# **OUTSIDE PLANT FIBER WAN EXTENSION**

Technology Request for Bid



00 01 01 - 0

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

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# **DIVISION 27 – TECHNOLOGY SYSTEMS**

<u>Section</u>	<u>Description</u>
27 13 23	Outside Plant Fiber Optic Network

### **APPENDICES**

<u>Section</u>	<u>Description</u>
А	Appendix A - Geotech Staking Sheets

END OF SECTION

# SECTION 00 01 15 LIST OF DRAWINGS

<u>File/Name</u> RPS-ETESS1-20 **Description** 

Rockford Public Schools Edgerton Trails Staking Sheets (By Geotech)

# END OF SECTION

LIST OF DRAWINGS 00 01 15 - 2

### SECTION 00 11 16 INVITATION TO BID

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

- A. Rockford Public Schools (Owner) is seeking bids for the extension of their Outside Plant (OSP) private fiber Wide Area Network (WAN), associated equipment and installation. Proposed systems shall be configured and installed to service Owner's new Edgerton Trails Elementary School facility with connectivity to the existing Freshman Center School Data Center, and as described herein.
- B. Project: OUTSIDE PLANT FIBER WAN EXTENSION
  - Owner: Rockford Public Schools 350 North Main Street Rockford, Michigan 49341
- C. Designer: Communications by Design, Inc.
- D. Sites of Work:
  - 1. Rockford Freshman Center
  - 2. Edgerton Trails Elementary

#### 1.02 GENERAL DESCRIPTION OF PROJECT SEQUENCE

- A. Sequences and dates specified herein are for information only and indicate the plan and intent of the Owner. Actual dates shall be established based on final award of project.
- B. Sequence of operations shall be established by the Contractor within the guidelines established by the Owner as required to meet schedules.
- C. Schedule:
  - 1. Request for Bid Distributed: October 5, 2023
  - 2. Pre Bid Meeting: October 11, 2023 at 12:30pm
  - 3. Question and Clarification Deadline: October 13, 2023 by 5:00pm
  - 4. Intent to Bids Due: October 13, 2023 by 5:00pm
  - 5. Public Bids Due: October 31, 2023 at 9:00am

#### 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 <u>highly encouraged</u> for all contractors interested in bidding on any components or portions of this project. Attendance at the pre-bid conference will be a factor considered during evaluation of bids.
- B. Time: October 11, 2023 at 12:30pm
- 1.05Location:Rockford Freshman Center, IT Conference Room4500 Kroes St. NE<br/>Rockford, MI 49341
  - A. Drawings identified in the table of contents herein will be reviewed at this conference.
  - B. Physical building inspections of sites of work will be provided for at this time.
- 1.06 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.

В.	Bid Receipt Deadline:	October 31, 2023 at 9:00am
C.	Bid Opening Location:	Rockford Public Schools Main Office 350 N. Main Street Rockford, MI 49341

- D. Faxed or electronically delivered bids will not be accepted.
- 1.07 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. Email <u>rszilagy@cbdconsulting.com</u>

#### 1.08 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.

#### 1.09 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.

# 1.10 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 Rockford Public Schools, a general powers school district.
- B. For purposes of this project, the terms "Architect", "Engineer" and "Designer" are used synonymously to refer to Communications by Design, Inc., a Michigan Corporation.
- C. The term "Bidder" refers to any organization properly and accurately submitting a complete "Intent to Bid Form" prior to the required time specified herein and subsequently properly submitting completed set of bid documents as specified herein.

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

### END OF SECTION

# SECTION 00 40 00 BID FORMS

BID FORMS 00 40 00 - 7

# 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 October 13, 2023. Only bidders returning a completed "Intent to Bid Form" will be notified of required addenda.

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

Portions of the bid for which you will be responding:

Section 27 13 23 – Outside Plant Fiber Optic Network

<u>Submit unaltered and completed form to:</u> Rebecca Szilagy Communications by Design, Inc. <u>rszilagy@cbdconsulting.com</u>

#### SEALED BID LABEL

Separate, or fold over, the label on the line below, and affix to the exterior of sealed container so information is clearly visible for Bid Submission. Insure 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:	Rockford Public Schools Attention: Mr. Michael Cuneo 350 N. Main Street Rockford, Michigan 49341
BID FROM:	
PROJECT:	OUTSIDE PLANT FIBER WAN EXTENSION TECHNOLOGY BID #3022
INCLUDING ADDENDA:	Addendum No.   Dated     Addendum No.   Dated
DUE:	9:00am on October 31, 2023

#### BID FORM

BID TO: Rockford Public Schools Attention: Mr. Michael Cuneo 350 N. Main Street Rockford, Michigan 49341

BID FROM:

### PROJECT: OUTSIDE PLANT FIBER WAN EXTENSION TECHNOLOGY BID #3022

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	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:

BID FORMS 00 40 00 - 10

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	
Voluntary Alternate D	
Voluntary Alternate E	
Voluntary Alternate F	
<b>PRINCIPAL SUBCONTRAC</b> As required herein, the following S	<b>TORS</b> Subcontractors are proposed to be used for this project:
Legal Name:	Work Proposed
Legal Name:	Work Proposed

Work Proposed

### **BID SECURITY:**

Legal Name:

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

BID FORMS 00 40 00 - 11

that non-compliance of this authority or any other bidding requirements may result in forfeiture of bid security, dismissal of consideration of bid submitted, and/or personal liability against the signatory.

#### AGREEMENT:

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

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

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

(If Corporation, affix Seal)

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

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

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

 (Chec	k only one Box Below)	
It is herby acknowledged and certified by Bidder that <u>no</u> familial relationship exists between the owner or any employee of the Bidder and any member of the project Owner's governing Board(s) or Superintendent(s).		
A familial relationship exists between the owner or an employee of the Bidder and a member of the project Owner's governing Board(s) or Superintendent(s). The person(s) and the relationship(s) are as follows:		
Bidder	<b>Board or Superintendent</b>	

blauer Authorizeu Representative:	
Bidder:	
Representative's Signature:	
Print or Type Name:	
Representative's Title:	
Subscribed and sworn this day of	, 2022.
In the County of State of	
By Notary Public Signature	Seal or Stamp:
My commission expires on:	

# BID FORMS 00 40 00 - 13

# **IRAN LINKED BUSINESS AFFIDAVIT**

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

The undersigned, owner or authorized officer of

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

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

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

# **REFERENCES**

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

# **CONTRACT EXCEPTIONS**

		Check one Box
Bidder takes no exception conditions and/or requires	n to, ment	and agrees to comply with all sections, terms, s of the Contract Documents.
Bidder proposes the follo	wing	exceptions to the Contract Documents:
Paragraph Number		Explanation

# NOTE:

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

# **SCHEDULE OF VALUES/BID FORM**

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

Bidder:

Bid Division: 271323

				Unit	Unit Labor	Total
ID	Otv	Part Number	Mfg and Description	Cost	Cost	Proposed Cost
10	Qiy	1 art I vanoer	ings and Description	0051	0051	Troposea Cost
			PROJECT MANAGEMENT			
			TRAINING			
			BONDS AND INSURANCE			
			GRAND TOTAL (Must match base bid)			

END OF SECTION

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#### SECTION 00 21 13 INSTRUCTIONS TO BIDDERS

#### PART 1 - GENERAL

#### 1.01 OWNERSHIP

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

#### 1.02 COMPLIANCE

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

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

#### 1.03 NOTICE AND RESPONSE

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

#### 1.04 PROTECTION AND SAFETY

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

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

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

#### 1.05 DRAWINGS DIAGRAMS AND ILLUSTRATIONS

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

#### PART 2 - MATERIALS

# 2.01 VOLUNTARY ALTERNATES AND SUBSTITUTION OF SPECIFIED PRODUCTS

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

#### PART 3 - EXECUTION

#### 3.01 EXAMINATION OF DOCUMENTS AND SITE

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

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

#### 3.02 QUESTIONS, INTERPRETATIONS AND ADDENDA

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

#### 3.03 BID SECURITY, BONDS AND INSURANCE

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

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

- 1. Insurance certificate(s) shall be signed by insurance agent licensed in the state of Michigan or a representative of the insurance company.
- E. Contractor agrees to indemnify and hold harmless the Owner and Designer, including their agents and employees, from and against all claims, damages, losses and expenses, including, but not limited to, attorney fees arising out of, or resulting from the performance of the work to the fullest extent allowed by law on a comparison basis of fault.

#### 3.04 MODIFICATION AND WITHDRAWL

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

# 3.05 CODES, ORDINANCES, REGULATIONS AND RELATED

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

#### 3.06 SUB-CONTRACTOR AND MATERIAL SUPPLIER

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

#### 3.07 BID RESPONSE FORMAT

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

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

#### 3.08 AWARD OF CONTRACT

- A. The material proposed to be used for the completion of work, and the competency, solvency and responsibility of bidders will receive due consideration before award of contract. In the reception of bids for this work, the Owner incurs no obligation to accept the lowest, or any bid submitted. The right to accept or reject any and all bids or portion thereof is reserved by the Owner. The Owner reserves the right to require testimonial, accounting or legal documents pertaining to the solvency of a Contractor, or any other decision factor the Owner deems appropriate, prior to award of contract.
- B. Owner reserves the right to select individual components from schedule of values independent of installation as may be determined in Owners best interest. Selected bidder may be required to install selected components provided by others.
- C. Issuance of a Purchase Order or other form of duly executed Notice to Proceed 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 (proposed schedule) in the form of a "Gantt Chart" (or equivalent) indicating the proposed sequence of events and approximate beginning and completion dates in accordance with, compliance to, and coordinated with requirements herein.
  - 3. Changes of the Project Manager during the project shall not be acceptable without prior written approval from the Owner.
  - 4. It is the responsibility of the Contractor's Project Manager to schedule work, work out issues, ensure that all required products and services are delivered according to schedule and attend to any other matters required by the Owner in the interest of professional and timely completion of the project.
  - 5. The appointed Project Manager, or a designee acceptable to the Owner, shall be in attendance of all project meetings throughout the term of the project. Failure to do so may be considered a material breach of contract.

6. After a ten (10) business day notice, the Owner reserves the right to request a new Project Manager, when it appears that, in the Owner's sole discretion, the Project Manager is not fulfilling the full responsibilities of the position. Failure by Contractor to provide adequate Project Manager meeting requirements of the Owner, may result in Contract termination.

#### 3.10 CHANGES IN THE WORK

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

#### 3.11 PAYMENT REQUESTS AND PAYMENTS

- A. Contractor's invoices shall be submitted monthly in correlation with the Project Schedule indicating percentage of work completed.
- B. All contract and change order invoices shall be sent directly to Contract Designer.

- C. A 10% retainage shall be held back on all payment requests, including, but not limited to hardware, software, change orders and services, until final completion and close out of the project or project phase as determined by Owner and Designer.
- D. Contractors are required to submit all invoices on approved AIA Payment Request Forms or other billing format pre-approved by Contract Designer. Each AIA Payment Request Form shall be accompanied by a properly completed, executed and notarized Waiver of Lien which shall be in a format and contain verbiage approved by Owner.
- E. The Contract Designer and Owner shall process payment requests on a monthly schedule and in accordance with their respective established processes and procedures. Payments will be made by the Owner based only on AIA Request Forms having been previously certified, audited and approved by Contract Designer and accompanied by acceptable Waiver of Lien.

END OF SECTION

### SECTION 00 65 00 CONTRACT CLOSE OUT

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED

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

#### 1.02 SUBSTANTIAL COMPLETION

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

#### PART 2 - MATERIALS

#### 2.01 NOT USED FOR THIS SECTION

#### PART 3 - EXECUTION

#### 3.01 PROCEDURES

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

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

# END OF SECTION

# SECTION 27 13 23 OUTSIDE PLANT FIBER OPTIC NETWORK

#### PART 1 - GENERAL

#### 1.01 DESCRIPTION OF PROJECT

- A. Work described in this specification section pertains to an outside plant fiber optic network expansion of the Rockford Public Schools private fiber optic network infrastructure.
- B. Owner intends to install outside plant fiber-optic from the Data Center at the Rockford Freshman Center to the MDF location in the Edgerton Trails Elementary School. The outside plant fiber-optic cables shall provide for extending all district communication between Owners existing connected sites and the Edgerton Trails Elementary School.
- C. Fiber count for route shall be Forty-Eight (48) strands.

#### 1.02 WORK INCLUDED

- A. Work includes, but is not limited to, the following:
  - 1. Single mode fiber optic cable.
  - 2. Connectors and couplers.
  - 3. Splice enclosures.
    - a. Aerial
    - b. Pedestal
  - 4. All Permits and inspections required by all legal authorities and agencies beyond those already provided for by Owner and it's consultants.
    - a. Owner has secured valid permits from local jurisdictions and pole owners including, but not limited to:
      - 1. Consumers Energy
      - 2. MDOT
      - 3. Kent County Road Commission
  - 5. Aerial Storage Loops on approved snowshoes
    - a. Installed at each major intersection crossing with forty (40) feet of stored cable.

- B. The Contractor shall design, engineer, supply, install, connect, test, document, and warrant a fully operational and compliant Outside Plant Network, complete as specified herein.
- C. Contractor shall coordinate their installation with other communication systems, contractors, Designer and the Owner as is appropriate.

#### 1.03 WORK NOT INCLUDED

- A. The Owner has engaged professional consultants to secure applicable permits from pole Owners and/or requisite public entities, associated with the proposed construction. As part of this effort, the Owner is responsible for the following to support Contractors proposed scope of work:
  - 1. Pole make-ready
  - 2. Pole agreements and/or permits
  - 3. Ongoing right of ways or pole access charges the Owner will be obligated to pay based on attachments and or construction as permitted.

#### 1.04 REQUIRED BASE BID AND ALTERNATE CONFIGURATIONS

- A. Base bid shall be for an outdoor fiber optic network as documented in Appendix A and otherwise herein.
  - 1. Pathway for new fiber shall be contractor provided, both aerial and underground, and as specified herein.

#### 1.05 CODES AND STANDARDS

- A. NEMA TC 6 & 8 Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installations
- B. NEMA TC 9 Fittings for Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installations
- C. ASTM C 31 Standards Practice for Making and Curing Concrete Test Specimens in the Field
- D. ASTM C 39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
- E. ASTM C 172 Standards Practice for Sampling Freshly Mixed Concrete
- F. ACI 301 Structural Concrete

- G. ASTM A 615 Deformed and Plain Carbon Steel Bars for Concrete Reinforcement
- H. ASTM D 698 Standard Test Methods for laboratory Compaction Characteristics of Soil Using Standard Effort

#### 1.06 WARRANTY

- A. Complete installation shall be free from defect and/or failure for a period of three (3) years. The installation shall withstand environmental conditions and remain operational throughout the seasons. 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.
- D. Contractor shall provide the following response times for all malfunctioning equipment:
  - 1. Four (4) hours or less for matters that render twenty percent (20%) or more of the system users unable to maintain normal productivity.
  - 2. Two (2) business days for matters not meeting the above criteria.
  - 3. Response time shall be measured from the time Contractor is notified by Owner to the time work is begun to resolve the matter.
- E. System Warranty shall commence on date of substantial completion as certified by Designer and provided for herein. Delivery to work site of materials, physical removal from packaging, issuance of Contractor documents including, but not limited to invoices and/or packing slips, or any event or documentation, not specifically provided for herein, shall have <u>no</u> effect on Warranty or System Acceptance by Owner and/or Designer.

#### 1.07 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.

### 1.08 SUBMITTALS

- A. Submittals shall consist of, but not be limited to, technical cut sheets and detailed information pamphlets on all components of the system to be installed. All cut sheets and submittals shall be distinctly marked to highlight the actual part number of the item being submitted for approval with Bid.
- B. Shop drawings and diagrams shall be submitted by Bidder for approval by Designer with Bid.
  - 1. Shop drawings and diagrams shall show all data relating to structural, electrical, wiring, cross connect, interconnect, equipment arrangement/layout, and any other information deemed significant by the Designer.
  - 2. No work constituting final installation shall be commenced until after approval of shop drawings by Designer.
- C. Equipment or material installed for this project that does not have an approved submittal associated with it, will be removed and replaced with acceptable equipment or material as defined by the Designer. All replacement costs including, but not limited to material and labor, shall be the sole responsibility of the Contractor.
  - 1. The Owner and/or Designer may notify Contractor of any offending situations under this provision allowing Contractor up to forty-eight (48) hours to correct the situation prior to taking other corrective action.
  - 2. The Owner reserves the right to replace unapproved materials and deduct the costs of doing so as defined herein from any amounts that may be due, or become due Contractor.
- D. The Contractor shall submit within five (5) calendar days after the Notice to Proceed, a schedule that reflects the sequence of activities of the contractor's

approach to the execution of and completion of the work. The schedule shall be broken into work areas to provide for a clear identification of the planned progress of the work. Included in the schedule will be a list of tasks with list of deliverables and the percentage of work completed. This schedule shall coincide with progress payments applications dates and projected amounts. All durations shown will be in working days. <u>Microsoft Project</u> is the software of choice for this schedule. The timeframe described in the Contractor's Schedule shall represent the Contractor's plan for organizing, directing, managing, controlling, staffing and executing the work required by the Contract Documents. The district will rely on such schedules to coordinate and otherwise plan the work of the District, other separate contractors, or the District's routine daily work.

#### 1.09 REFERENCE SPECIFICATIONS

- A. All work, products, and materials shall conform with the following standards as applicable for the intended use:
  - 1. EIA/TIA Commercial and Administration Standards
  - 2. NEC
    - a. Article 770
  - 3. UL
  - 4. MOSHA Safety Standards

#### 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 Voice Communication System and perform related tests as recommended by the manufacturer and in accordance with the manufacturer's best practices and methods.
- C. Project Managers, Engineers and Technicians employed on this project shall be properly and fully trained and qualified by the manufacturer on the installation and testing of the equipment and systems to be installed.
- D. The Contractor shall have a proven track record in Outside Plant 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 Outside Plant 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. Corning
  - 4. CommScope
  - 5. Hubbell
  - 6. Lucent
  - 7. Nordex
  - 8. Siecor / Corning Cable Systems
- C. Network shall be constructed using industry standards and as specified herein.
- D. Contractor shall provide all dielectric fiber optic cable. All fiber shall comply with applicable ANSI/TIA/EIA specifications, including, but not limited to 568A.

# 2.02 CONDUIT AND FITTINGS

- A. All products shall be new, first-quality materials.
- B. Nonmetallic Conduit shall be provided for all buried cable. Conduit sizes shall be 1.5". Provide continuous material. Where continuous material is not possible, water tight welded fitting of the same type material conduit is required.
- C. Provide polypropylene pull full length in each underground conduit.
- 2.03 PULL BOXES

- A. Top access of pull boxes shall be a minimum of 30" x 38".
- B. The pull box ring and cover shall be constructed of medium strength concrete including appropriate mix of sand and aggregate for not vehicular applications. Internal reinforcement may be provided by means of steel, high strength polymer, fiberglass, or a combination.
- C. Pull boxes shall be located at ends and change of directions where distance between poles exceeds standards and as indicated in Appendix A.
- D. Conduit must enter and exit pull boxes at same elevation with no more than 2"penetration into pull boxes.
- E. Mastic joint compound shall be provided and shall be placed in the grooves of the attached sections.
- F. Provide cable support hardware and all supports for all cable, cable splices and cable terminations as required to support cable inside pull boxes.

### 2.04 FIBER OPTIC CABLE

- A. All fiber optic cables shall meet or exceed the following specifications or performance requirements:
  - 1. Installed cable shall be single mode graded index glass fiber.
  - 2. All materials in the cable are to be dielectric.
  - 3. 8.3 micron core size
  - 4. 125 micron cladding
  - 5. Maximum Attenuation
    - a. 1310nm: 0.35 db/km
    - b. 1550nm: 0.2 db/km
  - 6. Loose Tube, Gel-Free Single Jacket.
  - 7. EIA/TIA 598 color coding for fiber optic cable
  - 8. Flooded core
  - 9. Capable of bend radius as small as 20 x outside cable diameter (under installation load) and 10 x outside cable diameter (long term load).
  - 10. Capable of a minimum crush resistance of 850 lb/in.

- 11. All cable shall be outdoor rated and armored.
- 12. Cable shall meet or exceed the reference material of:
  - a. Corning ALTOS Lite Loose Tube, Gel-Free, Single Jacket, Single-Armored Cables or equal
- B. All fibers shall be terminated on SC connectors with composite ferrules at head end locations (MDF and Data Center). Total optical attenuation through the cross connect from any terminated fiber to any other terminated fiber shall not exceed 2 dB. All optical fiber shall be handled, installed, and supported as per manufacturer recommendations.
- 2.05 Supply most current version of all products provided.
  - A. Prior and/or old versions of products, unless specifically approved and documented by Designer and/or Owner shall not be acceptable.
  - B. In cases where a newer version of hardware or software is available at the time of installation, Contractor shall request clarification from Designer on which version is to be used.
- 2.06 Furnish only new, first class quality materials and equipment.
- 2.07 System shall be comprised of interoperable components.

#### PART 3 - EXECUTION

#### 3.01 PREPARATION

- A. Contractor shall conduct detailed project walk-through examination 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 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.

#### 3.02 INSTALLATION

- A. Contractor shall be familiar with the environment where work will be done as specified herein.
- B. Work Areas shall be cleaned at the end of each day. All debris shall be cleared, removed and disposed of in an approved container for the site. All equipment and tools shall be removed from common areas and stored in approved, secure storage locations. Any work that may impede the general use

of the space and cannot be removed shall be flagged and cordoned off by the Contractor prior to their departure.

- C. All equipment and materials shall be installed in a neat and workmanlike manner. Best practices installation principles shall be used throughout the project.
- D. The Contractor shall furnish, set in place, and install all equipment necessary for a fully compliant and operational system as specified herein. The installation process includes, but is not limited to the following:
  - 1. Inventory receipt of all components and equipment.
  - 2. Storage of all equipment and components until such time those items are installed according to the specifications.
  - 3. Transport equipment to the Owner's installation location(s).
  - 4. Assemble, install, configure and test all equipment and components, maintaining accurate inventory records and status documents and discarding packaging.
  - 5. Prepare, execute, and coordinate with the pole owners, right of way authorities and others all applications and documentation as required by Owner. Owner shall provide a "Letter of Agency" to Contractor to facilitate this activity as required.
  - 6. All fiber optic cables installed on poles shall be supported with one (1) quarter inch (1/4") messenger strand and four (4) down-guy assemblies or as indicated in Appendix A.
    - a. All fiber optic cables shall be double lashed to the messenger strand.
    - b. Squirrel guard shall be installed as needed.
  - 7. Work shall be performed to meet local codes and industry standards, including, but not limited to:
    - a. Adequate electrical and lightning protection for outside plant cable connections entering buildings.
    - b. Grounding and Bonding.
    - c. Following all manufacturer's best practice installation procedures and industry best practices.

- 8. All underground cable must be installed as indicated in Appendix A and within conduit with pull one additional strings or more where may be specified.
  - a. Cable installed beneath roads, parking lots, or any other load bearing structures must be routed through conduit using approved methods.
  - b. Contractor shall properly restore all areas affected by the installation of conduit/backbone cabling.
  - c. "CAUTION" tape and/or messenger/locator wire manufactured with a metallic conductor shall be laid directly above buried cable or conduits between six and twelve inches (6-12") below grade. Where boring is employed, bury tape/locator wire alongside the cable or conduit.
- 9. Work includes extending outside plant cable connections, as required, to Owner identified equipment installation locations at all locations. It shall be the sole responsibility of Contractor to provide building entry and access to the Main Distribution Frames (MDF) in each building and as specified herein.
  - a. All cable installed inside buildings (from building entrance to individual building MDF as identified by Owner and herein) shall be installed in one and one half inch (1.5") PVC orange colored fiber optic inner duct with suitable couplings when joining ends of inner duct.
  - b. Contractor shall install spider fan-out kits on fiber optic cable prior to termination.
  - c. All fiber optic cables shall all be terminated on fiber optic LC connectors on rack mounted patch panels (racks provided by others).
  - d. All fiber optic cable terminations shall be clearly labeled at each end with computer generated labels designations as approved by Owner.
  - e. 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.
  - f. Any firewalls 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.

- E. Contractor shall be responsible for locating and avoiding all underground electrical, water, wastewater, and other services prior to beginning any underground work.
  - 1. Contractor damage to any existing utilities and/or structures shall remain the Contractors sole responsibility to fully restore.
- F. Contractor shall be responsible for ensuring cable and components are not damaged during installation and the manufacturer's recommended pulling ratings are not exceeded.
- G. It shall be the responsibility of the Contractor to repair or replace any damage done to the structure of finishes in the building by the Contractor. If in the course of work, Contractor damages, marks or misplaces any surfaces or access plates/panels the Contractor shall repair and/or replace the surface, plate or panel to the original condition.
  - 1. Final determination as to the damage condition and/or repair/replacement fitness of any surface, plate or panel shall be the sole responsibility of the Designer.
  - 2. The building and work area shall be returned to its original condition prior to final sign off of the project.
- H. TRENCH EXCAVATION (if applicable)
  - 1. Comply with applicable OSHA Safety and Health Regulations for Construction.
  - 2. Before beginning trenching operations, stake out the proposed routing including trench width and obtain approval from the Owner's representative. Coordinate location identification of all underground utilities and services with appropriate agency or agencies.
  - 3. After trenching has begun and before any ducts or conduits are placed, notify the Owner's representative so that the trenching and installation may be inspected. Also notify the Owner's representative prior to any placement of concrete for duct banks, so that he/she may observe the placement.
  - 4. Excavate to permit installation of the conduit duct bank approximately along the grades shown on the Diagram (Appendix A). Deviations to duct bank depth must have prior approval from the Owner and Designer.
  - 5. Excavate a trench of sufficient width to allow thorough compacting of the backfill under and around the duct bank. A level sand bed a minimum of 6 inches deep shall be placed in the trench before conduit is installed.

- 6. Where excavation is in rock, remove all rock to a depth below the grade shown on the Drawings. Rock is defined as material that cannot be ripped or excavated by a backhoe with a one cubic yard bucket with rock teeth. Water shall be continuously pumped out from the trench.
- 7. The Owner's approval is required for the extent of the trench excavation prior to the duct bank installation. Contractor shall schedule excavation in accordance with the Owner's requirements prior to beginning construction.
- 8. Provide all necessary bracing and bridging to maintain traffic flow during construction through all areas interrupted by trenching. Provide construction signage, traffic barriers, and warning notices throughout the construction period.
- 9. Provide all necessary repairs to erosion control measures and reseeding of grass in areas disturbed by trenching.
- 10. Sheet and brace the excavation as required to prevent caving. The trench width may be increased accordingly. Maintain sheeting until the duct bank has been inspected and backfilled to either a depth of 30-inch minimum over the top of the duct bank or as indicated on diagrams. Leave sheeting and shoring in place where directed by the Owner's representative.

# I. UNDERGROUND INSTALLATION

- 1. Provide conduit in one complete lot. Partial shipment is not approved.
- 2. Conduit runs shall not exceed 600 feet between pull boxes and/or as identified in Appendix A.
- 3. Carefully handle and place all conduits to prevent breakage or other damage. For duct banks, brace and support all conduits as shown on the Drawings to prevent shifting when concrete is poured. All underground duct banks under roads and parking lots shall be steel reinforced.
- 4. Lay conduit in true straight line of a gradual or uniform sweep. Maintain uniform grade between buildings and/or manholes per profile Drawings and/or as identified in Appendix A. Conduits shall be sloped to drain into manholes or buildings where possible at a minimum grade 4 inches per 100 feet. Provide factory made long sweep bends for all bends 15 degrees or more, either horizontal or vertical, unless prior approval is given by Owner to bend conduit in field. Bend radius shall be 48" minimum unless noted otherwise on Drawings or Appendix A.
- 5. Cleanout conduits as work progresses and securely plug all open ends to prevent water, mud or debris from entering.

- 6. A minimum 10-foot section of galvanized rigid steel conduit shall be used when conduits enter and terminate in pullboxes, buildings, concrete walls, or other rigid structures. Provide plastic/rigid steel conduit adapters and rigid steel end bells where the conduits enter and terminate in the pullboxes, building, concrete walls, or other rigid structures.
- 7. Identify the underground cable location with metallic safety tape or vinyl tape with magnetic tracer marked "CAUTION! BURIED CABLE". Tape shall be located 12 inches above the conduit where possible.

# J. PULL BOX INSTALLATION

- 1. The excavation for the pullbox shall be to a suitable depth to allow for the pull box cover to be slightly elevated above the finished grade to prevent run-off from the entering. The finished grade material shall be sloped around the pull box collar of frame to prevent adequate cover and support.
- 2. The site preparation for the pull box shall conform to the manufacturer's recommendations. Generally 3 to 6 inches of stabilize sand and base material shall be spread in the bottom of the excavation. The base material or sand shall be compacted and graded to the proper elevation.

### K. TRENCH BACKFILLING - (Where applicable)

- 1. Backfill using fine material up to 24 inches above the top of the duct bank placed in 6-inch lifts and thoroughly tamped.
- 2. Consolidate the conduit fill material under roads or similar traffic areas in such a manner as to provide an unyielding foundation of the paving. Remove all excess materials.
- 3. Succeeding layers of backfill 18 inches and greater above the duct bank may contain courser materials. Backfill shall be free of all organic material or any other material that would cause subsequent settlement. Maximum size of backfill stone or aggregate shall not exceed 6 inches in its greatest dimension.
- 4. Surface of backfill shall be safe for vehicular traffic as soon as possible. At the upper 12 inches of the backfill provide an approved moist material, thoroughly compacted by tamping thin lifts (approximately 4 inches per lift). Lay the top layer at the required grade surface.
- 5. Compact backfill by tamping or other method as approved by the Owner's representative. Maintain compaction at a minimum of 95 percent of the maximum density at optimum moisture content as determined by ASTM D 698. The Owner's representative shall direct which method of consolidation is to be followed on each part of the work.

- 6. Contractor shall assume full responsibility for any deficiency in quantity of material or filling of depressions caused by settlement of backfill material. Damage to other trade's work caused by settling shall be corrected at the Contractor's expense. Contractor shall assume full responsibility for damages to any underground utility lines or other structure.
- 7. Dispose of all excess material from the construction site as directed by the Owner. Contractor should remove excess spoils and other material from the site.

### 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 1300nm utilizing an Optical Tim Domain Reflectometer (OTDR). Attenuation will be recorded for each fiber.
  - 2. Continuity testing shall be performed on each fiber of each cable reel prior to installation.
- B. Contractor shall review all end faces of field terminated connectors with a fiber inspection scope following final polish. Connector end faces with hackles, scratches, cracks, chips and/or surface pitting shall be rejected and repolished, or replaced if re-polishing will not remove defects. The minimum viewing magnification for connector end inspections shall be 200x.
- C. Contractor shall conduct and document OTDR traces from head end location(s) for baseline documentation on each strand.
- D. All fiber optic cable (system) shall be tested in both directions by Contractor following installation, and prior to acceptance.
- E. All fiber optic strands shall be tested end-to-end for bi-directional attenuation, 1310 nm / 1550 nm. Tests shall be conducted in compliance with EIA/TIA-526-14 or OFSTP 14, Method B and according to the manufacturer's instructions for the test set being utilized.
- F. Tests must certify the measured link loss for each strand does not exceed the "worst case" allowable loss defined as the sum of connector loss (based on the number of mated connector pairs at EIA/TIA-568B maximum allowable loss of .75 dB per mated pair) and optical loss (based on the performance standard specified herein).
  - 1. The maximum allowable attenuation for any splice or termination is 0.3 dB.

- 2. Contractor shall perform Optical Test Set consisting of an Optical Source (transmitter) and Optical Meter (receiver) to determine end-to-end attenuation and fiber length. All testing will be done in accordance with EIA/TIA 526-14.
- 3. The procedure shall be completed in three steps.
  - a. Reference set-up
  - b. Jumper test
  - c. Standard test
- 4. Final test shall be the successful operation of the network utilizing the transfer of at least one ten megabyte (10Mb) file from computers located in each building to and from the 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 XP 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, throughout the completion of the project, provide Owner a file storage system that shall include all necessary equipment (file drawers, folders, dividers, etc.), to contain all as-built drawings, owners manuals of all equipment installed, warranty and maintenance information and other information the Contractor, Designer and/or District deem necessary.
- B. Contractor shall be responsible for providing thorough, timely documentation on all hardware, software. Documentation shall include, but not be limited to:
  - 1. Equipment description.
  - 2. Manufacturer's warranty.
  - 3. Maintenance contract terms.
  - 4. Verification of maintenance contract engagement.

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

#### 3.05 TRAINING

A. Not Used

### 3.06 SCHEDULE, MEETINGS AND PLANS

- A. Schedule
  - 1. Final Vendor Presentations: November 02, 2023
  - 2. Contractor Chosen: November 06, 2023
  - 3. Work Commences: November 20, 2023
  - 4. Substantial Completion of Project: January 31, 2024
  - 5. Project Close-out: February 29, 2024
- B. Planed sequence of operations shall be established by the Contractor within the guidelines established by the Owner, as required herein and as required to meet schedules.
- 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

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	THESE GUIDELINES MUST BE FOLLOWED WHEN BORING THE LAKE OR RIVER:       1. A MINIMUM OF 10 FEET IS MAINTAINED FROM THE TOP OF THE CONDUIT AND THE BOTTOM OF THE LAKE OR STREAM.         2. THE ENTRY AND EXIT POINTS SHALL BE LOCATED FAR ENOUGH AWAY FROM THE LAKE OR STREAM BANKS TO ASSURE THAT BANK DISTURBANCE DOES NOT OCCUR.         3. THE DRILLING OR BORING SITES (PITS) ARE LOCATED FAR SUTSIDE OF ANY APPLICABLE WATURAL RIVER DESIGNATION SETBACK REQUIREMENTS.         4. THE DRILLING OR BORING OPERATIONS WILL NOT RESULT IN THE ERUPTION/RELEASE OF ANY DRILLING FLUIDS UP THROUGH THE GROUND AND INTO THE LAKE OR STREAM.         4. DATA       178         1.178       754         1.16       146	$ \begin{array}{c}                                     $
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;-003 )DBS CHECKED 20 DATE: BY NEW ELEMENTARY SCHOOL FIBER ROUTE SHEET 5 OF 20 ROUTE PAGE 005	BLIC SCHOOLS	



TOTAL	POLE NO. (12) 13 15 16 16 18 19	SEE PAGE #005
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	650 0	MIDSPAN <sup>bo</sup> 20'-6" NEW M/S 18'-6"
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		PL A&DC OWNER CE POLE NO. N/A H/C 45/4 PWR 32'+ PWR 32'-1 NEUTRAL 26'-1" POA 23'-8"
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DATE:		POLE NO. PWR PWR PWR PWR PWR PWR PWR PWR PWR PWR	8 (D)
NOCKFORE	STAKING S	CE CE 1019077 40/6 24'-0" 22'-7" 22'-7" 22'-7" 22'-7"	MIDSPAN 4 20'-0" NEW M/S
O     PUBLIC       9N,R: 11W,SECTI       0. 573-003       RACED DBS       ATE: 10-20       ATE       BY	Geotech, Systems Engin Grand Rapids, S HEET & P	Know whats belon Call before yo	17 <sup>°</sup> −10 <sup>°°</sup> ⊗ ②
SCHOOL FIBER R SCHOOL FIBER R SCHOOL FIBER R SCHEMATIC SHEET 13 OF 20 SHEET 13 OF 20	<i>Inc.</i> <sup>neering</sup> <sup>Michigan</sup>		GE #014

ΤΟΤΑ				69	68	67	66	65	64	(63)	NO.																SEE	PAGE #013
													CABL	) • ]														
														1														+ MIDSPAN 0 32'+
													AN		τç			PW	PW	H/H	POLE	OWN						NEW M/S 27'-6"
163				Ģ	187	213	123	352	338	420	C024(i				د <u>ح</u> ا	1	2		3	0 4	NO. 101	FB (64)	)					
											6M)				0	c	, ກູ		2'+	5/4	9079	р П						
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														OWER COA	PUA			PWR	PWR	H/C	POLE NO.	OWNER (C	0					
											PE			x to 21'-			21 <sup>1</sup> _0"		24'-9"	45/4	1019098	-6 -	V					ୟ MIDSPAN ଅଥି 20'-0"
2											1-2				" 													NEW M/S 17'-2"
2						<u> </u>					PE1-3									W	VOL	VEN	RIDG	E				
											5 PF3																	© ⊗→
				 							-3 PF3																	y pl a&dg w/12
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											PE2-2														OLVEN			ម្ចុ MIDSPAN
2						_					PM																	N 25'-0" NEW M/S 17'-10"
											BA			RAISE CO	PUP			PWR	PWR	H/C	POLE NO	OWNED						
											M2(5/8)(			AX TO 20'	20 -0		•		32'+	45/.	0. N/P	- 6 ^F				HOPEWE	LL RD	
											(8) B			0"	2 2		*			4								2
											M53				PUA			PWR	PWR	H/C	POLE NO.	OWNED (C	)				с ТТ 10	¥ (3)
											B M 81				2- 02	- 01 - 02	"o_"oc		27'-5"	45/4	1018802	- jõi	V				ς,	_ MIDSPAN کی 16'−6" کی NEW M/S
											SSHOE										PO							18'−0" ↑ PL A&DG W/16' ⊗
											(M)	1			PUA			PWR	PWR	H/C	STE NO.	INNIED 69						$(\mathbf{f})$
											ВМ61 (1.25)D				6- 07		31'0"		32'+	40/5	1018803							MIDSPAN
2											PM2					 												<sup>№</sup> 19'-6" ຜູ



			>		18'-6"
SCHEMATIC SHEET 14 OF 20 ROUTE PAGE 014	W.O. 573-003 STAKED TRACED DBS CHECKED DATE: 10-20 DATE: REVISIONS DATE BY NEW ELEMENTARY SCHOOL FIBER ROUTE	STAKING SHEET & PLANT RECORD ROCKFORD PUBLIC SCHOOLS T: 9N, R: 11W, SECTION: 35	Geotech, Inc. Systems Engineering Grand Rapids, Michigan	Ronov what's below Call before you dg.	<ul> <li>✓ (20)</li> <li>✓ (20)</li></ul>

	_	 	 	 						_			_				 		
TOTAL						74	73	72	71	70	(69)	POLE NO.							
														CABLE					
														PLA					
1237						001		636 777	707	239	194	C024(6M						SEE PI	AGE #014
100											100	) 024(1						MIDSPAN 21'-1"	
30			_			JC						:00 (E						NEW M/S 20'-1"	194'
		_	_									24						POLE IS CRACKED	Ø (3)
																		MIDSPAN	239
2						_	_					PE1-2						NEW M/S 18'-6"	9
$\vdash$				-	_														
2						<u> </u>						°E1-3			POA				⊗ (_)
												PF3-3			CE 35/7 23'-9" 22'-5"				
												PF3-5			POLE N POLE N PWR PWR DRIP DRIP				
												PE2-2			CE CE CE CE CE CE CE CE CE CE	Ŵ		MIDSPAN	39
╞												PN				OLVEN		15'-0' NEW M/S 15'-6"	2,
2							_					M-11			OWNER OULE NO. H/C PWR PWR PWR PWR PWR PWR PWR PWR ORIP				
												B M2(5/8)			2 CE 1018806 35/6 28'-0" 22'-0" 22'-0"				
$\vdash$				 _	_							(8)							
												3 M53			NER NO. 10 NAX 2 2				⊗ (73)
						<u> </u>						B M81			CE 118807 40/5 8'-2" 3'-5"				
											_	SSHOE			OWNEF POLE N PWR PWR DRIP CATV			MIDSPAN	26
												(M)			CE         CE           0.         10188           40/         27-1           224'-         23'-			21'-9" NEW M/S 15'-6"	52'
												BM61 (1.25)D			0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0				
2						_						PMS					PI A&	DG W/24'	





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TOTAL									(74)	POLE NO.			SEE PAGE #017
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										PE1-3			
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										PE2-2			
										PM			66'
										-11 B			
										M2(5/8)			
										(8)			
										B M 53			
										B M81			
										SSHOE			
										(M)			
										ВМ61 (1.25)D			





TOTAL		75					(74)	POLE		
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								5 PF3-1		
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								PM-1		66' × L
								1 BM		
<b>_</b>								2(5/8)(		
								3) B		31'Q
		<u> </u>						M53		
				T				B M81		
								SSHOE		↓ ↓ ↓ 33'⊊ 1395 ↓ ↓ ↓ 20'⊊ EX PED 1375
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BM61 (1.25)D	(M)	SSHOE	BM81	B M 5 3	12(5/8)(8)	PM-11 BN	PE2-2	PF3-5	PF3-3	PE1-3	PE1-2	 U024	24(IL)	ON	UH-F	NO.E	y PO
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			   	     		BORE 800				<b></b>							
67	— ROW -								- 31'C	· <b></b> · · ·	— ROW -						
	_			_				_		#019	SEE PAGE						



NEW ELL SCHOOL F SCHEMATIC SHEET 18 01 ROUTE PAGE 018	DATE: DATE: 11-20 DATE: REVISIONS DATE BY	ROCKFORD PUBLIC SCHOO	STAKING SHEET & PLANT RE	Geotech, Inc. Systems Engineering Grand Rapids, Michigan	Know what's below Call before you dig.	SEE PAGE #017
NEW ELEMENTARY CHOOL FIBER ROUTE HEMATIC EET 18 OF 20 UTE UTE .GE 018	TE:	SCHOOLS	ANT RECORD	f <b>InC.</b> Tring Tring	Ģ	

TOTAL							78	(78) 77	NO.	-	CABLE	
331							331		C024(6M)	-	PLANT	σ
650 30								650 30	024(IL) U024	-		EE PAGE #018
2								_	PE1-2			BORE 650
2								-	PE1-3 PF3-3 PF3	-		31'œ
									-5 PE2-2 PM-	-		(P) (P) (P) (P) (P)
									-11 B M2(5/8)(8) B	-		PL A&DG W/24'
							-	<u> </u>	M53 BM81 SSHOE	-		MIDSPAN (3) 22'-3" NEW M/S 21'-3" POA PUTRAL POA PUTRAL
650 1								abu 1	HBFO BM61 (M) (1.25)D PM2A			231-27 PL A&DG W/8 V/8
			DATE:	STAKED	ROCKFO	· - 1			. STAKING	J		POA         PWR         CE         MIDSPAN         P80           23'-7"         26'-1"         0945912         NEW M/S         21'-1"
PAGE	SCHEM	SCHO	DATE: 11-20 DATE:	TRACED DBS CHECK	RD PUBLIC SCI 1:90,R:11W,SECTION:27				SHEET & PLAN	Geotech, Inc. Systems Engineering Grand Rapids, Michigan		SEE PAGE " Call before you dg.
019	ATIC 19 OF 20	W ELEMENTARY OOL FIBER ROUTE		,ED	HOOLS				T RECORD	n •'		



TOTAL	( POLE NO. (78) 79 79 80 80 81 82 82	
	CABL	
	ANT	
		SEE PAGE #019
88	.4(6M) .888 .68 .664	PL A&DG W/23' (
200	20024(E)	MIDSPAN 28'-0" & NEW M/S 24'-0"
400	U024 400	PL A&DG W/15'
		BOR
		→ → → → → → → → → → → → → → → → → → →
Ν	PE1-2	OWNER POLE NO. PWR PWR PWR PWR PWR PWR
Ν	PE1	CE 26'-10' 23'-6"
	ů.	
۵	эгз-з гз-з г г	PDA UTRAL P PWR R (8) PL 10M A&DG W/6'
	PF3-5	26 - 27 - 27 - 29 - 67 - 27 - 27 - 27 - 27 - 27 - 27 - 27
	PE2-2	
თ -	9M-11 1 1 2 2	9'- +'''''''''''''''''''''''''''''''''''
	B M2(5/	TON
	8)(8)	21'-         24'-
	B M 53	
		POA PWR PWR W/15'
		CE 23'-9" CE 006434 45/6 30'-7"
	В	
	25)D	/ / / MIDSPAN B', 15'-4"



			À	
	DATE: DATE: D		STAKING S	PL 10M A&DG W20'
-	ATE: 11–20 E	<b>D PUBLIC</b> 1,R: 11W,SECTION	<i>Geotech</i> Systems Engi Grand Rapids, SHEET & P	Know what's belo
	)ATE: NEW ELEMENTARY SCHOOL FIBER ROUTE SCHEMATIC SHEET 20 OF 20 ROUTE ROUTE	SCHOOLS N: 27	, <i>Inc.</i> neering Michigan LANT RECORD	