AND PLANS

- A. Time is of the essence on this project. Award of contracts for this project will be contingent on the bidder's agreement to complete the work on or before the contract completion date stated herein.
- B. All Contractors will commence work in such a manner and at such a time as to expeditiously interface with the work of other Contractors, and will pursue

the project diligently to completion. All Contractors will work in a cooperative manner with Owner and other Contractors.

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

3.10 CHANGES IN THE WORK

- A. No changes in work with the effect of either increasing or decreasing in the project value shall be made without specific and prior authorization by the Owner and Designer.
- B. Owner, without invalidating the contract and without notice to any surety, may at any time order extra work or make changes by altering, adding to or

deducting from the work, the Contract Sum being adjusted accordingly. All such work shall be authorized by a written Change Order approved by Owner and Contract Designer. Upon receipt of such an order Contractor shall promptly proceed with the work involved. All such work shall be executed under the conditions of the original Contract. Owner authorized change order(s) may be issued at any time prior to Contract close out.

- C. When so directed, Contractor shall promptly submit an itemized estimate and a unit price for performing or deleting such extra or changed work as my 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

INSTRUCTIONS TO BIDDERS 00 21 13 - 37

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 include, but is not limited to all other Sections herein and all related Contract Documents.
- C. Activities relative to Contract close-out are described in, but not limited to, this and other Sections of this document.

1.02 SUBSTANTIAL COMPLETION

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

PART 2 - MATERIALS

- 2.01 NOT USED FOR THIS SECTION
- PART 3 EXECUTION

3.01 PROCEDURES

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

- 1. Designer promptly will so notify Contractor, in writing giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.
- 2. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-inspection.
- 3. Designer will re-inspect the Work.
- 4. Excessive re-inspections of Work may result in fees being assessed Contractor.
- D. Should Designer concur the Work is substantially complete:
 - 1. Designer will prepare a letter of Substantial Completion.
 - 2. Designer will submit the letter to Owner and Contractor.
 - 3. Contract shall be deemed "Closed Out" for retainage purposes.
 - 4. Final Acceptance of the system shall be deemed complete.

END OF SECTION

SECTION 27 13 23 FIBER OPTIC CABLING

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

A. Work described in this specification section pertains to internal plant fiber optic network backbone installation and fiber optic cabling maintenance of the Traverse City Area Public Schools private fiber optic network infrastructure.

1.02 WORK INCLUDED

- A. Work includes, but is not limited to, the following:
- B. A single, armored, indoor rated twelve (12) strand $50/125 \ \mu m$ "laser optimized" OM4 fiber optic cable installed between MDF and each IDF in each facility for which work is included as indicated herein.
 - 1. Traverse City Area Public Schools West Senior High School MDF New STEM IDF
 - 2. New OM4 fiber optic cables shall be terminated on Contractor supplied enclosure shelf (Optical Fiber Interconnecting Unit LIU) with LC connectors.
- C. A single, armored, indoor rated twelve (12) strand OS1 single mode (SMF) fiber optic cable installed between MDF and each IDF in each facility for which work is included as indicated herein.
 - 1. Traverse City Area Public Schools Central High School MDF New STEM IDF
 - 2. New OS1 fiber optic cables shall be terminated on Contractor supplied enclosure shelf (Optical Fiber Interconnecting Unit LIU) with LC connectors.
- D. All 12 strands are to be terminated and tested.
- E. Connectors and couplers.
- F. Adequate cable support in existing or new raceway system as may be required for efficient and effective cable routing.
- G. Rack mounted termination enclosure shelves.
- H. Storage Loops

FIBER OPTIC CABLING 27 13 23 – 40

- 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. 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 Multi Mode fiber optic cables shall meet or exceed the following specifications or performance requirements:
 - 1. Installed cable shall be multi-mode graded index glass fiber.
 - 2. Armored
 - 3. All materials in the cable are to be dielectric.

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- 4. 50-micron core diameter size
- 5. 125-micron cladding diameter
- 6. Maximum Attenuation
 - a. 850nm: <2.3 dB/km
 - b. 1300nm: 0.6 dB/km
- 7. Fully buffered
- 8. EIA/TIA 598 color coding for fiber optic cable
- 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).
- 10. Indoor plenum rated.
- F. 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. Armored
 - 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. Indoor plenum rated
 - 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. Four (4) 3-meter, OM4 MMF LC to LC multi-mode fiber patch cables shall be provided for connection to Owner provided network equipment.
 - B. Four (4) 3-meter, OS1 SMF LC to LC single-mode fiber patch cables shall be provided for connection to Owner provided network equipment.
- 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 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.
 - C. Furnish only new, first-class quality materials and equipment.
 - D. 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.
- d. All interior cable shall be aqua colored, armored fiber optic cabling. Cable shall be properly and neatly terminated with armor properly grounded and finished at all end points of the link per the manufacturer installation guidelines.
- 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 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. Ramset anchors shall NOT be allowed in any locations with precast concrete. Drilled anchors should be used only.
- k. 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.
- 1. Where cable tray or raceway is not provided Contractor shall provide and install cable supports of intervals not more than five (5) feet.
- m. 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 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. Sites of Work:
 - Traverse City Central High School 1150 Milliken Drive Traverse City, Michigan 49686
 - Traverse City West High School 5376 N. Long Lake Road Traverse City, Michigan 49685

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 850nm and 1300nm wavelengths (MMF) utilizing an Optical Time Domain Reflectometer (OTDR). Attenuation will be recorded for each fiber.
 - 2. Tests shall be conducted at both 1310nm and 1550nm wavelengths (SMF) utilizing an Optical Time Domain Reflectometer (OTDR). Attenuation will be recorded for each fiber.
 - 3. 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 re-polished, or replaced if repolishing 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, 1300 nm / 850 nm MMF and 1310nm and 1550nm SMF. 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 11 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 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. Schedule
 - 1. Post bid Interviews: Week of April 22, 2024
 - 2. Contractor Chosen: Week of April 29, 2024
 - 3. Work Commences: May 20, 2024
 - 4. Substantial Completion of Project: November 1, 2024
 - 5. Project Close-out: January 1, 2025

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- B. 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.
- C. Contractor shall attend all construction progress meetings as may be required by Construction Manager and Owner. Such meetings shall aid in coordination and scheduling for fieldwork and be held at the convenience of the Construction Manager.

END OF SECTION

SECTION 27 13 23 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. The structured cable system shall be used to provide connectivity for their STEM additions as indicated and as specified herein.
- 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. The 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.
 - 2. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.

1.04 SUBMITTALS

- A. Submittals shall consist of technical cut sheets and information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval.
- B. Equipment or material installed for this project that does not have an approved submittal associated with it, shall be removed and replaced with acceptable equipment or material as defined by the Architect/Engineer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.
 - 1. The Owner and/or Architect/Engineer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.
 - 2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due, or become due Contractor.

- C. Shop drawings and diagrams shall be submitted by Bidder for approval by Architect/Engineer with Bids.
 - 1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Architect/Engineer.
 - 2. No work constituting final installation shall be commenced until after approval of shop drawings by Architect/Engineer.

1.05 REFERENCE STANDARDS

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

1.06 CONTRACTOR

- A. The Contractor shall accept complete responsibility for the installation, certification and support of the system. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project. Contractor shall be an authorized vendor of all major components.
- B. All work shall be performed and supervised by Project Managers, Engineers and/or Technicians who are qualified to install system and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods.
- C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed. Certification of such training shall promptly be provided if requested by Architect/Engineer.
- D. The Contractor shall have a proven track record in structured cable configuration and installation. This must be shown by the inclusion of references of at least three (3)

projects involving the installation of similar systems completed by the Contractor in the prior two (2) years on unaltered forms with the sealed Bid as provided herein.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

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

2.02 COPPER CABLE

- A. Station Cable shall meet or exceed:
 - 1. Four (4) pair Category 6a Unshielded Twisted Pair (UTP) cable.
 - 2. Rated and certified for installation in plenum air return spaces as may be required.
 - 3. Twenty-three (23) AWG
 - 4. Compliant as per EIA/TIA-568 specifications
 - 5. Certified under UL's LAN Cable Certification Program
 - 6. Plenum rated
- B. All cables shall be terminated for T568B compliant connection.
- C. Coordinate cable color(s) with Owner requirements prior to installation.

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2.03 CROSS CONNECT EQUIPMENT

- A. Cross Connect Equipment shall meet or exceed:
 - 1. Patch Panel for UTP Category 6a Cable Termination.
 - a. Rack mounted Category 6a compliant printed circuit board technology, patch panel with T568B compliant terminations on front of panel and 110 type terminations on rear of panel.
 - b. Rack mounted patch panels shall be no larger than Forty-eight (48) ports each.
 - 2. Furnish and install smear resistant, mechanically imprinted polyester or similar material labels to identify each port of all patch panels in compliance with EIA/TIA 606 standards or Owner required scheme. Labels shall be permanently affixed to patch panels.
 - 3. Coordinate cable color(s) with Owner requirements prior to installation.
 - 4. Patch panels shall be flat.
 - 5. Patch panels shall be mounted patch panel/switch/patch panel fashion.
 - 6. Contractor shall use Velcro for cable supports only, no wire ties.

2.04 WIRING DEVICES

- A. All station cable shall terminate on modular jacks that meet or exceed:
 - 1. Category 6a compliant
 - 2. 8 position T568B compliant modular female jack.
 - 3. Snap-in, high impact housing
 - 4. Field verify, and coordinate insert color to match Owner requirements.
 - 5. Field verify and coordinate plates and/or outlet frame colors and materials to coordinate with electrical devices and Owner requirements.
 - 6. Where station cable is to terminate above finished ceiling or behind a finished wall for cameras, speakers, or other special station devices, modular jack may be surface mounted in appropriate high strength, impact resistant plastic enclosure.
 - 7. Furnish and install matching coordinating blank cover plates for all unused communications outlets indicated on drawings.

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- 8. Mount flush plates so all four edges are in continuous contact with finished surfaces.
- 9. Furnish and install smear resistant, mechanically imprinted polyester or similar material labels to identify each 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.

2.05 OWNER STANDARDS

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

2.06 PROJECT CABLE CONFIGURATIONS

- A. Data Outlet
 - 1. Contractor shall supply data locations in quantities and locations identified on provided Appendix A Building Diagrams.
 - a. Cabling quantity and locations is identified with the Xd identifier, the "X" showing the quantity of data activations.
 - 2. Contractor shall provide data outlets including, but not limited to:
 - a. UTP station cable(s) terminated on compliant patch panel in nearest IDF and wire devices in a single box location.
 - b. In locations that terminate on wall locations, Contractor shall supply stainless steel faceplate compliant with Owner standards. Wire device(s) shall be installed in standard keystone insert with six (6) positions. All unused positions shall be blanked. Cabling locations in wall or floor box locations are identified in blue.
 - c. In locations that terminate above ceilings, Contractor shall supply surface mount device box. Box shall be bright in color and/or contain a permanently

attached brightly colored reflective identification label to facilitate visual location of connection point behind finished surfaces. Cabling in above ceiling locations are identified in red.

d. Faceplate compliant with Owner standards shall be provided.

2.07 EQUIPMENT RACKS

- A. Acceptable Manufacturer(s)
 - 1. APC
 - 2. Middle Atlantic
 - 3. Tripp Lite
 - 4. Or Equal.

B. 2 POST FLOOR STANDING RACK(S)

- 1. One (1) Rack Enclosure(s) shall be provided in the following locations and as indicated on drawings:
 - a. Central High School STEM IDF
 - b. West Senior High School STEM IDF
- 2. Rack enclosures shall meet or exceed the following requirements:
 - a. Middle Atlantic RL10-45 or equal
 - b. Rack shall be constructed of heavy-gauge steel for maximum strength and durability.
 - c. 45 RU
 - d. 2 post
 - e. Rack shall be securely attached to floor.
 - f. Threaded 10-32, with numbered spaces.
 - g. Top trough with waterfall to create pathway above rack.
 - h. Cable ladder to extend from wall to support cabling from wall to provided rack.
 - i. Grounding kit.

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- 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.

2.08 ANALOG PAGING SPEAKER INSTALLATION AND CABLING

- A. Contractor shall supply surface mount, pendant or recessed 25v paging speakers, cabling and installation in locations identified on diagrams in both West Senior and Central High School STEM addition locations and adjacent areas as indicated on provided drawings and as specified herein.
- B. Contractor shall supply 8" recessed, surface or pendant mount speakers as indicated on provided drawings.
 - 1. Recessed Valcom V-1020C or equal.
 - 2. Pendant Valcom V-1015B or equal.
 - 3. Surface Mount Valcom V-9880 or equal.
- C. All baffles shall be flush against the ceiling and enclosures shall be fully supported. All recessed speakers shall include a back box.
- D. Speakers shall be white in color, including grill.
- E. Each speaker shall be connected to central equipment with approved and appropriate media using established and approved pathways to provide for system wise broadcast and/or zone-specific broadcast.
- F. Each speaker shall be volume adjustable at installation to accommodate specific acoustical properties of the intended coverage area.
- G. Contractor shall supply all plenum rated cable to connect speakers to existing speaker zones.
- H. In hallway locations, Contractor shall integrate existing speakers into existing hallway speaker zone.
- I. Contractor shall supply all necessary amplification and accessories for the discreet paging of each STEM addition respectively.

- 1. All amplifier devices shall be installed in STEM IDF. Contractor shall supply all necessary mounting brackets and accessories to neatly mount devices in provided rack.
- J. All building-based equipment shall be mounted in STEM IDF rooms. Contractor shall extend existing cable connections from existing PA/Intercom location as needed for discreet zones for amplification.

2.09 DIGITAL CLOCKS

- A. Digital Clock Devices shall be provided and installed as indicated on provided drawings and as specified herein.
- B. Acceptable Manufacturer(s)
 - 1. National Time 24 volt/Wireless Sync
- C. Digital clock devices screen shall be red.
- D. 12-hour clock no seconds
- E. Digital clock shall be 4" in height
- F. White case
- G. Contractor shall supply all necessary repeater devices to ensure clock devices are properly synchronized with the remainder of the building clock system.
- H. Contractor shall include necessary 24-volt transformers, all transformer devices shall be installed in STEM IDF locations for connection to IDF rack PDU device.

2.10 ALLOWANCES

- A. Contractor shall include allowances for contract service reimbursements as required below in base bid lump sum amount(s).
 - 1. Allowance shall be made in the amount of \$10,000.00 for contract services for Owner directed infrastructure upgrades.
 - 2. 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.
 - 3. Any allowance amount proving to be excessive for the intended equipment and/or contract services
- 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.).
- 10. IDF(s) and MDF locations have been identified in the drawings. 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 6a compliant connectors. Approximately 10 ft. of Category 6a and/or fiber cabling shall be coiled and stored at each cable distribution center in order to accommodate future change.
- 12. Wiring not installed in conduit shall not be routed within 18 inches of light fixture ballasts or within 36 inches of motors or transformers.
- 13. Coordinate cable colors with Owner requirements prior to installation.
- 14. Contractor shall include any sleeves where wall penetrations are needed. Sleeves shall me a minimum of 2" diameter and sized for cable being installed with a maximum fill rate of 25%. All installed sleeves shall be fully fire stopped with compliant fire stop material following cable installation.
- 15. Assemble, install, configure and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
- 16. All work shall be completed in strict compliance with applicable codes, manufacturer's recommendations, and industry best practices and standards.
- 17. Work shall be performed to meet local codes and industry standards, including, but not limited to:
 - a. Grounding and Bonding.
- E. Sites of Work:
 - Traverse City Central High School 1150 Milliken Drive Traverse City, Michigan 49686

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- Traverse City West High School 5376 N. Long Lake Road Traverse City, Michigan 49685
- F. 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.
- G. The building and work area shall be returned to its original condition prior to final sign off of the project.
- 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.

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 6a cables shall be conducted at standard frequencies to meet or exceed referenced 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. Schedule
 - 1. Post bid Interviews: Week of April 22, 2024
 - 2. Contractor Chosen: Week of April 29, 2024
 - 3. Work Commences: May 20, 2024
 - 4. Substantial Completion of Project: November 1, 2024
 - 5. Project Close-out: January 1, 2025
 - B. 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.
 - C. Contractor shall attend all construction progress meetings as may be required by Construction Manager and Owner. Such meetings shall aid in coordination and scheduling for fieldwork and be held at the convenience of the Construction Manager.

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 Traverse City Area Public Schools.
- B. Contractors shall propose Systems and/or components to be deployed using standard procedures and technology components and as specified herein. The system components shall be installed and connected to the owner's existing physical infrastructure and as specified herein.
- C. Contractor shall advise, coordinate and work cooperatively with Owner representatives or owner's designee related to any configuration changes required and/or proposed for Owner's existing physical infrastructure.
- D. Contractor shall work collaboratively with Owner and Designer. Work shall include but not be limited to installation of supplied equipment, removal of existing equipment and full operational capacity of system as specified herein.
- E. The Contractor shall design, engineer, configure, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant system and/or component connection to the system complete and with full functionality as specified herein.
- F. Contractor shall provide all transportation and delivery services in a timely manner to individual work location(s) at each site of work in preparation for installation activity.
- G. Contractor shall coordinate their installation with other contractors, Designer and the Owner as is appropriate.

1.02 WARRANTY

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

- 2. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.
- 3. Standard manufacturer warranty duration and terms shall be identified for each component with bid as well as additional fee required for warranty duration election of each of the following terms:
 - a. Three (3) year parts and labor warranty.
- C. On site services provided under the warranty shall be performed by personnel or representatives of manufacturer of individual components and/or appropriately trained and certified Contractor representatives as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.
- D. Contractor shall provide the following response times for all malfunctioning equipment:
 - 1. Twenty-four (24) hours or less for matters that render twenty percent (20%) or more of the system unable to maintain normal functionality.
 - 2. Two (2) business days for matters not meeting the above criteria.
 - 3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.
- E. Bidder shall provide current annual maintenance contract pricing, terms and conditions for recommended maintenance programs for all equipment following the specified and included warranty periods as a Voluntary Alternate. This information will be considered by Owner and Designer as part of the bid evaluation process.
- F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have <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 All wiring not installed in conduit shall be plenum type cable and shall be so identified with continuous marking.
- 2.05 All connectors and accessories not installed in conduit and installed above finished ceiling shall be plenum rated.
- 2.06 SPECIAL CONDITION LOCATIONS
 - A. Configuration A -
 - 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. West Senior High School STEM Meeting Room C122
 - b. Central High School STEM Meeting Room F151
 - 2. One (1) Interactive Short Throw Projector shall be provided and installed.
 - a. Acceptable Manufacturer(s)
 - 1. EPSON
 - A 760Wi
 - b. Projectors shall meet or exceed the following minimum output, port availability and other standards:
 - 1. 4100 ANSI Lumens
 - 2. WXGA resolution
 - A 1280 x 800
 - 3. +/- 3-degree keystone correction.
 - 4. 1.2x optical zoom lens.
 - 5. Operating volume level of less than 40dB (fan).

- 6. Operating temperature range of 45 95 degrees Fahrenheit.
- 7. 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.
- 8. Mechanical keypad lock out to minimize tampering with device settings
- 9. Ethernet connector for management, monitoring and control applications.
- 10. User definable power on graphic to replace factory default or manufacturer logo.
- c. 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.
- d. All other features currently a part of the manufacturer's latest commercial release.
- e. Contractor shall include all necessary USB extension devices and necessary cable and accessories to extend interactivity to Owner provided device at conference table.
- 3. One (1) HDMI Transmission Device(s)
 - a. Acceptable Manufacturer(s)
 - 1. CRESTRON
 - 2. KRAMER
 - A TP-580T/TP-580R
 - b. HDMI Transmission Device shall meet or exceed the following minimum requirements:
 - 1. HDBaseT 1.0
 - 2. 4K60 4:2:0 Up to 130'
 - 3. HDCP 2.2

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- c. Contractor shall install HDMI transmitter at conference table provided by Others and integrate into table pocket. HDMI pass through connector in table pocket provided by Others.
- d. Contractor shall securely and neatly mount HDMI transmission equipment at table and monitor locations.
- e. Contractor shall supply and install category 6 shielded cable for HDMI transmission.
- f. Contractor to supply 8' ultra-slim HDMI cable for device connection.
- B. Configuration B Integrated AV System
 - 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. West Senior High School STEM
 - 1. Integrated System (All Listed Rooms Combined)
 - A Clean Lab/3D Printer Room C124
 - B CAD Lab C127
 - C Innovation and Manufacturing Lab C129
 - D Raw Material Manufacturing Lab C128
 - b. Central High School STEM
 - 1. Integrated System (All Listed Rooms Combined)
 - A Clean Lab/3D Printer Room F146
 - B CAD Lab F156
 - C Innovation and Manufacturing Lab F157
 - D Raw Material Manufacturing Lab F147
 - 2. One (1) Projector Innovation and Manufacturing
 - a. Acceptable Manufacturer(s)
 - 1. EPSON
 - A EB-PU2010B

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- b. 10,000 Lumens
- c. Black Color
- d. Downpipe and mount will be black
- e. Projector shall be provided with appropriate lens for an approximate 25' throw to fill a 13.5' wide front projection system with a 16:9 ratio projected image.
- 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 securely and safely extend projector to optimal location for projection onto screen.
- g. Projector shall be connected to supplied Q-SYS control system to receive transmission of signal from supplied input locations.
- 3. One (1) Powered Rollup Projection Screen Innovation and Manufacturing
 - a. Acceptable Manufacturer(s)
 - 1. DA-LITE
 - A Tensioned Cosmopolitan Electrol
 - 2. DRAPER
 - b. Powered Rollup Projection Screen shall meet or exceed the following minimum requirements:
 - c. 92" x 164" Wide (16:9) Format
 - d. Black powder coated finish
 - e. Surface mount
 - f. HD Progressive 1.1
 - g. 4' Black Drop
 - h. Low voltage control RS-232 capable
- 4. One (1) Interactive Short Throw Projector shall be provided and installed. CAD Lab
 - a. Acceptable Manufacturer(s)

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1. EPSON

A 760Wi

- b. Projectors shall meet or exceed the following minimum output, port availability and other standards:
 - 1. 4100 ANSI Lumens
 - 2. WXGA resolution
 - A 1280 x 800
 - 3. +/- 3-degree keystone correction.
 - 4. 1.2x optical zoom lens.
 - 5. Operating volume level of less than 40dB (fan).
 - 6. Operating temperature range of 45 95 degrees Fahrenheit.
 - 7. 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.
 - 8. Mechanical keypad lock out to minimize tampering with device settings
 - 9. Ethernet connector for management, monitoring and control applications.
 - 10. User definable power on graphic to replace factory default or manufacturer logo
- c. 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.
- d. All other features currently a part of the manufacturer's latest commercial release.
- e. Contractor shall supply all necessary devices and accessories to extend projector interactivity to teacher input location. Contractor shall supply all cabling, faceplates, devices and accessories for a fully functional system.
- 5. Six (6) LED Monitor(s) shall be provided and installed.

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- 1. CAD Lab Monitor 1 (75")
- 2. CAD Lab Monitor 2 (75")
- 3. CAD Lab Monitor 3 (75")
- 4. Innovation and Manufacturing Monitor 1 (75")
- 5. Innovation and Manufacturing Monitor 2 (75")
- 6. Innovation and Manufacturing Monitor 3 (75")
- b. Acceptable Manufacturer(s)
 - 1. NEWLINE
 - A TT-7523NT-PLUS
- c. LED Monitor shall meet or exceed the following minimum requirements:
 - 1. 75" diagonal
 - 2. Brightness 400 cd/m
 - 3. Rated for 24/7 run-time
 - 4. 8ms refresh rate
 - 5. 3840 x 2160 resolution
 - 6. 16:9 aspect ratio
 - 7. Three (3) HDMI input ports
 - 8. RS232C In/out
- d. Contractor shall supply and install appropriate mounts for supplied LED monitors. Mounts shall be Peerless (SF660P, ST660P or SA771PU) or Chief equivalent.
 - 1. CAD Lab Monitor 1 (75") Articulating Mount
 - 2. CAD Lab Monitor 2 (75") Articulating Mount
 - 3. CAD Lab Monitor 3 (75") Articulating Mount
 - 4. Innovation and Manufacturing Monitor 1 (75") Articulating Mount

- 5. Innovation and Manufacturing Monitor 2 (75") Articulating Mount
- 6. Innovation and Manufacturing Monitor 3 (75") Articulating Mount
- e. All monitors shall be controlled through supplied control system. If expansion of controller IO is necessary Contractor shall provide necessary IO expansion units.
- f. Contractor shall supply appropriate Q-SYS AV over IP equipment for discrete output for each monitor and projector concurrently for a fully functional system.
- g. Supplied Q-SYS AV over IP equipment shall scale images to optimal projector resolution.
- 6. One (1) Multimedia Processor/DSP
 - a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in building MDF location.
 - c. Contractor shall provide all control, communication, audio and video patch cables to connect input and output ports to all Contractor provided materials.
 - d. Contractor shall program Multimedia processor to integrate with Contractor provided monitors and projector. Contractor shall supply all necessary cabling and programming to fully enable integration with control system.
 - e. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - f. System shall be populated with necessary accessories for 8 line-level input audio channels.
 - g. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - h. Contractor shall supply all necessary labor to configure Mixer/DSP.
 - i. Contractor shall integrate Multimedia Processor/DSP with provided touchscreen.

- j. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
- k. Contractor shall supply all cables and accessories for a fully functional system.
- 1. Contractor shall provide and install fully compliant shielded cabling and any other low voltage communication infrastructure needed to fully connect to the projection system from Five (5) input plate(s), Two (2) wireless presentation system(s). Cable shall meet or exceed Q-SYS requirements for AV over IP systems.
- 7. One (1) Multimedia Input Location shall be provided.
 - a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Wall input to be installed in provided double gang box (transmitter should be single gang), Contractor shall supply stainless steel plate for fully finished installation.
 - c. Contractor shall supply correct in-plate transmit and receive equipment to extend input location to supplied Q-SYS AV over IP encoder.
 - d. Contractor will supply all necessary Q-SYS AV over IP decoder equipment to connect supplied projector and monitors.
 - e. Valid video input into the system shall turn on system automatically.
 - f. System shall power down after ten (10) minutes of no video signal.
 - g. Q-SYS AV over IP units shall properly scale input image to projector to optimal resolution.
- 8. Two (2) Wireless Presentation System(s)
 - a. Acceptable Manufacturers (in alphabetical order):
 - 1. KRAMER
 - A VIA GO 2
 - b. Wireless Presentation System shall meet or exceed the following requirements:

- 1. HDMI output with support for up to 4K@30Hz.
- 2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
- 3. 4GB Memory
- 4. 32GB Storage
- 5. All other features currently a part of the manufacturer's latest commercial release.
- 6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system in existing rack.
- c. Contractor shall integrate wireless presentation system with provided Q-SYS control system.
- d. Contractor shall coordinate installation and configuration of Wireless Presentation System per manufacturer recommended guidelines. Contractor shall work collaboratively as necessary with Owner and network support resources for a complete and compliant installation.
- e. Contractor shall provide licensing for Kramer VIA Cloud management platform for term of warranty. Contractor shall work collaboratively with Owner to make all Kramer VIA devices fully functional in management software.
- f. Contractor shall supply all necessary patch cables to connect Wireless Presentation Device to Owner supplied network cabling and switches. Contractor shall fully patch all devices and report back switch ports to Owner for programming.
- 9. Two (2) Touch Screen(s) shall be provided CAD Lab and Innovation and Manufacturing Lab.
 - a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - b. Touch Screen(s) shall be provided to control system operations.
 - 1. Touchscreen shall be 7"
 - 2. Black
 - 3. Connect touch screens to supplied control system as per manufacturer installation instructions.

- 4. Provide all necessary cabling, mounts and accessories to securely mount touch screen in provided double gang box.
- 5. Control touch screen shall be provided in locations specified herein that shall provide the following functions but not limited to.
 - A System Power On
 - B System Power Off
 - C Select Source, input 1-5, wireless presentation system 1-2
 - D Control Provided LED Panels and Projectors and powered screen.
 - E Audio Level Increase For each space
 - F Audio Level Decrease For each space
 - 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.
- 10. One (1) Amplification System shall be provided and installed
 - a. Acceptable Manufacturer(s)
 - 1. Q-SYS
 - 2. Or Equal
 - b. Four (4) input channels
 - c. Four (4) output channels
 - d. 300W maximum output per channel
 - e. S/N (20 Hz 20 kHz @ 8 Ohms) > 97 dB
 - f. Contractor shall integrate provided amplifier into provided control system. Amplifier and DSP system shall allow discrete volume control of each space.
- 11. Eight (8) Speakers shall be provided and installed.
 - a. Acceptable Manufacturer(s)

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1. HARMAN/JBL PRO

A Innovation and Manufacturing Lab – JBL CONTROL 28-1 – Eight (8)

- b. White color.
- c. Passive 2-way full range speaker
- d. 8" Low Frequency Driver, 1-inch Voice Coil
- e. 180W peak
- f. 8 ohms
- g. 94 dB sensitivity
- h. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
- i. Contractor shall safely and securely mount in ceiling structure using manufacturer recommended and industry best practices.
- j. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.
- k. Contractor shall supply and install properly sized speaker cabling to support supplied speakers. Each speaker shall be independently wired back to provided rack. Contractor shall wire each room to discretely allow independent volume control of each space.
- 12. Four (4) Speakers shall be provided and installed.
 - a. Acceptable Manufacturer(s)
 - 1. HARMAN/JBL PRO

A **Raw Material Manufacturing -** JBL CONTROL 28-1 – Four (4)

- b. White color.
- c. Passive 2-way full range speaker
- d. 8" Low Frequency Driver, 1-inch Voice Coil
- e. 180W peak
- f. 8 ohms

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- g. 94 dB sensitivity
- h. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
- i. Contractor shall safely and securely mount in ceiling structure using manufacturer recommended and industry best practices.
- j. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.
- k. Contractor shall supply and install properly sized speaker cabling to support supplied speakers. Each speaker shall be independently wired back to provided rack. Contractor shall wire each room to discretely allow independent volume control of each space.
- 13. Eight (8) Speakers shall be provided and installed
 - a. Acceptable Manufacturer(s)
 - 1. SOUNDTUBE
 - A CAD Lab Soundtube Mighty Mite 43-BGM Eight (8)
 - 2. Or Equal
 - b. White color.
 - c. Passive 3-way full range speaker
 - d. 5.25" dual-chamber, band-pass subwoofer
 - e. 4" woofer
 - f. $\frac{3}{4}$ " ring tweeter
 - g. 60W Max Power
 - h. 30W Continuous Power
 - i. 8 ohms
 - j. 84 dB sensitivity
 - k. Contractor shall install pendant speakers between decorative acoustical ceiling panels.
 - 1. Contractor shall safely and securely mount in ceiling structure using manufacturer recommended and industry best practices.

- m. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.
- n. Contractor shall supply and install properly sized speaker cabling to support supplied speakers. Each speaker shall be independently wired back to provided rack. Contractor shall wire each room to discretely allow independent volume control of each space.
- 14. Four (4) Speakers shall be provided and installed
 - a. Acceptable Manufacturer(s)
 - 1. SOUNDTUBE
 - A **Clean Lab/3D Printer Lab** Soundtube Mighty Mite 43-BGM Four (4)
 - 2. Or Equal
 - b. White color.
 - c. Passive 3-way full range speaker
 - d. 5.25" dual-chamber, band-pass subwoofer
 - e. 4" woofer
 - f. $\frac{3}{4}$ " ring tweeter
 - g. 60W Max Power
 - h. 30W Continuous Power
 - i. 8 ohms
 - j. 84 dB sensitivity
 - k. Contractor shall install pendant speakers between decorative acoustical ceiling panels.
 - 1. Contractor shall safely and securely mount in ceiling structure using manufacturer recommended and industry best practices.
 - m. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.
 - n. Contractor shall supply and install properly sized speaker cabling to support supplied speakers. Each speaker shall be independently wired back to

provided rack. Contractor shall wire each room to discretely allow independent volume control of each space.

- 15. One (1) Voice Amplification System(s) shall be provided and installed. Innovation and Manufacturing Lab
 - a. Acceptable Manufacturer(s)
 - 1. SHURE QLXD4
 - 2. Or Equal.
 - b. Handheld and Lavalier microphone combo
 - c. Contractor shall include charging base for handheld and lavalier microphone system concurrently.
 - d. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire Innovation and Manufacturing Lab (including mezzanine).
 - e. Contractor shall supply all mounting hardware to securely mount equipment into existing rack.
- 16. One (1) Voice Amplification System shall be provided and installed. CAD Lab
 - a. Acceptable Manufacturer(s)
 - 1. AUDIO ENHANCEMENT
 - 2. LIGHTSPEED
 - A 975 ACCESS LINK
 - b. Major components of the Voice Amplification System shall be carefully installed at rack location.
 - c. Voice Amplification systems shall meet or exceed the following minimum standards:
 - DECT (1.9 GHz) communication for complete classroom coverage of two (2) microphones simultaneously.
 - 2. Two (2) highly durable, rechargeable, battery powered, tamper resistant, impact resistant, lanyard based pendant microphones.
 - A Two (2) Lightspeed volume control Flexmikes

- d. Contractor shall provide one (1) cable for connectivity from audio output of projector to voice amplification system installed at rack location to support a fully functional and compliant system.
- 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.
- g. Voice Amplification Systems shall be neatly and securely mounted at Contractor provided rack. As indicated in the provided line diagram, Contractor shall supply and install audio cabling from Lightspeed device to provided DSP/Mixer.

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 \$5,000.00 for 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 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 (8') apart. Cables supported by structural steel, ceiling grid or hanger wires will not be acceptable. All cable routing shall be neat and orderly.
- 11. All cable connecting components mounted in/on Technology Cart, shall have adequate cable slack to provide for full system inspection and or service without the removal (intentional or inadvertent) of connecting cables, including items that will be placed on the keyboard tray of equipment carts.
- 12. Label all cable connections for intuitive user access and as directed by Owner and Designer.
- 13. Work may include extending cables from installed equipment, and as required and/or specified herein, to Owner identified connection outlets.
 - a. Work includes supply, connection and testing of any such cables.

14. ULTRA SHORT THROW INTERACTIVE PROJECTORS

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

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

15. WIRELESS PRESENTATION SYSTEM

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

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

16. VOICE AMPLIFICATION

- a. Provide and connect all audio input and output device cables.
- b. Secure mounting location at projector location with mounting screws or Velcro pads to eliminate involuntary equipment movement.
- c. Neatly route all cabling and secure slack.
- d. Adjust balance levels for standard configuration.
- e. Neatly route all cabling and secure slack.
- f. Provide and install connection from audio output on Contractor supplied projection units.
- E. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate or panel to the original condition.
 - 1. Repairs shall include, but not be limited to patching and painting.
 - 2. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.
 - 3. The building and work area shall be returned to its original condition prior to final sign off of the project.
- F. Following installation and system "turn-up", but prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.
 - 1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.
- G. All cable and device labels shall match existing standard.
- H. Sites of Work:

- Traverse City Central High School 1150 Milliken Drive Traverse City, Michigan 49686
- Traverse City West High School 5376 N. Long Lake Road Traverse City, Michigan 49685

3.03 TESTING

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

3.04 DOCUMENTATION

- A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment, including if reasonably required, file drawers, folders, dividers, etcetera, to contain all as-built drawings, owner's manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or Owner deem necessary. Documentation shall also be provided in a digital format in file formats and on media as specified by Owner and/or Designer.
- B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:
 - 1. Equipment description.
 - 2. Equipment make.
 - 3. Model number.
 - 4. Software release.
 - 5. Date installed.
 - 6. Manufacturer's warranty.
 - 7. Maintenance contract terms.
 - 8. Verification of maintenance contract engagement.
 - 9. Telephone numbers for service and support.
 - 10. Detailed technical support and service procedure instructions.
 - 11. All product (hardware and software) manuals and manufacturer supplied documentation, including, but not limited to owner manuals, system administrator manuals and configuration guides. Where number of duplicate copies for particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.
 - 12. Photocopy of original invoice listing make and model for all components and equipment from individual manufacturer(s), distribution source(s), or authorized agent(s) to establish manufacturer warranty start date for potential use after end of contract warranty provisions.
 - 13. CAD or Visio as built drawings/diagrams for each building.
 - 14. System Configuration Report.

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

3.05 TRAINING

- A. No training shall be conducted prior to training outline and/or syllabus being approved by Owner, Instructional or overview activities conducted without prior content approval with not be deemed contract training, and Contractor shall remain responsible for delivery of approved training.
- B. Contractor shall provide training for the Owner designated system administrator(s). Owner shall designate up to four (4) administrators to be trained. Training shall be a minimum of two (2), two (2) hour sessions in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:
 - 1. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.
 - 2. System back-up and restore functions and procedures for all system parameters and configurations.
 - 3. Device additions, moves and changes as well as reconfiguration.
 - 4. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to and system configuration changes.
- C. Contractor shall provide end user training on the daily operation of the installed system. Owner shall designate up to Eight (8) operators per building to be trained. Training shall be a minimum of two (2), one (1) hour session (per site) at the convenience of the Owner.

3.06 SCHEDULE, MEETINGS AND PLANS

- A. Schedule
 - 1. Post bid Interviews: Week of April 22, 2024
 - 2. Contractor Chosen: Week of April 29, 2024
 - 3. Work Commences: May 20, 2024
 - 4. Substantial Completion of Project: November 1, 2024
 - 5. Project Close-out: January 1, 2025

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- 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 0 - GENERAL

1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to the addition of access control equipment for the new STEM additions at both Central and West Senior High Schools in Traverse City Area Public Schools and as specified herein.
- 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 Appendix B and C 08 06 71 Door Hardware Schedule (Central and West Senior High Schools) 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) 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. 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.

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

1.05 REFERENCE SPECIFICATIONS

- A. All work, products, and materials shall conform with the following standards as applicable for the intended use:
 - 1. 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 Appendix B and C Section 087100 Door Hardware, "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.
- B. Acceptable Manufacturers (In alphabetical order):
 - 1. ASSA ABLOY
 - a. Door Contacts (or equal), REX (or equal)
 - 2. DNA FUSION

- a. Central Management Software
- 3. OPEN OPTIONS/MERCURY
 - a. Door Controllers
- 4. WAVELYNX
 - a. Credential Readers
- 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 CENTRAL MANAGEMENT SOFTWARE

- A. New access control hardware shall be integrated with existing Open Options/DNA Fusion open platform security software for a fully functional system.
- B. Contractor will supply all necessary licensing and labor to integrate new door access hardware into existing DNA Fusion system. Including all new hardware as indicated on new construction door schedule documents and all new card readers, door position indicators and REX devices in existing buildings as indicated on provided documents and as specified herein.
- C. Provide communication to credential readers, each with individual associated door interface hardware.
- D. System shall provide for Owner definition of access groups, schedules and door groups that can be combined by Owners system administrator into combination of access policies for users.
- E. All licensing shall be provided for in base bids for a complete and functional system as specified herein.

2.10 CONTROLLER

- A. Acceptable Manufacturer(s)
 - 1. OPEN OPTIONS/MERCURY
- B. Door controllers shall be provided in locations for electrified door hardware locations and as identified on drawings and door hardware schedule. Contractor shall supply all necessary door controller hardware, enclosures, accessories, expansion modules for a fully functional system.
- C. Controllers are to be housed in a surface mounted lockable impact resistant enclosure to protect the controller and provide for cable termination and management in centralized door controller location. Contractor shall provide all necessary plenum rated cables at both the closet and device location to the controller.
- 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.
- E. In identified locations where new controllers and doors are to be added. Controller(s) shall provide, but not be limited to:
 - 1. Mercury based hardware to support multiple software vendor's systems.
 - 2. Capable of supporting multiple types and styles of credential readers.

2.11 CREDENTIAL READERS

- A. Where indicated on drawings, credential readers shall be provided that meet or exceed the following requirements:
 - 1. WAVELYNX
 - a. ETHOS
 - 2. Contractor shall supply appropriately size card reader for either wall switch or mullion mounting.
 - 3. Read Owner supplied credentials.
 - 4. DC powered from associated Controller.
 - 5. Response time for passage requests of 800ms.
 - 6. Sealed weatherproof shell enclosure rated for outdoor operation.
 - 7. Surface mounted on exterior surface of structure for external readers.
 - 8. LED or other type of visual indicator indicating request status.
 - 9. Audible status indicator upon user prompt.
 - 10. Range of four inches (4").
- B. See associated supplied drawings and door schedule for location and quantity.

2.12 DOOR INTERFACE HARDWARE (INTEGRATED COMPONENTS)

- A. All controllers shall be Mercury door controllers, where new door controllers are to be provided, the door interface hardware provided by others shall meet or exceed the following:
 - 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 and as indicated on provided door schedule and diagrams, each door controlled by the system shall be equipped with PIR REX device where applicable and shall be integrated into the door controller installation by Contractor.
 - a. ASSA ABLOY
 - b. Or Equal.

- 3. Where new door controllers are to be provided and as indicated on provided door schedule and diagrams, each exterior door shall be equipped with magnetic DPI sensors by Contractor and shall be integrated into the door controller installation by Contractor.
 - a. ASSA ABLOY
 - b. Or Equal.
- 4. All door strike, REX and DPI cables shall be of a sufficient length to be neatly routed by Contractor supplying material, to a location suitable to reach inside controller enclosure for door(s).

2.13 POWER SUPPLIES

- A. Contractor shall supply necessary 24-volt power supplies to adequately power all equipment identified in provided Appendix C and D Door Hardware Schedule. Contractor shall centralize power supplies in IDF locations as identified in provided drawings.
 - 1. Power supplies shall meet or exceed the following requirements:
 - a. Contractor shall supply all necessary cabling to extend 24-volt power to door hardware as necessary and for a fully functional and manufacturer recommended installation.
 - b. Cabling shall be plenum rated and continuously marked as such.
 - c. Power supplies will have 5-15 outlet plugs for connection to UPS equipment provided by Others.
 - d. Contractor shall supply metal enclosure with fire rated backboard in IDF location.
 - e. Power supply devices shall provide adequate power for all door hardware indicated on provided "door hardware schedules" and as provided for herein.

2.14 BLUE LIGHT SYSTEM DEVICES

- A. Contractor shall supply Blue Light System devices in interior locations and at exterior door locations as identified in provided drawings and as specified herein.
 - 1. Blue light devices will be mounted at each location identified on provided drawing and have a blue LED light that activates in the event of a building lockdown.

- 2. Contractor shall supply all necessary power supplies, cabling, devices, licensing and installation to make Blue Light Devices functional.
- 3. Any power supply devices shall be centrally located in IDF locations. Contractor shall be responsible for extending power supply cabling as necessary for a fully functional system.
- 4. Contractor shall integrate provided Blue Light System Devices into existing DNA Fusion system. Contractor shall supply all licensing and labor to make additional devices fully functional.

2.15 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.

2.16 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.

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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.

2.17 ALLOWANCES

- A. Contractor shall include allowances for equipment and/or other contract service reimbursements as required below in base bid lump sum amount(s). Equipment and/or contract services shall be provided and sourced at Owner's discretion and convenience with full cooperation by Contractor and paid for from successful bidder's contract in the amount(s) provided for herein. Any allowance amount proving to be excessive for the intended equipment and/or contract services shall be credited to the Owner against contract payment requests.
 - 1. Allowance shall be made in the amount of \$5,000.00 for contract services related to 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. 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.
 - 4. 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:

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- Traverse City Central High School 1150 Milliken Drive Traverse City, Michigan 49686
- Traverse City West High School 5376 N. Long Lake Road Traverse City, Michigan 49685
- 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 as-built drawings, owner's manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or Owner deem necessary. Documentation shall also be provided in a digital format in file formats and on media as specified by Owner and/or Designer.
- B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:
 - 1. Equipment description.
 - 2. Equipment make.
 - 3. Model number.
 - 4. Software release.
 - 5. Date installed.
 - 6. Manufacturer's warranty.
 - 7. Maintenance contract terms.

- 8. Verification of maintenance contract engagement.
- 9. Telephone numbers for service and support.
- 10. Detailed technical support and service procedure instructions.
- 11. All product (hardware and software) manuals and manufacturer supplied documentation, including, but not limited to owner manuals, system administrator manuals and configuration guides. Where number of duplicate copies for particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.
- 12. Photocopy of original invoice listing make and model for all components and equipment from individual manufacturer(s), distribution source(s), or authorized agent(s) to establish manufacturer warranty start date for potential use after end of contract warranty provisions.
- 13. CAD 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.

3.06 SCHEDULE, MEETINGS AND PLANS

- A. Schedule
 - 1. Post bid Interviews: Week of April 22, 2024
 - 2. Contractor Chosen: Week of April 29, 2024
 - 3. Work Commences: May 20, 2024
 - 4. Substantial Completion of Project: November 1, 2024

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- 5. Project Close-out: January 1, 2025
- 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 new and rework of existing video monitoring equipment for the sites listed and specified herein. All equipment will be integrated into existing Milestone Video Monitoring System.
- B. Video monitoring work shall consist of the addition of necessary hardware, software and labor to enhance security in the identified locations, including the inclusion of new camera devices in locations in provided documents and as specified herein.
- C. 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.
- D. The centralized server recording equipment shall be Owner provided.
- E. 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.).
- F. 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.
- 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 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.

G. 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.

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.
- E. Owner reserves the right, with input from Designer and Contractor, to select other model(s) of materials, products, and/or equipment at their sole discretion, at any point during the contract term. Any such model change, being from the same or replacement product family, shall be accommodated by Contractor and provided at the same pricing strategy as similar and/or prior models as proposed under this contract.
- F. Owner may, or may not, elect to purchase individual camera devices, as may be applicable to system expansion from Contractor or other related camera vendors. Contractor shall fully cooperate with Owner decisions for related product sourcing and provide all integration service for such products as is appropriate for a fully functioning and operational system to meet the Owners needs.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers (In alphabetical order):
 - 1. I-PRO
 - 2. MILESTONE
- 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 Ethernet attached cameras, camera mounting brackets and housings, patch cords and all other necessary components integrated into a common working system.
- 2.05 All Ethernet cabling will be provided by Others.
- 2.06 All necessary PoE switch devices shall be provided by Owner, with the exception of any camera device that use more than Type 2 PoE+ power. In those cases, Contractor shall supply all necessary PoE injector devices for a fully functional system.

2.07 CENTRAL VIDEO MONITORING CONTROL SOFTWARE

- A. Contractor shall provide and install Milestone XProtect licensing compatible with current Owner software for all provided devices.
- B. Contractor shall integrate all new cameras into Milestone system.
- C. Contractor shall enable Milestone camera mapping feature and accurately place all existing and new cameras on Owner provided maps.
- D. Contractor shall integrate new cameras with Milestone software and work collaboratively to create security groups for appropriate access levels.
- E. Contractor shall work collaboratively with Owner to identify and enable users and groups in provided Milestone software.

2.08 CAMERAS

- A. Ethernet cameras shall be provided as indicated on provided building diagrams. Cameras shall meet or exceed the following specified capabilities:
 - 1. Interior/Exterior Panoramic Type 1
 - a. I-PRO WV-S4576LA
 - b. 183° horizontal and 183° vertical coverage
 - c. Activity/motion detection

VIDEO MONITORING SYSTEM 28 20 00–113

- d. 0.3 lux Min illumination/light sensitivity (Color)
- e. 0.04 lux Min illumination/light sensitivity (B/W)
- f. 2992 x 2992 max video resolution
- g. H.264 Compression
- h. H.265 Compression
- i. Motion JPEG Compression
- j. 30fps Frame Rate at full resolution in 360-degree Overview mode
- k. 10/100 Ethernet (RJ-45) connector
- 1. IEEE power over Ethernet (802.3at) compliance
- m. Internal image memory for motion-based buffering
- n. Operating temperature range from -35 120 degrees Fahrenheit.
- o. 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.
 - 2. Dust and water protection based.
 - 3. Integrated 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.
 - 4. Impact resistant with capability to withstand repeated multiple blunt impact forces up to 100 foot-pounds.
 - 5. Camera shall include all necessary mounting hardware and accessories for a fully supported installation.
- 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.

2.09 ALLOWANCES

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

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 coordinated with Owner.
- 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. Sites of Work:
 - Traverse City Central High School 1150 Milliken Drive Traverse City, Michigan 49686
 - Traverse City West High School 5376 N. Long Lake Road Traverse City, Michigan 49685
- 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 "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.

3.06 SCHEDULE, MEETINGS AND PLANS

- 1. Post bid Interviews: Week of April 22, 2024
- 2. Contractor Chosen: Week of April 29, 2024
- 3. Work Commences: May 20, 2024
- 4. Substantial Completion of Project: November 1, 2024
- 5. Project Close-out: January 1, 2025
- 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







EM LAB ADDITION - BID PACK 2 AREA PUBLIC SCHOOL CENTRAL HIGH SCHOOL STE TRAVERSE CITY / 1150 MILIKEN DR. TRAVERSE CITY, MI 49686

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REVISIONS

ISSUED

PROJECT NUMBER

SHEET TITLE

SHEET NUMBER

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Symbol Legend

- CR Card Reader
- (PA1) PA Speaker Type 1 Recessed
- (PA2) PA Speaker Type 2 Surface Mount
- (PA3) PA Speaker Type 3 Pendant
- (S1) Performance Speaker Type 1 Pendant
- S² Performance Speaker Type 2 Surface Mount
- C1 Clock Type 1 Single Sided Digital Security Camera Type 1 - Exterior Panoramic
- ^{Xd} Data Cabling In Wall/Floor Type
- Data Cabling Ceiling Type

Mount





REVISIONS

ISSUED

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SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Mechanical and electrified door hardware for:
 - a. Swinging doors.
 - 2. Electronic access control system components.

B. Section excludes:

- 1. Windows
- 2. Cabinets (casework), including locks in cabinets
- 3. Signage
- 4. Toilet accessories
- 5. Overhead doors
- C. Related Sections:
 - 1. Division 01 Section "Alternates" for alternates affecting this section.
 - 2. Division 06 Section "Rough Carpentry"
 - 3. Division 06 Section "Finish Carpentry"
 - 4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
 - 5. Division 08 Sections:
 - a. "Metal Doors and Frames"
 - b. "Flush Wood Doors"
 - c. "Stile and Rail Wood Doors"
 - d. "Interior Aluminum Doors and Frames"
 - e. "Aluminum-Framed Entrances and Storefronts"
 - 6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
 - 7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.02 REFERENCES

- A. UL Underwriters Laboratories
 - 1. UL 10B Fire Test of Door Assemblies
 - 2. UL 10C Positive Pressure Test of Fire Door Assemblies
 - 3. UL 1784 Air Leakage Tests of Door Assemblies
 - 4. UL 305 Panic Hardware

- B. DHI Door and Hardware Institute
 - 1. Sequence and Format for the Hardware Schedule
 - 2. Recommended Locations for Builders Hardware
 - 3. Keying Systems and Nomenclature
- C. NFPA National Fire Protection Association
 - 1. NFPA 70 National Electric Code
 - 2. NFPA 80 2016 Edition Standard for Fire Doors and Other Opening Protectives
 - 3. NFPA 101 Life Safety Code
 - 4. NFPA 105 Smoke and Draft Control Door Assemblies
 - 5. NFPA 252 Fire Tests of Door Assemblies
- D. ANSI American National Standards Institute
 - 1. ANSI/BHMA A156.1 A156.29, and ANSI/BHMA A156.31 Standards for Hardware and Specialties
 - 2. ANSI/BHMA A156.28 Recommended Practices for Keying Systems

1.03 SUBMITTALS

- A. General:
 - 1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
 - 2. Prior to forwarding submittal:
 - a. Comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.
 - b. Review drawings and Sections from related trades to verify compatibility with specified hardware.
 - c. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
- B. Action Submittals:
 - 1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
 - 2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - a. Wiring Diagrams: For power, signal, and control wiring and including:
 - 1) Details of interface of electrified door hardware and building safety and security systems.
 - 2) Schematic diagram of systems that interface with electrified door hardware.
 - 3) Point-to-point wiring.
 - 4) Risers.
 - Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.

- a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
- 4. Door Hardware Schedule:
 - a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
 - b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
 - c. Indicate complete designations of each item required for each opening, include:
 - 1) Door Index: door number, heading number, and Architect's hardware set number.
 - 2) Quantity, type, style, function, size, and finish of each hardware item.
 - 3) Name and manufacturer of each item.
 - 4) Fastenings and other pertinent information.
 - 5) Location of each hardware set cross-referenced to indications on Drawings.
 - 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
 - 7) Mounting locations for hardware.
 - 8) Door and frame sizes and materials.
 - 9) Degree of door swing and handing.
 - 10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.
- 5. Key Schedule:
 - a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
 - b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
 - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
 - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
 - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
 - f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.
- 6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory or shop prepared for door hardware installation.
- C. Informational Submittals:
 - 1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
 - 2. Provide Product Data:

Appendix B - Door Schedule

- a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
- b. Include warranties for specified door hardware.
- D. Closeout Submittals:
 - 1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Factory order acknowledgement numbers (for warranty and service)
 - d. Name, address, and phone number of local representative for each manufacturer.
 - e. Parts list for each product.
 - f. Final approved hardware schedule edited to reflect conditions as-installed.
 - g. Final keying schedule
 - h. Copies of floor plans with keying nomenclature
 - i. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
 - j. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
- E. Inspection and Testing:
 - 1. Submit a written report of the results of functional testing and inspection for fire door assemblies, in compliance with NFPA 80.
 - a. Written report to be provided to the Owner and be made available to the Authority Having Jurisdiction (AHJ).
 - b. Report to include the door number for each fire door assembly, door location, door and frame material, fire rating, and summary of deficiencies.
 - 2. Submit a written report of the results of functional testing and inspection for required egress door assemblies, in compliance with NFPA 101.
 - a. Written report to be provided to the Owner and be made available to the Authority Having Jurisdiction (AHJ).
 - b. Report to include the door number for each required egress door assembly, door location, door and frame material, fire rating, and summary of deficiencies.

1.04 QUALITY ASSURANCE

- A. Qualifications and Responsibilities:
 - Supplier: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
 - a. Warehousing Facilities: In Project's vicinity.
 - b. Scheduling Responsibility: Preparation of door hardware and keying schedules.
 - c. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

- d. Coordination Responsibility: Assist in coordinating installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.
 - 1) Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.
- 2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
- 3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
 - a. For door hardware: DHI certified AHC or DHC.
 - b. Can provide installation and technical data to Architect and other related subcontractors.
 - c. Can inspect and verify components are in working order upon completion of installation.
 - d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
- 4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
- B. Certifications:
 - 1. Fire-Rated Door Openings:
 - a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
 - b. Provide only items of door hardware that are listed products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
 - 2. Smoke and Draft Control Door Assemblies:
 - a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
 - b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
 - 3. Electrified Door Hardware
 - a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
 - 4. Accessibility Requirements:
 - a. Comply with governing accessibility regulations cited in "REFERENCES" article, herein for door hardware on doors in an accessible route.
- C. Pre-Installation Meetings
 - 1. Keying Conference

Appendix B - Door Schedule

Central & West High School STEM Addition Traverse City Area Public Schools

Traverse City, Michigan

- a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
 - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - 2) Preliminary key system schematic diagram.
 - 3) Requirements for key control system.
 - 4) Requirements for access control.
 - 5) Address for delivery of keys.
- 2. Pre-installation Conference
 - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Inspect and discuss preparatory work performed by other trades.
 - c. Inspect and discuss electrical roughing-in for electrified door hardware.
 - d. Review sequence of operation for each type of electrified door hardware.
 - e. Review required testing, inspecting, and certifying procedures.
 - f. Review questions or concerns related to proper installation and adjustment of door hardware.
- 3. Electrified Hardware Coordination Conference:
 - a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.06 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- E. Existing Openings: Where existing doors, frames and/or hardware are to remain, field verify existing functions, conditions and preparations and coordinate to suit opening conditions and to provide proper door operation.

1.07 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
 - 1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
 - 2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
 - a. Mechanical Warranty
 - 1) Locks
 - a) Schlage L Series: 3 year
 - 2) Exit Devices
 - a) Von Duprin: 3 year
 - 3) Closers
 - a) LCN 4000 Series: 30 year
 - b. Electrical Warranty
 - 1) Exit Devices
 - a) Von Duprin: 1 year

1.08 MAINTENANCE

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected

to prepare proprietary specifications. These products are specified with the notation: "No Substitute."

- 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

- A. Fasteners
 - 1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
 - 2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
 - 3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
 - 4. Install hardware with fasteners provided by hardware manufacturer.
- B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
 - 1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
- C. Cable and Connectors: Hardwired Electronic Access Control Lockset and Exit Device Trim:
 - 1. Data: 24AWG, 4 conductor shielded, Belden 9843, 9841 or comparable.
 - 2. DC Power: 18 AWG, 2 conductor, Belden 8760 or comparable.
 - 3. Provide type of data and DC power cabling required by access control device manufacturer for this installation.
 - 4. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with sufficient number and wire gauge with standardized Molex plug connectors to accommodate electric function of specified hardware. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.03 HINGES

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Ives 5BB series
 - 2. Acceptable Manufacturers and Products:
 - a. Hager BB series
 - b. McKinney TA/T4A series
 - c. Stanley FBB Series
- B. Requirements:
 - 1. Provide hinges conforming to ANSI/BHMA A156.1.
 - 2. Provide five knuckle, ball bearing hinges.
 - 3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
 - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
 - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
 - 4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
 - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
 - 5. 2 inches or thicker doors:
 - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
 - 6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
 - 7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
 - 8. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
 - 9. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Out-Swinging Exterior Doors: Non-removable pins
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins
 - Provide hinges with electrified options as scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

2.04 CONTINUOUS HINGES

A. Manufacturers:

- 1. Scheduled Manufacturer:
 - a. Ives
- 2. Acceptable Manufacturers:
 - a. Stanley
- B. Requirements:
 - 1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
 - 2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
 - 3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
 - 4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
 - 5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
 - 6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware.
 - 7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.05 ELECTRIC POWER TRANSFER

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Von Duprin EPT-10
 - 2. Acceptable Manufacturers:
 - a. ABH PT1000
 - b. Securitron CEPT-10
- B. Requirements:
 - 1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires sufficient to accommodate electric function of specified hardware.
 - 2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

2.06 FLUSH BOLTS

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives

- 2. Acceptable Manufacturers:
 - a. Burns
 - b. Rockwood
- B. Requirements:
 - Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

2.07 COORDINATORS

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Burns
 - b. Rockwood
- B. Requirements:
 - 1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
 - 2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes, or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

2.08 MORTISE LOCKS

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Schlage L9000 series
 - 2. Acceptable Manufacturers and Products:
 - a. Yale 8800 series
 - b. Sargent 8200 series
- B. Requirements:
 - 1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.

- 2. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
- 3. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
- 4. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
- 5. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
- 6. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
- 7. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
 - a. Provide levers with vandal resistant technology for use at heavy traffic or abusive applications.
 - b. Lever Design (Central): Schlage 06A.
 - c. Lever Design (West): Schlage 03A.

2.09 EXIT DEVICES

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Von Duprin 98/35A series
 - 2. Acceptable Manufacturers and Products:
 - a. Sargent 80 series
- B. Requirements:
 - 1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
 - 2. Cylinders: Refer to "KEYING" article, herein.
 - 3. Provide smooth touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
 - 4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
 - 5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
 - 6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
 - 7. Provide flush end caps for exit devices.
 - 8. Provide exit devices with manufacturer's approved strikes.
 - 9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
 - 10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
 - 11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
 - 12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.

- 13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
- 14. Provide electrified options as scheduled.
- 15. Concealed Vertical Cable Exit Devices: provide cable-actuated concealed vertical latch system in two-point for non-rated or fire rated wood doors up to a 90 minute rating and less bottom latch (LBL) configuration for non-rated or fire rated wood doors up to 20 minute rating. Vertical rods not permitted.
 - a. Cable: Stainless steel with abrasive resistant coating. Conduit and core wire ends snap into latch and center slides without use of tools.
 - b. Wood Door Prep: Maximum 1 inch x 1.1875 inch x 3.875 inches top latch pocket and 1 inch x 1.1875 inch x 5 inches bottom latch pocket which does not require the use of a metal wrap or edge for non-rated or fire rated wood doors up to a 45 minute rating.
 - c. Latchbolts and Blocking Cams: Manufactured from sintered metal low carbon copperinfiltrated steel, with molybdenum disulfide low friction coating.
 - d. Top Latchbolt: Minimum 0.38 inch (10 mm) and greater than 90^{-degree} engagement with strike to prevent door and frame separation under high static load.
 - e. Bottom Latchbolt: Minimum of 0.44-inch (11 mm) engagement with strike.
 - f. Product Cycle Life: 1,000,000 cycles.
 - g. Latch Operation: Top and bottom latch operate independently of each other. Top latch fully engages top strike even when bottom latch is compromised. Separate trigger mechanisms not permitted.
 - h. Latch release does not require separate trigger mechanism.
 - i. Cable and latching system characteristics:
 - 1) Installed independently of exit device installation, and capable of functioning on door prior to device and trim installation.
 - 2) Connected to exit device at single point in steel and aluminum doors, and two points for top and bottom latches in wood doors.
 - Bottom latch height adjusted, from single point for steel and aluminum doors and two points for wood doors, after system is installed and connected to exit device, while door is hanging
 - Bottom latch position altered up and down minimum of 2 inches (51 mm) in steel and aluminum doors without additional adjustment. Bottom latch deadlocks in every adjustment position in wood doors.
 - 5) Top and bottom latches in steel and aluminum doors and top latch in wood doors may be removed while door is hanging.
- 16. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
- 17. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

2.10 ELECTRIC STRIKES

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Von Duprin 6000 series
 - 2. Acceptable Manufacturers and Products:
 - a. Folger Adam 300 series
 - b. HES 1006 series

- B. Requirements:
 - 1. Provide electric strikes designed for use with type of locks shown at each opening.
 - 2. Provide electric strikes UL Listed as burglary-resistant.
 - 3. Where required, provide electric strikes UL Listed for fire doors and frames.
 - 4. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.

2.11 CYLINDERS

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Yale
 - 2. Acceptable Manufacturers and Products:
 - a. No Substitute
- B. Requirements:
 - 1. Nickel silver bottom pins.
 - 2. Temporary Construction Cylinder Keying.
 - a. Provide construction cores on exterior doors in accordance with the following requirements.
 - 1) 12 construction change (day) keys.

2.12 KEYING

A. Key to Owners Grand Master, 6-Pin Yale keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

2.13 DOOR CLOSERS

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. LCN 4010/4110/4020 series
 - 2. Acceptable Manufacturers and Products:
 - a. No Substitute
- B. Requirements:
 - 1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. Certify surface mounted mechanical closers to meet fifteen million (15,000,000) full load cycles. ISO 9000 certify closers. Stamp units with date of manufacture code.

- 2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
- 3. Cylinder Body: 1-1/2 inch (38 mm) diameter with 11/16 inch (17 mm) diameter double heat-treated pinion journal.
- 4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
- 5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
- 6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
- 7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers. When closers are parallel arm mounted, provide closers which mount within 6-inch (152 mm) top rail without use of mounting plate so that closer is not visible through vision panel from pull side.
- 8. Pressure Relief Valve (PRV) Technology: Not permitted.
- 9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI/BHMA Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
- 10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.
- 11. Through-bolt all wood door closers.

2.14 DOOR TRIM

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Burns
 - b. Rockwood
- B. Requirements:
 - 1. Provide push plates, push bars, pull plates, and pulls with diameter and length as scheduled.

2.15 PROTECTION PLATES

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Burns
 - b. Rockwood

B. Requirements: TCAPS West Senior High Bid Documents 20129.00

- 1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
- 2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
- 3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.16 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

- A. Manufacturers:
 - 1. Scheduled Manufacturers:
 - a. Glynn-Johnson
 - 2. Acceptable Manufacturers:
 - a. No Substitute
- B. Requirements:
 - 1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.
 - 2. Provide friction type at doors without closer and positive type at doors with closer.

2.17 DOOR STOPS AND HOLDERS

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Burns
 - b. Rockwood
- B. Provide door stops at each door leaf:
 - 1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
 - 2. Where a wall stop cannot be used, provide universal floor stops.
 - 3. Where wall or floor stop cannot be used, provide overhead stop.

2.18 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Zero International
 - 2. Acceptable Manufacturers:

- a. National Guard
- b. Reese
- B. Requirements:
 - 1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
 - 2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
 - 3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
 - 4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.19 SILENCERS

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Burns
 - b. Rockwood
- B. Requirements:
 - 1. Provide "push-in" type silencers for hollow metal or wood frames.
 - 2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
 - 3. Omit where gasketing is specified.

2.20 MAGNETIC HOLDERS

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. LCN
 - 2. Acceptable Manufacturers:
 - a. Rixson
 - b. ABH
- B. Requirements:
 - Provide wall or floor mounted electromagnetic door release as specified with minimum of 25 pounds of holding force. Coordinate projection of holder and armature with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Connect magnetic holders on fire-rated doors into the fire control panel for fail-safe operation.

2.21 FINISHES

A. Finish: Generally, Satin Chromium, US26D / BHMA 626. Provide finish for each item as indicated in sets.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.
- C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- D. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Where on-site modification of doors and frames is required:
 - 1. Carefully remove existing door hardware and components being reused. Clean, protect, tag, and store in accordance with storage and handling requirements specified herein.
 - 2. Field modify and prepare existing doors and frames for new hardware being installed.
 - 3. When modifications are exposed to view, use concealed fasteners, when possible.
 - 4. Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:
 - a. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
 - b. Wood Doors: DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
 - c. Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

3.03 INSTALLATION

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Custom Steel Doors and Frames: HMMA 831.
 - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

- B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
- H. Lock Cylinders:
 - 1. Install construction cores to secure building and areas during construction period.
 - 2. Replace construction cores with permanent cores as indicated in keying section.
 - 3. Furnish permanent cores to Owner for installation.
- I. Wiring: Coordinate with Division 26, ELECTRICAL sections for:
 - 1. Conduit, junction boxes and wire pulls.
 - 2. Connections to and from power supplies to electrified hardware.
 - 3. Connections to fire/smoke alarm system and smoke evacuation system.
 - 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 - 5. Testing and labeling wires with Architect's opening number.
- J. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- K. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
- L. Closer/Holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- M. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
- N. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- O. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- P. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

- Q. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- R. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.04 FIELD QUALITY CONTROL

- A. Inspection and Testing:
 - 1. Provide functional testing and inspection of fire door assemblies by a qualified person in accordance with NFPA 80.
 - a. Schedule fire door assembly inspection within 90 days of Substantial Completion of the Project.
 - b. Submit a signed, written final report as specified in Paragraph 1.03.E.1.
 - c. Correct all deficiencies and schedule a reinspection of fire door assemblies noted as deficient on the inspection report.
 - d. Inspector to reinspect fire door assemblies after repairs are made.
 - 2. Provide inspection of required egress door assemblies by a qualified person in accordance with NFPA 101.
 - a. Schedule egress door assembly inspection within 90 days of Substantial Completion of the Project for the required openings.
 - b. Submit a signed, written final report as specified in Paragraph 1.03.E.2.
 - c. Correct all deficiencies and schedule a reinspection of egress door assemblies noted as deficient on the inspection report.
 - d. Inspector to reinspect required egress door assemblies after repairs are made.

3.05 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 - 2. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.06 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items per manufacturer's instructions to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.07 DOOR HARDWARE SCHEDULE

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.
- D. Hardware Sets:

Central High School

Hardware Group No. 01

For use on Do	oor #(s):				
F144B	F144C	F144D	F145B	F145D	F145E
F145F	F157L	F157N			
Each to have:	:				

DESCRIPTION CATALOG NUMBER FINISH MFR QTY 3 ΕA HINGE 5BB1HW 4.5 X 4.5 652 IVE L9040 06A 09-544 L283-722 626 1 EΑ PRIVACY LOCK SCH 1 4011 689 EA SURFACE CLOSER LCN E 1 ΕA KICK PLATE 8400 10" X 1 1/2" LDW B-CS 630 IVE E 1 ΕA WALL STOP WS406/407CVX 630 IVE 1 EA GASKETING 488S E ΒK ZER

Hardware Group No. 02

For use on Door #(s): F144E

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	L9040 06A 09-544 L283-722	626	SCH
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488S	BK	ZER
For use on Door #(s): F147B

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	CONST LATCHING BOLT	FB51P		630	IVE
1	EA	DUST PROOF STRIKE	DP2		626	IVE
1	EA	CLASSROOM LOCK	L9070L 06A		626	SCH
1	EA	MORTISE CYLINDER	2153 KEY TO EXISTING SYSTEM		626	YAL
1				F	600	
I	EA	COORDINATOR	CORAFL		020	IVE
2	EA	MOUNTING BRACKET	MB (AS REQ'D)		689	IVE
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
2	EA	ARMOR PLATE	8402 36" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488S		BK	ZER
1	EA	MEETING STILE	8217S		BK	ZER

Hardware Group No. 04

For use on Door #(s):

F143

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080L 06A	626	SCH
1	EA	MORTISE CYLINDER	2153	626	YAL
			- KEY TO EXISTING SYSTEM		
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4011 ST-1544	689	LCN
1	EA	MOUNTING PLATE	4020-18	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

For use on Door #(s): F157E

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	L9080L 06A		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE CON	N	630	VON
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
3	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM ELECTRIC STRIKE TO POWER SUPPLY	×		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use on Door #(s): F145G

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	L9080L 06A		626	SCH
1	EA	MORTISE CYLINDER	2153		626	YAL
			- KEY TO EXISTING SYSTEM			
1	EA	ELECTRIC STRIKE	6211 FSE CON	×	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
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-6W	×		SCH
			- WIRE EXTENSION FROM			
			ELECTRIC STRIKE TO POWER			
			SUPPLY			
1	EA	MULTITECH READER	BY ACCESS CONTROL	N		B/O
			CONTRACTOR			
1	EA	POWER SUPPLY	BY ACCESS CONTROL	N		B/O
			CONTRACTOR			

NOTES:

For u	ise on Do	or #(s):					
F14	46A	F147 I	F151				
Each	to have:						
QT	Y	DESCRIPTION		CATALOG NUMBER		FINISH	MFR
3	EA	HINGE		5BB1HW 4.5 X 4.5		652	IVE
1	EA	STOREROOM W/DEADBOLT		L9480L 06A 09-544 L283-711		626	SCH
1	EA	MORTISE CYLINDEF	R	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE		6211 FSE CON	×	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
1	EA	KICK PLATE		8400 10" X 1 1/2" LDW B-CS		630	IVE
3	EA	SILENCER		SR64		GRY	IVE
1	EA	WIRE HARNESS		CON-6W - WIRE EXTENSION FROM ELECTRIC STRIKE TO POWER SUPPLY	×		SCH
1	EA	MULTITECH READE	R	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY		BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use on D	oor #(s):
F157M	F159

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
1	EA	STOREROOM LOCK	L9080L 06A		626	SCH
1	EA	MORTISE CYLINDER	2153		626	YAL
			- KEY TO EXISTING SYSTEM			
1	EA	ELECTRIC STRIKE	6211 FSE CON	N	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-6W	×		SCH
			- WIRE EXTENSION FROM			
			ELECTRIC STRIKE TO POWER			
			SUPPLY			
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use on Door #(s): F157D

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	CONST LATCHING BOLT	FB51P		630	IVE
1	EA	DUST PROOF STRIKE	DP2		626	IVE
1	EA	STOREROOM LOCK	L9080L 06A		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6223 FSE CON	N	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	COORDINATOR	COR X FL		628	IVE
2	EA	MOUNTING BRACKET	MB (AS REQ'D)		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
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	M		SCH
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	*		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

Appendix B - Door Schedule

Hardware Group No. 10

For use on Door #(s): F146B

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	CONST LATCHING BOLT	FB51P		630	IVE
1	EA	DUST PROOF STRIKE	DP2		626	IVE
1	EA	STOREROOM LOCK	L9080L 06A		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6223 FSE CON	×	630	VON
1	EA	COORDINATOR	COR X FL		628	IVE
2	EA	MOUNTING BRACKET	MB (AS REQ'D)		689	IVE
2	EA	SURFACE CLOSER	4111 SHCUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	N		SCH
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	*		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use on Door #(s): F158

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP		652	IVE
1	EA	STOREROOM LOCK	L9080L 06A		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE CON	×	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
1	EA	GASKETING	488S		BK	ZER
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM ELECTRIC STRIKE TO POWER SUPPLY	*		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	N		B/O

NOTES:

Appendix B - Door Schedule Central & West High School STEM Addition Traverse City Area Public Schools Traverse City, Michigan

Hardware Group No. 12

For use on Door #(s): F147A

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	STOREROOM W/DEADBOLT	L9480L 06A 09-544 L283-711		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE CON	×	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
1	EA	GASKETING	488S		BK	ZER
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM ELECTRIC STRIKE TO POWER SUPPLY	×		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	N		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	N		B/O

NOTES:

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Hardware Group No. 13

For use on Door #(s): F147C

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	CONST LATCHING BOLT	FB51P		630	IVE
1	EA	DUST PROOF STRIKE	DP2		626	IVE
1	EA	STOREROOM LOCK	L9080L 06A		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6223 FSE CON	×	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	COORDINATOR	COR X FL		628	IVE
2	EA	MOUNTING BRACKET	MB (AS REQ'D)		689	IVE
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
2	EA	ARMOR PLATE	8402 36" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488S		BK	ZER
1	EA	MEETING STILE	8217S		BK	ZER
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	×		SCH
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	*		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use on Door #(s): F160

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112XY		628	IVE
1	EA	STOREROOM LOCK	LV9080L 06A		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE CON	×	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	SURFACE CLOSER	4111 SCUSH SRI		689	LCN
1	EA	CUSH SHOE SUPPORT	4110-30 SRI		689	LCN
1	EA	BLADE STOP SPACER	4110-61 SRI		689	LCN
1	EA	DOOR SWEEP	39A		А	ZER
1	EA	THRESHOLD	655A		А	ZER
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM ELECTRIC STRIKE TO POWER SUPPLY	×		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	N		B/O
1	EA	DOOR CONTACT	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	×		B/O

NOTES:

For use on Door #(s): F1220

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	224XY		628	IVE
2	EA	FIRE EXIT HARDWARE	9849-EO-F-LBL - AUXILIARY FIRE LATCH (AS REQ'D)		626	VON
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)	N	689	LCN
1	EA	GASKETING	488S		BK	ZER
1	EA	OVERLAPPING ASTRAGAL	PROVIDED BY DOOR MANUFACTURER			OVE

NOTES:

For use on Door #(s): F156A

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	ELEC PANIC HARDWARE	QEL-98-NL-CON	×	626	VON
1	EA	RIM CYLINDER	1109		626	YAL
			- KEY TO EXISTING SYSTEM			
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
3	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	N		SCH
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	*		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use on Door #(s): F156C

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			652	IVE
1	EA	POWER TRANSFER	EPT10 CON		×	689	VON
1	EA	ELEC PANIC HARDWARE	QEL-98-NL-CON		×	626	VON
1	EA	RIM CYLINDER	1109			626	YAL
			- KEY TO EXISTING SYSTEM	_			
1	EA	SURFACE CLOSER	4111 SCUSH			689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS			630	IVE
3	EA	SILENCER	SR64			GRY	IVE
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)		×		SCH
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY		×		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR		×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR		×		B/O

NOTES:

Appendix B - Door Schedule Central & West Hig

Central & West High School STEM Addition Traverse City Area Public Schools Traverse City, Michigan

Hardware Group No. 18

For use on Door #(s): F1221

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	224XY		628	IVE
1	EA	CONT. HINGE	224XY EPT		628	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
1	EA	PANIC HARDWARE	LD-98-EO		626	VON
1	EA	ELEC PANIC HARDWARE	QEL-98-NL-CON	×	626	VON
1	EA	RIM CYLINDER	1109		626	YAL
			- KEY TO EXISTING SYSTEM			
1	EA	MORTISE CYLINDER	2153		626	YAL
			- KEY TO EXISTING SYSTEM			
2	EA	SURFACE CLOSER	4111 EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7850 (COORDINATE	×	689	LCN
			VOLTAGE AS REQ'D)			
2	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D)	×		SCH
			- ELECTRIFIED HARDWARE TO			
			POWER TRANSFER			
			REQ'D)			
1	FA	WIRE HARNESS	CON-6W	N		SCH
•	_ / (- WIRE EXTENSION FROM			0011
			POWER TRANSFER TO POWER			
			SUPPLY			
1	EA	MULTITECH READER	BY ACCESS CONTROL	N		B/O
			CONTRACTOR			
1	EA	POWER SUPPLY	BY ACCESS CONTROL	×		B/O
			CUNTRACTOR			

NOTES:

Appendix B - Door Schedule

Hardware Group No. 19

For use on Door #(s): F120

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	224XY		628	IVE
1	EA	CONT. HINGE	224XY EPT		628	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB		689	VON
1	EA	FIRE EXIT HARDWARE	98-EO-F		626	VON
1	EA	ELEC FIRE EXIT HARDWARE	QEL-98-NL-F-CON	N	626	VON
1	EA	RIM CYLINDER	1109 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
2	EA	SURFACE CLOSER	4111 EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" 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
1	EA	MEETING STILE	8217S		BK	ZER
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	N		SCH
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	×		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

Appendix B - Door Schedule

Hardware Group No. 20

For use on Door #(s): F157A F157C

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112XY EPT		628	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-OP-110MD-CON	×	626	VON
1	EA	RIM CYLINDER	1109 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	90 DEG OFFSET PULL	8190EZHD 18" O		630- 316	IVE
1	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	CUSH SHOE SUPPORT	4110-30		689	LCN
1	EA	BLADE STOP SPACER	4110-61		689	LCN
1	EA	DOOR SWEEP	39A		А	ZER
1	EA	THRESHOLD	625A		А	ZER
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	*		SCH
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	~		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	DOOR CONTACT	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	*		B/O

NOTES:

1) OPERATIONAL DESCRIPTION PROVIDED BY OWNER.

Hardware Group No. 21

For use on Door #(s):

F156B F157G

Each to have:

QTY DESCRIPTION

CATALOG NUMBER HARDWARE BY DOOR MANUFACTURER FINISH MFR

West High School

Hardware Group No. 01

For use on Door #(s): C123

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	L9040 03A 09-544 L283-722	626	SCH
1	EA	SURFACE CLOSER	4011	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488S	BK	ZER

Hardware Group No. 02

For use on Door #(s): C125

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	L9070L 03A	626	SCH
1	EA	MORTISE CYLINDER	2153	626	YAL
			- KEY TO EXISTING SYSTEM		
1	EA	SURFACE CLOSER	4111 EDA	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488S	BK	ZER

For use on Door #(s): C129E

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	STOREROOM LOCK	L9080L 03A		626	SCH
1	EA	MORTISE CYLINDER	2153		626	YAL
			- KEY TO EXISTING SYSTEM			
1	EA	ELECTRIC STRIKE	6211 FSE CON	N	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
3	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-6W	×		SCH
			- WIRE EXTENSION FROM			
			ELECTRIC STRIKE TO POWER			
			SUPPLY			
1	EA	MULTITECH READER	BY ACCESS CONTROL	N		B/O
			CONTRACTOR			
1	EA	POWER SUPPLY	BY ACCESS CONTROL	N		B/O
			CONTRACTOR			

NOTES:

For use on [Door #(s):
C220	C223

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	STOREROOM LOCK	L9080L 03A		626	SCH
1	EA	MORTISE CYLINDER	2153		626	YAL
			- KEY TO EXISTING SYSTEM			
1	EA	ELECTRIC STRIKE	6211 FSE CON	×	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-6W	×		SCH
			- WIRE EXTENSION FROM			
			ELECTRIC STRIKE TO POWER			
			SUPPLY			
1	EA	MULTITECH READER	BY ACCESS CONTROL	N		B/O
			CONTRACTOR			
1	EA	POWER SUPPLY	BY ACCESS CONTROL	N		B/O

NOTES:

For use on Door #(s): C128A

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	STOREROOM W/DEADBOLT	L9480L 03A 09-544 L283-711		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE CON	×	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	ARMOR PLATE	8400 36" X 1 1/2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM ELECTRIC STRIKE TO POWER SUPPLY	×		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	N		B/O

NOTES:

For use on Door #(s): C126B

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	L9080L 03A		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE CON	×	630	VON
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
1	EA	GASKETING	488S		BK	ZER
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM ELECTRIC STRIKE TO POWER SUPPLY	×		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	N		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

Appendix B - Door Schedule Central & West High School STEM Addition Traverse City Area Public Schools Traverse City, Michigan

Hardware Group No. 07

For use on Door #(s): C122B

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	STOREROOM W/DEADBOLT	L9480L 03A 09-544 L283-711		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE CON	×	630	VON
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
1	EA	GASKETING	488S		BK	ZER
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM ELECTRIC STRIKE TO POWER SUPPLY	×		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	N		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	N		B/O

NOTES:

Appendix B - Door Schedule

Hardware Group No. 08

For use on Door #(s): C126A

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	CONST LATCHING BOLT	FB51P		630	IVE
1	EA	DUST PROOF STRIKE	DP2		626	IVE
1	EA	STOREROOM LOCK	L9080L 03A		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6223 FSE CON	×	630	VON
1	EA	COORDINATOR	COR X FL		628	IVE
2	EA	OH STOP	100S		630	GLY
2	EA	SURFACE CLOSER	4011 ST-1544		689	LCN
2	EA	MOUNTING PLATE	4020-18		689	LCN
2	EA	ARMOR PLATE	8402 36" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488S		BK	ZER
1	EA	MEETING STILE	8217S		BK	ZER
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	×		SCH
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	*		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use on D	oor #(s):
C221A	C222

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	STOREROOM LOCK	L9080L 03A		626	SCH
1	EA	MORTISE CYLINDER	2153		626	YAL
			- KEY TO EXISTING SYSTEM			
1	EA	ELECTRIC STRIKE	6211 FSE CON	N	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
1	EA	GASKETING	488S		BK	ZER
1	EA	WIRE HARNESS	CON-6W	×		SCH
			- WIRE EXTENSION FROM			
			ELECTRIC STRIKE TO POWER			
			SUPPLY			
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use on Door #(s): C122A

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	STOREROOM W/DEADBOLT	L9480L 03A 09-544 L283-711		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE CON	N	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
1	EA	GASKETING	488S		BK	ZER
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM ELECTRIC STRIKE TO POWER SUPPLY	*		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	N		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	N		B/O

NOTES:

Appendix B - Door Schedule Central & West High School STEM Addition Traverse City Area Public Schools Traverse City, Michigan

Hardware Group No. 11

For use on Door #(s): C124

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	CONST LATCHING BOLT	FB51P		630	IVE
1	EA	DUST PROOF STRIKE	DP2		626	IVE
1	EA	STOREROOM LOCK	L9080L 03A		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6223 FSE CON	×	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	COORDINATOR	COR X FL		628	IVE
2	EA	MOUNTING BRACKET	MB (AS REQ'D)		689	IVE
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488S		BK	ZER
1	EA	MEETING STILE	8217S		BK	ZER
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	×		SCH
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	×		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	N		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use on Door #(s): C130

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112XY		628	IVE
1	EA	STOREROOM LOCK	LV9080L 03A		626	SCH
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	ELECTRIC STRIKE	6211 FSE CON	×	630	VON
1	EA	LOCK GUARD	LG14		US32D	IVE
1	EA	SURFACE CLOSER	4111 SCUSH SRI		689	LCN
1	EA	CUSH SHOE SUPPORT	4110-30 SRI		689	LCN
1	EA	BLADE STOP SPACER	4110-61 SRI		689	LCN
1	EA	DOOR SWEEP	39A		А	ZER
1	EA	THRESHOLD	655A		А	ZER
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM ELECTRIC STRIKE TO POWER SUPPLY	×		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	N		B/O
1	EA	DOOR CONTACT	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	×		B/O

NOTES:

Appendix B - Door Schedule

Hardware Group No. 13

For use on Door #(s): C121

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	224XY		628	IVE
1	EA	CONT. HINGE	224XY EPT		628	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB		689	VON
1	EA	FIRE EXIT HARDWARE	98-EO-F		626	VON
1	EA	ELEC FIRE EXIT HARDWARE	QEL-98-NL-F-CON	×	626	VON
1	EA	RIM CYLINDER	1109 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	SURFACE CLOSER	4111 EDA		689	LCN
1	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
1	EA	GASKETING	488S		BK	ZER
1	EA	MEETING STILE	8217S		BK	ZER
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	M		SCH
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	*		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use on Door #(s): C129A

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	ELEC PANIC HARDWARE	QEL-98-NL-CON	×	626	VON
1	EA	RIM CYLINDER	1109		626	YAL
			- KEY TO EXISTING SYSTEM			
1	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	ARMOR PLATE	8400 36" X 1 1/2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS	*		SCH
			REQ'D)			
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	*		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use on Door #(s): C127A

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
1	EA	PANIC HARDWARE	98-EO		626	VON
1	EA	ELEC PANIC HARDWARE	QEL-98-NL-CON	×	626	VON
1	EA	RIM CYLINDER	1109 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
2	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS		630	IVE
2	EA	SILENCER	SR64		GRY	IVE
1	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	M		SCH
1	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	*		SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR	×		B/O

NOTES:

For use	e on Doo	or #(s):					
C127	В	C129B	C129C				
Each to	have:						
QTY		DESCRIPTION		CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE		112XY EPT		628	IVE
1	EA	POWER TRANSFER	२	EPT10 CON	×	689	VON
1	EA	ELEC PANIC HARD	WARE	RX-QEL-98-NL-OP-110MD-CON	×	626	VON
1	EA	RIM CYLINDER		1109 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	90 DEG OFFSET PU	JLL	8190EZHD 18" O		630- 316	IVE
1	EA	SURFACE CLOSER	ł	4111 SCUSH		689	LCN
1	EA	CUSH SHOE SUPP	ORT	4110-30		689	LCN
1	EA	BLADE STOP SPAC	ER	4110-61		689	LCN
1	EA	DOOR SWEEP		39A		А	ZER
1	EA	THRESHOLD		625A		А	ZER
1	EA	WIRE HARNESS		CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	×		SCH
1	EA	WIRE HARNESS		CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY	*		SCH
1	EA	MULTITECH READE	ER	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	DOOR CONTACT		BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY		BY ACCESS CONTROL CONTRACTOR WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	M		B/O

NOTES:

For use on Door #(s): C120A

Each to have:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	112XY EPT		628	IVE
2	EA	POWER TRANSFER	EPT10 CON	×	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-EO-CON	×	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-OP-110MD-CON - RHRA	N	626	VON
1	EA	RIM CYLINDER	1109 - KEY TO EXISTING SYSTEM		626	YAL
1	EA	MORTISE CYLINDER	2153 - KEY TO EXISTING SYSTEM		626	YAL
2	EA	90 DEG OFFSET PULL	8190EZHD 18" O		630- 316	IVE
2	EA	OH STOP	100S		630	GLY
2	EA	SURFACE CLOSER	4111 EDA		689	LCN
2	EA	BLADE STOP SPACER	4110-61		689	LCN
1	EA	MULLION SEAL	8780N		BK	ZER
2	EA	DOOR SWEEP	39A		А	ZER
1	EA	THRESHOLD	625A		А	ZER
2	EA	WIRE HARNESS	CON-XX/XXP (AS REQ'D) - ELECTRIFIED HARDWARE TO POWER TRANSFER (EVALUATE CONDITIONS AND MODIFY WIRE LENGTH AS REQ'D)	×		SCH
2	EA	WIRE HARNESS	CON-6W - WIRE EXTENSION FROM POWER TRANSFER TO POWER SUPPLY			SCH
1	EA	MULTITECH READER	BY ACCESS CONTROL CONTRACTOR	N		B/O
2	EA	DOOR CONTACT	BY ACCESS CONTROL CONTRACTOR	×		B/O
1	EA	POWER SUPPLY	BY ACCESS CONTROL CONTRACTOR WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	*		B/O

NOTES:

For use on Door #(s): C127C C128B

Each to have:

QTY DESCRIPTION

CATALOG NUMBER HARDWARE BY DOOR MANUFACTURER FINISH MFR

END OF SECTION

Appendix C – AV Connection Line Diagrams

Configuration A – Conference Room





Communications by Design

Configuration B – STEM Integrated System

Appendix C – AV Connection Line Diagrams



Communications by Design


