PROJECT SPECIFICATIONS FOR

Project:

Structured Cabling Systems

Amerman Elementary & Meads Mill Middle School

Project Number:
24-NPS-SCS-01

Owner:
Northville Public Schools
405 W. Main Street
Northville, MI 48167

Designer:
Wright & Hunter, Inc.
818 W. 11 Mile Road
Royal Oak, MI 48067

January 9, 2025

REQUEST FOR BIDS

SECTION 00 01 10

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SECTION 00 01 15

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A. List of drawings provided.

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PART 2 PRODUCTS - Not applicable to this Section.

PART 3 EXECUTION - Not applicable to this Section.

END OF SECTION

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SECTION 00 01 20

LIST OF SCHEDULES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Timetable of key dates.

1.2 RELATED DOCUMENTS

A. Section 00 11 13 Advertisement for Bids
B. Section 00 21 13 Instructions to Bidders
C. Section 00 41 13 Bid Forms

1.3 TIMETABLE

A. The timetable of key dates for this RFB are as follows:

Bids Released	January 9, 2025
Pre-Bid Meeting	January 16, 2025 at 2:00 p.m.
Vendor Questions Due	January 22, 2025 by 5:00 p.m.
Answers Due	January 28, 2025 by 5:00 p.m.
Bids Due	February 4, 2025 at 2:00 p.m.
Post Bid Interviews	February 5, 2025
Award to Vendor	February 19, 2025
Start Installation	June 12, 2025 (Amerman ES and MMMS)
Completion Date	August, 2025 (Amerman ES, all areas except MC) October, 2025 (Amerman ES, Media Center) August, 2025 (MMMS, all areas except STEAM space) December, 2025 (MMMS STEAM space)

If school is closed on the due date, the bid will be due the next open school day at the same time.

PART 2 PRODUCTS - Not applicable to this Section.

PART 3 EXECUTION - Not applicable to this Section.

END OF SECTION

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SECTION 00 11 13

ADVERTISEMENT FOR BIDS

DATE: January 9, 2025

PROJECT: Northville Public Schools
Structured Cabling Systems
Project No. 24-NPS-SCS-01

OWNER: Northville Public Schools
405 W. Main Street
Northville, MI 48167

DESIGNER: Wright & Hunter, Inc.
818 W. 11 Mile Road
Royal Oak, MI 48067

BID DUE DATE: Until 2:00 p.m. local time on February 4, 2025, the Owner will receive sealed bids for the work as set forth in the bid specifications and proposal forms ("RFB documents") at:

Devin Kling
Assistant Superintendent for Finance & Operations
Northville Public Schools
Business Office, 3rd Floor
405 W. Main Street
Northville, MI 48167

If school is closed on the due date, the bid will be due the next open school day at the same time.

Bids will be publicly opened and read aloud at this time. Bids received after the above date and time will **not** be accepted.

Bids that do not include a sworn and notarized statement disclosing any familial relationship between the Owner and the bidder as defined in Michigan Public Act No. 232 of 2004 will **not** be accepted.

Bids that do not include an Iran Economic Sanctions Act Disclosure statement as defined in Michigan Public Act No. 517 of 2012 will **not** be accepted.

Each bid shall be accompanied by a certified check, cashier's check, money order or bid bond made payable to Northville Public Schools in an amount of five percent (5%) of the base bid as a bid guarantee. Bids that do not include the bid guarantee will **not** be accepted.

BID DOCUMENTS: RFB documents will be available on or after January 9, 2025 and can be obtained from the Northville Public Schools web site at www.northvilleschoools.org. On the homepage, select Departments, then select Finance & Operations, and finally click on Bid Information on the right side of the webpage or click the link below.

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https://www.northvilleschools.org/apps/pages/index.jsp?uREC_ID=350734&type=d&pREC_ID=760860.

The Project Drawings and Contract will not be available for download through this link. Please email rrichcreek@wrighthunter.com for secure access to the Project Drawings and Contract.

PRE-BID MEETING: A pre-bid meeting is scheduled for January 16, 2025 at 1:00 p.m. local time at:

Meads Mill Middle School
16700 Franklin Road
Northville, MI 48168

Although the meeting is not mandatory it is strongly encouraged.

If school is closed on the pre-bid meeting date, the meeting will be held the next business calendar day at the same time and location.

Withdrawal of any bid is prohibited for a period of ninety (90) days after the actual date of the opening thereof.

The Owner reserves the right to reject any or all bids, either in whole or in part, to reject a bid not accompanied by the required bid guarantee, or by other data required by the RFB documents and Michigan law or to reject a bid which is in any way non-compliant with the bid requirements. Submitted bids may be adjusted by unit prices included by the bidder to ensure all bids submitted are compared on the same basis with respect to required materials.

The Owner reserves the right to accept alternates in any order or combination and to determine the low bidder on the basis of the sum of the base bid and the alternates accepted.

END OF SECTION

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SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submissions of bids, bidding procedures, proposal requirements, required disclosure statements, examination of bidding documents, contract liability, proposal modifications, discrepancies, withdrawal of proposals, alternatives, acceptance, rejection of bids and required bonds.

1.2 RELATED DOCUMENTS

A. Section 00 11 13 Advertisement for Bids

B. Section 00 25 13 Pre-bid Meeting

C. Section 00 41 13 Bid Forms

D. Section 00 01 20 List of Schedules

1.3 SEALED BID RECEIPT

A. The Owner is soliciting proposals until **2:00 p.m. local time on February 4, 2025**. Sealed bids will be received at Northville Public Schools, 405 W. Main Street, Northville, MI, 48167 up to this time, at which time they will be publicly opened and read aloud at a public meeting.

B. If school is closed on the due date, the bid will be due the next open school day at the same time.

C. Proposals must be received, and time stamped at Northville Public Schools on or before the due date and time specified. Vendors are responsible for timely receipt of their proposal. Proposals which are received after the specified due date and time will not be considered.

D. The original, plus two (2) hard copies and one (1) full electronic copy of the Vendor's proposal must be delivered in sealed package(s). All packages shall be clearly labeled with the following information:

1. SEALED BID ENCLOSED FOR STRUCTURED CABLING SYSTEMS

   Devin Kling
   Asst. Superintendent of Finance & Operations
   Northville Public Schools
   405 W. Main Street
   Northville, MI 48167

2. Vendor's Name and Address

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3. Project Title: Structured Cabling Systems (24-NPS-SCS-01)

4. Proposal Due Date

1.4 BID PROPOSAL REQUIREMENTS

A. Provide the following information as required under each tab, assembled in three (3) ring binders complete with Table of Contents. All pages shall have page numbers, which shall be included in the Table of Contents.

B. The Table of Contents shall be as follows:

1. Tab No. 1 Required Forms: Bid Bond, Familial and Iran Forms

2. Tab No. 2 Bid Proposal Form, District Totals, Mandatory Alternates and Voluntary Alternates

3. Tab No. 3 Bill of Materials and Break-Down by Building

4. Tab No. 4 Catalog Cut Sheets for Base Bid, Mandatory and Voluntary Alternates

5. Tab No. 5 Cover Letter, References and Rough Schedule

6. Tab No. 6 Warranty, Maintenance and Service Agreements

7. Tab No. 7 Structured Cabling Systems

8. Tab No. 8 Company Information

C. Description of Contents:

1. Tab No. 1, Required Forms include a Bid Bond, Familial Relationship Disclosure Statement and Iran Economic Sanctions Form. Forms must be fully executed and include a bid bond, if required. To be considered a qualified bid, all three forms must be fully executed and included with the bid response.

2. Tab No. 2, Bid Proposal Form shall include a completed bid proposal form and totals for the project.

a. Mandatory Alternates (if applicable) shall include a complete bill of materials and any of the following that are applicable: footage, operating characteristics, physical characteristics, equipment configuration for each of the systems.

b. Voluntary Alternates are optional and made available to permit all Vendors to submit alternates to the bid documents. These voluntary alternates shall clearly define the intent of the alternate, cost impact to implement the alternates, and a description of the deviation in functions and features between the alternates and the base bid documents. Include a complete bill of materials.

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3. Tab No. 3, Bill of Materials and Break-Down by Building shall include a complete bill of materials depicting quantities, manufacturer, catalog number, complete description, material unit price, labor cost breakdown and extended price.

4. Tab No. 4, Catalog cutsheets for Base Bid, Mandatory and Voluntary Alternates.

5. Tab No. 5, Cover Letter shall include an executive overview of the project and depict the Vendor's complete understanding of the project, include any clarifications and/or qualifications. References and a rough schedule that illustrates major milestones required to achieve the completion dates specified in the RFB should also be included under this tab. Typical milestone events include (Vendors can include contingencies that will affect their timelines):

    a. Approximate equipment order and delivery dates.
    b. Estimated installation dates by location.
    c. Installation completion date by site.
    d. Estimated final test dates.
    e. Estimated training dates.
    f. Provide an estimate of anticipated manpower required at each building to meet the specified completion dates in the RFB.

6. Tab No. 6, Warranty information and sample maintenance and service contracts. Include current service rates, trip charge rates and any additional charges that may apply

7. Tab No. 7, Structured Cabling Systems, shall include the following information:

    a. Description of system operation.
    b. System configuration.
    c. List of clients of similar size and type with contact information.
    d. Number of years providing and installing similar equipment in schools.
    e. Manufacturer's names.
    f. List of subcontractors that will or may be utilized on this project.

8. Tab 8, Company information, shall provide information about the prime Vendor, any subcontractors, major suppliers, trainers, project managers, superintendents and service staff that will be involved with the project. Contact and escalation information on the project team will be required by the successful vendor upon award of the project.

1.5 FAMILIAL RELATIONSHIP DISCLOSURE STATEMENT

A. As required by Public Act 232 of 2004, all bids shall be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the owner or any employee of the Vendor and any member of the Monroe County Community College board, or the superintendent of the school district.

B. The Owner will not accept a bid to a Vendor that does not provide this sworn and notarized disclosure statement.

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1.6 IRAN ECONOMICS SANCTIONS ACT

A. As required by the Iran Economic Sanctions Act, Public Act 517 of 2012, all bids shall be accompanied by a sworn and notarized statement certifying that the Vendor is not an “Iran linked business” within the meaning of Act.

B. The Owner will not accept a bid to a Vendor that does not provide this sworn and notarized disclosure statement.

1.7 AFFIDAVIT OF COMPLIANCE - CRIMINAL BACKGROUND CHECK

A. The Contractor further hereby certifies that no owner, employee, agent, representative, contractor and/or other personnel of the Contractor will be on any School District premises if they are a registered criminal sexual offender under the Sex Offenders Registration Act, Public Act 295 of 1994, or have been convicted of “Listed Offense” as defined under Section 722 of the Sex Offenders Registration Act, MCL 28.722.

B. The Owner will not accept a bid to a Vendor that does not provide this sworn and notarized disclosure statement.

1.8 EXAMINATION OF BIDDING DOCUMENTS AND SITE

A. At the time of the bid opening, each Vendor shall have examined the premises and sites to compare them with the contract drawings and specifications.

B. Failure or omission of any Vendor to examine any form, instrument or document shall in no way relieve any Vendor from any obligation with respect to their proposal. No allowances or extra payment will be made to a Vendor for failure to comply with the provisions of this section, or by reason of error or oversight on the part of the Vendor.

C. It is understood, and the Vendor hereby agrees, that it shall be solely responsible for all equipment and/or services that it proposes. Notwithstanding the details presented in these specifications, it is the responsibility of the Vendor to verify the completeness of the equipment required and its suitability to meet the intent of this proposal. Each system proposed shall be for a complete turnkey system.

D. The Owner reserves the right to withdraw this RFB at any time or to reject any or all proposals submitted in response to this RFB, without penalty. The Owner further reserves the right to select a single Vendor as a prime for the entire project or for only portions of it. The Owner also reserves the right to accept or reject any part of any proposal and to accept or reject any or all proposals without penalty. The Owner will be the sole judge of its needs and of the best elements of a proposal to meet those needs and shall award to the lowest responsible bidder as required by law. The Owner’s decision is final.

E. Proposals containing terms and conditions different from this section of the RFB may be rejected.

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1.9 CONTRACT LIABILITY

A. The Vendor will be required to assume responsibility for all contractual activities offered in this proposal whether or not the Vendor performs them. Further, the Owner will consider the Vendor to be the sole point-of-contact with regard to contractual matters, including payment of any or all charges resulting from the anticipated contract. If any part of the work or component of the proposed configuration is to be subcontracted, responses to this RFB must include a list of subcontractors, including firm name and address, contact person, complete description of work to be subcontracted or component to be provided and descriptive information concerning subcontractor's organizational abilities.

B. The Owner reserves the right to approve subcontractors for this project and to require the Vendor to replace subcontractors found to be unacceptable. The Vendor is totally responsible for adherence by the subcontractor to all provisions of the contract. All contract clauses between the Owner and the Vendor shall also apply to any contract between the selected Vendor and subcontractor(s).

1.10 PROPOSAL MODIFICATIONS

A. Any explanations or statements, which the Vendor wishes to make, must be written on or attached to the proposal. Unless indicated, it is understood that the proposal is in strict accordance with all requirements and specifications. The Technology Designer and/or the Owner may request additional information to clarify the Vendor's response, to verify responsiveness to mandatory specifications, or to facilitate the fair comparison of competing bid responses.

B. Proposals shall be deemed final, conclusive and irrevocable. No proposal shall be subject to correction or amendment for any error or miscalculation unless unit prices for the additional or missing item(s) are included on the Bid Form. Submitted bids may be adjusted by unit prices up or down to ensure all bids submitted are compliant and compared fairly. Proposal prices shall provide for a complete turnkey system as specified. Installation shall include, but is not limited to, all labor required for a turnkey system.

1.11 DISCREPANCIES, OMISSIONS AND INTERPRETATIONS

A. Vendors shall promptly notify Wright & Hunter (the "Technology Designer") of any ambiguities, inconsistencies or errors, which it may discover upon examination of the RFB, the Bid Form, Drawings, AIA documents, purchase orders generated by the Owner, any addenda to the aforementioned documents and all other documents pertaining to the SCS (the "Contract Documents") or of the site and local conditions. A Vendor requesting clarification or interpretation of the bid documents shall make a written request no later than the "Vendor Questions Due" date and time listed in Section 00 01 20. E-mail all questions to:

Rob Richcreek
Email: rrichcreek@wrighthunter.com

B. All questions and answers will be shared with all Vendors.

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C. If prior to the date fixed for submission of proposals, a Vendor fails to notify the Technology Designer of a known error in the RFB or of an error that reasonably should have been known to the Vendor and if a contract is awarded to the Vendor, the Vendor shall not be entitled to additional compensation or time, by reason of the error or its later correction.

D. In the event it becomes necessary to provide additional clarifying data or information, or to revise any part of this RFB, supplements or revisions will be provided to all known recipients of the initial RFB.

E. Failure to acknowledge receipt of supplements or revisions, in accordance with the instructions contained in the supplement or revision, may result in proposals not being considered. Each Vendor's proposal shall stipulate that it is predicated upon all the terms and conditions of the RFB and any supplements or revisions thereto. The submission of a proposal is an acknowledgment to comply with all terms of the RFB, the form of Contract and any other contract document, except and only to the extent that the Vendor provides an express objection to a provision or provisions in writing, attached as a separate document along with its proposal, and specifically identifying the objection and providing a proposed alternative thereto. In the absence of the foregoing, the Vendor shall be deemed to have agreed to all stated terms.

1.12 WITHDRAWAL OF PROPOSALS

A. Proposals may be withdrawn, modified and resubmitted at any time prior to the time set for the receipt of proposals. The Vendor may not withdraw its proposal prices during the ninety (90) day period immediately following the proposal bid opening. All proposals and proposal prices shall be guaranteed for that period of time.

B. When the selected Vendor(s) (the “Vendor”) receives the notice of award from the Owner within the above ninety (90) day period, it shall guarantee the prices through the interval required to execute the Vendor's Bond.

1.13 ACCEPTANCE OF PROPOSAL

A. The Contract Documents shall include all bidding requirements and specifications, the terms of this RFB, the form of Contract, approved project specifications and approved project manual. Except as to any specific objection as required by Paragraph 1.10(E) above, all of the foregoing, as well as the accepted portions of the Vendor's proposal shall become contractual obligations of the Vendor upon award by the Board of Education. Failure of the successful Vendor to accept these obligations in a contractual agreement may result in cancellation of the award and this RFB, forfeiture of the entire bid bond, and any additional damages incurred by the Owner. If the terms, conditions or assumptions included in the Vendor’s proposal or response to this RFB differ from the Contract Documents, the terms and conditions that are most favorable to the Owner, as determined in the Owner's sole discretion, shall be binding.

B. The Owner reserves the right to reject any or all bids, either in whole or in part, to reject a bid not accompanied by the required bid guarantee, or by other data required by the RFB documents and Michigan law or to reject a bid which is in any way non-compliant with the bid requirements. Submitted bids may be adjusted by unit prices included by the bidder to ensure all bids submitted are compared on the same basis with respect to required materials.

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C. The Owner reserves the right to accept alternates in any order or combination and to determine the low bidder on the basis of the sum of the base bid and the alternates accepted.

1.14 REQUIRED BONDS

A. At the time bids are submitted, Vendors are required to submit a ninety (90) day Bid Guarantee Bond (5% of the total dollar amount).

B. The successful Vendor will be required to furnish a Labor and Materials Bond valued at the full amount of the contract at the time the contract is awarded for all labor and materials to be contracted.

C. The successful Vendor will be required to furnish a Performance Bond valued at the full amount of the contract at the time the contract is awarded.

1.15 QUANTITIES

A. It is understood and agreed that the Owner reserves the right to either increase or decrease quantities and to buy additional services under the terms of any contract resulting from this bid, so long as in accordance with law.

1.16 PRICES

A. Purchase prices shall remain firm throughout the entire contract.

B. The Vendor must use the Bid Forms included with this RFB. If additional pages are necessary, they must be in the same format as the original.

C. Any rebates applied in response to this RFB must be applied to line item pricing, and not be included as one lump sum.

1.17 ALTERNATIVES

A. All bid proposals must be based upon the specifications included in this RFB. In addition to a base bid proposal, the submission of voluntary alternatives is acceptable. The base bid must conform to the materials, labor and terminations established by the bid specifications in this document. The Vendor must bid the base bid to be eligible to bid an alternative. Each Vendor must identify in their response any deviations to the scope of work and any construction requirements not addressed.

1.18 CERTIFICATION OF INDEPENDENT PRICE DETERMINATION

A. By submission of this proposal, the Vendor certifies, and in the case of a joint proposal, each party thereto certifies as to its own organization, that in connection with this procurement:

1. The prices in this proposal have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other Vendor or with any competitor.

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2. Unless otherwise required by law, the prices, which have been quoted in this proposal, have not been knowingly disclosed by any Vendor and will not knowingly be disclosed by the Vendor prior to procurement or prior to award in the case of a negotiated procurement, directly or indirectly to any other Vendor or to any competitor.

3. No attempt has been made or will be made by the Vendor to induce any other person or firm to submit or not to submit a proposal for the purpose of restricting competition.

B. Each person signing this proposal certifies that:

1. He/she is the person in the Vendor's organization responsible within that organization for the decision as to the prices being offered herein.

2. He/she is not the person in the Vendor's organization responsible within that organization for the decision as to the prices being offered herein, but that he/she has been authorized in writing to act as agent for the persons responsible for such decision.

C. By submission of Vendor’s proposal to this project, the Vendor certifies, and in the case of a joint proposal, each party thereto certifies as to its own organization, that in connection with this procurement: the that no relationship exists between the Vendor and the procuring or contracting agency that interferes with fair competition or is in conflict of interest, and no relationship exists between the Vendor and another person or organization that constitutes a conflict-of-interest that is adverse to the Owner.

1.19 PROPRIETARY INFORMATION

A. This is a public bid. Information submitted in response to this RFB is subject to Freedom of Information Act requests and to be viewed by any interested party by request. Any bids identified in whole or in part as proprietary will be disqualified.

B. Unless specifically excluded from this provision, all data, documentation and innovations resulting from contractual services will become the property of the Owner. Data contained in the proposal and all documentation provided as a result of these contractual services cannot be copyrighted and innovations developed as a result of these contractual services cannot be copyrighted or patented. Proposals must clearly specify any data, documentation, software, or other innovations that are proposed to be excluded from this provision and specifically provide, where applicable, for licensing of these materials to the Owner for the life of the system.

1.20 NONCOMPLIANCE

A. Failure to include in the Vendor's proposal all information requested in this RFB may be cause for rejection of the proposal. When responding to this RFB, please clearly state whether your firm complies with each section.

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1.21 COST LIABILITY

A. The Owner assumes no responsibility or liability for costs incurred by the Vendor prior to the signing of any Contract resulting from this Request.

PART 2 PRODUCTS - Not applicable to this Section.

PART 3 EXECUTION - Not applicable to this Section.

END OF SECTION

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SECTION 00 25 13

PRE-BID MEETING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pre-bid meeting attendance requirement, date, time, and location.

1.2 RELATED DOCUMENTS

A. Section 00 11 13 Advertisement for Bids

B. Section 00 21 13 Instructions to Bidders

1.3 PRE-BID MEETING

A. There will be a pre-bid meeting on January 16, 2025 at 1:00 p.m. local time at the following location:

Meads Mill Middle School
16700 Franklin Road
Northville, MI 48168

B. All Vendors submitting a bid are strongly encouraged to attend the pre-bid meeting.

C. No one person attending the pre-bid meeting may represent more than one Vendor.

D. A sign-in sheet provided at the pre-bid meeting shall serve as the official document verifying attendance. The Owner will not accept any other form of proof or documentation to verify attendance. It is the Vendor's responsibility to locate the sign-in sheet and provide the required information. Failure to complete the sign-in sheet as required may result in disqualification of the Vendor's bid.

E. All Vendors should arrive prior to the starting time for the pre-bid. Vendors who arrive after the starting time but prior to the end of the pre-bid will be permitted to sign-in but are responsible for all matters discussed at the pre-bid meeting.

F. Any discussions, questions or answers at the pre-bid meeting are preliminary in nature and non-binding. All questions must be submitted in writing per Section 00 21 13. Only those questions and answers issued in an Addendum are binding.

PART 2 PRODUCTS - Not applicable to this Section.

PART 3 EXECUTION - Not applicable to this Section.

END OF SECTION

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SECTION 00 41 13

BID FORMS

**FAMILIAL RELATIONSHIP
DISCLOSURE STATEMENT**

Important: This disclosure statement must be included with your bid as required by state law (Public Act 232 of 2004).

As required by Public Act 232 of 2004, all bids shall be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the owner or any employee of the bidder and any member of the Northville Public Schools Board of Education. The board shall not accept a bid that does not include this sworn and notarized disclosure statement.
++++

I state that no familial relationship exists between the owner or any employee of the company and any member of the Northville Public Schools' board, intermediate school board, or board of directors or the superintendent of the school district. If such a relationship exists, please explain:

_____

_____

_____

_____

By: _____ (Signature)

Title: _____ (Type or Print)

Date: _____

Subscribed and Sworn to Before Me:

This _____ day of _____ , 2025 in and for the County of _____ ,

Michigan. My commission expires _____

_____
Signature of Notary

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IRAN ECONOMIC SANCTIONS ACT
DISCLOSURE STATEMENT

Important: This disclosure statement must be included with your bid as required by state law (Public Act 517 of 2012).

As required by Iran Economic Sanctions Act, Public Act 517 of 2012 (the "Act"), all bids shall be accompanied by a sworn and notarized statement certifying that the Contractor is not an "Iran linked business" within the meaning of the Act and that in the event Contractor is awarded a contract as a result of the aforementioned RFB, the Contractor will not become an "Iran linked business" at any time during the course of performing any services under the contract.

The Act defines an Iran Linked Business as an individual or any entity, including all successors, parent companies, subsidiaries and companies under common control, engaged in investment activities of $20,000,000.00 or more with the energy sector of Iran, including providing of products used to construct or maintain oil or liquefied natural gas pipelines.

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 it is determined that the person has submitted the false certification.

By: _____ (Signature)

Title: _____ (Type or Print)

Date: _____

Subscribed and Sworn to Before Me:

This _____ day of _____ , 2025 in and for the County of _____ ,

Michigan. My commission expires _____

_____
Signature of Notary

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AFFIDAVIT OF COMPLIANCE
CRIMINAL BACKGROUND CHECKS

The undersigned, the owner or authorized officer of the below-named contractor (the "Contractor"), pursuant to the criminal background compliance certification requirements of Northville Public Schools (the "School District") hereby represents and warrants that the Contractor has performed and/or will perform sufficient criminal background checks, including at a minimum, an Internet Criminal History Tool ("ICHAT") check, for all of its owners, employees, agents, representatives, contractors and/or other personnel who will be on any School District premises to carry out the services contemplated by the Contract Documents. The Contractor further hereby certifies that no owner, employee, agent, representative, contractor and/or other personnel of the Contractor will be on any School District premises if they are a registered criminal sexual offender under the Sex Offenders Registration Act, Public Act 295 of 1994, or have been convicted of "Listed Offense" as defined under Section 722 of the Sex Offenders Registration Act, MCL 28.722.

The Contractor further acknowledges that if it is found to have submitted a false certification or otherwise fails to comply with the requirements of this certification, the School District may immediately terminate the Contract.

CONTRACTOR:

_____
Name of Contractor

By: _____ **, Its:** _____
Name Position

Date: _____

STATE OF _____)
)ss.
COUNTY OF _____)

This instrument was acknowledged before me on the _____ day of _____

2025, by _____ .

_____
, Notary Public

_____ County,

My commission Expires: _____

Acting in the County of: _____

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BID FOR: NORTHVILLE PUBLIC SCHOOLS
NORTHVILLE, MICHIGAN

PROJECT: STRUCTURED CABLING SYSTEMS

DATE: _____

VENDOR'S NAME: _____

VENDOR'S ADDRESS: _____

_____

_____

GENERAL:

Pursuant to and in compliance with the instructions in the Contract Documents, as defined in W&H Project No. 24-NPS-SCS-01 in the Request for Bid, the undersigned proposes and agrees to furnish equipment, materials, and labor and perform all work necessary to complete the Structured Cabling Systems contract for Northville Public Schools (the "Owner") in accordance with the plans and specifications prepared by Wright & Hunter, Inc. (the "Technology Designer") and agrees to accept payment as herein provided.

BASE BID:

Lump sum bid for all Structured Cabling Systems work specified in the RFB and shown on the Drawings as indicated for base bid.

_____

_____

Dollars _____

Note: The amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.

BASE BID BONDS:

The undersigned affirms that the cost of a Labor and Material Payment Bond and a Performance Bond are **included** in the base bid amount above.

_____

Amount **included** above for Bonds _____

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VOLUNTARY ALTERNATES

The following Voluntary Alternates are offered by the Vendor. The Vendor shall provide a complete description of each Voluntary Alternate and indicate the amount to be added to or deducted from the Base Bid should the Owner accept the Voluntary Alternate. Attach additional pages if required to explain each Voluntary Alternate.

Voluntary Alternate 1 (VA-1):

Add / Deduct / No Change Dollars $ _____

Voluntary Alternate 2 (VA-2):

Add / Deduct / No Change Dollars $ _____

Voluntary Alternate 3 (VA-3):

Add / Deduct / No Change Dollars $ _____

BASE BID BREAKDOWN

The Vendor shall provide the following breakdown of the base bid. Failure to list this information shall be cause for the bid to be considered unresponsive.

Base Bid	Material	Labor	Other	Total
Amerman Elementary School	$0.00	$0.00	$0.00	$0.00
Meads Mill Middle School	$0.00	$0.00	$0.00	$0.00
Bonds			$0.00	$0.00
Other			$0.00	$0.00
TOTAL	**$0.00**	**$0.00**	**$0.00**	**$0.00**

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COMPLIANCE

Failure to include in the Vendor's proposal all information requested in this RFB may be cause for rejection of the proposal. When responding to this RFB, please clearly state whether your firm complies with each section.

Section	Compliant (Yes or No)	Comments or Exceptions
00 01 15		
00 01 20		
00 11 13		
00 21 13		
00 25 13		
00 41 13		
00 72 13		
00 73 16		
01 11 00		
01 29 00		
01 77 19		
01 78 36		
01 78 39		
27 11 16		
27 13 23		
27 15 13		
27 41 43		

TAXES

The Vendor shall include in his/her proposal and shall pay all applicable Federal, State and local taxes of whatever character and description.

ADDENDA

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

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

WITHDRAWAL OF BIDS

The undersigned agrees that his/her proposal shall not be withdrawn for a period of ninety (90) days after the date set for receipt of proposal.

COMMENTS: _____

_____

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SIGNATURE

Signed and sealed this _____ day of _____, 2025

_____
(Individual, Partnership, Corporation)

Affix Corporate Seal

By: _____
(Authorized Signature of Vendor)

_____
(Business Address)

_____
(Telephone Number)

INSTRUCTIONS: Submit one (1) original and two (2) hard copies
Submit one (1) full electronic copy.
Retain one (1) copy for your files.

END OF SECTION

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SECTION 00 72 13

GENERAL CONDITIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General conditions including contract, laws and permits, protection of persons, safety, implementation plan, additional resources, and clean-up and maintenance.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 00 21 13 Instructions to Bidders

C. Section 01 11 00 Summary of Work

1.3 CONTRACT

A. A form of contract is attached to this RFB and shall be binding on each proposing Vendor except and to the extent set forth in Section 00 21 13, Paragraph 1.11(E). It is acknowledged that the form of contract incorporates by reference the terms of this RFB and, in the event of any conflict among the contract documents; the provision most beneficial to the Owner shall govern. Notwithstanding the foregoing, the Owner reserves the right in its sole discretion to negotiate any term of the Contract prior to contract award so long as any negotiated term does not affect the propriety of the competitive bidding process. While not limiting the breadth of the form of contract's incorporation of the RFB, the following are all required contractual provisions:

1.4 LAWS AND PERMITS

A. The Vendor shall comply with all federal, state and municipal laws, rules, regulations, ordinances, or orders governing or affecting in any way the work under this contract, including board of education policies. Also, the Vendor shall give all notices and obtain all permits necessary and required for this work and shall pay all costs and fees for the same. The Vendor must furnish copies of all approved inspection certificates and approvals from authorities having jurisdiction within thirty (30) days of completion and acceptance of work as evidenced by applicable acceptance documents.

B. Where appropriate, all equipment and installation workmanship shall comply with specifications contained in Electronics Industries Association Standards and the National Electrical Code. As pertinent, all equipment shall be FCC-certified, FCC type accepted and/or UL listed. All work shall be conducted according to the standards of good engineering practice.

1.5 PROTECTION OF PERSONS AND OTHER STRUCTURES

A. The Vendor agrees to exercise special precautions to avoid damage to facilities of the Owner and others. The Vendor hereby assumes responsibility for any and all damage to

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such facilities arising out of or caused by the conduct or property of the Vendor, whether by the negligence of the Vendor, its agents or employees. The Vendor shall make an immediate report to the Owner and the Technology Designer of any damage to the facilities or others. The Vendor hereby agrees to repair or replace at their own expense or to reimburse the Owner for expenses incurred by the Vendor in making necessary repairs and replacements.

B. The Vendor shall assume all responsibility for bodily injury to persons, including death or damages sustained or claimed by its employees, the employees of the Owner, or by any other person, and also for damage to property, including property of the Vendor, the Owner or any other person; and also, for any interruptions to electric or community antenna television or other communications service which may occur or allegedly occur because of, or result from, or in any manner are connected with, or directly or indirectly, arise out of or are caused in whole or in part by the material provided or the work performed by the Vendor, its agents or employees under this agreement.

C. The Vendor shall assume all responsibility for and shall indemnify and hold the Owner harmless from and against all losses, liabilities, claims, demands, payments, actions, legal proceedings, recoveries, costs, expenses, attorney fees, settlements, judgments, orders and decrees of every nature and description brought or recovered against, or incurred by the Vendor, the Owner, or both of them, by reason of any such bodily injury to person, damage to property, or interruptions to service caused by the Vendor, its agents or employees. Notwithstanding the foregoing, the Vendor shall not be required to indemnify the Owner against liability for damages arising out of bodily injury to persons, damage to property, or interruptions to service caused by or resulting from the negligence of the Owner, its agents or employees. The Vendor's indemnification obligation shall be limited to, but shall fully include, the degree of all fault for which it is responsible.

1.6 SAFETY

A. Each Vendor shall be responsible for its own safety and hazard program. Each program shall be in accordance with provisions of the Occupational Safety and Health Act (OSHA), Michigan OSHA (MIOSHA), the Environmental Protection Agency (EPA), and the Material Safety Data Sheets (MSDS). The Vendor shall maintain an effective safety program and conform to all federal and local safety codes. Upon written request by the Owner and/or the Project Manager, the Vendor shall provide the registered programs documenting safety and hazard programs.

B. During projects in construction zones or if site conditions require, the Vendor and all of his/her staff, agents and/or subcontractors must wear Vendor provided hard hats anytime they are onsite. The Vendor shall assume sole responsibility and liability for hat usage of his/her staff, agents and/or subcontractors.

1.7 IMPLEMENTATION PLAN

A. The successful Vendor must prepare and submit a final implementation plan and timeline as part of the final Contract Documents. The Vendor and the Owner will mutually determine the critical dates that must be met, so long as consistent with the then-applicable Project Schedule. The Vendor will be required to adhere to, meet and maintain activities to the timeline schedule as planned. The Vendor will also be required

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to be flexible towards changes in the priorities of the timeline schedule during the entire project and will make all related changes at no additional cost to the Owner.

1.8 INTERRUPTION OF OCCUPANCY

A. The installation must not interrupt the normal activity of the Owner. All work which will cause disruption of the Owner's existing systems and services must be accomplished during time periods when it is least inconvenient to the Owner and completed in the shortest possible time frame (i.e. after normal school hours). The Owner is not responsible for any overtime and/or premium time not identified in the Vendor's base bid pricing response.

B. Each Vendor is responsible to plan, coordinate and execute their work in such a manner that there will be no disruption of the Owner's operations. If an interruption of operations is unavoidable, the work will be scheduled with the Owner prior to beginning such work.

1.9 REJECTING DEFECTIVE WORK

A. The Technology Designer and/or the Owner will have the authority to disapprove or reject work, which is defective, unsatisfactory, faulty, does not conform to the requirements of the Contract Documents or does not meet the manufacturers' requirements. The Technology Designer and/or the Owner will also have the authority to require special inspection or testing of the work whether or not the work is fabricated, installed or completed.

1.10 SPECIFICATION DEVIATION

A. Commodities procured under these specifications shall not deviate from those originally contracted for without written approval from the Owner and so long as consistent with law.

B. The Owner has sole responsibility for the interpretation of all documents. Any claims and/or disputes associated with and/or arising from this RFB must be submitted in writing and directed to the Owner within thirty (30) days of dispute and/or claim.

1.11 EXECUTED CONTRACT TO CONSTITUTE ENTIRE AGREEMENT

A. All contracts for work herein are subject to all existing and applicable provisions for the payment of prevailing rate of wages to laborers, workmen and mechanics engaged in the work.

B. Except as set forth in Paragraph 1.11(C) below, the contents of the Contract Documents of the successful Vendor shall be contractual obligations upon bid acceptance. Failure of the successful Vendor to accept these obligations in a contractual agreement may result in a cancellation of award and forfeiture of bid bond.

C. The Owner reserves the right to negotiate provisions in addition to those stipulated in this RFB or proposed by the successful Vendor for the purpose of obtaining the best possible offer. If the Vendor should discover any provisions in the contract that are contrary to or inconsistent with the law, ordinance, order or decree, the Vendor shall immediately report it to the Owner in writing.

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1.12 CONTRACT SUSPENSION, TERMINATION AND CANCELLATION

A. The Owner may cancel the contract effective as a result of this RFB in whole or in part as follows:

1. By mutual agreement of the contracting parties. Upon such termination, the Owner's liability shall be limited to the reasonable value of services performed and deemed acceptable by the Owner upon the date of such mutual agreement.

2. If the Owner deems that such termination is in its best interest. In the event that the Owner gives notice to terminate pursuant to this subsection, such notice shall be given no less than thirty (30) days prior to the date on which the termination becomes effective. Upon such termination, the Owner's liability shall be limited to the reasonable value of services performed and deemed acceptable by the Owner as of the effective date of the termination.

3. For cause, which shall include, but is not necessarily limited to, failure or unwillingness of the Vendor to comply with the approved program, including attached conditions; failure to comply with applicable state statutes or other applicable laws or policies; or failure to comply with such directives as may become generally applicable at the time; refusing/failing to provide enough properly skilled workers to timely complete the work; failing to pay subcontractors and suppliers; failing to prosecute the work with diligence; and breaching any term of the Contract.

4. Due to lack of appropriation of necessary funding, cancellation due to lack of appropriation shall be without penalty. Upon such cancellation, the Owner's liability shall be limited to the reasonable value of services performed and deemed acceptable by the Owner as of the effective date of cancellation.

B. The Contract may only be modified by: (i) mutual written agreement of the parties, (ii) a properly-executed change order, signed by the Vendor, Owner and Technology Designer describing the additional/different work, price and time frame for performance, and (iii) a construction change directive issued by the Owner, for which the Vendor must commence prosecution of the work promptly (but no less than 10 days) and any modification to contract price or time will be later determined. In the event the parties cannot mutually agree to an adjustment in price or time for a construction change directive, the Technology Designer shall have the right and authority to determine same. If the Vendor objects to such determination, it may file a claim in accordance with the Contract. Rejection by the Vendor of any construction change directive may be the basis of contract suspension, termination or cancellation.

C. No cancellation will affect any expenditures or legally binding commitments made prior to receiving notice of the cancellation, suspension or termination provided such expenditures or commitments were made in good faith and not in anticipation of cancellation and are otherwise allowable.

D. Upon execution of the Contract, the Owner shall be deemed the owner of all materials and equipment actually incorporated into or purchased for the project, as well as the owner of all documentation used with respect to same. In the event of cancellation prior to the full term of the contract, the Vendor shall arrange to provide the Owner with all work documents, computer programs and files used/developed by the Vendor during the

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period the contract was effective. The title to such programs and materials as well as any equipment and materials supplied while the contract is in effect, shall rest with the Owner.

1.13 DELAYS AND EXTENSIONS OF TIME

A. If the Vendor is delayed at any time in the progress of the work by any act or neglect of the Owner, an employee of the Owner, any separate Vendor employed by the Owner (whether related to technology improvements or non-technology improvements), changes ordered in the work, acts of God, fires, floods epidemics, quarantine restrictions, or any other cause beyond the Vendor's reasonable control, then the contract time shall be extended by change order for such reasonable time as the Owner and the Vendor may determine. An extension of time for performance shall be the only remedy for any such delay, and damages related to any such delay are inapplicable.

B. If the Technology Designer and/or the Owner determines that the progress of the work falls behind the current project schedule due to the control, management, direction, acts or omissions of the Vendor, its agents or employees, the Vendor shall take whatever remedial action as directed, including, but not limited to the following:

1. Increase staff and labor force
2. Work overtime
3. Add or change subcontractors
4. Utilize more expensive materials/methods
5. Reschedule

C. Costs of any remedial action, which are caused by the control, management direction, acts or omissions of the Vendor, its agents or employees, shall not be assigned to the Owner and no increase in contract price will be authorized.

1.14 DELIVERY OF EQUIPMENT AND/OR MATERIALS

A. Delivery shall be destination, set in place, ready for use unless otherwise specified, with packing and debris removed by the Vendor. The Vendor shall receive and accept its equipment and/or materials from the transportation company or carrier and shall provide all handling, carrying, etc., to the final location for each piece of equipment and/or materials in the building. Crating materials and other trash resulting from the installation shall be removed from the premises daily. Excelsior and similar hazardous trash shall be removed immediately upon unpacking. No accumulation of trash shall be permitted.

B. The Vendor must have a representative at the job site during all unloading and placing of equipment. This service shall be included in the Vendor's proposal (and, thus, the Contract Sum). The Owner shall hold this representative operationally responsible for the services indicated and he/she shall have such capability and be given such responsibility by the Vendor that he/she can act on the Vendor's behalf in any situation, which may arise on the site of delivery. The Vendor’s representative shall use some method, approved by the Owner, to show the item has been inspected and whether it has been "Approved" by the Vendor or if repairs or replacement is necessary. This shall be done prior to the Owner's final inspection. Any Owner rejection shall be honored, even if the Vendor has previously "approved" the equipment.

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C. Vendors are cautioned to check their manufacturing and shipping schedules carefully before fixing their proposed delivery schedule. If, for any reason, any items of equipment should arrive prior to the building being ready to receive them, the successful Vendor shall make its own arrangements for temporary storage arrangements at no cost to the Owner. No on site storage will be available and all staging should be complete before delivery and installation of the equipment.

D. Vendors doing work are to cooperate fully and coordinate the work of all other Vendors to expedite the proper and timely completion of the furnishing projects. It is acknowledged that coordination with non-technology contractors (e.g., mechanical and electrical contractors installing improvements to facilitate technology upgrades) is expected and required, so as to provide a seamless and efficient installation of all Owner improvements pursuant to the bond project.

E. In making delivery and installation, the Vendor must repair, at its own expense, any damage done to any of the buildings, equipment or property that are a part of this project that occur as a result of the control, management, direction, acts or omissions of the Vendor, its agents or employees and hold the Owner harmless from any other claims or property damage and/or personal injury.

1.15 SUBCONTRACTING AND ASSIGNMENT

A. The Vendor shall be responsible to the Owner for the acts and omissions of all its employees and all subcontractors, their agents and employees and all other persons performing any of the work under a contract with the Vendor.

B. This Contract, with all its rights and duties, and any part thereof, shall not be deleted, subcontracted or assigned to another Vendor without prior written permission of the Owner.

1.16 RECORD KEEPING AND RECORD RETENTION

A. It is acknowledged and agreed that the Vendor shall not be entitled to any additional costs or expenses for its scope of work, other than as is consistent with the Vendor's accepted proposal. For a change in the scope of work, the Vendor's costs shall be determined: (a) if a change order, as agreed in the approved change order, and (b) if a construction change directive and the parties cannot mutually agree to a modified amount, as determined by the Technology Designer. For purposes of the Technology Designer's determination, the Vendor shall establish and maintain adequate records of all expenditures incurred under the construction change directive. All records shall be kept in accordance with general accepted accounting procedures. All procedures shall be in accordance with Federal, State, and local ordinances.

B. The Owner shall have the right to audit, review, examine, copy, and transcribe pertinent records or documents relating to any contract resulting from this RFB held by the Vendor. The Vendor shall retain all documents applicable to the contract for a period of not less than six (6) years after final payment has been made.

1.17 RISK OF LOSS OR DAMAGE

A. The Owner shall be relieved from all risks of loss or damage to materials or equipment during the period of transportation, installation, and during the entire time the equipment

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is in possession of the Vendor, unless and until such time as unencumbered title for the equipment is vested in the Owner and the materials or equipment is in the exclusive possession of the Owner.

B. Should the materials or equipment be lost or damaged under such circumstances where the Owner is relieved from the risk of loss or damage, the Vendor shall immediately cause the damaged materials or equipment to be repaired or replaced at no cost to the Owner.

C. In such event, any payments for the lost or damaged equipment shall be suspended from the time loss or damage occurs until such time as the lost or damaged materials or equipment is repaired or replaced and accepted by the Owner.

D. It is understood, and the Vendor hereby agrees, that the Vendor shall be solely responsible for all equipment and/or services that the Vendor proposes. Notwithstanding the details presented in these specifications, it is the responsibility of the Vendor to verify the completeness of the equipment required and its suitability to meet the intent of this proposal. Any additional equipment required for installation shall be provided by the Vendor; it is understood that complete operating systems are required.

1.18 ADDITIONAL RESOURCE REQUIREMENTS

A. If the Vendor fails to complete the project or a segment of the project within the time period agreed to in the Contract Documents, and if as a result, the Owner finds it necessary to incur any additional costs and/or expenses (for example, needing to hire additional Vendors to complete work which is not being completed in a timely or satisfactory manner), the Vendor shall pay all those costs and expenses incurred by the Owner. These costs and expenses may include, but are not limited to, such items as additional hours spent by the Technology Designer, additional architectural fees and fees related to the acquisition of additional Vendors to complete the job. These costs and expenses may be retained by the Owner from any payments otherwise due to the Vendor for work, which has not been completed within the terms of the Contract Documents. The Owner may hire additional Vendors if seven (7) day notice has been given to the Vendor and the Vendor has failed to remedy the failure, to act in accordance with the notice, or has repudiated the contract. Failure by the Vendor to give adequate assurances when deadlines on the timeline have not been met will also result in the Owner’s right to bring in other Vendors to complete the contract or a segment of the contract.

1.19 CLEAN-UP AND MAINTENANCE

A. During preparation and construction, the project area must be kept free from scrap and debris in accordance with established safety and health standards. Upon completion of work, each day and at the end of the project, the Vendor will be held responsible to clean up and remove debris from the site. Damage to any portion of equipment or existing structure is the responsibility of the Vendor and repairs must be completed before acceptance and final payment is issued.

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1.20 SYSTEM ACCEPTANCE

A. Payment will be made only to the successful Vendor for services properly performed under the contract. The Owner will withhold retainage of 10% until final payment, which will follow the Vendor's fulfillment of all obligations.

1.21 INSPECTION OF WORK AND ACCEPTANCE TESTS ACCEPTANCE

A. The Vendor shall at all times, permit and facilitate inspection of the work by the Technology Designer and by public authorities having jurisdiction. The Technology Designer shall have the authority to stop the work, if necessary, to insure its proper execution. Tests will be performed and documented by the installing Vendor and turned over to the Owner as part of the "as-built" drawings at the time of completion. Deviations and/or corrections to the installation will be completed within ten (10) working days.

PART 2 PRODUCTS - Not applicable to this Section.

PART 3 EXECUTION - Not applicable to this Section.

END OF SECTION

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SECTION 00 73 16

INSURANCE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Insurance requirements.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 INSURANCE

A. The Vendor shall purchase and maintain insurance for protection from the claims set forth below which may arise out of or result from the Vendor's operations under the Contract, whether such operations be by the Vendor or Subcontractor, or by anyone directly employed by any of them:

1. Claims under workers or workmen's compensation, disability benefits and other similar employee benefit acts;

2. Claims for damages because of bodily injury, occupational sickness or disease, or death of the Vendor's employees;

3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Vendor's employees;

4. Claims for damages insured by usual personal injury liability coverage, which are sustained by any person as a result of an offense directly, related to the employment of such person by the Vendor;

5. Claims for damages, other than to the work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom; and

6. Claims for damages because of bodily injury or death of any person or property damage arising out of the maintenance or use of any motor vehicle. The insurance required shall be written in the following minimum limits:

a. General Liability:

1) $2,000,000
2) Including personal injury and property damage
3) $2,000,000 each aggregate

b. Automobile Liability:

1) $2,000,000
2) $2,000,000 each aggregate

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c. Workers' Compensation:

1) As required by the State of Michigan

d. Employers' Liability:

1) $2,000,000
2) $2,000,000 each aggregate

B. Certificates shall name the Owner as additional insured.

C. The Vendor's insurance shall either be (I) occurrence-based and in effect from the commencement of work and for 18 months following final completion of the work, or (ii) claims-based and in effect from the commencement of work and in effect for 6 years following final completion of the work.

PART 2 PRODUCTS - Not applicable to this Section.

PART 3 EXECUTION - Not applicable to this Section.

END OF SECTION

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Project identification, project summary, Owner furnished equipment,

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1. 27 11 16 Communications Cabinets, Racks, Frames, and Enclosures

2. 27 13 23 Communications Optical Fiber Backbone Cabling

3. 27 15 13 Communications Copper Horizontal Cabling

1.3 PROJECT IDENTIFICATON

A. Structured Cabling Systems
Northville Public Schools
405 W. Main Street
Northville, MI 48167

1.4 PROJECT SUMMARY

A. Provide all labor, materials, equipment and services necessary to furnish, install, program, test and certify fully operational Structured Cabling Systems.

B. All work shall be in accordance with the true intent of these drawings and specifications, and as required to leave all systems complete and in satisfactory operating condition, excluding those items listed under Work provided by Others.

C. The Structured Cabling Systems shall include, but are not limited to, the following principal components and materials:

1. Category 6 Cabling
2. Category 6 Patch Panels
3. Optical Fiber Cabling
4. Optical Fiber Enclosure Panels
5. Enclosure Cabinets
6. Patch Cables
7. Connectors and Faceplates
8. Professional Training
9. System Warranties

D. The Structured Cabling Systems equipment and software shall be new, of modern design, and current standard production of the various manufacturers.

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E. The Contractor shall verify dimensions and conditions at the job site prior to installation, and perform installation in accordance with these specifications, manufacturer's recommendations and the latest edition or revision of all applicable codes and standards.

F. The Contractor shall provide any additional items, not specifically mentioned herein, necessary to meet system requirements as specified, without claim for additional pay.

1.5 OWNER FURNISHED EQUIPMENT (OFE)

A. The Owner will furnish various equipment for installation by the Vendor as indicated in the project documents.

B. The Owner will pay for and arrange for delivery of this equipment in accordance with the Vendor's schedule and will inspect the deliveries for damage.

C. If Owner Furnished Equipment is damaged, defective, or missing, through no fault of the Vendor, the Owner will arrange for replacement.

D. The Vendor is responsible for protecting Owner furnished items from damage, and to repair or replace items damaged as a result of their operations.

PART 2 PRODUCTS Not applicable to this Section.

PART 3 EXECUTION Not applicable to this Section.

END OF SECTION

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SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Payment procedures and requirements.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 PAYMENT FOR SERVICES

A. No later than two (2) weeks prior to the date of the first application for payment, the Vendor shall furnish the Owner with a breakdown of the contract amount setting forth the schedule of values of labor and materials of the various parts of the work on which this contract is based as detailed from the specifications or as further directed by the Owner. A meeting between the Technology Designer and the Vendor shall also be required before the first application for payment is submitted to set forth the procedure and format in which all applications are to be submitted. Final payment will be made only after the successful completion of a performance-testing period, the Owner's acceptance of the system and final documentation has been received and approved by the Technology Designer and the Owner.

B. Final payment by the Owner to the Vendor shall be made within thirty (30) days of final completion, Owner acceptance of the system as installed and receipt and approval of final documentation by the Technology Designer and the Owner.

C. Ten percent (10%) of the total contract amount will be withheld and will not be paid until after final acceptance, which includes submission and approval by the Owner and the Technology Designer of all work, testing results, documentation and as-built drawings (see Section 01 77 19 Owner's Right to Use).

1.4 CONTRACT PAYMENT SCHEDULE

A. The Vendor shall pay all sales, consumers, use and any and all other applicable taxes required by law.

B. The Technology Designer will review and certify the accuracy of invoices for the Owner's subsequent review, approval and payment. Certification by the Technology Designer that the invoice is an accurate account of work properly performed does not prevent the Owner from disputing the propriety of any applicable payment.

C. Any questions regarding the payment process should be directed to Rob Richcreek by e-mail at rrichcreek@wrighthunter.com.

D. All invoices and requests for payment should be directed to Rob Richcreek by e-mail at rrichcreek@wrighthunter.com.

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E. Rates quoted in response to this request are firm for the duration of the proposed contract phase. No increases will be permitted. Any requests for modification to the original design and/or scope of work must be approved in writing by the Owner prior to any modification.

F. Each Application for Payment shall be consistent with previous applications and payments as certified by the Technology Designer and paid for by the Owner.

1. The Application for Payment at time of Substantial Completion and the final Application for Payment involve additional requirements.

G. Payment Application Times: The date for each progress payment is the 15th day of each month. The period of construction Work covered by each Application for Payment is the period ending fifteen (15) days prior to the date for each progress payment and starting the day following the end of the preceding period.

H. Payment Application Forms: Use AIA Document G 702 and Continuation Sheets G 703 as the form for Application for Payment.

I. If the bid involves more than one project, each project shall have separate payment application forms. The Technology Designer will identify each project.

J. Application Preparation: Complete every entry on the form, including notarization and execution by the person authorized to sign legal documents on behalf of the Vendor. Incomplete applications will be returned without action.

1. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

K. Transmittal: Submit three (3) executed copies of each Application for Payment to the Technology Designer. One copy shall include waivers of lien, proof of items stored, proof of insurance for stored items and similar attachments, when required.

L. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics lien from every entity who may lawfully be entitled to file a mechanics lien arising out of the Contract, and related to the Work covered by the payment. The Vendor acknowledges that liens cannot be placed on public property and are therefore inapplicable to this project.

M. Application for Payment at Substantial Completion: Actions and submittals that shall proceed or coincide with this application include:

1. As built drawings (should be received by the Technology Consultant Once Vendor states the Project is complete – before punch list has been issued to the Vendor).
2. Warranties (guarantees) and maintenance agreements.
3. Test/adjust/balance reports.
4. Maintenance instructions.
5. Start-up performance reports.
6. Final cleaning.
7. Application for reduction of retainage, and consent of surety.
8. Punch list of incomplete Work.

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N. Final Payment Application: Actions and submittals that shall precede or coincide with this application include:

1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Transmittal of required Project construction records to the Owner.
4. Proof that taxes, fees and similar obligations have been paid.
5. Removal of surplus materials, rubbish and similar elements.

1.5 VENDOR'S SWORN STATEMENT AND WAIVER OF LIEN

A. The Vendor's sworn statement and waiver of lien shall be submitted with the invoice. The Vendor must state all subcontractors and status of payment for labor and materials to each. Payment will not be processed until these forms have been received.

PART 2 PRODUCTS - Not applicable to this Section.

PART 3 EXECUTION - Not applicable to this Section.

END OF SECTION

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SECTION 01 77 19

CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Project closeout requirements.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 CLOSEOUT

A. Inventory Validation

1. The Vendor shall validate inventory receipt and confirm all shipments before invoicing for payment. The Vendor shall notify the Technology Designer of completion of all shipments and installation through a final inventory, which will be certified by the Technology Designer prior to final acceptance and approval for payment.

2. A complete inventory of installed equipment and tangible assets shall be provided to the Technology Designer and Owner upon completion of final inspection and prior to project closeout, as defined in Section 01 78 39 Project Record Documents.

B. Punch List

1. The Vendor shall be responsible for the completion of their own final punch list work and notify the Technology Designer or Owner of readiness of final inspection. Upon final inspection by the Owner and/or Technology Designer, the Vendor shall perform required remedial work, without claim for additional labor or other costs. Where required, the Vendor shall re-test and submit a revised Test Report.

2. The Vendor shall notify the Technology Designer of completion of the Technology Designer/Owner Punch List.

3. If after notification and inspection by the Technology Designer the identified Punch List items have not been corrected, the Vendor will be notified that remedial work is still required. Additional time spent by the Technology Designer, due to the failure of the Vendor to correct Punch List items and finish the project by the agreed upon completion date as set forth in the Contract Documents, will be charged to the Vendor at the rate of one hundred twenty-five dollars ($125) per hour and deducted from the Vendors retainage.

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4. Fully detailed inventory documentation, warranty documentation, and test reports shall be submitted for review. Final payment / retainage will NOT be considered or approved if all aspects of the contract have not been satisfied and approved by the Technology Designer.

1.4 OWNER'S RIGHT TO USE

A. Acceptance of the Work of this Section will occur after completion of corrections and adjustments required by "Punch List" (as generated during on-site inspections and review of testing documentation).

B. The Owner reserves the right to use equipment, material and services provided as part of Work of this Section, prior to Acceptance, without incurring any obligation to accept any equipment or completed systems until Punch List work is complete and systems comply with Contract Documents.

PART 2 PRODUCTS – Not applicable to this Section.

PART 3 EXECUTION – Not applicable to this Section.

END OF SECTION

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SECTION 01 78 36

WARRANTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Warranty requirements.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 WARRANTY

A. All Structured Cabling System components and installation of same shall be guaranteed free of defects in materials and workmanship and shall be repaired or replaced within twenty-four (24) hours following report of such component defects and installation workmanship by the Owner.

B. The Contractor shall be available on call and shall respond on site within one (1) business day of notice, and without cost to the Owner, during the first twelve (12) months of full- scale operation, following acceptance of the system, to repair and/or correct any problems that may arise during the initial period of operation.

C. The components of this project, upon completion will be warranted by the manufacturer. The warranty for this wiring system shall be provided as follows:

1. The twenty (20) Year Warranty shall ensure against product defects, that all approved cabling components meet or exceed the specifications and performance requirements of ANSI/TIA-568.1-E, ANSI/TIA-568.2-D, and ANSI/TIA-568.3-D, ANSI/TIA-569-E, ANSI/TIA-606-D, ANSI/TIA-607-D and ISO/IEC 11801 for the copper and fiber optic cabling links/channels. The end-to-end passive product solution shall be capable of delivering Category 6/6A performance to the networked devices. The warranty shall apply to all passive SCS components.

2. The twenty (20) Year Product Warranty shall cover the replacement or repair of defective product(s) and labor for the replacement or repair of such defective product(s) for a twenty (20) year period.

3. A twenty (20) Year Application Assurance shall cover the failure of the cabling system to support the application which it was designed to support, as well as additional application(s) introduced in the future within the recognized standards or user forums that use the ANSI/TIA-568.1-E, ANSI/TIA-568.2-D, and ANSI/TIA-568.3-D and ISO/IEC IS 11801 component and link/channel specifications for cabling.

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4. Upon successful completion of the installation and subsequent inspection, the Owner shall be provided with a certificate, from the manufacturer, registering the installation.

PART 2 PRODUCTS – Not applicable to this Section.

PART 3 EXECUTION – Not applicable to this Section.

END OF SECTION

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SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. As-built documentation requirements.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 AS-BUILT DOCUMENTATION

A. Fully detailed documentation and record drawings of installation layout and performance shall be submitted for review within thirty (30) days of completion of work and shall include as a minimum:

1. Marked drawings showing routing of all inside cable with gauge, type and numbering scheme.

2. Location of outlets with their new identification number prepared on most recent installation drawing.

3. Drawings shall accurately record actual locations of each item of fixed equipment and show interconnecting wiring. Drawings will indicate location of equipment and tagged circuits. A functional block diagram will also be required.

B. Drawings, whenever submitted, shall be submitted with a PDF copy to the Owner and Technology Designer.

C. Drawings shall be professionally done. Hand drawings and notations will not be accepted.

D. Submit pictures of the equipment rooms, backboards, and rack elevations. Pictures must include room entry point, all surrounding walls, backboards, front rack elevations and rear rack elevations.

E. All drawings and the information contained therein become the sole property of the Owner.

F. Vendor shall turn over to the Owner all manufacturer documentation, completed warranty registrations, user and technical manuals, device driver and software documentation, and any other written or electronic documentation that is relative to the installation or subsequent operation or modifications by the Owner.

G. Two (2) soft copies of all documentation shall be copied onto a USB drive or cloud storage service with the associated link.

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H. All products and equipment must be registered to NPS by the Vendor prior to substantial completion.

I. All keys, specialty tools, and loose equipment shall be inventoried and delivered to the Owner for signoff.

PART 2 PRODUCTS – Not applicable to this Section.

PART 3 EXECUTION – Not applicable to this Section.

END OF SECTION

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SECTION 27 11 16

COMMUNICATIONS CABINETS, RACKS, FRAMES, AND ENCLOSURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section includes the minimum requirements for the installation of communications cabinets and ladder racking within the communications closets.

B. This section includes, but is not limited to the following:

1. Floor standing cabinets

C. Provide all labor, materials, and equipment for the completion of work called for in the Contract Documents.

D. The Contractor shall be responsible for providing the services necessary to furnish, configure, deliver, install, integrate, and test all specified equipment. All work shall be in accordance with the intent of these specifications, and as required to leave the infrastructure components complete and in manufacturer certified operating conditions, excluding those items listed under “Work by Others.”

E. The Contractor shall provide any additional items, not specifically mentioned herein or on the drawings, necessary to meet system requirements as specified, without claim for additional payment.

F. Errors or Omissions in Drawings or Documentation

1. If any errors or omissions appear in Drawings, Specifications, or other documents, the bidding Contractor shall notify the Engineer no later than ten (10) days prior to submitting the bid.
2. Should conflict occur in or between Drawings and Specifications, the bidding Contractor is deemed to have estimated the more expensive way of doing the work, unless the bidding Contractor has asked for and obtained written decision (addendum) before submission of the bid as to which method or materials will be required.

G. Related Sections:

1. Section 27 13 23 Communications Optical Fiber Backbone Cabling
2. Section 27 15 13 Communications Copper Horizontal Cabling

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1.3 DEFINITIONS

A. ANSI – American Northern Standards Institute

B. BICSI – Building Industry Consulting Service International

C. EIA – Electronics Industry Alliance

D. IEEE – Institute of Electrical and Electronic Engineers

E. ISO – International Standards Organization

F. NECA – National Electrical Contractors Association

G. NFPA – National Fire Protection Agency

H. TIA – Telecommunications Industry Association

I. UL – Underwriters Laboratory

J. Main Distribution Frame (MDF): This technology space houses main network distribution equipment and acts as the main connection point between the Core/Network and the TR/IDF/access zones for all connections.

K. Telecommunications Room (TR)/Intermediate Distribution Frame (IDF): is the location for the termination of backbone cables and for termination of horizontal cables, and for the interconnection of each. The space also hosts access–layer switches and user network connections within each floor.

L. Building Backbone: cabling system consisting of media and termination hardware interconnecting MDFs to IDFs.

M. Horizontal: cabling system consisting of media and termination hardware interconnecting the Telecommunication Outlets (TOs) and the TRs.

N. Bonding: permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed on it.

O. Cabinet: free standing, floor–mounted or wall–mounted modular enclosure designed to house and protect rack–mounted electronic equipment and passive terminations.

P. Grounding: a conducting connection to earth, or to some conducting body that serves in place of earth.

Q. Ladder Cable Tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).

R. UTP: Unshielded Twisted Pair.

S. FO: Fiber Optic

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T. Patch Panel: system of terminal blocks or connectors used with patch cords that facilitate administration of cross–connect fields.

U. Racks: An open, freestanding, floor–mounted structure, typically made of aluminum or steel, used to mount equipment; usually referred to as an equipment rack.

V. Riser Backbone: The Riser Backbone subsystem links the main cross connect (MDF) in the equipment room to the distribution rooms (TRs).

W. Structured Cabling System (SCS): A SCS is defined as all required cabling including hardware, termination blocks, cross connect wire or cordage, patch panels, patch cords, telecommunication outlets, work area cords, UTP and fiber optic cable installed and configured to provide computer data and voice connectivity from each data or voice device to the network file server or voice network/switch designated as the service point of the local area network.

1.4 SUBMITTALS

A. Shop drawings: Within ten (10) calendar days after award of contract, the Contractor shall submit product data cut sheets and catalog information to the Technology Designer for approval. The Contractor shall not begin installation or fabrication without such approval. The Technology Designer will indicate approval of shop drawings, product data, and samples submitted to the Designer by stamping such submittals “APPROVED” with a stamp. All shop drawings shall be marked with the pertaining specification paragraph or drawing number when submitted. Submit three (3) copies of each item to the Technology Designer.

B. Shop drawings shall be submitted on the following:

1. Bill of materials and cut sheets.
2. Project schedule including all major work components that materially affect any other work on the project.

C. A technical data sheet from the manufacturer shall be included with the response for each product proposed. This data sheet shall include the physical specifications as well as the following electrical and transmission characteristics if appropriate:

1. Mutual capacitance
2. Impedance
3. DC resistance
4. Attenuation
5. Worst Pair-to-Pair Near End Cross Talk
6. Power Sum Near End Cross Talk

1.5 QUALITY ASSURANCE

A. The contractor shall adhere to the most current applicable rulings of the Federal Communications Commission (FCC). Provide the FCC registration number with the equipment submittal. All components and installations shall bear an Underwriters’

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Laboratories (UL) listing and shall conform with the latest edition or revision of the following codes and standards:

1. ANSI American National Standards Institute
2. ASTM American Society for Testing and Materials
3. BICSI Building Industry Consulting Service International
4. CSI Construction Specifications Institute
5. EIA Electronics Industries Alliance
6. FCC Federal Communications Commission
7. ICEA Insulated Cable Engineers Association
8. IEC International Electro Technical Commission
9. IEEE Institute of Electrical and Electronics Engineers
10. ISO International Organization for Standardization
11. NEC National Electrical Code
12. NEMA National Electrical Manufacturer's Association
13. NFPA National Fire Protection Association.
14. TIA Telecommunications Industry Association
15. UL Underwriters Laboratories, Inc.

B. The code or standard establishing the more stringent requirements shall be followed where areas of conflict occur between codes and standards or between codes and standards and drawings and specifications.

C. References

1. BICSI Telecommunications Distribution Methods Manual
2. BICSI Cabling Installation Manual
3. BICSI LAN Design Manual
4. CSI Master Format 2004 Edition – Division 27 - Communications
5. TIA/EIA-568-C.1 – Commercial Building Telecommunications Wiring Standard, Part 1: General Requirements
6. TIA/EIA-568-C.2 – Commercial Building Telecommunications Wiring Standard, Part 2: Balanced Twisted-Pair Cabling Components
7. TIA/EIA-568-C.3 – Commercial Building Telecommunications Wiring Standard, Part 3: Optical Fiber Cabling Components
8. TIA/EIA-569-B - Commercial Building Standard for Telecommunications Pathways and Spaces
9. TIA/EIA-606-A – Administration Standard for Commercial Telecommunications Infrastructure
10. ANSI-J-STD-607-A – Commercial Building Grounding and Bonding Requirements for Telecommunications
11. ISO/IEC 11801 – Information Technology – General Cabling for Customer Premises
12. ISO/IEC 11801 – Information Technology – Pathways and Spaces for Customer Premises Cabling
13. NFPA 70, NEC and NFPA 255
14. UL Cable Verifications Program
15. UL Testing Bulletin

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D. All materials shall be manufactured and tested by manufacturers who are regularly engaged in the production of the components of similar systems for a minimum of five (5) years.

E. The Contractor shall maintain service facilities in the installation area. The facilities shall include a permanent source of factory trained service technicians on twenty-four (24) hour call experienced in servicing this type of cabling system and shall provide warranty and routine maintenance service to afford the Owner maximum coverage. The Contractor shall also provide a central source of support to guarantee immediate answers to Owner's problems and questions.

F. The Contractor selected for this project must be certified by the manufacture(s) specified within their submittals, adhere to the engineering, installation, and testing procedures, and utilize the recommended components in provisioning the voice and data aspects of this Project.

G. Any sub-contractor who will assist the Contractor in performance of this work shall have the same training and certification as the Contractor.

H. The Contractor shall procure and pay for all necessary permits, licenses and inspections and observe any requirements stipulated therein. The Contractor shall conform in all trades with all local regulations and codes.

I. The Contractor shall guarantee at the time of the bid that all cabling and components meet or exceed specifications of TIA/EIA-568-C.1, TIA/EIA-568-C.2, and TIA/EIA-568-C.3, TIA/EIA-569-B, TIA/EIA-606-A and ANSI J-STD-607-A.

J. The Contractor shall provide as part of the bid proposal a complete bill of materials, including catalog cuts, line item and extended pricing, and equipment configurations for all technologies noted in this section. This is in addition to the requests on the bid form.

K. The components shall be new, of modern design, and current standard production of the various manufacturers.

1.6 DELIVERY, STORAGE, AND HANDLING

A. To prevent damage, theft, soiling, and misalignment, protect equipment during transit, storage, and handling.

B. The contractor shall coordinate the secure storage of equipment and materials on site, or, if no on-site storage is available, shall provide their own secure storage at the Contractor’s expense.

C. Do not store equipment where conditions fall outside the manufacturer's recommendations for environmental conditions.

D. Do not install damaged equipment. Remove damaged equipment from the site and replace with new equipment.

E. If off-site storage of materials is necessary, this shall be at the Contractor’s expense.

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PART 2 - PRODUCTS

2.1 GENERAL

A. The proposed major components shall have a consistent architecture to reduce total cost of ownership for on-going support, maintenance, and training.

B. The Contractor shall provide all equipment, miscellaneous cables, terminators, materials, parts, software, and labor for a complete and satisfactory operating environment.

C. Systems shall be in full accordance with the recommendations of the equipment and software manufacturers, with the requirements of the specifications, and with all current edition or revision of all applicable codes and standards as listed under references in this section of the specifications.

2.2 MANUFACTURERS

A. Approved cabinet manufacturers:

1. Middle Atlantic
2. Pre-Approved Equivalent

2.3 FLOOR MOUNTED CABINET

A. Floor standing

B. 40 RU

C. 23” wide

D. 32” overall deep

E. Black, powder coat finish

F. LVFD-40 vented front door.

G. DWR-SR-6-FK Fan Kit.

H. DWR-RR40 Rear Rail Kit.

I. LT-1R Rackmount Light.

J. Maximum useable internal depth of 30”

K. Rack spaces must be numbered

L. Provide and install one (1) PDX-920R-SP 120V rackmount PDU, 9 NEMA 5-20R outlets, NEMA L5-20P input with 5-20P adapter, 10 ft. (4.57 m) cord.

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M. Approved Product:

1. Middle Atlantic Pivoting Wall Rack #SR-40-32

PART 3 - EXECUTION

3.1 INSTALLATION

A. General location and placement of equipment cabinets are shown on the project drawings.

B. Verify exact placement of cabinets and racks with the Owner prior to final installation and mounting.

C. Equipment cabinets and racks shall be assembled and installed per the manufacturer's printed instruction.

D. Do not install patch panels, cabling or equipment to the cabinets and racks until their installation has been accepted by the Owner.

E. Cabinets and racks are to be installed such that there are no obstructions or impediments to the full opening radius of the enclosure.

F. Cabinets and racks are to be mounted such that they do not obstruct access to any other junctions, pull boxes, control panels , cabinets, etc.

3.2 GROUNDING AND BONDING

A. Communication bonding and grounding shall be in accordance with the NEC® and NFPA. Cabinets and ladder racking shall be grounded and bonded in compliance with ANSI-J-STD-607-A, ANSI/NFPA 70, and local requirements and practices. Horizontal equipment includes cross connect frames, patch panels and racks, active telecommunication equipment and test apparatus and equipment. When required by local code, provide a Telecommunications Bonding Backbone utilizing a No. 6 AWG or larger bonding conductor that provides direct bonding between equipment rooms and telecommunications closets. This is part of the grounding and bonding infrastructure (part of the telecommunications pathways and spaces in the building structure) and is independent of equipment or cable.

END OF SECTION

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SECTION 27 13 23

COMMUNICATIONS OPTICAL FIBER BACKBONE CABLING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section includes the minimum requirements for the installation of optical fiber backbone cabling between telecommunications rooms.

B. This section includes, but is not limited to the following:

1. Optical fiber cabling
2. Optical fiber enclosures and terminations
3. Optical fiber patch cords
4. Testing
5. Administration

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

A. Provide all labor, materials, and equipment for the completion of work called for in the Contract Documents.

B. The Contractor shall be responsible for providing the services necessary to furnish, configure, deliver, install, integrate, and test all specified equipment. All work shall be in accordance with the intent of these specifications, and as required to leave the infrastructure components complete and in manufacturer certified operating conditions, excluding those items listed under “Work by Others.”

C. The Contractor shall provide any additional items, not specifically mentioned herein or on the drawings, necessary to meet system requirements as specified, without claim for additional payment.

D. Errors or Omissions in Drawings or Documentation

1. If any errors or omissions appear in Drawings, Specifications, or other documents, the bidding Contractor shall notify the Engineer no later than ten (10) days prior to submitting the bid.
2. Should conflict occur in or between Drawings and Specifications, the bidding Contractor is deemed to have estimated the more expensive way of doing the work,

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unless the bidding Contractor has asked for and obtained written decision (addendum) before submission of the bid as to which method or materials will be required.

E. Related Sections:

1. Section 27 11 16 Communications Cabinets, Racks, Frames, and Enclosures
2. Section 27 15 13 Communications Copper Horizontal Cabling

1.4 DEFINITIONS

A. ANSI – American Northern Standards Institute

B. BICSI – Building Industry Consulting Service International

C. EIA – Electronics Industry Alliance

D. IEEE – Institute of Electrical and Electronic Engineers

E. ISO – International Standards Organization

F. NFPA – National Fire Protection Agency

G. OFE – Optical Fiber Enclosure

H. TIA – Telecommunications Industry Association

I. SM – Single-mode Fiber

J. UL – Underwriters Laboratory

K. Main Distribution Frame (MDF): This technology space houses main network distribution equipment and acts as the main connection point between the Core/Network and the TR/IDF/access zones for all connections.

L. Intermediate Distribution Frame (IDF): is the location for the termination of backbone cables and for termination of horizontal cables, and for the interconnection of each. The space also hosts access–layer switches and user network connections within each floor.

M. Campus Backbone: cabling system consisting of media and termination hardware interconnecting POE, Net–Pop's and Future onsite buildings.

N. Building Backbone: cabling system consisting of media and termination hardware interconnecting MDFs to IDFs.

O. Horizontal: cabling system consisting of media and termination hardware interconnecting the Telecommunication Outlets (TOs) and the TRs.

P. Cabinet: free standing, floor–mounted or wall–mounted modular enclosure designed to house and protect rack–mounted electronic equipment and passive terminations.

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Q. Grounding: a conducting connection to earth, or to some conducting body that serves in place of earth.

R. UTP: Unshielded Twisted Pair.

S. FO: Fiber Optic

T. Patch Cords: a length of wire or fiber cable with connectors on one or both ends used to join communications circuits at a cross–connect.

1.5 SUBMITTALS

A. Shop drawings: Within ten (10) calendar days after award of contract, the Contractor shall submit product data cut sheets and catalog information to the Technology Designer for approval. The Contractor shall not begin installation or fabrication without such approval. The Technology Designer will indicate approval of shop drawings, product data, and samples submitted to the Designer by stamping such submittals “APPROVED” with a stamp. All shop drawings shall be marked with the pertaining specification paragraph or drawing number when submitted. Submit three (3) copies of each item to the Technology Designer.

B. Shop drawings shall be submitted on the following:

1. Bill of materials and cut sheets.
2. Project schedule including all major work components that materially affect any other work on the project.

C. A technical data sheet from the manufacturer shall be included with the response for each product proposed. This data sheet shall include the physical specifications as well as the following electrical and transmission characteristics if appropriate:

1. Mutual capacitance
2. Impedance
3. DC resistance
4. Attenuation
5. Worst Pair-to-Pair Near End Cross Talk
6. Power Sum Near End Cross Talk-

1.6 QUALITY ASSURANCE

A. The contractor shall adhere to the most current applicable rulings of the Federal Communications Commission (FCC). Provide the FCC registration number with the equipment submittal. All components and installations shall bear an Underwriters’ Laboratories (UL) listing and shall conform with the latest edition or revision of the following codes and standards:

1. ANSI American National Standards Institute
2. ASTM American Society for Testing and Materials
3. BICSI Building Industry Consulting Service International
4. CSI Construction Specifications Institute
5. EIA Electronics Industries Alliance

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6. FCC Federal Communications Commission
7. ICEA Insulated Cable Engineers Association
8. IEC International Electro Technical Commission
9. IEEE Institute of Electrical and Electronics Engineers
10. ISO International Organization for Standardization
11. NEC National Electrical Code
12. NEMA National Electrical Manufacturer's Association
13. NFPA National Fire Protection Association.
14. TIA Telecommunications Industry Association
15. UL Underwriters Laboratories, Inc.

B. The code or standard establishing the more stringent requirements shall be followed where areas of conflict occur between codes and standards or between codes and standards and drawings and specifications.

C. References
1. BICSI Telecommunications Distribution Methods Manual
2. BICSI Cabling Installation Manual
3. BICSI LAN Design Manual
4. CSI Master Format 2016 Edition – Division 27 - Communications
5. TIA/EIA-568-1-E – Commercial Building Telecommunications Wiring Standard, Part 1: General Requirements
6. TIA/EIA-568.2-C – Commercial Building Telecommunications Wiring Standard, Part 2: Balanced Twisted-Pair Cabling Components
7. TIA/EIA-568.3-D – Optical Fiber Cabling and Components Standard
8. TIA/EIA-569-E - Commercial Building Standard for Telecommunications Pathways and Spaces
9. TIA/EIA-606-D – Administration Standard for Commercial Telecommunications Infrastructure
10. ANSI-J-STD-607-A – Commercial Building Grounding and Bonding Requirements for Telecommunications
11. ISO/IEC 11801 – Information Technology – General Cabling for Customer Premises
12. ISO/IEC 11801 – Information Technology – Pathways and Spaces for Customer Premises Cabling
13. NFPA 70, NEC and NFPA 255
14. UL Cable Verifications Program
15. UL Testing Bulletin

D. All materials shall be manufactured and tested by manufacturers who are regularly engaged in the production of the components of similar systems for a minimum of five (5) years.

E. The Contractor shall maintain service facilities in the installation area. The facilities shall include a permanent source of factory trained service technicians on twenty-four (24) hour call experienced in servicing this type of cabling system and shall provide warranty and routine maintenance service to afford the Owner maximum coverage. The Contractor shall also provide a central source of support to guarantee immediate answers to Owner's problems and questions.

F. The Contractor selected for this project must be certified by the manufacture(s) specified within their submittals, adhere to the engineering, installation, and testing procedures, and utilize the recommended components.

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G. The Contractor shall be experienced in all aspects of this work and shall be required to demonstrate direct experience on recent systems of similar type and size. The Contractor shall own and maintain tools and equipment necessary for successful installation and testing of optical fiber distribution systems and have personnel who are trained and certified in the use of such tools and equipment.

H. Any sub-contractor who will assist the Contractor in performance of this work shall have the same training and certification as the Contractor.

I. The Contractor shall procure and pay for all necessary permits, licenses and inspections and observe any requirements stipulated therein. The Contractor shall conform in all trades with all local regulations and codes.

J. The Contractor shall guarantee at the time of the bid that all cabling and components meet or exceed specifications of ANSI/TIA-568.1-E, ANSI/TIA-568.2-D, and ANSI/TIA-568.3-D, ANSI/TIA-569-E, ANSI/TIA-606-D and ANSI/TIA-607-D.

K. The Contractor shall provide as part of the bid proposal a complete bill of materials, including catalog cuts, line item and extended pricing, and equipment configurations for all technologies noted in this section. This is in addition to the requests on the bid form.

L. The components shall be new, of modern design, and current standard production of the various manufacturers.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.

1. Test optical fiber cable to determine the continuity of the strand end to end.
2. Test optical fiber cable while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector, including the loss value of each. Retain test data and include the record in maintenance data.

B. To prevent damage, theft, soiling, and misalignment, protect equipment during transit, storage, and handling.

C. The contractor shall coordinate the secure storage of equipment and materials on site, or, if no on-site storage is available, shall provide their own secure storage at the Contractor’s expense.

D. Do not store equipment where conditions fall outside the manufacturer's recommendations for environmental conditions.

E. Do not install damaged equipment. Remove environmental conditions from the site and replace damaged equipment with new equipment.

F. If off-site storage of materials is necessary, this shall be at the Contractor’s expense.

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PART 2 - PRODUCTS

2.1 GENERAL

A. The proposed major components shall have a consistent architecture to reduce total cost of ownership for on-going support, maintenance, and training.

B. The Contractor shall provide all equipment, miscellaneous cables, terminators, materials, parts, software, and labor for a complete and satisfactory operating environment.

C. Systems shall be in full accordance with the recommendations of the equipment and software manufacturers, with the requirements of the specifications, and with all current edition or revision of all applicable codes and standards as listed under references in this section of the specifications.

2.2 MANUFACTURERS

A. Approved optical fiber cabling and component manufacturers:

1. Corning
2. Superior Essex
3. CommScope
4. Prysmian/General Cable
5. Pre-approved equivalent

2.3 OPTICAL FIBER CABLE

A. Multi-mode 50 µm (OM3) tight-buffered, indoor plenum armored interlocking optical fiber

B. Twelve (12) strand fiber count

C. 900µm buffered design

D. Mechanical and transmission performance specifications that meet or exceed TIA/EIA-568-C.3.

E. NEC/CEC Type OFCP (NFPA 262) compliant for plenum

F. Outer jacket color: Aqua

G. Approved Product:

1. Corning 012T88-33180-A3
2. Superior Essex L4012B401
3. CommScope P-012-DZ-5L-FSUAQ
4. General Cable BE0121PNU-ILPA
5. Pre-approved equivalent

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2.4 OPTICAL FIBER ENCLOSURES AND TERMINATIONS

A. Enclosure shall be 1RU and hold a minimum of two (2) adapter panels.

B. Enclosure shall be black in color.

C. Enclosure shall have slidable access.

D. Enclosure shall have moveable mounting brackets that allow for flush or protruding mounting.

E. Install blank panels as required for all unused panel slots in the new IDF enclosures.

F. Adapters shall be blue in color.

G. LC 50/125 µm OM3 multi-mode fiber optic connectors, which meet or exceed the performance specifications in ANSI/TIA/EIA-568-C.3.

H. Approved Product:

1. Hubbell OptiChannel
2. Corning CCH series CCH-01U
3. Panduit OptiCom
4. Pre-approved equivalent

2.5 OPTICAL FIBER PATCH CABLES

A. The Contractor shall provide twenty-four (24) 2-meter multi-mode (OM3) LC to LC duplex patch cables.

B. Fiber patch cables shall be aqua in color.

C. Fiber patch cables shall meet all requirements of the installed optical fiber backbone cable.

2.6 UNSPECIFIED EQUIPMENT AND MATERIAL

A. Any item of equipment or material not specifically addressed on the drawings or in this document and required to provide a complete and functional installation shall be provided in a level of quality consistent with other specified items.

PART 3 - EXECUTION

3.1 GENERAL

A. Upon completion of work, the Contractor shall submit as-built drawings to the Owner and Engineer.

B. Install all cables in accordance with project drawings.

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C. Provide any screws, anchors, clamps, tie wraps, distribution rings, miscellaneous grounding, and support hardware, etc. needed to facilitate the installation of the cable plant system.

D. Furnish any special installation equipment or tools required to properly complete the installation.

E. Do not roll or store cable reels without an appropriate underlay.

F. Failure to follow the appropriate guidelines may require the installer to provide the additional material and labor required to bring the installation back into alignment with the guidelines. This shall also apply to any and all damages caused to the cables by the installer during the implementation.

G. Provide fire stopping at all fire-rated ceiling, wall, and floor penetrations.

H. Plug conduits where cabling has been installed in the main equipment room, backbone, and other cable entrance locations with re-enterable duct seal of flame-retardant putty.

I. Provide bushings on all conduit ends.

J. All wiring, materials, and equipment must be listed and labeled by an NRTL. To certify that performance characteristics, meet ANSI/TIA 568 Standards, provide all Original Equipment Manufacturer (OEM) documentation to the Owner.

K. All of the pathways shown on the drawings are suggested routes for the Contractor to use as guidelines. Prior to construction, the Contractor shall coordinate in the field with other trades to determine the exact feeder, tie, and riser backbone cabling pathways. In any case where the communication pathway must be removed and re-routed, due to conflicts with other trades with which the Contractor did not previously coordinate, the Contractor is responsible for all costs associated with the removal and relocation.

3.2 OPTICAL FIBER BACKBONE CABLE

A. Install the optical fiber backbone in a continuous length from the OFE in the MDF to an OFE within each IDF.

B. Leave a 3-meter maintenance loop at each end of the link, neatly contained in the cabinet or ladder rack in a “figure 8” loop at the rear of the OFE.

C. Throughout the length of the cable, maintain the minimum bend radius and pulling force recommended by the manufacturer and required by industry standards, both during installation and after termination and testing.

D. On each end, remove all outer jacket and strength member materials to expose the individual 900-micron buffering of the individual strands for a length of 0.5 m (18 inches).

E. On each end, hold the cable ends securely in place with the cable clamping accessories in each OFE.

F. Route individual strands in the rear of the OFE in a neat and orderly fashion and place them so as not to create undue stress or micro bending of the strands.

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G. Secure all cable bundles with proper bundling or securing materials so as to ensure that the cable runs are securely held in place both vertically and horizontally.

H. Do not tighten bundling materials or securing devices so tightly that they deform the inherent cable geometry or construction.

I. Do not use cable ties or hook-and-loop tape to secure cable runs to other building systems such as electrical conduit, Electric Metallic Tube (EMT), sprinkler pipes, ceiling suspension members.

J. In environmental air-handling spaces, only use appropriately listed materials.

3.3 LABELING

A. Uniquely identify all components of the installed system by location, function, unit, and sub-unit.

B. Identify each location with a unique alphanumeric identifier.

C. Assign a unique alphanumeric identifier for each equipment enclosure in the building.

D. Identify each adapter module in each distribution or interconnect enclosure with an alphanumeric identifier.

E. Identify all conduits, trays, and pathways with a unique alphanumeric identifier.

F. Identify optical fiber cables by a textual label that indicates its type, strand count, point of origin, and termination.

G. Supply a Cable Identification Matrix

H. Supply all records in compliance with ANSI/TIA 606.

I. Before installing or terminating cable, confirm all specific labeling requirements with the Owner or the Owner’s Engineer.

J. Mark each backbone cable at each endpoint and at all intermediate pull and access points and junction boxes with a label that indicates the origination and destination identifiers, the sheath identifier, and the strand or pair range.

K. Optical Fiber Enclosures (OFEs)

1. Mark each OFE with an adhesive label that indicates the range of circuits installed within it.
2. Label each port with the origination and destination grid identifier and the individual strand ID.
3. At each end of each cable, within 75 mm (3 inches) of the end of the sheath, place a self-laminating label that surrounds the outermost jacket and bears the appropriate cable identifier.
4. On each equipment enclosure, affix self-adhesive labels, bearing the enclosure’s identifier in block characters, at the top center of the front and rear doors or faces.

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5. In all enclosures, place a label directly adjacent to the shortest side of each adapter that bears that adapter's identifier. Rotate the characters on the labels to maintain a left to right, top to bottom orientation.

3.4 GROUNDING AND BONDING

A. Communication bonding and grounding shall be in accordance with the NEC® and NFPA. Horizontal cables shall be grounded in compliance with ANSI-J-STD-607-A, ANSI/NFPA 70, and local requirements and practices. Horizontal equipment includes cross connect frames, patch panels and racks, active telecommunication equipment and test apparatus and equipment. When required by local code, provide a Telecommunications Bonding Backbone utilizing a No. 6 AWG or larger bonding conductor that provides direct bonding between equipment rooms and telecommunications closets. This is part of the grounding and bonding infrastructure (part of the telecommunications pathways and spaces in the building structure) and is independent of equipment or cable.

3.5 OPTICAL FIBER CABLE TESTING

A. Test all fiber (100%) using a bidirectional, power meter, and light source field test of all fiber strands in both directions.

B. Bidirectional Power Meter testing shall be conducted on each strand. Provide test results and include as a minimum the following information for all cables:
   1. Fiber cable label number
   2. Fiber cable length
   3. Attenuation (dB loss)
   4. Test Date
   5. Tester make and model number
   6. Tester calibration date
   7. Perform tests at both 850nm and 1300nm wavelengths

C. All cable testing shall be conducted by an experienced technician.

D. The test reports shall be in PDF format from the cable manufacturer's certified testing equipment. An electronic copy of all test reports shall be provided to the Owner with an electronic version on a USB drive. Additionally, this Contractor shall provide hardcopy documentation indicating test results for each strand installed.

E. Any cable or component that does not meet the required operational tests or fails to meet installation standards as specified shall be repaired or replaced by the Contractor as directed by, and at no expense to, the Owner.

END OF SECTION

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SECTION 27 15 13

COMMUNICATIONS COPPER HORIZONTAL CABLING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section includes, but is not limited to the following:

1. Copper cabling
2. Patch panels
3. Modular jacks
4. Faceplates and modules
5. Patch cords

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

A. This section includes the minimum requirements for the installation of communications horizontal cabling between telecommunications rooms and outlets or devices.

B. Provide all labor, materials, and equipment for the completion of work called for in the Contract Documents.

C. The Contractor shall be responsible for providing the services necessary to furnish, configure, deliver, install, integrate, and test all specified equipment. All work shall be in accordance with the intent of these specifications, and as required to leave the infrastructure components complete and in manufacturer certified operating conditions, excluding those items listed under “Work by Others.”

D. The Contractor shall provide any additional items, not specifically mentioned herein or on the drawings, necessary to meet system requirements as specified, without claim for additional payment.

E. Errors or Omissions in Drawings or Documentation

1. If any errors or omissions appear in Drawings, Specifications, or other documents, the bidding Contractor shall notify the Engineer no later than ten (10) days prior to submitting the bid.
2. Should conflict occur in or between Drawings and Specifications, the bidding Contractor is deemed to have estimated the more expensive way of doing the work,

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unless the bidding Contractor has asked for and obtained written decision (addendum) before submission of the bid as to which method or materials will be required.

F. Related Sections:

1. Section 27 11 16 Communications Cabinets, Racks, Frames, and Enclosures
2. Section 27 13 23 Communications Optical Fiber Backbone Cabling

1.4 DEFINITIONS

A. ANSI – American Northern Standards Institute

B. BICSI – Building Industry Consulting Service International

C. EIA – Electronics Industry Alliance

D. IEEE – Institute of Electrical and Electronic Engineers

E. IDC – Insulation displacement contact

F. ISO – International Standards Organization

G. NFPA – National Fire Protection Agency

H. TIA – Telecommunications Industry Association

I. UL – Underwriters Laboratory

J. Structured Cabling System (SCS) wiring is defined as all required equipment and cabling including hardware, termination blocks, cross connect wire or cordage, patch panels, patch cords, telecommunication outlets, work area cords, UTP and fiber cable installed and configured to provide computer data and voice connectivity.

K. Main Distribution Frame (MDF): This technology space houses main network distribution equipment and acts as the main connection point between the Core/Network and the TR/IDF/access zones for all connections.

L. Intermediate Distribution Frame (IDF): is the location for the termination of backbone cables and for termination of horizontal cables, and for the interconnection of each. The space also hosts access–layer switches and user network connections within each floor.

M. Horizontal: cabling system consisting of media and termination hardware interconnecting the Telecommunication Outlets (TOs) and the TRs.

N. Bonding: permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed on it.

O. Cabinet: free standing, floor–mounted or wall–mounted modular enclosure designed to house and protect rack–mounted electronic equipment and passive terminations.

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P. Grounding: a conducting connection to earth, or to some conducting body that serves in place of earth.

Q. Jack: receptacle used in conjunction with a plug to make electrical contact between communications circuits, e.g., eight–position/eight–contact modular jacks.

R. UTP: Unshielded Twisted Pair.

S. Patch Cords: a length of wire or fiber cable with connectors on one or both ends used to join communications circuits at a cross–connect.

T. Patch Panel: system of terminal blocks or connectors used with patch cords that facilitate administration of cross–connect fields.

U. Pathway: facility for the placement of communications cable. A pathway facility can be composed of several components including conduit, wireway, cable tray, surface raceway, under floor systems, overhead systems, raised floor, ceiling support wires, etc.

V. Racks: An open, freestanding, floor–mounted structure, typically made of aluminum or steel, used to mount equipment; usually referred to as an equipment rack.

1.5 SUBMITTALS

A. Shop drawings: Within ten (10) calendar days after award of contract, the Contractor shall submit product data cut sheets and catalog information to the Technology Designer for approval. The Contractor shall not begin installation or fabrication without such approval. The Technology Designer will indicate approval of shop drawings, product data, and samples submitted to the Designer by stamping such submittals “APPROVED” with a stamp. All shop drawings shall be marked with the pertaining specification paragraph or drawing number when submitted. Submit three (3) copies of each item to the Technology Designer.

B. Shop drawings shall be submitted on the following:

1. Bill of materials and cut sheets.
2. Project schedule including all major work components that materially affect any other work on the project.

C. A technical data sheet from the manufacturer shall be included with the response for each product proposed. This data sheet shall include the physical specifications as well as the following electrical and transmission characteristics if appropriate:

1. Mutual capacitance
2. Impedance
3. DC resistance
4. Attenuation
5. Worst Pair-to-Pair Near End Cross Talk
6. Power Sum Near End Cross Talk

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1.6 QUALITY ASSURANCE

A. The contractor shall adhere to the most current applicable rulings of the Federal Communications Commission (FCC). Provide the FCC registration number with the equipment submittal. All components and installations shall bear an Underwriters' Laboratories (UL) listing and shall conform with the latest edition or revision of the following codes and standards:

1. ANSI American National Standards Institute
2. ASTM American Society for Testing and Materials
3. BICSI Building Industry Consulting Service International
4. CSI Construction Specifications Institute
5. EIA Electronics Industries Alliance
6. FCC Federal Communications Commission
7. ICEA Insulated Cable Engineers Association
8. IEC International Electro Technical Commission
9. IEEE Institute of Electrical and Electronics Engineers
10. ISO International Organization for Standardization
11. NEC National Electrical Code
12. NEMA National Electrical Manufacturer's Association
13. NFPA National Fire Protection Association.
14. TIA Telecommunications Industry Association
15. UL Underwriters Laboratories, Inc.

B. The code or standard establishing the more stringent requirements shall be followed where areas of conflict occur between codes and standards or between codes and standards and drawings and specifications.

C. References

1. BICSI Telecommunications Distribution Methods Manual, 14th Edition
2. BICSI Cabling Installation Manual
3. CSI Master Format 2016 Edition – Division 27 - Communications
4. ANSI/TIA-568.1-E – Commercial Building Telecommunications Infrastructure Standard
5. ANSI/TIA-568.2-D – Balanced Twisted-Pair Telecommunications Cabling and Components Standard
6. ANSI/TIA-568.3-D – Optical Fiber Cabling and Components Standard
7. ANSI/TIA-569-E - Telecommunications Pathways and Spaces
8. ANSI/TIA-606-D - Administration Standard for Telecommunications Infrastructure
9. ANSI/TIA-607-D – Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
10. ISO/IEC 11801 – Information Technology – General Cabling for Customer Premises
11. ISO/IEC 11801 – Information Technology – Pathways and Spaces for Customer Premises Cabling
12. NFPA 70, NEC and NFPA 255
13. UL Cable Verifications Program
14. UL Testing Bulletin

D. All materials shall be manufactured and tested by manufacturers who are regularly engaged in the production of the components of similar systems for a minimum of five (5) years.

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E. The Contractor shall maintain service facilities in the installation area. The facilities shall include a permanent source of factory trained service technicians on twenty-four (24) hour call experienced in servicing this type of cabling system and shall provide warranty and routine maintenance service to afford the Owner maximum coverage. The Contractor shall also provide a central source of support to guarantee immediate answers to Owner's problems and questions.

F. The Contractor selected for this project must be certified by the manufacture(s) specified within their submittals, adhere to the engineering, installation, and testing procedures, and utilize the recommended components.

G. The Contractor shall be experienced in all aspects of this work and shall be required to demonstrate direct experience on recent systems of similar type and size. The Contractor shall own and maintain tools and equipment necessary for successful installation and testing of Category 6 distribution systems and have personnel who are trained and certified in the use of such tools and equipment.

H. Any sub-contractor who will assist the Contractor in performance of this work shall have the same training and certification as the Contractor.

I. The Contractor shall procure and pay for all necessary permits, licenses and inspections and observe any requirements stipulated therein. The Contractor shall conform in all trades with all local regulations and codes.

J. The Contractor shall guarantee at the time of the bid that all cabling and components meet or exceed specifications of ANSI/TIA-568.1-E, TIA/EIA-568-C.2, and TIA/EIA-568-C.3, TIA/EIA-569-B, TIA/EIA-606-A and ANSI J-STD-607-A.

K. The Contractor shall provide as part of the bid proposal a complete bill of materials, including catalog cuts, line item and extended pricing, and equipment configurations for all technologies noted in this section. This is in addition to the requests on the bid form.

L. The components shall be new, of modern design, and current standard production of the various manufacturers.

1.7 DELIVERY, STORAGE, AND HANDLING

A. To prevent damage, theft, soiling, and misalignment, protect equipment during transit, storage, and handling.

B. The contractor shall coordinate the secure storage of equipment and materials on site, or, if no on-site storage is available, shall provide their own secure storage at the Contractor’s expense.

1. Do not store equipment where conditions fall outside the manufacturer's recommendations for environmental conditions.
2. Do not install damaged equipment. Remove environmental conditions from the site and replace damaged equipment with new equipment.
3. If off-site storage of materials is necessary, this shall be at the Contractor’s expense.

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PART 2 - PRODUCTS

2.1 GENERAL

A. The proposed major components shall have a consistent architecture to reduce total cost of ownership for on-going support, maintenance, and training.

B. The Contractor shall provide all equipment, miscellaneous cables, terminators, materials, parts, software, and labor for a complete and satisfactory operating environment.

C. Systems shall be in full accordance with the recommendations of the equipment and software manufacturers, with the requirements of the specifications, and with all current edition or revision of all applicable codes and standards as listed under references in this section of the specifications.

2.2 MANUFACTURERS

A. Approved copper cabling manufacturers:

1. General Cable
2. Superior Essex
3. Belden/Mohawk
4. CommScope
5. Equivalent

B. Approved component manufacturers:

1. Hubbell
2. Panduit
3. CommScope
4. Equivalent

2.3 CATEGORY 6 CABLE

A. Category 6 rated 100 ohm balanced Unshielded Twisted Pair (UTP) with four individually twisted-pairs, which exceed the mechanical and transmission performance specifications in ANSI/TIA 568-C.2, 250 MHz.

B. 23 AWG solid bare annealed copper

C. NEC/CEC Type CMP (NFPA 262) compliant for plenum

D. Cable color specification:

1. Data - Blue
2. Wireless Access Points - Blue
3. Cameras - Orange

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E. Approved Product:

1. Superior Essex 77 Series Category 6 23AWG Plenum
2. General Cable GenSPEED 6 Category 6 23AWG Plenum
3. Belden D6 Series Category 6 23AWG Plenum
4. CommScope NetConnect Category 6 23AWG Plenum
5. Equivalent

2.4 CATEGORY 6 DATA JACKS

A. Data jacks shall be 8-position configuration and shall meet the transmission performance of Category 6.

B. The jacks shall be wired to TIA/EIA 568B wiring scheme.

C. Keystone type module.

D. Jack color specifications:

1. Data - Blue
2. Wireless Access Points - Green
3. Cameras - Orange

E. Jacks shall mount within keystone faceplates at workstation end.

F. Jacks shall mount within modular patch panels in MDF and IDFs.

G. Approved Product:

1. Hubbell NEXTSPEED
2. Panduit NetKey
3. CommScope NetConnect
4. Equivalent

2.5 PATCH PANELS

A. 19 in. rack mountable, 48-port, 2RU flush mount modular patch panels.

B. Keystone openings.

C. Patch panels shall have area for labels and identifications.

D. Patch panels shall be black in color.

E. Patch panels must include rear cable strain relief bar.

F. Approved Product:

1. Hubbell NSPJ48
2. Panduit NetKey

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3. Pre-approved equivalent

2.6 FACEPLATES AND INSERTS

A. Provide flush mount stainless steel faceplates at all locations, with numbers of modules, jacks and/or connectors, inserts and blanks as required.

B. Single or double gang as required.

C. Faceplates must accept decora inserts with keystone openings. Decora inserts shall be white in color.

D. Provide inserts, jacks and/or connectors and blanks for all outlet ports.

E. All faceplates shall be stainless steel or Wiremold Series, depending on location.

F. Contractor shall blank off all unused ports.

2.7 SURFACE MOUNT BACKBOXES

A. Provide one (1) two-port surface box at each Wireless Access Point location as indicated on the project drawings. The box shall house and protect the jacks and terminations.

B. Surface mount backboxes shall accept keystone modules.

C. Surface mount backboxes shall be white in color.

D. Contractor shall blank all unused outlet ports.

E. APPROVED PRODUCT:

1. Hubbell ISB2W
2. Panduit NetKey NK2BX
3. CommScope SMB-2P
4. Equivalent

2.8 COPPER PATCH CORDS – CLOSET END

A. The Contractor shall provide one (1) one foot (1') patch cord for each drop installed for the MDF/IDF end of the link.

B. Copper patch cords shall be Category 6 rated.

C. Copper patch cords shall match the color of the cable for which it is being supplied.

D. Copper patch cords shall be 24AWG and have stranded conductors.

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E. The copper patch cords shall meet or exceed ANSI/TIA 568 C.2 standards for Category 6 cables.

F. The copper patch cords shall be non-booted.

G. The patch cables shall be labeled in accordance with TIA/EIA 606-B.

2.9 UNSPECIFIED EQUIPMENT AND MATERIAL

A. Any item of equipment or material not specifically addressed on the drawings or in this document and required to provide a complete and functional communications cabling system installation shall be provided in a level of quality consistent with other specified items.

PART 3 - EXECUTION

3.1 GENERAL

A. Upon completion of work, the Contractor shall submit as-built drawings to the Owner and Engineer.

B. Install all cables in accordance with project drawings.

C. Provide any screws, anchors, clamps, tie wraps, distribution rings, miscellaneous grounding, and support hardware, etc. needed to facilitate the installation of the cable plant system.

D. Furnish any special installation equipment or tools required to properly complete the installation.

E. Do not roll or store cable reels without an appropriate underlay.

F. Failure to follow the appropriate guidelines may require the installer to provide the additional material and labor required to bring the installation back into alignment with the guidelines. This shall also apply to any and all damages caused to the cables by the installer during the implementation.

G. Provide fire stopping at all fire-rated ceiling, wall, and floor penetrations.

H. Plug conduits where cabling has been installed in the main equipment room, backbone, and other cable entrance locations with re-enterable duct seal of flame-retardant putty.

I. Provide bushings on all conduit ends.

J. All wiring, materials, and equipment must be listed and labeled by an NRTL. To certify that performance characteristics, meet ANSI/TIA 568 Standards, provide all Original Equipment Manufacturer (OEM) documentation to the Owner.

K. All of the pathways shown on the drawings are suggested routes for the Contractor to use as guidelines. Prior to construction, the Contractor shall coordinate in the field with other trades to determine the exact feeder, tie, and riser backbone cabling pathways. In any case where

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the communication pathway must be removed and re-routed, due to conflicts with other trades with which the Contractor did not previously coordinate, the Contractor is responsible for all costs associated with the removal and relocation.

3.2 COPPER HORIZONAL CABLE

A. All horizontal cables shall be run continuous from Main Distribution Frame (MDF) or Intermediate Distribution Frame (IDF) to media outlet and free from splices, reverses, grounds, or other connections.

B. The Contractor shall provide a one foot (1') minimum service loop at the workstation jack end and a ten foot (10') minimum service loop in each closet, and at each wireless access point and ceiling data jack above accessible ceiling to accommodate future changes.

C. The Contractor shall terminate all horizontal cable according to T568B jack pin assignments.

D. The Contractor shall remove only the amount of cable jacket necessary for termination. The Contractor shall maintain wire twist for all pairs of Category 6 cable to within one-half (1/2") of the termination point.

E. The Contractor shall not run cable longer than the maximum ninety (90) meter TIA/EIA recommended length.

F. Copper splices in the horizontal distribution are prohibited.

G. All cables installed shall be plenum-rated.

H. The Contractor shall carefully lay all cable with appropriate radius of curvature and protect at bends and corners. The Contractor shall observe minimum bend radius and tension limitations as specified by TIA/EIA for Category 6.

I. Cable bundles shall not exceed 192 cables.

J. Equipment cabinets and patch panels shall be arranged to allow for natural wiring progression in functional fields, eliminate crossing of wires and allow for the easy access to each component.

K. The Contractor shall assure that at the completion of cable installation, cables are free from twists, kinks, sharp bends, cuts, gouges, or any other physical damage that might cause alterations to the electrical characteristics of the cables.

L. The Contractor shall seal both ends of all sleeves, including the outside perimeter with Nelson or 3M fire retardant caulk and putty after cable installation. The fire rating classification shall equal or exceed the fire rating of the wall.

3.3 LABELING

A. The Contractor shall provide cable number designations tags on the cables in each outlet box. All cable designations and color-coding shall be in full compliance with TIA/EIA 606.

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1. The Contractor shall clearly label cables at both ends with permanently applied, mechanically printed labels. Handwritten labels **will not** be acceptable. The Contractor shall use standardized colors and alphanumeric codes. The Owner shall approve the labeling system and method prior to installation.
2. Data: In work areas, the Contractor shall place cable ID labels around each new cable drop in the outlet boxes within two (2) inches of the jacks and on front of the faceplates at all new and existing locations. Use flexible vinyl or polyester labels that will flex as cables are bent. The Contractor must provide proof of concept labels for Owner approval before any work is performed.
3. In all MDF and IDF locations, the Contractor shall place ID labels around each cable. Labels shall be located within six (6) inches of the termination. Use flexible vinyl or polyester labels that will flex as cables are bent.
4. The Contractor shall front label each telecommunications room, rack, patch panel, and patch panel port and perform continuity, polarity, and map test for each port.
5. The specific labeling scheme for each facility will be determined by the Owner at the time of installation. The labeling scheme shall include closet, patch panel, and port designations.

3.4 GROUNDING AND BONDING

A. Communication bonding and grounding shall be in accordance with the NEC® and NFPA. Horizontal cables shall be grounded in compliance with ANSI-J-STD-607-A, ANSI/NFPA 70, and local requirements and practices. Horizontal equipment includes cross connect frames, patch panels and racks, active telecommunication equipment and test apparatus and equipment. When required by local code, provide a Telecommunications Bonding Backbone utilizing a No. 6 AWG or larger bonding conductor that provides direct bonding between equipment rooms and telecommunications closets. This is part of the grounding and bonding infrastructure (part of the telecommunications pathways and spaces in the building structure) and is independent of equipment or cable.

3.5 UTP CABLE TESTING

A. The Contractor shall, at all times, permit and facilitate work inspection by the Owner Representative and by public authorities having jurisdiction. The Owner's Representative shall have the authority to stop the work, if required, to insure proper execution.
   1. Each UTP cable pair shall be tested end to end from the outlet termination to the patch panel.
   2. Tests shall be permanent link only.

B. Cables and connectors comprising Category 6 must be certified compliant with the performance requirements listed in TIA/EIA-568-B.2.
   1. As a minimum, test documentation shall include:
      a. Cable Identification Number
      b. Worst Case Near End Cross Talk (NEXT)
      c. Attenuation
      d. PSNEXT
      e. Resistance
      f. Return Loss
      g. ELFEXT

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h. PSELFEXT
i. Propagation Delay
j. Propagation Delay Skew
k. Cable Length
l. Test Date

2. Each data circuit, including all connectors, shall be tested to verify all bandwidth performance and crosstalk specifications as outlined for Category 6. Any cables not in one hundred percent (100%) compliance with the minimum performance criteria relating to Category 6 will be replaced with no additional cost to the Owner.

C. Each data circuit, including all connectors, shall be tested to verify all bandwidth performance and crosstalk specifications as outlined for Category 6. Any cables not in one hundred percent (100%) compliance with the minimum performance criteria relating to Category 6 will be replaced with no additional cost to the Owner.
1. Cable testing will be conducted by a programmable, ISO/IEC 11801 Class C, D, E, F micro-computer-based tester capable of testing all specific standard requirements and generating completed printed test results.

D. Test equipment shall be a designed, and of such grade, so as to provide reliable certification and testing compliant with the SCS manufacturer's requirements.

E. The test reports shall be in PDF format from the cable manufacturer's certified testing equipment. An electronic copy of all test reports shall be provided to the Owner with an electronic version on a USB drive. Additionally, this Contractor shall provide hardcopy documentation indicating test results for each cable installed by closet and in numerical order.

F. Any outlet, cable or component that does not meet the required operational tests or fails to meet installation standards as specified shall be repaired or replaced by the Contractor as directed by, and at no expense to, the Owner.

END OF SECTION

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SECTION 27 41 43 – COMMUNICATIONS CABLING UNIT PRICE SHEET

NOTE: Unit prices are to be included with bidder's original sealed proposal for the Work to be per Project Specifications. All unit prices shall include installation labor unless otherwise noted.

Item or Material	Unit Price Regular Time
Provide 1 – Single Category 6 data drop including cable, jacks, faceplate, etc.	$
Provide 1 – Dual Category 6 data drop including cable, jacks, faceplate, etc.	$
Provide 1 – Single Category 6 data drop in the ceiling for a security camera or wireless access point including cable, jacks, surface-mount box, etc.	$
Provide 1 – Single Category 6 wall phone drop including cable, jacks,	$
Provide 25 – Category 6 data drop including cable, jacks, faceplate, etc.	$
Provide 50 – Category 6 data drop including cable, jacks, faceplate, etc.	$
Provide 1 – Category 6 24-port modular patch panel, mounted, unpopulated	$
Provide 1 – Category 6 48-port modular patch panel, mounted, unpopulated	$
Provide 1 – Category 6 patch cable, 6-inch (delivered, no install)	$
Provide 1 – Category 6 patch cable, 1-foot (delivered, no install)	$
Provide 1 – Category 6 patch cable, 3-foot (delivered, no install)	$
Provide 1 – Category 6 patch cable, 10-foot (delivered, no install)	$
Provide 1 – Multi Mode OM3 fiber optic patch cable, 1-meter, LC-LC (delivered, no install) - Color Aqua	$
Provide 1 – Multi Mode OM3 fiber optic patch cable, 2-meter, LC-LC (delivered, no install) – Color Aqua	$
Provide 1 – Multi Mode OM3 fiber optic patch cable, 3-meter, LC-LC (delivered, no install)- Color Aqua	$
Provide 1 – Floor mount enclosed equipment cabinet, as specified	$
Provide 1 – 1" Conduit sleeve including coring, conduit, bushings, firestop	$
Provide 1 – 6ft. Wiremold V700 raceway, including back box and faceplate	$
Provide 1 – Demolition and removal of ten (10) Cat 5, 5e, or 6 data drops from outlet back to IT closet. Price shall include removal from patch panel and disposal from jobsite. Assume drops are in the same or Adjacent classrooms and/or office area	$

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Provide 1 – Demolition and removal of twenty (20) Cat 5, 5e, or 6 data drops from outlet back to IT closet. Price shall include removal from patch panel and disposal from jobsite. Assume drops are in the same or Adjacent classrooms and/or office area	$
Provide 1 – Demolition and removal of thirty (30) Cat 5, 5e, or 6 data drops from outlet back to IT closet. Price shall include removal from patch panel and disposal from jobsite. Assume drops are in the same or Adjacent classrooms and/or office area	$
Cabling Technician (Hourly Rate)	$
Cabling Technician (Overtime Hourly Rate)	$
Cabling Technician (Holiday Hourly Rate)	$

END OF SECTION

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