

7/8/2024

Request for Proposal Critical Communications Systems



**For
North Branch Area Schools
6655 Jefferson Road
North Branch, MI 48461**

**Prepared by
Convergent Technology Partners, LLC
6197 Miller Rd, Swartz Creek, MI 48473
810.720.3820
www.ctpartners.net**

NORTH BRANCH AREA SCHOOLS
CRITICAL COMMUNICATIONS SYSTEMS

SECTION 00 30 00 – BIDDING REQUIREMENTS – INSTRUCTION TO BIDDERS

PART 1 - GENERAL

1.1 INTRODUCTION

- A. North Branch Area Schools is seeking bids and proposals for a new paging system at The High School, Ruth Fox Middle School and the Elementary School.
- B. **Bid documents may be obtained on the State of Michigan’s website at www.Michigan.gov/VSSlogin and on the Owner’s website at <https://www.nbbroncos.net/board-of-education/request-for-bids>.**

- 1.2 **Due per the Schedule of Events**, the Owner will receive bid proposals for the project. The Owner will not consider or accept a bid proposal received after the due date for bid proposal submission. The Owner is not responsible for any postal or delivery delays. No email, facsimile or other electronic bid proposals will be accepted. All bid proposals received after the due date will be returned by making them available to the respective Bidder, unopened, for said Bidder to pick-up at their sole cost and expense. Bid proposals shall be submitted to:

Mark Brown
IT Director
North Branch Area Schools
6655 Jefferson Rd
North Branch, MI 48461

1.3 PROPOSALS/QUOTES

- A. Two (2) “hard” copies and two (2) electronic copies on a USB “flash” drive of each complete proposal are to be submitted in sealed packaging, clearly marked: **“Critical Communications Systems Sealed Bid”** for North Branch Area Schools and shall be identified with the Bidder’s name and address and the date and time of the bid proposal opening. The Owner is not responsible for any postal or delivery delays. No email, facsimile or other electronic bid proposals will be accepted.
- B. **Proposals will be opened immediately following the due date of the proposals:**
- C. The hard copy with the original bid Bond shall be conspicuously labeled on the exterior of the proposal stating “ORIGINAL”. All other copies shall be labeled “COPY”.

1.4 PROPOSAL FORMAT

- A. The Bid response shall be structured as follows:
 - 1. Section 1 – Submittal Letter, Executive Summary and Bid Bond
 - 2. Section 2 – Proposal Forms and Bill of Materials with Installed Pricing
 - 3. Section 3 – Narratives, System Description, Information, and Brochures
 - 4. Section 4 - Bidder Qualifications, References

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5. Section 5 – Sample Bidder’s Maintenance Contract

- B. The “hard copy” Bids shall be submitted on 8 1/2" by 11" paper, single sided, single spaced using 10 to 12-point print, in 3 ring binders, clearly labeled to show the Bidder's name.
- C. The electronic Bid shall be in the same structure and individual sections as the “hard copy” Bids, bound in .pdf files per section above, submitted on an USB “flash”, “Thumb” or similar drive with the hard copies. The electronic copy shall provide an exact duplicate of the information provided in the hard copy vice versa.

1.5 SECURITY

- A. Each bid proposal must be accompanied by bid security in the form of a certified check or bid bond in the amount not less than 5% of the bid proposal amount, made payable to North Branch Area Schools or naming North Branch Area Schools as the obligee. Bid bonds shall be issued by a company licensed to do business in the State of Michigan

1.6 INSURANCE REQUIREMENTS

- A. The Owner requires that all bidders submit proof of insurance with the following requirements:
 - 1. North Branch Area Schools must be listed as an additional insured on the Contractors General Liability Coverage. Bidders must agree to this in their Bid.
 - 2. Provide North Branch Area Schools with a copy of the Proof of General Liability Coverage from the Contractor with a minimum of \$1,000,000 for projects with a value less than \$1,000,000 and a minimum limit of \$2,000,000 for projects with a value between \$1,000,000 and \$10,000,000. Bidders must agree to this in their proposal.
 - 3. The Contractor must agree to hold the Owner harmless and to indemnify the Owner for losses from Contractor negligence as follows:
 - a. The waiver of subrogation clause in the AIA contract (A-201 or A-232) “General Conditions, and/or any other contract regarding this project, must be deleted.
 - b. The parties agree that the Owner is not waiving any rights its insurers may have to subrogation. To the extent any term in the Agreement is contrary to this provision, such term is void and unenforceable.

1.7 FAMILIAL DISCLOSURE AFFIDAVIT

- A. Each bid proposal must 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 Board of Education or the Superintendent of North Branch Area Schools. The Board of Education will not accept a bid proposal that does not include this sworn and notarized disclosure statement.

1.8 AFFIDAVIT OF COMPLIANCE – IRAN ECONOMIC SANCTIONS

- A. Each bid proposal must be accompanied by the Iran Economic Sanctions Affidavit of Compliance in compliance with Michigan Public Act No. 517 of 2012. The Board of Education will not accept a bid proposal that does not include this sworn and notarized disclosure statement.

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1.9 RESERVATION OF RIGHTS

- A. The Owner reserves the right, in its sole and absolute discretion (for this provision and all other provisions contained in this RFP), to accept or reject, in whole or in part, any or all bid proposal with or without cause, to waive any irregularities or informalities in this RFP process or any bid proposal, and to award the contract to other than the low bidder, when in the opinion of the Owner, such action will best serve the Owner's interests.

1.10 WITHDRAWAL OF BID PROPOSALS/QUOTES

- A. All bid proposals submitted shall not be withdrawn and shall be irrevocable for a minimum period of ninety (90) calendar days following the due date for receipt of bid proposals set forth above.

1.11 REQUESTS FOR CLARIFICATION

- A. Bidders may request that the Owner clarify information contained in this RFP. All such requests must be made in writing via email to Convergent Technology Partners, at ehelsel@ctpartners.net. Requests for Clarifications and inquiries may only be made via email. The deadline for all Requests for Clarification is per the date and time indicated in the schedule of events. The aggregated answers to all Requests for Clarification will be provided in an addendum to the RFP which will be issued and posted on the Purchasing page of the **State of Michigan's web site at www.Michigan.gov/VSSlogin** and on the **Owner's website at <https://www.nbbrncos.net/board-of-education/request-for-bids>** no later than three (3) business days prior to the bid opening date for all potential proposers to view.

1.12 RESTRICTION ON COMMUNICATION

- A. From the issue date of this RFP until a Contractor is selected and the contract is awarded a prospective Contractor shall not communicate about the subject of this RFP or a Contractor's bid proposal with the Owner, its Board of Education, or any individual member, administrators, faculty, staff, students, or employees, except for additional requests for clarification in accordance with the paragraph above.

1.13 RELEASE OF CLAIMS

- A. Each Bidder by submitting its Proposal releases the Owner from all claims arising out of, and related to, this RFP process and selection of a Contractor.

1.14 PROPOSAL COST

- A. Respondents of this RFP are responsible for all costs incurred by them or others acting on their behalf in preparing or submitting a bid proposal, or otherwise responding to this RFP, or any negotiations incidental to its bid proposal or this RFP.

1.15 COLLUSIVE BIDDING

- A. All Bidders certify that its bid proposal is made without any previous understanding, agreement or connection with any person, firm or corporation making a bid proposal for the same project and is in all respects fair, without outside control, collusion, fraud, or other illegal action.

1.16 DEFINITIONS

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- A. Bid Documents are defined as the Instructions to Bidders, Schedule of Events, this RFP, including all Supplemental forms, Attachments, Appendices, Specifications, Drawings and Addenda and the Contract.
- B. Addenda are written or graphic instruments issued prior to the due date of bid proposals which modify or interpret the Bid Documents by additions, deletions, clarifications, or corrections. All Addenda issued to Bidders prior to the due date of bid proposals shall become part of the Bid Documents and all bid proposals are to include the Project/Work therein described. Each Bid Proposal submitted shall list all Addenda that have been received prior to the due date of bid proposals.
- C. As used in these Instructions to Bidders, the term "Bid Proposal" means a bid proposal prepared and submitted in response to this RFP.
- D. As used in these Instructions to Bidders, the term "PSC" refers to the Professional Service Contractor and means Convergent Technology Partners and its assigned representatives.
- E. Throughout this RFP and Contract, the "Owner" or "North Branch Area Schools" will be used to refer to North Branch Area Schools and bidders submitting bid proposals will be referred to as "Bidders" or "Vendors" and a successful Bidder or Vendor will be referred to as a "Contractor" or "Integrator".

1.17 BIDDER'S REPRESENTATION

- A. Each Bidder, by submitting a Bid Proposal, represents that the Bidder has read and understands the Bid Documents and is familiar with the local conditions under which the project is to be performed. Bidders will be held to have physically reviewed and compared the Sites with Bid Documents and have satisfied themselves to all conditions affecting the execution of the Work/Project.

1.18 EXAMINATION OF BID DOCUMENTS

- A. A **Mandatory** pre-bid walk through will be held per the Schedule of Events for the purpose of answering any questions from the Vendors and visiting the Site. The location of the Bidder's conference is:

North Branch High School
6598 Brush Street
North Branch, MI 48461

- B. Before submitting a Bid Proposal, each Bidder shall examine the RFP documents carefully and shall read the Specifications and the Bid Documents. Each Bidder shall gather complete information prior to bidding as to existing conditions and limitations under which the Work/Project is to be performed and shall include in its Bid Proposal a sum to cover the cost of items necessary to perform the Work/Project as set forth in the Bid Documents.
- C. No allowance or additional fees will be made to a Bidder because of lack of such examination or knowledge. The submission of a Bid Proposal will be considered as conclusive evidence that the Bidder has made such examination. An on-site-inspection of the Sites during the Bidder's Conference will be for all Bidders.

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- D. Bidders may make written request to the PSC for interpretation or correction of any ambiguity, inconsistency or error in the Bid Documents that are discovered. These questions shall be submitted to the PSC per the Schedule of Events. Only a written interpretation or correction by Addendum shall be binding on Bidders. No explanations or interpretations requested or made orally will be considered binding. All questions will be responded to in writing and all addenda will be posted to the State of Michigan's web site at www.Michigan.gov/VSSlogin and on the **Owner's website** at <https://www.nbbrncos.net/board-of-education/request-for-bids>.

1.19 SUBSTITUTIONS

- A. Each Bid Proposal shall be based upon the materials and equipment described in the Bid Documents. Please note material that are indicated no substitutions allowed.
- B. Voluntary alternates as substitutions for materials and equipment will be considered and evaluated if the Base Bid includes specified materials and equipment. In addition to the Base Bid, the submission of voluntary alternates is acceptable. If a voluntary alternate is submitted for consideration, it shall be expressed on the Bid Form as an "add" or "deduct" amount from the Base Bid. If a voluntary alternate is submitted, the Bidder shall also submit sufficient information in the form of drawings, specifications, and a complete description of the proposed substitute, the cost savings, or advantages. Additionally, provide the name of the material or equipment for which it is substituted, drawings, cuts, performance and test data and any other data or information necessary for a complete evaluation, sufficient for analysis of the alternate. The Owner reserves the right to unilaterally accept or reject, in whole or in part, any voluntary alternates.

1.20 BIDDING PROCEDURES

- A. All Bids Proposal must be submitted on the Bid Proposal Forms provided as part of the Bid Documents and in accordance with the Advertisement to Bid and Instructions to Bidders. Bidders must provide a complete list of proposed subcontractors (one per discipline) as indicated on the Bid Forms. Listing two or more subcontractors per discipline will be grounds for disqualification.
- B. All Bidders must provide a proposal for the Base Bid that meets or exceeds the specifications set forth in this RFP. However, all Bidders may suggest voluntary alternates if it is felt that the alternate proposal better suits the intent of this RFP. Any alternate must be listed as such with separate pricing sheets. Any variance of the feature/functionality of the Base Bid must be identified in any alternates proposed.
- C. Prior to the due date for bid proposals, any Addenda will be available for inspection wherever the Bid Documents are kept available for that purpose. No Addendum will be issued later than three (3) days prior to the due date for bid proposals. It is each Bidders responsibility to ascertain prior to submitting a Bid Proposal that he/she has received all Addenda issued and shall acknowledge their receipt in their Bid Proposal Form.
- D. All Bids must be signed as follows:
1. Corporations: Signature of an officer of the firm who is authorized to bind the corporation.
 2. Partnerships: Signature of one partner who is authorized to bind the firm and all its Partners.

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3. Bids submitted by Joint Ventures shall be signed by one of the Joint Ventures and shall be accompanied by a certified copy of the Power of Attorney authorizing the individual signing to bind all the Joint Ventures. If a certified copy of the Joint Venture's certificate submitted with the Bid Proposal indicates that all Joint Ventures have signed, no authorization is required.
 4. Individuals signing on own behalf: No authorization is required.
 5. Individual signing on behalf of another: Power of Attorney or comparable evidence of authority shall accompany Bid.
- E. Bid proposals shall be prepared on unaltered Bid Forms, which are a part of this RFP. Bidders shall make no additional stipulations on the Bid Form nor qualify the Bid Proposal in any other manner. Unauthorized conditions, limitations, or provisions attached to the Bid Proposal will be cause for rejection of the Bid Proposal. If alterations by erasure or interlineations are made for any reason, explain over such erasure or interlineations with a signed statement from the Bidder. No additional charges, other than those listed on the Bid Proposal Form and Bid Supplemental Forms, shall be made. Prices quoted will include verification/coordination of order, all costs for shipping, delivery to all Sites, insurance, payment and performance bonds, unpacking, setup, installation, operation, testing, cleanup, training, and all other requirements contained in the bid documents.
- F. Bids shall be submitted in a sealed envelope. Identified on the face of the envelope:
1. Project name
 2. Name and address of Bidder
 3. Notation **“CRITICAL COMMUNICATIONS SYSTEM SEALED BID”**
- G. No responsibility shall attach to the PSC, the Owner, or the authorized representatives of either one, for the premature opening of any Bid Proposal which is not properly addressed, delivered and/or identified. In such event, that Bid Proposal will not be considered, and the Bidder will be automatically disqualified from consideration.
- H. Negligence in preparation, improper preparation, errors in and/or omissions in the Bid Proposal shall not relieve the Bidder from fulfillment of all applicable obligations and requirements of contained in the Bid Documents.
- I. The Owner or PSC in making copies available of the Bid Documents to Bidders do so only for the purpose of obtaining bid proposals on the project and do not confer a license or grant of use to a Bidder for any other purpose.
- J. All Bidders must complete, sign, and return the attached “FAMILIAL DISCLOSURE” and “IRAN ECONOMIC SANCTIONS AFFIDAVITS” with their Bid Proposal.
- K. **Bidders must include a Bill of Material (BOM) per building, along with installed line-item pricing for all components proposed**, including, but not limited to, maintenance and support with the total listed where indicated in the Bid Proposal Forms. **Failure to provide the complete BOM with line-item pricing will result in disqualification of the Bid proposal.** This does not preclude filling out the Unit Pricing Form Attachment B.

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- L. The Owner considers this RFP legally binding and will require that this Request for Proposal and the Bid Proposal be incorporated by reference into any subsequent Contract between the Contractor and the Owner. It should be understood by the Bidder that this means that the Owner expects the Bidder to satisfy all requirements and specifications contained in the RFP. Any exceptions to the RFP must be explicitly noted in the Bid Proposal and accepted by the Owner. Lack of listing all exceptions will be considered acceptance of all specifications as presented in this RFP

1.21 CONSIDERATION OF BIDS

- A. The Bidder acknowledges the right of the Owner to accept or reject any or all Bid proposals, in whole or in part, with or without cause, to waive any irregularities or informalities in this RFP process or any Bid Proposal, and to award the contract to other than the low bidder. In addition, the Bidder recognizes the right of the Owner to reject a Bid Proposal:
 - 1. If the Bidder fails to furnish any required Bid Security, or to submit the data and forms required by the Bid Documents; or
 - 2. If the Bid Proposal is in any way incomplete or irregular; or
 - 3. If the Bidder's performance was unsatisfactory under a prior contract for the construction, repair, modification, or demolition of a facility with the Owner, or a contractor in privacy of contract with the Owner, which was funded, directly or indirectly, by the Owner.
- B. The Owner shall have the right to accept alternates in any order or combination and to determine the lowest qualified Bidder based on the sum of the base bid, revisions due to missing material and the alternates accepted.
- C. Once the contract is awarded to the Contractor, the contract is contingent upon North Branch Area Schools' Board of Education approval and the Contractor providing the Owner with all documents required by the RFP prior to commencement of the Work/Project (i.e. Insurance Certificates, Labor and Material Payment Bond and Performance Bond, etc.). Further, the Owner reserves the unrestricted right to reduce the contract amount by reducing the scope of Work/project and/or components. Any such action will be taken before specific work on a building or on a project component has commenced. Contract amount shall be reduced or increased based on the unit pricing values.
- D. Bidders to whom an award of a contract is under consideration shall submit to the Owner upon his/her request a properly executed Contractor's Qualification Statement, AIA Document A305 or other information format specified by the Owner.

1.22 BID SECURITY

- A. The Bid Proposal shall be accompanied by a Bid Security of a certified check or cashier's check payable to the Owner or by a satisfactory Bid Bond Entity naming the Owner as the obligee and executed by the Bidder and a surety company authorized to do business in the State of Michigan, in an amount identified in the Instructions to Bidders. The check or amount of Bid Bond shall be forfeited to the Owner upon failure of the Contractor to enter into the Contract. The Contractor's Bid security will be retained until the Contractor has signed the contract and has furnished the required Certificates of Insurance and other required Bonds and documents

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required by the RFP. Bonds signed by an Attorney-In-Fact must be accompanied by a certified and effectively dated copy of their Power of Attorney.

- B. The Owner reserves the right to retain the Bid security of all Bidders until the Contractor enters into the contract or until ninety (90) days after bid opening, whichever is later. If the Contractor refuses to enter into the Contract, the Owner may retain their Bid Security as liquidated damages but not as a penalty.

1.23 PERFORMANCE, LABOR, AND MATERIAL PAYMENT BONDS

- A. At or prior to delivery of the signed Contract, the Owner will require the Contractor to secure and post a Labor and Material Payment Bond and a Performance Bond including bonding for all subcontractors, each in the amount of 100% of the Contract Sum including bonding for all subcontractors. Surety shall be a company incorporated in the United States and must appear on the U.S. Treasury Departments approved surety list and be adaptable to the Owner. The Contractor shall obtain such bonds in a manner consistent with Michigan law.

1.24 TAXES

- A. Installation services for the tangible personal property purchased by the Owner is not subject to sales taxation. Moreover, the Owner is exempt from taxation on all tangible personal property purchased by the Owner for its use and consumption; however, this exemption would not apply to any materials required under the Bid Documents that are deemed to be a component of a construction/improvement project to the Owner's Sites/Facilities. All prices submitted on the Bid Proposal Form shall be inclusive of all applicable taxes.

1.25 PERMITS AND FEES

- A. All prices submitted on the Bid Proposal Form shall be inclusive of all applicable/required permits and fees.

1.26 MICHIGAN RIGHT-TO-KNOW LAW

- A. All Contractors must conform to the provisions of the Michigan Right-To-Know Law, 1986 PA 80, which requires employers to:
 - 1. Develop a communication program designed to safeguard the handling of hazardous chemicals through labeling of chemical containers, and development and availability of Material Safety Data Sheets.
 - 2. Provide training for employees who work with these chemicals; and
 - 3. Develop a written hazard communications program.
- B. The law also provides for specific employee rights. These include:
 - 1. The right to be notified (by employer or Contractor posting) of the location of Safety Data Sheet (SDS)
 - 2. The right to be notified (by employer or Contractor posting) of new or revised SDS no later than five working days after receipt
 - 3. The right to request copies of SDS from their employers or Contractors.
- C. Provisions of Michigan's Right-to-Know Law may be found in those sections of the Michigan Occupational Safety and Health Act (MIOSHA), which contain Right-to-Know provisions, and

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the Federal Hazard Community Standard, which is part of the MIOSHA Right-to-Know Law through adoption.

1.27 WITHDRAWAL OF BIDS

- A. A Bidder may withdraw its Bid Proposal by written request from an authorized Bidder representative, at any time prior to the due date of bid proposals.
- B. No Bidder may withdraw a Bid Proposal for a period of ninety (90) calendar days, following the due date for receipt of bid proposals, and all bid proposals shall be subject to acceptance by the Owner during this ninety (90) day period.

1.28 EXECUTION OF CONTRACT

- A. The Contractor to whom the contract is awarded shall, within ten (10) calendar days after Notice of Award and receipt of the contract from the Owner, execute and deliver required copies to the Owner.
- B. At or prior to delivery of the executed Contract, the Contractor to whom the contract is awarded shall deliver to the Owner those Certificates of Insurance required by the Bid Documents and such Labor and Materials Payment Bonds and Performance Bond as are required by Owner and any other documents required by this RFP.
- C. The Owner shall approve the provided Bonds and Certificates of Insurance before the Contractor may proceed with the Work/Project. Failure or refusal to provide Bonds, Certificates of Insurance or any other documents required by this RFP in a form(s) satisfactory to the Owner shall subject the Contractor to loss of time from the allowable construction period equal to the time of delay in furnishing the required material.

1.29 POST BID INFORMATION

- A. All additional information required for the proper evaluation of the bidder's proposal shall be promptly provided upon request by the PSC or Owner.
 - 1. This is not to be construed as additional time to provide documentation or information that is required to be included to be in the bid proposal.

1.30 TIME OF COMPLETION

- A. The Bidder agrees to complete the Work within the timeframes listed in the Schedule of Events or as mutually agreed during the project kick-off meeting.

1.31 EQUAL OPPORTUNITY

- A. The Contractor and all its subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin.

PART 2 - EXECUTION

2.1 SITE REQUIREMENTS

- A. The Owner Site is an instructional and administrative facility that provides up to year-round services to their students, staff, and the community. As such, activities in all buildings are critical to the provisioning of services to the students, staff and the community and shall not be interrupted by the Contractor's Work activities.

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- B. The computer and telephone systems associated with this Work will not be taken off-line or removed from service during normal working hours without coordination of the Owner's IT department and the staff of affected buildings. Arrangements must be made by the Contractor to coordinate any such activities.
- C. The Contractor will be required to work around all the conditions listed above, as well as working with the Owner's staff to minimize disruptions to normal Owner activities.
- D. Installation Guidelines
 - 1. All Work performed on this Project will be installed in accordance with the current edition of the Michigan Electrical Code, the current edition of the BICSI Telecommunications Distribution Methods Manual, the current edition of the BICSI Cabling Installation Manual, the latest issue of the TIA Standards as published by Global Engineering Documents as TIA Commercial Building Telecommunications Standard, and all local codes and ordinances.

2.2 QUALITY ASSURANCE

- A. Project Manager
 - 1. The Contractor will provide a full-time Project Manager who will act as a single point of contact for all activities regarding this Project. The Project Manager must be a management employee and will not be involved in personally performing craft installation work
 - 2. The Project Manager is required to attend necessary technology and construction meetings for coordination before Work is started and construction meetings once Work is in progress.
 - 3. The Project Manager will be required to make on-site decisions regarding the scope of the Work and any changes required by the Work.
 - 4. The Project Manager will be totally responsible for all aspects of the Work and shall have the authority to make immediate decisions regarding implementation or Owner approved changes to the Work.
- B. Compliance with Laws and Regulations
 - 1. The Contractor performance of the Work shall comply with all applicable federal, state, and local laws, rules, and regulations and Owner policies, procedure, rules and regulations. The Contractor shall give required notices, shall procure necessary governmental licenses and inspections, and shall pay without burden to the Owner, all fees and charges in connection therewith unless specifically provided otherwise. In the event of violation, the Contractor shall pay all fines and penalties; including attorney's fees and other defense costs and expenses in connection therewith.
- C. Federal Communications Commission
 - 1. Equipment requiring FCC registration or approval shall have received such approval and shall be appropriately identified.
- D. Codes, Standards, and Ordinances

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1. All Work shall conform to the latest edition of the Michigan Electrical Code, the Building Code, and all local codes and ordinances, as applicable. Current versions of TIA-568 and TIA-569 shall be adhered to during all installation activities. Methodologies outlined in the latest edition of the BICSI Telecommunications Distribution Methods Manual shall also be used during all installation activities. Should conflicts exist with the foregoing, the authority having jurisdiction for enforcement will have responsibility for making interpretation. The Contractor is wholly responsible to meet or exceed all codes, standards, regulation, manufacturer installation standards and industry best practices.

2.3 SAFETY

- A. The Contractor shall take the necessary precautions and bear the sole responsibility for the safety of the methods employed in performing the Work. The Contractor shall at all times comply with the regulations set forth by federal, state, and local laws, rules, and regulations concerning "OSHA" and all applicable state labor laws, regulations, and standards. The Contractor shall indemnify and hold harmless the Owner from and against all liabilities, suits, damages, costs, and expenses (including attorney's fees and court costs) that may be imposed on the Owner because of the Contractor, or its subcontractor, or supplier's failure to comply with the regulations stated herein.

2.4 INSPECTION, ACCEPTANCE, AND TITLE

- A. Inspection and Acceptance will be upon successful installation unless otherwise provided. Title to/or risk of loss or damage to all items shall be the responsibility of the Contractor until acceptance by the Owner unless loss or damage results from negligence by the Owner. If the materials or services supplied to the Owner are found to be defective or do not conform to the specifications, the Owner reserves the right to cancel the Contract upon written notice to and return products at the Contractor's expense, based upon the terms of the Contract.
 1. When the Owner is referred to in this section of the RFP relative to inspections, the Owner has designated the PSC as the party to perform such inspections on behalf of the Owner. Notwithstanding the above, the Owner may also perform such inspections along with the PSC.
- B. The Owner shall at all times have access to the Work wherever it is in preparation or progress and shall provide proper facilities for such access and for inspection.
- C. The Contractor shall not close-up any Work until the Owner or applicable AHJ has inspected the Work. Should the Contractor close-up the work prior to inspection, the Contractor shall uncover the Work for inspection at no cost to the Owner, and then recover the Work according to the specifications contained herein. The Contractor shall notify the Owner and applicable AHJ in writing when the Work is ready for inspection. The Owner and AHJ will inspect the Work as expeditiously as possible after receipt of notification from the Contractor.

2.5 STATUS REPORTS, MEETINGS AND CONSTRUCTION COORDINATION

- A. It shall be the Contractor's responsibility to provide the Owner / PSC with written weekly project status reports while actively engaged in craft work and a summary report at the beginning of periods of inactivity between phases or construction delays noting status at that time and expected date of return to work in addition to the requirements listed below. These reports are required and shall include, but not be limited to:

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- B. Project completion percentage.
- C. All problems that were encountered.
- D. Any foreseeable problems that may arise.
- E. General status of the project
- F. The Owner / PSC reserves the right to hold additional status meetings on a regular basis with the Contractor's Project Manager.

END OF SECTION

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SECTION 00 30 10 - SCHEDULE OF EVENTS

The following is a projected schedule of events for this project. The schedule may change depending upon the results of the responses and a final schedule will be established prior to contracting with the Contractor.

EVENT	DATE
Bid Release	July 8 th , 2024
Bidder's Conference Date and time	10:00 A.M. July 16 th , 2024
Final Date and time for Questions	12:00 P.M. July 23 rd , 2024
Bid Due Date/time and Public Opening	2:00 P.M. July 30 th , 2024
Contract Award	Aug 22 nd , 2024
Project Start Date	June 2025
Project Completion	Aug 15 th , 2025

End of Section

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SUPPLEMENTAL A - COST ANALYSIS WORKSHEET

OWNER: Mark Brown, IT Director
6655 Jefferson Road
North Branch, MI 48461

BIDDER: _____

ADDRESS: _____

BID BREAKDOWN

HIGH SCHOOL	COMPONENT	Pricing
System Headend Equipment	Material	
	Labor	
	Sub Total	
Wiring	Material	
	Labor	
	Sub Total	
Speakers/Clocks/Strobes/Displays	Material	
	Labor	
	Sub Total	
Demo of Existing	Labor	
Programming	Labor	
Training	Labor	
	Sub Total	
Performance and Materials Bond		
HIGH SCHOOL PRICING		

RUTH FOX MIDDLE SCHOOL	COMPONENT	Pricing
System Headend Equipment	Material	
	Labor	
	Sub Total	
Wiring	Material	
	Labor	
	Sub Total	
Speakers/Clocks/Strobes/Displays	Material	
	Labor	
	Sub Total	
Demo of Existing	Labor	
Programming	Labor	

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Training	Labor	
	Sub Total	
Performance and Materials Bond		
RUTH FOX MIDDLE SCHOOL PRICING		

ELEMENTARY SCHOOL	COMPONENT	Pricing
System Headend Equipment	Material	
	Labor	
	Sub Total	
Wiring	Material	
	Labor	
	Sub Total	
Speakers/Clocks/Strobes/Displays	Material	
	Labor	
	Sub Total	
Demo of Existing	Labor	
	Programming	
	Training	
	Sub Total	
Performance and Materials Bond		
ELEMENTRY SCHOOL PRICING		

TOTAL PRICE PROPOSAL

HIGH SCHOOL	
RUTH FOX MIDDLE SCHOOL	
ELEMENTRY SCHOOL	
TOTAL (MATCHES BID FORM)	

Alternates – See alternate Supplement for detail	
Alternate 1 Three (3) year extended Warranty	
Alternate 2: Provide LED clocks in lieu of scrolling displays	
Alternate 3: Alternate switch manufacturer	
Alternate 4: Delete strobes on Hallway clocks	
Alternate 5:	
Voluntary Alternate 1:	
Voluntary Alternate 2:	

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SUPPLEMENTAL B - UNIT PRICING

Unit Pricing: In addition to the required Bill of Material (BOM) with installed unit prices, please provide the following specific unit pricing, which shall be considered firm pricing during the contract period and not subject to change.

BOM Unit prices will be used to modify quantities prior to award, the Unit Prices below will be used to determine pricing (Inclusive of licenses, labor and material including connectivity and programming into system) for additions and deletions during the contract period (after award).

	Item	Part Number	Unit Price
UP1	Paging speaker – Ceiling, One-way		
UP2	Paging speaker – Ceiling, Talkback		
UP3	Paging Speaker – Wall, Talkback		
UP4	Paging Speaker – Wall, One-way		
UP5	Paging Horn 7.5W		
UP6	Paging Horn 15W		
UP7	Cat 6 Cable run - complete		
UP8	2 wire Cable run for new analog speaker – < 51'		
UP9	2 wire Cable run for new analog speaker – > 50'		
UP10	IP multicolor LED Strobe		
UP11	Combination Speaker/Display - Wall		
UP12	Combination Speaker/Clock - Wall		
UP13	2-sided Digital Display - Wall		
UP14	2-sided Digital Clock - Wall		
UP15	Combination Speaker/Display with Strobe		
UP16	2-sided Combination Speaker/Clock with strobe		
UP17	2-sided Digital Display - Wall		
UP18	2-sided Digital Clock - Wall		
UP19	Large Digital Signage – Speaker/Clock/Display		

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SUPPLEMENTAL C - MANDATORY ALTERNATES

Alternate 1: Provide price to reduce the manufacturer's warranty to Three (3) years.

Deduct _____ (\$) _____

Alternate 2: Replace wall LCD scrolling message display in each classroom with digital clocks.

Deduct _____ (\$) _____

Alternate 3: Provide alternate LAN switches, equivalent to the preferred Brocade models 7450 & 7150 that are the district standard. Include all connectivity to the district's LAN.

Add/Deduct _____ (\$) _____

Alternate 4: Delete strobes from Hallway combination speaker/clock units.

Delete _____ (\$) _____

Alternate 5:

Add _____ (\$) _____

Alternate 6:

Add _____ (\$) _____

SUPPLEMENTAL D - VOLUNTARY ALTERNATES

VOLUNTARY ALTERNATE 1:

Add/Deduct/No Change

_____ Dollars (\$_____)

VOLUNTARY ALTERNATE 2:

Add/Deduct/No Change

_____ Dollars (\$_____)

VOLUNTARY ALTERNATE 3:

Add/Deduct/No Change

_____ Dollars (\$_____)

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SUPPLEMENTAL E - FAMILIAL DISCLOSURE AFFIDAVIT

The undersigned, the owner or authorized officer of _____ (the "Bidder"), pursuant to the familial disclosure requirement provided in the North Branch Area Schools (the "Owner") Request for Proposal(s), hereby represents and warrants that, except as provided below, no familial relationships exist between the owner or any employee of the Bidder, and any member of the Board of Education of the Owner or the Superintendent of the Owner.

List any Familial Relationships:

BIDDER:

By:

Title:

STATE OF MICHIGAN
COUNTY OF _____

This instrument was acknowledged before me on the ____ day of _____, _____, by

_____.

, Notary Public

_____ County, Michigan

My Commission Expires: _____

Acting in the County of: _____

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SUPPLEMENTAL F - AFFIDAVIT OF COMPLIANCE – IRAN ECONOMIC SANCTIONS ACT

Michigan Public Act No. 517 of 2012

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

The Applicant 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.

APPLICANT:

Name of Applicant _____

By: _____

Title: _____

Date: _____

STATE OF Michigan

COUNTY OF _____)

This instrument was acknowledged before me on the ____ day of _____, _____, by

_____.

_____, Notary Public _____ County, _____

My Commission Expires: _____

Acting in the County of: _____

**NORTH BRANCH AREA SCHOOLS
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A. SECTION 27 05 00 COMMON WORK RESULTS FOR TECHNOLOGY

PART 1 - GENERAL

1.1. SUMMARY

- A. The successful bidder/Integrator (hereafter referred to as the Integrator) shall supply equipment, materials, labor, and services to provide the following systems including, but not limited to:
 - 1. System(s) as indicated in each Section
 - 2. Reuse or new Structured Cabling, Paging/Audio Cabling and system wiring
 - 3. Testing and test documentation as indicated in each Section.
 - 4. Fire stopping.
 - 5. Extended warranty and manufacturer's certification of systems, products, and labor.
- B. Provide all equipment, materials, labor, whether specifically mentioned or not, which are necessary to complete or perfect all parts of the installation. Ensure that they are in compliance with requirements stated or reasonably inferred by the contract documents.

1.2. RELATED SECTIONS

- A. Section 00 00 00
- B. Section 27 10 00 Structured Cabling
- C. Section 27 10 00 Critical Communications System

1.3. RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this section.
- B. Also as indicated in each section.

1.4. REFERENCES

- A. Local Codes and Standards - all applicable
 - 1. Anywhere Standards conflict with electrical or safety Codes, Integrator shall defer to applicable local codes or ordinances, or default to the most stringent requirements listed by either. Knowledge and execution of applicable codes is the sole responsibility of the Integrator. Any code violations committed at the time of installation shall be remedied at the Integrator's expense. Integrator is responsible to bring any perceived conflicts between project documents and referenced Standards or Codes to the attention of the PSC for resolution.
- B. Integrators shall adhere to latest ratified editions of the following; this list is not all inclusive:
 - 1. ADA – Americans with Disabilities Act
 - 2. American Society for Testing and Materials (ASTM)
 - 3. American National Standards Institute (ANSI)
 - 4. Insulated Cables Engineers Association (ICEA)
 - 5. National Electrical Manufacturers Association (NEMA)
 - 6. Institute of Electrical and Electronics Engineers (IEEE)
 - a. National Electric Safety Code (NESC IEEE C2)

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7. American National Standards Institute (ANSI) Telecommunications Industry Association (TIA)
 - a. ANSI/TIA-568- Commercial Building Telecommunications Cabling Standard
 - b. ANSI/TIA-569 - Telecommunications Pathways and Spaces
 - c. ANSI/TIA-606 - Administration Standard for Telecommunications Infrastructure
 - d. ANSI/TIA-607 - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
 8. ISO/IEC
 - a. ISO/IEC 11801– Information Technology – Generic Cabling For Customer Premises
 - b. ISO / IEC 10918 – JPEG
 - c. ISO / IEC 14496 –10, MPEG-4 Part 10 (ITU H.264) EC 60839-11-1:2013 Alarm and electronic security systems
 - d. ISO/IEC 14443-3:2011 – Identification Cards
 9. National Fire Protection Association
 - a. NFPA 70 National Electrical Code (NEC)
 - b. NFPA 101 – Life Safety Code
 - c. NFPA 731 - Standard for the Installation of Electronic Premises Security Systems
 10. Michigan Electrical Code
 11. Restriction of Hazardous Substances Directive 2002/95/EC (RoHS)
 12. Security Industry Association - Open Supervised Device Protocol (OSDP)
 13. Underwriters Laboratories (UL)
 - a. UL 2024A Optical Fiber Cable Routing Assemblies for non-metallic cable pathways
 - b. UL-294 Standard for Safety Access Control System Units
 14. Building Industry Consulting Services International (BICSI)
 - a. Telecommunications Distribution Design Manual (TDMM)
 - b. Information Technology Systems Installations Methods Manual (ITSIMM)
 - c. Outside Plant Design Reference Manual (OSPDRM)
 - C. Federal, state, and local codes, rules, regulations, and ordinances
 1. The Integrator shall perform all work according to Federal, State, and local codes, rules, regulations, and ordinances governing the work. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.
 - D. Others as indicated in each section.
- 1.5. QUALITY ASSURANCE
- A. Electrical Components, Devices, and Accessories: Listed and labeled, meeting the National Electrical code, Michigan Electrical Code and/or National Building Code and tested by a qualified testing agency, and marked for intended location and application
 - B. Telecommunications Pathways and Spaces: Comply with TIA-569, the National Electrical Code and the National Building Code.
 - C. Grounding: Comply with ANSI/TIA-607 and the National Electrical Code.
- 1.6. GENERAL PROJECT CONDITIONS

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- A. Environmental Limitations: Do not deliver or install interior equipment cable until spaces are enclosed and weather-tight, wet work in spaces is complete and dry, and work above ceilings in IT spaces is complete.
- B. This Integrator shall examine the conditions under which the system installation is to be performed and notify the Owner's Representative or Design Professional in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to provide a workmanlike installation.
- C. Review areas of potential interference and resolve conflicts before proceeding with the work. Coordinate ceiling layout and wall layout and other work that penetrates or is supported throughout the space of the building. All work shall be flush and workmanlike in all finished areas.

1.7. COORDINATION

- A. Coordinate layout and installation of communications equipment with Owner's telecommunications and LAN equipment and service suppliers.
- B. Coordinate all work with:
 - 1. Owner for available work hours and site access requirements
 - 2. Owner IT department
 - 3. Others as indicated herein.
 - 4. Centegix representative
- C. Record agreements reached in meetings and distribute them to other participants.
- D. Adjust arrangements and locations of distribution frames, cross -connects, and patch panels in equipment rooms to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment and as required by project documents.
- E. Adjust arrangements and locations of equipment with distribution frames, cross-connects, and patch panels of cabling systems of other communications, electronic safety and security, and related systems that share space in the equipment room.
- F. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

1.8. PERMITS, FEES, and CERTIFICATES OF APPROVAL.

- A. The Integrator will make application and pay for all required permits.
- B. As indicated in each section.

1.9. ABBREVIATIONS AND ACRONYMS

- A. General
 - 1. 8p/8c connector – Commonly referred to as “RJ45”
 - 2. MPTL – Modular Plug Terminated Link, ANSI/TIA test procedures for field installed modular plugs on UTP cable
 - 3. NLT – No Later Than
 - 4. SCS - Structured Cabling System
 - 5. TBD – To be determined
 - 6. PSC – Professional Services Contractor (Convergent Technology Partners)
 - 7. UNO – Unless Notified/Noted Otherwise
 - 8. UTP – Unshielded Twisted Pair

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9. IP: Internet Protocol
 10. LAN: Local Area Network
 11. UPS: Uninterruptible Power Supply
 12. SMS: Security Management System
 13. SAN: Storage Area Network
 14. DAS: Direct Attached Storage
 15. LDAP: Lightweight Directory Access Protocol
 16. NAS: Network Attached Storage
 17. AES: Advanced Encryption Standard.
 18. API: Application Programming Interface.
 19. NVR: Network Video Recorder
- 1.10. SUBMITTALS
- A. General:
 1. As required by individual Sections herein
 - B. Shop Drawings:
 1. Provide cable routing diagrams.
 2. Show patch panel numbering for all patch panels.
 3. Provide a schedule of materials list with quantities and manufactures indicated for all materials installed in the project.
 - C. Product Data:
 1. Provide manufacturer's product data specifications sheets indicating products being submitted and any long lead time items.
 2. Provide submittals for products with long lead times as soon as possible for ordering the materials.
 3. Provide submittals (1) week after receiving notice to proceed and prior to installation of any of the product.
 - D. Schedule
 1. Submit a coordinated schedule no later than (2) weeks after "notice to proceed" to include the following.
 - a. Preconstruction meeting and walkthrough.
 - b. Start and duration of system milestones.
 - c. Punch List.
 - d. Final Punch List.
 - E. Cable Test Results:
 1. Cable Tests
 - a. All UTP shall be tested using the "Permanent Link Method" and MPLT for Modular Terminated Plugs as outlined in the ANSI/TIA 568 Standard.
 - b. All shielded or unshielded audio cable or wire shall be tested for short and open conditions.
 - F. Project Record Drawings
 1. Submit project record documents at Contract Closeout.
 2. The Integrator shall deliver one (1) set of hard-copy and one (1) set of electronics as-built drawings per building to the PSC/owner within two (2) calendar weeks of completion of the project. A set of as-built drawings shall be provided to the

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owner in approved electronic form (i.e., USB) and utilizing software that is acceptable to the owner and PSC. The Integrator shall deliver the digital media to the owner/PSC within two (2) calendar weeks of completion of the project.

a. As-built Drawings must contain.

- 1) Main Cable Routes
- 2) Labeling at end device
- 3) Cable locations by type

G. Submit, within two (2) weeks after notice to proceed, the names and qualifications of those persons who will have management and supervisory positions over the employees on the job site. Submit the name of the supervisory person who will be on the job site daily and have responsibility for day-to-day decisions. Submit the name of the Project Manager who will attend meetings and have authority to make decisions for issues and requirements that arise from such meetings.

H. Upon request by the engineer/designer (PSC), the Owner, and/or the Owner's representative will furnish a list of references with specific information regarding the type of project and involvement in providing other products and/or support equipment used on this project.

I. Where equipment and materials have industry certification, labels, or standards (i.e., NEMA-National Electrical Manufacturer's Assn.), this equipment shall be labeled as certified or complying with the standards.

J. Material and equipment shall be new, and conform to grade, quality, and standards specified. Equipment and materials of the same type shall be a product of the same manufacturer throughout.

1. All hardware proposed must be the current offering of the manufacturer and receive the highest level of standard support offered by the manufacturer.

a. All equipment shall have the latest firmware revisions installed at time of acceptance.

2. Factory refurbished hardware which is in "new condition" as well as used, shopworn, prototype, demonstrator models, etc. are not acceptable.

3. The System must consist of standards-based products or components whose performance, reliability, and maintainability can be demonstrated.

1.11. QUALITY ASSURANCE

A. Submit documentation with the bid listing the names of employees that may be used on this project indicating their experience, level of expertise, and certificates of training.

B. The Integrator's project manager shall make periodic inspections to assure quality, code, standards, and RFP compliance.

C. Comply with directives from the PSC regarding quality, codes, standards, and RFP compliance.

1.12. WARRANTY

A. Submit at project closeout, a signed and registered manufacturer product warranty and applications assurance. See individual (system) Sections for warranty requirements.

- B. All software required to run or view the test data must accompany the application to the manufacturer for the warranty.
 - C. Copies of as-built drawings must be submitted to the manufacturer via electronic or hard copy. (Drawings must be in AutoCAD or Visio)
 - D. Submit a statement, at notice to proceed or contract start, of any Integrator warranties in addition to the manufacturer's stated and supplied warranties. Submit at closeout signed copies of the Integrator provided warranties that are in addition to manufacturer's stated and supplied warranties.
- 1.13. DELIVERY, STORAGE, AND HANDLING
 - A. Protect equipment during transit, storage, and handling to prevent damage, theft, soiling, and misalignment. Coordinate with the owner for potential secure storage of equipment and materials.
 - B. Do not store equipment where conditions fall outside manufacturer's recommendations for environmental conditions.
 - C. Follow manufacturer's recommended procedures for storage of materials & equipment.
 - D. Do not install damaged equipment; remove from site and replace damaged equipment with new equipment.
- 1.14. USE OF THE SITE
 - A. The sites are both educational and administrative in nature. Access to the sites shall be at the owner's direction in matters in which the owner deems it necessary to place restriction.
 - B. Access to building wherein the work is performed shall be as directed by the owner.
 - C. The owner will occupy the premises during the entire period of construction for conducting his or her normal business operations. Cooperate with the owner to minimize conflict and to facilitate the owner's operations.
 - D. Proceed with the work without interfering with ordinary use and operations of the owner.
- 1.15. CONTINUITY OF SERVICES
 - A. Take no action that will interfere with, or interrupt, existing building services, especially security and surveillance, unless previous arrangements have been made with the owner's representative. Arrange the work to minimize shutdown time
 - B. Owner's personnel will perform shutdown of operating systems. The Integrator shall give three (3) days' advance notice for systems shutdown.
 - C. Should services be inadvertently interrupted, immediately furnish labor, including overtime, material, and equipment necessary for prompt restoration of interrupted service.
- PART 2 - PRODUCTS
 - 2.1. MANUFACTURERS
 - A. Provide products as indicated in individual articles.
 - B. Where no manufacturer is specified, provide products of manufacturers in compliance with requirements.

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- C. Provide proof the manufacturer selected has successfully had these same products installed at other facilities and provide references with name, title, address, phone number & e-mail address of each point of contact within each referenced account.
- D. Provide proof the manufacturer is located within the U.S., is incorporated within the U.S. and/or that the major products (system equipment, cable assemblies and termination hardware) are manufactured within the U.S.
- E. Substitutions: Substitution requests will be considered only if submitted to Owner's Representative not less than 7 working days prior to project bid date. Acceptance or rejection of proposed substitution is at Owner's Representatives sole discretion. No exceptions. Requests for substitutions shall be considered not approved unless approval is issued in writing by Owner's Representative.
- F. Rejection: For equipment, cabling, wiring, materials, and all other products indicated or specified as no substitutions or no alternates, Owner does not expect nor desire requests for substitutions and alternate products other than those specified. Owner reserves right for Owner's Representative to reject proposed substitution requests and submissions of alternates without review or justification.

PART 3 - EXECUTION

3.1. PRE-INSTALLATION SITE SURVEY

- A. Prior to the start of systems installation, The Integrator will meet at the project site with the owner's representative and representatives of trades performing related work to coordinate efforts. Review areas of potential interference and resolve conflicts before proceeding with the work. Facilitation with the general contractor (when applicable) shall be necessary to plan the crucial scheduled completions of the equipment rooms and telecommunications rooms.
- B. Examine areas and conditions under which the system is to be installed. Do not proceed with the work until satisfactory conditions have been achieved.
- C. Exact location of cable terminations and field devices shall be field verified with owner at time of installation.

3.2. HANDLING AND PROTECTION OF EQUIPMENT AND MATERIALS

- A. The Integrator shall be responsible for safekeeping their own and subcontractor's property, such as equipment and materials, on the job site. The owner assumes no responsibility for protection of above-named property against fire, theft, and environmental conditions.

3.3. CLEANUP

- A. Touch-up, repair or replace damaged products before substantial completion, unless specified otherwise.
- B. All work materials shall be removed at the end of each workday and the work area left in the same condition as found. Upon completion of the work, the Integrator must remove all tools, equipment and all rubbish and debris from the premises and must leave the premises clean and neat.

3.4. PROTECTION OF OWNER'S FACILITIES

- A. Effectively protect the owner's facilities, equipment, and materials from dust, dirt, and damage during construction.
- B. Protect installed products until completion of project

C. Remove protection at completion of work.

3.5. QUALITY ASSURANCE

A. Should it be found by the engineer that the materials, or any portion thereof, furnished and installed under this contract fail to comply with the specifications and drawings, with respect or regard to the quality, amount of value of materials, appliances, or labor used in the work, it shall be rejected and replaced by the Integrator, and all work distributed by changes necessitated in consequence of said defects or imperfections shall be made good at the Integrator's expense.

3.6. INSTALLATION

- A. Prior to pulling cable through conduit, mandrel the conduits to remove foreign material before pulling commences.
- B. Beginning installation means that the Integrator accepts existing conditions.
- C. Integrator shall furnish all required installation tools to facilitate Cable installation without damage to the cable jacket. Such equipment is to include, but not be limited to, sheaves, winches, cable reels, cable reel jackets, duct entrance funnels, pulling tension gauges, and similar devices. All equipment shall be of substantial construction to allow steady progress once pulling has begun. Makeshift devices that may move or wear in a manner to pose a hazard to the cable or employees shall not be used.
- D. Cable pulling shall be done in accordance with cable manufacturer's recommended procedures and ANSI/IEEE C2 standards. Manufacturer's recommendations shall be a part of the cable submittal. Recommended pulling tensions and minimum bending radii shall not be exceeded. Any cable bent or kinked to a radius less than recommended shall not be installed.
- E. During cable pulling operation, an adequate number of workers shall be present to allow cable observation at all points of duct entry and exit as well as to feed cable and operate pulling machinery.
- F. Pulling lubricant shall be used to ease pulling tensions. Lubricant shall be of a type that is non-injurious to the cable material used. Lubricant shall not harden or become adhesive with age.
- G. Avoid abrasion and other damage to cables during installation.
- H. All exposed cable shall be labeled at 35-foot (maximum) intervals with tags indicating ownership, cable type, and fiber type installed.
- I. All above ceiling equipment, cable or other technology devices shall be permanently affixed to building structure, using independent, dedicated supports.
 - 1. Devices installed in lay in ceiling tile shall be supported by the ceiling grid, not the tile.

3.7. LABELING

- A. All labeling shall be in accordance with ANSI/TIA-606 unless otherwise noted by the owner.
- B. Mark up floor plans showing Cable routes, segments, Cable type, and marking of cables. Turn these drawings over to the owner two (2) weeks prior to move-in to allow the owner's personnel to connect and test owner-provided equipment in a timely fashion.

3.8. TESTING AND ACCEPTANCE

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- A. Test procedures must meet manufacturer's standards and Section 27 10 00.
- B. The Integrator shall correct, in a timely manner, any failure to comply with Contract Documents as reasonably determined by Owner.
- C. If final acceptance is significantly delayed because of defective new equipment or because the installation is not in accordance with the Contract Documents, the Integrator shall pay for all the Owner's and PCS's additional time and expenses resulting from the delay and any extensions of Acceptance Testing at a rate of \$150.00 per hour, deducted from project retainage as a change order.
- D. As additionally indicated in each Section.
 - 1. The Integrator shall provide written reports of all test data in written form to the owner. At such time the Integrator turns over test data to the PSC.
 - 2. In the event that test results are not satisfactory, the Integrator shall make adjustments, replacements, and changes as necessary and shall then repeat the test or tests that disclosed faulty or defective material, equipment, or installation method, and shall perform additional tests as the PSC deems necessary.
 - a. Tests related to connected equipment of others shall only be done with the permission and presence of the Integrator involved.
 - b. One (1) record copy of all test data shall be submitted to the PSC/engineer for approval. The Integrator shall notify the PSC/engineer at least one week in advance of the test date so that the PSC/engineer may be present.

END OF SECTION

SECTION 27 10 00 CABLING SYSTEMS

PART 1 - GENERAL

1.1. SUMMARY

- A. All hardware, enclosures, racks, equipment and other equipment as indicated herein and on project drawings and documents, and as required for a complete installation per industry norms, standards and best practices
- B. Section Includes:
 - 1. Reuse of existing Category 6 UTP cabling
 - a. Termination and testing of existing spare cables as required.
 - 2. New Category 6 UTP cabling, termination and testing as required
 - 3. Other Speaker cabling as required.
 - 4. Racks, cabinets and accessories as indicated
 - 5. Adjustment of existing equipment in existing enclosures for inclusion of new equipment
 - 6. Raceway, J-Hooks and other supports
 - 7. Labeling and documentation

1.2. RELATED SECTIONS:

- 1. Section 27 51 13 Critical Communications Paging System

1.3. RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 0 & 1 Specification Sections, apply to this Section.

1.4. CODES, STANDARDS AND REFERENCES

- A. The Contractor shall adhere to the latest edition of the following codes, standards, and references. Additionally, the Contractor shall adhere to all other codes, regulation and standards not stated here:
 - 1. As listed in Section 27 05 00
 - 2. Manufacturers Recommendations
 - 3. Best Practices and Industry Norms

1.5. SUBMITTALS

- A. Coordinate with Division 0 & 1 and individual Sections herein.
- B. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for equipment racks and cabinets. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
 - 1. Cable - Include the following installation data for each type used:
 - a. Nominal OD.
 - b. Minimum bending radius.
 - c. Maximum pulling tension.
- C. Shop Drawings: For communications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

2. Wiring diagrams to show typical wiring schematics including the following:
 - a. Patch panels.
 - b. Cross-connects and patch cords
 3. Equipment Racks and Cabinets: Include workspace requirements and access for cable connections.
 4. Cross-connects and patch panels: Detail mounting assemblies and show elevations and physical relationship between the installed components.
 - D. Field quality-control reports.
 - E. Maintenance Data: For splices and connectors to include in maintenance manuals.
 - F. Qualification Data: For installer, qualified layout technician, installation supervisor, and field inspector.
- 1.6. QUALITY ASSURANCE
 - A. Bidder qualifications:
 1. Work under this section shall be performed by and the equipment shall be provided by the approved telecommunications contractor and key personnel. Qualifications shall be provided for the telecommunications system contractor, the telecommunications system installer, and the supervisor (if different from the installer). A minimum of 30 days prior to installation, submit documentation of the experience of the telecommunications contractor and of the key personnel.
 2. The telecommunications contractor shall be a firm which is regularly and professionally engaged in the business of the applications, installation, and testing of the specified telecommunications systems and equipment. The telecommunications contractor shall demonstrate experience in providing successful telecommunications systems within the past 3 years of similar scope and size. Submit documentation for a minimum of three and a maximum of five successful telecommunication system installations for the telecommunications contractor.
 3. Minimum Manufacturer Qualifications
 - a. Cabling, equipment and hardware manufacturers shall have a minimum of 3 years' experience in the manufacturing, assembly, and factory testing of components which comply with TIA-568, TIA-569, TIA 606 and TIA-607.
 - B. Installer Qualifications
 1. Installers: Installation personnel shall be certified by the manufacturer for the installed product.
 2. Installation Supervision: Installation shall be under the direct supervision of an RCDD, ITS Technician or ITS 2 Installer or equivalent certification, who shall be present at all times when Work of this Section is performed at Project site.
 3. Cable Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 4. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- C. Telecommunications Pathways and Spaces: Comply with TIA-569
 - D. Bonding and Grounding: Comply with TIA-607
 - E. Test Plan - Provide a complete and detailed test plan for the telecommunications cabling system including a complete list of test equipment for the components and accessories for each cable type specified, 30 days prior to the proposed test date for approval. Include procedures for certification, validation, and testing. Test plan shall include all test requirements detailed herein at a minimum.
 - F. Regulatory Requirements - In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.
 - G. Standard Products - Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship unless specific manufacturer and/or part numbers is included herein. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.
 - H. Material and Equipment Manufacturing Date - Products manufactured more than 1 year prior to date of delivery to site shall not be used, unless specified otherwise.
- 1.7. CABLE DELIVERY, STORAGE, AND HANDLING
- A. Inspect and test cables upon receipt at Project site.
- 1.8. PROJECT CONDITIONS
- A. Environmental Limitations: Do not deliver or install cable, equipment frames and cable trays until spaces are enclosed and weather tight, wet work in spaces is complete and dry.
- 1.9. COORDINATION
- A. Coordinate layout and installation of security equipment with Owner's telecommunications and LAN equipment and service suppliers.
 - B. Meet jointly with telecommunications and LAN equipment suppliers, local exchange carrier representatives, and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
 - 1. Record agreements reached in meetings and distribute them to other participants.
 - 2. Adjust arrangements and locations of distribution frames, cross-connects, and patch panels in equipment rooms to accommodate and optimize arrangement and space requirements of security equipment.
 - 3. Adjust arrangements and locations of equipment with distribution frames, cross-connects, and patch panels of cabling systems of other

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telecommunications, electronic safety and security, and related systems that share space in the equipment room.

4. Coordinate location of power raceways and receptacles with locations of telecommunications equipment requiring electrical power to operate.

1.10. SYSTEM DESCRIPTION

A. GENERAL DESCRIPTION

- B. Category 6 UTP cable, terminations and testing as indicated on drawings and herein.
- C. Two conductor paging cable.

1.11. REUSE OF CABLE

- A. Only Category 6 UTP, as indicated on drawings or o indicated by Owner, may be reused. All other cable needed shall be new with old cable removed end-to-end formt eh building.

1.12. DEFINITIONS AND ABBREVIATIONS

1. Unless otherwise specified or indicated herein, electrical and electronics terms used in this specification shall be as defined in TIA-568, TIA-569, TIA-606 and IEEE 100 and herein.
2. BICSI: Building Industry Consulting Service International.
3. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection. AKA Telecommunications closet or room, (TR or TC), Entrance Facility (EF), Computer Room (CR), IDF or MDF
4. MDF: Main Distribution Frame – The main technology space for a facility
5. IDF: Intermediate Distribution Frame – Secondary technology spaces in a facility
6. EMI: Electromagnetic interference.
7. IDC: Insulation displacement connector.
8. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
9. RCDD: Registered Communications Distribution Designer.
10. TDMM (BICSI): Telecommunications Design Methods Manual
11. UTP: Unshielded twisted pair.
12. LAN: Local area network.
13. PSC – Professional Services Contractor (Convergent Technology Partners)
14. SCS – Structured Cabling System
15. WAO – Work Area Outlet

1.13. SUBMITTALS

- A. Provide Permanent Link” test results for all Category 6 UTP cables.
 1. Summary reports in a bundled .pdf format for each building.
 2. Detailed reports for each cable in a bundled .pdf format, then “zipped” to reduce file size.
- B. Test results for other types of cable as necessary.
- C. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, pathways and cables, termination hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow

convention of TIA-606. Furnish electronic record of all drawings, in software and format selected by Owner.

PART 2 - PRODUCT

- 2.1. Components shall be UL or third party certified. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations, submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Owner. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard. Provide a complete system of telecommunications cabling and pathway components using star topology. Provide support structures and pathways, complete with outlets, cables, connecting hardware and telecommunications cabinets/racks. Cabling and interconnecting hardware and components for telecommunications systems shall be UL listed or third-party independent testing laboratory certified and shall comply with NFPA 70 and conform to the requirements specified herein.

A. Category 6 Plenum Rated UTP Cable

1. Approved manufacturers
 - a. CommScope
 - b. Belden
 - c. Vertical Cable
 - d. Superior Essex
 - e. Purenet
 - f. Leviton
 - g. Siemon
 - h. General Cable
2. Category 6 Connectivity Approved Manufacturers
 - a. Belden IBDN
 - b. Dynacom
 - c. Hubbell
 - d. ICC
 - e. Legrand/Ortronics
 - f. Leviton
 - g. Signamax
 - h. Siemon
 - i. Superior Modular (OCC)
 - j. Systimax/CommScope & Uniprise/CommScope

B. Audio Cable

1. Two-conductor shielded or unshielded, 18AWG, CMP rated.

2.2. Pathways

- A. General Requirements:** Provide telecommunications pathways in accordance with TIA-569 and as specified herein and on project drawings and associated documents. Provide system furniture pathways in accordance with UL 1286.

- B. Cable Support: NRTL labeled. Cable support brackets shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.
- C. Cable Guides and Fasteners
 - 1. Provide cable guides specifically manufactured for the purpose of routing cables, wires and patch cords horizontally and vertically on equipment racks and telecommunications backboards (to accommodate cross-connect wiring, etc.).
 - 2. Cable guides of ring or bracket type devices mounted on rack and backboard for horizontal cable management and individually mounted for vertical cable management. Mount cable guides with screws, nuts and lock washers.
 - 3. Hook and Loop (I.e. Velcro®) shall be used to fasten cables. Tie-wraps or similar type fasteners shall not be used.
- D. Category 6 Cable Connectivity
 - 1. Category 6 UTP Jacks ("8p/8c" or "RJ45") or field terminated plugs.
 - 2. Patch Panels
 - 3. Surface Mounted Jack Housings
- E. Patch and Line Cords
 - 1. Category 6 UTP – factory assembled with strain relief boots
 - a. Patch cords (between patch panel and equipment) shall be shall nominally be 1M in length, and
 - 1) Coordinate final lengths with Owner/PSC
 - b. Line cords (Between Jack housing and end device) shall be 2M in length
- F. Fire Stopping / Smoke Seal
 - 1. Intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cable trays, conduits, and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.
 - 2. Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of UL/C, Interlink listed and FM approved, and not exceeding opening sizes for which they are intended.
 - a. Intumescent Putties
 - b. Caulks and sealants
 - c. Collars, sheets, blankets, pillows and bricks

PART 3 - EXECUTION

3.1. WIRING METHODS

- A. Wiring Method: Install cables in raceways and cable trays (if specified) except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces, in attics, and in gypsum board partitions where unenclosed wiring method may be used. Conceal raceway and cables except in unfinished spaces.
- B. Install plenum cable in environmental air spaces, including plenum ceilings.
- C. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.2. INSTALLATION OF PATHWAYS

- A. Comply with requirements for demarcation point, pathways, cabinets, and racks.
Drawings indicate general arrangement of pathways and fittings.

3.3. INSTALLATION OF CABLES

A. Summary

1. UTP cable shall be home run from the device outlet to each building's Telecommunications room, IDF or MDF as indicated and terminated on new patch panels.
 - a. A minimum 1-foot service loop shall be neatly coiled and secured at the end device and be fastened to the building's structure.
 - b. Surface mounted jack enclosures shall house the termination at the device for UTP cabling, with the line cord running from the jack to the end device.
 - 1) Neatly coil and secure excess length on the line cord and fasten to building structure.
 - 2) Fasten the jack enclosure to building structure. Label, in the largest font possible, the jack enclosure.
 - a) Double-sided tape is not acceptable.

- B. Paging/audio wire and cable shall be directly connected to speakers or to speaker wire leads using wire nuts of appropriate size or crimp on butt-splices and connectors.

C. Comply with NECA 1.

D. General Requirements for Cabling:

1. Comply with TIA-568.
2. Comply with BICSI TDMM, "Cable Termination Practices."
3. Install 110-style IDC termination hardware unless otherwise indicated.
4. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
5. UTP Cables shall not be spliced.
6. Secure and support all cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 - a. Cables shall be independently supported from building structure. Attaching to ceiling tile or other system support wires, rods, J-hooks, bridles rings, etc. shall not be permitted unless indicated otherwise.
7. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
8. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI TDMM, "Cabling Termination Practices". Install lacing bars and distribution spools.
9. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.

10. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
11. In the telecommunications equipment room, provide a 5-foot-long service loop on the end of each cable.
- E. Pulling Cable: Comply with BICSI TDMM, "Pulling Cable." Monitor cable pull tensions.
 1. UTP Cable Installation:
 - a. Comply with TIA-568 and manufacturer's instructions.
 - b. Do not remove more than the minimum cable jacket required for termination. To maintain cable geometry do not untwist UTP cables more than 1/2 inch from the point of termination.
 2. Open-Cable Installation:
 - a. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
 - b. Suspend UTP cable not in a wire way or pathway a minimum of 8 inches above ceilings by approved cable supports not more than 60 inches apart.
 - c. Approved support includes Category 6 rated J – hooks, saddles etc.
 - d. All cable shall be independently suspended from building structure using rated support components. **The use of tie wraps and bridle rings without Cat6 UTP saddles is prohibited.**
 - e. Cable shall not be supported directly by structural members or in contact with pipes, ducts, or other potentially damaging items.
 - f. Group connecting hardware for cables into separate logical fields.
- F. **Cable Fasteners shall be loop and hook (i.e. Velcro™) only. The use of nylon cable ties, tie-wraps, tape or any other means of securing cable together or to supports or structures is prohibited.**
- G. Separation from EMI Sources (Copper UTP and SDI Cabling):
 1. Comply with BICSI TDMM and TIA-569 for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
 2. Separation between open telecommunications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.
 - d. Separation between telecommunications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
 - e. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
 - f. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
 - g. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.

- h. Separation between telecommunications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
 - i. Electrical Equipment Rating Less Than 2 kVA: No requirement.
 - j. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
 - k. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.
 - l. Separation between Telecommunications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
 - m. Separation between Telecommunications Cables and Fluorescent Fixtures: A minimum of 5 inches.
- 3.4. FIRESTOPPING
 - A. Comply with TIA-569, "Firestopping."
 - B. Comply with BICSI TDMM, "Firestopping Systems" Article.
 - C. Firestop all new and reused or abandoned existing fire partition penetrations to meet or exceed the partitions fire rating.
- 3.5. GROUNDING
 - A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
 - B. Comply with TIA-607-A.
 - C. Bond metallic equipment and cable shield to the grounding bus bar, using not smaller than No. 6 AWG stranded copper equipment grounding conductor.
 - D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG stranded copper equipment grounding conductor.
 - E. Bond the shield of shielded cable to the grounding bus bar in telecommunications rooms and spaces.
- 3.6. IDENTIFICATION
 - A. Identify system components, wiring, and cabling complying with TIA-606.
 - B. Label each cable within 4 inches (100 mm) of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
 - C. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
 - D. Individually number wiring conductors connected to terminal strips and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
 - E. Label each unit and field within distribution racks and frames.
 - F. Label all components of the grounding system per TIA – 606 and TIA-607.
 - G. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors.
 - H. Cable and Wire Identification:
 - 1. Label each cable within 4 inches (100 mm) of each termination, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
 - 2. Label each connector and connecting hardware. (Jack and jack patch panel)

- a. Manufacturer's preprinted labels for each jack is acceptable.
 - 3. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA-606.
 - 4. Cables use flexible vinyl or polyester that flex as cables are bent.
 - 5. Cable system label method:
 - a. Category 6 UTP Cables shall be labeled "Termination Location" (MDF, IDF, etc.) – "Cabinet #" – "Patch Panel #" – "Jack #". For example: "MDF-1-1-38" which denoted terminated in the MDF in the first cabinet on the first patch panel on the 38th port.
 - b. All other security cables shall be labeled per individual sections.
- 3.7. FIELD QUALITY CONTROL
- A. Perform tests and inspections.
- 1. Visually inspect UTP jacket materials for NRTL certification markings. Inspect cabling terminations in telecommunications equipment rooms for compliance with color-coding for pin assignments and inspect cabling connections for compliance with TIA-568.
 - 2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
 - 3. Horizontal UTP for data shall be tested using the Permanent Link Method. UTP Test instruments shall meet or exceed applicable requirements in TIA-568 for Category 6 Permanent Link. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for permanent link test configuration.
 - a. All Category 6 cable shall be tested using the Permanent Link method.

END OF SECTION

SECTION 27 51 13 – CRITICAL COMMUNICAITONS SYSTEMS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS AND SCOPE

- A. The Owner is seeking proposals for a stand-alone 100% turnkey Critical Communications System. The successful bidder shall be required to design, furnish and install all equipment, accessories, and materials in accordance with these performance specifications and drawings to provide a complete, fully functional, and operating Critical Communications System.
 - 1. The system shall consist of normal and emergency Critical Communications, digital clocks, scrolling message displays, strobes and interactive software including mapping function.
- B. The Critical Communications System shall be new, of modern design, and current standard production of the manufacturer.
- C. The existing paging and clock system and all devices shall be completely demolished in its entirety (Including all cable and wiring) and removed from site.
- D. The new Critical Communications systems must work with the district's existing Local Area Network, Wide Area Network (OSP SM Fiber) and Mitel 3300 VoIP telephone system.
 - 1. The Mitel system is hosted locally on Owner servers.
- E. **The proposed manufacturer shall not have a geographical or vendor limitation (integrator territories) prohibiting the ability for multiple integrators of a specific manufacturer to bid and service the system.**
- F. The Integrator is responsible for:
 - 1. Final system design
 - 2. Pre-installation resting and documentation.
 - 3. Any additional required data gathering such as building schedules.
 - 4. Complete system installation including new wiring and speakers.
 - 5. Coordination with service providers or telephone integrator as required.
 - 6. Configuration and programming
 - 7. Integration with other systems
 - 8. Training
 - 9. Post installation testing, documentation, and closeout.
 - 10. All other system recommendations to meet the Owner's requirements, as outlined in this document.
- G. Provide a narrative summary of the proposed solution, including diagrams or illustrations as necessary for ease of understanding your proposal.

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- H. The Bidder's proposal must also state in detail the extent to which the quoted system meets, exceeds, or fails to meet the following requirements. Provide as part of the bid proposal, a complete bill of materials, including catalog cuts and equipment configurations.
- I. The Integrator shall provide the services necessary to furnish, install, train, and to provide maintenance to support the Critical Communications system conforming to acceptable industry standards. All work shall be in accordance with the true intent of the specifications, and as required herein, to leave the Critical Communications system complete and in satisfactory operating condition, excluding those items listed under "Work by Others."

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract apply to this Section.

1.3 APPLICABLE CODES AND STANDARDS

- A. All devices of the system shall be listed by UL (Underwriters Laboratory). All components of the system shall bear the UL label.
- B. ANSI/NEMA SB 40-2015 Communication Systems for Life Safety in Schools
- C. The system shall be installed in strict accordance with all the requirements of NFPA 70 and the Michigan Electrical Code.
- D. The system shall be installed in strict accordance with the requirements of the Americans with Disabilities Act (ADA).
- E. The system shall be installed in strict accordance with the requirements of all other Federal, State, and local applicable codes.

1.4 SUMMARY

- A. North Branch Area Schools desires to replace existing Critical Communications Systems in the High School, Ruth Fox Middle School and the Elementary School with a new Critical Communications system. The final solution must allow associated building systems to communicate using IP protocol within each building and between buildings via the school's optical fiber WAN.
 - 1. An administrative telephone and software or access to the system GUI shall be provided to an additional location at the Superintendent's office in the alternative education building.
- B. Operation within the building will be full IP (preferred) or analog from IP gateways to end points, (Hallway Speakers, etc.).
 - 1. The Bidder must include all additional anticipated Category 6 UTP cabling to support the solution.
 - 2. The Bidder must provide the quantity of required POE switches and POE type (Switch ports per closet and the amount of POE required per port (15W/30W/60W, etc.).
 - a. The district's standard is Brocade 7450 and 7150 models. However, reference the mandatory alternates supplemental to provide other manufacturer's switches in lieu of Brocade.

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- C. All material and/or equipment necessary for the proper operation of the system, even if not specifically identified in the contract documents, shall be deemed part of this contract.

1.5 WORK INCLUDED

- A. Critical Communications System Headend
- B. Speakers, Horns, Strobes, Scrolling displays.
- C. Large space displays as indicated on drawings.
- D. Wiring and cabling
 - 1. Existing unused Category 6 UTP provided at wireless access points in each classroom may be reused for the Critical Communications System.
- E. Existing Critical Communications system demolition
 - 1. All existing speakers, wiring, equipment, call buttons, etc. are to be demolished and removed from site.
- F. Cable/wire Pathway (conduit) as required or indicated on project drawings.
- G. Three color (Minimum) IP strobe lights.
- H. Lockdown buttons.
- I. Protective cages on devices specified on project drawings and devices in gymnasiums or other areas prone to damage.
- J. Protective screens (I.e. Gorilla Glass™) on all medium and large displays.
- K. Centegix Alert System
- L. VOIP telephone system integration.
- M. Other system integration as noted herein.

1.6 WIRING/ZONES

- A. Classrooms – (talkback) Homerun to new system via IP over Category 6 UTP
- B. Corridors
 - 1. Homerun (IP) and/or serially (analog via IP gateway) to new system
 - 2. Shall be separate zones with separate/dedicated amplification ability.
 - a. Separate zones are also required per class level.
- C. Gymnasiums and Cafeterias
 - 1. Homerun (IP) and/or serially (analog via IP gateway) to new system
 - 2. Shall be separate zones with separate/dedicated amplification ability.
- D. Non-instructional spaces (offices, kitchen, etc.)
 - 1. Homerun (IP) and/or serially (analog via IP gateway) to new system

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- 2. Shall be separate zones.
- E. Exterior
 - 1. Homerun and/or serially to new system
 - 2. Shall be separate zones with separate/dedicated amplification ability.
- 1.7 WORK HOURS
 - A. While students are in session all work shall be second shift. (after 4:00 PM). Crews may work as late as they wish.
 - B. When school is not in session normal work start times apply. Crews may work as late as they wish.
- 1.8 APPROVED MANUFACTURERS
 - A. Valcom
 - B. Audio Enhancement
 - C. Telecor
 - D. Atlas IED
 - E. Advance Networks (for ancillary devices)
 - F. Galaxy Next (G2)
- 1.9 CRITICAL COMMUNICATIONS SYSTEM PERFORMANCE REQUIREMENTS
 - A. The Critical Communications System shall be provided with management software for programming and scheduling of bells and tones at each building, which can be accessed and modified locally over the network, over the internet via web page or from the administration office.
 - B. Only systems designed primarily as a Critical Communications System shall be considered. Safety features shall include but not be limited to; priority-based access to voice functions, emergency Critical Communications, emergency call-in, PC based call-in, pre-recorded emergency announcements, external and internal telephone access, and optional district wide communication functions. Critical Communications systems, traditional school intercom systems, or any system that does not include the above minimum features will not be considered.
 - C. The Critical Communications system shall be non-blocking.
 - 1. Talkback gateways must be non-blocking and accommodate a minimum of two (2) active audio paths (2-way intercom, 1-way Critical Communications, background music, etc.). Single channel systems are not acceptable.
 - D. **The solution shall not have recurring license fees.**
 - 1. Subscription-based systems may be proposed **as a voluntary alternate** (see section "Instructions to Bidders" for requirements when providing voluntary alternates), providing they meet all requirements herein and will continue to operate if the internet connection is inoperable.

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- E. The solution shall have an easy-to-use software suite with an intuitive, interactive, web-based Graphical User Interface (GUI) with mapping function.
- F. The Critical Communications system shall provide a means to filter all voice signals to maximize voice intelligibility.
- G. Critical Communications system amplifiers shall go to sleep thus reducing their current draw when not in use.

1.10 CRITICAL COMMUNICATIONS SYSTEM FUNCTIONAL REQUIREMENTS

- A. System access
 - 1. Administrative telephone, back up microphone, or standard telephones from the district's IP-based voice communication system
 - 2. Pre-recorded or pre-programmed messages
 - 3. Automatic or manually activated tones and alarms (i.e.- bell schedule, emergency tones, etc.)
 - 4. Physical all-call emergency button panel
 - 5. Centegix Alert system integration
- B. The Critical Communications system shall provide for a minimum of twenty-five (25) Owner pre-recorded voice messages in addition to any system pre-programmed messages, accessible by pushing a preprogrammed button on the administrative telephone or a code from a standard telephone.
- C. The Critical Communications system shall allow for user-programmable room number assignment in the form of 3, 4, 5 or 6-digit alphanumeric format for architectural room numbering and a 60-character alpha-numeric caller ID description associated with each audio port.
- D. Each building Critical Communications system shall allow for a minimum of 64 page/time/program zones that can be assigned and configured as desired.
- E. The Critical Communications system administrative telephone shall allow for the user to view the alphanumeric room address and the caller-ID information of the calling station and the call priority (e.g., emergency, normal) on the display. The administrative telephone shall use distinctive ringing patterns to announce the type of call.
- F. Each building Critical Communications system shall be capable of receiving simultaneous call-ins without data collisions or loss of any call-ins. Call-ins shall remain in the system call queue until answered. Emergency Call-ins shall automatically move to the top of the call-in queue and announced in the in-use telephone earpiece to notify the user of an emergency call.
- G. The Critical Communications system shall provide "talk-back" functionality and communicate with each instructional area loudspeaker hands-free. The staff member or occupant in the classroom need not press any buttons to reply to a call. The administrative telephone operator shall be able to use the hands-free speaker phone or handset on an administrative telephone.
- H. The Critical Communications system shall operate under the following audio priority scheme.

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1. An emergency page suspends all other audio, All strobes flash Red.
 2. An emergency tone suspends all other audio except the above.
 3. A normal all-call page suspends all other audio except the above, all strobes flash Amber or Blue.
 4. A normal talk-back page suspends all other audio in the room, the room strobe(s), if room is so equipped, flash Amber or Blue.
 5. A tone suspends all other audio except the above
 6. Interrupted lower priority functions shall be restored after conclusion of the higher priority function.
 7. The system shall have the ability to send out a manually initiated all-clear all-call message, recording or user voice, and all strobes flash Green.
- I. The Critical Communications system shall allow a call-in to be escalated from a normal call-in to an emergency call-in at any time.
 - J. The Critical Communications system shall allow for any connected telephone to place an emergency voice Critical Communications announcement.
 - K. The Critical Communications system shall allow for operation via a GUI based PC based application. The PC application shall allow for emergency Critical Communications, normal Critical Communications, intercom, activation of any system/user tone, schedule changes, program distribution, call-in management, and on the fly room exclusion.
 - L. The Critical Communications system shall use a PC-based GUI scheduling tool for schedules and tone management. This tool shall not allow access to any system configuration controls. This tool shall not prevent the Critical Communications system from operating when being used. This tool shall allow the user to schedule events and manage tones over the local LAN/WAN and the Internet. It shall not be required to be directly connected to the central system to use this tool.
 - M. The Critical Communications system shall have a built-in 30-day log of every system function and access.
 - N. The Critical Communications system shall have a built-in real-time system diagnostics application.
 - O. The Critical Communications system shall allow for system diagnostics, system log access firmware updates, and programming over the local LAN/WAN or over the Internet.
 - P. Exterior strobes shall be able to be initiated independently of building lockdown procedures, indicating a building or district-wide emergency without audibly alarming. (In conjunction with or independent of pre-recorded lockdown messages)
 - Q. The final programmed color of strobe lights during different states shall be coordinated with the Owner.
- 1.11 LOCK DOWN

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- A. The system shall provide a pre-recorded message or other means of notification as determined by the Owner upon a Lock-down condition being initiated within the system.
 - 1. Coordinate final annunciation with Owner.
 - B. Lock-down initiation shall be through:
 - 1. Administrative console
 - 2. Manually via physical lock-down buttons in offices
 - 3. A preset code being entered via any IP telephone or authorized cellular telephone user.
 - 4. Via the system GUI
 - 5. Centegix Alert system
 - C. Once initiated, the lock down status may only be reset via the system GUI.
- 1.12 INTEGRATION
- A. Centegix Alert system
 - 1. Via Centegix API
 - B. 3CX VOIP telephone system (on premise server based)
- 1.13 TONES AND SOURCES
- A. Shall provide preannounce and privacy tones that are software programmable.
 - 1. Programmed to not sound any preannounce tone during covert, emergency calls to any talk-back equipped space.
 - B. Distribution of discreet signal tones to a zone, group of zones, or all zones.
 - C. Program sources shall include music, recorded speech or signals or digital audio messaging units (programmable)
- 1.14 TONES
- A. The Critical Communications system shall support WAV type audio files. The user shall be able to add 25+ custom WAV files for use as pre-recorded announcements, bells, reminders, pre-announce tones, or any other system tone.
- 1.15 WIRES AND CABLING
- A. The Critical Communications system shall use CAT-6 unshielded twisted pair cabling or shielded twisted pair speaker wire engineered to eliminate noise and crosstalk.
- 1.16 QUALIFICATIONS
- A. System components shall be the standard product of one manufacturer to maintain continuity in manufacturer. Establish common sources for equipment of all systems.
 - B. The work to be provided under this Section consists of furnishing and installing all equipment, cabling, and labor required for complete, operable, new district-wide Critical Communications system.

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- C. The system Integrator must have a minimum of five years of experience in the specific application of the equipment proposed for these systems.
- D. The system Integrator's programmer assigned to this project must have a current manufacturer certification. The Integrator shall maintain permanent service facilities in the area of the installation. The facilities shall include a permanent source of trained service technicians on twenty-four (24) hour call experienced in servicing Critical Communications system and shall provide warranty and manufacturer suggested maintenance service to afford the Owner maximum coverage. The Integrator shall also provide a central source of support to guarantee immediate answers to the Owner's problems and questions.
- E. The Integrator 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 Integrator shall own and maintain tools and equipment necessary for successful installation and testing of the Critical Communications system and have personnel who are trained and certified in the use of such tools and equipment.
- F. The Integrators(s) selected for this project must adhere to the engineering, installation and testing procedures as established by the manufacturer and applicable standards groups.
- G. The Integrator must be a company that is proposing and can demonstrate an installed system. It is preferred that the Integrator have experience installing the system in a K-12 education setting. The Integrator must submit a minimum of three (3) verifiable references including contact names and telephone numbers of projects that qualify.
- H. A resume of qualification shall be submitted with the Integrator's proposal indicating the following:
 - 1. A list of projects completed within the last three (3) years of similar type and size with current contact names and telephone numbers for each.
 - 2. A technical resume of experience for the Integrator's Project Manager, Design Engineer, Programmer and on-site installation supervisor who will be assigned to this project.
 - 3. A list of technical product training attended and (current) certifications received by the Integrator's personnel that will install the systems shall be submitted with the response.

1.17 SUBMITTALS

- A. The Integrator shall provide the following documentation and service:
 - 1. With Bid Submission:
 - a. Complete BOM with installed unit pricing
 - b. Data Sheets and Shop drawings: One (1) electronic set in an approved electronic format.
 - 1) Provide a system schematic of all major components.
 - 2) Manufacturers' specification sheets, including all component parts.
 - 2. At Closeout:

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- a. As-built drawings: One (1) electronic set in an approved electronic format. They shall include up-to-date drawings including any changes made to the system/wiring during installation.
 - b. Circuit diagrams and other information necessary for the proper operation and maintenance of the system shall be included.
 - c. An Excel spreadsheet with all IP and MAC addresses of all devices, passwords and login credentials.
3. Submit a certificate of completion of installation and service training.

1.18 QUALITY ASSURANCE

1. All items of equipment shall be designed by the manufacturer to function as a complete system and shall be accompanied by the manufacturer's complete service notes and drawings detailing all interconnections.
2. The Integrator shall be an established communications and electronics Integrator that has had and currently maintains a locally run and operated business for at least three (3) years. The Integrator shall utilize a duly authorized distributor of the equipment supplied for this project location with full manufacturer's warranty privileges.
3. The Integrator shall show satisfactory evidence, upon request, that the Integrator maintains a fully equipped service organization capable of furnishing adequate inspection and service to the system. The Integrator shall maintain at his facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied.
4. Electrical Component Standard: Provide work complying with applicable requirements of NFPA 70 "National Electrical Code" and the Michigan Electrical Code.
5. The Integrator providing equipment shall be responsible for providing all required equipment and services for all equipment for a 100% turnkey solution, regardless of whether specified herein. The Integrator must provide written proof that the Integrator is adequately staffed with trained technicians for all the specified equipment. The Integrator must be currently providing all services for the equipment.
6. The Integrator shall visit the site and familiarize themselves with the existing conditions and field requirements prior to submitting a proposal. Failure to do so does not preclude the requirement for the Contractor to provide the full scope of work at no additional cost.
7. The Integrator is responsible for all costs associated with proper installation, termination, configuration, programming, impedance, and load matching of all system components.

1.19 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in factory boxes. Store in clean, dry space in original boxes. Protect products from fumes and construction traffic. Handle carefully to avoid damage.

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1.20 TRAINING

- A. The Integrator shall provide training with this system. These sessions shall be broken into segments that will facilitate the training of individuals in the operation of this system. Operators Manuals and Users Guides shall be provided at the time of this training.
 - 1. The Integrator shall supply up to 2 hours of onsite user training. User training shall consist of operation of all system functions and scheduling software.
 - 2. The Integrator shall supply up to 2 hours of onsite system administration technical training. Training shall consist of operation, programming and troubleshooting of all system functions and scheduling software.
 - a. User training shall not be considered the technical training required above.
- B. The user shall have access to telephone support from the manufacturer at no additional cost for the life of the product.

1.21 WARRANTY

- A. The Integrator shall provide a minimum one (1) year parts, labor and workmanship warranty and shall guarantee availability of local service by trained personnel of all specified equipment from an authorized distributor of all equipment specified under this section. Maintenance shall be provided at no cost to the purchaser for a period of one (1) year (parts and labor) from date of acceptance unless damage or failure is caused by misuse, abuse, neglect, or accident.
- B. The Integrator shall, at the Owner's request, make available a service contract offering continuing service of the system after the initial warranty period.
- C. The manufacturer shall provide a (5) five-year warranty against defects in material and workmanship. All materials shall be provided at no expense to the owner. The warranty period shall begin on the date of final acceptance by the owner/engineer.
- D. Provide Software Assurance (Software service packs) during the entire warranty period at no additional cost. This shall include software and firmware updates and the labor to install them.
- E. The Integrator supplying the equipment shall show satisfactory evidence, upon request, that they maintain a fully equipped service organization capable of furnishing adequate inspection and service to the system, including replacement parts. The Integrator shall be prepared to offer a service contract for the maintenance of the system after the guarantee period. The bidder shall produce evidence that they have a fully experienced and established service organization for at least five years and proven satisfactory installations during that time.

1.22 WORK HOURS

- A. While students are in session all work shall be second shift or as coordinated with the IT director and building administrator.
- B. When school is not in session normal work start times apply, as coordinated with the IT director and building administrator.

PART 2 - PRODUCTS

2.1 GENERAL

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- A. Components shall be UL or third party certified. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations, submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Owner. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard. Cabling and interconnecting hardware and components for telecommunications systems shall be UL listed or third-party independent testing laboratory certified and shall comply with NFPA 70 and conform to the requirements specified herein.
 - B. All hardware proposed must be the current offering of the manufacturer and receive the highest level of standard support offered by the manufacturer. Factory refurbished hardware which is in "new condition" as well as used, shopworn, prototype, demonstrator models, etc. are not acceptable.
 - C. All software and firmware shall be at the manufacturer's current release at the point of system acceptance.
 - D. The Integrator shall be responsible for providing a complete functional system including all necessary components whether included in this specification or not.
 - E. The Integrator shall be responsible for all permits and fees for this work.
 - F. In preparing the bid, the bidder should consider the following:
 - 1. No claim will be made against the Owner for any costs incurred by the bidder for any equipment demonstrations which the Owner requests.
 - 2. Any prior approval of an alternate system does not automatically exempt the Integrator from the intent of these specifications. Failure to comply with the operational and functional intent of these specifications may result in the total removal of the alternate system at the expense of the Integrator.
- 2.2 APPROVED MANUFACTURERS
- A. Valcom
 - B. Audio Enhancement
 - C. Telecor
 - D. Atlas IED
 - E. G2 Galaxy Next
 - F. No other manufacturers are approved.
- 2.3 ADMINISTRATIVE CONSOLES
- A. Provide for the main office (location to be coordinated with Owner).
- 2.4 SPEAKERS AND STROBES
- A. Ceiling speakers and supports for lay-in tile ceilings.

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- B. Wall mounted inset speakers.
 - 1. Contractors may opt to reuse existing grills and replace only the speaker horns, if determined in good shape and approved by the Owner.
 - C. Surface mounted combination speaker /Digital scrolling displays
 - D. Surface mounted speakers
 - E. Surface mounted double-sided combination speaker /Digital scrolling displays / strobes (l.e. hallways)
 - F. Horns:
 - 1. Weather resistant 15W Horns
 - a. NEMA 4 or IEC IP-56 rated.
 - 2. Mounting hardware
 - G. Weather resistant Strobes
 - 1. NEMA 4 or IEC IP-56 rated.
 - 2. Three-color (minimum)visual alerting IP endpoint.
 - H. Clocks (Scrolling Digital displays)
 - 1. Minimum 4" H. characters (Clock)
 - 2. Ability to scroll messages in lieu of clock or on second line of display
 - I. Large Digital IP Signboard (Scrolling Digital displays) with two (2) 8" speakers and flashing LEDS or Strobes
 - 1. Shall be Advanced Networks IPSIGNL-RWB or equal
 - J. Raceway and blank cover plates
 - 1. EMT, LFMC or IMC conduit or Metal Raceway, fittings, boxes and covers in areas prone to damage (l.e. Gymnasiums) and as indicated on drawings.
 - 2. Plastic latch-duct or similar plastic raceway in areas not prone to damage.
 - 3. Cover plates used for blanking off existing speakers shall be painted the same color as the adjacent wall or as coordinated with the Owner.
 - 4. New raceway and boxes shall be the same color as existing wall.
 - K. Lock-down button (Covert front office and as indicated on project drawings)
 - 1. United Security Hub2sa Hold-Up Button, Momentary Spdt, 3 Screw Terminals
- 2.5 CRITICAL COMMUNICATIONS EQUIPMENT PROTECTION
- A. Provide and install wire guards or other means of physical protection on all internal speakers, horns, clocks, displays and strobes in common areas that have the potential for intentional or accidental damage. Examples include Gymnasiums, Cafeterias, Multipurpose rooms, etc.

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PART 3 - EXECUTION

3.1 INSTALLATION

- A. See section “Work Included”.
- B. All installation shall adhere to the latest ratified version of the following standards and codes:
 - 1. BICSI TDMM, ANSI TIA 568, ANSI TIA 569, ANSI TIA 606, ANSI TIA 607, NECA 1
 - 2. NFPA 70 (National Electric Safety Code) and NFPA 101 (Life Safety Code) and the Michigan Electrical Code
 - 3. All other associated codes not listed herein.
- C. Wire all speakers to the new system headend location in the building’s MDF (centralized) or to the nearest IDF (distributed).
 - 1. Except for within the MDF and device cordage in the main office, no system cabling, or wiring shall be run without being enclosed in conduit, raceway or above accessible ceilings. All cabling installed in finished ceiling areas shall be run above the ceiling, regardless of ceiling type, unless otherwise specified within the drawings or RFP. Conduit and surface raceway is not acceptable except as specified in the RFP or on drawings.
 - 2. Existing Critical Communications wiring shall not be reused and shall be removed in its entirety.
- D. Provide and install speakers of the type and quantity indicated on project drawings. Field verify exact locations.

3.2 SYSTEM DOWNTIME

- A. The existing system must stay operational during building’s operational hours until cut over to the new system, except as coordinated with the Owner. System downtime to be scheduled with District during periods when schools are not in session.

3.3 PROGRAMMING

- A. Upon completion of the installation the Integrator shall meet with the owner to go over all aspects of programming. Programming shall be performed as follows.
 - 1. Bell schedules in calendar format.
 - 2. Tone distribution
 - 3. Audio WAV file distribution
 - 4. Room dialing configuration
 - 5. Page zone assignment
 - 6. Emergency page assignment/Tone
 - 7. Emergency procedures

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- B. Once all programming has been completed the Integrator shall have as part of their bid to perform one additional trip to make any changes the owner may have after final acceptance. This shall be included within the proposal cost.
- C. Upon completion of programming, the Contractor shall change usernames and passwords from their default settings to Owner coordinated settings.

3.4 FIELD QUALITY ASSURANCE

- A. Integrator Field Service:
 - 1. Provide services of a service representative for this project location to supervise the field assembly and connection of components and the pre-testing, testing, and adjustment of the system.
- B. Inspection
 - 1. Make observations to verify that units and controls are properly labeled, mounted properly, all equipment is plumb and level.
- C. Testing:
 - 1. Rectify deficiencies indicated by tests and completely re-test work affected by such deficiencies at the Integrator's expense. Verify by the system test that the total system meets the specifications and complies with applicable standards.

3.5 CLEANING AND PROTECTION

- A. Prior to final acceptance, clean system components
- B. Provide adequate protection to Owner facilities to protect from damage.
- C. All spaces associated with this work shall be left clean at the end of each day's work, and at the end of the project. Trash, boxes, packing material, debris and litter shall be removed daily and disposed of.
 - 1. The Academy could provide a dumpster for waste removal.
- D. Restoration of, or compensation for, damage to the facility or Owner's contents by the Integrator is the Integrator's sole responsibility. Examples include paint, wall and ceiling damage.

3.6 DEMOLITION OF EXISTING AND RESTORATION

- A. Remove all existing equipment, wiring, and associated hardware and materials for both the exiting Paging and Clock systems. Properly dispose of all equipment and material offsite.
 - 1. Wiring removed shall be completely removed from all ceiling spaces in accordance with NFPA 70 and the Michigan Electrical Code.
- B. The Owner shall restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing. Integrator shall indicate all such areas to owner.
- C. All new conduit, boxes, covers, etc. shall be painted to match existing wall color.

3.7 FINAL TESTING AND COMMISSIONING

- A. Upon completion of the installation, each system device shall be fully tested for proper connectivity and operation with the Owner's time server. Demonstrate the same to the Owner for final acceptance.
- B. Test procedures:
 - 1. Use pre-recorded text to speech message for testing sound pressure levels. I.e.: "This a test of the Critical Communications system, we apologize for the interruption. This message will play continuously until testing is complete," or similar.
 - 2. Test and document each speaker using a hand-held sound level meter (SLM) held at 36" above finished floor (indoors) directly below the speaker, 36" above finished floor in the center of the gymnasium and at a distance of ~ 30' from exterior speakers, with SLM at 36" above finished grade.
 - 3. Acceptance speaker sound pressure levels, at 36" AFF:
 - a. Corridors shall be at 75dB +/- 2 dB
 - b. Exterior, Cafeterias, Gymnasiums and other large venues with high ceilings and loud ambient levels shall be at 80dB +/- 2dB
 - c. Classrooms shall be at 70dB +/- 2dB
 - d. Offices shall be at 68dB +/- 2 dB
 - e. In no cases shall the SPL be at or above 85db in any location.
 - 4. Integrator shall revisit each building to do a final adjustment during full occupancy (I.e. – classrooms during class session, corridors during class change, etc.) after start of the school year; final level shall be approved by the building's administrator.
- C. Documentation
 - 1. Indicate speaker location, type and dB reading on building floor plans and provide as part of the post-installation test submittal.
 - 2. Document sound pressure level (SPL) reading in dB

3.8 TRAINING

- A. Train Owner's maintenance personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. Operators Manuals and Users Guides shall be provided at the time of this training.
 - 1. Provide a maximum of two (2) hours user training, broken into one (1) hour blocks, as well as a maximum of two (2) hours of administration/maintenance/troubleshooting training for the district's technical staff.
- B. Schedule training with Owner, with at least seven (7) days advance notice.

3.9 CLOSEOUT

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- A. Provide, prior to Final Acceptance, to the Owner all system documentation, updated floor plans showing final speaker locations, volume at each and warranty information.

3.10 FINAL ACCEPTANCE

- A. Final acceptance and closeout of the contract will be given only after all the following have occurred:
 - 1. All closeout and administration documentation have been received, reviewed, and approved by the Owner.
 - 2. All tests have been conducted, system demonstrated with and accepted by the Owner and review and approval of all test documents by the Owner.
 - 3. A physical “punch” inspection has been made for quality of workmanship, operation, and identification by the Owner.
- B. Acceptance shall not be given until all “punch list” items have been rectified to Owner satisfaction, Owner has beneficial use of the system, all training has been conducted to the Owner’s satisfaction and Owner has accepted the system by signature and taken full ownership.
- C. All punch list items shall be complete within 10 business days.
- D. If deemed by the Owner that the system is not ready for inspection when the punch list is attempted requiring multiple trips to inspect or confirm completion of certified completed punch-list (certified by Integrator) a fee of \$150.00 per hour shall be assessed against and paid by the Integrator’s retainage.

END OF SECTION