

Trenton Public Schools



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DIVISION 00 - BIDDING AND CONTRACT REQUIREMENTS

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INVITATION TO BID

PART 1 - GENERAL

1.01 WORK INCLUDED: DISTRICT TECHNOLOGY RENOVATIONS

- A. Trenton Public Schools (Owner) is seeking bids for new internal fiber cabling and network switch equipment and installation. Proposed systems shall be configured and installed to service Owner's needs across multiple instructional facilities, and as described herein.
- B. Project: DISTRICT TECHNOLOGY RENOVATIONS
- C. Owner: Trenton Public Schools
2603 Charlton Road
Trenton, Michigan 48183
- D. Designer: Communications by Design, Inc.
- E. Sites of Work:
 - 1. Anderson Elementary
2600 Harrison Avenue
Trenton, Michigan 48183
 - 2. Hedke Elementary
3201 Marian Drive
Trenton, Michigan 48183
 - 3. Arthurs Middle School
4000 Marian Drive
Trenton, Michigan 48183
 - 4. Trenton High School
2601 Charlton Road
Trenton, Michigan 48183

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: Thursday, December 21, 2023
2. Pre-Bid Meeting: Thursday, January 4, 2024 at 1:00pm
3. Intent to Bids Due: Monday, January 8, 2024 by 5:00pm
4. Question and Clarification Deadline: Monday, January 8, 2024 by 5:00pm
5. Public Bids Due: Friday, January 26 at 11:00am

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.

1. Date: Thursday, January 4, 2024 at 1:00pm

Location: VIRTUAL - meet.google.com/qdq-ohqn-vmi
JOIN BY PHONE - (US) +1 929-399-7758 PIN: 453 416 946#

- B. Any drawings identified in the table of contents herein will be distributed and reviewed at this conference.
- C. 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: Friday, January 26, 2024 at 11:00am
- C. Bid Opening Location: Trenton Public Schools Admin Building
2603 Charlton Road
Trenton, MI 48183

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 SE Grand Rapids, MI 49546
2. Email – rszilagy@cbdconsulting.com

1.07 BID SECURITY

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

1.08 PERFORMANCE BOND COVERAGE

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

1.09 UNIVERSAL SERVICE FUND (USF) CONDITIONS

- A. IDENTIFICATION NUMBER – the service provider's USF Service Provider Identification Number (SPIN) must be included in the Bid. Direct all questions regarding the USF requirements in this document to the Universal Service Administrative Company (USAC), Schools and Libraries Division (SLD) at (888) 203-8100.
- B. FUNDING REQUESTS (FY24 E-rate) - The specified products and/or services are to be provided for FY24 (April 1, 2024-June 30, 2025) and qualify for universal service discounts under the FY24 universal service support mechanism, E-rate.

- C. UNIVERSAL SERVICE DISCOUNTS – The service provider contract may be conditional upon the Owner receiving universal service discounts under the FY24 universal service support mechanism, E-rate. The Owner reserves the unrestricted right to change the contract amount by adding to, and/or reducing the amount of services and/or products in order to meet budget requirements in the event the level of universal service discounts is changed. Any such adjustments to the contract amount will be taken prior to the start of the specific work being adjusted or eliminated on a given building and/or project.
- D. UNIVERSAL SERVICE DISCOUNT IMPLEMENTATION – The Owner reserves the unrestricted right to specify the filing option for the universal service discount for each product and/or service offered within the Bid: Billed Entity Applicant Reimbursement (BEAR) or Service Provider Invoice (SPI).
- E. ELIGIBLE PRODUCTS AND SERVICES – The USF eligible products and/or services identified on the USAC FY24 (2024-2025) Eligible Services List, which is incorporated herein by reference, must be identified separately from any and all “ineligible” products and/or services in the Bid. Bidder shall note eligibility of items on required Schedule of Values form(s).
- F. FUNDING AVAILABILITY – Owner may or may not elect to proceed with project in whole or, or in part based on multiple possible sources of funding. Approval of E-rate funding will not be the sole criteria for Owner approval to proceed with any/all/some implementation activity on or after April 1, 2024.

1.10 OWNER’S RIGHT TO REJECT BIDS

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

1.11 DEFINITIONS

- A. “Owner” is intended to mean Trenton Public Schools a general powers school district.
- B. For purposes of this project, the terms “Architect”, “Engineer” and “Designer” are used synonymously to refer to Communications by Design, Inc., a Michigan Corporation.
- C. The term “Bidder” refers to any organization properly and accurately submitting a complete “Intent to Bid Form” prior to the required time

specified herein and subsequently properly submitting completed set of bid documents as specified herein.

- D. The term “Contractor” herein is a reference to the firm(s) eventually selected by the Owner to provide the intended system(s), or any portion thereof, and fulfill the terms of the contract.
- E. The term Contract is a reference to the collective set of documents, drawings, diagrams, Owner’s Purchase Order, Addenda and all other materials as provided for herein defining arrangement between Owner and Contractor.
- F. The term Addenda (or Addendum) are that portion of the Contract consisting of modifications, amendments, deletions or substitutions to the contract documents issued prior to the execution of the Contract.

END OF SECTION

SECTION 00300
BID FORMS

Intent to Bid Form

Complete and submit the following form if you have interest or intend to submit a Bid for this project. Unaltered and completed forms must be received on or before 5:00 PM on Monday, January 8, 2024. Only bidders returning a completed “Intent to Bid Form” will be directly 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 13 23 – Fiber Optic Cable Network
- ☐ Section 27 21 00 – Low Voltage Cabling
- ☐ Section 27 21 19 – Network Electronics

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: Trenton Public Schools
Attention: Stephanie O'Connor
2603 Charlton Road
Trenton, Michigan 48183

BID FROM: _____

PROJECT: DISTRICT TECHNOLOGY RENOVATIONS
TECHNOLOGY BID #3025

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

DUE: Friday, January 26, 2024 at 11:00am

BID FORM

BID TO: Trenton Public Schools
Attention: Stephanie O'Connor
2603 Charlton Road
Trenton, Michigan 48183

BID FROM: _____

PROJECT: DISTRICT TECHNOLOGY RENOVATIONS
TECHNOLOGY BID #3025

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

TAXES:

Bid sum includes all applicable taxes.

ALLOWANCES:

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

COST OF BONDS:

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

ACKNOWLEDGEMENT OF ADDENDA:

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

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

ALTERNATES:

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

Voluntary Alternate A _____

Voluntary Alternate B _____

Voluntary Alternate C _____

PRINCIPAL SUBCONTRACTORS

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

Legal Name: _____ Work Proposed _____

Legal Name: _____ Work Proposed _____

BID SECURITY:

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

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

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

FAMILIAL DISCLOSURE:

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

EXCEPTIONS:

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

SIGNATORY AUTHORITY:

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

AGREEMENT:

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

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

Respectfully submitted,

Date: _____

Firm Name: _____

By: _____

Signed: _____

Title: _____

Official Address: _____

Telephone Number: _____

Fax Number: _____

Primary Contact Email Address: _____

(If Corporation, affix Seal

Michigan Familial Relationship Disclosure Statement

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

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

(Check only one Box Below)

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

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

Bidder

Board or Superintendent

_____	_____
_____	_____
_____	_____
_____	_____

Bidder Authorized Representative:

Bidder: _____

Representative's Signature: _____

Print or Type Name: _____

Representative's Title: _____

Subscribed and sworn this _____ day of _____, 2024.

In the County of _____ State of _____

By _____
Notary Public Signature

Seal or Stamp:

My commission expires on: _____

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

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

The Contractor further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than \$250,000.00 or 2 times the amount of the contract or proposed contract for which the false certification was made, whichever is greater, the cost of the School District’s investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on a request for proposal for three (3) years from the date the it is determined that the person has submitted the false certification.

CONTRACTOR:

BIDDER’S FIRM NAME _____

BY (SIGNATURE) _____

PRINTED NAME AND TITLE _____

STATE OF MICHIGAN)
)
COUNTY OF)

Subscribe and sworn before me on this _____

Seal:

day of _____, 20____, a Notary Public

in and for _____ County,

Notary Public

My Commission expires _____

REFERENCES

Customer name: _____
Address: _____
City/State/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/>
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NOTE:

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

SCHEDULE OF VALUES/BID FORM

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

Bidder: Bid Division: 27 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. Form submitted must materially match below both in content and format. Electronic version of this form is required with bid package as Microsoft Excel compatible spreadsheet on USB Drive for each project section being bid. Failure to provide appropriate and complete **SCHEDULE OF VALUES**, as determined by the Owner and/or Designer, may result in disqualification of Bid.)*

Bidder: Bid Division: 27 21 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. Form submitted must materially match below both in content and format. Electronic version of this form is required with bid package as Microsoft Excel compatible spreadsheet on USB Drive for each project section being bid. Failure to provide appropriate and complete SCHEDULE OF VALUES, as determined by the Owner and/or Designer, may result in disqualification of Bid.)

Bidder: Bid Division: 27 21 19

[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. If portions of separate bids are deemed compatible and compliant with the intent of the project, and a combination of partial bids is deemed to be in the Owner's best interest, and the Owner reasonably expects willing and compliant bidders will cooperate with others for the benefit of the Owner during implementation of the system, the Owner reserves the right to award portions of the project to multiple bidders which will cooperate to complete the work.
- C. By their response, Bidders agree to comply with all sections, terms, conditions and/or requirements of the contract documents except as expressly noted, and specifically identified by paragraph number on the unaltered Contract Exceptions Bid Form. Exceptions to any bid sections, terms, conditions and/or requirements deemed excessive by the Owner and/or Bid Coordinator may disqualify Bid.
- D. In compliance with the Freedom of Information Act (FOIA), the Owner shall make bid documents available for public review after issuance of purchase order to the successful bidder/s.
- E. In connection with the execution of this Contract, Contractor and any Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, or national origin.

- F. Negligence in preparation, improper preparation, errors in, or omissions from Bids shall not relieve Bidder from fulfillment of any and all obligations and requirements of the Contract Documents.
- G. All Bid documents and worksheets must be completed in detail and submitted together on time.
- H. All documents constituting the entire present agreement shall be construed in accordance with and governed by the laws of the State of Michigan.
- I. Designer shall have authority for interpretation of Contract Documents. In the event terms, provisions or any other portion of the Contract Documents is/are in dispute, Designer shall have full and final authority to interpret the Contract Documents, and such interpretation shall be final and binding.
- J. In the event of a conflict between any terms or conditions in any of the documents comprising the entire present Agreement, the terms and conditions set forth in this document shall take precedence.

1.03 NOTICE AND RESPONSE

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

1.04 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 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.

3.04 MODIFICATION AND WITHDRAWAL

- A. Bids may be withdrawn and/or changed any time prior to the bid opening. Bids may not be withdrawn or changed after the bid opening, and shall be deemed a firm offer continuing for ninety (90) calendar days. Bids received after the time and date for the public opening will be returned unopened at the Owner's discretion.
- B. Withdrawal of any Bid after the opening time without specific approval by Owner may result in forfeiture of required bid security by Bidder.

3.05 CODES, ORDINANCES, REGULATIONS AND RELATED

- A. All labor and materials shall be furnished and installed in strict accordance with the latest applicable codes, ordinances and regulations of any governing body having jurisdiction over this project.
- B. In the event the quality of labor and materials required by the Drawings and Specifications herein exceeds requirements of current applicable codes, ordinances and regulations, the Drawings and Specifications shall take precedence.
- C. In the event the quality of labor and materials required by current applicable codes, ordinances and regulations having jurisdiction over this project exceeds that of the Drawings and Specifications herein, the applicable codes, ordinances and regulations shall take precedence.
- D. The Contractor shall give all notices and comply with all codes, laws, ordinances, rules and regulations of any authority having jurisdiction, which bears on the performance of its work. This compliance includes, but is not limited to, the Michigan School Safety Initiative (PA129, PA130, PA131 and PA138) if applicable to work being performed.

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

3.06 SUB-CONTRACTOR AND MATERIAL SUPPLIER

- A. The successful Bidder shall submit to the Owner and Designer a complete list of all sub-contractors and all material suppliers proposed to engage on the work. Sub-contracts shall not be awarded until after they have been approved by the Designer and Owner.
- B. Finalist bidders may be required to submit additional details related to 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 10 workstation. Electronic media shall contain separate folders to organize response documentation as described herein. Files submitted on USB Drive shall be ***Adobe Acrobat*** "PDF" format (SCHEDULE OF VALUES is additionally required to be on the disk in the appropriate folder as a spreadsheet and as described herein).
- B. All Bid Response formats shall be clearly externally marked to include, but not be limited to:
 - 1. Bidder identification.
 - 2. Project Owner identification.

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

3.08 AWARD OF CONTRACT

- A. The material proposed to be used for the completion of work, and the competency, solvency and responsibility of bidders will receive due consideration before award of contract. In the reception of bids for this work, the Owner incurs no obligation to accept the lowest, or any bid submitted. The right to accept or reject any and all bids or portion thereof is reserved by the Owner. The Owner reserves the right to require testimonial, accounting or legal documents pertaining to the solvency of a Contractor, or any other decision factor the Owner deems appropriate, prior to award of contract.
- B. Owner reserves the right to select individual components from schedule of values independent of installation as may be determined in Owners best interest. Selected bidder may be required to install selected components provided by others.

- C. Issuance of a Purchase Order by Owner in response to a valid bid shall be a Notice to Proceed, and shall become part of, but not limited to, all terms, conditions and requirements herein. Notice to Proceed shall have the full effect of contract award, and shall make all terms, conditions, requirements and responsibilities of Bidder binding upon issuance. Notice to Proceed, once issued, shall become an inseparable part of the contract documents herein, and constitute both Bidder and Owner's acceptance of contract.

3.09 TIME, SCHEDULES, PROJECT MANAGEMENT, MEETINGS AND PLANS

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

5. The appointed Project Manager, or a designee acceptable to the Owner, shall be in attendance of all project meetings throughout the term of the project. Failure to do so may be considered a material breach of contract.
6. After a ten (10) business day notice, the Owner reserves the right to request a new Project Manager, when it appears that, in the Owner's sole discretion, the Project Manager is not fulfilling the full responsibilities of the position. Failure by Contractor to provide adequate Project Manager meeting requirements of the Owner, may result in Contract termination.

3.10 CHANGES IN THE WORK

- A. No changes in work with the effect of either increasing or decreasing in the project value shall be made without specific and prior authorization by the Owner and Designer.
- B. Owner, without invalidating the contract and without notice to any surety, may at any time order extra work or make changes by altering, adding to or deducting from the work, the Contract Sum being adjusted accordingly. All such work shall be authorized by a written Change Order approved by Owner and Contract Designer. Upon receipt of such an order Contractor shall promptly proceed with the work involved. All such work shall be executed under the conditions of the original Contract. Owner authorized change order(s) may be issued at any time prior to Contract close out.
- C. When so directed, Contractor shall promptly submit an itemized estimate and a unit price for performing or deleting such extra or changed work as 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 include, but is not limited to all other Sections herein and all related Contract Documents.
- C. Activities relative to Contract close-out are described in, but not limited to, this and other Sections of this document.

1.02 SUBSTANTIAL COMPLETION

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

PART 2 - MATERIALS

2.01 NOT USED FOR THIS SECTION

PART 3 - EXECUTION

3.01 PROCEDURES

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

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

D. Should Designer concur the Work is substantially complete:

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

END OF SECTION

SECTION 27 13 23
FIBER OPTIC CABLING

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

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

1.02 WORK INCLUDED

- A. Work includes, but is not limited to, the following:
- B. A single indoor rated twelve (12) strand OS1 single mode (SMF) fiber optic cable installed between MDF and each IDF identified in this document and in provided on Appendix A for which work is included as indicated herein.
- C. New OS1 fiber optic cables shall be terminated on Contractor supplied enclosure shelf (Optical Fiber Interconnecting Unit - LIU) with LC connectors.
- D. All 12 strands are to be terminated and tested.
- E. Connectors and couplers.
- F. Adequate cable support in existing or new raceway system as may be required for efficient and effective cable routing.
- G. Rack mounted termination enclosure shelves.
- H. Storage Loops
 - 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. Sincor / 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. Any armored cable installed, as provided for, shall be appropriately grounded.
 3. All materials in the cable are to be dielectric (excepting the armor if used in lieu of specified innerduct as provided for herein).
 4. 8.3-micron fiber core diameter size

5. 125-micron cladding diameter
 6. Maximum Attenuation
 - a. 1310nm: 0.5 dB/km
 - b. 1550nm: 0.5 dB/km
 7. Tight buffered
 8. EIA/TIA – 598 color coding for fiber optic cable
 9. Indoor plenum rated
 10. Capable of bend radius as small as 20 x outside cable diameter (under installation load) and 10 x outside cable diameter (long term load).
- F. 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. Forty-Two (42) – 3-meter, OS1 LC to SC single mode fiber patch cables shall be provided for connection to Owner provided network equipment.
- 2.03 Contractor shall provide termination shelves to support newly installed optical fiber. Fiber termination shelves shall meet or exceed the following specifications:
- A. Rack mountable - 1U
 1. Where fiber densities are greater than can be accommodated in 1U, larger enclosures will be permitted.
 - B. Provide security and protection.
 - C. Be accessible from both front and rear.
 - D. Provide adequate strain relief for cables.
- 2.04 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.
- C. Furnish only new, first-class quality materials and equipment.
- D. System shall be comprised of interoperable components.

2.06 FIBER OPTIC MAINTENANCE

- A. Owner has found that several fibers in the current cable plant no longer meet the specifications and requirements for data transmission at speeds required for the instructional models and learning modes intended to be deployed over the next several years. In order to rectify this, the project includes testing and inspection work identifying necessary steps to return certain components of the existing fiber optic network to acceptable working condition.
- B. Work described in this specification section pertains to an outside plant fiber optic network maintenance of the existing Trenton Public Schools private fiber optic network infrastructure.
 - 1. Twelve (12) month agreement for Ongoing Fiber Optic Outside Plant Ownership Coordination including, but not limited to:
 - a. Receiving, coordination, marking and reporting for Owner notification all reports, including, but not limited to, MISS DIG and similar requests issued for district fiber network.
 - b. Single mode fiber optic cable repair and/or replacement to restore full operational capacity of network as may be needed due to environmental or accidental conditions.
 - c. Emergency repairs
 - d. Scheduled repairs and maintenance
 - e. In the event of any operational interruption, and/or potential operational interruption of communication, the Contractor shall design, engineer, propose, then, if approved, supply, connect, test, document, train Owner representatives and warrant a fully operational and compliant fiber optic link between all sites of

operation.

- f. Contractor shall coordinate their installation with other communication systems, contractors, Utilities, governmental entities having jurisdiction and the Owner as is appropriate.
- g. Maintenance for all fiber optic entrance facilities required to provide access into the building systems will be the responsibility of the Bidder and must be coordinated with the Owner.
- h. Owner shall retain the option to extend the contract for an additional period of 12 months, and notify contractor of any such extension to the contract 60 days before the contract is scheduled to expire.

2. Connectors and couplers.

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

4. Storage Loops

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

C. 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.

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

PART 3 - EXECUTION

3.01 PREPARATION

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

3.02 INSTALLATION

FIBER OPTIC CABLING

- 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. Ramset anchors shall NOT be allowed in any locations with precast concrete. Drilled anchors should be used only.
 - k. Any firewall penetrated to facilitate the routing of communication wiring shall be fire stopped using approved methods as outlined in the current National Electric Code (NEC) and all applicable State, County and Local ordinances.
 - l. Where cable tray or raceway is not provided Contractor shall provide and install cable supports of intervals not more than five (5) feet.
 - m. Cables shall not be laid on ceiling grid structure or any structure not specifically designed to support cable.
- F. Contractor shall be responsible for ensuring cable and components are not damaged during installation and the manufacturer’s recommended pulling ratings are not exceeded.

FIBER OPTIC CABLING

- 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.

3.03 TESTING

- A. All fiber optic cable shall be factory tested on a reel basis with performance data for each cable supplied to Owner.
1. Tests shall be conducted at both 1310nm and 1550nm wavelengths utilizing an Optical Time Domain Reflectometer (OTDR). Attenuation will be recorded for each fiber.
 2. Continuity testing shall be performed on each fiber of each cable reel prior to installation.
- B. Contractor shall review all end faces of field terminated connectors with a fiber inspection scope following final polish. Connector end faces with hackles, scratches, cracks, chips and/or surface pitting shall be rejected and 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.

3.04 DOCUMENTATION

- A. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:
1. Equipment description.
 2. Manufacturer's warranty.
 3. Maintenance contract terms.
 4. Verification of maintenance contract engagement.
 5. Telephone numbers for service and support.
 6. Detailed technical support and service procedure instructions.
 7. All product (hardware and software) manuals and manufacturer supplied documentation, including, but not limited to owner manuals, system administrator manuals and configuration guides. Where number of duplicate copies for

particular manual or documentation item could be reasonably considered excessive, Contractor shall request direction from Owner and Designer.

8. Photocopy of original invoice listing make and model for all material components and equipment from individual manufacturer(s), distribution source(s), or authorized agent(s) to establish manufacturer warranty start date for potential use after end of contract warranty provisions.
9. CAD as built drawings for each building.

3.05 TRAINING

- A. Not Used

3.06 SCHEDULE, MEETINGS AND PLANS

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

END OF SECTION

SECTION 27 13 23
LOW VOLTAGE CABLING

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to structured cabling to support various types and styles of communications systems. Owner expects structured cable system shall be used to provide connectivity for their new elementary school building as indicated and as specified herein.
- B. Structured cable system shall be compliant with EIA/TIA 568B.
- C. The Contractor shall configure, supply, install, connect, test, document and train Owner representatives and warrant a fully operational and compliant communications transport system, complete and with full functionality as specified herein including, but not limited to:
 - 1. Cables
 - 2. Jacks
 - 3. Cable support hardware
 - 4. Communication distribution racks
 - 5. Cross connect blocks and devices
- D. Contractor shall supply all necessary labor and material to demolish existing network IDF as specified herein including, but not limited to:
 - 1. Removal of existing network rack
 - 2. Removal of abandoned structured cabling
 - 3. Provide telecommunication box blank plates (approximately 40)
- E. Contractor shall coordinate their installation with other contractors, Architect, Construction Manager, Architect/Engineer and the Owner as is appropriate.

1.02 DRAWINGS

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

- B. Examine drawings of other trades and verify conditions of work sites. Arrange work accordingly.
- C. Deviations from drawings, with the exception of minor changes in routing and other such incidental changes not affecting functionality or serviceability of systems, shall not be made without written approval of Architect/Engineer.

1.03 WARRANTY

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

1.04 SUBMITTALS

- A. Submittals shall consist of technical cut sheets and information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval.
- B. Equipment or material installed for this project that does not have an approved submittal associated with it, shall be removed and replaced with acceptable equipment or material as defined by the Architect/Engineer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.

1. The Owner and/or Architect/Engineer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.
 2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due, or become due Contractor.
- C. Shop drawings and diagrams shall be submitted by Bidder for approval by Architect/Engineer with Bids.
1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Architect/Engineer.
 2. No work constituting final installation shall be commenced until after approval of shop drawings by Architect/Engineer.

1.05 REFERENCE STANDARDS

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

1.06 CONTRACTOR

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

- C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed. Certification of such training shall promptly be provided if requested by Architect/Engineer.
- D. The Contractor shall have a proven track record in structured cable configuration and installation. This must be shown by the inclusion of references of at least three (3) projects involving the installation of similar systems completed by the Contractor in the prior two (2) years on unaltered forms with the sealed Bid as provided herein.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

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

2.02 COPPER CABLE

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

C. Coordinate cable color(s) with Owner requirements prior to installation.

2.03 CROSS CONNECT EQUIPMENT

A. Cross Connect Equipment shall meet or exceed:

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

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. Snap-in, high impact housing
4. Field verify, and coordinate insert color to match Owner requirements.
5. Field verify and coordinate plates and/or outlet frame colors and materials to coordinate with electrical devices and Owner requirements.
6. Where station cable is to terminate above finished ceiling or behind a finished wall for cameras, speakers, or other special station devices, modular jack may be surface mounted in appropriate high strength, impact resistant plastic enclosure.
7. Furnish and install matching coordinating blank cover plates for all unused communications outlets indicated on drawings.
8. Mount flush plates so all four edges are in continuous contact with finished surfaces.

9. Furnish and install smear resistant, mechanically imprinted polyester or similar material labels to identify each port of all patch panels (fiber optic and copper) in compliance with EIA/TIA 606 standards or Owner required scheme. Labels shall be permanently affixed to patch panels.

2.05 OWNER STANDARDS

- A. Contractor shall provide connectors in a color to match the Owner's existing standards.
- B. Contractor shall provide cover plates and any associated keystone inserts as may be required matching Owner's existing standards.
 1. White cover plates.
 2. White 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. Special Communication (SC) A

1. Contractor shall provide Special Communication outlets for connectivity including, but not limited to:
 - a. UTP station cables to be installed in all locations identified in Appendix B – Building Diagrams.
 - b. One (1) UTP cables shall be made to locations identified as Special Communication A
 - c. UTP station cables shall be installed and terminated on compliant patch panel in nearest IDF and wire device with a single surface mounted biscuit jack.
 - d. Device location shall be as indicated on drawings and above finished ceiling/surface, but accessible for station connection.
 - e. 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.

B. Special Communication (SC) B

1. Contractor shall provide Special Communication outlets for connectivity including, but not limited to:
 - a. UTP station cables to be installed in all locations identified in Appendix B – Building Diagrams.
 - b. One (1) Data runs shall be installed and terminated with keystone jacks in empty surface mounted single gang box provided by others.
 - c. UTP station cables shall be installed and terminated on compliant patch panel in nearest IDF and wire device with a single surface mounted biscuit jack.
 - d. Device location shall be as indicated on drawings and shall be installed in existing telecommunications box.

2.07 ALLOWANCES

- A. Contractor shall include allowances for contract service reimbursements as required below in base bid lump sum amount(s).
 1. Allowance shall be made in the amount of \$10,000 for contract services 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

PART 3 - EXECUTION

3.01 PREPARATION

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

3.02 INSTALLATION

- A. Contractor shall be familiar with the environment where work shall be done as specified herein.

LOW VOLTAGE CABLING

- 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 drawings. Contractor shall calculate distances to ensure the adherence to the EIA/TIA 568 distance limitations. Contractor shall notify Architect/Engineer of cable length exceptions prior to installation in writing and request direction.

11. All copper data cabling shall terminate on Category 6 compliant connectors. Approximately 10 ft. of Category 6 and/or fiber cabling shall be coiled and stored at each cable distribution center in order to accommodate future change.
12. Wiring not installed in conduit shall not be routed within 18 inches of light fixture ballasts or within 36 inches of motors or transformers.
13. Coordinate cable colors with Owner requirements prior to installation.
14. Contractor shall include any sleeves where wall penetrations are needed. Sleeves shall be a minimum of 2" diameter and sized for cable being installed with a maximum fill rate of 25%. All installed sleeves shall be fully fire stopped with compliant fire stop material following cable installation.
15. Assemble, install, configure and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
16. All work shall be completed in strict compliance with applicable codes, manufacturer's recommendations, and industry best practices and standards.
17. Work shall be performed to meet local codes and industry standards, including, but not limited to:
 - a. Grounding and Bonding.

E. Sites of Work:

1. Hedke Elementary
3201 Marian Drive
Trenton, Michigan 48183

- F. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.
- G. The building and work area shall be returned to its original condition prior to final sign off of the project.
- H. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure or finishes in the building by the Contractor. If in the course of work, Contractor damages, marks or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate or panel to the original condition.

3.03 DOCUMENTATION

- A. Contractor shall be responsible for providing thorough, timely documentation. Documentation shall include, but not be limited to both printed and electronic copies of:

1. CAD as-built drawings of each building.
2. Copper station cable test results.

3.04 TESTING

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

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

3.05 TRAINING

- A. Not Used.

3.06 SCHEDULE, MEETINGS AND PLANS

- A. Schedule

1. Post bid Interviews: Week of January 29, 2024
2. Contractor Chosen: Week of January 29, 2024
3. Work Commences: April 1, 2024
4. Substantial Completion of Project: June 1, 2024

5. Project Close-out: July 1, 2024
- B. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner, documented herein, required by Architect/Engineer, Architect and/or Construction Manager and as required to meet schedule.
 - C. Contractor shall attend all construction progress meetings as may be required by Construction Manager and Owner. Such meetings shall aid in coordination and scheduling for field work and be held at the convenience of the Construction Manager.

END OF SECTION

SECTION 27 21 19
NETWORK ELECTRONICS

PART 1 - GENERAL

1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to Ethernet switch infrastructure upgrades to existing equipment in MDF and IDF locations in Trenton Public Schools.
- B. System shall be comprised of building core consolidation switches in each remote building end and distribution switches (stackable) in distribution closets for connection to end devices as described herein. Switches shall be installed, configured and connected to the existing building cable plant at the Owner's discretion.
- C. Contractor shall coordinate their delivery and installation with other contractors, Designer and the Owner as is appropriate.

1.02 WARRANTY

- A. Complete installation shall be free from defect and/or failure for a period of three (3) years. Any replacement, upgrade or fix, including labor for any non-conforming or non-operational part of the system shall be fixed and/or replaced at no cost to the Owner.
- B. Manufacturer's warranty and/or extended warranty shall be provided for all components of the system.
 - 1. Any documents and/or submittals required by individual manufacturers for compliance with the standard and/or applicable extended warranty programs shall be provided and submitted for approval by the Contractor.
 - 2. Contractor shall submit all documents, apply for warranty or extended warranty certification, and provide a Certificate of Warranty or Extended Warranty as may be applicable from the manufacturer prior to project closeout.
 - 3. Network switches deployed for both Building Distribution and Device Distribution as described herein shall additionally be covered by a manufacturers limited lifetime warranty. Such warranty shall provide for the full repair or replacement of any component not properly functioning, including materials and labor, for the useful life of the product.

- 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. Next business day (NBD) or less for matters that render twenty percent (20%) or more of the system unable to maintain normal functionality. Replacement parts for any item determined to be functioning below full design capacity shall be replaced promptly. Replacement components shall be shipped to Owner in order to arrive on the next business. Replacement components shall be shipped in advance of Owner return of non-functional components (Advance Replacement).
 - 2. Two (2) business days for matters not meeting the above criteria.
 - 3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.
- E. Bidder shall provide current annual maintenance contract pricing for recommended maintenance programs for all equipment following the specified and included warranty period as an 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 STORAGE OF MATERIALS

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

1.04 SUBMITTALS

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

1.05 REFERENCE SPECIFICATIONS

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

1. IEEE
2. EIA/TIA Commercial and Administration Standards
3. NEC
4. FCC – All Applicable Rules and Regulations
5. UL
6. MOSHA Safety Standards

1.06 CONTRACTOR

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

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers (In alphabetical order):

1. CISCO SYSTEMS/MERAKI

2. Or Equal.

- 2.02 Supply most current version of all products provided.
- A. Manufacturer shall have five (5) years of experience and history manufacturing similar products to those specified.
 - B. Proposed components shall have been field tested and proven in actual use.
 - C. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.
 - D. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.
- 2.03 Furnish only new, first-class quality materials and equipment.
- 2.04 Individual switches shall be capable of being fully administered from any web browser attached to the network.
- 2.05 Administration access shall be protected by unique and secure log on (User ID and Password).
- 2.06 System administrator shall be capable of complete switch back-up and full switch restoration from a previously saved configuration.
- 2.07 In the event of a power failure, complete system shall automatically re-initialize and “become active” to the last configuration in use with no human intervention.
- 2.08 All necessary supporting materials, including, but not limited to, optics (SFP+), mounting kits, power supplies, brackets, etcetera, for a fully compliant, supported, and operational system. Note that SMF optical patch cables are supplied by others.
- 2.09 NETWORK SWITCHES
- A. One (1) – Forty-Eight (48) port Network Core Switches shall be provided and installed in locations identified on Appendix C, meeting or exceeding the following features, ports and capabilities:
 - 1. 10GB Ethernet port(s) shall be provided per switch as identified below with appropriate SMF SFP+ optics packages (if applicable) for building connection using external and internal single mode as described herein.
 - a. Two (2) ports shall be provided for interconnection of network core switches in a resilient configuration. Switches shall be stacked and configured in a single logical unit.

- b. All remaining ports shall be SFP+ capable.
- 2. Switches shall provide aggregate bandwidth of 20Gb (10+10) on active/active links across switches to all dual connected devices and facilities.
- 3. Switches shall provide for management of full layer 3 controls and feature set as an integrated unit – not as two separate switches.
- 4. Switches shall include N+1 load balancing, hot swappable, power supplies.

2.10 DEVICE DISTRIBUTION SWITCHES

- A. Stackable Device Distribution Switches shall be provided in locations identified on Appendix C. Quantity shall be referenced on Appendix C. Switches shall be installed to facilitate cross connection of all station cables in the district connecting network devices.
- B. Switches shall replace and expand upon the variety of existing device distribution switches currently deployed across the district.
- C. Switch shall be complete with associated optics, stacking cables and options for a fully functional and operation system.
- D. Switches provided shall meet or exceed the following:
 - 1. Forty-Eight (48) 10/100/1000 UTP Ethernet ports.
 - 2. Four (4) 10GB Ethernet SFP+ based port per stack.
 - 3. Adequate stacking cables and/or ports to facilitate configuration of stack with no more than 384 ports per stack and as described in associated appendices and described herein.
 - 4. Switches shall be stackable and support 384 ports per stack with a single IP address
 - 5. Switches shall support uplink trunking across the stack
 - 6. IEEE 802.1p QoS with 4 queues per port.
 - 7. SNMPv1/v2c/v3
 - 8. 802.1X and Protocol based VLAN support.
 - 9. IEEE 802.3ad Link Aggregation (LACP).
 - 10. Broadcast, Unicast and Multicast traffic suppression.

11. IGMP Snooping
12. DHCP Helper
13. IEEE 802.1X Port Based Network Access Control
14. Power over Ethernet Plus (PoE+)
 - a. All Device Distribution switches provided shall be 802.3at PoE+ compliant.
 - b. Each switch shall have a PoE power budget of 720 Watts with a single power supply and be upgradable to a total power budget of 1440 Watts in the future with the addition of a second power supply.
15. Contractors shall supply all cables (excepting SMF patch cords provided by others as described herein), optics, licensing and labor to enable two (2) 10Gbe connections to all device distribution stacks.

2.11 BASIC INFRASTRUCTURE MANAGEMENT

- A. A new basic Network Management platform shall be deployed and include features such as, but not limited to:
 1. Automated discovery and mapping of network devices.
 2. Bulk configuration, back-up and restore tools.
 3. Troubleshooting tools that facilitate rapid location, isolation and repair of network problems.
 4. Provide detailed performance monitoring and assist in detecting network performance anomalies and trends both in real time and historical.
 5. Maintain and flexibly report network inventory, configuration details, device history and performance.
 6. Assist with system update management.
 7. Provide management incorporating all provided new, as well as existing switches that remain.
 8. Provide management incorporating Owner's existing network core switch.
- B. Network management platform shall be deployed on an Owner provided device dedicated to, and provisioned for network management. Virtual server based options may be shown preference.

- C. All installation, configuration, set-up and initial system deployment efforts shall be the responsibility of Contractor.

2.12 ALLOWANCES

- A. Contractor shall include allowances for contract service reimbursements as required below in base bid lump sum amount(s).
 - 1. Allowance shall be made in the amount of \$5,000.00 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 a detailed walk through of all facilities to verify mounting and physical installation requirements.
- B. Contractor shall conduct a preliminary installation and configuration meeting at the convenience of the Owner to discuss Owner plans for network applications and device attachments to insure proper final configuration for all parameters including, but not limited to:
 - 1. VLAN and routing configuration
 - 2. Security configuration
 - 3. Physical layout and connection schemes and configurations
 - 4. PoE applications intended devices.
 - 5. Confirm switch and device naming and identification scheme.
 - a. Physical labeling
 - b. Electronic / configuration management information.
 - 6. Management and problem diagnostic options.

- C. Contractor shall insure all submittals and shop drawings have been provided to, and approval has been obtained from Designer prior to commencement of any final installation activities.
 - 1. Additionally, a detailed installation plan shall be provided for Owner and Designer approval prior to the commencement of any final installation activities. This plan shall include, but not be limited to the following:
 - a. Switch software configuration(s).
 - b. Physical layout and connection schemes and configurations

3.02 INSTALLATION

- A. Contractor shall be familiar with the environment where work will be done as specified herein and make every reasonable effort to minimize interference with Owner's or other contractor's activities.
- B. All equipment provided by contractor shall be fully configured and installed for the Owner's applications based on an installation plan provided by Contractor and meeting approval of Owner and Designer prior to the commencement of work.
- C. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed and disposed of in an approved container for the site. All equipment and tools shall be removed from common areas and stored in approved, secure storage locations. Any work that may impede the general use of the space and/or other contractor's work and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.
- D. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.
- E. 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.
- F. The Contractor shall furnish, set in place, and physically install all equipment necessary for a fully compliant and operational system as specified herein.

- G. Contractor shall fully cooperate with Owner for detailed switch software/firmware configuration and system integration activities.
1. Such integration activities Contractor shall be responsible for include, but are not limited to:
 - a. Compatible connection to Owner's existing district core switch.
 - b. Compatible programming of any/all 802.1p/Q VLAN and tags
 - c. Complete compliance with existing Owner switch programing standards and functions.
- H. The installation process includes, but is not limited to the following:
1. Inventory receipt of all components and equipment.
 2. Storage of all equipment and components at Owner designated and provided until such time those items are installed according to the specifications.
 3. Transport equipment to the Owner's installation location(s).
 4. Physically assemble, install, configure and test based on an approved test plan all equipment and components, maintaining accurate inventory records and status documents and discarding packaging as may be directed by Owner.
 - a. No reuse of existing power cables, patch cables, brackets or other used components will be permitted. Contractor shall provide all new cables, screws, brackets, and all other materials for a first-class new installation at each site of work.
 5. Label all system devices as may be appropriate and required by Owner and Designer using approved Brady labels.
 6. Work includes extending connection and interconnection cables from equipment, as required, to Owner identified connection ports at all locations.
 - a. Work includes supply and installation of new connection/patch cables to all devices for a fully functional and compliant system. Some devices may require special care and suitable tools to complete such connection or re-connection of cables.
 - b. Patch cables shall not exceed ten (10) feet in length unless otherwise specified.

- c. Switch installation in cabinets shall be between patch panels to the greatest degree possible in order to facilitate short and direct patch cable connection. Contractor shall be responsible to adjust heights in cabinets of patch panels and switches to accommodate such an installation. Such adjustment shall include, but not be limited to extending existing service loops to facilitate vertical adjustment of components in cabinets.
 - d. Coordinate all patching plans and specific cable lengths used with Owner and Designer. Patch cables shall not be excessive in length for the connections made, and as such multiple lengths of cable will be required in each closet to properly and acceptably complete this portion of the work.
 - e. Patch cables shall be Category 6 cable.
 - f. Coordinate all patch cable color with Owner and Designer. Multiple colors shall be used to differentiate particular device types.
 - g. Install all patch cable in neat workman like manner including, but not limited to dressing all cable routes and slack with .5" velcro straps.
 - h. One compliant patch cable shall be provided for each device distribution port provided under this contract.
7. Work includes removal and, at the Owner's discretion, disposal of all old and unused patch cords and wiring closet rack and switch components that will not be in use for the new systems being deployed.
- a. This includes, but is not limited to:
 - 1. Unused switches and hubs found in racks.
 - 2. Unused patch cords
 - 3. Unused PDU and power cables
 - 4. Unused mounting brackets and screws
8. Complete system administrator training programs as specified herein.
9. Work shall be performed to meet local codes and industry standards including proper grounding and bonding of installed equipment.
- I. Sites of Work:

1. Hedke Elementary
3201 Marian Drive
Trenton, Michigan 48183
 2. Trenton High School
2601 Charlton Road
Trenton, Michigan 48183
 3. Arthurs Middle School
4000 Marian Drive
Trenton, Michigan 48183
- J. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate or panel to the original condition.
1. 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.
- K. Contractor shall fully install and configure all network infrastructure for complete, compliant and final Owner applications and requirements including all physical labeling for asset management.

3.03 TESTING

- A. In an effort to insure a smooth “turn-up” of the new system Contractor shall submit to a thorough testing process as defined herein prior to cut-over.
- B. Prior to requesting testing by Designer, the Contractor shall use adequate means to assure the Work is completed in accordance with the specified requirements, meets the owner’s specific application requirements and is ready for functionality and integrity testing.
- C. Testing Procedures
1. Prior to system “turn-up”, Contractor shall submit a written request to Designer indicating they have completed full and final configuration of the system, and are ready to have system integrity and functionality tested. Such request shall include a written proposed test plan for complete system functionality.

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

3.04 DOCUMENTATION

- A. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:
1. Equipment description.
 2. Equipment make.
 3. Model number.
 4. Serial number.
 5. Software release.
 6. Manufacturer's warranty.
 7. Maintenance contract terms.
 8. Verification of maintenance contract engagement.
 9. Telephone numbers for service and support.

10. Clearly label provided devices with E-Rate FRN.
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. Complete inventory of installed hardware and system software. Hardware inventory shall include, but not be limited to, model numbers, serial number, physical installation location and software/firmware options.

3.05 TRAINING

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

3.06 SCHEDULE, MEETINGS AND PLANS

C. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner, documented herein, required by Designer, Architect and/or Construction Manager and as required to meet schedules.

D. Schedule

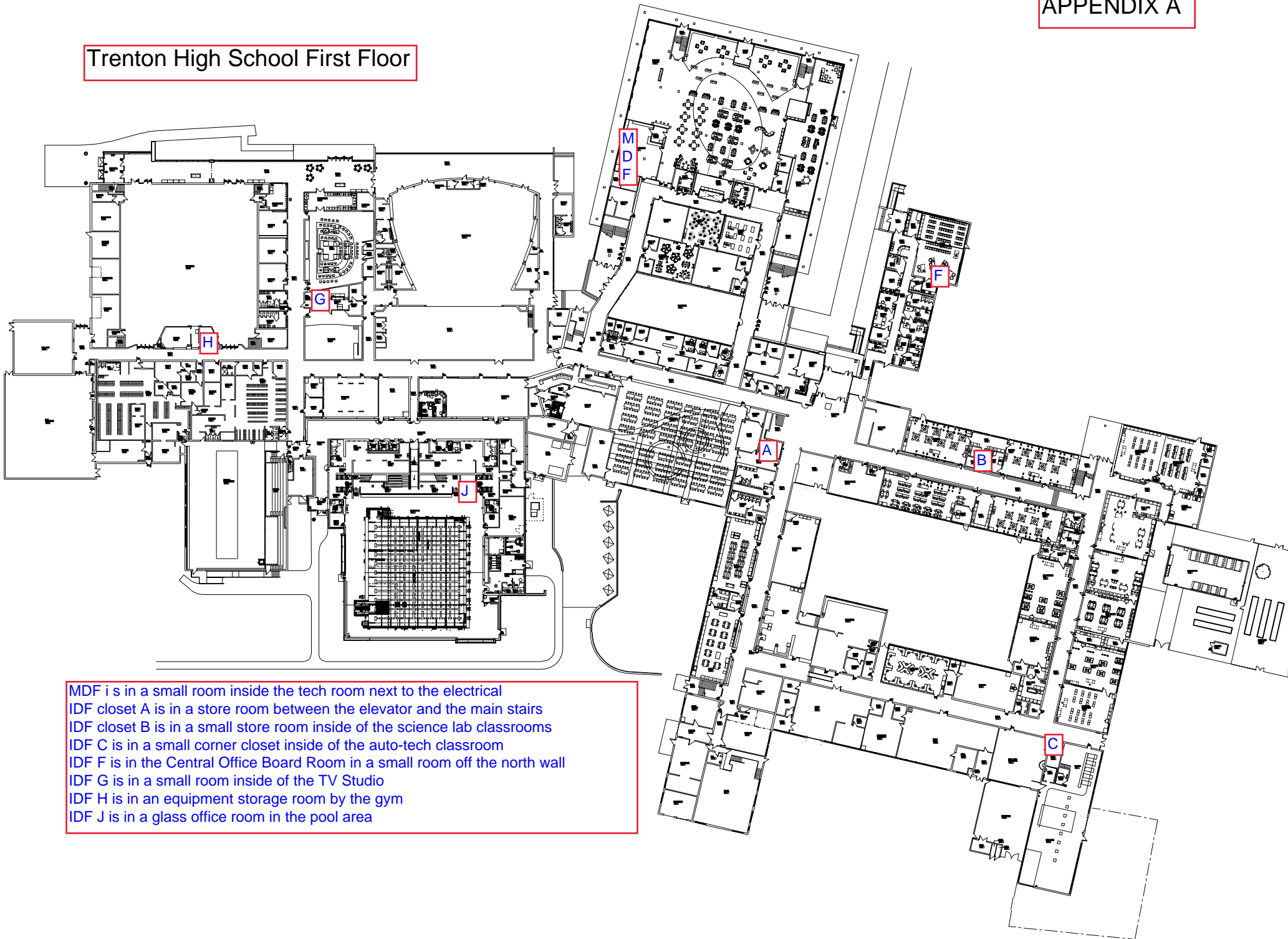
1. Post bid Interviews: Week of January 29, 2024
2. Contractor Chosen: Week of January 29, 2024
3. Work Commences: April 1, 2024
4. Substantial Completion of Project: June 1, 2024
5. Project Close-out: July 1, 2024

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

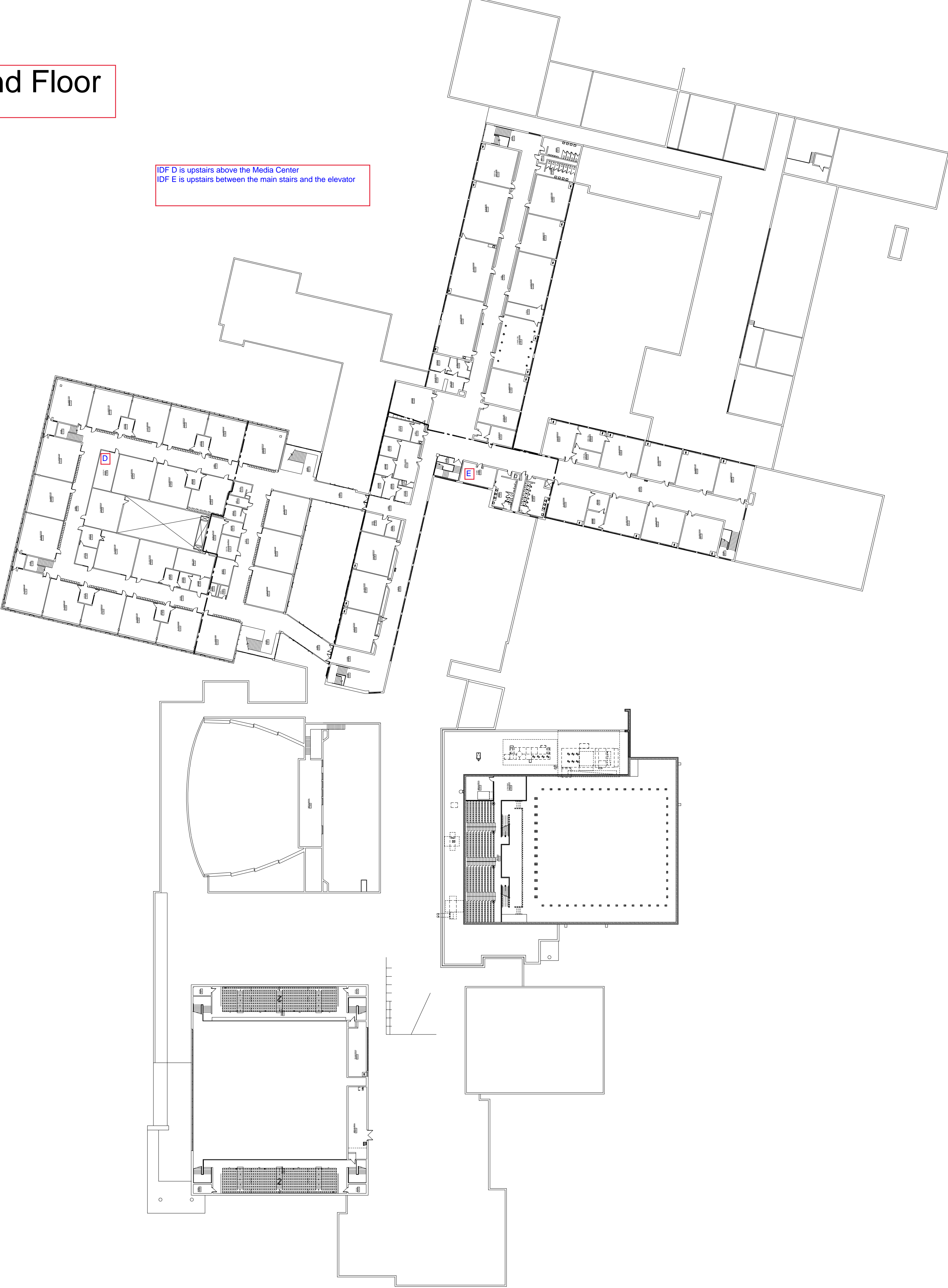
C. Project progress meetings shall be held, but not limited to, weekly at a site and time identified as convenient for Owner and as required herein. Meetings will be attended as required herein.

END OF SECTION

Trenton High School First Floor



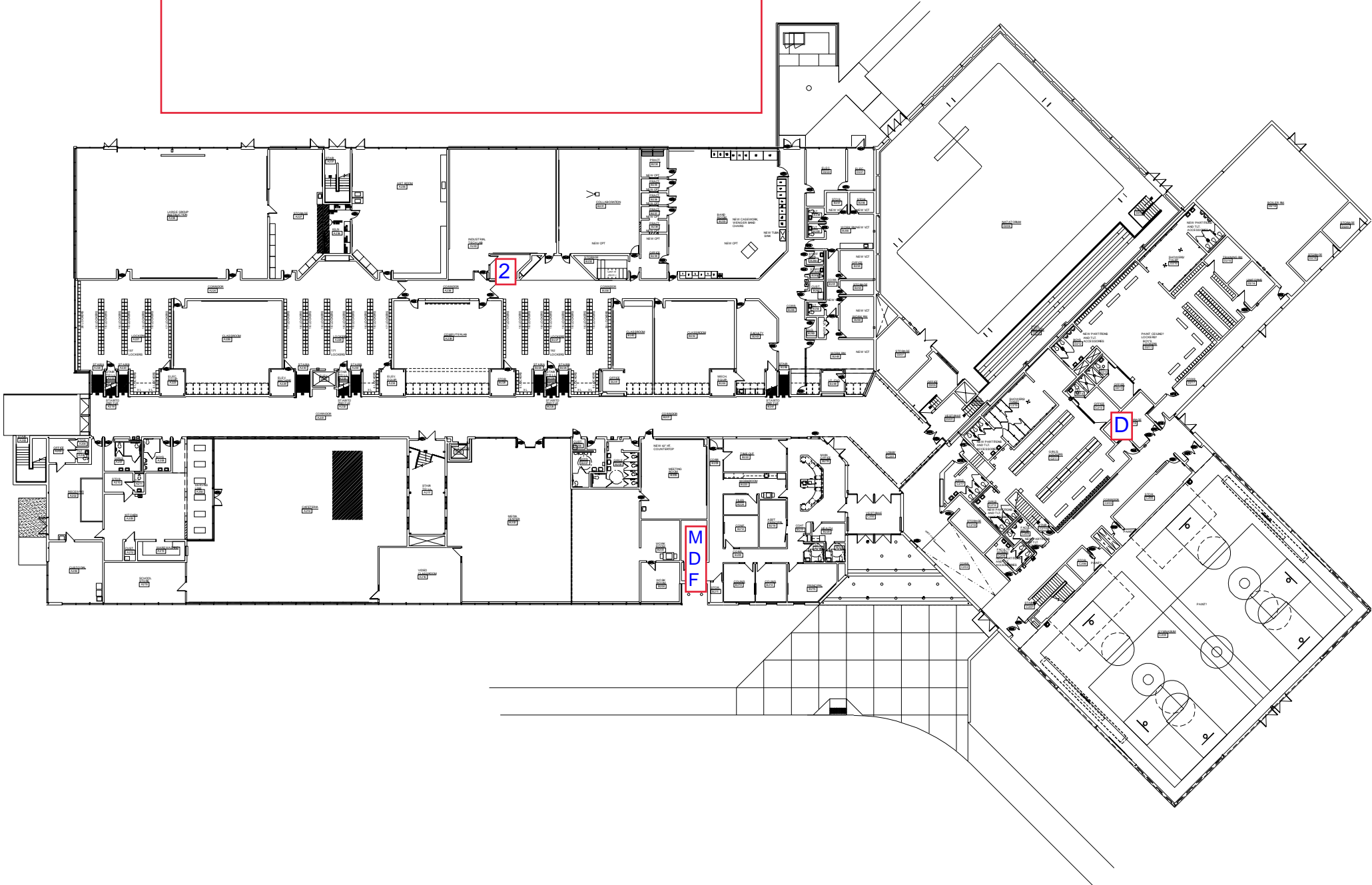
Trenton High School Second Floor



IDF D is upstairs above the Media Center
IDF E is upstairs between the main stairs and the elevator

MDF is located in the main office area in a small storage room
IDF closet 2 is in a storage room within the tech lab classroom
IDF closet 3 is in a small maintenance room by the gym

Arthurs Middle School First Floor



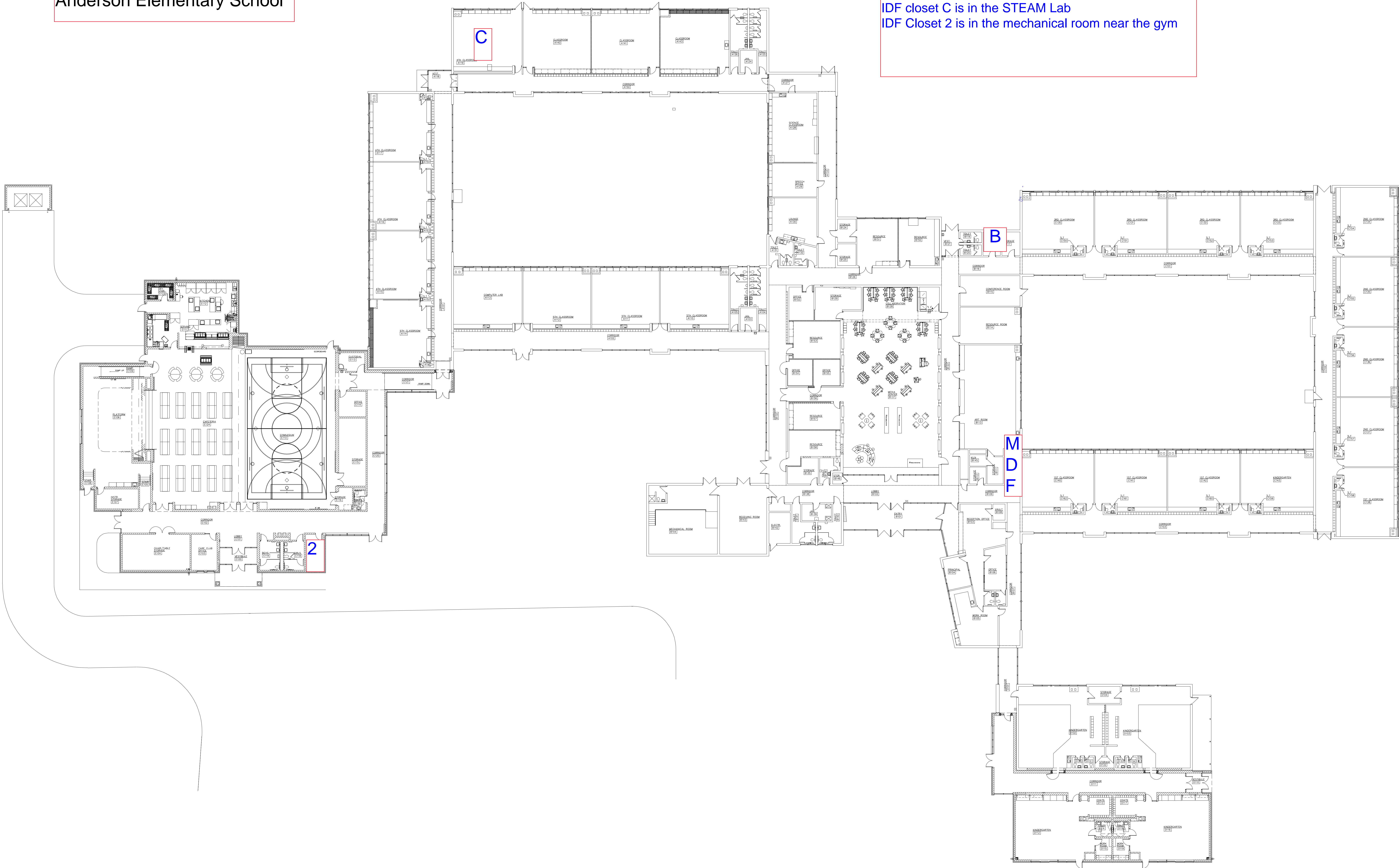
Arthurs Middle School Second Floor

IDF 1 is located on the west side upper level in a small workroom



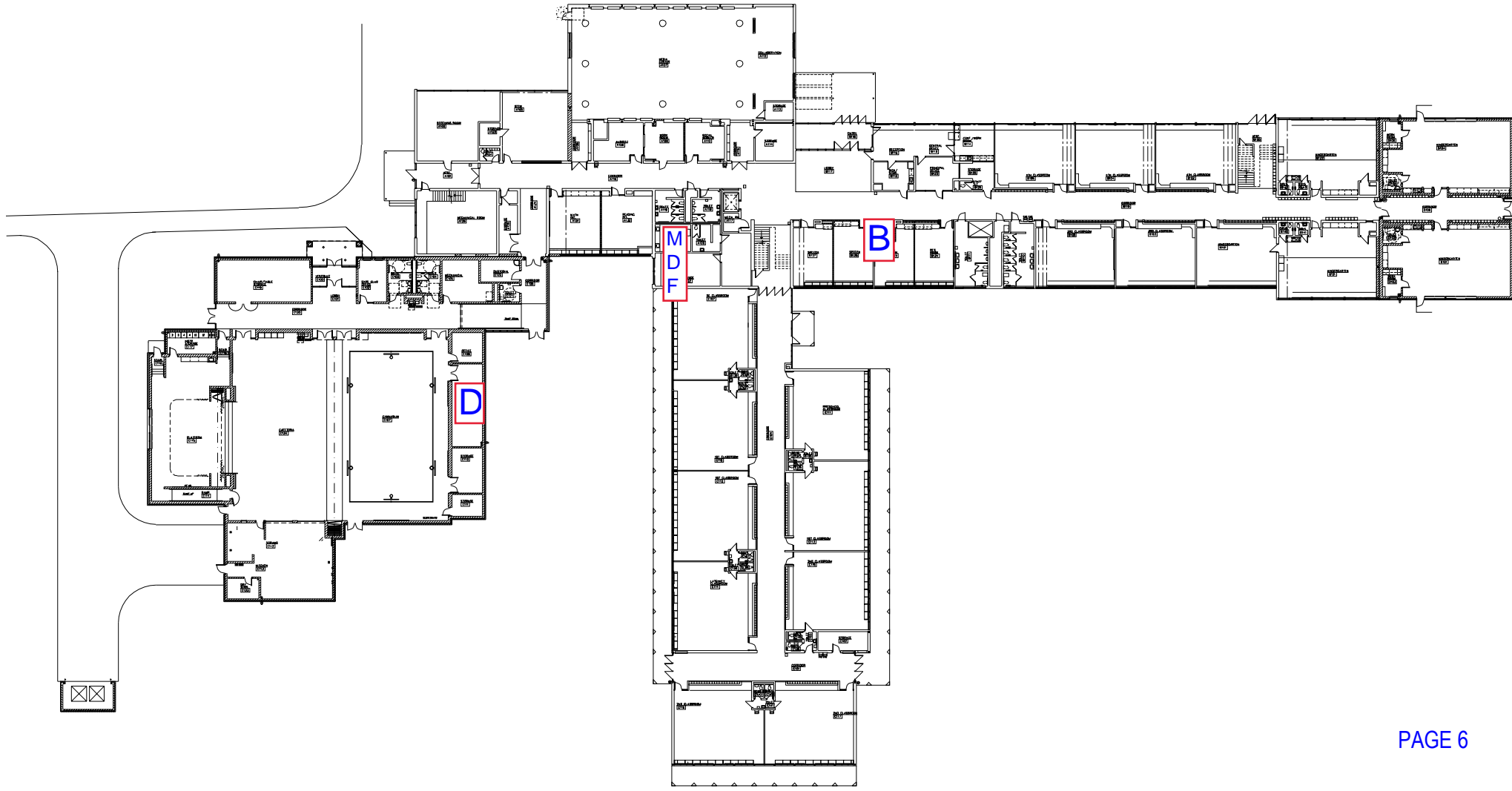
Anderson Elementary School

MDF is in the custodial closet near the main office.
IDF closet B is in the custodial closet
IDF closet C is in the STEAM Lab
IDF Closet 2 is in the mechanical room near the gym



Hedke Elementary First Floor

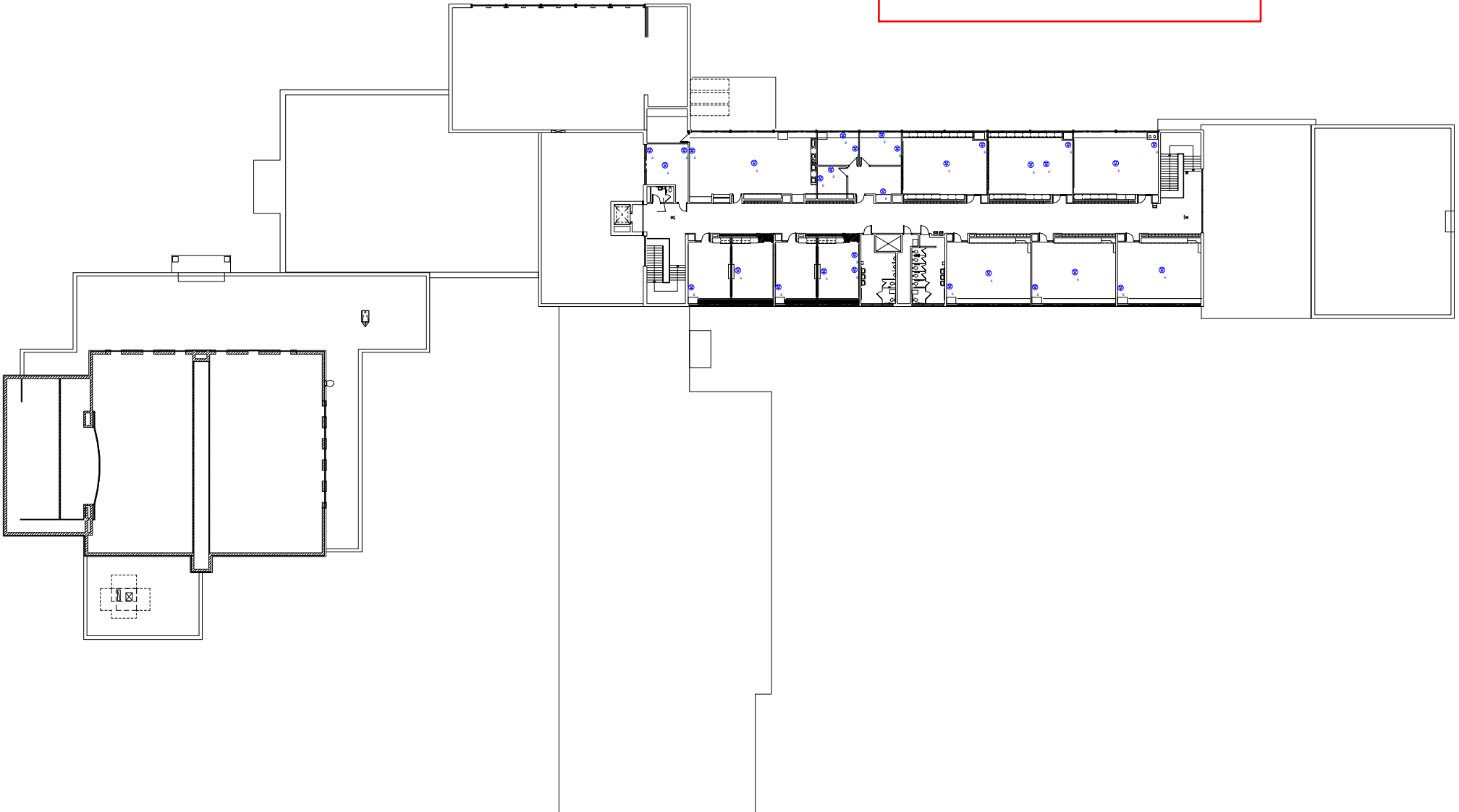
MDF is in the Kitchenette connected to the Staff Lounge
IDF closet B is across from the main office in the entry to small classrooms
IDF D is located in the gym storage room



APPENDIX C

Hedke Elementary Second Floor

- Ⓟ_A Reference Special
Communication A
- Ⓟ_B Reference Special
Communication B



APPENDIX C

NETWORK SWITCHES	Quantity
Hedke Elementary School	
MDF	1
Anderson Elementary School	
MDF	1
Arthurs Middle School	
MDF	1
Trenton High School	
MDF	2
DEVICE DISTRIBUTION SWITCHES	Quantity
Hedke Elementary School	
MDF	6
IDF B	4
GYM IDF	1
Total	11
Arthurs Middle School	
MDF	7
IDF 1	3
IDF 2	3
GYM IDF	1
Total	14
Trenton High School	
MDF	6
Total	6