



**TROY SCHOOL DISTRICT
TROY, MICHIGAN**

BID PACKAGE T2

**E-RATE DISTRICT-WIDE NETWORK AND
WIRELESS**

- NETWORK SWITCHES
- WIRELESS ACCESS POINTS

**REQUEST FOR PROPOSALS AND SPECIFICATIONS
DECEMBER 16, 2024**

**Bid Proposal Due Date / Opening:
January 16, 2025 at 10:00 AM local time**

**Online Pre-Bid Proposal Meeting:
December 19, 2024 at 10:00 AM local time**

**TECHNOLOGY DESIGNER / :
CONSTRUCTION MANAGER**

**Barton
Malow**

**REQUEST FOR BIDS/PROPOSALS
E-RATE NETWORK AND WIRELESS**

1. STATEMENT OF PURPOSE

- A. Troy School District (TSD or Owner) is in the second year of a ~10-year bond program in which each building will undergo renovations and/or additions. Barton Malow Builders, LLC (BMB or Designer) is the Technology Designer and Construction Manager related to the Work included in this RFP.
- B. TSD is requesting bid proposals for the purchase and installation of district-wide network and wireless infrastructure items. While this work is impacting the majority of the buildings in the district, it is not anticipated that ongoing construction projects will conflict with work related to this RFP.
- C. While this RFP is being issued to utilize e-rate funding, the Project is not solely reliant on e-rate funding, though the scope and solutions may be modified if TSD does not receive e-rate funds.

D. District Buildings:

Early Learning & Elementary Schools

| | | |
|---------------------------|-------------------------|----------------|
| 1. Troy Preschool | 205 W. Square Lake Rd. | Troy, Michigan |
| 2. Barnard Elementary | 3601 Forge Drive | Troy, Michigan |
| 3. Bemis Elementary | 3571 Northfield Parkway | Troy, Michigan |
| 4. Costello Elementary | 1333 Hamman | Troy, Michigan |
| 5. Hamilton Elementary | 5625 Northfield Parkway | Troy, Michigan |
| 6. Hill Elementary | 4600 Forsyth Drive | Troy, Michigan |
| 7. Leonard Elementary | 4401 Tallman Drive | Troy, Michigan |
| 8. Martell Elementary | 5666 Livernois Road | Troy, Michigan |
| 9. Morse Elementary | 475 Cherry Drive | Troy, Michigan |
| 10. Schroeder Elementary | 3541 Jack Drive | Troy, Michigan |
| 11. Troy Union Elementary | 1340 E. Square Lake Rd. | Troy, Michigan |
| 12. Wass Elementary | 2340 Willard Drive | Troy, Michigan |
| 13. Wattles Elementary | 3555 Ellenboro | Troy, Michigan |

Middle Schools

| | | |
|-------------------------------|-------------------------|----------------|
| 14. Baker Middle School | 1359 Torpey Drive | Troy, Michigan |
| 15. Boulan Park Middle School | 3570 Northfield Parkway | Troy, Michigan |
| 16. Larson Middle School | 2222 E. Long Lake Rd. | Troy, Michigan |
| 17. Smith Middle School | 5835 Donaldson Drive | Troy, Michigan |

High Schools

| | | |
|----------------------------------|-------------------------|----------------|
| 18. Athens High School | 4333 John R Road | Troy, Michigan |
| 19. Troy High School | 4777 Northfield Parkway | Troy, Michigan |
| 20. International Academy | 1291 Torpey Drive | Troy, Michigan |
| 21. Troy College & Career Center | 1522 E. Big Beaver Road | Troy, Michigan |

Other Buildings

| | | |
|-----------------------------|--------------------|----------------|
| 22. Administration Building | 4400 Livernois | Troy, Michigan |
| 23. Services Building | 4420 Livernois | Troy, Michigan |
| 24. Transportation Building | 120 Hart Street | Troy, Michigan |
| 25. Facilities/Operations | 1140 Rankin Street | Troy, Michigan |

- E. The submission of a bid proposal on the included bid proposal form shall constitute an offer on behalf of the Bidder to provide equipment and services through the duration of the Bond Project at or below the bid proposal pricing / unit pricing if the Owner chooses to purchase additional equipment.

- F. The Owner understands that the current model selected may not be manufactured through the installation period for multi-phase Projects. As the manufacturer's product changes, the Bidder for no additional cost will supply the model marketed by the manufacturer as being the successor to the model initially chosen. If there is no successor model, the Bidder will propose alternative product options and the associated cost, based on the minimum discount percentage outlined in the Unit Price section of the bid proposal form. The Owner may choose to select that model or end the intent of purchasing through this RFP.
- G. The intent is to utilize this RFP for purchasing standard equipment throughout the Bond Project. However, if future models become available that better suit the Owner's needs, or if purchasing through a cooperative purchasing program provides reduced pricing for the Owner, the Owner reserves the right to procure equipment from other sources.

2. SCOPE OF WORK

- A. This RFP consists of a single bid category. Bidders must submit a bid for the entire scope of Work related to the RFP.
- B. Bidders are to include planning, demolition, installation, configuration, training (at no cost the Owner), and documentation.
- C. The successful Bidder(s) will be responsible for demolishing and removing existing network switches and wireless access points. Equipment will be turned over to the Owner at a central location which will be determined after award.
- D. Bidders are to review the entire set of bid proposal documents for all bid categories to include coordination items required between bid categories.
- E. Contractors will be responsible for all equipment and material handling. The Owner will not accept equipment or material deliveries directly to the school buildings.

Bid Category 1: Network and Wireless

- A. Reference specifications and relevant drawings sheets for the full scope of work for your category. The work scopes below are major highlights of the work scopes. Additional work not listed in the work scopes below but shown on the relevant drawings and specifications is still the responsibility of the contractor.
- B. Remove existing network switches and turn over the Owner at a predetermined central location in the district.
- C. Provide new network switches throughout the district. The quantities required are described in the specifications. Provide all stacking cables, power cables, 5 years of required licensing, and all other accessories and parts required for a fully turnkey solution. Installation and configuration is included. Excluded from this scope of work is replacement of the district core switches.
- D. Remove existing wireless access points and turn over to the Owner at a predetermined central location in the district.
- E. Provide new wireless access points throughout the district. The quantities required are described in the specifications. Provide mounting hardware, 5 years of required licensing, and all other accessories and parts required for a fully turnkey solution. Installation and configuration on the district's existing wireless controller is required. Provide mounts and protective covers required for Gyms and Natatoriums as necessary.
- F. Contractor to include 100 Cisco Learning Credits (or equivalent from non-Cisco manufacturer) for the Owner's discretionary use.
- G. Refer to Specification Sections:
 - 1. 27 0000 General Technology Requirements
 - 2. 27 1000 General Cabling Requirements

3. 27 1500 Data and Voice Horizontal Cabling
4. 27 2100 Network Infrastructure
5. 27 2110 Wireless Infrastructure

3. PRE-BID PROPOSAL MEETING

- A. For the dissemination of information and clarification of intent of the Contract Documents, a pre-bid proposal meeting will be held on:

Date: **December 19, 2024**

Time: **10:00 AM local time**

Place: Meeting will be an online Microsoft Teams meeting. For full access go to:

<https://bit.ly/TroyBPT2Prebid>

For audio only Dial-in Number: (248) 572-3806
Conference ID: 285 899 890 529

- B. A date will be setup at the pre-bid proposal meeting for any bidders requesting to tour the inside of buildings. Bidders wishing to visit the outside of buildings only are still asked to check-in at the office upon their arrival to notify office staff that you may be on their grounds.
- C. The pre-bid proposal meeting is not mandatory, but bidders are responsible for the information provided at the pre-bid proposal meeting.
- D. Responses to questions and requests for clarifications will be made by written addenda only after the pre-bid proposal meeting if required. Any representations and/or oral discussions not confirmed by addenda will not be binding upon the Owner.

4. RECEIPT AND OPENING OF BID PROPOSALS

- A. The Contract Sum includes all costs associated with known and current COVID-19 impacts, including impacts on materials, the supply chain, labor, productivity and schedule.
- B. Bid Proposals must be submitted prior to the Time and Due Date specified below, at which time they will be publicly opened and read aloud. Bid Proposals will be opened publicly in a manner to avoid full public disclosure of contents until after all evaluations have been completed; however Bidder's name and bid proposal amount will be read aloud. Decisions will not be made at the bid proposal opening; bid proposals will be evaluated before presentation to the Board of Education for approval.

DUE DATE: January 16, 2025

TIME: 10:00 AM

The public bid opening may be attended virtually at: <https://bit.ly/TroyBPT2BidOpening>

- C. Online Submission through BuildingConnected.com
1. Bid Proposals will be received online through www.BuildingConnected.com up until the time of the Bid Proposal Due Date and Time. Through Building Connected, all Bid Proposals are kept confidential until the Bid Proposal Due Date and Time. Bidders will be able to submit and revise their Bid Proposals right up to the Bid Proposal Due Date and Time, but no revisions or new bid proposals will be accepted after the deadline has passed.
 2. The Bid Proposal form and bid proposal documents are available through Building Connected using the following link:
<https://app.buildingconnected.com/public/55a1292ff1a96708004a19dc>
 3. For instructions on how to submit a Bid Proposal please follow this link:

<https://buildingconnected.zendesk.com/hc/en-us/articles/360010222793-How-to-submit-your-bid-through-BuildingConnected->

4. Bidders can start typing information into Building Connected immediately upon invitation. The information is sealed and not accessible by the Owner until the Bid Proposal Due Date and Time but the Bidder can enter and change information until the Bid Proposal Due Date and Time.
 5. **Bidders must type answers into the Building Connected Bid Proposal Form as well as upload signed and notarized copies of the Iran Sanctions Form, Familial Disclosure Affidavit, Bid Bond, Bill of Materials, and any other required or supporting documentation.**
 6. **Bidders are encouraged, but not obligated, to submit bid proposals electronically via Building Connected.** If a Bidder chooses to submit an electronic bid proposal, it assumes any and all risk related to software, connectivity, or any other issues related to the electronic bidding process. It is further recommended, but not required, that any electronic bid proposals be submitted at least two hours before the deadline for bid proposal submission to confirm that the bid proposal has been timely, accurately, and completely received.
 7. Bidders submitting a hard copy of their Bid Proposal can print the Bid Proposal Form from Building Connected. Bidders submitting a hard copy of their Bid Proposal must notify BMB at least 24 hours prior to when the bids are due to ensure an Owner's representative will be available for receiving the Bid Proposal.
- D. All bid proposals must be accompanied by the following documents uploaded through Building Connected. Bidders who will be awarded Work will be required to provide original hardcopies.
1. Familial Disclosure Affidavit, sworn and notarized.
 2. Affidavit of Compliance – Iran Economic Sanctions Act, sworn and notarized.
 3. Executive Summary or other supporting documentation including a summary of any deviations/enhancements/exemptions to the minimum configurations listed
 4. Bill of materials with itemized costs.
 5. Specification sheets on the systems proposed.
 6. Summary of manufacturer's standard warranty.
 7. A list of projects completed during the previous three (3) years, including the contract values and owner's contact information.
- E. Bid Proposals received from Bidders after the Due Date and Time will be returned to Bidder unopened.
- F. When submitting a bid proposal, use only the forms provided. Forms that have been altered or substitute forms will not be accepted.
- G. A Bid Security in the form of a bid bond from a qualified surety for the full amount of the bid or a cashier's check equal to five percent (5%) of the total bid. Bid bonds shall be duly executed by the Bidder, as principal, and by a surety that is properly licensed and authorized to do business in the state in which the Work is to be performed. Bidder agrees that this Bid Proposal shall be irrevocable. All sureties providing bid bonds for this Project must be listed in the latest version of the Department of Treasury's Circular 570, entitled "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies", with the bond amount less than or equal to the underwriting limitation, and/or have an A.M. best rating of A- or better.
1. Note: Bid Bonds may be submitted electronically through Building Connected with the original provided afterward; but the original cashier's check must be provided to the Owner prior to the Bid Proposal Date and Time to be considered a valid Bid Security.

- H. All Bid Proposals must include the sworn statement included with the Bid Proposal Form, in accordance with MCL 380.1267, disclosing any familial relationship that exists between the owner(s) or any employee of the Bidder and any member of the school board or the superintendent of the school district.
- I. All Bid Proposals must include the affidavit included with the Bid Proposal Form certifying that the Bidder is not Iran-linked business.
- J. Troy School District reserves the right to accept or reject any or all bid proposals, either in whole or in part, to waive any informalities or irregularities therein, and the right to award the Contract to other than the Bidder(s) submitting the best financial Bid Proposal (low bidder).
- K. Additional information provided with a Bid Proposal shall be used in the evaluation of bid proposals, but do not replace the requirements established by the Contract Documents (request for proposals, drawings, specifications, etc.). Neither BMB nor the Owner will be responsible for reviewing equipment lists for completeness or conformance to the Contract Documents. Lists of material, bills of material, etc. submitted by the Bidder do not replace the submittal requirements and do not replace the requirements established by the Contract Documents.

5. TIMELINE

A. Milestone Dates:

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|---|---------------------------------------|
| 1. Release of the bid document: | December 16, 2024 |
| 2. Pre-bid proposal meeting: | December 19, 2024 at 10:00 AM |
| 3. Deadline for written requests for clarification: | January 7, 2025 at 3:00 PM |
| 4. Bid Proposal Time: | January 16, 2025 at 10:00 AM |
| 5. Post-bid proposal Interviews: | January 20 – 24, 2025 |
| 6. Board of Education presentation: | February 11, 2025 (anticipated) |
| 7. Board of Education consideration: | February 25, 2025 (anticipated) |
| 8. Spring Break: | March 24, 2025 through March 28, 2025 |
| 9. Project Start Date: | April 1, 2025 |
| 10. Wireless Surveys Completed By: | May 15, 2025 |
| 11. Last day of School for students: | June 6, 2025 |
| 12. Project Substantial Completion: | August 8, 2025 |

B. On-site Work shall be performed around school activities, cleaning schedules, etc. Any changes to the established schedule must have prior approval of the Owner, and scheduled at the least disruptive time possible. In general buildings will be available:

- | | |
|---|--|
| 1. School Breaks (summer, spring break) | 7:00 AM to 3:30 PM, Mon thru Fri |
| 2. Early Childhood | 6:30 PM to 10:30 PM, Mon thru Fri |
| 3. Elementary Schools | 4:30 PM to 10:30 PM, Mon thru Fri |
| 4. Middle Schools | 4:00 PM to 10:30 PM, Mon thru Fri |
| 5. High Schools | 3:00 PM to 11:30 PM, Mon thru Fri |
| 6. Admin/Support | 5:00 PM to 11:30 PM, Mon thru Fri or as arranged |

- C. Any installation in corridors or classrooms including system cutovers must be performed outside of school hours aside from scheduled Work completed during school breaks. Bidder to include the cost of any premium time in their base bid proposal.
- D. The Bidder must provide written documentation outlining their Work schedule.
- E. The Bidder will be charged for weekends and holidays if Owner, BMB, or Owner's Representative's labor force is scheduled to allow access to the facility.

6. EVALUATION AND POST-BID INFORMATION

- A. An Evaluation Committee selected by the Superintendent, or their designee, will make evaluation of evaluate the Bid Proposals. The Committee will evaluate the bid proposals and recommend a prospective Contractor for award based on the best interests of the Owner.
- B. After the Bid Proposals are received, the Project team may require a post-bid proposal meeting for the purpose of further evaluating and clarifying the bid proposal. Items clarified during the post-bid proposal evaluation will become part of the Contract between Owner and the selected Contractor.
- C. Shortlisted Bidders may be asked to provide a demonstration of their systems during the Post-Bid Proposal interview and may be asked to provide an evaluation unit for the Owner to evaluate.
- D. Bidder may be requested to provide follow up information including but not limited to:
 - 1. Designation of the Work to be performed by the Bidder with his/her own forces, and that to be contracted.
 - 2. Complete detailed cost breakdown including manpower requirements and cleanup costs associated with Work activities.
 - 3. A list of names of the Subcontractors or other entities (including those who are to furnish systems of materials and/or equipment fabricated to a special design) proposed for the principal portions of the Work. The list shall further include the value of the subcontracts and their percentage of value of the Bidder's total bid proposal. The Bidder will be required to establish, to the satisfaction of the Owner, the reliability and responsibility of the persons or entities proposed.
- E. Any requests made by the Owner for written cost analysis shall be adhered to by the bidder. Any bidder that does not comply with this request may be rejected.
- F. Once the Contract is awarded to the successful bidder(s), the successful bidder shall be known as the "Contractor".

7. CLARIFICATIONS, DISCREPANCIES, OMISSIONS OR INTERPRETATIONS

- A. Bidder shall promptly notify BMB in writing of any ambiguity, conflict, inconsistency, discrepancy, omission or other errors which they may discover upon examination of the RFP, otherwise the bid proposal will be deemed to incorporate appropriate solution to the issue. Bidders requesting clarification or interpretation of the RFP Documents can:
 - 1. **Submit questions through the Messages tab in BuildingConnected (preferred)**
 - 2. Email to: brian.beck@bartonmalow.com
- B. All such requests must be made in writing via Building Connected or e-mail. No response will be made to any oral question.
- C. Any interpretation, correction or change of the Contract Documents will be made by Addendum issued by BMB on behalf of the Troy School District. Interpretations, corrections or changes of the Contract Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections and/or changes. Addenda will be distributed through BuildingConnected.
- D. Each bidder in its Bid Proposal must acknowledge all addenda which it has received, but the failure of a Bidder to receive, or acknowledge receipt of, any addendum shall not relieve the Bidder of the responsibility for complying with the terms thereof.
- E. The Owner intends that all bidders have equal access to information relative to this RFP, and that this RFP contains adequate information. No information communicated, either verbally or in writing, to or from a Bidder shall be effective unless confirmed by written communication

contained in an addendum to this RFP, or a Request for Clarification, or other written response thereto.

- F. From the issue date of this RFP until a Bidder is selected and the selection announced, a prospective Bidder shall not communicate about the subject of this RFP or a Bidder's Bid Proposal with the Owner, its Board of Education, or any individual member, administrator, faculty, staff, student, employee, or its Owner's Representatives.

8. BID PROPOSAL FORM

- A. Each bid proposal shall be submitted on the bid proposal form in BuildingConnected.com with all blank spaces filled in (enter "\$0.00" where items are included at no additional charge, enter "N/A" for items that are not applicable or available from the Bidder.
- B. All interlineations, alternations or erasures shall be initialed by the bid representative of the Bidder that executes the bid proposal form.
- C. Each copy of the Bid Proposal Form shall include the legal name of the Bidder and shall be signed by the person or persons legally authorized to bind the Bidder to a contract. If Bid Proposals are submitted by an agent, provide satisfactory evidence of agency authority.

9. ALLOWANCES

- A. **Bidder is to include a \$25,000 Owner directed allowance as part of their base bid proposal.** If submitting for multiple bid categories the full allowance should be included in each bid category. This allowance is above and beyond the scope identified in the specifications, drawings, or Work scopes. This Owner Directed Allowance is to be used by the Owner at their discretion for Owner Directed Changes. Any unused portion of the Owner Directed Allowance will be credited to the Owner through a deduct change order at the end of the Project.

10. VOLUNTARY ALTERNATES

- A. All bid proposals must be based upon the base requirements established in this RFP. In addition to a base bid proposal, the submission of voluntary alternates is acceptable. If a voluntary alternate is submitted for consideration, it shall be expressed on the bid proposal form along with sufficient information in the form of an executive summary, specification, product data, etc., sufficient for analysis of the alternate.

11. TAXES

- A. The bidder shall pay applicable taxes for any Work that is not tax exempt. Exemption certificates, if required, will be furnished when requested by awarded Bidder.

12. CONTRACT AND INSURANCE

- A. The form of Contract that will be used for the services under this Bid Package shall be the Agreement for Purchase and Installation of Technology System(s) included with this RFP (the Contract). The Contract contains many details relative to the Services requested by the Owner, the terms and conditions under which the Services shall be provided by the Bidder and should be reviewed carefully by each Bidder prior to submitting a Bid Proposal.
- B. A copy of the Insurance Requirements is attached as Exhibit A to the Contract form.
- C. Before commencement of any Work, a Certificate of Insurance executed by Bidder's insurance agent or carrier showing evidence of required insurance coverages shall be submitted in accordance with the Insurance Requirements attached the Contract.
- D. Any exceptions to the terms and conditions contained in this RFP or the form of Contract attached to this RFP, or any other special considerations or conditions requested or required by the Bidder MUST be specifically enumerated by the Bidder and be submitted as part of its Bid Proposal, together with an explanation as to the reason such terms and conditions of this RFP or

form of Contract cannot be met by, or, in the Bidder's opinion, are not applicable to, the Bidder. The Bidder shall be required and expected to meet the specifications and requirements as set forth in this RFP and the form of Contract in their entirety, except to the extent exceptions or special considerations or conditions are expressly set forth in the Bidder's Bid Proposal and those exceptions or special considerations or conditions are expressly accepted by the Owner. All Pricing factors must be clearly indicated in the Bid Proposal Forms provided as part of the Bidder's Bid Proposal.

13. PAYMENTS

- A. Refer to the Contract Form for detailed information on the payment process.
- B. Contractor may submit for progress payments for Work complete at most monthly.
- C. Pay applications shall be submitted using the Application and Certificate for Payment (AIA Documents G702 and G703 Continuation Sheet) or other form approved in advance by BMB.
- D. Applications for Payment and all supporting documents (including but not limited to lien waivers, sworn statements, and the like) for the Contractor, its Subcontractors, and its sub-subcontractors and suppliers, shall be in electronic format and shall be submitted to BMB using the Oracle Textura Payment Management (TPM) system. Contractor shall be responsible for the fees and costs owed associated with their use of TPM. Contractor shall include a similar provision in its subcontracts and purchase orders. Fees to Contractors are calculated as 0.22% (22 basis points) of Contract Sum (including applicable taxes), with a maximum fee of \$5,000. Fees to Subcontractors and suppliers are a fixed fee of \$100 per sub-subcontractor or supplier contract.

14. PERFORMANCE AND PAYMENT BONDS

- A. Bidders are to include the price of a performance and payment bond in their bid proposal. The bid proposal form provides a means for identifying the cost of the bond. For bid proposals under \$50,000, the Owner may choose to waive the bonds in which case the amount would be deducted from the contract price.
- B. For all bid proposals over \$50,000, Owner will require Bidder to furnish a Performance Bond and a Payment Bond, in amounts equal to the Contract Sum, by a qualified surety naming both Troy School District and Barton Malow Builders, LLC as dual Obligees. All sureties providing bonds on this Project must be listed in the Department of Treasury's Circular 570, entitled "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" with the bond amounts less than or equal to the underwriting limitation indicated in the Circular, and/or must have an A.M. Best rating of A - or better. Bonds shall be duly executed by the Bidder, as principal, and by a surety that is licensed in the state in which the Work is to be performed.
- C. The Bidder shall deliver the required bonds to BMB prior to execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder, at a minimum, shall submit evidence to the satisfaction of BMB such bonds will be furnished prior to commencement of on-site Work. In no event may the Bidder commence on-site Work without the required bonds properly issued and delivered.
- D. Performance Bond and Payment Bond form AIA Document A312 (2010 Edition) must be used for this Project.
- E. The Bidder's proposed surety must be acceptable to the Owner and BMB. If, at any time, after acceptance of the Bidder's bonds, the surety fails to meet the criteria stated above, the Bidder must, as a precondition to continuing Work and receiving further payments, replace the bonds with bonds from a surety that meets the stated criteria.
- F. The Performance and Payment Bond penal sums (i.e., the Contract Sum) must be listed as a separate line item on the Bid Proposal Form and payment requests.

- G. In the event of a Change Order to the Contract that increases the Contract Sum, the penal sum of any required Performance and Payment Bonds shall also be increased so that each penal sum equals the adjusted Contract Sum. BMB or Owner shall have the right to request submission of bond riders, issued by the original qualified surety, evidencing that such increase to the penal sum of the bonds has been accomplished. Notwithstanding the foregoing, in the next pay application after the Contract Sum has been increased by twenty-five percent (25%) or more, as a condition precedent to payment, Bidder shall deliver a bond rider issued by the original qualified surety evidencing that the appropriate increase in penal sums has been accomplished. No alteration, erasure, or addition is to be made in the typewritten matter.

15. USF FUNDING

- A. While this Project is part of the Owner's Bond Program, the Owner is applying for USF (e-rate) funding for eligible portions of this Project. Direct all questions regarding the USF requirements in this RFP to the Universal Service Administrative Company (USAC), Schools and Library Division (SLD) at (888) 203-8100.
- B. While the intent is to complete the Project under the Bond scope, the Owner may reduce or cancel the Contract in the event the level of the universal service discounts is reduced. Any reductions will be taken prior to the start of the specific Work being reduced or eliminated on a given building and/or Project.
- C. USF Registration: Bidder shall submit with its bid proposal a valid Service Provider Identification Number ("SPIN") and a valid Federal Communications Commission Registration Number ("FCCRN"). Furthermore, Bidder shall submit to the SLD its annual Service Provider Annual Certification ("SPAC"), FCC Form 473, in a timely manner before the beginning of each funding year. Direct all questions regarding the USF requirements in this RFP to the Universal Service Administrative Company (USAC), Schools and Library Division (SLD) at (888) 203-8100. Bidders MUST maintain active service provider status for the entire duration of the Project.
- D. USF Knowledge: Bidder shall have, at a minimum, a working knowledge of the federal Universal Service Support Mechanism for Schools and Libraries (commonly known as "E-rate"). The Owner expects each Service Provider to make themselves thoroughly familiar with any rules or regulations regarding the E-rate program.
- E. USF Participation and Cooperation: Bidder shall agree to participate in the E-rate Program and to cooperate fully and in all respects with the Owner, the Universal Service Administrative Company ("USAC"), and any agency or organization administering the E-rate Program to ensure that the Owner receives all of the E-rate funding for which it has applied and to which it is entitled in connection with the Bidder's services and/or products.
- F. USF Information and Documentation: Bidder shall provide to Owner's staff and/or the Owner's E-rate consultant within a commercially reasonable period of time, all of the information and documentation that the Bidder has or that Bidder reasonably can acquire that the Owner may need to prepare its E-rate applications and/or to document transactions eligible for E-rate support.
- G. Pay application procedures included in this RFP will be modified to accommodate the USF procedures. Pay applications for eligible items will only be accepted during the FY2025 date window. The Owner reserves the right to specify the filing option for the universal service discounts for each product and/or service.
- H. Invoicing Documentation: Bidder shall itemize, price, and invoice all materials or services that are eligible and ineligible for E-rate funding. In addition to the pay application requirements, Bidder must include the following information on all pay applications to the Owner for E-rate eligible equipment and/or services:

1. Date of Invoice
 2. Dates of Service
 3. FRN association on each line item
- I. Clear, concise breakdown of amount(s) to be billed to USAC (discounted portion of eligible charges) and amount(s) to be billed to the Owner (non-discounted amount of eligible charges)
 - J. Bidders are to separate USF eligible products and/or services from those that are ineligible on the bid proposal form. The USF eligible products and/or services identified on the USAC website are incorporated in this RFP by reference.
 - K. The eligible products and/or services are to be provided during FY2025 (April 1, 2025-June 30, 2026). Work shall only commence prior to the FY2025 date window with approval of the Owner's e-rate consultant.
 - L. No invoices will be DATED or PAID before April 1, 2025.
 - M. USF Audit and Document Retention Requirement: Bidder shall maintain all bids, quotes, records, correspondence, receipts, vouchers, delivery information, memoranda and other data relating to Bidder's services to the Owner. All such records shall be retained for ten (10) years following completion of services and shall be subject to inspection and audit by the Owner. In the event of questions during the E-Rate audit process, the successful Bidder is expected to reply within 3 days to questions associated with their bid proposal.
 - N. Contract Term Modification: The Owner reserves the right to extend or abbreviate the Contract period if such extension or abbreviation is necessary to make the Contract term coincide with an E-rate "program year" or an extended service end date for an E-rate program year pursuant to a "service delivery deadline extension," as those terms are defined by the Federal Communications Commission ("FCC") or the Universal Service Administrative Company ("USAC").
 - O. The successful bidder will provide a tag with e-rate information including e-rate FRN number and funding year, along with equipment-specific designations as approved by Owner.

16. EQUIPMENT PROTECTION AND OFF-SITE MATERIALS

- A. For any materials stored off-site (either delivered to the Contractor's warehouse or taken by the Contractor from Owner's warehouse), Contractor is to provide copies of insurance policies that cover the stored materials. Insurance policy is to name BMB and Owner as additional insureds. The limit of the insurance policy shall be equal to or greater than the replacement value of the stored materials. Copies of this insurance policy must be provided with payment applications.
- B. Equipment at Contractor's warehouse is to be segregated from their general inventory and marked. Contractor is to provide the location where the material will be physically stored including the address and storage location within the warehouse.

17. DELIVERIES

- A. Contractors will be responsible for all equipment and material handling. The Owner will not accept deliveries to equipment or materials directly to the school buildings. Contractor must be onsite to accept any deliveries.
- B. Refer to the Contract Form for detailed information on deliveries.
- C. Contractor will coordinate delivery with BMB, the Construction Manager, the Owner's staff, and other Contractors working at the schools. Delivery dates will be confirmed by the Contractor one (1) week prior to delivery.

18. DEFINITIONS

- A. The Contract Documents consist of the Agreement for Purchase and Installation of Technology Equipment included with this RFP (including the Exhibit A attached thereto) (together, the "Contract"), this Request for Proposal, the post-bid proposal review form, the Project Manual, all Addenda issued prior to Bid Proposal Due Date and Time, and all clarifications noted during the post-bid proposal interview. In the case of a discrepancy between the terms contained in the Contract Documents and the Owner's purchase order, the terms in the Contract Documents shall supersede.
- B. The Project Manual refers to this document and all associated documents issued as part of this RFP. This includes the drawings, specifications, equipment lists, schedules, documentation of existing equipment, etc.).
- C. Addenda are written and/or graphic instruments issued by the Owner or BMB prior to the award of the Contract which modify or interpret the Contract Documents by additions, deletions, clarifications or corrections.
- D. A Bidder is a legal entity submitting a bid proposal.
- E. Bid, Bid Proposal, and Proposal are used interchangeably and refer to the bid proposal submission from the Bidder in accordance with the Contract Documents.
- F. Base bid proposal is the sum stated for which the Bidder offers to perform the complete Work of, or supply equipment to which Work may be added or deducted. The base bid proposal shall be in strict accordance with this RFP, though voluntary alternates may be submitted in addition to the base bid proposal.
- G. An alternate bid (or alternate) is an amount stated in the bid proposal corresponding to change in Project, materials, or methods of Work described in the Contract Documents if accepted by the Owner.
- H. A unit price is an amount stated in the bid proposal as a price per unit of measurement for materials or services as described in the Contract Documents.
- I. The term "day" is defined as calendar days unless otherwise specified.
- J. The term "Subordinate Parties" includes all of Contractor's employees, workers, laborers, agents, consultants, suppliers, sub-contractors or sub-subcontractors, at any tier, who perform, assist with or otherwise are involved in any of the Work.
- K. The term "Work" includes all work and responsibilities performed or to be performed by Contractor or its Subordinate Parties under the Contract Documents.

19. GENERAL CONDITIONS

- A. The submission of a bid proposal will be construed to mean that the Bidder is fully informed as to the extent and the character of the supplies, materials, or equipment and services required and a representation that the Bidder can furnish the item(s) in complete compliance with the Contract Documents.
- B. Before submitting a bid proposal, each Bidder shall make all investigations and examinations necessary to ascertain conditions, requirements and obstacles, if any exist, affecting the operation of the proposed services. Failure to make such investigations and examinations shall not relieve the successful Bidder from the obligation to comply, in every detail, with all provisions and requirements of this RFP nor shall it be a basis for any claim whatsoever for alteration in any term or payment required by the Contract.
- C. No alteration, erasure, or addition is to be made to the Bid Proposal Form or other Contract Documents. Deviations from the Contract Documents must be set forth-in space provided on the Bid Proposal Form.
- D. The Owner intends to communicate with Bidders via email or Building Connected (e.g. RFP clarifications and addenda). Except for the delivery of the Proposal itself, references in this RFP to "written" form of communication include e-mail.

- E. Any decision made by the Owner, including Bidder selection, shall be final.
- F. Products and services which are not specifically requested in this RFP, but which are necessary to provide the functional capabilities proposed by the Bidder, shall be included in the Bid Proposal.
- G. Each Bidder submitting its Proposal releases the Owner from any and all claims arising out of, and related to, this RFP process and selection of a Bidder.
- H. A recipient of this RFP is responsible for any and all costs and liabilities incurred by it or others acting on its behalf in preparing or submitting a Proposal, or otherwise responding to this RFP, or any negotiations incidental to its Proposal or this RFP.
- I. The Bidder certifies that its Proposal is made without any previous understanding, agreement or connection with any person, firm or corporation making a Proposal for the same equipment and/or services and is in all respects fair, without outside control, collusion, fraud or otherwise illegal action.
- J. The material/equipment specifications should be considered as a minimum requirement. Any deviations from the standard specified will be considered only when fully described and accompanied by descriptive literature and samples.
- K. All equipment must be supplied directly from the manufacturer with manufacturer standard components. No mixing of products or components from various manufacturers will be accepted, unless approved by the Owner.
- L. Bidders must pass through all rebates, incentives, warranties, and licenses purchased through this RFP and not require the Owner to file with a manufacturer.
- M. All components must be identical in similar systems purchased for each implementation phase.
- N. All prices bid must be "per unit" as specified.
- O. Prices shall be net, including transportation and delivery charges fully prepaid by the Contractor to destination indicated in the Contract Documents. If award is made on any other basis, transportation charges must be prepaid by the Contractor and added to the invoice as a separate item. In any case, title shall not pass until item(s) have been delivered and accepted by the Owner, in its sole determination.
- P. The Owner's operations must continue uninterrupted throughout the Project. Certain portions of the Work must be performed and completed in such order so as to permit the orderly operation of the Owner's activities. Each bidder shall review the work of their particular bid category, and all other bid categories to assure proper coordination to complete their Work per schedule.
- Q. A survey of the site will be conducted, and documented by the Contractor, to determine current site conditions. The Contractor shall be responsible to repair any damage to the site, which occurs during this Project.
- R. Contractors and their Sub Contractors shall park their work vehicles in the area(s) designated for parking. Contractors and their Sub Contractors shall not park or drive on sidewalks or grassy areas.
- S. Contractors will submit daily report of all activities through AutoDesk Build or in the format approved by the BMB. Report will document site location, Work complete, commissioning checklists (if applicable), staffing levels (onsite and total), open issues, photos of completed Work, etc.
- T. Contractors will attend all meetings required by the Owner or BMB including planning meetings, coordination meetings, construction meetings, progress meetings (anticipate weekly during planning and implementation), etc.
- U. Contractors will attend construction meetings facilitated by the construction manager when the work is part of a larger construction/renovation project.

20. ACCEPTANCE AND REJECTIONS OF BID-PROPOSALS

- A. It is the intent of the Owner to award a contract to the lowest responsible Bidder whose Bid Proposal meets the criteria of the evaluation committee, provided the bid proposal has been submitted in accordance with the requirements of the RFP and does not exceed the funds available. The Owner has not had the opportunity to review all of the products listed in this RFP, during the post-bid proposal process the Owner will also review products bid to evaluate product suitability, initial cost, and ongoing costs.
- B. Although cost must be considered (for both eligible and non-eligible goods and services), other factors will influence the awarded Bidder. The Owner, at its sole discretion, shall determine whether particular Bidders have the qualifications to perform the scope of Work. In determining whether a Bidder possesses the basic qualifications Owner may consider, but not be limited to: references, whether provided by the Bidder or acquired independently by the Owner; Bidder and manufacturer's reputation for performance and service; product availability; longevity of service (number of years); previous experience with similar projects; years of continuous business; commitment to schedule and completion date; financial condition; Bidder's current workload; product availability; features and benefits of the proposed solution; alternates and voluntary alternates; product life cycle; warranty, etc.
- C. The Owner reserves the right to make awards within 3 months after the date bid proposals are due during which time Bid Proposals may not be withdrawn, unless the Bidder distinctly states in its bid proposal that acceptance thereof must be made within a shorter specified time.
- D. Owner reserves the right to negotiate further with the successful Bidder.
- E. The Owner reserves the right to accept or reject any and all bid proposals. Owner also reserves the right to reject for cause any bid proposal in whole or in part; to waive technical defects; qualifications; irregularities; and omissions if in its judgment the best interest of the Owner will be served.
- F. Bid proposals are considered irregular and may be rejected for any of the following reasons unless otherwise provided by law:
 - 1. If bid proposal form furnished is not used, altered, or incomplete.
 - 2. If there are unauthorized additions, qualifications, conditions or irregularities of any kind this may make the bid proposal incomplete, indefinite or ambiguous as to its meaning.
 - 3. If Bidder adds any provisions reserving right to accept or reject any award of contract.
 - 4. If unit or lump sum prices or alternates contained in the bid schedule are obviously unbalanced either in excess of, or below, reasonable cost analysis values.
 - 5. If Bidder fails to complete bid proposal form in any other particulars where information is requested so bid proposal form may be properly evaluated.
 - 6. If bid security does not accompany bid proposal form.
 - 7. If the Familial Disclosure Affidavit, Criminal Background Check Affidavit, or the Iran Economic Sanction Affidavit does not accompany bid proposal form.
- G. Bidder's lack of responsibility as revealed by submitted information on either experience, or equipment statements.
- H. Bidder's lack of expertise as shown by past work and judged from the standpoint of workmanship and performance history.
- I. If any pertinent instructions to bidders are not fully complied with.
- J. The Owner shall have the right to waive any informality or irregularity in any bid proposal or bid proposals received and to accept bid proposal or bid proposals which, in their judgment, is in their best interest.

- K. The Owner shall have the right to accept alternates in any order or combination and to determine the low Bidder based on the sum of the base bid proposal and the alternates accepted.

21. GUARANTEES BY THE CONTRACTOR

The Contractor guarantees:

- A. Their products against defective material or workmanship and to repair or replace any damaged material/equipment or marring occasioned in transit or assembly when installation is specified.
- B. That all delivered material/equipment shall be as bid. No substitutions will be accepted unless prior to delivery material/equipment has been inspected by the Owner and found to be equal to the item specified.
- C. That all material/equipment or furniture offered is standard, new, latest model of regular stock product or as required by the Contract Documents, with parts regularly available for the type of equipment or furniture offered; also that no attachment or part has been submitted or applied contrary to manufacturer's recommendations and standard practice. All equipment must be guaranteed against faulty material and workmanship, and a manufacturer's warranty indicating the warranty or guarantee period must be available at time of delivery or acceptance.
- D. That he/she has carefully checked the enclosed figures and understands that he/she shall be responsible for any error of omission in this Bid Proposal.
- E. Contractor's employees assigned to provide Work hereunder shall be fully certified, licensed and approved as necessary to lawfully perform the Work.

22. ON-SITE SAFETY AND LOSS CONTROL PROGRAM

A. General Requirements:

- 1. In addition to the requirements set forth below, the Contractor shall comply with all terms, conditions and provisions of all applicable laws. Contractor will also be required to follow any Project requirements established by the Construction Manager.
- 2. Contractors shall take the safety orientation remotely. The link to the safety orientation video is <https://vimeo.com/505422173/5dc2540f34> Contractor will send email to brian.beck@bartonmalow.com each time a new employee starts on site verifying they have completed the safety orientation video.
- 3. Contractor must submit information for any safety incidents as a requirement for payment processing.
- 4. The Contractor shall assign an individual to act as Safety Representative who will have the responsibility of resolving safety matters and acting as a liaison among Contractor, BMB and the Owner. The Safety Representative must be a person who is capable of identifying existing and predictable hazards in surroundings that are unsanitary, hazardous or dangerous to employees, and has the authority to take prompt corrective measures to eliminate them. The Safety Representative must meet the standards for a competent person under applicable law when required (scaffolding, confined spaces, etc.) and be on site full time. The Safety Representative or an alternate must attend periodic safety meetings as directed by BMB.
- 5. Contractor, through its site supervisors and/or Safety Representative, shall attend a pre-construction meeting where planning for safe execution of the Project will be addressed.
- 6. All on-site employees of either Contractor or its Subordinate Parties are required to report any unsafe act or condition and any work-related injuries or illness immediately to a supervisor. If the act or condition can be safely and easily corrected, the employee or supervisor shall make the correction.

7. Contractor shall inform BMB immediately of the arrival of any federal or state inspector or compliance officer prior to touring the site. Any reports, citations, or other documents related to the inspection shall be provided promptly to BMB.
8. Contractor shall be responsible for payment of all safety-related citations, fines and/or claims arising out of or relating to its Work levied against the Owner, BMB or any of their respective employees or affiliates.

B. BMB Requirements

1. Work crews shall conduct a Job Hazard Analysis (JHA) discussion to plan for safe performance before beginning any Work task. Contractor is encouraged to prepare a written record of each JHA.
2. All workers, management and visitors shall wear approved hard hats, safety glasses, gloves, and high visibility vests while on site within construction areas.
3. Sleeved shirts (minimum of four inches), long pants, and durable work boots are required minimum clothing.
4. Personal cell phones are not to be used on construction sites except to report an emergency or on approved break time. Use of business cell phones must not interfere with jobsite safety. The use of camera features on cell phones is strictly prohibited.
5. Personal radios or music players with earphones are not permitted.
6. All persons working at elevations of six feet or greater must have 100% continuous fall protection. Engineering controls are preferred, but personal fall arrest systems are also permissible. An exception is permitted for safe use of ladders up to 24 feet long.
7. Contractor is responsible to repair or restore any barricade that it modifies or removes.
8. Class III (household) stepladders are prohibited; metal ladders are strongly discouraged.
9. All scaffolds must be checked daily and before each use for safety compliance. Scaffolds shall never be left in an unsafe condition and must be removed and/or disabled immediately, if not to be used again.
10. Keep equipment at least 15 feet from energized power lines.
11. Electrical, pneumatic, and other energy systems that could be accidentally energized or started up while Work is in process must be locked out (not merely tagged out).
12. Only fire retardant materials may be used to build shanties or other temporary enclosures inside of buildings finished or under construction. Shanties shall be continually policed by their occupants to prevent the accumulation of waste or other combustibles.
13. Engineering controls must be used to restrain silica dust per applicable law.

C. Contractor’s Safety Submittals

1. Contractor shall provide copies of the following written safety submittals to BMB at the times indicated:

| Submittal | Timing |
|--|-----------------------------|
| Safety Certificate, Barton Malow Form SAF 6.3.3.3 | Before on-site Work begins |
| Site-specific Safety Program, including substance abuse policy, hazard communication program, and Material Safety Data Sheets (MSDS) , Barton Malow Form SAF 6.3.2.1 | Before on-site Work begins |
| Tool Box Talk Reports | Weekly |
| Incident Reports (OSHA form 301 or equivalent) | Within 24 hours of incident |

2. BMB's receipt of any, all or none of the foregoing from Contractor does not constitute approval thereof or permission to deviate from the requirements of the Contract Documents and applicable law.
3. Contractor will allow inspection of, and BMB may request copies of, any and all safety-related documents and records in its possession relating to the Project.

D. BMB's Rights

1. Safety Hazard Notifications may be issued to the Bidder when an unsafe act or condition is reported or observed. BMB shall not be required to supervise the abatement or associated reprimand of unsafe acts or conditions within a Contractor's scope of Work as this is solely the responsibility of Contractor. Nevertheless, BMB has the right, but not the obligation, to require Contractor to cease or abate any unsafe practice or activity it notices, at Contractor's sole expense.
2. Contractor's failure to comply with the contract safety requirements will be considered a default of the Contract Documents and may result in remedial action including, but not limited to, withholding of payment of any sums due or termination.
3. BMB's failure to require the submission of any form, documentation, or any other act required under the Contract Documents shall not relieve the Contractor from any of its safety obligations.
4. Nothing in the Contract Documents makes BMB responsible or liable for protecting Contractor's employees and other Subordinate Parties or assuring or providing for their safety or preventing accidents or property damage.
5. All requirements referenced above are binding on Bidder and all of its Subordinate Parties, even where such requirements may exceed the standards of applicable law.

23. HAZARDOUS MATERIALS

- A. When use or storage of flammable, volatile or other Hazardous Materials or System(s) or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. As used in this RFP, "Hazardous Materials" means asbestos; cadmium; chlorofluorocarbons; chromium VI; hydrochlorofluorocarbons; lead; mercury; nickel; polybrominated biphenyls; polychlorinated biphenyls and terphenyls; azo colorants, aromatic amines and azo dyes; halogenated flame retardants and additives; tributyl tin, tributyl tin oxide and triphenyl tin; polychlorinated naphthalene; antimony; arsenic; beryllium; bismuth; phthalates; selenium; ozone depleting substances; chloroparaffins; polyvinyl chloride; halogenated plastics or polymers; expanded polystyrene foam; any materials containing such substances; compounds of such substances, including, but not limited to, their ethers and oxides; molds; and any other chemical, material, or substance subject to regulation as a hazardous material, hazardous substance, toxic substance, or otherwise, under applicable federal, state, or local law, and any other chemical, material, or substance that may have adverse effects on human health or the environment.
- B. Contractor must provide OSHA/EPA certified hazardous material awareness training (notably asbestos and lead) for all employees working onsite that will be disturbing the existing surfaces.
- C. Each Contractor shall be constantly aware of the possible discovery of Hazardous Materials. Should Contractor encounter any Hazardous Material or suspected Hazardous Material, the Contractor shall immediately stop Work in the area affected and report the condition.
- D. If the Contractor encounters any Hazardous Material or suspected Hazardous Material, the Contractor agrees to immediately initiate the required procedures of the Environmental Protection Agency (EPA), and/or state or local agencies having jurisdiction to protect any and all persons exposed to the affected areas or adjacent areas affected.
- E. Contractor is fully responsible for all Hazardous Materials it creates or releases in connection with, or brings to, the Project.

- F. Each Contractor shall be responsible to bind ALL of its personnel and its Subordinate Parties to the provisions in the Contract Documents related to hazardous materials and to instruct each employee of its own duty to report any and all suspected Hazardous Materials and to comply with all applicable laws.
- G. Absolutely no material shall be brought on or to the Project Site that does not have a manufacturer's label stating contents.
- H. The Contractor shall comply with all applicable federal and state laws, rules, ordinances and regulations regarding transportation, storage, spills, releases, and disposal of Hazardous Materials.
- I. No asbestos or asbestos-containing material will be brought to the jobsite or incorporated into the Work by Contractor or its Subordinate Parties.

24. EQUAL EMPLOYMENT OPPORTUNITY

- A. It is the Owner's policy not to discriminate against any employee, applicant for employment, contractor, or material supplier, because of race, religion, national origin, ancestry, or sex.
- B. Contractor understands that any agreement with the Owner shall be in consideration of maintaining the above mentioned non-discrimination policy.
- C. Contractor understands that they may be required to submit further information covering the race, color and work classification for our employees and those of subcontractors to be employed on this Project.

PART II – ATTACHED DOCUMENTS

The following documents are included with the bid documents:

1. Agreement for Purchase and Installation of Technology System(s)
2. Affidavit of Compliance – Iran Economic Sanctions Act
3. Familial Disclosure Affidavit

PART III – DRAWINGS AND SPECIFICATIONS

This Request for Proposal includes the following drawings and specifications. Specifications are intended to define the level of quality and performance of the requested equipment/service and not to be restrictive. All variations from the specified items shall be fully explained and included with the bid proposal. Manufacturer names and manufacturer product numbers are to be used in all cases. All prices quoted shall be on a unit basis. The determination of the Bid Evaluation Committee as to what alternates are equal shall be final and conclusive.

A. Specifications

- 27 0000 General Technology Requirements
- 27 1000 General Cabling Requirements
- 27 1500 Data and Voice Horizontal Cabling
- 27 2100 Network Infrastructure
- 27 2110 Wireless Infrastructure

AGREEMENT FOR PURCHASE AND INSTALLATION OF TECHNOLOGY SYSTEM(S)

This Agreement for Purchase and Installation of Technology System(s) (this "Agreement") is made as of the ____ day of _____, 202_ (the "Effective Date"), by and between:

Troy School District (the "Owner")
4400 Livernois Rd.
Troy, Michigan 48098

and

Name (the "Contractor")
Address
City, State ZIP

Recitals

- A. As set forth in the Contract Documents (as defined below), Owner desires to have the System(s) (both Contractor-furnished and/or Owner-furnished) installed at the site of the Project (the "Project Site"), and Contractor desires to provide the System(s) to Owner and provide all necessary equipment, components, materials, documentation, labor, migration services, testing, and other related Services for its installation and configuration, as required in the Contract Documents, based on the terms and conditions set forth in this Agreement.

Agreement

Now, therefore, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Owner and Contractor agree as follows:

1. Contract Documents.

- 1.1 As used in this Agreement, the "Contract Documents" include the following documents, which are incorporated herein by reference into this Agreement:

(a) this Agreement;

(b) the Bid Package ___ documents dated _____ (the "RFP") assembled by Barton Malow Builders, LLC ("BMB"), on behalf of the Owner, for the labor, materials and services required for the Contractor to complete the scope of work in accordance with the Contract Documents for the Project (collectively, the "Work"). Contractor is being awarded the following bid categories: _____;

(c) addenda issued during the bid period: _____;

(d) post-bid review form dated _____;

(e) any graphic and pictorial representations showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams (collectively, the "Drawings");

(f) the written requirements for the System(s) and workmanship standards for the Work (collectively, the "Specifications");

(g) any written amendment to this Agreement signed by both parties;

(h) a written order for a minor change in the Work issued by BMB. or the Owner; and

(i) the Contractor's bid proposal in response to the RFP, including the Drawings and Specifications dated _____ except to the extent deviations or exceptions contained in the Contractor's bid proposal are not expressly accepted by the Owner in writing and incorporated into this Agreement ("Proposal").

- 1.2 The Owner and Contractor agree that where there is a conflict between terms of this Agreement and the other Contract Documents, this Agreement shall take precedence. However, the parties agree that where there is not a conflict between any of the terms and conditions contained in the above referenced Contract Documents, all the Contract Documents shall be binding upon both parties, except to the extent the deviations or exceptions contained in the Contractor's Proposal in response to the RFP are not expressly accepted by the Owner in writing and incorporated into this Agreement.

- 1.3 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

- 1.4 Unless otherwise stated in the Contract Documents, words that have well-known technical or industry meanings are used in the Contract Documents in accordance with such recognized meanings.

- 1.5 Because the Contract Documents are complementary, the Contractor shall, before starting the Work, carefully study and compare the various Drawings, Specifications, and other Contract Documents relative to the Work, as well as the information furnished by the Owner. These obligations are for the purpose of facilitating delivery and installation of the System(s) and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall report promptly to BMB any errors, inconsistencies, or omissions the Contractor discovers.
- 1.6 The Contractor's execution of this Agreement is a representation that the Contractor has reviewed the Contract Documents, visited the Project Site, become generally familiar with the conditions under which the Work is to be performed and correlated personal observations with the requirements of the Contract Documents and the Project Site's suitability for the Owner's intended use as such use relates to the Work.
- 1.7 The order of precedence for the Contract Documents will be as follows:
 - (a) this Agreement;
 - (b) the most recent version of any drawing, specification, change order, or clarification;
 - (c) the post bid review form, including any clarifications;
 - (d) the RFP and any issued addenda or clarifications;
 - (e) the Contractor's bid proposal.

2. Owner's Obligations

- 2.1 The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization with respect to the Contract Documents. Unless expressly provided in writing by the Owner, BMB does not have such authority.
- 2.2 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work after receipt from the Contractor of a written request for such information or services. However, the Contractor acknowledges that the Owner is a public body and that certain requests may require approval by its governing body.

3. Contractor's Obligations

- 3.1 The Contractor shall perform the Work in accordance with the Contract Documents in a good and workmanlike manner.
- 3.2 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of BMB in its administration of this Agreement or by tests, inspections or approvals required or performed by persons other than the Contractor.
- 3.3 This Agreement and the other Contract Documents set forth the terms and conditions upon which the Contractor will provide a "turnkey" solution for installation and operation of the System(s) for use by the Owner. The Contractor agrees that it will provide a complete "Turnkey Solution" to the Owner. The Contractor shall be responsible for the successful installation and operation of the System(s) in all phases of design, acceptance testing, and documentation of the System(s) as detailed in the Contract Documents.

4. Time

- 4.1 Unless otherwise directed by Owner in writing, within five (5) business days of the Effective Date of this Agreement, Contractor shall commence the Work. The Work may constitute the whole or a part of the Project regarding the System(s) required by the Contract Documents.
- 4.2 Contractor shall proceed expeditiously with adequate forces and shall complete the installation and configuration on or before _____ with any remaining post-install Work and documentation completed by _____ (the "Completion Date") with phases complete as shown in the RFP.
- 4.3 Time limits stated in the Contract Documents are of the essence of this Agreement. By executing this Agreement, the Contractor confirms that the completion date stated above provides a reasonable period for performing the Work.
- 4.4 In the event the Contractor is unable to adhere to the implementation schedule or complete the Work, the Owner shall have the option to terminate this Agreement, award the remaining Work to another contractor or negotiate a final Completion Date. In the event the Owner so terminates this Agreement and awards the remaining Work to another contractor, the Contractor shall be responsible for and shall hold Owner harmless from any costs or fees to complete the Work which exceed the amount of the Contract Sum remaining unpaid at the time of termination. If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for BMB's services and expenses made necessary thereby, and other damages incurred by the Owner in pursuing termination and completion of the Work, including actual attorney and legal fees and costs, and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. Contractor is required to immediately notify the Owner in writing of any conditions that are (or may) result in a delay, so they may be promptly remedied or accounted for. Contractor, other contractors, and consultants shall not be entitled to monetary recovery for delays in installation caused by failure of the Owner, Owner's employees or the Owner's independent contractors.

5. Contract Sum and Payments

5.1 The Owner shall pay the Contractor the sum of _____ and ___/100 Dollars (\$_____) in current funds, including all applicable taxes (collectively, the "Contract Sum"), for the Contractor's satisfactory performance of its obligations under the Contract Documents; provided, however, that the Contract Sum is subject to change, as provided in this Agreement. The Contract Sum is based on the following:

Bid Category(ies) Awarded:

| | | |
|----------------------------|--------------------------|-----------|
| Base Bid: | | \$ |
| Alternate X: | Description | \$ |
| Vol Alternate Y: | Description | \$ |
| Allowance: | Owner-Directed Allowance | \$ |
| Total Contract Sum: | | \$ |

The Contract Sum includes a \$XX,XXX.00 Owner allowance. The allowance may be used for additional services and equipment as directed by the Owner. Any unused portion of the allowance will be credited back to the Owner at project conclusion.

- 5.1.1 The Contract Sum will be adjusted using the alternate pricing submitted with the Contractor's Proposal to the RFP if the associated scope of work authorized in writing by the Owner is added to this Agreement.
- 5.1.2 The Project will use AutoDesk Build and/or AutoDesk BIM360 for documentation. Each Contractor will be charged 0.1% of their Contract Sum for using these products. Contractor will be invoiced directly at Project start-up with payment submitted prior to the start of Work.
- 5.1.3 The Contract Sum includes all costs associated with known and current COVID-19 impacts, including impacts on materials, the supply chain, labor, productivity and schedule.
- 5.2 Applications for Payment and all supporting documents (including but not limited to lien waivers, sworn statements, and the like) for Contractor, its Subcontractor(s), Sub-subcontractors and suppliers, shall be in electronic format and shall be submitted to BMB using the Oracle Textura Payment Management (TPM) system. Contractor shall be responsible for the fees and costs owed associated with Subcontractor's use of TPM. Contractor shall include a similar provision in its subcontracts and purchase orders. Fees to Contractors are calculated as 0.22% (22 basis points) of Contract Sum (plus applicable taxes), with a maximum fee of 5,000. Fees to Sub-subcontractors and suppliers are a fixed fee of \$100 per Sub-subcontractor or supplier contract.
- 5.3 Within fifteen (15) days of award or fifteen (15) days prior to the first payment application deadline, the Contractor shall submit to the Owner a quotation schedule showing the values allocated to each quotation for portions of the Work ("Schedule of Values"). The Contractor's Schedule of Values shall be broken down in a manner agreed to by the Owner and BMB and supported by such data to substantiate its accuracy as the Owner may require. This schedule, when approved by the Owner, shall be submitted with each Application for Payment and shall be used as a basis for reviewing the Contractor's Applications for Payment.
 - 5.3.1 The sum of the parts of the Schedule of Values shall equal the Contract Sum.
 - 5.3.2 The Schedule of Values shall have a direct and understandable relation to the Project phasing and major milestones.
 - 5.3.3 Bond costs, if applicable, and costs associated with the preparation of closeout documentation will be separated.
 - 5.3.4 A listing of approved and executed Change Orders to this Agreement, if any, will be listed in sequential order. Change Order costs are to be broken out as directed by BMB.
 - 5.3.5 The Owner or BMB shall have the right to require the Contractor to alter the value or add/delete categories listed on the Schedule of Values at any time. Typical reasons include the Schedule of Values being incorrect or unbalanced, revisions due to revised sequencing of the Project, or modifications made by Change Orders.
- 5.4 Unless otherwise specified by BMB, on or before the twentieth (20th) of the month, the Contractor may submit a draft of the Application for Payment. The Contractor is to invoice for Work completed from the twentieth (20th) of last month to the twentieth (20th) of the present month. Contractor's pay application shall only reflect Work completed through the date of submission. In no event will payments be authorized for forecasted or future Work.
- 5.5 With the draft information agreed upon by BMB and the Contractor, the Contractor will prepare a formal Application for Payment request via Textura before the twenty-fifth (25th) of the month, or as otherwise scheduled with the Project team. Late or incomplete application packets will not be accepted. Before submitting these documents to BMB, each request for payment must be signed by a duly authorized agent of the Contractor and notarized. The Contractor must include with each request for progress payment a waiver of lien for all previous payments, Contractor's sworn statement and any necessary backup data, Waivers of Lien and Sworn Statements. In addition, at submission of the final pay application Contractor shall provide unconditional final waivers of lien for all Subordinate Parties, as well as all documentation required.
 - 5.5.1 In requests for payment which follow the execution of a Change Order in excess of twenty-five percent (25%) of the Contract Sum, Contractor must present a bond rider evidencing that the penal sum of any required payment

and performance bonds have been increased to one hundred percent (100%) of the adjusted Contract Sum. Submission of the required back-up data is a condition precedent to payment. Payment will be issued by Owner check or ACH, as decided by the Owner.

- 5.6 No payment shall be issued to a Contractor for materials stored off-site unless approved in writing by the Owner. If approved, the Contractor will be required to provide additional documentation for the properly stored materials. If billing for stored materials is requested by the Contractor, the Contractor must review the additional requirements with BMB prior to submission on the Application for Payment.
- 5.6.1 "Properly stored" shall mean in an insured warehouse with the Owner and BMB being named as insureds, and all material identified as property of the Owner.
- 5.6.2 Contractor shall provide BMB and the Owner verification in writing for all material so stored. Such materials shall be protected from diversion, destruction, theft, and damage to the satisfaction of BMB, Owner and the lender (if any), specifically marked for use on the Project, and segregated from other materials at the storage facility.
- 5.6.3 The Contractor bears all risk of loss to materials and equipment stored off site.
- 5.6.4 Contractor is to provide supporting documentation in the form of invoices, insurance policies, and any other pertinent documentation as requested by BMB or Owner for items the items stored off-site. Documentation shall include the following:
- .1 Detailed description of the material including quantities that will serve as a material description for the billing and as information to file a claim with an insurance company.

Stored Materials - Each item must be identified as to manufacturer, model number, and serial number, if applicable, or other identifiers should be listed for each item. Each listing must be accompanied by invoices, shipping tickets, consent of surety, and any other applicable supporting documentation.

Stored Manufactured Building Materials - Each item must be identified as to type, manufacturer's number or designation, and should also list the number of cartons and the contents therein storage. Each listing must also be accompanied by supporting documents including all invoices, shipping tickets and consent of surety.

Stored Fabricated Materials - A listing specifying the number of pieces, items, and marks as may be applicable to the particular type of items. Photographs should accompany the request.
 - .2 Individual itemized costs of materials and the total cost value, which shall not exceed the Contractor's subcontractor or material supplier cost. The total cost value shall be supported by the Contractor's subcontractor or material supplier invoices for the stored material.
 - .3 Estimated cost value for those materials that are fabricated by the Contractor's subcontractor or material supplier.
 - .4 The location where the material is physically stored, including the warehouse address and storage location within the warehouse, such as bin number, aisle number or other designation. All material shall be segregated and marked.
 - .5 Copies of the insurance policies that cover the stored materials and that name BMB and the Owner as insureds. The limit of the insurance policy shall be equal to or greater than the replacement value of the stored materials.
- 5.6.5 When Applications for Payment include products stored off the Project Site or stored on the Project Site but not incorporated in the Project, for which no previous payment has been requested, a complete description of such product shall be attached to the application.
- 5.6.6 Contractor shall submit a certificate of title listing the Owner's ownership in the off-site stored materials equal to the amount paid effective at the time funds are delivered.
- 5.6.7 If the size, quantity, and/or type of material or product is such that a bonded warehouse is deemed unsuitable, then, with BMB's approval, the Contractor may elect to prepay its subcontractor or supplier for certain material and products which are to remain on and be stored on that subcontractor/supplier's premises until needed by the Project. In such event, the Contractor shall enter into a security agreement with the subcontractor/supplier under which the Contractor shall be granted a security interest in and to all such material and products fabricated and/or to be supplied by the subcontractor/supplier for this Project and stored on the subcontractor/supplier's premises. This Security Agreement shall be a part of the financing statement, which shall be presented to a filing officer for filing pursuant to the Uniform Commercial Code. All expenses incurred in obtaining this security agreement shall be at Contractor's sole cost and expenses, and shall not accrue to the Owner, BMB, nor the Project. A copy of every security agreement shall be filed with BMB with the first Application for Payment which requests payment for such material or products.
- 5.6.8 All payment requests for off-site stored materials must be accompanied using the "Payment Request for Stored Materials" and a "Subcontractor Affidavit for Stored Materials." Payment requests for stored materials not complying with the foregoing requirements will not be approved. Contractors are to notify the BMB in ample time to conduct verification procedures.
- 5.6.9 Contractors may not apply the cost of materials stored off-site towards a reduction in the retention amount.

- 5.6.10. Representatives of BMB, Owner and the lender (if applicable) shall have the right to make inspections of the storage areas at any time.
- 5.7 Owner shall be entitled to withhold ten (10%) percent of each payment due to a Contractor until the punchlist has been completed and five (5%) percent until all closeout documents have been submitted.
- 5.8 Each Application for Payment shall be based on the payment terms as described in this Section and shall be prepared in such form and supported by such data to substantiate its accuracy as the Owner may require.
- 5.9 Second and final payments must be accompanied by lien waivers from the Contractor, its Subordinate Parties or receipted invoices covering payment to the Contractor for previous billings. Lien waivers must be unconditional and must show the amount paid.
- 5.10 An "Acknowledgment of Payment and Partial Unconditional Release" will be provided by BMB to be signed by an authorized representative of the Contractor. Under no circumstances will payment be released to the Contractor until the completed "Acknowledgment of Payment and Partial Unconditional Release" has been submitted and signed by the Contractor from the previous month.
- 5.11 Final payment will not be made until an Unconditional Final Release and Waiver has been submitted. This will also be distributed by BMB for Contractor signature and must be returned by the Contractor. The Unconditional Final Release and Waiver must be signed by an authorized representative of the Contractor and must be notarized.
- 5.12 An Unconditional Final Release and Waiver will be required from all of Contractor's Subordinate Parties (e.g. suppliers) and must be submitted along with the Unconditional Final Release and Waiver, before payment can be made.
- 5.13 Provided an Application for Payment is submitted to BMB and approved not later than the date specified in 5.5, the Owner's payment to the Contractor will be issued not later than 45 days from the date the approved invoice is received by the Owner, unless and to the extent reasonably disputed by the Owner in good faith. Disputes regarding requests for payments will be communicated to Contractor by Owner, in writing, within thirty (30) days of the receipt of Application for Payment. Payments will not be delayed unless Contractor is unable to resolve the matter to Owner's satisfaction ten (10) days prior to payment due date.
6. Taxes, Permits, Fees and Notices
- 6.1 The Contract Sum is inclusive of any applicable taxes. The Owner, however, is a tax-exempt entity except if the Project makes additions and/or enhancements to real property. The Contractor shall pay all required sales, consumer, use and similar taxes for the Work provided by the Contractor.
- 6.2 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work which are customarily secured after execution of this Agreement, and which are legally required as of that date.
- 6.3 The Contractor shall comply with and give notices required by all applicable laws, ordinances, rules, regulations, and lawful orders of public authorities.
7. Supervision of the Work
- 7.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention, will adhere to professional standards, and will perform all Work in a manner consistent with generally accepted proficiency and competency for the type and nature of Work rendered. The Contractor shall be solely responsible for and have control over the means, methods, techniques, sequences and procedures of completing the Work and for coordinating all portions of the Work under this Agreement, unless the Contract Documents give other specific instructions concerning these matters.
- 7.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors, Sub-subcontractors, Suppliers, and their agents and employees, and other persons or entities performing or providing portions of the Work to, for or on behalf of, the Contractor or any of its Subcontractors.
- 7.3 The Contractor shall not contract with a proposed Subcontractor, person or entity to whom the Owner or BMB has made reasonable objection or change a Subcontractor, person or entity previously selected if the Owner or BMB makes reasonable objection to such change. If the Owner or BMB has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or BMB has no reasonable objection.
- 7.4 By appropriate written agreement, each Subcontractor to the extent of the Work to be performed by the Subcontractor, shall agree to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by the Contract Documents, assumes toward the Owner and BMB. Each subcontract agreement shall preserve and protect the rights of the Owner, Construction Manager, Technology Designer, and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with persons or entities who have a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site (each, a "Sub-Subcontractor").
- 7.5 All contracts between Contractor and Subcontractors and Subcontractors and Sub-subcontractors shall be in writing and shall specifically provide that the Owner is an intended third-party beneficiary of such subcontracts. Each such agreement

shall also be assigned to the Owner, provided, that (a) assignment is effective only after termination of this Agreement by the Owner and only for those agreements which the Owner expressly accepts by notifying the Subcontractor or the Sub-Subcontractor in writing; and (b) assignment is subject to the prior rights of the surety, if any, obligated under bond relating to this Agreement.

8. Labor and Materials

8.1 Contractor shall provide and pay for any labor, materials, tools, machinery, delivery, installation and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated into the Work.

8.2 The Contractor shall not make substitutions until after evaluation by BMB and written approval by the Owner.

9. Indemnification

9.1 Contractor shall indemnify, defend and hold harmless the Owner, its Board of Education, its Board Members, in their official and individual capacities, its administrators, employees, contractors and agents, including BMB and BMB's employees, contractors and agents, from and against any and all claims, counter claims, suits, debts, demands, actions, judgments, liens, costs, expenses, damages, injuries, losses and liabilities, including attorney's fees and expert witness fees, arising out of, in connection with or resulting from: (i) the negligent acts, omissions or willful misconduct of the Contractor, its officers, directors, employees, agents, Subcontractors and Sub-Subcontractors at any tier, and their respective agents and employees, and other persons performing portions of the Work for, or on behalf of, the Contractor; (ii) any breach of the terms of this Agreement by the Contractor, its officers, directors, employees, agents Subcontractors and Sub-Subcontractors at any tier, and their respective agents and employees, and other persons performing portions of the Work for, or on behalf of, the Contractor; (iii) any violation or breach of any applicable law and/or licensing and permitting requirements applicable to providing the Work; or (iv) any breach of any representation or warranty by the Contractor, its officers, directors, employees, agents and Subcontractors and Sub-Subcontractors at any tier, and their respective agents and employees, and other persons performing portions of the Work for, or on behalf of, the Contractor under this Agreement. Contractor shall notify the Owner by certified mail, return receipt requested, immediately upon knowledge of any claim, suit, action, or proceeding for which it may be entitled to indemnification under this Agreement. This Section shall survive the expiration or earlier termination of this Agreement and shall not be limited by the Contractor's insurance obligations contained in this Agreement. The Contractor's indemnification responsibilities herein are applicable on a comparison basis of fault. If any portion of this Section is deemed illegal or unenforceable, it shall be interpreted to remain enforceable to the fullest extent permitted by law in light of the parties' original intent.

9.2 In claims against any person or entity indemnified under this Section by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 9.1 of this Agreement shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

9.3 Contractor warrants that the transfer to Owner and the Owner's use of any and all software and related documentation and that the manufacture, installation or sale by Contractor of any System(s) or use thereof by Owner required for the Work pursuant to the Contract Documents will not infringe any proprietary rights (including patents, copyrights, trademarks, service marks, trade secrets or other ownership rights) of any other entity. To the fullest extent permitted by law, Contractor shall indemnify, defend and hold harmless the Owner, its Board of Education, its Board Members, in their official and individual capacities, its administrators, employees, contractors and agents, BMB, BMB's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from any breach of the foregoing warranty, provided that the party seeking indemnification under this Section notifies Contractor in a timely fashion of such claim. In the event a claim of infringement is asserted, Contractor may (a) replace or modify the software and related documentation transferred to Owner, so long as Owner agreed that such replacement or modification achieves the substantive results of the original versions provided, or (b) procure, at its expense, appropriate licenses for Owner to use the rights allegedly infringed. If (a) or (b) are not commercially feasible, Contractor will refund all monies paid to the Contractor for the software, System(s) and related documentation. The Contractor shall also pay to the Owner all reasonable related losses related to the software, System(s) and related documentation and for all reasonable expenses related to the installation and conversion to the new software, System(s) and related documentation. Such obligation of Contractor shall not be construed to negate, abridge or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section.

10. Title and Risk of Loss

10.1 Notwithstanding the provisions of Section 14 of this Agreement, title to all System(s), including any software, software configurations, components and systems associated with such System(s), together with their respective titles, license numbers, serial numbers and associated use, maintenance and operating manuals, as required by the Contract Documents, shall be transferred to the Owner upon Acceptance and payment of amounts due, free and clear of all liens, encumbrances, claims and charges of any kind or nature.

10.2 The risk of loss, with respect to all System(s) provided by the Contractor, shall remain on the Contractor until title to the System(s), or designated portion thereof, is transferred to the Owner pursuant to Section 10.1 of this Agreement.

10.3 The Owner shall be under no obligation to ensure any System(s) that does not conform to the Contract Documents or has been rejected by the Owner. Under such circumstances, the risk of loss shall remain with the Contractor.

11. Clean Up

- 11.1 The Contractor shall keep the Project Site and surrounding area free from accumulation of waste materials and other debris created by operations required of the Contractor under the Contract Documents. At completion of the Work, the Contractor shall remove or cause to be removed from and about the Project Site all waste materials and other debris created by Contractor's activities, tools, system, machinery and surplus materials, including, but not limited to, any and all packing materials for the System(s).
- 11.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so with its own or separately contracted forces, and, in either case, the cost thereof shall be charged to the Contractor.
- 11.3 The Contractor is responsible for providing a dumpster for all demolition and construction debris, or responsible for taking the debris off-site for disposal or recycling. The Owner's dumpster can only be used for minor debris.

12. Delivery

- 12.1 Contractor shall become fully informed of the conditions relating to delivery, installation, and labor under which the Work will be performed. Contractor shall employ such labor and means and methods of carrying out the Work as are required by such conditions.
- 12.2 Delivery and installation of all System(s) shall be made to the location or locations specified by the Owner and confirmed by the Contractor in writing. The Contract Sum includes all costs for delivery of the System(s) under this Agreement, whether accomplished in single or multiple deliveries. Installation of System(s) shall include testing as required by the Contract Documents.
- 12.3 Delivery of the System(s) shall also include delivery to Owner in electronic and written form compiled code and original source code, together with applicable documentation, for any software or software configuration that has been custom-configured for the Project or is otherwise not commercially available to the general public,.
- 12.4 Contractor shall consult with Owner and BMB to identify the route to be used within the Project Site from the point of initial delivery to the place of final placement and/or installation. After its selection, the route shall be made available for delivery of System(s) as provided in the Contract Documents.
- 12.5 Contractor shall, within a reasonable time prior to delivery, provide the Owner and BMB with schedules for access and arrange for the use of elevators and unloading facilities as required.

13. Installation

- 13.1 Any access to the Owner's facilities, data network, telecommunications network, proprietary network, systems and/or components necessary for the installation required by the Contract Documents shall be limited to specifically designated areas defined by Owner in writing for a specified, limited period of time, as required for the Work related to the Project.
- 13.2 Contractor shall keep all security, confidential information, data, network, systems, access privileges and passwords of Owner (collectively, the "Confidential Information") in strictest confidence and shall use its best efforts and utmost diligence to safeguard Owner's Confidential Information and to protect it against disclosure, misappropriation, misuse, espionage, loss, and theft. Contractor shall notify Owner immediately in the event of any breach or threat of breach of the Confidential Information.
- 13.3 Contractor shall change initial administrator accounts, password, etc. and disable guest accounts unless directed otherwise by the Owner in writing. Contractor shall terminate all temporary user logins and passwords created to complete the Project upon termination of Contractor or completion of the Project. Contractor shall notify Owner and obtain Owner's consent to any "back door" methods of System(s) entry upon termination of Contractor or completion of the Project; in the event Owner does not approve any such entry, Contractor shall eliminate all such methods as a condition to final payment.
- 13.4 All installation included in the Work shall comply with all rules, regulations, requirements and/or standards established by the National Electric Code, the Underwriters Laboratory and all applicable building, fire and safety codes.
- 13.5 When the Contractor considers installation of all or a designated portion of the System(s) required by the Contract Documents to be complete, Contractor shall advise the Owner and BMB in writing.

14. Acceptance

- 14.1 Prior to the tender of delivery by the Contractor, the Owner may conduct a preliminary inspection of the System(s) for the purpose of verifying the delivery of the System(s), including an inventory of quantities. Such preliminary inspection shall not, however, constitute an acceptance of, taking charge over or control of such System(s). Any defects, damages, deficiencies, or nonconformity discovered by the Owner shall be reported to the Contractor.
- 14.2 Upon completion of delivery and installation of the System(s), the Owner, shall conduct an acceptance inspection, including, but not limited to, an inventory of the System(s). If the Owner determines that the System(s) complies with the requirements of the Contract Documents, the Owner shall notify the Contractor that the System(s) has been accepted. If the Owner determines that all or any portion of the System(s) does not conform to the requirements of the Contract Documents, the Owner shall reject such nonconforming portion by notifying the Contractor in writing of such rejection.

- 14.3 If the Owner rejects all or any portion of the delivery, the Owner shall notify the Contractor within a reasonable time, which shall not be more than ten (10) days after the date of the Owner's inspection of the delivery, and such notice shall include the specific basis for rejection.
- 14.4 If the Owner rejects all or any portion of the delivery, the Owner shall hold such portion for a reasonable time to permit such portion to be removed from the Project Site by the Contractor at Contractor's sole cost and expense.
- 14.5 Upon rejection by the Owner, the Contractor shall have ten (10) days to provide acceptable evidence of arrangements to remedy the basis for rejection. If the Contractor remedies the basis for rejection, the Contractor shall notify the Owner in writing. The Owner shall have an additional period to conduct an acceptance inspection of the previously rejected System(s). If the Owner agrees to accept the System(s), the Owner shall so notify the Contractor in writing. If the Owner rejects the tender of such System(s), the Owner shall notify the Contractor within a reasonable time, which shall not be more than ten (10) days. Such notice shall include the specific basis for rejection. Upon rejection, the Contractor shall remove the rejected System(s) from the Project Site at Contractor's sole cost and expense.
- 14.6 If System(s) that has been previously accepted is found not to comply with the requirements of the Contract Documents, the Owner shall be entitled to revoke acceptance. Such revocation of acceptance shall be made by giving prompt notice to the Contractor. In such event, the Contractor shall proceed in accordance with Section 14.4
- 14.7 The provisions of this Section do not limit or supersede the provisions of Section 10 or preclude recovery of damages as provided by law.
- 14.8 The System(s) proposed shall be defined to be finally accepted by Owner after meeting all requirements of this Agreement, and other Contract Documents. The Owner or BMB shall be the sole judge of whether all conditions for final acceptance have been met.

15. Warranties

- 15.1 The Contractor expressly warrants to the Owner and BMB that the System(s) and the Work comply with the requirements of the Contract Documents. The Contractor further warrants that the Owner shall receive the benefit of standard manufacturer's warranties and guarantees applicable to the Work and the System(s).
- 15.2 The Contractor provides to the Owner and BMB all warranties relating to the System(s) implied by law, including but not limited to the warranty of merchantability and fitness for a particular purpose.
- 15.3 The Contractor acknowledges that no exclusion of or limitation on warranties contained in Contractor's Proposal, product literature or other submittal shall affect the warranties provided pursuant to this Section.
- 15.4 During the warranty period, the Contractor will, without charge to Owner, correct any defects in the System(s) providing modifications and adjustments to the System(s) as may be necessary to keep the System(s) in operating order.
- 15.5 All warranties shall survive the expiration or termination of this Agreement.
- 15.6 All warranties are effective from the date of final acceptance of the System(s) unless a different date is agreed to by the Owner in writing.
- 15.6.1 The Contractor will provide written documentation of manufacturer's warranty and end date.

16. Claims and Disputes

- 16.1 As used in this Agreement, a "Claim" is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Agreement terms, payment of money, extension of time or other relief with respect to the terms of this Agreement. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to this Agreement. Claims must be initiated by written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.
- 16.2 Claims by either party must be initiated within twenty-one (21) days after occurrence of the event giving rise to such Claim or within twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims must be initiated by written notice to BMB and the other party.
- 16.3 Pending final resolution of a Claim, the Contractor shall proceed diligently with performance of this Agreement, and the Owner shall continue to make payments in accordance with the Contract Documents.
- 16.4 The Contractor waives Claims against the Owner for consequential damages arising out of or relating to this Agreement, including (a) damages incurred by the Owner for rental expenses, losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons, and (b) damages incurred by the Contractor for principal office expenses, including the compensation of personnel stationed there; for losses of financing, business and reputation; and for loss of profit, except anticipated profit arising directly from the Work. Nothing contained in this Section shall be deemed to preclude an award of liquidated direct damages, when applicable, in accordance with the requirements of the Contract Documents.

17. Resolution of Claims and Disputes

17.1 Claims shall be referred initially to BMB. An initial recommendation in writing by BMB, followed by negotiation of the parties, shall be required as a condition precedent to the Alternative Dispute Resolution process herein, unless thirty (30) days have passed after the Claim has been referred to BMB with no recommendation having been made by BMB.

18. Alternative Dispute Resolution

18.1 Claims, disputes, or other matters in controversy arising out of or related to this Agreement except those waived as provided for in Section 17.1 above, shall be subject to non-binding Alternative Dispute Resolution as a condition precedent to binding dispute resolution. On those occasions when a dispute arises between the parties to this Agreement, the parties shall be compelled to seek an alternative means of resolving the dispute as a condition precedent to litigation. Therefore, the parties agree to the following terms and conditions:

18.1.1 The party bringing a claim shall give notice to the other party and, in writing, propose a meeting within seven (7) days after the Claim arises in which to discuss and attempt to resolve the Claim.

18.1.2 In the event the meeting between the parties to resolve the Claim does not resolve the dispute or does not take place within said seven (7) day period, the parties shall designate, by mutual agreement, an independent mediator who shall convene a meeting of the parties within a period of fourteen (14) days of the later of the initial meeting between the parties or the date notice was given pursuant to the Paragraph above. The mediator shall render his/her decision within seven (7) days of said meeting.

18.1.3 The purpose of the mediation is to attempt to resolve the dispute between the parties. The mediator shall not be empowered with the authority to render a binding opinion or award. The confidentiality of mediation shall be governed by the Michigan Court Rules and the Michigan Rules of Evidence.

18.1.4 In the event the independent mediator's attempt to resolve the dispute between the parties fails, then each party will be free to pursue recovery of Claims at law.

18.1.5 During the pendency of this alternative dispute resolution process, the parties agree that the statute(s) of limitations applicable to all Claims that are the subject of this process shall be tolled.

18.1.6 Should a party's Claim also concern Claims against or by Technology Designer, then Owner may include Technology Designer in the alternative dispute resolution process.

18.1.7 Contractor shall continue providing all Work during any dispute, including during the alternative dispute resolution process.

18.2 The parties shall share the mediator's fee. The Alternative Dispute Resolution shall be held in the place where the Owner is located, as indicated on page one of this Agreement, unless another location is mutually agreed upon.

18.3 If the parties do not resolve a dispute through Negotiation or Alternative Dispute Resolution pursuant to this section, the method of binding dispute resolution shall be as follows: litigation in any federal, state, county, or municipal court, of competent jurisdiction in the county where the Owner is located.

19. Termination

19.1 Each party shall have, in addition to all other remedies available to it, the right to terminate this Agreement immediately upon written notice to the other party that the other party has committed a material breach of any of its obligations herein and such material breach shall not have been cured or corrected within ten (10) days following written notice of the same. Furthermore, in addition to the rights of the Owner under this Section if the Owner must regularly request that the Contractor to cure breaches of this Agreement, such circumstances shall be grounds for termination of this Agreement for cause, even if each breach on its own would not be material.

19.2 Upon termination of this Agreement by either party for breach or default of the other party, each party shall be entitled to exercise any other right, remedy or privilege which may be available to it under applicable law or proceed by appropriate court action to enforce the terms of this Agreement or to recover damages for the breach of this Agreement. Upon termination of this Agreement, the Contractor shall immediately provide the Owner with all current Drawings and documentation regarding this Project. In the event of termination, title to all equipment purchased by the Contractor for integration into the Project shall pass to Owner, and Contractor shall deliver possession of said equipment to Owner at a location to be designated by Owner.

20. Bonds

20.1 The Contractor shall furnish a Performance Bond and a Payment Bond, in amounts equal to the Contract Sum, by a qualified surety naming both the Owner and BMB as dual Obligees. All sureties providing bonds on this Project must be listed in the Department of Treasury's Circular 570, entitled "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" with the bond amounts less than or equal to the underwriting limitation indicated in the Circular, and/or must have an A.M. Best rating of A - or better. Bonds shall be duly executed by the Contractor, as principal, and by a surety that is licensed in the state in which the Work is to be performed.

20.2 The Contractor shall deliver the required bonds to BMB prior to execution of this Agreement. If the Work is to be commenced prior thereto in response to a letter of intent, the Contractor, at a minimum, shall submit evidence to the satisfaction of BMB

that such bonds will be furnished prior to commencement of on-site Work. In no event may the Contractor commence on-site Work without the required bonds properly issued and delivered.

20.3 Performance Bond and Payment Bond form AIA Document A312 (2010 Edition) must be used for this Project.

20.4 The Contractor's proposed surety must be acceptable to the Owner and BMB. If, at any time, after acceptance of the Contractor's bonds, the surety fails to meet the criteria stated above, the Contractor must, as a precondition to continuing Work and receiving further payments, replace the bonds with bonds from a surety that meets the stated criteria.

20.5 The Performance and Payment Bond penal sums (i.e., the Contract Sum) must be listed as a separate line item on the Bid Proposal Form and payment requests.

20.6 In the event of a Change Order to this Agreement that increases the Contract Sum, the penal sum of any required Performance and Payment Bonds shall also be increased so that each penal sum equals the adjusted Contract Sum. BMB or Owner shall have the right to request submission of bond riders, issued by the original qualified surety, evidencing that such increase to the penal sum of the bonds has been accomplished. Notwithstanding the foregoing, in the next pay application after the Contract Sum has been increased by twenty-five percent (25%) or more, as a condition precedent to payment, Contractor shall deliver a bond rider issued by the original qualified surety evidencing that the appropriate increase in penal sums has been accomplished. No alteration, erasure, or addition is to be made in the typewritten matter.

21. Insurance

21.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from Claims listed in this Agreement which may arise out of or result from the Contractor's services under this Agreement and for which the Contractor may be legally liable, whether such services be by the Contractor, by a Subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable: (a) claims under workers' compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed; (b) claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees; (c) claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees; (d) claims for damages insured by usual personal injury liability coverage; (e) claims for damages, other than to the Work itself, because of injury to, or destruction of, tangible property, including loss of use resulting therefrom; (f) claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle; (g) claims involving contractual liability insurance applicable to the Contractor's obligations; and (h) claims for products liability insurance.

21.2 The insurance required above shall be written for not less than the limits of liability specified on Exhibit A, attached hereto and incorporated herein by this reference, or required by law, whichever coverage is greater.

22. Protection of Persons and Property

22.1 Neither the Contractor nor its agents, employees, Subcontractors, consultants, or the like shall enter the location of the Project without the prior consent of Owner and BMB, which consent may be conditioned upon Contractor's providing Owner with satisfactory evidence of safety training for those persons entering the Project Site.

22.2 Contractor shall comply fully with all federal, state and local laws, statutes, ordinances, rules, orders regulations and codes applicable to the Work performed as well as all applicable provision of the Revised School Code, applicable Board of Education policies and guidelines, Occupational Safety and Health Act and the Michigan Occupational Safety and Health Administration throughout the duration of the Project. The Contractor shall be responsible for adhering to all local and state fire codes and shall be responsible for firestopping all penetrations utilized.

22.3 The Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of this Agreement, in accordance with the safety program established for the Project by the Owner and/or BMB (the "Project Safety Plan"). In case of any conflict between Contractor's safety program and the Project Safety Plan, the Project Safety Plan shall control.

22.4 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to (a) employees on the Work and other persons who may be affected thereby, (b) the Work and materials, furniture, furnishings and System(s) to be incorporated therein, including the System(s), whether in storage on or off the Project Site, under care, custody or control of the Contractor or Subcontractors, and (c) other property at the Project Site or adjacent thereto, including property of the Owner, separate Contractors or other persons, whether or not completed or installed.

22.5 The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

22.6 When use or storage of flammable, volatile or other Hazardous Materials or System(s) or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. As used in this Agreement, "Hazardous Materials" means asbestos; cadmium; chlorofluorocarbons; chromium VI; hydrochlorofluorocarbons; lead; mercury; nickel; polybrominated biphenyls; polychlorinated biphenyls and terphenyls; azo colorants, aromatic amines and azo dyes; halogenated flame retardants and additives; tributyl tin, tributyl tin oxide and triphenyl tin; polychlorinated naphthalene; antimony; arsenic; beryllium; bismuth; phthalates; selenium; ozone depleting substances; chloroparaffins; polyvinyl chloride; halogenated plastics or polymers; expanded polystyrene foam; any materials containing such substances; compounds of such substances, including, but not

limited to, their ethers and oxides; molds; and any other chemical, material, or substance subject to regulation as a hazardous material, hazardous substance, toxic substance, or otherwise, under applicable federal, state, or local law, and any other chemical, material, or substance that may have adverse effects on human health or the environment.

22.7 The Contractor shall promptly remedy damage and loss to property caused in whole or in part by the Contractor or anyone directly or indirectly employed by the Contractor. The Owner shall determine whether the Contractor shall remedy the damage, or a third party shall remedy the damage, to be compensated by the Contractor. The Owner shall have the authority to back-charge the Contract Sum or receive reimbursement from the Contractor related to remedying such damage.

23. Administration of this Agreement

23.1 BMB will provide administration of this Agreement as described in the Contract Documents and will be an Owner's representative during performance of the Work until final payment is made. BMB will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions of this Agreement.

23.2 BMB will not be responsible for failure of the Contractor or a Subcontractor to meet schedules for completion or to perform their respective duties and responsibilities in conformance with such schedules.

23.3 BMB shall not have control over, charge of or responsibility for the means, methods, techniques, sequences, or procedures of the Work, or for the safety precautions and programs in connection with the Work since these are solely the Contractor's obligations under the Contract Documents and this Agreement.

23.4 BMB will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. BMB shall not have control over, charge of or responsibility for acts or omissions of the Contractor, Subcontractors, their agents or employees, or any other persons or entities performing portions of the Work.

23.5 BMB will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the time, and not inconsistent with the intent of the Contract Documents. Such changes shall be affected by written order and shall be binding on the Contractor. The Contractor shall carry out such written orders promptly.

23.6 Unless otherwise provided herein, BMB's authority shall not extend to the receipt, inspection, or acceptance on behalf of the Owner of the System(s) at the time of their delivery to the Project Site. BMB is not authorized to reject nonconforming Work, stop the Work, or terminate this Agreement.

23.7 BMB may recommend to the Owner rejection of Work that does not conform to the Contract Documents. A recommendation by BMB made in good faith shall not give rise to a duty or responsibility of BMB to the Owner, Contractor, Subcontractors, their agents or employees, or other persons or entities performing portions of the Work.

24. Miscellaneous

24.1 The Drawings, Specifications, and other Contract Documents, including those in electronic form, prepared by BMB and its consultants are instruments of service through which the Work to be executed by the Contractor is described (collectively, the "Instruments of Service"). The Contractor may retain one record set. Neither the Contractor nor any Subcontractor or supplier shall own or claim a copyright in the Drawings, Specifications and other Contract Documents prepared by BMB or its consultants, and unless otherwise indicated BMB and its consultants shall be deemed the authors of them and will retain all common law, statutory and other reserved rights, in addition to the copyrights. All copies of Instruments of Service, except the Contractor's record set, shall be returned or suitably accounted for to BMB, on request or upon completion of the Work. The Drawings, Specifications and other Contract Documents prepared by BMB and its consultants, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. They are not to be used by the Contractor or any Subcontractor or supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, BMB and its consultants. The Contractor, Subcontractors or suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other Contract Documents prepared by BMB and its consultants appropriate to and for use in the execution of their Work under this Agreement. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other Contract Documents prepared by BMB and its consultants. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of BMB's or its consultants' copyrights or other reserved rights.

24.2 As and to the extent required by the Contract Documents and confirmed by the Owner in writing, Contractor shall remove from the Project Site and dispose of all system(s) that Owner is trading in to Contractor in connection with the procurement of the System(s) (collectively, the "Trade-In System") following (a) delivery and installation of the System(s), and (b) Owner's written confirmation of satisfactory delivery, installation and operation of the System(s).

24.2.1 Contractor shall remove from the Project Site and dispose of all Trade-In System(s) in accordance with ISO14001:2004 Environmental Management Systems, all applicable regulations promulgated or enforced by the United States Environmental Protection Agency, including, but not limited to, the Resource Conservation and Recovery Act, the Solid Waste Disposal Act and the Hazardous and Solid Wastes Amendment Act, and all applicable laws and environmental protection agencies' requirements. Under no circumstance shall any Trade-In System(s) be recycled, refurbished, or resold.

24.2.2 All Trade-In System(s) shall be disposed of in a manner designed to (a) keep environmentally sensitive materials out of landfills, (b) conserve natural resources, (c) ensure tags and labels are removed from all Trade-In System(s),

and (d) ensure inoperable disks are overwritten with an automated script or, when necessary, shredded.

24.2.3 Within thirty (30) days of disposal of the Trade-In System(s), Contractor shall deliver to BMB and Owner an original certificate of disposal, satisfactory to Owner, verifying (a) the disposal method used, (b) the hard disks or other stored data of the Trade-In System(s) were erased in a non-recoverable manner with an automated script or physically removed or destroyed prior to removal from the Project Site, (c) the data destruction method used, (d) inoperable disks were shredded, (e) all identification, inventory tags and software were removed, and (f) all Trade-In System(s) was disposed of in a manner that meets all applicable laws, rules, regulations and guidelines.

24.3 The Contract Documents represent the entire and integrated agreement between the parties hereto and supersedes prior and subsequent negotiations, representations, or agreements, either written or oral.

24.4 The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between BMB and Contractor; (2) between the Owner and a Subcontractor; (3) between the Owner and BMB; or (4) between any persons or entities other than the Owner and Contractor. BMB shall, however, be entitled to performance and enforcement of obligations under this Agreement and the Contract Documents intended to facilitate performance of BMB's duties.

24.5 The Owner expressly reserves the right to perform activities related to the Project with the Owner's own forces and to award separate contracts in connection with other portions of the Project or other activities at the Project Site. Other Contractors under separate agreements with the Owner may concurrently perform construction or other activities for the Project.

24.6 This Agreement shall be considered to be for sale of goods and shall be governed by the Uniform Commercial Code (UCC) as adopted in the place where the Project is located. The Contract Documents shall be governed by the law of the place where the Project is located without regard to principles of conflicts of law that would require the application of the laws of another state.

24.7 The Owner and Contractor respectively represent and warrant that this Agreement has been duly authorized and executed by all necessary and appropriate corporate action and bind themselves, their partners, successors, assigns, heirs and legal representatives to the other party hereto and to partners, successors, assigns, heirs and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign this Agreement as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under this Agreement.

24.8 The terms of this Agreement are independent of and severable from each other, and neither this Agreement nor any provision shall be affected or rendered invalid or unenforceable by virtue of the fact that for any reason, any other or others of them may be invalid or unenforceable, in whole or in part.

24.9 Any notice given in connection with this Agreement shall be sent by registered or certified mail, postage prepaid, to the address set forth or to any other address as such party may designate in writing to the other:

If to Contractor: _____

Attention: _____

If to Owner: Troy School District
4400 Livernois Rd
Troy, MI 48098
Attention: _____

with a copy in like manner to: Barton Malow Builders, LLC
26500 American Dr.
Southfield, MI 48034
Attention: _____, Project Manager

IN WITNESS WHEREOF, this Agreement is entered into as of the day and year first written above and is executed in at least three original copies, of which one is to be delivered to the Contractor, one to BMB for use in the administration of this Agreement and the remainder to the Owner.

OWNER: _____ CONTRACTOR: _____
Name (Print): _____ Name (Print): _____
Title: _____ Title: _____

EXHIBIT A

Insurance Requirements

1. As a condition of performing Work under this Agreement, Contractor will keep in force, at all times during performance of the Work, policies of insurance covering all Basic Insurance Requirements (as defined below) and any applicable Supplemental Insurance Requirements (as defined below). The requirements identified below are minimum requirements; provided, however, that where a Controlled Insurance Program (a "CIP") is specified by the Owner, the insurance requirements listed in this Exhibit A (collectively, these "Insurance Requirements") shall not apply to coverages supplied by the CIP but shall apply to coverages which Contractor is required to carry outside the scope of the CIP.

2. As used in this Agreement, the "Basic Insurance Requirements" include the following:

2.1 Workers' compensation covering Contractor's statutory obligations in the state(s) in which the Work is to be performed or Federal statutory obligations, if applicable to the Project, and employers' liability insurance with limits of liability of One Million and 00/100 Dollars (\$1,000,000.00) per accident. Where applicable, a US Longshore and Harborworker's Compensation Act endorsement must be included.

2.1.1 If Contractor employs the services of leased employees for the Work or for a portion of the Work, then Contractor will be required to submit evidence, to the satisfaction of Owner and BMB, that such leased employees are fully covered by the minimum limits of workers' compensation and employers' liability insurance. Such evidence shall include, but not be limited to, submission of the applicable leasing agreement.

2.2. Automobile liability insurance with the limit of One Million and 00/100 Dollars (\$1,000,000.00) per accident covering Contractor's owned, non-owned and hired automobiles.

2.3. Commercial general liability insurance written on the 1988 ISO OCCURRENCE policy form or subsequent versions with limits of liability as follows:

| | |
|---|-------------|
| General Aggregate | \$2,000,000 |
| Products-Completed Operations Aggregate | \$2,000,000 |
| Personal/Advertising Injury | \$2,000,000 |
| Each Occurrence | \$2,000,000 |

This coverage shall include coverage for premises-operations, independent contractors' protective, products and completed operations, personal injury and broad form property damage (including coverage for explosion, collapse, and underground hazards), and contractual liability protection with respect to Contractor's indemnification obligations under this Agreement. Products-completed operations coverage must be maintained for at least two (2) years after final completion of the Project.

3. As used in this Agreement, the "Supplemental Insurance Requirements" include the following:

3.1 Watercraft protection and indemnity liability insurance if and only if any of the Work is on or over navigable waterways or involves use of any vessel. Limits are to be approved by Owner in writing.

3.2 Aircraft liability insurance if and only if any aircraft is used in performance of the Work. Limits are to be approved by Owner in writing.

3.3 Railroad protective liability insurance if and only if any of the Work is on or within fifty (50) feet of any railroad or affects railroad property, including but not limited to tracks, bridges, tunnels, and switches. Limits are to be approved by Owner in writing.

3.4 Professional liability insurance, if and only if architecture, engineering or design services are provided, with limits of liability as follows:

| | |
|------------|-------------|
| Each Claim | \$5,000,000 |
| Aggregate | \$5,000,000 |

Provided, however, that if the Contract Sum is \$10,000,000 or less, then the following limits of liability shall apply:

| | |
|------------|-------------|
| Each Claim | \$2,000,000 |
| Aggregate | \$2,000,000 |

Contractor shall keep such professional liability insurance in force during this Agreement and for three (3) years after final completion of the Project.

3.5 Pollution liability insurance, which must be on an occurrence basis, if and only if abatement, removal, remediation, transporting, or disposal of any Hazardous Materials are provided or any assessments or consulting relating to same, with limits of liability as follows:

| | |
|-----------------|-------------|
| Each Occurrence | \$5,000,000 |
| Aggregate | \$5,000,000 |

4. General Provisions.
 - 4.1 Every policy must be written by an insurance company that is licensed in the state where Work is being performed and is reasonably acceptable to Owner.
 - 4.2. Limits for employer's liability, commercial general liability and automobile liability may be attained by a combination of an underlying policy with an umbrella or excess liability policy.
 - 4.3. BMB, Owner, and all other entities as required by Owner shall be endorsed as additional insureds on Contractor's liability insurance (including general liability, excess liability, automobile liability and pollution liability, where applicable) with respect to liability arising out of activities performed by or on behalf of Contractor, including BMB's general supervision of Contractor, products and completed operations of Contractor and automobiles owned, leased, hired or borrowed by Contractor. The coverage provided by the additional insured endorsement shall be at least as broad as the Insurance Service Office, Inc.'s Additional Insured, Form B CG 20 10 11 85 or CG 20 26 11 85. Forms that do not provide additional insured status for completed operations will not be accepted.
 - 4.4. Contractor will furnish, before any Work is started, certificates of insurance and copies of any required additional insured endorsements showing the required coverages. Receipt of a non-conforming certificate of insurance without objection, or failure to collect a certificate of insurance, shall not waive or alter Contractor's duty to comply with the Insurance Requirements. Any modifications, deviations, waivers or exceptions to the Insurance Requirements will not be effective unless made in a writing executed by an authorized representative of Owner. Upon written request by Owner, Contractor will provide copies of its insurance policies.
 - 4.5. Evidence of the required insurance is to be provided to Owner on ACORD Certificate Form 25-S and must indicate each of the following:
 - 4.5.1 Any coverage exclusions or deviations from the 1988 ISO commercial general liability form or subsequent versions;
 - 4.5.2A Best's rating for each insurance carrier at A minus VII or better;
 - 4.5.3 That the issuing insurance company shall provide thirty (30) days written notice of cancellation to the certificate holder and the words "endeavor to" and "but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives" do not apply or have been removed;
 - 4.5.4 That additional insured endorsements have been provided as required under this Agreement; and
 - 4.5.5. Any deductibles over Ten Thousand and 00/100 Dollars (\$10,000.00) applicable to any coverage.
 - 4.6 All coverage must be primary and not excess over or contributory with any other valid, applicable and collectible insurance in force for BMB, Owner or other additional insureds.
 - 4.7 Contractor will provide full coverage for all of Contractor's System(s), property and tools used in the Work.
 - 4.8 Contractor shall waive and shall require (by endorsement or otherwise) its insurers providing the coverage required by these Insurance Requirements to waive, subrogation rights against Owner, BMB and all other additional insureds for losses and damages incurred and/or paid under the insurance policies required by the Insurance Requirements or other insurance applicable to Contractor or others for whom Contractor is responsible, including, but not limited to, Subcontractors and Sub-subcontractors, and will include this same requirement in its contracts with such parties. If the policies of insurance referred to in this section require an endorsement to provide for continued coverage where there is a waiver of subrogation, the owners of such policies will cause them to be so endorsed.
 - 4.9. Contractor will send or fax a copy of the Insurance Requirements to its agent when an insurance certificate is requested to assure that the policies comply with the Insurance Requirements.
 - 4.10. If Contractor requires its Subcontractors, Sub-subcontractors or other parties to provide additional insured endorsements in favor of Contractor, those endorsements shall be extended to Owner, BMB and all other required additional insureds.
 - 4.11. Contractor's duty to provide the insurance coverage set forth in these Insurance Requirements is a severable obligation from Contractor's indemnification obligations as set forth in this Agreement. Nothing in these Insurance Requirements shall be deemed to limit Contractor's liability under this Agreement.

SECTION 27 0000 – GENERAL TECHNOLOGY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section includes general administrative and procedural requirements. The following requirements are included to supplement the requirements specified in Division 1 Specification Sections.
- B. The project consists of the following major systems:
 - 1. Structured cabling system
 - 2. Network Infrastructure
 - 3. Wireless network infrastructure

1.3 USF FUNDING

- A. While this project is part of the Owner's bond program, the Owner is applying for USF (e-rate) funding for eligible portions of this project. Direct all questions regarding the USF requirements in this RFP to the Universal Service Administrative Company (USAC), Schools and Library Division (SLD) at (888) 203-8100.
- B. While the intent is to complete the project under the bond scope, the Owner may reduce or cancel the contract in the event the level of the universal service discounts is reduced. Any reductions will be taken prior to the start of the specific work being reduced or eliminated on a given building and/or project.
- C. USF Registration: Vendor shall submit with its proposal a valid Service Provider Identification Number ("SPIN") and a valid Federal Communications Commission Registration Number ("FCCRN"). Furthermore, Vendor shall submit to the SLD its annual Service Provider Annual Certification ("SPAC"), FCC Form 473, in a timely manner before the beginning of each funding year. Direct all questions regarding the USF requirements in this RFP to the Universal Service Administrative Company (USAC), Schools and Library Division (SLD) at (888) 203-8100. Bidders MUST maintain active service provider status for the entire duration of the project.
- D. USF Knowledge: Vendor shall have, at a minimum, a working knowledge of the federal Universal Service Support Mechanism for Schools and Libraries (commonly known as "E-rate"). The District expects each Service Provider to make themselves thoroughly familiar with any rules or regulations regarding the E-rate program.
- E. USF Participation and Cooperation: Vendor shall agree to participate in the E-rate Program and to cooperate fully and in all respects with the District, the Universal Service Administrative Company ("USAC"), and any agency or organization administering the E-rate Program to

ensure that the District receives all of the E-rate funding for which it has applied and to which it is entitled in connection with the Vendor's services and/or products.

- F. USF Information and Documentation: Vendor shall provide to District staff and/or the District's E-rate consultant within a commercially reasonable period of time, all of the information and documentation that the Vendor has or that Vendor reasonably can acquire that the District may need to prepare its E-rate applications and/or to document transactions eligible for E-rate support.
- G. Pay application procedures included in the project manual will be modified to accommodate the USF procedures. Pay applications for eligible items will only be accepted during the FY2025 date window. The District reserves the right to specify the filing option for the universal service discounts for each product and/or service.
- H. Invoicing Documentation: Vendor shall itemize, price, and invoice all materials or services that are eligible and ineligible for E-rate funding. In addition to the pay application requirements, Vendor must include the following information on all pay applications to the District for E-rate eligible equipment and/or services:
 - 1. Date of Invoice
 - 2. Dates of Service
 - 3. FRN associated with each line item
- I. Clear, concise breakdown of amount(s) to be billed to USAC (discounted portion of eligible charges) and amount(s) to be billed to the District (non-discounted amount of eligible charges)
- J. Bidders are to separate USF eligible products and/or services from those that are ineligible on the bid proposal form. The USF eligible products and/or services identified on the USAC website are incorporated in these bid documents by reference.
- K. The eligible products and/or services are to be provided during FY2025 (April 1, 2025-June 30, 2026). Work shall only commence prior to the FY2025 date window with approval of the Owner's e-rate consultant.
- L. No invoices will be DATED or PAID before April 1, 2025.
- M. USF Audit and Document Retention Requirement: Vendor shall maintain all bids, quotes, records, correspondence, receipts, vouchers, delivery information, memoranda and other data relating to Vendor's services to the District. All such records shall be retained for ten (10) years following completion of services and shall be subject to inspection and audit by the District. In the event of questions during the E-Rate audit process, the successful vendor is expected to reply within 3 days to questions associated [SEP] with their proposal.
- N. Contract Term Modification: The District reserves the right to extend or abbreviate the contract period if such extension or abbreviation is necessary to make the Contract term coincide with an E-rate "program year" or an extended service end date for an E-rate program year pursuant to a "service delivery deadline extension," as those terms are defined by the Federal Communications Commission ("FCC") or the Universal Service Administrative Company ("USAC").
- O. Contractor will provide a tag with e-rate information including e-rate FRN number and funding year, along with equipment-specific designations as approved by Owner.

1.4 GENERAL REQUIREMENTS

- A. Bidders must submit a bill of materials with the proposal. BOM must list all major components, quantities, and extended price. BOM is provided for information only to assist in evaluating the various bid proposals. Bidder agrees to the scope of work outlined in the bid documents.
- B. The bid documentation does not provide for every component or requirement of installation; however, it does establish minimum requirements for the system. The final solution shall be well documented within the bid proposal. Drawings are not intended to be scaled for rough-in or to serve as shop drawings. Take all field measurements required to complete the work. Installation within a reasonable distance from the locations shown on the drawing will be performed without additional cost.
- C. Contractor is to visit the site, examine and verify the conditions under which the work will be performed before submitting a bid response. The submitting of a bid response implies that the Contractor has visited the site and understands the conditions under which the work must be conducted. Additional charges will not be allowed because of failure to make this examination or to include all materials and labor to complete the work.
- D. Other bids may be issued related to this Contractor's scope of work. This Contractor is responsible for knowing what work will be provided by others and how it affects their Work (e.g. electrical rough-ins, etc.). Contractors, during bidding or after, can contact the project team to view related drawings and/or specifications.
- E. If backend systems (power supplies, master clock, master PA console, etc.) need dedicated or hardwired electrical connections, each Contractor is to provide the requirements for their systems as part of the bid response. If the electrical requirements are not specifically called out in the bid response, the Contractor will subcontract to a licensed electrical contractor to complete the electrical work as part of the Contractor's cost.
- F. Additional information provided with a bid response shall be used in the evaluation of bids, but do not replace the requirements established by the contract documents (project manual, drawings, specifications, etc.). The Technology Designer and Owner will not be responsible for reviewing equipment lists for completeness or conformance to the contract documents. Lists of material, bills of material, etc. submitted by the contractor do not replace the submittal requirements and do not replace the requirements established by the contract.
- G. The Contractor shall provide the services necessary to engineer, procure, install, test, and certify the systems described in the bid documents conforming to manufacturer specifications and applicable industry standards.
- H. All materials and equipment shall be furnished complete with all accessories normally supplied for a complete and operating system. All materials and equipment shall be new and shall be standard products in production and shall be of the manufacturer's current design. Any items with a known end of manufacture date will be specifically called out for approval before procurement. All equipment of the same or similar systems shall be by the same manufacturer.
- I. The methods of implementation shall be in accordance with the latest issue of the various authorities including but not limited to:
 - 1. ANSI American National Standards Institute
 - 2. ASTM American Society for Testing and Materials
 - 3. BICSI Building Industries Consulting Services International
 - 4. FCC Federal Communications Commission
 - 5. ICEA Insulated Cable Engineers Association

- | | | |
|-----|------|---|
| 6. | IEEE | Institute of Electrical and Electronics Engineers |
| 7. | ISO | International Organization for Standardization |
| 8. | NEC | National Electrical Code |
| 9. | NECA | National Electrical Contractors Association |
| 10. | NEMA | National Electrical Manufacturer's Association |
| 11. | NFPA | National Fire Protection Association |
| 12. | TIA | Telecommunications Industry Association |
| 13. | UL | Underwriters Laboratories, Inc. |

- J. Notify the Technology Designer before the bid period question deadline, established at the pre-bid meeting, should any changes in bid documents be required to conform to recommended manufacturer guidelines or the applicable codes, rules, or regulations. After entering into Contract, make all changes required to conform to applicable guidelines, ordinances, rules, and regulations without additional expense to the Owner.
- K. Any required permits, licenses, inspections, approvals, and fees for the work shall be secured and paid for by the Contractor. All work shall conform to all applicable codes, rules, and regulations. Perform all tests required by state, city, county and/or other agencies having jurisdiction. Provide all materials, equipment, etc., and labor required for tests.
- L. Contractor shall comply with all rules and regulations of local utility companies. Coordinate requirements with applicable companies supplying service and include the cost of all such items in proposal.
- M. Each contractor is to provide any backboards and access panels necessary for their installation that meet the manufacturer guidelines for the equipment to be installed. Materials are to be fire-rated. Provide D-rings, spaced no greater than 12" apart, to support cables routed to and along backboards.
- N. Each contractor is to use plenum rated cabling and accessories throughout the project.
- O. Where not provided by the electrical contractor, each contractor is required to provide their own penetrations, sleeves, and cores with firestopping. Sleeves and cores shall have nylon bushings.
- P. Install surge suppressors where ac-power-operated devices are not protected against voltage transients by integral surge suppressors specified in UL 1449. Install surge suppressors at the devices' power-line terminals. All surge suppression devices shall warranty protection of all downstream equipment.
- Q. Unit prices established for the project shall remain in effect throughout the duration of the contract.

1.5 DEFINITIONS

- A. ADA: Americans with Disabilities Act.
- B. AIA: American Institute of Architects.
- C. FBO: Furnished By Others.
- D. IR: Infrared.
- E. MC: Main Cross-Connect. (Applies to MDF or Headend references).

- F. OFE: Owner Furnished Equipment. (Applies to OFCI references)
- G. POE: Power over Ethernet.
- H. RF: Radio Frequency.
- I. TR: Telecommunications Room. (Applies to MDF or IDF references).

1.6 SUBMITTALS

- A. All submittals shall be complete and organized by related items. Incomplete submittal packets will be returned unchecked. Any modifications to or deviations from the bid documents shall be specifically highlighted on the submittals. In addition to requirements specified in Division 1, include the following:
 - B. Lists of material, bills of material, etc. submitted by the contractor do not replace the submittal requirements and do not replace the requirements established by the contract documents. The Technology Designer and Owner will not be responsible for reviewing lists of material for completeness or conformance to the contract documents.
 - C. Copies of any professional licenses or certifications requested in the documents.
 - D. Product Data: For each product indicated in the specifications or included in the scope, provide a product data sheet in PDF format. Data sheets indicating multiple products must have the applicable product highlighted or marked.
 - E. Shop Drawings: Shop drawings are to be provided in both PDF and native electronic format (e.g AutoCAD format).
 - F. Closeout documents will include a spreadsheet identifying system components, installed location, model number, serial number, label designation, and any other pertinent data. Submittals shall include spreadsheet format for approval.

1.7 QUALITY ASSURANCE

- A. The Contractor and their Sub-Contractors shall be experienced in all aspects of the work and shall demonstrate direct experience on recent systems of similar type, complexity, and size.
 - 1. Upon request, Contractor shall furnish for both the Contractor and all Sub-Contractors information on the corporation, project manager, and installers indicating recently completed projects, technical experience, and completed training.
 - 2. The Contractor shall maintain consistent staffing for Project Management and lead installers throughout the project, except for illness or loss of personnel. The Technology Designer and Owner reserve the right to require staffing substitutions if deemed beneficial to satisfactory completion of the project.
- B. The Contractor shall utilize equipment from manufacturers regularly engaged in the production of similar systems and components for a minimum of five (5) years.
- C. The Contractor must be a certified reseller and installer for the products/solutions provided and/or installed.

- D. The Contractor shall install in accordance with all applicable codes and standards, including federal, state, and local codes and authorities.

1.8 COORDINATION

- A. Contractor is to coordinate with other construction and technology contractors.
- B. Contractor is to coordinate building access with building staff including scheduling around building activities, building access, etc.
- C. Contractors shall be responsible for coordinating their configuration with the Owner, access providers, and other integrators whose systems will interact. If problems occur during implementation or commissioning, all contractors will be responsible for ongoing/additional coordination regarding configuring, testing, and troubleshooting of related/ inter-related devices until a resolution acceptable to the Owner is achieved. This includes coordination with outside agencies such as telephone service providers and internet service providers when necessary.
- D. Coordinate layout, rough-in requirements, and installation of the work of this section with the Owner's equipment, furniture, electrical, mechanical, architectural, and other technology trades.
- E. Coordinate with the appropriate utility companies for installation and cutover.
- F. Where multiple contractors will share a common pathway or faceplate, coordinate requirements and installation.
- G. Contractor shall uncover Work as needed for review by the Owner, Technology Designer, Architect, Construction Manager, or contractors performing related work. Work uncovered for observation will be replaced at the Contractor's expense without change in the Contract Time or Contract Sum.

1.9 WARRANTY

- A. All division 27 and 28 systems shall be provided with a five (5) year warranty unless noted otherwise in scope specific specification sections. Manufacturer and contractor warranties are to include the entire system (equipment, software updates, licensing, installation, etc.).
- B. Unless a specification section has a specific requirement, manufacturer warranties for each component shall begin on the date that equipment is delivered from the manufacturer/supplier. The contractor warranty period shall begin at the date indicated on the certificate of substantial completion or the date of Owner acceptance (to be received in writing and approved by the Owner), whichever comes later.
- C. Contractor is to provide:
 - 1. Evidence of the manufacturer's warranty end date.
 - 2. Procedures for warranty issues (e.g. phone number to call, warranty ID numbers, etc.)
 - 3. Documentation for all manufacturer's warranties including the operating conditions required for the warranty.
 - 4. Contractor's guarantee.
- D. The manufacturer warranty shall include phone support and software assurance including patches, updates and version upgrades for both major and minor releases throughout the warranty period.

- E. After substantial completion the following are also required throughout the contractor warranty period.
1. Contractor is to install critical firmware updates during the warranty period.
 2. Contractor is to provide an annual "health check" on the system with corresponding report noting items corrected and suggested maintenance or configuration changes.
 3. Contractor is to provide an overview of non-critical updates and version upgrades as they become available.
 4. Owner will decide which version upgrades they wish to implement.
 5. Contractor to install maximum of two (2) major version upgrades throughout warranty period. Contractor is to make configuration changes on the equipment and provide administrative training session on the new features and system administration, but Contractor is not required to perform any work on individual devices or computers.
- F. The Owner shall not be responsible for additional charges during the equipment warranty period. Labor, service charges, trip charges, etc. to configure and install equipment during the warranty period shall be included in the contractor's warranty.
- G. Contractor is to register all equipment in the Owner's name, not the Contractor's. All manufacturer warranty and support must be available to the Owner directly and not required to channel through the Contractor, distributor, or other entity.
- H. When a manufacturer's warranty is provided, it is the Bidder's responsibility to make sure the manufacturer's records reflect the correct warranty period start date as established in the contract terms.
- I. The contractor warrants the system to be free of product, workmanship, and configuration defects and will inspect and repair the system within 48 hours during school breaks during the warranty period at no additional cost to the Owner. The Contractor shall respond on site within four (4) hours' notice, and without cost to the Owner, during this warranty period. Contractor agrees to correct system deficiencies and replace components that fail in materials or workmanship including deficiencies arising when used according to the manufacturer or Contractor's written instructions. No warranty or terms therein shall limit or be interpreted to limit remedies as provided by law.
- J. Contractor will be responsible for repairing/replacing (including installation) any aspect of the system unless a specific specification section states that the Owner will install replacement equipment.
- K. Contractor is also to provide terms of any additional warranties as a manufacturer's standard. Special warranty specified shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Contractor is responsible for ensuring that no asbestos containing building materials (ACBM) are used and must certify to the Owner and Technology Designer that none was used.

- B. Any equipment, software, system, etc. with time dependent functions (e.g. bell systems) shall automatically adjust for daylight saving time without human intervention.

2.2 MANUFACTURERS

- A. Permit Competition. The name of a model, manufacturer or brand in this RFP shall not be considered as exclusive of other brands. Brands and models specified in this RFP are preferred. Owner expects all supplies, materials, equipment, or products bid by a Bidder to meet or exceed the specifications set forth in this RFP. Further, it is Owner's intent that this RFP permit competition. Accordingly, the use of any patent, proprietary name or manufacturer's name is for demonstrative purposes only and is not intended to curtail competition. Whenever any supplies, material, equipment or products requested in this RFP are specified by patent, proprietary name or by the name of the manufacturer, unless stated differently, such specification shall be considered as if followed by the words "or comparable equivalent," whether or not such words appear. Owner, in its sole and absolute discretion, shall have the right to determine if the proposed equivalent products/brands submitted by Bidder meet the specifications contained in this RFP and possess equivalent and/or better qualities. It is the Bidder's responsibility to notify Owner in writing if any specifications or suggested comparable equivalent products/brands require clarification by Owner prior to the Due Date for Bids. All Bid deviations from specifications must be noted on the Proposal Form.
- B. Base bid shall utilize manufacturers listed in the applicable specification sections. Contractor may include deviations as voluntary alternates in addition to the base bid, not in lieu of the base bid.
- C. The Owner expects all supplies, materials equipment or products proposed by a Bidder to meet or exceed the Specifications set forth in the Bidding Documents. Further, it is the Owner's intent that the Bidding Documents permit competition. Accordingly, the use of any patent, proprietary name or manufacturer's name is for demonstrative purposes only and is not intended to curtail competition. Whenever any supplies, material, equipment or products requested in the Bidding Documents are specified by patent, proprietary name or by the name of the manufacturer, unless stated differently, such specification shall be considered as if followed by the words "or comparable equivalent," whether or not such words appear. The Owner, in its sole and absolute discretion, shall have the right to determine if the proposed equivalent products/brands submitted by Bidder meet the Specifications contained in the Bidding Documents and possess equivalent and/or better qualities. It shall be the Bidder's responsibility to notify the Owner in writing if any Specifications or suggested comparable equivalent products/brands require clarification by the Owner prior to the Due Date for Bid Proposals.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. It is the Contractor's responsibility to review the site work, architectural, structural, mechanical, and electrical drawings, specifications, and field conditions, for any details that may impact the installation or provisioning of the system.
- B. Failure or omission of the Contractor to examine the site or documents does not relieve the Contractor. No additional payment will be made to the Contractor for failure to comply.

- C. Review building plans and installations to confirm outlet and conduit installation and location. Check outlets, conduits, raceways, cable trays, and other elements in the proposed pathways for compliance with space allocations, clearances, installation tolerances, hazards to cable installation, and other conditions affecting installation in compliance with manufacturer requirements.
- D. Device locations shown on drawings are diagrammatic only and may not represent intended location due to conflicts with other CAD symbols, room names, etc. Field verify conditions and coordinate device locations with other trades. Devices shall be installed to perform optimally for the usage and conditions of the space. Notify Barton Malow of conflicts that negatively affect performance prior to installation.
- E. Contractor shall choose appropriate mounting method and materials for each location based on manufacturer's requirements, wall construction, building structure, etc.
- F. On projects where existing category cabling is to be reused, Contractors are to assume that the existing cabling is appropriately labeled, but in some instances (up to 25% of the time) labels may be missing or damaged. In these situations, the Contractor installing the equipment (i.e. wireless access points, cameras, phones, etc) will be responsible for toning and relabeling the cabling. If the cabling is found to be damaged and requires replacement or re-termination, the Contractor will be compensated for the repair or replacement by means of utilizing unit pricing.
- G. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 DEMOLITION

- A. Demolition of existing equipment and materials will be performed by the Contractor unless otherwise noted. Demolition work indicated on the drawings is conceptual in nature. Include all items related to the existing system including equipment, cabling, raceway, supports, etc., in order to remove abandoned systems or accomplish the installation of the specified new work.
- B. Unless specifically noted to the contrary, removed materials shall not be reused in the work. Salvaged materials that are to be reused shall be stored safe against damage and turned over to the appropriate trade for reuse. Salvaged materials of value that are not to be reused shall remain the property of the Owner unless such ownership is waived. Items on which the Owner waives ownership shall become the property of the Contractor, who shall remove and legally dispose of same, away from the premises. If requested, Contractor will provide certification showing the items have been environmentally disposed of in accordance with applicable laws.
- C. Savings due to items with residual value / trade-in credit / scrap recycling value / etc. should be reflected in the base bid.
- D. Reroute cabling and relocate equipment as required to maintain service until systems can be permanently removed.
- E. Cables shall be removed to their source and any corresponding labels removed from the equipment or termination point. Dust covers shall be installed in patch panel ports associated with removed cables. Remove corresponding patch cable from patch panel or cross-connect cable from a 66 or 110 block.
- F. Cabling contractor is to provide blank stainless-steel faceplates for any empty low-voltage boxes that will remain after demolition.

- G. Contractor shall replace ceiling tiles where removing equipment (e.g. cameras, ceiling projectors, mounts, etc.) and the new equipment will not cover the original opening. Contractor is to provide ceiling tiles (acoustical, metal, etc.) to match existing manufacturer/model unless the drawings or specifications state that the contractor can use Owner's spare tiles. Verify manufacturer/model for each location with Owner.
- H. Contractor to provide 16-gauge (min) metal cover plate for any opening (clock, speaker, AV equipment, etc.) that will not be completely covered by the new device. Paint to match surrounding surface or provide with powder coat finish in color approved by Owner. Sheet metal coverings will not be accepted.

3.3 INSTALLATION

- A. Equipment that extends more than 4" from the wall will be mounted above 80" above finished floor unless reviewed and approved by Technology Designer or Owner.
- B. Consult with the Owner's Representative as to the method of completing work to avoid interfering with the Owner's operation. All systems shall remain operational and shall only be interrupted at times coordinated with the Owner's Representative.
- C. The Contractor shall provide all miscellaneous items and accessories required to make the system operational whether or not such items are specifically mentioned in the plans or specifications.
- D. The Contractor shall be familiar with the site and the rooms to ensure a proper installation. The final installation methods are left to the discretion of the contractor in accordance with this specification, within standards of generally accepted workmanship, and in accordance with manufacturer's recommended installation practices.
- E. The Contractor shall protect equipment and components during installation. Damage resulting from the Contractor's work shall be promptly replaced or repaired at the Contractor's expense.
- F. The Contractor shall provide all lifts and temporary supports necessary to accomplish their installation.
- G. The Contractor shall accomplish all cutting, removal and replacement of ceiling tile, drilling, coring and patching of walls, floors, casework, and ceilings required to complete their work. Contractor is responsible for replacing any damaged tiles and cleaning the ceiling grid upon completion of their work.
- H. Contractor to ensure Owner and Technology Designer have reviewed above ceiling or concealed work before reinstalling ceiling tiles or other obstructions. If work is performed in occupied areas where ceiling tiles or other obstructions must be re-installed upon completion of work, Contractor will be required to remove and reinstall in selected areas for inspection by Owner or Technology Designer.
- I. The Contractor, in accordance with all applicable codes, shall provide fire and smoke stopping through all partitions. Verify that penetrations of rated fire walls are made using products labeled for type of partition penetrated.
- J. All cables within racks, cabinets, or enclosures will be cable wrapped with hook and loop tape (Velcro) at no greater than one-foot intervals. Cabling housed in wiring management shall be tied at no less than two-foot intervals.

- K. Due to field conditions or other situations, installation locations may have to be relocated a reasonable distance from the plan location. Unless relocations, modifications and reengineering are consistently or substantially unfavorable to either the Contractor or the Owner, there will be no additional charge or credit for this work.
- L. No additional compensation will be provided for moving installed equipment for reasons including, but not limited to:
 - 1. Performance issues.
 - 2. Failure to coordinate with other trades for existing conditions and renovations or new construction.
 - a. All drawings (including Architectural, Mechanical, Electrical, etc.) are available for review at the jobsite.
 - 3. Locations deviating from design drawings (unless approval has been obtained prior to installation).
 - 4. Failing to follow manufacturer's recommendations.
- M. The lack of permanent power does not relieve contractor of installation requirements as dictated in the specifications. If permanent power is not available, contractor must provide temporary power (e.g. UL approved extension cords) to complete installation, configuration, and testing of equipment (e.g. projectors, interactive whiteboards, etc.). Extension cords and/or other means of temporary power are to be removed immediately after the initial installation/configuration. At the time permanent power is completed, contractor to return to make final equipment connections and any necessary adjustments. Refer to the safety section of the project manual for guidelines of proper use with regards to temporary power.

3.4 CLEANING

- A. All debris will be removed by the contractor daily as required to maintain the work area in a neat, orderly condition.
- B. Contractors working above ceiling or drilling are to bring their own vacuums unless the building custodian allows theirs to be used.
- C. Contractor shall clean all equipment before Owner acceptance using methods and materials recommended by the manufacturer.

3.5 PROTECTION AND HANDLING OF EQUIPMENT AND MATERIALS

- A. Equipment and materials shall be protected from theft, injury, or damage. Equipment set in place must be provided with temporary protection.
- B. Provide adequate storage for all equipment and materials delivered to the site. Owner shall not be required to provide secure storage but will attempt to accommodate the Contractor's requirements.
- C. Contractor will be required to protect any Owner-Furnished-Contractor-Installed (OFCI) equipment and will be responsible for replacing any missing or damaged equipment.

3.6 IDENTIFICATION

- A. Unless noted otherwise, use logical and systematic designations for facility's architectural arrangement and nomenclature.
- B. Contractor is responsible for permanently identifying all major components used in the project. Component list, identification method, and nomenclature to be coordinated with and approved by the Technology Designer.
- C. All cross-connecting cable shall be adequately tagged as "to" and "from."

3.7 FIELD QUALITY CONTROL

- A. All ancillary accessories (e.g. remote controls, keys, etc.) shall be collected, identified by installation location, and turned over to the Owner. Coordinate delivery with Technology Designer to ensure appropriate signoffs are received.
- B. The Owner and/or Technology Designer may designate an agent who may be present during testing and may provide additional testing to verify cabling installer results. The agent shall accept or reject the installation.

3.8 DEMONSTRATION AND STARTUP

- A. All training and demonstration will be provided at no cost to the District.
- B. At the completion of each phase of work, Contractor will provide four (4) hours of startup assistance for out-of-scope work, scheduled at the Owner's discretion. The assistance time may not be contiguous and does not include travel time to or from the project site. Startup assistance shall utilize staff involved in the onsite installation unless added personnel is needed to complete the base scope of work according to the project schedule or Owner's requirements. Unused time will be deducted utilizing the labor material price.
- C. Additional training requirements are listed in individual specification sections.

3.9 DOCUMENTATION

- A. For multi-phase projects, adequate documentation for completed work shall be submitted as each phase is completed to allow the owner and project team to utilize the system.
- B. Provide progressive "as-builts" to the Owner as devices are installed, including MAC address, serial number information, and specific installed location. Provide this information to the Owner daily as necessary, through a collaborative software (ex. Google Sheets, or Office365) and in a format approved by the Owner and Technology Designer. Handwritten notes will not be accepted.
- C. At the conclusion of the project (or major phase for multi-phase projects), all documentation is to be compiled into an organized, comprehensive package. Copies are to be submitted both in hard copy and electronic formats. CAD drawings shall be in AutoCAD formats. The Contractor is responsible for any fees charged by the architect for providing CAD backgrounds.
- D. Contractor responsible for all equipment registration per manufacturer's instructions.

- E. As-Built: In addition to requirements specified in Division 1, include the following:
1. As-built drawings are to reflect all changes between the bid documents and the final installation, including final location of all equipment, outlets, racks, penetrations, etc. inclusive of the base bid, implementation add/changes, and all change orders.
 2. Drawings for systems showing location and cabinet/enclosure layout. Include all components identifying component manufacturer and model, serial numbers, and connections.
 3. Cable tests, OTDR traces, etc. are to be provided in both hardcopy format as well as electronic format. Any software necessary to view the tests must be provided to the Owner.
 4. Wiring and systems certification.
 5. Certificate of manufacturer's extended warranty, where applicable.
 6. Spreadsheet identifying system components, installed location, model number, serial number, label designation, warranty expiration, and any other project-specific pertinent data. Spreadsheet format to be approved by Technology Designer.
 7. Schematics shall be created in AutoCAD or Visio format. Handwritten drawings shall be accepted for draft or working copies only.
 8. Drawings with floorplans shall be created in AutoCAD format. Handwritten drawings shall be accepted for draft or working copies only.
 9. All as-built and other closeout documentation to be submitted as a PDF in addition to the native file format.
- F. Maintenance Data:
1. Detailed operating instructions covering operation under both normal and abnormal conditions.
 2. Routine maintenance procedures for system operation, customized for the installation.
 3. Lists of spare parts and replacement components recommended being stored at the site.

END OF SECTION 27 0000

SECTION 27 1000 – GENERAL CABLING REQUIREMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Specification Sections:
 - 1. 27 0000 General Technology Requirements

1.2 SUMMARY

- A. This Section includes general cabling requirements for contractors installing cabling within their scope of work.
- B. Contractor is required to furnish and install cables and accessories in locations as shown on plan drawings, details, and specifications.
- C. Scope of work includes all physical cable management hardware, including, but not limited to backboards, cable supports, raceway, and cable management required to complete the system.
- D. Each Contractor is required to provide their own penetrations, sleeves, and cores with firestopping. Sleeves and cores shall have nylon bushings. Contractors are to control dust generated from penetrations, protect nearby equipment and surfaces from dust, and follow all OSHA regulations.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated, provide a product data sheet in both hard-copy and electronic (PDF) formats. Data sheets indicating multiple products must have the applicable product highlighted or marked.
 - 1. All cable types
 - 2. Terminations components for each system
 - 3. Faceplates
 - 4. Cable supports
 - 5. Grounding and surge suppression
 - 6. Firestopping
- B. Shop Drawings:
 - 1. Include all labeling schemes for all systems such as station outlets, cable runs, patch panels, punchdown blocks, racks, etc.
 - 2. Include composite drawing indicating cable routing plans. Label cable types.
- C. Qualification Data:

1. Include written confirmation from the manufacturer that the bidder is a certified installer for the structured cable plant solution.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Contractor must be certified by the manufacturer of the solution being installed and be BICSI certified.
- B. Layout Responsibility: Preparation of Shop Drawings by an RCDD.
- C. Installation Supervision: Installation and testing shall be performed by BICSI Registered Installers or manufacturer certified installers, with a consistent supervisor who shall be present at all times when work of this section is performed.
- D. Comply with all requirements of the 2017 NEC unless jurisdiction requires a different version. Cables must comply with temperature rating requirements including Table 725.144.
- E. Comply with the current versions of TIA 568B, TIA 569, and TIA 606.

1.5 COORDINATION

- A. Coordinate layout and installation of the work of this section with the Owner's equipment, furniture, electrical, mechanical, architectural, and other technology trades.
- B. All Contractors utilizing a shared pathway shall be responsible for coordinating and ensuring that firestopping requirements are fulfilled. Any unused penetrations installed by the electrical contractor for future use shall be firestopped by the data cabling contractor.
- C. All Contractors utilizing penetrations shall be present during electrical and fire marshal inspections with adequate firestopping material and shall immediately correct any issues identified during the inspections.
- D. Each Contractor is to protect their own cables during installation. Rough cables are to be properly supported and not left on the floor. If conditions necessitate leaving cables Contractor is to put a note on the cables to reduce chance of damage by others and note cable location to controlling contractor.
- E. Each Contractor to protect their cables in areas where ceilings will be painted to ensure cable sheath is not painted.
- F. For projects where the structured cabling for access points, video surveillance cameras, etc. is being provided by a different contractor, the Contractor providing and installing the equipment (access point, video surveillance camera, etc.) will be responsible for coordinating the cable locations with the structured cabling contractor. In general:
 1. Equipment contractor is to extend the cable to the final equipment mounting location including penetrations, firestopping, waterproofing, raceway, etc. Equipment contractor to provide longer patch cables if needed to reach the mounted equipment location.
 2. For areas where equipment will be mounted in accessible ceiling, cabling contractor is to run the cable to the center of the space for wireless access points or the general area where video surveillance cameras or other equipment are shown. Coil adequate cable to reasonably relocate the equipment within the space.

3. For outdoor equipment, stairwells, equipment in open ceiling spaces to be mounted adjacent to accessible the accessible ceiling in an adjacent space (corridor, etc.) cabling contractor is to run the cable to the adjacent interior space. Equipment contractor is to create the penetration and extend cable to final equipment location, and seal the penetration as required for weatherproofing or firestopping.
4. For open ceiling areas where cabling will be routed away from the adjacent accessible ceiling (e.g. along the perimeter of the space or along the beams/trusses and dropped down to the equipment location in a gymnasium, natatorium, atrium, etc.), the cabling contractor is to run the cable near/above the equipment location. Equipment contractor is to extend cable to final equipment location.

1.6 WARRANTY

- A. The contractor warrants the system to be free of defects of workmanship or products and will inspect and repair the system during the warranty period at no additional cost to the Owner. Contractor agrees to correct system deficiencies and replace components that fail in materials or workmanship including deficiencies arising when used according to the manufacturer or Contractor's written instructions. No warranty or terms therein shall limit or be interpreted to limit remedies as provided by law.
- B. Contractor is also to provide terms of any additional warranties as a manufacturer's standard. Special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- C. The data and voice structured cable plant shall be covered by the manufacturer's extended warranty (eg. Panduit Certification Plus System Warranty, Hubbell Premise Wiring Mission Critical Warranty and System Performance Guarantee, etc.).

PART 2 - PRODUCTS

2.1 SYSTEM REQUIREMENTS

- A. Coordinate the features of materials and equipment so they form an integrated system complying with TIA-568B. Match components and interconnections for optimum future performance.
- B. The Contractor is to use plenum rated cabling and accessories throughout the project. All cables shall be continuous and free from splices.

2.2 FACEPLATES, CONDUIT, AND SURFACE-MOUNTED RACEWAYS

- A. These general requirements apply to all contractor(s) unless more specific information is included in a particular contractor's specification sections (i.e. structured cabling, audiovisual cabling, etc.).
- B. Coordinate faceplate requirements with the furniture installer, where applicable.

- C. Each contractor shall provide and install blank faceplates / insert on any outlets provided by the electrical contractor for their potential technology use (video outlets, security outlets, data/voice general purpose telecommunication outlets, etc.).
- D. Faceplate labels shall be secured to the faceplate (loose or removable labels on the screw covers are not permanent and not acceptable).
- E. Each Contractor installing cabling is responsible for all surface-mounted raceways and conduit not provided by the electrical contractor. Common potential locations requiring conduit for cables are described below:
1. Conduit for security cameras, wireless access points, audiovisual components, or general communications outlets installed outdoor or in large open spaces without drop ceilings (i.e. gymnasium, cafeteria).
 2. Security cabling for access control systems and intrusion detection systems in vestibules, entrances, doorways, or other areas where cabling cannot be concealed.
 3. Other public spaces where cabling cannot be concealed, and contractor could have reasonably known they existed.
 4. In all other instances requiring surface-mounted raceways that the contractor could not have reasonably known about from construction coordination drawings (e.g. ceiling plans) or pre-bid walkthroughs made available to the contractor whether or not they participated, unit pricing will be utilized. Approval must be obtained prior to installation.
- F. The following are general guidelines for raceways:
1. Surface-mounted raceway shall not be used unless the wall or other structure cannot be fished and cut into. Contractor to obtain approval prior to installing surface-mounted raceway in areas not already indicated on the drawings.
 2. Surface-mounted raceways shall be sized appropriately for each installation following all manufacturers' guidelines.
 3. Steel raceway (e.g. Legrand/Wiremold) shall be used in classroom and office areas. EMT conduit may be used in lieu of steel raceways in gymnasiums or other similar spaces and only after approval is received.
 4. All surface-mounted raceways shall be steel construction (e.g. Legrand/Wiremold V700, V4000, etc.).
 5. All steel raceways shall be ivory.
- G. The following are general guidelines for faceplates:
1. For recessed boxes and surface-mounted faceplates, data faceplates shall be stainless steel with module frames or decora inserts. A/V faceplates may be plastic if necessary to provide the required A/V inserts.
 2. Where single-channel surface-mounted raceway and boxes are used, faceplates shall match the raceway color.
 3. Where dual-channel surface-mounted raceway is used (e.g. Legrand/Wiremold V4000), faceplate shall match the faceplates used in the existing installation.
 4. Plastic faceplates are to be used where necessary to coordinate and match modular furniture systems.
 5. Blank faceplates are to be stainless steel. Blank inserts for dual-channel raceway shall match the faceplate type and color.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. It is the Contractor's responsibility to review the site work, architectural, structural, mechanical, and electrical drawings, specifications, and field conditions, for any details that may impact the installation or provisioning of the system.
- B. Review building plans and installations to confirm outlet and conduit installation and location. Check outlets, conduits, raceways, cable trays, and other elements in the proposed pathways for compliance with space allocations, clearances, installation tolerances, hazards to cable installation, and other conditions affecting installation in compliance with manufacturer requirements.
- C. Contractors are to examine existing telecommunication rooms, equipment, cabinets, racks, etc. to ensure the conditions will not interfere with their installation. Contractors will be responsible for moving existing items where possible to allow for their installation (e.g. shifting patch panels, wire management, and equipment within a rack or cabinet; moving items on a backboard, etc. to make room for the new installation). If the rework requires re-ordering the existing items or removing wire management, review the layout with the Technology Designer and Owner.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. The Contractor shall provide all miscellaneous items and accessories required to make the system operational whether or not such items are specifically mentioned in the plans and specifications.
- B. The Contractor shall be familiar with the site and the rooms to ensure a proper installation. The final installation methods are left to the discretion of the contractor in accordance with this specification, manufacturer's specifications, and within standards of generally accepted workmanship.
- C. Contractor shall be familiar and install in accordance with all applicable codes and standards, including FCC, NEC (NFPA 70), TIA 568, 569 and 606, BICSI (Telecommunications Distribution Methods Manual, Current Edition), federal, state, and local building/fire codes.
- D. All cable above the ceiling must be independently and properly supported to the building structure with hangers or cable tray independent from the ceiling grid or other support systems (e.g. cables shall not be run through trusses). Each contractor will provide all supports necessary for their work.
 - 1. Separate supports are to be used for each type of cabling runs (e.g. data, voice, fiber, video, PA, security, etc.).
 - 2. Cable supports (e.g. J-Hooks) shall be wide enough to maintain required cable bend radius and to avoid pinch points on the corners of the support.
 - 3. All cable hangers/supports shall be no more than 60" apart.
 - 4. Each cable bundle shall include a maximum of 192 cables.
 - 5. Special care will be taken to avoid damage to ceiling grid, ceiling tiles, or other installed work. Cable "draped" across ceiling tiles is unacceptable.

- E. Ensure all cables within cable trays are arranged to avoid individual cables supporting the weight of the cable bundle. Cable trays shall have appropriate bend radii for cable and fiber. Provide elbows, supports, and ties to assist in offloading the weight of the cable and adequately support the tray.
- F. Support riser cables every floor and at the top of the run with cable grips. Limit number of four-pair data riser cables per grip to fifty (50).
- G. Fiber optic cable shall be plenum rated armored cable.
- H. Fill rates for all cable supports must not exceed the lesser of 50 percent, or as recommended by the manufacturer(s).
- I. All wiring shall be protected from moving mechanical or physical contacts. All cabling shall be free from tension at both ends, as well as the length of each run.
- J. Cables to be kept a minimum of 18" from power lines, fluorescent fixtures, or heat generating devices. All cross-connecting cable shall meet or exceed the transmission characteristics for the cable used in the adjoining segments.
- K. All cabling shall be bundled and properly secured and terminated in the telecommunication room cabinet. Cables must be properly supported and separated to avoid crushing or cinching by supports, protective covers, doors, etc. All cables within wire management cabinets will be cable wrapped with Velcro cable ties at no greater than one-foot intervals. Velcro tie-wraps only are to be used.
- L. For general communications outlets, Contractor to provide additional 10' of cabling coiled above nearest accessible ceiling at each drop and 10' of cable at each telecommunication room. Unless noted otherwise, specialized systems (i.e. security and wireless) shall have 20' of cable coiled above the ceiling at each drop and 10' of cable at each telecommunication room. The additional lengths of cable shall be included in distance calculations. Cable routing within the telecommunication closet is to be approved by the Technology Designer before beginning termination.
- M. In general, adhesives and non-mechanical fastening methods of installation will not be accepted. All conduit, cable and raceway installation support must be mechanically fastened to walls, decks, slab, structure, etc.
- N. Install parallel to building lines, follow surface contours, and support the cable according to manufacturer's written instructions. Do not run adjacent and parallel to power or data cables.
- O. All horizontal cabling terminations shall be provided with sufficient additional cabling to permit re-termination within the cabinet. The additional lengths of cable shall be included in distance calculations. Service loops shall be irregularly coiled to avoid electromagnetic or antenna effects.
- P. All connections of twisted wiring shall be made in such a way as to minimize the extent in which each twisted pair is unraveled at the point of its physical termination. No more than 0.5 inches of exposed untwisted pairs shall be present at these locations.
- Q. Provide sufficient pulling lubrication for all underground cable pulls. Do not exceed the manufacturers tension requirements for any installation.
- R. Exposed wiring will not be accepted unless approved in writing by the Technology Designer. Cabling shall be in the wall, above the ceiling, or in conduit or raceways designed for the

application. A difficult installation will not be sufficient to avoid the requirement for non-exposed wiring.

1. Contractor to install conduit in exposed areas along cable pathway. Raceway can be used for the vertical segment transitioning to the outlet location (e.g. from ceiling space down wall to outlet). Conduit in exposed areas are to be painted to match surrounding conduits/ceiling color.
 2. Exposed wiring will be acceptable in crawl spaces.
 3. Exposed wiring will be acceptable in high bay gymnasiums if the cables are run along a joist and hidden from view. Cables must be concealed from the wall to the joist.
 4. No exposed cabling will be allowed in natatoriums.
 5. No exposed cabling will be allowed in architecturally significant spaces, such as a media center or entrance lobby.
 6. In instances greater than 15' requiring conduit that the contractor could not have reasonably known about from available drawings (e.g. ceiling plans) or pre-bid walkthroughs made available to the contractor whether or not they participated, the contractor may request reimbursement for the installation. Approval must be obtained prior to installation.
- S. Locate service loops in accessible ceiling unless location in exposed room is approved by Owner..
1. Example: in areas with a drop ceiling "cloud" in the room but exposed ceilings on the room perimeter, the service loop is to be above the cloud.
 2. Example: cables running from drop ceiling corridor to a space with open ceilings are to have the service loop in the corridor at the penetration location.
- T. In unheated crawl spaces, contractor is to install the cable at least four feet (4') from the exterior wall mounted securely to the slab or structure.

3.3 UNDERGROUND INSTALLATION

- A. Prior to beginning any underground work, Contractor shall contact MISS DIG, local utility survey staff, and utility companies for the location of all existing underground services and provide, if requested, documentation of such contact to Barton Malow. If necessary, Contractor shall pay for appropriate layout and locating of all existing utilities, and stake said utilities.
- B. Utilities and/or other services which are shown, or not shown but encountered, shall be protected by the Contractor from any damage arising or resulting from work, unless or until they are abandoned. If the utilities or services are damaged from Contractor's work, Contractor shall notify the Technology Designer immediately. Contractor shall repair any damage and restore the utilities and services to an equal or better condition than that which existed prior to the damage within four (4) hours. If the Contractor does not repair the work or the Owner or Barton Malow considers the damage unresolved in a timely manner, repairs will be made at Contractor expense.
- C. Contractor shall provide and maintain proper shoring and bracing during its excavation, to protect from collapse or movement, or other type of damage until such time as they are to be removed, incorporated into the new Work or can be properly backfilled upon completion of the work and inspections.
- D. Contractor shall photograph and document the environment immediately before beginning work, upon exposing any utilities, and after work and/or repair is completed. Barton Malow shall review the work and/or repairs before any work is buried.

- E. Contractor will be responsible for all liabilities, damages, expenses, lawsuits or claims arising or resulting from such damage and will defend, hold harmless and indemnify Owner and Barton Malow from any claims or lawsuits or other expenses.

3.4 IDENTIFICATION

- A. In addition to requirements in this Article, comply with TIA-606.
- B. Use logical and systematic designations for facility's architectural arrangement and nomenclature, and a consistent color-coded identification of individual conductors. All rack fields, devices, components, etc. shall be tagged with appropriate designations on the front and rear of the equipment. All devices are to be installed and labeled in a sequential, logical order.
- C. Adhesive labels shall meet the legibility, defacement, and adhesion requirements specified in UL969 for indoor use. Cable labels shall have a durable substrate, such as vinyl, suitable for wrapping. Labeling practices shall be consistent across the installation.
- D. Cable runs shall be machine labeled within 1" of each termination. All cabling and fiber optics are to be tagged in a consistent manner, approved by the Technology Designer.
- E. Fiber Optic Safety Installation. Label all fiber optic junction boxes and termination points with "fiber-optic cable - lasers in-use - possible eye injury" warnings inside and outside of the location.
- F. At junction boxes, label with a description of the cable, termination location, and strand count.

3.5 FIELD QUALITY CONTROL

- A. Contractor will provide cabling acceptance testing. Agent of owner may provide additional testing and cable acceptance. Contractor is responsible for correcting any instances of test failures.
- B. Indicate and interpret test results for compliance with performance requirements of installed systems. All test results shall be marked as "Pass" or "Fail".
- C. All test results must be provided in both hard copy and electronic format.
- D. Contractor is responsible for correcting any instances of marginal test results or test failures.

3.6 DOCUMENTATION

- A. As-Built Documentation:
 - 1. Include scaled drawings reflecting all changes between the bid documents and the final installation, including final location of all telecommunication rooms, equipment, cable paths, outlets, etc.
 - 2. Drawings shall include all cable routing, outlet locations, and outlet labels.
 - 3. Drawings shall be created in AutoCAD format. Handwritten drawings shall be accepted for draft or working copies only.

END OF SECTION 27 1000

SECTION 27 1500 – DATA HORIZONTAL CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Specification Sections:
 - 1. 27 0000 – General Technology Requirements
 - 2. 27 1000 – General Cabling Requirements

1.2 SUMMARY

- A. This Section includes general cabling requirements for contractors installing structured data cabling within their scope of work.
- B. The cabling infrastructure shall be implemented as a data solution compliant with TIA standards under T568B. Campus voice, fiber optic, data and video infrastructure shall be implemented compliant with applicable standards.
- C. Extent of the cabling systems work is indicated by the drawings and schedules, and is hereby defined to include, but not by of limitation, the provisions of:
 - 1. Horizontal cables to the telecommunication rooms.
 - 2. All termination blocks, outlets/jacks, patch panels, patch cords, etc.
 - 3. Termination, cross connect, and patching.
- D. Data cables shall be routed so as not to exceed 90 meters in length. Notify the Technology Designer before bid period question deadline, established at the pre-bid meeting, should any changes in bid documents be required to conform to this limitation. After entering Contract, Contractor shall provide Technology Designer-approved solution to meet the 90-meter requirement without additional expense to the Owner.
- E. Color Coding:
 - 1. The following chart describes the cable type/color for the primary structured cabling systems defined in this spec section.

| System | Cable Type | Distributi on Cable | Patch Cable (Station) | Patch Cable (Closet) | Jack Color (User End) | Jack Color (Patch Panel) |
|---------------|-------------------|----------------------------|------------------------------|-----------------------------|------------------------------|---------------------------------|
| Data | CAT 6 | Blue | Black | Blue | Blue | Blue |
| Wireless | CAT 6A | Purple | Purple | Purple | Purple | Purple |

- F. Patching:

1. The Owner or their integrator will patch to the network equipment; but this contractor will be responsible for providing the patch cables.
2. Do NOT patch unused patch panel ports.

G. Patch Cables:

1. Provide patch cables for use within telecommunication rooms. Provide one for every data cable installed throughout the project.
 - a. Patch cables shall be the minimum lengths necessary to patch while utilizing the wire management. Technology Designer to approve patching method.
2. In addition to the patch cables to be used in the telecommunication rooms, provide patch cables for the owner’s use at the station end in the following lengths. Colors are to match the system use from the table above. Provide one for every data cable installed throughout the project.

| <u>Min. Length</u> | <u>Quantity</u> |
|--------------------|-----------------|
| 6 ft | 40% |
| 10 ft | 40% |
| 20 ft | 20% |

1.3 DEFINITIONS

- A. ER: Equipment Room
- B. MC: Main Cross-connect [Applies to references to MDF]
- C. TR: Telecommunication Rooms [Applies to references to IDF]
- D. PoE: Power over Ethernet

1.4 SUBMITTALS

- A. Prior to ordering, confirm colors of horizontal cables, patch cables, and jacks.
- B. Product Data: For each type of product indicated, provide a product data sheet in both hard-copy and electronic (PDF) formats. Data sheets indicating multiple products must have the applicable product highlighted or marked.
 1. Cable
 2. Faceplates
 3. Terminations (Patch panels, jacks, etc.)
 4. Patch cables (Identify lengths, colors, and quantities)
- C. Qualification Data:
 1. Include written confirmation from the manufacturer that the bidder is a certified installer for the cable plant solution.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Contractor must be certified by the manufacturer of the solution being installed and be BICSI certified.
- B. Installation Supervision: Installation and testing shall be performed by BICSI Registered Installers or manufacturer certified installers, with a consistent supervisor who shall always be present when work of this section is performed.
- C. Comply with current versions of TIA 568B, TIA 569, and TIA 606.

1.6 COORDINATION

- A. Coordinate cables for door entry, video surveillance, wireless infrastructure, etc. with the contractor who will be installing the equipment for termination location and method.
- B. Other bids may be issued related to this contractor's scope of work. This Contractor is responsible for knowing what work will be provided by others and how it affects their Work (e.g. electrical rough-ins, etc.). Contractors, during bidding or after, can contact the project team to view related drawings and/or specifications.

1.7 WARRANTY

- A. Contractor is also to provide terms of any additional warranties as a manufacturer's standard. Special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. The cable plant shall be covered by the manufacturer's warranty for a minimum of fifteen (15) years (e.g. Panduit Certification Plus System Warranty, Hubbell Premise Wiring Mission Critical Warranty and System Performance Guarantee, etc.).

PART 2 - PRODUCTS

2.1 SYSTEM REQUIREMENTS

- A. Coordinate the features of materials and equipment so they form an integrated system complying with TIA/EIA-568-B. Match components and interconnections for optimum future performance.
- B. One manufacturer must be used for all termination jacks, patch panels, and patch cables.
- C. Contractor is to use plenum rated cable and cabling accessories throughout this project.
- D. All Category 6A cables will be UL limited power (LP) rated.

2.2 MANUFACTURERS

- A. The following are acceptable manufacturers for general equipment within this section, unless noted otherwise for any product. Any deviations must be approved in writing by the Technology Designer before installation.
1. Data Cable
 - a. Berk-Tek
 - b. Belden
 - c. Commscope
 - d. General
 - e. Liberty Wire & Cable
 - f. Lucent
 - g. Mohawk
 - h. Superior Essex
 - i. Approved Equal
 2. Patch Panels, Faceplates, Station Terminations, Jacks, other Accessories
 - a. Hubbell
 - b. Panduit
 - c. Ortronics
 - d. Leviton
 - e. Approved Equal

2.3 DATA CABLE AND TERMINATIONS

- A. Cable Standards:
1. Cabling shall be contiguous, plenum rated, four-pair UTP cable compliant with EIA/TIA 568B-2.1 standards. Refer to the table in Section 1 for cable rating.
 2. Cable shall be solid copper.
 3. Cabling shall be certified as a complete system with other components required herein to achieve manufacturers cabling system extended warranty.
- B. Termination Standards:
1. Terminations shall be modular, T568B RJ-45 jacks. Refer to the table in Section 1 for cable rating.
 2. Video surveillance, wireless access point, or other equipment terminations shall be modular T568B RJ-45 jacks in a plenum-rated biscuit box located in the nearest accessible ceiling or junction box to the end device. Alternatively contractor can use a modular plug terminated link (i.e. direct connect) that meets the ANSI/TIA-568-C.2 clause 6.3 requirements. If a modular plug terminated link (MPTL) is used, testing must be performed with the appropriate channel adapter.

2.4 INDOOR/OUTDOOR DATA STATION CABLING

- A. Cable Standards:
1. Cable is to be continuous UTP cable rated for indoor and outdoor installations between two environmentally protected points, including underground pathways. Refer to the table in Section 1 for cable rating.
 2. Use in areas with thermal or chemical exposure.
 3. Plenum-rated required when cabling indoors extend beyond 50' from the building entry location.

4. Cable shall have an UV-resistant sheath and a core of solid-copper conductors, dual insulated resistant to chemical, moisture, and thermal exposure.
5. Cabling shall be certified as a complete system with other components required herein to achieve manufacturer's cabling system extended warranty.

B. Manufacturer:

1. Hitachi Cable Drybit Indoor-Outdoor Cable
2. Super Essex with FEP Jacket CMP Indoor/Outdoor
3. Approved equivalent

C. Termination standards:

1. Contractor shall install lightning protectors in telecommunication room for each data cable.
2. Terminate at station location in "biscuit box" in nearest accessible ceiling or as recommended by station equipment manufacturer/installer.

2.5 EXTENDED DISTANCE CABLING

A. General Requirements:

1. Extended distance cabling is only to be used for video surveillance and IP-paging devices with cable distances under 150m.
2. Prior to installation the contractor must demonstrate functionality with the end point (i.e. camera) and a spool of cable that meets or exceeds the expected distance, and obtain Owner sign off.
3. Contractor is to note on each cable test result that the cable run uses extended distance cabling.
4. Cable must be a different color or have a distinctive stripe to visually separate it from the Category cable used throughout the project. Review color or designation with project team before ordering.

B. Approved Manufacturers:

1. Belden RemoteIP Cable
2. Paige GameChanger Cable
3. Approved equivalent

2.6 PATCH PANEL DISTRIBUTION FRAME TERMINATIONS

A. Standards:

1. Patch panels must be 19", 48-port patch panels with T568B terminations.
2. Patch cables shall match the structured cabling type (i.e. Cat 6 patch cables for Cat 6 drops; Cat 6A patch cables for Cat 6A drops, etc.).
3. Patch panels shall accept keystone jacks and the contractor shall populate all openings with a keystone. Keystone color should match the distribution cable color.
4. Provide patch panels for all cables installed plus eight (8) open ports in each telecommunication room for future use.
5. Patch panels shall have a rear strain relief bar to organize cables and maintain appropriate bend radius.
6. Data cables shall be terminated sequentially. If terminated on the patch panels, cables installed for building systems (fire alarm phone line, security phone line, pay phones, etc.)

shall be terminated together in the last patch panel positions and its use labeled on the patch panel.

2.7 FACEPLATES AND MODULE FRAMES

- A. Faceplates shall be sized to accommodate the raceway, back box, or floorbox for each location with adequate modules for the required jacks.
- B. All faceplates shall be Decora style stainless steel. Utilize smooth metal 302/304 stainless steel for all faceplates. Blank plates shall be sized to fit box without Decora cutout.
 - 1. Exception: Plastic module frames shall be used where necessary to match installation of other contractors.
- C. Faceplate labels shall be secured to the faceplate (loose or removable labels on the screw covers are not permanent and not acceptable).

2.8 PATCH CABLES

- A. Patch cables shall match the structured cabling type (i.e. Cat 6 patch cables for Cat 6 drops; Cat 6A patch cables for Cat 6A drops, etc.).
- B. Patch cable manufacturer shall be consistent with the patch panel and jack manufacturer.
- C. Patch cables shall NOT have boots.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. It is the Contractor's responsibility to review the site work, architectural, structural, mechanical, and electrical drawings, specifications, and field conditions, for any details that may impact the installation or provisioning of the system.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Review all closet layouts with Technology Designer prior to installation.
- B. Contractor shall be familiar and install in accordance with all applicable codes and standards, including FCC, NEC (NFPA 70), EIA/TIA 568, 569 and 606, BICSI (Telecommunications Distribution Methods Manual, current edition), federal, state, and local building/fire codes.
- C. Contractor shall limit cable bundles for cable runs, cables in telecommunication rooms, and penetrations to:
 - 1. Cat 5e 52 cables
 - 2. Cat 6 64 cables
 - 3. Cat 6A 74 cables

- D. Contractor to provide additional cabling coiled above ceiling at both the workstation locations and in telecommunication rooms. The additional lengths of cable shall be included in distance calculations. Cable routing within the telecommunication closet is to be approved by the Owner's Representative before beginning termination.
- E. At station locations, terminate all 8 conductors on all jacks, regardless of data or telephone use.
- F. Ensure all cables within cable trays are arranged to avoid individual cables supporting the weight of the cable bundle. Cable trays shall have appropriate bend radii for cable and fiber. Provide elbows, supports, and ties to assist in offloading the weight of the cable and adequately support the tray.
- G. Service loops for Cat 6A cables are to be installed in an S-configuration and not a circular loop.
- H. All service loops are to be located in accessible ceiling, not in exposed visible locations.

3.3 IDENTIFICATION

- A. In addition to requirements in this Article, comply with TIA/EIA-606-A.
- B. Data cable patch panels shall be labeled sequentially with letter designations A, B, C, etc.
- C. Patch panel ports used for mounted devices (wireless access points, surveillance cameras, displays, etc.) will be labeled with the device name (e.g. WAP-09 for access point 9, CAM-07 for surveillance camera 7).
- D. Each termination module shall be labeled with a white, wrap-around self-adhesive label. Use Panduit MINI-COM® Module Port Identification Self-Adhesive Labels, or equivalent.
- E. Each label shall identify the telecommunication room, patch panel and patch panel port. For example: 1-A-34 would refer TR-1, patch panel A, port 34.
- F. In addition to the faceplate label, each cable is to be labeled behind the faceplate and patch panel with a machine generated wrap-around self-adhesive label that matches the port label on the patch panel and faceplate.

3.4 FIELD QUALITY CONTROL

- A. The installations must be tested and certified as compliant for Category 6 (or 6A as applicable) Gigabit connectivity. The installation is to be tested to the current EIA/TIA TSB Channel Performance Testing Standard, or equivalent as approved by the Technology Designer. For workstation locations without a patch cable, use a 10' cable at for testing purposes.
 - 1. Cables are to be tested with a Fluke Versiv Cable Certifier, or equivalent by Agilent or Wavetek, using the correct software version and adapter for the cable installation or as required for manufacturers warranty program.
 - 2. Cables are to be tested consistently with the tester in the telecommunication room, and the injector at the workstation termination locations.
 - 3. Testing will be performed after faceplates have been secured to the raceway/wall/floorbox.
- B. Document for each pair as well as the worst margin the following test results:

1. Cable identification (Building and Circuit ID)
2. Test date
3. Cable length (ft.)
4. Wiremap
5. Delay (ns)
6. Skew (ns)
7. Resistance (Ohms)
8. Attenuation
9. NEXT
10. ELFEXT
11. Return Loss
12. PSNEXT
13. PSELFEXT

- C. Any cables that do not meet the minimum performance criteria established by the standards or manufacturer shall be corrected or replaced at no additional cost to the Owner.

3.5 DEMONSTRATION

- A. Contractor shall train the Owner on the layout of the cabling system including the pathways, termination methods, and interconnections.

3.6 DOCUMENTATION

- A. As-Built Documentation:

1. Include scaled drawings reflecting the final installation, including final location of all telecommunication rooms, equipment, cable paths, outlets, etc.
2. Drawings shall include all cable routing, outlet locations, and outlet labels.
3. Drawings shall be created in AutoCAD format. Handwritten drawings shall be accepted for draft or working copies only.

- B. Cable Testing

1. Cable test results are to be provided in hard copy format as well as a PDF organized by building and telecommunication room.

- C. Warranty

1. Provide certificate of manufacturer's extended warranty for the structured cabling system.

END OF SECTION 27 1500

SECTION 27 2100 – NETWORK INFRASTRUCTURE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Specification Sections:
 - 1. 27 0000 – General Technology Requirements
 - 2. 27 2110 – Wireless Network

1.2 SUMMARY

- A. This Section includes the following major components related to the network infrastructure:
 - 1. Edge Switches
 - 2. Patch Cables (copper and/or fiber)
 - 3. Cable Management
- B. Related work existing or provided by others:
 - 1. Core switches
 - 2. Structured cabling system (other than new patch cables)
 - 3. Servers and client computers
- C. Contractor shall be responsible for providing, installing, patching, wire managing, labeling, configuration, and interconnecting network equipment as required to migrate the Owner's existing network infrastructure to an infrastructure based on the existing fiber WAN.
 - 1. A pair of 10GB connections between each building aggregate switch and the core switch in the data center.
 - 2. Forty eight (48) 10/100/1000 GB connections within the data center (does not need to be POE)
 - 3. Forty eight (48) 10 GB SFP+ connections within the data center
 - 4. A pair of 10GB connections between the building aggregate switch and each switch stack in each telecommunication room
 - 5. Stackable edge switches in each closet supporting 10/100/1000 full POE+ connections
- D. Include a system diagram with the proposed solution including a listing and description of all components within the proposed solution.
- E. Provide information about service and maintenance capabilities. Bid shall include a description of the service options and associated costs with the proposed system solution.
- F. Remove unused existing equipment and deliver to a centralized location identified by the Owner.

- G. Contractor shall be responsible for coordinating the network configuration with the integrators who will be utilizing the network (e.g. servers, clients, peripherals, IP telephony, video systems, classroom presentation systems and projector management system, building security systems, building environmental management systems, etc.).

1.3 DEFINITIONS

- A. POE: Power Over Ethernet
- B. LAN: Local Area Network
- C. MC: Main Equipment Room. (Applies to MDF or Headend references).
- D. OFE: Owner Furnished Equipment.
- E. TR: Telecommunications Room. (Applies to MDF or IDF references).
- F. WAN: Wide Area Network

1.4 EXISTING SYSTEM

- A. This project replaces the majority of the district's existing Cisco infrastructure, however there are some 9300 series switches that will remain in place.
- B. Existing fiber optic cabling includes SC terminations for the Fiber WAN. Verify existing terminations and order appropriate cable types and lengths.
- C. Contractor is to configure the new equipment to be compatible with the portions of the existing data network installation that will remain after the installation. The contractor is responsible for confirming the existing configuration.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated, provide a product data sheet in both hard-copy and electronic (PDF) formats. Data sheets indicating multiple products must have the applicable product clearly highlighted or marked.
 - 1. Switches and modules
 - 2. Patch cables
- B. Shop Drawings / Schematic Diagrams:
 - 1. Include a schematic drawing of the overall data network identifying all components and the interconnection of components. Include both existing equipment and systems provided by others that will integrate with the data system. Include connections with utility providers.
 - 2. Provide the proposed configuration of the network components with settings, VLANs, IP addressing scheme, QOS, network security, etc.
- C. Qualification Data:

1. Include written confirmation from the manufacturer that the contractor is an authorized factory agent or distributor for the submitted products.

1.6 QUALITY ASSURANCE

- A. The Contractor and their Sub-Contractors shall be experienced in all aspects of the work and shall demonstrate direct experience on recent systems of similar type, complexity, and size.
 1. Upon request, Contractor shall furnish for both the Contractor and all Sub-Contractors information on the corporation, project manager, and installers indicating recently completed projects, technical experience, and completed training.
 2. The Contractor shall maintain consisting staffing for Project Management and lead installers throughout the project, with the exception of illness or loss of personnel.
- B. Contractor must employ on-staff personnel certified by the manufacturer at the highest level for the data solution specified under this bid package. This engineer must be available during the planning phase and during troubleshooting. Installers must have the appropriate level of manufacturer certification required for the installation.
- C. The Technology Designer and Owner reserve the right to require staffing substitutions if deemed beneficial to satisfactory completion of the project.
- D. Contractor shall install in accordance with all applicable codes and standards.

1.7 COORDINATION

- A. Coordinate layout and installation of the work of this section with the Owner's equipment, furniture, electrical, mechanical, architectural, and other technology trades.
- B. While each contractor is responsible for the configuration and operation of their equipment, Network Contractor is to lead in troubleshooting issues for devices that are on the network once data cabling has been tested; whether those devices were installed by the network contractor, other contractors, or the Owner.

1.8 WARRANTY

- A. The contractor warrants the system to be free of defects of workmanship or products and will inspect and repair the system during the warranty period at no additional cost to the Owner. Contractor agrees to correct system deficiencies and replace components that fail in materials or workmanship including deficiencies arising when used according to the manufacturer or Contractor's written instructions. No warranty or terms therein shall limit or be interpreted to limit remedies as provided by law.
- B. The period for warranty/licensing for any equipment included in these specifications shall be through July 31, 2029.
 1. **If the manufacturer's warranty begins at the time the equipment is purchased, contractor is to include the additional warranty duration with the equipment purchase to ensure the extended warranty period extends through this date.**
- C. The manufacturer warranty shall include all equipment unless noted below, manufacturer phone support, software assurance (including new versions), firmware updates, and any other special warranties. **Contractor must provide evidence of manufacturer warranty and duration.**

1. Edge switches if they have a limited lifetime warranty
 2. Contractor is to install critical firmware updates during the warranty period.
 3. Contractor is to provide an annual "health check" on the system with corresponding report noting items corrected and suggested maintenance or configuration changes.
 4. Contractor is to provide an overview of non-critical updates and version upgrades as they become available.
 - a. Owner will decide which version upgrades they wish to implement.
 - b. Contractor to install maximum of three (3) version upgrades throughout warranty period. Contractor is to make configuration changes on the switches and provide administrative training session on the new features and system administration, but Contractor is not required to perform any work on individual devices or computers.
- D. In addition to the service and warranty requirements above, provide all repair, preventative maintenance, continual documentation, and upgrade of the system for the first year. Provide all corresponding modifications to the documentation.
- E. Warranty is to cover on-site replacement of equipment (including labor, shipping, travel, etc.), phone support, software updates, etc.
- F. Contractor is also to provide terms of any additional warranties as a manufacturer's standard. Special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The following are acceptable manufacturers for general equipment within this section, unless noted otherwise for any product. Any substitutions must be included in the bid as a voluntary alternate and if accepted approved in writing by the Technology Designer and Owner before installation.
1. Cisco Systems
 2. Approved Equal

2.2 SYSTEM REQUIREMENTS

- A. Provide the most current release of software and patches at the time of implementation.
- B. All equipment shall come complete with rack mounting kits, cables, and other components required for installation.
- C. No mixing of products from various manufacturers will be accepted. All switches shall come from the same manufacturer.
- D. Network switches and wireless access points shall be from a single manufacturer.
- E. All switches must be compatible with Cisco ThousandEyes.
- F. No cloud managed solutions will be accepted.

- G. All proposed Layer 3 switches must natively stack with existing Cisco 9300 switches throughout the district.
- H. The Contractor shall provide all miscellaneous items and accessories required to make the system operational whether or not such items are specifically mentioned in the plans and specifications.
- I. Contractor is to provide all optics, modules, and interconnecting cables for a complete installation. Field verify length requirements for all cables.
- J. Stackable switches refer to switches that can be managed as one switch, have one IP address, and share a common backplane.

2.3 EDGE SWITCHES

- A. Provide powered stackable switches in each TR. Configuration shall be based upon the Cisco 9200L series, layer 3 switches.
- B. Two 10 GbE Fiber uplink from each closet to building aggregation switch per stack with no more than 192 ports per stack.
- C. 48-port 740 W PoE+ switches or switches as shown in the equipment schedule.
- D. All ports support IEEE 802.3at-2009 Power over Ethernet (PoE+)
- E. Provide optics, modules, and cables to interconnect all switches.

Base Bid Edge Equipment Schedule:

| Switch Model | Quantity |
|-------------------------------|----------|
| Cisco C9200L-48P-4X | 63 |
| Cisco C9200L-48P-4G | 65 |
| Cisco 9300L-48UXG4X | 63 |
| Total number of edge switches | 191 |

2.4 PATCH CABLES

- A. Contractor to provide **9168** new copper and fiber patch cables for all switches. Existing patch cables are not to be reused. Provide 3' patch cables. **Verify colors prior to ordering, but assume up to 6 different colors will be required.**
- B. Provide bootless Cat 6 (Cat 6A for access points) patch cables with lengths necessary to utilize existing wire management and route cables appropriately.
- C. Purchase patch cables for all switch ports but do not patch unused switch ports. Turn over remaining patch cables to Owner.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. It is the Contractor's responsibility to review the site work, architectural, structural, mechanical, electrical, and furniture drawings, specifications, and field conditions, for any details that may impact the installation or provisioning of the system.
- B. Prior to installation, a site survey must be performed to determine equipment placement. Any issues with the systems, design, or installation must be brought to the attention of the Technology Designer before the bid is submitted.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. The Contractor shall install and configure the system according to the manufacturer's sequence and guidelines as well as generally accepted telecommunications standard practices.
- B. The Contractor shall protect equipment and components during installation until final acceptance of the project, and clean all equipment before Owner acceptance using methods and materials recommended by the manufacturer.
- C. Contractor shall be responsible for final configuration (IP addressing, VLANs, QOS, network management, etc.).
- D. Contractor will be responsible for burn-in testing showing sustainable throughput at rated speeds, less expected traffic and overhead. Burn-in will be no less than 48 hours and will be followed by signed reports showing results and acceptance by owner.
- E. Any service interruptions must be coordinated and approved by the Technology Designer and Owner at least two weeks before initiation. All shutdowns and cutovers must be scheduled with the district at least two weeks before initiation. For occupied facilities or networks, service interruptions and cutovers will be scheduled outside of the Owner's business hours.
- F. Contractor will be responsible for relocating existing patch panels to accommodate new equipment or wire management.

3.3 PATCHING AND WIRE MANAGEMENT

- A. This Contractor is responsible for patching all switches.
- B. Do NOT patch unused patch panel ports.
- C. Contractor will be responsible for all cross-connection cabling and patching of the equipment utilizing wire management. Technology Designer and Owner to approve the mounting location of new equipment. Existing patch panels and/or wire management panels may need to be moved to accommodate the new equipment. Contractor to provide hook-and-loop tape for tying exposed cables.
- D. Installer shall coordinate installation requirements with the Technology Designer before installation begins.

3.4 IDENTIFICATION

- A. In addition to requirements in this Article, comply with the current version of TIA-606.
- B. Include the e-rate FRN number and USAC funding year on all switches.
- C. Use logical and systematic designations for facility's architectural arrangement and nomenclature, and a consistent color-coded identification.
- D. Review identification labels with Technology Designer and Owner before implementation.

3.5 FIELD QUALITY CONTROL

- A. All devices must be tested at their operational location under normal operational conditions.

3.6 DELIVERY STORAGE AND HANDLING

- A. Contractor is responsible for all delivery, storage, and handling.
- B. Contractor is responsible for all debris, trash, and packing material removal off site. The contractor may not use district dumpsters or waste receptacles.
- C. Contractor shall submit registration information to the manufacturer for any equipment required by the manufacturer for upgrades and/or warranty.

3.7 DEMONSTRATION / TRAINING

- A. The Contractor shall demonstrate for the Technology Designer and Owner that the system operates under manufacturer guidelines under both normal operational conditions and during the loss of power.
- B. In addition to cutover testing for each building, demonstrate to the Owner:
 - 1. Survivability in the data center with the loss of redundant systems (e.g. core switch, firewall, etc.)
- C. The Contractor shall train the Owner on the operation of the system.
 - 1. Provide two (4) hour pre-install training sessions on the features, interface, and basic use of the systems. This training is anticipated to be completed after the project is awarded and before the design is finalized to familiarize the IT administrative staff with the new network/wireless environment.
 - 2. Provide five (5) days of post-install training on the configuration, administration, and maintenance of the system. Key systems include:
 - a. The network solution
 - b. The wireless solution
- D. Training will be in a minimum of 2-hour blocks scheduled in advance. Travel time and non-training time (e.g. time initially allocated to training but used to troubleshoot and correct installation issues) will not count toward the training hours.

- E. Contractor to include **100 Cisco Learning Credits** (or equivalent from non-Cisco manufacturer) for the Owner's discretionary use.
- F. Any unused training time will be converted to post-contract support hours.
- G. The Contractor shall also provide the Owner with information and pricing on any training offered at the manufacturer's facility or designated training facility.
- H. The Contractor's trainer will supply system documentation and training aids customized to this installation prior to training sessions.

3.8 DOCUMENTATION

- A. As-Built Documentation:
 - 1. Provide as-built drawings of each TR detailing equipment layouts and identifying equipment components, serial numbers, and IP address.
 - 2. Provide a spreadsheet of each TR detailing identifying equipment components, software versions, network settings (VLANs, IP address, etc.), and serial numbers.
 - 3. Provide schematic diagram of the entire network infrastructure including type of equipment, type of connections, VLANs, IP address, QOS settings, etc. Network diagram shall include all Owner equipment and connections to outside entities.
 - 4. The contractor is responsible to provide and coordinate asset tagging of all equipment with the Owner. Labeling to meet district and e-rate requirements including FRN numbers and funding year.
 - 5. Provide documentation for warranties for all components including service procedures and expiration dates.
- B. Manufacturer's Instructions: Provide complete installation, set-up and maintenance instructions.

END OF SECTION 27 2100

SECTION 27 2110 – WIRELESS INFRASTRUCTURE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Specification Sections:
 - 1. 27 0000 – General Technology Requirements
 - 2. 27 1000 – General Cabling Requirements
 - 3. 27 1500 – Data Voice Horizontal Cabling.

1.2 SUMMARY

- A. Bidders are to submit pricing based on the quantities shown in table included herein. Unit pricing will be used to adjust final quantities after the pre-installation survey is completed. Any equipment required for a final solution must be included in the unit pricing or as a separate attachment submitted with the bid.
- B. The District utilizes a mixture of Windows, Chrome, Android, and Apple devices.
- C. This Section includes the following related to wireless infrastructure:
 - 1. Pre-installation survey
 - 2. Access points
 - 3. Post-installation survey.
- D. In addition to the equipment and installation costs, the bid is to include costs for conducting site surveys for all non-classroom spaces throughout the district, and providing a detailed design in accordance with the specifications below. The intent of this project is to design and install a new wireless data system in each building throughout the district. The design must provide for every component or requirement of installation.
- E. Contractor to include all data cabling and accessories (patch panels, patch cables, etc.) required for a complete solution. Assume new patch panels in each telecommunication closet., though available patch panel ports may be utilized and if patch panels aren't needed unit pricing will be used to adjust the contract amount.
- F. Wireless access points and all related equipment shall be configured for 802.11ax Wi-Fi 6e.
- G. Wireless access points must work with the district's existing Cisco 9800 series wireless controller.
- H. Wireless access points must be managed through the district's existing Cisco DNA Center.
- I. No cloud managed solutions will be accepted.
- J. A single manufacturer for wired network and wireless access point hardware is required.

- K. Provisions for guest access shall be provided. Guests will be required to agree to an acceptable use policy with each login.
- L. The specifications are intended give general, not specific requirements. Contractor shall review locations and mounting options for intended requirements for specific equipment (e.g. access points, antennas, etc.) with Technology Designer before installation to ensure Owner's requirements are met.

1.3 DEFINITIONS

- A. AP: Access point
- B. MIMO: Multiple In, Multiple Out.

1.4 EXISTING INFRASTRUCTURE

- A. The network infrastructure is based on Cisco 9300 and 9200 switches, and all buildings are connected to by a private optical fiber network. The vendor will work with the Owner to modify the switch configurations as needed to support the new wireless infrastructure.
- B. The District utilizes a mixture of Windows, Chrome, Android, and Apple devices.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated, provide a product data sheet in both hard-copy and electronic (PDF) formats. Data sheets indicating multiple products must have the applicable product clearly highlighted or marked.
 - 1. Access points
 - 2. Antennas
- B. Pre-installation survey documentation
- C. Identify telecommunication closet(s) used for the AP cabling
- D. Within six weeks of award, contractor must submit an updated list of AP locations. This list is to include the following details (minimum):
 - 1. Mounting height
 - 2. Description of location (i.e. above soffit, above ceiling, etc.)
 - 3. If existing access point will be relocated within the space
 - 4. Identify telecommunication closet used for the AP cabling
 - 5. Note any locations with extraordinary cabling/pathway requirements

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is an authorized representative of the equipment manufacturer, for both installation and supervision of the installation of the system.
- B. Follow all FCC rules and regulations.

1.7 COORDINATION

- A. Coordinate layout and installation of the work of this section with the Owner's equipment, furniture, electrical, mechanical, architectural, and other technology trades.
- B. Contractor to provide access point locations to Technology Designer within six weeks of contract award, and coordinate data cable installation with the wireless integrator's cabling subcontractor.
- C. Coordinate user authentication with the Owner for both existing user accounts as well as guest access.

1.8 WARRANTY

- A. The contractor warrants the system to be free of defects of workmanship or products and will inspect and repair the system during the warranty period at no additional cost to the Owner. Contractor agrees to correct system deficiencies and replace components that fail in materials or workmanship including deficiencies arising when used according to the manufacturer or Contractor's written instructions. No warranty or terms therein shall limit or be interpreted to limit remedies as provided by law.
- B. The warranty for the controller and any centralized equipment shall be an 8x5xNBD onsite warranty with advanced replacement.
- C. Unless licensing is required for the solution, provide manufacturer's standard warranty for:
 - 1. Access points
 - 2. External antennas
- D. The period for warranty/licensing for centralized equipment (controller, management, licensing, etc.) shall be through July 31, 2029.
 - 1. **If the manufacturer's warranty begins at the time the equipment is purchased, contractor is to include the additional warranty duration with the equipment purchase to ensure the extended warranty period extends through this date.**
- E. Extended warranties are not required for APs or antennas. Any applicable ongoing licenses should be included through the warranty period.
- F. The manufacturer warranty shall include all equipment unless noted below, manufacturer phone support, software assurance (including new versions), firmware updates, and any other special warranties. **Contractor must provide evidence of manufacturer warranty and duration.**
 - 1. Contractor is to install critical firmware updates during the warranty period.
 - 2. Contractor is to provide an annual "health check" on the system with corresponding report noting items corrected and suggested maintenance or configuration changes.
 - 3. Contractor is to provide an overview of non-critical updates and version upgrades as they become available.
 - a. Owner will decide which version upgrades they wish to implement.
 - b. Contractor to install maximum of two (2) version upgrades throughout warranty period. Contractor is to make configuration changes on the switches and provide administrative training session on the new features and system administration, but Contractor is not required to perform any work on individual devices or computers.

- G. In addition to the service and warranty requirements above, provide all repair, preventative maintenance, continual documentation, and upgrade of the system for the first year. Provide all corresponding modifications to the documentation.
- H. Warranty is to cover on-site replacement of centralized equipment (including labor, shipping, travel, etc.), phone support, software updates, etc. Contractor is not expected to visit on-site to replace access points.
- I. Contractor is also to provide terms of any additional warranties as a manufacturer's standard. Special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- J. At the end of the warranty period, all operating systems shall be upgraded to the most current version and verified to function as specified.

PART 2 - PRODUCTS

2.1 REQUIREMENTS

- A. In general for classroom areas assume internal antennas and below ceiling mounting. For specialty spaces (i.e. gyms, auditoriums, press box, outdoor spaces, etc.), provide internal or external antennas appropriate for the space.
- B. The following are manufacturers are the basis of design for this bid due to Owner's familiarity and current support systems.
 - 1. Cisco Systems
 - 2. Approved Equal
- C. Bidders may submit solutions based on other manufacturers but those solutions must meet/exceed the specifications and functionality of the basis for design. Bidder will be required to demonstrate solution and management system to Owner.

2.2 ACCESS POINTS

- A. General Requirements
 - 1. Provide **1305** wireless access points for use throughout the district
 - 2. Wi-Fi 6E certified
 - 3. 2.4-GHz, 5-GHz, and 6-GHz radios
 - 4. 4x4 downlink MU-MIMO with four spatial streams
 - 5. Integrated BLE
 - 6. Multigigabit Ethernet
 - 7. Cisco DNA Essentials (5 year term) or equivalent
- B. Basis of base bid design for standard indoor locations should be:
 - 1. Cisco 9164I
 - 2. Approved equivalent
- C. All access points shall be provided with mounting brackets, patch cables, and connections. Units shall be installed in a non-obtrusive manner to avoid accidental damage or vandalism. All

cabling shall be hidden within the ceiling or wall whenever possible, provide metal surface mounted raceway where cabling would be visible. Adhere to plenum requirements.

- D. Provide any required attachments, kits, installations, etc. to provide a turnkey solution. Access points are to be mounted to solid surfaces (walls, solid ceilings, building structure, ceiling grid, etc.). Access points are not to be supported directly by ceiling tiles; they must either use a tile bridge or be supported by the ceiling grid.
- E. Provide mounts for horizontal installations where recommended by the manufacturer (Oberon H-Plane or equivalent).
- F. Provide lightning protection for cables used for outdoor access points.
- G. All antennas shall be provided with mounting brackets, cords, and connections. Units shall be installed in a non obtrusive manner. All cords and cabling shall be hidden within the ceiling or wall whenever possible.
- H. Power Supply Characteristics: Devices shall be provided with inline 802.3at Power over Ethernet.
- I. RF Impedance Matching: Signal-handling components, including connecting cable, shall have end-to-end impedance-matched signal paths.
- J. The vendor shall load and provide documentation for the following information at each wireless access point as a minimum:
 - 1. System Name
 - 2. MAC Address
 - 3. Default IP Address
 - 4. Map with physical locations
 - 5. TR location
- K. Contractor shall enable system filtering, radio, Ethernet, server, routing and association configurations as required to ensure a compatible, robust, and secure system. These services shall also be configured and documented.
- L. APs must support multiple VLAN environment.

2.3 ENCLOSURES

- A. Provide for all AP's in gymnasiums, natatoriums, and exterior AP locations.
- B. Enclosures are to be non-metallic with a translucent door sized for the AP. Include angled bracket where manufacturer recommendation is to mount AP's horizontally.
- C. Enclosures are to be the appropriate size for the corresponding AP.
- D. Manufacturers:
 - 1. Oberon Skybar series
 - 2. Approved equivalent

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine pathway elements intended for cable. Check raceways, cables trays, and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation.
- B. Examine walls, floors, roofs, equipment bases, and roof supports for suitable conditions where equipment is to be installed.
- C. During construction, visually inspect the facility. Walk through the facility before performing any tests to verify the accuracy of the facility diagram. Determine preliminary access point locations.
- D. Plan for some propagation overlap among adjacent access points, but channel assignments for access points will need to be far enough apart to avoid channel interference.
- E. Mounting locations are typically metal supports below ceiling tiles.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PRE-INSTALLATION SURVEY

- A. Wireless contractor is required to perform a complete survey of all District buildings and provide design documentation for 802.11ax Wi-Fi 6E coverage for all non-classroom areas. Software-based surveys can be used in conjunction with a physical site survey but cannot take the place of a site survey to identify mounting location, physical obstructions, etc. Survey must be performed on site using the proposed APs and professional RF measurement tools.
- B. Contractor shall indicate access point location and document installation location if cabling will be performed by others (e.g. picture of proposed location with either a sticker/semi-permanent mark (if ceilings won't be removed), marked-up photo, or photo with written description). Pictures are to be included in the survey documentation.
- C. Survey documentation to be reviewed with Technology Designer and the Owner. Contractor to receive sign off on survey documentation before installation begins.
- D. Review coverage expectations with the Owner and Designer prior to beginning the survey.
- E. Survey documentation to include the following information (at a minimum) on a spreadsheet and floorplans as appropriate. Information shall be generated by hardware management solution or by professional testing/survey devices.
 - 1. To be shown on spreadsheet:
 - a. Access point number
 - b. Access point name
 - c. Antenna type
 - d. Access point location
 - e. Telecommunication closet connected to
 - 2. To be shown on map
 - a. Access point name/number
 - b. Access point location

- c. Telecommunication closet connected to (draw box around AP's showing telecommunication room boundaries)
 - d. RF radiation pattern
- F. Once the survey is complete, the contractor will meet with Barton Malow and the Owner to discuss possible cost saving scenarios including, but not limited to, AP placement, wireless bridges, security configurations, etc.

3.3 INSTALLATION

- A. Access points are to be installed below the ceiling.
- B. Label all access points with the:
 - 1. Access point number
 - 2. Access point name in the management system
 - 3. Associated IDF and patch panel port
 - 4. E-Rate FRC year and number
- C. Wireless contractor is required to furnish and install equipment in locations as outlined in the final design.
- D. Provide and install brackets for installation on a wide variety of building materials, including drywall, cinderblock, and suspended ceilings.
- E. Protect signal cables and connected components against transient-voltage surges by suppressors and absorbers designed specifically for the purpose.
- F. All antennas will be provided and tuned as appropriate to the space.
- G. The wireless contractor will be responsible for relocating data cables to final AP locations including penetrations from nearest accessible ceiling to AP location (for outdoor AP's, stairwells, hard ceiling areas, etc.)
- H. Contractor to provide and install any additional cabling required for a complete and operational system. This includes any cabling required by the antenna, cross connect cabling for wireless management equipment, or other components and cabling required for a complete and fully functional system.
- I. Unless distance or field conditions prohibit, each access point is to be provided with a minimum 15' service loop. When a service loop is not feasible, contractor is to notify Technology Designer and obtain approval on an individual basis.
- J. When field conditions require significant design changes (locations, quantity of access points, quantity of antennas, type of antennas, etc.), the contractor must obtain explicit approval, in writing, from Technology Designer.
- K. The wireless infrastructure will be completely installed, tested and verified before being turned over to the client.

3.4 POST-INSTALLATION SURVEY

- A. After installation, contractor is required to perform a complete survey of all District buildings and provide documentation. Survey documentation to be reviewed with Technology Designer and

the Owner. Contractor to receive sign off on survey documentation as part of the contract close-out requirements.

3.5 DELIVERY STORAGE AND HANDLING

- A. Deliver all components to the site in the manufacturer's original packaging. Packaging shall contain manufacturer's name and address, product identification number, and other related information. Contractor to dispose of all packaging.

3.6 DEMONSTRATION

- A. After installation, Contractor will demonstrate to Technology Designer and Owner that selected APs meet or exceed the specification requirements (including density and throughput).
- B. The Contractor shall train the Owner on the operation of the system.
 - 1. Provide two (2) 2-hour pre-install training sessions on the features, interface, and basic use of the systems. This training is anticipated to be completed after the project is awarded and before the design is finalized to familiarize the IT administrative staff with the new network/wireless environment.
 - 2. Provide twenty (20) hours of post-install training on the configuration, administration, and maintenance of the system. (Note: For combined network/wireless systems the requirement is the combined total of the 2 spec sections.)
- C. Training will be in a minimum of 2-hour blocks scheduled in advance. Travel time and non-training time (e.g. time initially allocated to training but used to troubleshoot and correct installation issues) will not count toward the training hours.
- D. Any unused training time will be converted to post-contract support hours.

3.7 DOCUMENTATION

- A. Post-survey documentation to include the following information (at a minimum) on a spreadsheet and two separate maps for each floor of each building:
- B. Information shall be generated by hardware management solution or by professional testing/survey devices.
 - 1. To be shown on spreadsheet:
 - a. Access point number
 - b. Access point name
 - c. Access point IP address
 - d. Access point MAC address
 - e. Access point channel
 - f. Access point power information
 - g. Antenna type
 - h. Access point location
 - i. Telecommunication closet and patch panel port
 - 2. To be shown on map(s)
 - a. Access point name
 - b. Access point location

- c. Channel information
 - d. Technology closet, cable routing, and patch panel port
 - e. Power output information
 - f. RF radiation pattern
- C. Warranty information (contract numbers, contact numbers, expiration dates, etc.)
- D. Hardware inventory with model numbers, serial numbers, software version numbers, etc.
- E. Configuration documentation as defined during the programming/design meetings with the Owner.

END OF SECTION 27 2130