

DISTRICT TECHNOLOGY RENOVATIONS

Technology Request for Bid



Mount Pleasant Public Schools

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DIVISION 00 – BIDDING & CONTRACT REQUIREMENTS

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DIVISION 27 – TECHNOLOGY SYSTEMS

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APPENDICES

<u>Section</u>	<u>Description</u>
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END OF SECTION

SECTION 00 01 15
LIST OF DRAWINGS

<u>File/Name</u>	<u>Description</u>
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NOTE:

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

END OF SECTION

SECTION 00 11 16
INVITATION TO BID

PART 1 - GENERAL

1.01 WORK INCLUDED: DISTRICT TECHNOLOGY RENOVATIONS

A. Mount Pleasant Public Schools (Owner) is seeking bids for purchase and installation of low voltage cabling and classroom multimedia and associated equipment and installation. Proposed systems shall be configured and installed as described herein.

B. Project: DISTRICT TECHNOLOGY RENOVATIONS

C. Owner: Mount Pleasant Public Schools
720 N. Kinney Ave
Mount Pleasant, Michigan 48858

D. Designer: Communications by Design, Inc.

E. Sites of Work:

1. Fancher Elementary
801 S. Kinney Avenue
Mount Pleasant, Michigan 48858
2. Ganiard Elementary
101 S. Adams Street
Mount Pleasant, Michigan 48858
3. McGuire Elementary
4883 E. Crosslanes Street
Mount Pleasant, Michigan 48858
4. Mount Pleasant High School
1155 S. Elizabeth Street
Mount Pleasant, Michigan 48858
5. Mount Pleasant Middle School
440 S. Bradley Street
Mount Pleasant, Michigan 48858
6. Pullen Elementary
251 S. Brown Street
Mount Pleasant, Michigan 48858
7. Vowles Elementary

1560 S. Watson Street
Mount Pleasant, Michigan 48858

1.02 GENERAL DESCRIPTION OF PROJECT SEQUENCE

- A. Sequences and dates specified herein are for information only and indicate the plan and intent of the Owner. Actual dates shall be established based on final award of project.
- B. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner as required to meet schedules.
- C. Schedule:
 - 1. Request for Bid Distributed: February 10, 2023
 - 2. Virtual Pre-Bid Meeting: February 17, 2023 at 12:00pm
 - 3. Intent to Bids Due: February 17, 2023 at 5:00 PM
 - 4. Question and Clarification Deadline: February 17, 2023 at 5:00 PM
 - 5. Public Bids Due: February 24, 2023 at 10:00am

1.03 TYPES OF BIDS

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

1.04 PRE-BID CONFERENCE

- A. A pre-bid conference will be held. A discussion of the project and review of bid documents will be followed by a site review and an opportunity to ask questions. Attendance is highly encouraged for all contractors interested in bidding on any components or portions of this project. Attendance at the pre-bid conference will be a factor considered during evaluation of bids.
- B. Time: February 17, 2023 at 12:00pm
 - 1. Location: Virtual Meeting
Meeting ID – <https://meet.google.com/unb-icns-awo>
Phone Number – (US) +1 352-616-7621
PIN: 533 490 256#

C. Any drawings identified in the table of contents herein will be distributed and reviewed at this conference.

D. Physical building inspections of sites of work will be provided for at this time.

1.05 TIME AND PLACE OF BID RECEPTION

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

B. Bid Receipt Deadline: February 24, 2023 at 10:00am

C. Bid Opening Location: Mount Pleasant Public Schools
Board Room
720 North Kinney Ave.
Mount Pleasant, Michigan 48858

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

1.06 EXAMINATION AND PROCUREMENT OF DOCUMENTS

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

1. Writing – 4101 Sparks Drive Grand Rapids, Michigan 49546

2. Email – rszilagy@cbdconsulting.com

1.07 BID SECURITY

A. Bid security equal to five percent (5%) of the total bid amount, must accompany each base bid in accordance with the Instruction to Bidders.

B. Bid security shall be either a Bid Bond issued by a company licensed in the State of Michigan to furnish bid security or Certified Check made payable to the Owner.

1.08 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.

1.09 DEFINITIONS

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

END OF SECTION

SECTION 00 40 00
BID FORMS

Intent to Bid Form

Complete and submit the following form if you have interest or intend to submit a Bid for this project. Unaltered and completed forms must be received on or before 5:00 PM on February 17, 2023. Only bidders returning a completed "Intent to Bid Form" will be notified of required addenda.

Company Information

Name: _____

Address Line1: _____

Address Line2: _____

City, State and Zip Code _____

Primary Contact Information

Name: _____

Phone No.: _____

Fax. No.: _____

E-Mail Address: _____

Portions of the bid for which you will be responding:

- ☐ Section 27 10 00 - Low Voltage Cabling
- ☐ Section 27 13 23 - Fiber Optic Cable Network
- ☐ Section 27 41 16 - Multimedia Systems
- ☐ Section 27 51 16 - Public Address and Program System

Submit unaltered and completed form to:

Rebecca Szilagy

Communications by Design, Inc.

rszilagy@cbdconsulting.com

SEALED BID LABEL

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

BID TO: Mount Pleasant Public Schools
Attention: Jennifer Verleger
720 N. Kinney Ave
Mount Pleasant, Michigan 48858

BID FROM: _____

PROJECT: DISTRICT TECHNOLOGY RENOVATIONS
TECHNOLOGY BID #3003

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

DUE: February 24, 2023 at 10:00am

BID FORM

BID TO: Mount Pleasant Public Schools
Attention: Jennifer Verleger
720 N. Kinney Ave
Mount Pleasant, Michigan 48858

BID FROM: _____

PROJECT: DISTRICT TECHNOLOGY RENOVATIONS
TECHNOLOGY BID #3003

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

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

Said amount written above constituting the Base Bid

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

Said amount written above constituting the Base Bid

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

Said amount written above constituting the Base Bid

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

TAXES:

Bid sum includes all applicable taxes.

ALLOWANCES:

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

COST OF BONDS:

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

ACKNOWLEDGEMENT OF ADDENDA:

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

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

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

ALTERNATES:

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

Alternate A _____

Alternate B _____

Alternate C _____

Alternate D _____

PRINCIPAL SUBCONTRACTORS

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

Legal Name: _____ Work Proposed _____

Legal Name: _____ Work Proposed _____

Legal Name: _____ Work Proposed _____

BID SECURITY:

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

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

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

FAMILIAL DISCLOSURE:

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

EXCEPTIONS:

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

SIGNATORY AUTHORITY:

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

AGREEMENT:

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

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

Respectfully submitted,

Date: _____

Firm Name: _____

By: _____

Signed: _____

Title: _____

Official Address: _____

Telephone Number: _____

Fax Number: _____

Primary Contact Email Address: _____

(If Corporation, affix Seal)

Michigan Familial Relationship Disclosure Statement

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

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

(Check only one Box Below)

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

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

Bidder

Board or Superintendent

_____	_____
_____	_____
_____	_____
_____	_____

Bidder Authorized Representative:

Bidder: _____

Representative's Signature: _____

Print or Type Name: _____

Representative's Title: _____

Subscribed and sworn this _____ day of _____, 2023.

In the County of _____ State of _____

By _____
Notary Public Signature

Seal or Stamp:

My commission expires on: _____

IRAN LINKED BUSINESS AFFIDAVIT

All Bids shall be accompanied by a sworn statement disclosing any Iran Linked Business relationship that exists within the owners, including its officers, directors, and employees.

The undersigned, owner or authorized officer of

_____ (bidder), pursuant to Michigan Public Act No. 517 of 2012, the "Iran Linked Business" requirement provided in the Mount Pleasant Public Schools Proposals hereby represents and warrants that the bidder, including its officers, directors and employees, is not an "Iran Linked Business" within the meaning of the applicable Public Act, and that in the event bidder is awarded a contract as a result of this RFB, the bidder will not become an "Iran Linked Business" at any time during the course of performing under the contract. The bidder further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than \$250,000.00 or 2 times the amount of the contract or proposed contract for which the false certification was made, whichever is greater, the cost of the District investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on future Requests for Bids for three (3) years from the date that it is determined that the person has submitted the false certification.

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

Bidder:

[Company Name]

[Signature]

[Title]

Notary:

This instrument was acknowledged before me, a Notary Public in and for

_____ County, on this

_____ day of _____, 20____.

[Notary Public Signature]

My Commission expires: _____

Acting in the County of: _____

REFERENCES

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

Date of completion: _____

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

Date of completion: _____

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

Date of completion: _____

CONTRACT EXCEPTIONS

Check one Box

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

☐ Bidder proposes the following exceptions to the Contract Documents:

<i>Paragraph Number</i>	<i>Explanation</i>
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>
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<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>

NOTE:

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

SCHEDULE OF VALUES/BID FORM

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

Bidder: _____

Bid Division:27 10 00

[illegible]

SCHEDULE OF VALUES/BID FORM

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

Bidder: _____

Bid Division:27 13 23

[illegible]

SCHEDULE OF VALUES/BID FORM

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

Bidder: _____

Bid Division:27 41 16

[illegible]

SCHEDULE OF VALUES/BID FORM

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

Bidder: _____

Bid Division:27 51 16

[illegible]

END OF SECTION

SECTION 00 21 13
INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 OWNERSHIP

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

1.02 COMPLIANCE

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

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

1.03 NOTICE AND RESPONSE

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

1.04 PROTECTION AND SAFETY

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

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

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

1.05 DRAWINGS DIAGRAMS AND ILLUSTRATIONS

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

PART 2 - MATERIALS

2.01 VOLUNTARY ALTERNATES AND SUBSTITUTION OF SPECIFIED PRODUCTS

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

PART 3 - EXECUTION

3.01 EXAMINATION OF DOCUMENTS AND SITE

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

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

3.02 QUESTIONS, INTERPRETATIONS, AND ADDENDA

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

3.03 BID SECURITY, BONDS, AND INSURANCE

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

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

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

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

3.04 MODIFICATION AND WITHDRAWAL

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

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

3.05 CODES, ORDINANCES, REGULATIONS AND RELATED

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

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

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

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

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

3.06 SUB-CONTRACTOR AND MATERIAL SUPPLIER

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

3.07 BID RESPONSE FORMAT

- A. Bidder shall provide complete Bid copies in two formats as described herein.
 - 1. One (1) Hard copy format responses shall be in a bound tabulated format. Each response shall have tab indicators for each section.
 - 2. One (1) Electronic copy format responses shall be submitted on a USB Drive, readable by a standard Microsoft Windows 11 workstation. Electronic media shall contain separate folders to organize response documentation as described herein. Files submitted electronically shall be ***Adobe Acrobat*** "PDF" format (SCHEDULE OF VALUES is additionally required to be on the disk in the appropriate folder as a Microsoft Excel compatible spreadsheet and as described herein).
- B. All Bid Response formats shall be clearly externally marked to include, but not be limited to:
 - 1. Bidder identification.
 - 2. Project Owner identification.
 - 3. Project name.
 - 4. Bid submission date.

- C. Bid Responses shall include an index containing copies/PDF of a complete index of documents comprising Bid Response. Responses shall include, but not be limited to the following tabbed/folder sections:
1. Section 1 – Forms, which shall contain copies/PDF files of all required and completed bid forms.
 - a. BID FORM
 - b. Michigan Familial Relationship Disclosure Statement
 - c. REFERENCES
 - d. CONTRACT EXCEPTIONS
 - e. SCHEDULE(s) OF VALUES
 - f. BID BOND
 2. Section 2 – Overview, which shall contain copies/PDF files of cover letter and/or executive overview.
 3. Section 3 – Submittals, which shall contain copies/PDF files of all required and voluntary submittals.
 4. Section 4 – Appendices, which shall contain copies/PDF files of other reference materials Bidder wishes to or is required to submit.

3.08 AWARD OF CONTRACT

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

and responsibilities of Bidder binding upon issuance. Notice to Proceed, once issued, shall become an inseparable part of the contract documents herein, and constitute both Bidder and Owner's acceptance of contract.

3.09 TIME, SCHEDULES, PROJECT MANAGEMENT, MEETINGS AND PLANS

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

discretion, the Project Manager is not fulfilling the full responsibilities of the position. Failure by Contractor to provide adequate Project Manager meeting requirements of the Owner, may result in Contract termination.

3.10 CHANGES IN THE WORK

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

3.11 PAYMENT REQUESTS AND PAYMENTS

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

completion and close out of the project or project phase as determined by Owner and Designer.

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

END OF SECTION

SECTION 00 65 00
CONTRACT CLOSE OUT

PART 1 - GENERAL

1.01 WORK INCLUDED

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

1.02 SUBSTANTIAL COMPLETION

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

PART 2 - MATERIALS

2.01 NOT USED FOR THIS SECTION

PART 3 - EXECUTION

3.01 PROCEDURES

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

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

END OF SECTION

SECTION 27 10 00
LOW VOLTAGE CABLING

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

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

1.02 DRAWINGS

- A. Drawings show the location and general arrangement of equipment, systems and related items. They shall be followed as closely as elements of construction permit.
- B. Examine drawings of other trades and verify conditions of work sites. Arrange work accordingly.
- C. Deviations from drawings, with the exception of minor changes in routing and other such incidental changes not affecting functionality or serviceability of systems, shall not be made without written approval of Architect/Engineer.

1.03 WARRANTY

- A. Complete installation shall be free from defect and/or failure for a period of fifteen (15) years. Any replacement, upgrade or fix, including labor for any non-conforming or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.
- B. Manufacturer's warranty shall be provided for all components of the system.
 - 1. Any paperwork and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.
 - 2. Contractor shall submit all paperwork, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.
- C. On site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.
 - 1. Contractor shall provide response times for all malfunctioning equipment of two (2) business days or less.
 - 2. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.

1.04 SUBMITTALS

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

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

1.05 REFERENCE STANDARDS

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

1.06 CONTRACTOR

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

Certification of such training shall promptly be provided if requested by Architect/Engineer.

- D. The Contractor shall have a proven track record in structured cable configuration and installation. This must be shown by the inclusion of references of at least three (3) projects involving the installation of similar systems completed by the Contractor in the prior two (2) years on unaltered forms with the sealed Bid as provided herein.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

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

2.02 COPPER CABLE

- A. Station Cable shall meet or exceed:
 - 1. Four (4) pair Category 6 Unshielded Twisted Pair (UTP) cable.
 - 2. All wiring not installed in conduit shall be plenum type cable and shall be so identified with continuous marking.

3. Twenty-three (23) AWG
 4. Compliant as per EIA/TIA-36 specifications
 5. Certified under UL's LAN Cable Certification Program
- B. All cables shall be terminated for T568B compliant connection.
- C. Coordinate cable color(s) with Owner requirements prior to installation.

2.03 CROSS CONNECT EQUIPMENT

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

2.04 WIRING DEVICES

- A. All station cable shall terminate on modular jacks that meet or exceed:
1. Category 6 compliant
 2. 8 position T568B compliant modular female jack.
 3. Modular jacks that terminate above finished ceiling will be plenum rated.
 4. Snap-in, high impact housing
 5. Field verify and coordinate insert color to match Owner requirements.
 6. Field verify and coordinate plates and/or outlet frame colors and materials to coordinate with electrical devices and Owner requirements.
 7. Where station cable is to terminate above finished ceiling or behind a finished wall for cameras, speakers, or other special station devices,

modular jack may be surface mounted in appropriate high strength, impact resistant plenum rated plastic enclosure.

8. Furnish and install matching coordinating blank cover plates for all unused communications outlets indicated on drawings.
9. Mount flush plates so all four edges are in continuous contact with finished surfaces.
10. Furnish and install smear resistant, mechanically imprinted polyester or similar material labels to identify each port of all patch panels (fiber optic and copper) in compliance with EIA/TIA 606 standards or Owner required scheme. Labels shall be permanently affixed to modular jack.

2.05 OWNER STANDARDS

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

2.06 PROJECT CABLE CONFIGURATIONS

- A. See Appendix A – Communication Drawings for cable locations and quantity.
- B. Wall Data Outlet
 1. Contractor shall provide data outlets including, but not limited to:
 - a. UTP station cable(s) terminated on compliant patch panel in nearest IDF and wire devices in a single box location.
 - b. Wire device(s) shall be installed in standard keystone insert with six (6) positions. All unused positions shall be blanked.
 - c. Faceplate compliant with Owner standards shall be provided.
 2. Outlet shall be provided at each location indicated on drawings, noting the number of station cables to be terminated.

3. Raceway shall be existing or provided by Others.

C. Above Ceiling Outlet

1. Contractor shall provide above ceiling outlets including, but not limited to:
 - a. UTP station cable(s) terminated on compliant patch panel in nearest IDF and wire device with a single surface mounted biscuit jack.
 - b. Device location shall be as indicated on drawings and above finished ceiling/surface, but accessible for station connection.
 - c. Surface mount device box shall be bright in color and/or contain a permanently attached brightly colored reflective identification label to facilitate visual location of connection point behind finished surfaces.
2. Outlet shall be provided at each location indicated on drawings, noting the number of station cables to be terminated.

D. Floor Box, Raceway and Furniture Outlets

1. Contractor shall provide floor box, raceway and furniture outlets including, but not limited to:
 - a. UTP station cable(s) terminated on compliant patch panel in nearest IDF and wire device with appropriate frame and plate for a compliant installation.
 - b. Wire device(s) shall be installed in standard keystone insert with necessary positions. All unused positions shall be blanked.
 - c. Faceplate compliant with Owner standards shall be provided.
2. Outlet shall be provided at each location indicated on drawings, noting the number of station cables to be terminated.

2.07 MIDDLE SCHOOL PAGING HEAD END RELOCATION

- A. Contractor shall relocate existing Mount Pleasant Public Schools Middle School paging head end to adjacent IDF.
1. Contractor shall supply plenum rated box above new finished air plenum ceiling to consolidate existing analog speaker cabling. Contractor shall carefully pull back, label and rework cabling as necessary.
 2. Contractor shall extend all necessary cabling into new rack location for a fully functional system.

3. Contractor shall fully test existing paging system to identify any non-functional areas prior to beginning rack move work.
4. Contractor shall fully test moved paging system after installation to verify a fully functional paging system.

2.08 MIDDLE SCHOOL OFFICE AREA PAGING PLENUM CABLE INSTALLATION

- A. Contractor shall rewire and reinstall existing analog speakers with new plenum rated cable. Existing speakers are to be reused and reworked as necessary for a fully functional system.
- B. All existing non-plenum rated analog speaker cabling shall be completely removed from new Middle School office air plenum.
- C. Existing speakers shall be removed from existing acoustical ceiling tiles and cut into new tiles provided by Others.

2.09 ANALOG PAGING SPEAKER INSTALLATION AND CABLING

- A. Contractor shall supply surface mount or recessed 25v paging speakers, cabling and installation in locations identified on diagrams in both High School and Middle School weight rooms and adjacent areas.
- B. Contractor shall supply all plenum rated cable to connect speakers to existing speaker zones.

2.10 ALLOWANCES

- A. Contractor shall include allowances for contract service reimbursements as required in base bid lump sum amount(s).
 1. Allowance shall be made in the amount of \$20,000.00 for Owner directed infrastructure upgrades.
- B. Contract services shall be provided and sourced at Owner's discretion, direction and convenience with full cooperation by Contractor, and paid for from successful bidder's contract in the amount(s) provided for herein.
- C. Any allowance amount proving to be excessive for the intended equipment and/or contract services shall be credited to the Owner against contract payment requests.
- D. No material or labor charges and/or mark-ups or margins will be permitted on allowance expenditures approved by Owner and Designer.

PART 3 - EXECUTION

3.01 PREPARATION

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

3.02 DEMOLITION

- A. Contractor shall remove and dispose of all non-plenum rated cable in new Middle School office plenum ceiling. All existing plenum rated data cabling will be retained and left for future use.
- B. Contractor shall remove and reinstall existing analog paging speakers as necessary in Middle School and Fancher Elementary hallway and classroom locations as selective construction ceiling demolition takes place. See Appendix D – Construction Demolition Diagrams for demolition scope. Speakers and to be taken down, stored in Owner provided location and reinstalled as necessary for a fully functional system.

3.03 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 not acceptable.
6. The Contractor shall label all cables, jacks, patch panel positions, faceplates and cross connects.
7. In-line cable splicing shall not be permitted.
8. Contractor shall provide 10’ minimum service loop above accessible ceiling for each terminated cable in pole access for modular furniture to accommodate future changes.
9. Length of each individual run of horizontal cable from the MDF/IDF to the information outlet shall not exceed 90 meters (295 ft.).
10. IDF(s) and MDF locations have been identified in the appendices herein. Contractor shall calculate distances to ensure the adherence to the EIA/TIA 568 distance limitations. Contractor shall notify Architect/Engineer of cable length exceptions prior to installation in writing and request direction.
11. All copper data cabling shall terminate on Category 6 compliant connectors. Approximately 10 ft. of Category 6 and/or fiber cabling shall be coiled and stored at each cable distribution center in order to accommodate future change.
12. Wiring not installed in conduit shall not be routed within 18 inches of light fixture ballasts or within 36 inches of motors or transformers.
13. Coordinate cable colors with Owner requirements prior to installation.
14. Contractor shall include any sleeves where wall penetrations are needed as identified on provided communications drawings. Sleeves shall be a minimum of 2”. All installed sleeves shall be fully fire stopped with compliant fire stop material following cable installation. If other wall penetrations are required to complete work but are not identified on provided drawings, contractor shall supply 1 - 2” sleeve.

15. Provide backboards, properly treated for fire retardation in locations with new racks and required by site conditions.

E. Sites of Work:

1. Fancher Elementary
801 S. Kinney Avenue
Mount Pleasant, Michigan 48858
2. Ganiard Elementary
101 S. Adams Street
Mount Pleasant, Michigan 48858
3. McGuire Elementary
4883 E. Crosslanes Street
Mount Pleasant, Michigan 48858
4. Mount Pleasant High School
1155 S. Elizabeth Street
Mount Pleasant, Michigan 48858
5. Mount Pleasant Middle School
440 S. Bradley Street
Mount Pleasant, Michigan 48858
6. Pullen Elementary
251 S. Brown Street
Mount Pleasant, Michigan 48858
7. Vowles Elementary
1560 S. Watson Street
Mount Pleasant, Michigan 48858

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

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

3.04 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.

3.05 TESTING

- A. End to end testing of UTP copper Category 6 cables shall be conducted at 350 Mhz to meet or exceed reference standards. 100% of all pairs shall be tested. Documentation of test results shall be provided including, but not limited to the following parameters:

- 1. Attenuation.
- 2. Near End Cross Talk (NEXT).
- 3. Signal to noise ratio.
- 4. Continuity
- 5. Pair integrity
- 6. EMI interference.
- 7. Any cable that does not meet EIA/TIA 568 specifications shall be repaired or replaced at the Contractor's expense.
- 8. Cable length.

3.06 TRAINING

- A. Not Used.

3.07 SCHEDULE, MEETINGS AND PLANS

- A. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.

- B. Schedule

- 1. Post bid Interviews: Week of February 27, 2023
- 2. Contractor Chosen: Week of March 6, 2023
- 3. Work Commences: June 1, 2023

- 4. Substantial Completion of Project: August 15, 2023
- 5. Project Close-out: November 1, 2023
- C. All work shall be coordinated with Owner's construction manager on site.
- D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.
- E. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner, documented herein, required by Architect/Engineer, Architect and/or Construction Manager and as required to meet schedule.

END OF SECTION

SECTION 27 13 23
FIBER OPTIC CABLE NETWORK

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to internal and external plant fiber optic network backbone upgrades of the Mount Pleasant Public Schools private fiber optic network infrastructure.
- B. The Owner has identified MDF/IDF locations in selected buildings to receive new and reworked fiber optic cabling. New internal and external single mode fiber optic cable shall be installed to connect new and existing internal data cabinets.
- C. Sites of Work:
 - 1. Mount Pleasant High School
1155 S. Elizabeth Street
Mount Pleasant, Michigan 48858
 - 2. Mount Pleasant Middle School
440 S. Bradley Street
Mount Pleasant, Michigan 48858

1.02 WORK INCLUDED

- A. Work includes, but is not limited to, the following:
- B. A single outdoor rated twelve (12) strand OS1 single mode (SMF) armored fiber optic cable installed between buildings/locations identified in this document and as identified on Appendix B – Fiber Path.
 - 1. Contractor shall provide pricing for fiber connectivity in the following locations.
 - a. Mount Pleasant High School MDF
 - 1. Mount Pleasant Football Field Press Box IDF
 - b. Mount Pleasant Middle School MDF
 - 1. Mount Pleasant Transportation Building
 - 2. Work includes, but is not limited to, the following:

3. Contractor shall carefully pull exterior single mode cable to buildings in pathway provided by Others.
4. New OS1 fiber optic cables shall be terminated on Contractor supplied enclosure shelf with LC connectors.
5. All 12 strands are to be terminated and tested.

C. Connectors and couplers.

D. Adequate cable support in existing or new raceway system as may be required for efficient and effective cable routing.

E. Rack mounted termination enclosure shelves.

F. Storage Loops

1. Installed prior to cable entry to cabinet or rack where termination is completed with fifteen (15) feet of stored cable.

1.03 The Contractor shall design, engineer, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant backbone fiber network connections, complete as specified herein.

1.04 Contractor shall coordinate their installation with other communication systems, contractors, Designer and the Owner as is appropriate.

1.05 DRAWINGS

- A. Drawings show the location and general arrangement of equipment, systems and related items. They shall be followed as closely as elements of construction permit.
- B. Examine drawings of other trades and verify conditions of work sites. Arrange work accordingly.
- C. Deviations from drawings, with the exception of minor changes in routing and other such incidental changes not affecting functionality or serviceability of systems, shall not be made without written approval of Architect/Engineer.

1.06 REFERENCE STANDARDS

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

3. EIA/TIA Commercial and Administration Standards
4. NEC
5. BICSI
6. UL
7. MOSHA Safety Standards
8. IEC
9. IEEE

1.07 WARRANTY

- A. Complete installation shall be free from defect and/or failure for a period of fifteen (15) years. Any replacement, upgrade or fix, including labor for any non-conforming or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner
- B. Manufacturer's warranty shall be provided for all components of the system.
 1. Any paperwork and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.
 2. Contractor shall submit all paperwork, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.
- C. On site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.

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

1. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter
- D. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have no 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. 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. The district will rely on such schedules to coordinate and otherwise plan the work of the District, other separate contractors, or the District's routine daily work.

- E. Determination of acceptance of proposed equal equipment is at the sole discretion of the Designer/Owner.

1.10 CONTRACTOR

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

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturer of major components of the Fiber Optic Network shall be a known and leading entity in the cabling and/or connector field, and shall have been designing, manufacturing and installing similar components for a period of no less than four (4) years.
- B. Acceptable Manufacturers (In alphabetical order):

1. Belden
 2. Berk-Tek
 3. CommScope
 4. Hubbell
 5. Lucent
 6. Siecor / Corning Cable Systems
- C. Network shall be constructed using industry standards and as specified herein.
- D. Contractor shall provide all dielectric fiber optic cable and termination components. All provided and installed fiber components shall comply with ANSI/TIA/EIA 568C specifications.
- E. All indoor single mode fiber optic cables shall meet or exceed the following specifications or performance requirements:
1. Installed cable shall be single mode graded index glass fiber.
 2. All materials in the cable are to be dielectric.
 3. 8.3-micron core diameter size
 4. 125-micron cladding diameter
 5. Maximum Attenuation
 - a. 1310nm: 0.5 dB/km
 - b. 1550nm: 0.5 dB/km
 6. Tight buffered
 7. EIA/TIA – 598 color coding for fiber optic cable
 8. Indoor plenum rated
 9. Capable of bend radius as small as 20 x outside cable diameter (under installation load) and 10 x outside cable diameter (long term load).
- F. All outdoor single mode fiber optic cables shall meet or exceed the following specifications or performance requirements:
1. Cable shall be armored.

2. Installed cable shall be single mode graded index glass fiber.
3. All materials in the cable are to be dielectric.
4. 8.3-micron core diameter size
5. 125-micron cladding diameter
6. Maximum Attenuation
 - a. 1310nm: 0.5 dB/km
 - b. 1550nm: 0.5 dB/km
7. Tight buffered
8. EIA/TIA – 598 color coding for fiber optic cable
9. Rated for outdoor use.
10. Capable of bend radius as small as 20 x outside cable diameter (under installation load) and 10 x outside cable diameter (long term load).

G. All indicated fibers shall be terminated on high quality IEC 61754 compliant LC connectors at head end locations (MDF). Total optical attenuation through the cross connect from any terminated fiber to any other terminated fiber shall not exceed .5 dB. All optical fiber shall be handled, installed, and supported as per manufacturer recommendations.

2.02 Contractor shall supply new fiber patch cables for MDF and IDF locations.

A. Four (4) – 3-meter, OS1 LC to LC single mode fiber patch cables shall be provided for connection to network equipment provided by Others.

2.03 Contractor shall provide termination shelves to support newly installed optical fiber. Fiber termination shelves shall meet or exceed the following specifications:

A. Rack mountable - 1U

1. Where fiber densities are greater than can be accommodated in 1U, larger enclosures will be permitted.

B. Provide security and protection.

C. Be accessible from both front and rear.

D. Provide adequate strain relief for cables.

- 2.04 Contractor shall supply non-metallic flexible innerduct for all fiber optic paths and install provided cabling within. Armored cable will be considered equivalent in lieu of fiber optic cabling with innerduct. All other specifications identified herein will still be required.
- 2.05 Supply most current version of all products provided.
 - A. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.
 - B. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.
- 2.06 Furnish only new, first-class quality materials and equipment.
- 2.07 System shall be comprised of interoperable components.

PART 3 - EXECUTION

3.01 PREPARATION

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

3.02 DEMOLITION

- A. Contractor shall fully remove existing fiber cable and innerduct (if applicable) at both High School and Middle School locations during installation of new cable.
- B. Contractor shall reconnect and rework existing 10 pair copper cable at Middle School site to Transportation building. Contractor shall install new section of cable and splice cable as necessary at both hand hole locations on each side of new driveway.

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

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

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

3.04 TESTING

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

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

3.05 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.

3.06 TRAINING

- A. Not Used

3.07 SCHEDULE, MEETINGS AND PLANS

- A. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.
- B. Schedule
 1. Post bid Interviews: Week of February 27, 2023
 2. Contractor Chosen: Week of March 6, 2023
 3. Work Commences: June 1, 2023
 4. Substantial Completion of Project: August 15, 2023
 5. Project Close-out: November 1, 2023
- C. All work shall be coordinated with Owner's construction manager on site.
- D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.
- E. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner, documented herein, required by Architect/Engineer, Architect and/or Construction Manager and as required to meet schedule.

END OF SECTION

SECTION 27 41 16
MULTIMEDIA SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

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

1.02 WARRANTY

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

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

1.03 SUBMITTALS

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

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

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

1.04 REFERENCE SPECIFICATIONS

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

1.05 CONTRACTOR

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

PART 2 - PRODUCTS

2.01 Acceptable Manufacturers

- A. Acceptable manufacturers have been provided to comply with a standard for individual components associated with the specified system. Indicated components include particular models and makes currently installed and/or preferred by Owner.

- B. Any system bid shall be based only on acceptable manufacturer's components.
- 2.02 Supply most current version of all products provided.
- A. Manufacturer shall have five (5) years of experience and history manufacturing similar products to those specified.
 - B. Proposed components shall have been field tested and proven in actual use.
 - C. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.
 - D. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.
- 2.03 Furnish only new, first-class quality materials and equipment.
- 2.04 SPECIAL CONFIGURATION LOCATIONS
- A. CONFIGURATION A**
- 1. Contractor shall supply one (1) of the specified configurations in each of the following locations.
 - a. Middle School Cafeteria
 - 2. One (1) Projector
 - a. Acceptable Manufacturer(s)
 - 1. Epson
 - A EB-PU1008W
 - b. 8,500 Lumens
 - c. Projector shall be provided with appropriate lens for an approximate 25' throw to fill a 13.5' wide front projection system with a 16:9 ratio projected image.
 - d. Projector shall be securely installed and affixed to mounting system and downpipe that is structurally attached to finished ceiling. Contractor shall supply appropriate mount and downpipe to securely and safely extend projector to optimal location for projection onto screen.

- e. Projector shall be connected to supplied Crestron control system to receive transmission of signal from supplied input locations.
- 3. One (1) Multimedia Processor
 - a. Acceptable Manufacturer(s)
 - 1. CRESTRON
 - A CP4
 - 2. QSC
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in existing AV rack.
 - c. Contractor shall provide all control, communication, audio and video patch cables to connect input and output ports to all Contractor provided materials.
 - d. Contractor shall program Multimedia processor to integrate with Contractor provided powered roll-up screen and projector. Contractor shall supply all necessary cabling and programming to fully enable integration with control system.
 - e. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - f. Contractor shall provide and install fully compliant shielded cabling and any other low voltage communication infrastructure needed to fully connect to the projection system from one (1) input plates and one (1) wireless presentation system. Cable shall meet or exceed Crestron requirements for NVX systems.
 - g. Contractor shall completely integrate control system and multimedia systems with provided audio system.
- 4. One (1) multimedia input location shall be provided.
 - a. Acceptable Manufacturer(s)
 - 1. CRESTRON
 - A DM-NVX
 - 2. QSC

- b. AV input to be installed in double gang box provided by Others, Contractor shall supply stainless steel plate for fully finished installation.
 - c. Contractor shall supply correct in-plate DM transmit and receive equipment to extend input location to supplied NVX encoder.
 - d. Contractor will supply all necessary NVX decoder equipment to connect supplied projector.
 - e. Valid video input into the system shall turn on system automatically.
 - f. System shall power down after ten (10) minutes of no video signal.
 - g. NVX units shall properly scale input image to projector to optimal resolution.
5. One (1) Touch Screen(s) shall be provided
- a. Acceptable Manufacturer(s)
 - 1. CRESTRON
 - A TSW-770-B-S
 - 2. QSC
 - b. Touch Screen(s) shall be provided to control system operations.
 - 1. Connect touch screens to supplied NVX control system as per manufacturer installation instructions.
 - 2. Provide all necessary cabling, mounts and accessories to securely mount touch screen to provided raceway.
 - 3. Control touch screen shall be provided in locations specified herein that shall provide the following functions but not limited to.
 - A System Power On
 - B System Power Off
 - C Select Source, input 1 or wireless presentation system
 - D Control Provided LED Panels
 - E Audio Level Increase
 - F Audio Level Decrease

G Image Freeze

H Audio Mute

- c. Contractor shall provide all control, communication, audio and video patch cables, transmitters and receivers to connect input and output ports to all Contractor and Owner provided materials in the space.
- d. Contractor shall program Multimedia Control System to integrate with Owner provided motorized electric screens.

6. One (1) Powered Rollup Projection Screen

a. Acceptable Manufacturer(s)

1. DA-LITE

A Tensioned Cosmopolitan Electrol

2. DRAPER

- b. Powered Rollup Projection Screen shall meet or exceed the following minimum requirements:
- c. 92" x 164" – Wide (16:9) Format
- d. White powder coated finish
- e. Surface mount
- f. Matte white screen surface
- g. c
- h. Low voltage control RS-232 capable

7. One (1) Wireless Presentation System

a. Acceptable Manufacturers (in alphabetical order):

1. KRAMER

A VIA GO 2

- b. Wireless Presentation System shall meet or exceed the following requirements:
 - 1. HDMI output with support for up to 4K@30Hz.

2. Gigabit LAN and dual-band 802.11ac Wireless connectivity
3. 4GB Memory
4. 32GB Storage
5. All other features currently a part of the manufacturer's latest commercial release.
6. All necessary cables, mounting brackets and connectors to securely mount Wireless presentation system in Contractor provided rack.
- c. Contractor shall integrate wireless presentation system with provided Crestron control system.
- d. Contractor shall coordinate installation and configuration of Wireless Presentation System per manufacturer recommended guidelines. Contractor shall work collaboratively as necessary with Owner and network support resources for a complete and compliant installation.
- e. Contractor shall supply and install all necessary patch cables to connect equipment to network and in data closet location. Contractor shall cross connect equipment in data closet and report to Owner data closet, switch and port location for programming.
8. Two (2) Voice Amplification System(s) shall be provided and installed
 - a. Acceptable Manufacturer(s)
 1. SENNHEISER
 2. SHURE – QLXD4
 3. Or Equal.
 - b. Handheld and Lavalier microphone combo
 - c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire gymnasium.
 - d. Contractor shall supply all mounting hardware to securely mount equipment into Owner supplied rack.
9. Sixteen (16) Speakers shall be provided and installed
 - a. Acceptable Manufacturer(s)
 1. Harman/JBL Pro

A JBL CONTROL 18C/T

2. Or Equal

- b. Passive 2-way full range speaker
- c. 8" Low Frequency Driver, 1-inch Voice Coil
- d. 180W peak
- e. 8 ohms
- f. 94 dB sensitivity
- g. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
- h. Contractor shall safely and securely mount speakers to cafeteria ceiling structure using manufacturer recommended and industry best practices.
- i. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.
- j. Contractor shall supply and install properly sized speaker cabling to support supplied speakers.
- k. Speakers shall be white in color.

10. One (1) Mixer/DSP shall be provided and installed.

- a. Acceptable Manufacturer(s)
 - 1. Biamp/Community
 - 2. Peavey
 - 3. Symetrix
 - 4. QSC
 - 5. Or Equal
- b. System shall be populated with necessary accessories for 4 line-level input audio channels.
- c. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
- d. Contractor shall supply all necessary labor to configure Mixer/DSP.

- e. Contractor shall integrate DSP with provided Crestron touchscreen and control system
 - f. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - g. Contractor shall supply all cables and accessories for a fully functional system.
11. One (1) Amplification System shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. HARMAN/JBL PRO
 - A CSA2300Z
 - 2. Or Equal
 - b. Two (2) input channels
 - c. Two (2) output channels
 - d. 300W maximum output per channel
 - e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB
12. One (1) CD/Bluetooth Player shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. DENON
 - A DN300Z
 - 2. Or Equal.
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - c. Contractor shall provide all audio cables and accessories to integrate CD/Bluetooth player with provided DSP/Mixer system.
13. One (1) Remote input location(s) shall be provided and installed.

- a. Remote input location shall provide XLR and 3.5mm connectivity in identified locations.
- b. Contractor shall supply all cabling, faceplates and accessories for a complete installation.
- c. Contractor shall integrate XLR and 3.5mm connection into provided DSP/Mixer system.

B. CONFIGURATION B

- 1. Contractor shall supply one (1) of the specified configuration(s) in the following locations:
 - a. Fancher Elementary - Cafeteria
- 2. One (1) Projector
 - a. Acceptable Manufacturer(s)
 - 1. EPSON
 - A L630U
 - b. 6,300 Lumens
 - c. Projector shall be installed and positioned for the projected image to completely fill Contractor provided powered rollup screen.
 - d. Projector shall be securely installed and affixed to mounting system and downpipe that is structurally attached to finished ceiling. Contractor shall supply appropriate mount and downpipe to securely and safely extend projector to optimal location for projection onto Contractor provided screen.
 - e. Provided white projector downpipe shall allow routing of projector cabling internally.
 - f. Contractor shall supply and install all necessary patch cables to connect equipment to network and in data closet location. Contractor shall cross connect equipment in data closet and report to Owner data closet, switch and port location for programming.
 - g. Projector shall be manually controlled with supplied projector remote.
- 3. One (1) Multimedia Input Location(s) shall be provided.
 - a. Acceptable Manufacturer(s)

1. CRESTRON
 - A HD-TX-101-C-1G-E-B-T
2. QSC
3. Or Equal.
- b. 4K60 signal
- c. Contractor shall supply correct DM-Lite receiver at projector location.
- d. Contractor shall supply appropriate stainless-steel faceplate to integrate transmitter into supplied metallic raceway.
4. One (1) Powered Rollup Projection Screen
 - a. Acceptable Manufacturer(s)
 1. DA-LITE
 - A Tensioned Cosmopolitan Electrol
 2. DRAPER
 - b. Powered Rollup Projection Screen shall meet or exceed the following minimum requirements:
 - c. 78" x 139" – Wide (16:9) Format
 - d. White case
 - e. Surface mount
 - f. Matte white screen surface
 - g. Low voltage control RS-232 capable
 - h. Three (3) feet of additional black screen drop
 - i. Contractor shall supply low voltage control screen switch to be mounted in provided raceway. Contractor shall supply all parts, labor and accessories for a fully functional system.
5. One (1) Rack System(s) shall be provided and installed
 - a. Acceptable Manufacturer(s)
 1. Middle Atlantic

A DWR-12-26PD

2. Or Equal.

- b. Wall Mount
- c. 12U
- d. Plexiglas Locking Door
- e. Forward rackrail
- f. UL Load Capacity 200 lbs
- g. 26" usable depth
- h. 21" usable height
- i. Contractor to supply 8-Outlet PDU (Middle Atlantic PD-815R or Equal).

6. One (1) Wireless Presentation System shall be provided and installed.

a. Acceptable Manufacturers (in alphabetical order):

1. KRAMER

A VIA GO2

- 2. HDMI output with support for up to 4K30Hz video streaming
- 3. Gigabit LAN and dual-band 802.11ac Wireless connectivity
- 4. 4GB Memory
- 5. 32GB Storage
- 6. 3.5mm Audio Output
- 7. All other features currently a part of the manufacturer's latest commercial release.

b. Cables and Accessories

- 1. 3' HDMI cable for connectivity to switcher
- 2. All necessary mounting brackets and connectors to securely mount at teacher input location.

3. Work includes extending Ethernet Category 6 compliant patch cables from installed equipment, as required, to Owner identified connection ports at all locations.
 - A Patch cables shall not exceed fifteen (15) feet in length.
 4. Material and labor to cross connect wireless presentation systems in communication closets to PoE switches shall be provided by Contractor using provided Category 6 patch cables.
 - A Cable lengths shall be appropriate for connections made, and not include excessive cable.
 - B Coordinate all work with Owner, Designer and other contractors prior to installation.
 5. Contractor shall coordinate installation and configuration of Wireless Presentation System per manufacturer recommended guidelines. Contractor shall work collaboratively as necessary with Owner and network support resources for a complete and compliant installation.
7. One (1) Voice Amplification System(s) shall be provided and installed
- a. Acceptable Manufacturer(s)
 1. SENNHEISER
 2. SHURE – QLXD4
 3. Or Equal.
 - b. Handheld and Lavalier microphone combo
 - c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire gymnasium.
 - d. Contractor shall supply all mounting hardware to securely mount equipment into Contractor supplied rack.
 - e. Contractor shall supply 3U drawer to store microphone in Contractor supplied rack.
8. Eight (8) Speakers shall be provided and installed
- a. Acceptable Manufacturer(s)
 1. Harman/JBL Pro

A JBL CONTROL 18C/T

2. Or Equal

- b. Passive 2-way full range speaker
- c. 8" Low Frequency Driver, 1-inch Voice Coil
- d. 180W peak
- e. 8 ohms
- f. 94 dB sensitivity
- g. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
- h. Contractor shall safely and securely mount speakers to cafeteria ceiling structure using manufacturer recommended and industry best practices.
- i. Contractor shall include any necessary backbox and speaker protection for a fully functional and compliant system where applicable.
- j. Contractor shall supply and install properly sized speaker cabling to support supplied speakers.
- k. Speakers shall be white in color.

9. One (1) Mixer shall be provided and installed.

- a. Acceptable Manufacturer(s)
 - 1. BIAMP/COMMUNITY
 - 2. HARMAN/JBL PRO

A CSM 28

3. QSC

4. Or Equal.

- b. System shall be populated with necessary accessories for 8 line-level input audio channels.
- c. System shall be populated with necessary accessories for 2 line-level output audio channels.

- d. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - e. Contractor shall supply all necessary labor to configure Mixer.
 - f. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - g. Contractor shall supply all cables and accessories for a fully functional system.
10. One (1) Amplification System shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. Harman/JBL Pro
 - A CSA2300Z
 - 2. Or Equal
 - b. Two (2) input channels
 - c. Two (2) output channels
 - d. 300W maximum output per channel
 - e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB
11. One (1) CD/Bluetooth Player shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. DENON
 - A DN300Z
 - 2. Or Equal.
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - c. Contractor shall provide all audio cables and accessories to integrate CD/Bluetooth player with provided Mixer system.
12. One (1) Remote input location(s) shall be provided and installed.

- a. Remote input location shall provide XLR and 3.5mm connectivity in identified locations.
- b. Contractor shall supply all cabling, faceplates and accessories for a complete installation.
- c. Contractor shall integrate XLR and 3.5mm connection into provided DSP/Mixer system.

C. CONFIGURATION C

- 1. Contractor shall supply one (1) of the specified configuration in the following locations:
 - a. Middle School – Office Conference Room
- 2. One (1) Interactive LED Monitor(s)
 - a. Acceptable Manufacturer(s)
 - 1. NEWLINE
 - A TT6521Q
 - b. LED Monitor shall meet or exceed the following minimum requirements:
 - 1. 65” diagonal
 - 2. Brightness 400 cd/m
 - 3. 8ms refresh rate
 - 4. 3840 x 2160 resolution
 - 5. Two (2) HDMI input ports
 - c. Contractor shall supply and install appropriate mounts for supplied Interactive LED monitors, one (1) Peerless or Chief equivalent flat shall be provided. See drawings for location.
- 3. One (1) HDMI Transmission Device(s)
 - a. Acceptable Manufacturer(s)
 - 1. CRESTRON
 - 2. KRAMER

A TP-580T/TP-580R

- b. HDMI Transmission Device shall meet or exceed the following minimum requirements:
 - 1. HDBaseT 1.0
 - 2. 4K60 4:2:0 Up to 130'
 - 3. HDCP 2.2
 - c. Contractor shall install HDMI transmitter at conference table provided by Others and integrate into table pocket. HDMI pass through connector in table pocket provided by Others.
 - d. Contractor shall securely and neatly mount HDMI transmission equipment at table and monitor locations.
 - e. Contractor shall supply and install category 6 shielded cable for HDMI transmission.
 - f. Contractor to supply 8' ultra-slim HDMI cable for device connection.
4. One (1) Wireless Presentation System shall be provided and installed.
- a. Acceptable Manufacturers (in alphabetical order):
 - 1. KRAMER

A VIA GO2

- 2. HDMI output with support for up to 4K30Hz video streaming
 - 3. Gigabit LAN and dual-band 802.11ac Wireless connectivity
 - 4. 4GB Memory
 - 5. 32GB Storage
 - 6. 3.5mm Audio Output
 - 7. All other features currently a part of the manufacturer's latest commercial release.
- b. Contractor shall securely mount wireless presentation system device at monitor location.
 - c. Contractor shall coordinate installation and configuration of Wireless Presentation System per manufacturer recommended guidelines.

Contractor shall work collaboratively as necessary with Owner and network support resources for a complete and compliant installation.

- d. Contractor shall supply and install all necessary patch cables to connect equipment to network and in data closet location. Contractor shall cross connect equipment in data closet and report to Owner data closet, switch and port location for programming.

D. CONFIGURATION D

- 1. Contractor shall supply one (1) of the specified configuration(s) in the following locations:
 - a. High School Weight Room
- 2. One (1) INTERACTIVE LED Monitor(s)
 - a. Acceptable Manufacturer(s)
 - 1. NEWLINE
A TT-8621Q
 - 2. Or Equal.
 - b. LED Monitor shall meet or exceed the following minimum requirements:
 - 1. 85” diagonal
 - 2. Brightness 400 cd/m
 - 3. 8ms refresh rate
 - 4. 3840 x 2160 resolution (4K UHD)
 - 5. Two (2) HDMI input ports
 - c. Contractor shall supply and install appropriate mounts for supplied LED monitors, one (1) flat mount Peerless SF660P or Chief equivalent shall be provided. See drawings for location.
 - d. Monitor shall be controlled using the remote.
- 3. One (1) Multimedia Input Location(s) shall be provided.
 - a. Acceptable Manufacturer(s)
 - 1. CRESTRON

A HD-TX-101-C-1G-E-B-T

2. KRAMER

- b. 4K60 signal
- c. Contractor shall supply correct DM-Lite receiver at monitor location.
- d. Contractor shall supply appropriate stainless-steel faceplate to integrate transmitter into supplied metallic raceway.

4. One (1) Rack System(s) shall be provided and installed

a. Acceptable Manufacturer(s)

1. Middle Atlantic

A DWR-12-26PD

2. Or Equal.

- b. Wall Mount
- c. 12U
- d. Plexiglas Locking Door
- e. Forward rackrail
- f. UL Load Capacity 200 lbs
- g. 26" usable depth
- h. 21" usable height
- i. Contractor to supply 8-Outlet PDU (Middle Atlantic PD-815R or Equal).

5. One (1) Wireless Presentation System shall be provided and installed.

a. Acceptable Manufacturers (in alphabetical order):

1. KRAMER

A VIA GO2

- 2. HDMI output with support for up to 4K30Hz video streaming
- 3. Gigabit LAN and dual-band 802.11ac Wireless connectivity

4. 4GB Memory
 5. 32GB Storage
 6. 3.5mm Audio Output
 7. All other features currently a part of the manufacturer's latest commercial release.
- b. Cables and Accessories
1. 3' HDMI cable for connectivity to switcher
 2. All necessary mounting brackets and connectors to securely mount at teacher input location.
 3. Work includes extending Ethernet Category 6 compliant patch cables from installed equipment, as required, to Owner identified connection ports at all locations.
 - A Patch cables shall not exceed fifteen (15) feet in length.
 4. Material and labor to cross connect wireless presentation systems in communication closets to PoE switches shall be provided by Contractor using provided Category 6 patch cables.
 - A Cable lengths shall be appropriate for connections made, and not include excessive cable.
 - B Coordinate all work with Owner, Designer and other contractors prior to installation.
 5. Contractor shall coordinate installation and configuration of Wireless Presentation System per manufacturer recommended guidelines. Contractor shall work collaboratively as necessary with Owner and network support resources for a complete and compliant installation.
6. One (1) Voice Amplification System(s) shall be provided and installed
- a. Acceptable Manufacturer(s)
 1. SHURE – QLXD4
 2. Or Equal.
 - b. Handheld and Lavalier microphone combo

- c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire gymnasium.
 - d. Contractor shall supply all mounting hardware to securely mount equipment into Contractor supplied rack.
 - e. Contractor shall supply 3U drawer to store microphone in Contractor supplied rack.
7. Eight (8) Pendant Speakers shall be provided and installed
- a. Acceptable Manufacturer(s)
 - 1. Harman/JBL Pro
 - A JBL CONTROL 67 P/T
 - 2. Or Equal
 - b. Passive 2-way full range speaker
 - c. 6.5" Low Frequency Driver, 1-inch Voice Coil
 - d. 300W peak
 - e. 8 ohms
 - f. 94 dB sensitivity
 - g. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz
 - h. Contractor shall safely and securely mount speakers to weight room ceiling structure using manufacturer recommended and industry best practices.
 - i. Contractor shall include any necessary speaker protection for a fully functional and compliant system where applicable.
 - j. Contractor shall supply and install properly sized speaker cabling to support supplied speakers.
 - k. Speakers shall be black in color.
8. One (1) Mixer shall be provided and installed.
- a. Acceptable Manufacturer(s)
 - 1. BIAMP/COMMUNITY

2. HARMAN/JBL PRO

A CSM 28

3. QSC

4. Or Equal.

- b. System shall be populated with necessary accessories for 8 line-level input audio channels.
- c. System shall be populated with necessary accessories for 2 line-level output audio channels.
- d. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
- e. Contractor shall supply all necessary labor to configure Mixer.
- f. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
- g. Contractor shall supply all cables and accessories for a fully functional system.

9. One (1) Amplification System shall be provided and installed

a. Acceptable Manufacturer(s)

1. Harman/JBL Pro

A CSA2300Z

2. Or Equal

- b. Two (2) input channels
- c. Two (2) output channels
- d. 300W maximum output per channel
- e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB

10. One (1) CD/Bluetooth Player shall be provided and installed

a. Acceptable Manufacturer(s)

1. DENON
 - A DN300Z
 2. Or Equal.
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - c. Contractor shall provide all audio cables and accessories to integrate CD/Bluetooth player with provided DSP/Mixer system.
11. One (1) Remote input location(s) shall be provided and installed.
- a. Remote input location shall provide XLR and 3.5mm connectivity in identified locations.
 - b. Contractor shall supply all cabling, faceplates and accessories for a complete installation.
 - c. Contractor shall integrate XLR and 3.5mm connection into provided DSP/Mixer system.

E. CONFIGURATION E

1. Contractor shall supply one (1) of the specified configuration(s) in the following locations:
 - a. Middle School Weight Room
2. One (1) INTERACTIVE LED Monitor(s)
 - a. Acceptable Manufacturer(s)
 1. NEWLINE
 - A TT-8621Q
 2. Or Equal.
 - b. LED Monitor shall meet or exceed the following minimum requirements:
 1. 85" diagonal
 2. Brightness 400 cd/m
 3. 8ms refresh rate

- 4. 3840 x 2160 resolution (4K UHD)
- 5. Two (2) HDMI input ports
- c. Contractor shall supply and install appropriate mounts for supplied LED monitors, one (1) flat mount Peerless SF660P or Chief equivalent shall be provided. See drawings for location.
- d. Monitor shall be controlled using the remote.
- 3. One (1) Multimedia Input Location(s) shall be provided.
 - a. Acceptable Manufacturer(s)
 - 1. CRESTRON
 - A HD-TX-101-C-1G-E-B-T
 - 2. KRAMER
 - b. 4K60 signal
 - c. Contractor shall supply correct DM-Lite receiver at projector location.
 - d. Contractor shall supply appropriate stainless-steel faceplate to integrate transmitter into supplied metallic raceway.
- 4. One (1) Rack System(s) shall be provided and installed
 - a. Acceptable Manufacturer(s)
 - 1. Middle Atlantic
 - A DWR-12-26PD
 - 2. Or Equal.
 - b. Wall Mount
 - c. 12U
 - d. Plexiglas Locking Door
 - e. Forward rackrail
 - f. UL Load Capacity 200 lbs
 - g. 26" usable depth

- h. 21” usable height
 - i. Contractor to supply 8-Outlet PDU (Middle Atlantic PD-815R or Equal).
5. One (1) Wireless Presentation System shall be provided and installed.
- a. Acceptable Manufacturers (in alphabetical order):
 - 1. KRAMER
 - A VIA GO2
 - 2. HDMI output with support for up to 4K30Hz video streaming
 - 3. Gigabit LAN and dual-band 802.11ac Wireless connectivity
 - 4. 4GB Memory
 - 5. 32GB Storage
 - 6. 3.5mm Audio Output
 - 7. All other features currently a part of the manufacturer’s latest commercial release.
 - b. Cables and Accessories
 - 1. 3’ HDMI cable for connectivity to switcher
 - 2. All necessary mounting brackets and connectors to securely mount at teacher input location.
 - 3. Work includes extending Ethernet Category 6 compliant patch cables from installed equipment, as required, to Owner identified connection ports at all locations.
 - A Patch cables shall not exceed fifteen (15) feet in length.
 - 4. Material and labor to cross connect wireless presentation systems in communication closets to PoE switches shall be provided by Contractor using provided Category 6 patch cables.
 - A Cable lengths shall be appropriate for connections made, and not include excessive cable.
 - B Coordinate all work with Owner, Designer and other contractors prior to installation.

5. Contractor shall coordinate installation and configuration of Wireless Presentation System per manufacturer recommended guidelines. Contractor shall work collaboratively as necessary with Owner and network support resources for a complete and compliant installation.
6. One (1) Voice Amplification System(s) shall be provided and installed
 - a. Acceptable Manufacturer(s)
 1. SHURE – QLXD4
 2. Or Equal.
 - b. Handheld and Lavalier microphone combo
 - c. Contractor shall supply and install any necessary external antennas and cabling to enable clear and reliable audio signal coverage for entire gymnasium.
 - d. Contractor shall supply all mounting hardware to securely mount equipment into Contractor supplied rack.
 - e. Contractor shall supply 3U drawer to store microphone in Contractor supplied rack.
7. Eight (8) Pendant Speakers shall be provided and installed
 - a. Acceptable Manufacturer(s)
 1. Harman/JBL Pro
 - A JBL CONTROL 67 P/T
 2. Or Equal
 - b. Passive 2-way full range speaker
 - c. 6.5” Low Frequency Driver, 1-inch Voice Coil
 - d. 300W peak
 - e. 8 ohms
 - f. 94 dB sensitivity
 - g. 34Hz-18kHz +/- 3dB, -10dB @ 50Hz

- h. Contractor shall safely and securely mount speakers to weight room ceiling structure using manufacturer recommended and industry best practices.
 - i. Contractor shall include any necessary speaker protection for a fully functional and compliant system where applicable.
 - j. Contractor shall supply and install properly sized speaker cabling to support supplied speakers.
 - k. Speakers shall be black in color.
8. One (1) Mixer shall be provided and installed.
- a. Acceptable Manufacturer(s)
 - 1. BIAMP/COMMUNITY
 - 2. HARMAN/JBL PRO
 - A CSM 28
 - 3. QSC
 - 4. Or Equal.
 - b. System shall be populated with necessary accessories for 8 line-level input audio channels.
 - c. System shall be populated with necessary accessories for 2 line-level output audio channels.
 - d. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - e. Contractor shall supply all necessary labor to configure Mixer.
 - f. Contractor shall provide all system programming and operation software for a fully functional and operational system. All programming and/or configuration activity shall be completely coordinated and approved by Owner and/or Designer prior to initiation of final installation activity.
 - g. Contractor shall supply all cables and accessories for a fully functional system.
9. One (1) Amplification System shall be provided and installed
- a. Acceptable Manufacturer(s)

1. Harman/JBL Pro
 - A CSA2300Z
 2. Or Equal
 - b. Two (2) input channels
 - c. Two (2) output channels
 - d. 300W maximum output per channel
 - e. S/N (20 Hz – 20kHz @ 8 Ohms) > 97 dB
10. One (1) CD/Bluetooth Player shall be provided and installed
- a. Acceptable Manufacturer(s)
 1. DENON
 - A DN300Z
 2. Or Equal.
 - b. Contractor shall supply all parts, cables and accessories to securely mount unit in provided cabinet.
 - c. Contractor shall provide all audio cables and accessories to integrate CD/Bluetooth player with provided DSP/Mixer system.
11. One (1) Remote input location(s) shall be provided and installed.
- a. Remote input location shall provide XLR and 3.5mm connectivity in identified locations.
 - b. Contractor shall supply all cabling, faceplates and accessories for a complete installation.
 - c. Contractor shall integrate XLR and 3.5mm connection into provided DSP/Mixer system.

F. CONFIGURATION F

1. Contractor shall supply one (1) of the specified configuration(s) in the following locations:
 - a. Middle Schools – Room 510
2. One (1) INTERACTIVE LED Monitor(s)

- a. Acceptable Manufacturer(s)
 - 1. NEWLINE
 - A TT-7521Q
 - 2. Or Equal.
 - b. LED Monitor shall meet or exceed the following minimum requirements:
 - 1. 75” diagonal
 - 2. Brightness 400 cd/m
 - 3. 8ms refresh rate
 - 4. 3840 x 2160 resolution (4K UHD)
 - 5. Two (2) HDMI input ports
 - c. Contractor shall supply and install appropriate mounts for supplied LED monitors, one (1) flat mount Peerless SF660P or Chief equivalent shall be provided. See drawings for location.
 - d. Monitor shall be controlled using the remote.
3. One (1) Voice Enhancement System shall be provided and installed.
- a. Acceptable Manufacturer(s)
 - 1. LIGHTSPEED
 - A 975
 - b. Major components of Voice Amplification System shall be carefully installed at projector location.
 - c. Voice Amplification systems shall meet or exceed the following minimum standards:
 - 1. DECT (1.9 GHz) communication for complete coverage.
 - 2. 40 Watts (20W/Channel)
 - 3. Two (2) highly durable, rechargeable, battery powered, tamper resistant, impact resistant, lanyard based pendant microphones.

- d. Contractor shall provide one (1), three (3) foot audio patch cables to connect input ports on amplifier to audio output on monitor.
 - 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.
4. Two (2) Classroom Audio Speakers shall be provided and installed.
- a. Acceptable Manufacturer(s)
 - 1. LIGHTSPEED
 - b. Where classroom speakers are to be installed in drop ceilings, they shall be near flush mount and cleanly cut into available tiles for optimal and uniform audio fill of the relevant classroom space. Speakers shall meet or exceed the following minimum standard requirements:
 - 1. 6” driver; 1” horn per speaker
 - 2. Frequency response: 40 Hz – 20 kHz
 - 3. Impedance of 8 Ohms
 - 4. Power handling of 30 watts
 - 5. Speakers shall be mounted in fully enclosed, acoustically appropriate, metallic back boxes and fully supported by appropriate tile bridges.
 - c. Where flush mounting is not possible or practical, Contractor shall install surface mounted speakers meeting or exceeding all requirements above.
 - d. Where specific speaker location is in question, obtain Owner approval prior to any final installation activity.
 - e. All speakers shall include attractive finished white grill.
 - f. All speaker wire shall be 16 AWG high quality plenum rated cable.
 - g. All speaker cable shall be terminated at Voice Amplification System mounted at or near monitor.
 - h. All speaker cable shall be protected in existing owner raceway.

5. Two (2) HDMI Transmission Device(s) shall be provided and installed.
 - a. Acceptable Manufacturer(s)
 1. CRESTRON
 2. KRAMER
 - A TP-580T/TP-580R
 - b. HDMI Transmission Device shall meet or exceed the following minimum requirements:
 1. HDBaseT 1.0
 2. 4K60 4:2:0 Up to 130'
 3. HDCP 2.2
 - c. Contractor shall install HDMI transmitter at teacher desk 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.

2.05 ALLOWANCES

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

PART 3 - EXECUTION

3.01 PREPARATION

- A. Contractor shall conduct detailed walk-through examination with Designer, Construction Manager and Owner verifying equipment and material locations as well as mounting and placement requirements prior to commencement of other installation activities.
- B. Contractor shall completely cooperate with Owner's Construction Manager for all site access, site safety and related matters. Contractor shall obtain current drawings, specifications and plans from Owner's Construction Manager and make field adjustments as required to correctly and reasonably coordinate with other trades. Contractor will attend all CM field coordination and schedule meetings and cooperate with project timelines as directed.
- C. Contractor shall ensure all submittals and have been provided to, and approval has been obtained from Designer and Owner prior to commencement of any final installation activities. Submittals shall include, but not be limited to:
 - 1. Shop drawings, data sheets and system diagrams including specific cable connectors and types proposed to be installed.
 - 2. Asset tag format, composition, attachment method and location on each serialized component being provided.
 - 3. Firmware configuration template to be used for each component provided.
 - 4. Written installation, coordination, and test procedure to be followed by installing technicians and engineers.
 - 5. Final documentation template.

3.02 INSTALLATION

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

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

11. All cable connecting components mounted in/on Technology Cart, shall have adequate cable slack to provide for full system inspection and or service without the removal (intentional or inadvertent) of connecting cables, including items that will be placed on the keyboard tray of equipment carts.
12. Label all cable connections for intuitive user access and as directed by Owner and Designer.
13. Work may include extending cables from installed equipment, and as required and/or specified herein, to Owner identified connection outlets.
 - a. Work includes supply, connection, and testing of any such cables.
 - b. Work includes neatly routing all cables and securing cables with Velcro straps as may be reasonably required to keep cables in position during normal operating, service, and inspection operations.
 - c. Cables for some devices may be routed in air plenum spaces, above finished ceilings, or in other ways require special care and suitable tools to complete. Where air plenum status is in question and/or may change, plenum rated cable shall be used.
- E. All installation and configuration activity shall fully comply with both the manufacturer's recommended procedures as well as industry best practices.
- F. VIDEO PROJECTORS AND INTERACTIVE PANELS
 1. Install, configure and test approved firmware configuration template including, but not limited to:
 - a. Firmware based Device ID (Including parameters such as: TCP/IP settings, Host Name, etc.).
 - b. Contractor shall be responsible for fully configuring network connectivity and enabling the device for management and wireless presentation using manufacturer recommended settings.
 - c. Contractor shall supply and connect plenum rated patch cable for connection of projector to network.
 - d. Contractor shall cross connect projector in data closet and document switch and port location to Owner for programming.
 - e. Default port selection.
 2. Neatly configure all cables as directed by Owner.

3. Connect AC power using cord provided to projector.
4. Configure system for a fully functional system.
5. Remove and dispose of all existing screens, brackets, excess materials and packaging as directed by Owner.

G. WIRELESS PRESENTATION DEVICES

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

H. VOICE AMPLIFICATION SYSTEM

1. Connect all audio input and output device cables.
2. Secure mounting location with mounting screws or Velcro pads to eliminate involuntary equipment movement.
3. Neatly route all cabling and secure slack.
4. Adjust balance levels for standard configuration.
5. Verify target volume level in space with sound meter and record level at installation.

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

1. 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.

- J. 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.

K. All cable and device labels shall match existing standard.

L. Worksites include the following:

1. Fancher Elementary
801 S. Kinney Avenue
Mount Pleasant, Michigan 48858
2. Mount Pleasant High School
1155 S. Elizabeth Street
Mount Pleasant, Michigan 48858
3. Mount Pleasant Middle School
440 S. Bradley Street
Mount Pleasant, Michigan 48858

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. Location installed.
 - 7. Manufacturer's warranty.
 - 8. Maintenance contract terms.
 - 9. Verification of maintenance contract engagement.
 - 10. Telephone numbers for service and support.

11. Detailed technical support and service procedure instructions.
12. All product (hardware and software) manuals and manufacturer supplied documentation, including, but not limited to owner manuals, system administrator manuals and configuration guides. Where number of duplicate copies for particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.
13. Photocopy of original invoice listing make and model for all components and equipment from individual manufacturer(s), distribution source(s), or authorized agent(s) to establish manufacturer warranty start date for potential use after end of contract warranty provisions.
14. CAD or Visio as built drawings/diagrams for each building.
15. System Configuration Report.
16. Complete inventory of installed hardware and system software including, but not be limited to, model numbers, Ethernet MAC address, serial numbers, physical installation location and software options.

3.05 TRAINING

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

3.06 SCHEDULE, MEETINGS AND PLANS

- A. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.
- B. Schedule
 - 1. Post bid Interviews: Week of February 27, 2023
 - 2. Contractor Chosen: Week of March 6, 2023
 - 3. Work Commences: June 1, 2023
 - 4. Substantial Completion of Project: August 15, 2023
 - 5. Project Close-out: November 1, 2023
- C. All work shall be coordinated with Owner's construction manager on site.
- D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.
- E. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner, documented herein, required by Architect/Engineer, Architect and/or Construction Manager and as required to meet schedule.

END OF SECTION

SECTION 27 51 16
PUBLIC ADDRESS SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to Public Address and Program System work for Mount Pleasant Public Schools. Work shall include, but not be limited to, head-end equipment, cabling, ceiling and/or wall speakers, interface units and all other components and services required for a full and operational system.
- B. The Contractor shall design, engineer, configure, supply, connect, test, document, and warrant a fully operational and compliant system, complete and with full functionality as specified herein.
- C. Contractor shall coordinate their installation with other communication systems, contractors, Designer, and the Owner as is appropriate.

1.02 WARRANTY

- A. Complete installation shall be fully functional and free from defect and/or failure for a period of three (3) years. Any replacement, upgrade, or fix, including labor for any non-conforming or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.
 - 1. Owner shall be provided full operation of system functions and features during the complete warranty period incurring absolutely no costs during that time.
- B. Manufacturer's warranty shall be provided for all components of the system.
 - 1. Any paperwork and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.
 - 2. Contractor shall submit all paperwork, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.
- C. On site services provided under the warranty shall be performed by personnel or representatives of Contractor as herein defined and located within physical proximity to provide response levels deemed acceptable to Owner.
- D. Contractor shall provide the following response times for all malfunctioning equipment:

1. Four (4) hours or less for matters that render twenty percent (20%) or more of the system users unable to maintain normal productivity.
 2. Two (2) business days for matters not meeting the above criteria.
 3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.
- E. Bidder shall provide current monthly maintenance/service contract pricing for recommended programs for all equipment following the specified and included period as additional information. This information will be considered by Owner and Designer as part of the bid evaluation process.
- F. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, connection of circuits, turn-up of system, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have no effect on Warranty or System Acceptance by Owner and/or Designer.

1.03 STORAGE OF MATERIALS

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

1.04 SUBMITTALS

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

arrangement/layout, and any other information deemed significant by the Designer.

2. No work constituting final installation shall be commenced until after approval of shop drawings by Designer.
- C. Contractor shall provide proof of manufacturer support by photocopy of certification and letter of support from major component manufacturers for this specific project with Bid Proposals.
- D. Equipment or material installed for this project that does not have an approved submittal associated with it, will be removed, and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.
 1. The Owner and/or Designer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.
 2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due or become due Contractor.
- E. The Contractor shall submit within five (5) calendar days after the Notice to Proceed, a schedule that reflects the sequence of activities of the contractor's approach to the execution of and completion of the work. The schedule shall be broken into work areas to provide for a clear identification of the planned progress of the work. Included in the schedule will be a list of tasks with list of deliverables and the percentage of work completed. This schedule shall coincide with progress payments applications dates and projected amounts. All durations shown will be in working days. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing and executing the work required by the Contract Documents. Owner will rely on such schedules to coordinate and otherwise plan related work of Owner personnel, other separate contractors, or the Owner's routine daily work.

1.05 REFERENCE SPECIFICATIONS

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

4. IETF RFCs
5. FCC Emissions Ratings
6. UL
7. MOSHA Safety Standards

1.06 CONTRACTOR

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

PART 2 - PRODUCTS

2.01 MANUFACTURERS

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

1. Acceptable Manufacturers

- a. BOGEN
- b. CAREHAWK/DUKANE
- c. VALCOM
- d. Or Equal

2.02 Supply most current version of all products provided.

- A. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.
 - B. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.
- 2.03 Furnish only new, first-class quality materials and equipment.
- 2.04 PUBLIC ADDRESS AND INTERCOM SYSTEM HEAD END
- A. Contractor shall supply, install, and configure all necessary materials for a fully IP PoE Paging/Intercom system. System shall fully integrate new speakers and intercom devices as specified herein for a fully working and compliant system.
 - B. System shall reside on a Contractor provided server that shall be installed in the building MDF.
 - C. System shall provide for, but not be limited to the following:
 - 1. Building wide paging
 - 2. Program bells and alerts for normal school operation, configurable by simple calendar-based user interface.
 - 3. Individual volume control of each IP speaker.
 - 4. Full SIP compliance for communication between devices.
 - 5. All other features and functions that are part of the manufacturer's current release of the product offering.
 - D. The Owner has preference for software licensing based on a persistent or perpetual model. Monthly or annual subscription licensing will not be as favorably considered as the preferred model.
- 2.05 COMMON INTERIOR SPEAKERS (2x2 TILE REPLACEMENT AND SURFACE MOUNT)
- A. One (1) Common Interior Speaker (one way audio) shall be installed in/on finished ceiling surfaces in corridor as indicated on drawings (shown in red).
 - B. Contractor shall provide and install PoE Speakers as indicated herein:
 - 1. Valcom VIP-402A
 - 2. Or equal.

- C. Final speaker placement shall be adjusted as needed for appropriate audio intelligibility, volume levels and ceiling obstructions and/or conditions and shall remain the responsibility of the contractor.
- D. Speakers shall provide balanced intelligible sound that is free of distortion, free from noise and evenly dispersed.
- E. 2'x2' lay in speaker with 8" cone speaker complete and assembled shall be installed.
 - 1. Capable of >96 dB at 4'.
 - 2. Frequency range is 45-18,000Hz.
- F. All speakers shall be field firmware changeable to support multiple other SIP based software systems.
- G. Any speaker baffles shall be installed with hardware matching the color of the baffle. Baffle color shall match finished ceiling color.
 - 1. All baffles shall be flush against the ceiling and enclosures shall be fully supported. All speakers shall include a back-box.
- H. All devices shall be mounted square and plumb and as recommended by the manufacturer and required by Owner and Architect.
- I. Each speaker shall be connected to central equipment PoE+ compliant cabling provided by Others and provide for system wide broadcast and/or zone-specific broadcast.
- J. Each speaker shall be volume adjustable at installation to accommodate specific acoustical properties of the intended coverage area.
- K. Where 2x2 lay-in speaker installation is not possible contractor shall supply appropriate and compatible speakers:
 - 1. Where ceilings are hard-lid Valcom VIP-428A or equal shall be used complete with backbox and all supporting components as recommended by manufacturer.
- L. Coordinate final placement of speakers with Designer and/or Architect.
 - 1. Area of coverage will be such that calls will be clearly audible in the operating area and surrounding space.
- M. System shall produce audio at a peak level of approximately eighty-five (85) dBA at probable listener's positions.

2.06 INTERIOR/EXTERIOR HORNS

- A. One (1) interior/exterior horn (one way audio) shall be installed in/on finished walls or ceiling surfaces in spaces as indicated on drawings (shown in red).
- B. Contractor shall provide and install PoE Speakers as indicated herein:
 - 1. Valcom FlexHorn VIP-9880A
 - a. Or Equal
- C. Final speaker placement shall be adjusted as needed for appropriate audio intelligibility, volume levels and ceiling obstructions and/or conditions and shall remain the responsibility of the contractor.
- D. Speakers shall provide balanced intelligible sound that is free of distortion, free from noise and evenly dispersed.
- E. 3.5" speaker element with .75" Voice Coil.
 - 1. Capable of >108 dB at 4'.
 - 2. Frequency range is 400-10,000Hz.
- F. All speakers shall be field firmware changeable to support multiple other SIP based software systems.
- G. Any speaker baffles shall be installed with hardware matching the color of the baffle. Baffle color shall match finished ceiling color.
 - 1. All baffles shall be flush against the ceiling and enclosures shall be fully supported. All speakers shall include a back-box.
- H. All devices shall be mounted square and plumb and as recommended by the manufacturer and required by Owner and Architect.
- I. Each speaker shall be connected to central equipment PoE+ compliant cabling provided by Others and provide for system wide broadcast and/or zone-specific broadcast.
- J. Each speaker shall be volume adjustable at installation to accommodate specific acoustical properties of the intended coverage area.
- K. Where indoor horn is not possible contractor shall supply appropriate and compatible exterior rated equivalent speakers:
 - 1. In exterior applications a Valcom VIP-480AL or equal shall be used
- L. Coordinate final placement of speakers with Designer and/or Architect.

1. Area of coverage will be such that calls will be clearly audible in the operating area and surrounding space.

M. System shall produce audio at a peak level of approximately eighty-five (85) dBA at probable listener's positions.

2.07 COMPONENT INTERCONNECTION

- A. All wiring not installed in conduit shall be plenum type cable and shall be so identified with continuous marking.
- B. No wiring installed shall be visible unless specifically and individually approved by Owner and Designer. All wire that traverses open areas shall be installed in metal raceway of appropriate size for the number of wires installed plus twenty percent more.
 1. All metal raceway shall be ordered in standard colors to as closely match the environment in which it is being installed as possible.
 2. Metal raceway shall be carefully and neatly installed, to meet manufacturer recommendations and standards for professional installation.
 3. Sharp edges, gaps in the covering or corners or other unprofessional workmanship characteristics of installation will not be acceptable.
- C. Wiring color shall remain the same throughout the system. Colors used for coding shall be as directed by the system manufacturer, Owner, and Architect.
- D. Wire shall be copper.

2.08 ALLOWANCES

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

- A. Contractor shall remove and dispose of analog paging head end (amplifiers to be provided to Owner for disposition). All abandoned analog speaker cabling from speaker to paging head end shall be removed and disposed of. All analog paging speakers shall be removed and disposed of.

3.03 INSTALLATION

- A. Contractor shall be familiar with the environment where work will be done as specified herein.
- B. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed, and disposed of in an approved container for the site. All equipment and tools shall be removed from common areas and stored in approved, secure storage locations. Any work that may impede the general use of the space and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.
- C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.
- D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:
 - 1. Inventory receipt of all components and equipment.
 - 2. Storage of all equipment and components until such time those items are installed according to the specifications.
 - 3. Transport equipment to the Owner's installation location(s).
 - 4. Assemble, install, configure, and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.

5. Collect all information necessary to accurately program all sets and/or system devices to the Owner's intended use and need.
6. Complete end user and system administrator training programs as specified herein.
7. Work shall be performed to meet local codes and industry standards, including, but not limited to:
 - a. Adequate gas tube protection for outside plant cable connections.
 - b. Grounding and Bonding.
8. Work includes extending cable bundles, as required, to Owner identified equipment installation locations at all locations.
9. Owner will provide contractor with permanent asset tags for each system component that exceeds \$100.00 in value. Equipment installed in wiring closets will have district asset tags installed in a prominent location. Assets installed in public areas, such as staff desktop devices, will have asset tags installed in discreet but consistent area of each asset.
 - a. Asset number, device/component description, serial number, make, model, part-number, site, room number/name and any other critical asset information shall be recorded for Owner.

E. Worksites include the following:

1. Fancher Elementary
801 S. Kinney Avenue
Mount Pleasant, Michigan 48858
2. Ganiard Elementary
101 S. Adams Street
Mount Pleasant, Michigan 48858
3. McGuire Elementary
4883 E. Crosslanes Street
Mount Pleasant, Michigan 48858
4. Pullen Elementary
251 S. Brown Street
Mount Pleasant, Michigan 48858
5. Vowles Elementary
1560 S. Watson Street
Mount Pleasant, Michigan 48858

- F. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks, or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate, or panel to the original condition.
 - 1. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.
 - 2. The building and work area shall be returned to its original condition prior to final sign-off of the project.
- G. Following installation and prior to final acceptance of the system, Contractor shall conduct follow-up interviews with Owner identified administrators and staff to review system functionality, suitability and confirm feature and program fitness for Owner applications.
 - 1. Follow-up interviews shall be fully documented by Contractor and submitted to Owner for approval.
- H. Contractor shall collect, consolidate and otherwise prepare for shipping or disposal Owner's existing telecommunications system components, including, but not limited to stations, processors, cards, options, and application servers in a manner acceptable to, and consistent with, Owner's intended disposition of the items.

3.04 TESTING

- A. In an effort to ensure a smooth "turn-up" of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over. Testing shall include, but not be limited to the following:
- B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements, meets the owner's specific application requirements and is ready for functionality and integrity testing.
- C. PROCEDURES
 - 1. Prior to system "turn-up", Contractor shall submit a written request to Designer indicating they have completed full and final configuration of the system and are ready to have system integrity and functionality tested.
 - 2. Within reasonable time after receipt of request, Designer will provide a test schedule and coordinate testing date(s) with Owner and Contractor.

3. Should Designer determine the Work is not acceptably configured or not of adequate integrity:
 - a. Designer promptly will so notify Contractor, giving reasons therefore and providing sufficient details to allow Contractor to make corrective actions.
 - b. Contractor shall then expeditiously remedy the deficiencies and notify Designer in writing when ready for re-testing.
 - c. Designer will schedule re-test of the Work.
 - d. Excessive re-testing of Work may result in fees being assessed Contractor.
4. Should Designer and Owner concur the Work is configured properly, and system integrity is as required:
 - a. Designer will review Contractors detailed cut-over plan, and upon finding it acceptable issue a memorandum of Testing Completion to Owner and Contractor after which system cut-over can proceed.

3.05 DOCUMENTATION

- A. Contractor shall, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment (file drawers, folders, dividers, etc.), to contain all as-built drawings, owner's manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or Owner deem necessary.
- B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:
 1. Equipment description.
 2. Equipment make.
 3. Model number.
 4. Software release.
 5. Date installed.
 6. Manufacturer's warranty.
 7. Maintenance contract terms.
 8. Verification of maintenance contract engagement.

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

3.06 TRAINING

- A. No training shall be conducted prior to training outline and/or syllabus being approved by Owner. Instructional or overview activities conducted without prior content approval with not be deemed contract training, and Contractor shall remain responsible for delivery of approved training.
- B. Contractor shall provide training for the Owner designated system administrator(s). Training shall be a minimum of one (4), two (2) hour session in length, at the convenience of the Owner personnel, and of sufficient duration to satisfactorily complete training on all system administration functions including, but not limited to:
 1. Basic trouble shooting of the installed system and components including diagnostic and problem resolution actions.
 2. System back-up and restore functions and procedures for all system parameters and configurations.
 3. Device additions moves and changes as well as reconfiguration.
 4. Review of system alerts, logs and monitoring of configuration parameters including, but not limited to and system configuration changes.
 5. System power-up and power down process.
 6. Recording and playing pre-recorded content.
 7. System update process

8. System maintenance procedures.
 9. Problem reporting.
- C. Contractor shall provide in-person end user training for building office staff. Training shall be available at substantial completion. Training shall include, but not limited to the following:
1. System functionality overview.
 2. Bell schedule programming and changes.
 3. Paging zone controls.
 4. Intercom function use incoming and outgoing.
 5. System operation best practices.
 6. Building wide all page.
 7. Recording and playing pre-recorded content.
 8. Problem reporting.

3.07 SCHEDULE, MEETINGS AND PLANS

- A. Planned sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.
- B. Schedule
1. Post bid Interviews: Week of February 27, 2023
 2. Contractor Chosen: Week of March 6, 2023
 3. Work Commences: June 1, 2023
 4. Substantial Completion of Project: August 15, 2023
 5. Project Close-out: January 1, 2023
- C. All work shall be coordinated with Owner's construction manager on site.
- D. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.

- E. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner, documented herein, required by Architect/Engineer, Architect and/or Construction Manager and as required to meet schedule.

END OF SECTION