

November 17, 2023

Request for Proposal Wireless Network

For

**Armada Area Schools
74500 Burk St.
Armada, Michigan 48005**

Prepared by

Convergent Technology Partners, LLC

6197 Miller Road, Suite 4

Swartz Creek, MI 48473

810.720.3820

www.ctpartners.net

ARAMDA AREA SCHOOLS
WIRELESS NETWORK

SECTION 00 01 00 – TABLE OF CONTENTS

SECTION TITLE

DIVISION 00 - BIDDING REQUIREMENTS, BID FORMS

SECTION 00 01 00 – TABLE OF CONTENTS

SECTION 00 30 00 – INSTRUCTIONS TO BIDDERS

SECTION 00 30 10 – SCHEDULE OF EVENTS

SECTION 00 40 10 – BID PROPOSAL FORM

SUPPLEMENTAL A – COST ANALYSIS WORKSHEET

SUPPLEMENTAL B – UNIT PRICING

SUPPLEMENTAL C – MANDATORY ALTERNATES

SUPPLEMENTAL D – VOLUNTARY ALTERNATES

SUPPLEMENTAL E – FAMILIAL DISCLOSURE AFFIDAVIT

SUPPLEMENTAL F – IRAN ECONOMIC SANCTIONS ACT AFFIDAVIT

DIVISION 27 – COMMUNICATIONS TRANSMISSION AND DISTRIBUTION

SECTION 27 10 00 – COMMUNICATIONS CABLING

SECTION 27 21 29 – DATA COMMUNICATION SWITCHES

SECTION 27 21 33 – DATA COMMUNICATIONS WIRELESS ACCESS POINTS

APPENDICES

A – PROJECT DRAWINGS

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SECTION 00 30 00 – BIDDING REQUIREMENTS – INSTRUCTION TO BIDDERS

PART 1 - GENERAL

1.1 REQUEST FOR PROPOSALS

- A. Armada Area Schools is seeking proposals in conjunction with the Federal Universal E-Rate Program for new Category 2 services for a new wireless network.
- B. See individual sections for requirements.
- C. Bidders shall provide, install, configure, test and commission a fully operational wireless network for all District buildings.
- D. **Bid documents may be obtained from the Support Services Department section of the District's web site at www.armadaschools.org.**

1.2

The Owner will receive bid proposals for the project. **Due on or before the date as specified in the Schedule of Events.** The Owner will not consider or accept a bid proposal received after the due date for bid proposal submission. All bid proposals received after the due date will be returned by making them available to the respective Bidder, unopened, for said Bidder to pick up at their sole cost and expense. Bid proposals shall be submitted to:

Jack Bostonian
Technology Director
Armada Area Schools
74500 Burk St.
Armada, MI 48005

1.3 PROPOSALS/QUOTES

- A. Two (2) "hard" copies and two (2) "soft" (electronic) copy on a USB "flash" drive of the proposals are to be submitted in sealed packaging, clearly marked: "**WIRELESS NETWORK SEALED BID**" for Armada Area Schools and shall be identified with the Bidder's name and address and the date and time of the bid proposal opening. The Owner is not responsible for any postal or delivery delays. No email, facsimile or other electronic bid proposals will be accepted.
- B. Proposals will be opened publicly immediately following the due date of the proposals

1.4 PROPOSAL FORMAT

- A. The Bid response shall be structured as follows:
 - 1. Section 1 – Submittal Letter, Executive Summary and Bid Bond
 - 2. Section 2 – Proposal Forms and Pricing
 - 3. Section 3 – Narratives, System Description, Information, and Brochures

ARMADA AREA SCHOOLS
WIRELESS NETWORK

4. Section 4 - Bidder Qualifications, References

5. Section 5 – Bidder’s Maintenance Contract

- B. The “hard copy” Bids shall be submitted on 8 1/2" by 11" paper, single sided, single spaced using 10 to 12-point print, in 3 ring binders, clearly labeled to show the Bidder's name.
- C. The “soft copy” Bid shall be in the same structure as the “hard copy” Bids, bound in a .pdf file, submitted on an USB “flash”, “Thumb” or similar drive with the hard copies.

1.5 FAMILIAL DISCLOSURE AFFIDAVIT

- A. Each bid proposal must be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the owner or any employee of the Bidder and any member of the Board of Education or the Superintendent of Armada Area Schools. The Board of Education will not accept a bid proposal that does not include this sworn and notarized disclosure statement.

1.6 AFFIDAVIT OF COMPLIANCE – IRAN ECONOMIC SANCTIONS

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

1.7 BIDDING INDIVIDUAL SECTIONS OF RFP

- A. The Vendor may bid any or all sections of the RFP.
- B. All mandatory alternates and unit pricing that are applicable to the section you are bidding must be completed and included with your bid response.

1.8 RESERVATION OF RIGHTS

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

1.9 WITHDRAWAL OF BID PROPOSALS/QUOTES

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

ARMADA AREA SCHOOLS
WIRELESS NETWORK

1.10 SITE VISITS

- A. There will be a mandatory site visit. **The date and time are identified in the Schedule of Events.** Participants will meet in the Elementary School lobby.
- B. Only the Elementary School is mandatory. Bidders may opt out of other buildings.
- C. No other time or date for site visits will be entertained.

1.11 REQUESTS FOR CLARIFICATION

- A. Bidders may request that the School District clarify information contained in this RFP. All such requests must be made in writing via email John Foster, Convergent Technology Partners, at jfoster@ctpartners.net. Requests for Clarifications and inquiries may only be made via email. The deadline for all Requests for Clarification is per the schedule of events. The aggregated answers to all Requests for Clarification will be provided in an addendum to the RFP which will be issued and posted on the Support Services Department page of the District website at www.armadaschools.org for all potential proposers to view.

1.12 RESTRICTION ON COMMUNICATION

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

1.13 RELEASE OF CLAIMS

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

1.14 PROPOSAL COST

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

1.15 COLLUSIVE BIDDING

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

1.16 DEFINITIONS

ARMADA AREA SCHOOLS
WIRELESS NETWORK

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

1.17 BIDDER'S REPRESENTATION

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

1.18 EXAMINATION OF BID DOCUMENTS

- A. Before submitting a Bid Proposal, each Bidder shall examine the RFP documents carefully and shall read the Specifications and the Bid Documents. Each Bidder shall gather complete information prior to bidding as to existing conditions and limitations under which the Work/Project is to be performed and shall include in its Bid Proposal a sum to cover the cost of items necessary to perform the Work/Project as set forth in the Bid Documents.
- B. No allowance or additional fees will be made to a Bidder because of lack of such examination or knowledge. The submission of a Bid Proposal will be considered as conclusive evidence that the Bidder has made such examination. An on-site-inspection of the Sites during the Bidder's Conference will be for all Bidders and their subcontractors, if any. Vendors may use subcontractors in connection with the Work/Project performed under this RFP provided the Owner has approved the subcontractors. In using subcontractors, the Vendor agrees to be responsible for all their acts and omissions to the same extent as if the subcontractors were employees of the Vendor.
- C. Bidders may make written request to the PSC for interpretation or correction of any ambiguity, inconsistency or error in the Bid Documents that are discovered. These questions shall be submitted to the PSC no later than the date as set forth in the Schedule of Events. Only a written

ARMADA AREA SCHOOLS
WIRELESS NETWORK

interpretation or correction by Addendum shall be binding on Bidders. No explanations or interpretations requested or made orally will be considered binding. All questions will be responded to in writing and all addenda will be posted to the Support Services Department page of the of the District website at www.armadaschools.org.

1.19 SUBSTITUTIONS

- A. Each Bid Proposal shall be based upon the materials and equipment described in the Bid Documents.
- B. Voluntary alternates as substitutions for materials and equipment will be considered and evaluated if the Base Bid includes specified materials and equipment. In addition to the Base Bid, the submission of voluntary alternates is acceptable. If a voluntary alternate is submitted for consideration, it shall be expressed on the Bid Form as an “add” or “deduct” amount from the Base Bid. If a voluntary alternate is submitted, the Bidder shall also submit sufficient information in the form of drawings, specifications, and a complete description of the proposed substitute, the cost savings or advantages. Additionally, provide the name of the material or equipment for which it is substituted, drawings, cuts, performance and test data and any other data or information necessary for a complete evaluation, sufficient for analysis of the alternate. The Owner reserves the right to unilaterally accept or reject, in whole or in part, any voluntary alternates.

1.20 BIDDING PROCEDURES

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

ARMADA AREA SCHOOLS
WIRELESS NETWORK

2. Partnerships: Signature of one partner who is authorized to bind the firm and all of its Partners.
 3. Bids submitted by Joint Ventures shall be signed by one of the Joint Ventures and shall be accompanied by a certified copy of the Power of Attorney authorizing the individual signing to bind all the Joint Ventures. If a certified copy of the Joint Venture's certificate submitted with the Bid Proposal indicates that all Joint Ventures have signed, no authorization is required.
 4. Individuals signing on own behalf: No authorization is required.
 5. Individual signing on behalf of another: Power of Attorney or comparable evidence of authority shall accompany Bid.
- E. Bid proposals shall be prepared on unaltered Bid Forms, which are a part of this RFP. Bidders shall make no additional stipulations on the Bid Form nor qualify the Bid Proposal in any other manner. Unauthorized conditions, limitations, or provisions attached to the Bid Proposal will be cause for rejection of the Bid Proposal. If alterations by erasure or interlineations are made for any reason, explain over such erasure or interlineations with a signed statement from the Bidder. No additional charges, other than those listed on the Bid Proposal Form and Bid Supplemental Forms, shall be made. Prices quoted will include verification/coordination of order, all costs for shipping, delivery to all Sites, insurance, payment and performance bonds, unpacking, setup, installation, operation, testing, cleanup, training and all other requirements contained in the bid documents.
- F. No responsibility shall attach to the PSC, the Owner, or the authorized representatives of either one, for the premature opening of any Bid Proposal which is not properly addressed, delivered and/or identified. In such event, that Bid Proposal will not be considered, and the Bidder will be automatically disqualified from consideration.
- G. Negligence in preparation, improper preparation, errors in and/or omissions in the Bid Proposal shall not relieve the Bidder from fulfillment of all applicable obligations and requirements of contained in the Bid Documents.
- H. The Owner or PSC in making copies available of the Bid Documents to Bidders do so only for obtaining bid proposals on the project and do not confer a license or grant of use to a Bidder for any other purpose.
- I. All Bidders must complete, sign and return the attached "FAMILIAL DISCLOSURE" and "IRAN ECONOMIC SANCTIONS AFFIDAVITS" with their Bid Proposal.
- J. Bidders must include a Bill of Material (BOM), in the format using the **Internal Connections Template** spreadsheet provided, with line-item pricing for all components proposed, including, but not limited to material, maintenance and support with the total listed where indicated in the Bid Proposal Forms. The Bidder is only required to fill out the first tab labeled Category 2 Internal Connections. The BOM must be broken down into the following categories:

Category 2 – Wireless Products and Cabling

ARMADA AREA SCHOOLS
WIRELESS NETWORK

Category 2 - Data Communications Switches

These items must be broken down and identified as eligible or in-eligible under E-rate Category 2 funding.

Failure to provide the BOM with line-item pricing may result in disqualification of the Bid proposal. This does not preclude filling out the Unit Pricing Form, Supplemental B.

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

1.21 UNIVERSAL SERVICE FUND (USF) CONDITIONS

- A. The service provider's USF Service Provider Identification Number (SPIN) *must* be included in the Bid Proposal Form. Direct all questions regarding the USF requirements in this IFB to the Universal Service Administrative Company (USAC), Schools and Library Division (SLD) at (888) 203-8100.
- B. The specified products and/or services are to be provided for FY2024 (July 1, 2024-June 30, 2025) and must qualify for universal service discounts under the FY2024 universal service support mechanism, E-Rate.
- C. This project qualifies for USF funding. Construction may begin as early as June 6, 2024; however, no invoices can be dated prior to July 1, 2024.
- D. DISCOUNT IMPLEMENTATION - The District would like to specify the reimbursement filing option for implementing the USF E-rate discounts *as* Service Provider Invoice (SPI).
- E. The USF eligible products and/or services identified on the USAC FY2024 Eligible Services List, which is incorporated herein by reference, must be identified separately from all "ineligible" products and/or services in the Bid.

CONSIDERATION OF BIDS

1.22

- A. The Bidder acknowledges the right of the Owner to accept or reject any or all Bid proposals, in whole or in part, with or without cause, to waive any irregularities or informalities in this RFP process or any Bid Proposal, and to award the contract to other than the low bidder. In addition, the Bidder recognizes the right of the Owner to reject a Bid Proposal:
1. If the Bidder fails to furnish any required Bid Security, or to submit the data required by the Bid Documents; or
 2. If the Bid Proposal is in any way incomplete or irregular; or

ARMADA AREA SCHOOLS
WIRELESS NETWORK

3. If the Bidder's performance was unsatisfactory under a prior contract for the construction, repair, modification, or demolition of a facility with the Owner, or a contractor in privacy of contract with the Owner, which was funded, directly or indirectly, by the Owner;
 4. If the Bidder was an employer of construction mechanics working on the construction of facilities funded, directly or indirectly, by the Owner through contracts under 1984 PA 431, MCL 18.1101 et seq; MSA 3.516 (101) et seq, and was determined by the Michigan Department of Labor to have failed to comply with a contractual provision requiring the payment of Department of Labor's prevailing wage or the maintenance of Department of Labor's prevailing wage or the maintenance of Department of Labor's apprentice-journeyman ratio determinations for construction mechanics for that facility.
 5. Other than price, bids will be evaluated on service transition, adherence to specifications, prior experience with the District, financial capability and experience with similar projects.
- B. The Owner shall have the right to accept alternates in any order or combination and to determine the lowest responsible Bidder based on the sum of the base bid and the alternates accepted.
- C. Once the contract is awarded to the Contractor, the contract is contingent upon Armada Area Schools Board of Education approval and the Contractor providing the Owner with all documents required by the RFP prior to commencement of the Work/Project (i.e. Insurance Certificates, Labor and Material Payment Bond and Performance Bond, etc.). Further, the Owner reserves the unrestricted right to reduce the contract amount by reducing the scope of Work/project and/or components. Any such action will be taken before specific work on a building or on a project component has commenced. Contract amount shall be reduced or increased based on the unit pricing values or canceled in its entirety.
- D. Bidders to whom an award of a contract is under consideration shall submit to the Owner upon his/her request a properly executed Contractor's Qualification Statement, AIA Document A305 or other information format specified by the Owner.

1.23 BID SECURITY

- A. The Bid Proposal shall be accompanied by a Bid Security of a certified check or cashier's check payable to the Owner or by a satisfactory Bid Bond Entity naming the Owner as the obligee and executed by the Bidder and a surety company authorized to do business in the State of Michigan, in an amount identified in the Instructions to Bidders. The check or amount of Bid Bond shall be forfeited to the Owner upon failure of the Contractor to enter into the Contract. The Contractor's Bid security will be retained until the Contractor has signed the contract and has furnished the required Certificates of Insurance and other required Bonds and documents required by the RFP. Bonds signed by an Attorney-In-Fact must be accompanied by a certified and effectively dated copy of their Power of Attorney.
- B. The Owner reserves the right to retain the Bid security of all Bidders until the Contractor enters into the contract or until ninety (90) days after bid opening, whichever is later. If the Contractor

ARMADA AREA SCHOOLS
WIRELESS NETWORK

refuses to enter into the Contract, the Owner may retain their Bid Security as liquidated damages but not as a penalty.

1.24 PERFORMANCE AND LABOR AND MATERIAL PAYMENT BONDS

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

1.25 TAXES

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

1.26 PERMITS AND FEES

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

1.27 MICHIGAN RIGHT-TO-KNOW LAW

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

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- C. Provisions of Michigan's Right-to-Know Law may be found in those sections of the Michigan Occupational Safety and Health Act (MIOSHA), which contain Right-to-Know provisions, and the Federal Hazard Community Standard, which is part of the MIOSHA Right-to-Know Law through adoption.

1.28 WITHDRAWAL OF BIDS

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

1.29 EXECUTION OF CONTRACT

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

1.30 POST BID INFORMATION

- A. Bid Form(s) shall be submitted as indicated in the Bid Documents. The Bid Form(s) requires all proposed subcontractors for the project to be named; no more than one per discipline.

1.31 TIME OF COMPLETION

- A. The Bidder agrees to complete the Work within the timeframes listed in the Schedule of Events.

1.32 EQUAL OPPORTUNITY

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

PART 2 - EXECUTION

2.1 SITE REQUIREMENTS

BIDDING REQUIREMENTS - INSTRUCTIONS TO BIDDERS

00 30 00 - 10

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- A. The Owner Sites are both instructional and administrative facilities that provide year-round services to their students, staff and the community. As such, activities in all buildings are critical to the provisioning of services to the students, staff and the community and shall not be interrupted by the Contractor's Work activities.
- B. The computer and telephone systems associated with this Work will not be taken off-line or removed from service during normal working hours without coordination of the Owner's IT department and the staff of affected buildings. Arrangements must be made by the Contractor to coordinate any such activities.
- C. The Contractor will be required to work around all of the conditions listed above, as well as working with the Owner's staff to minimize disruptions to normal Owner activities.
- D. Installation Guidelines
 - 1. All Work performed on this Project will be installed in accordance with the current edition of the National Electrical Code®, the current edition of the National Electrical Safety Code®, the current edition of the BICSI Telecommunications Distribution Methods Manual, the current edition of the BICSI Cabling Installation Manual, the latest issue of the ANSI/TIA/EIA Standards as published by Global Engineering Documents as TIA/EIA Commercial Building Telecommunications Standard, and all local codes and ordinances.

2.2 QUALITY ASSURANCE

- A. Project Manager
 - 1. The Contractor will provide a full-time Project Manager who will act as a single point of contact for all activities regarding this Project. The Project Manager must be a management employee and will not be involved in personally performing craft installation Work
 - 2. The Project Manager is required to attend necessary technology and construction meetings for coordination before Work is started and status meetings once Work is in progress.
 - 3. The Project Manager will be required to make on-site decisions regarding the scope of the Work and any changes required by the Work.
 - 4. The Project Manager will be totally responsible for all aspects of the Work and shall have the authority to make immediate decisions regarding implementation or Owner approved changes to the Work.
- B. Compliance with Laws and Regulations
 - 1. The Contractor performance of the Work shall comply with all applicable federal, state, and local laws, rules, and regulations and Owner policies, procedure, rules and regulations. The Contractor shall give required notices, shall procure necessary governmental licenses and inspections, and shall pay without burden to the Owner, all

ARMADA AREA SCHOOLS
WIRELESS NETWORK

fees and charges in connection therewith unless specifically provided otherwise. In the event of violation, the Contractor shall pay all fines and penalties; including attorney's fees and other defense costs and expenses in connection therewith.

- C. Federal Communications Commission
 - 1. Equipment requiring FCC registration or approval shall have received such approval and shall be appropriately identified.

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

2.3 SAFETY

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

2.4 INSPECTION, ACCEPTANCE, AND TITLE

- A. Inspection and Acceptance will be upon successful installation unless otherwise provided. Title to/or risk of loss or damage to all items shall be the responsibility of the Contractor until acceptance by the Owner, unless loss or damage results from negligence by the Owner. If the materials or services supplied to the Owner are found to be defective or do not conform to the specifications, the Owner reserves the right to cancel the Contract upon written notice to and return products at the Contractor's expense, based upon the terms of the Contract.
 - 1. When the Owner is referred to in this section of the RFP relative to inspections, the Owner has designated the PSC as the party to perform such inspections on behalf of the Owner. Notwithstanding the above, the Owner may also perform such inspections along with the PSC.

- B. The Owner shall at all times have access to the Work wherever it is in preparation or progress, and shall provide proper facilities for such access and for inspection.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- C. The Contractor shall not close up any Work until the Owner has inspected the Work. Should the Contractor close up the work prior to inspection by The Owner, the Contractor shall uncover the Work for inspection by the Owner at no cost to the Owner, and then recover the Work according to the specifications contained herein. The Contractor shall notify the Owner in writing when the Work is ready for inspection. The Owner will inspect the Work as expeditiously as possible after receipt of notification from the Contractor.

2.5 STATUS REPORTS, MEETINGS AND CONSTRUCTION COORDINATION

- A. It shall be the Contractor's responsibility to provide the Owner / PSC with written weekly project status reports while actively engaged in craft work and a summary report at the beginning of periods of inactivity between phases or construction delays noting status at that time and expected date of return to work in addition to the requirements listed below. These reports are required and shall include, but not be limited to:
 - B. Project completion percentage.
 - C. Any and all problems that were encountered.
 - D. Any foreseeable problems that may arise.
 - E. General status of the project
 - F. The Owner / PSC reserves the right to hold additional status meetings on a regular basis with the Contractor's Project Manager.

END OF SECTION

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SECTION 00 30 10 - SCHEDULE OF EVENTS

The following is a projected schedule of events for this project. The schedule may change depending upon the results of the responses and a final schedule will be established prior to contracting with the Contractor. Additionally, the final schedule may be subject to change based on school schedules and progress.

EVENT	DATE
Bid Release	November 17, 2023
Site Visits @ 4:00 PM	November 27, 2023
Final Date and time for Questions – 5:00 PM	December 5, 2023
Final Addendum Published	December 11, 2023
Bid Due Date/Time and Public Opening - 2:00 PM	December 18, 2023
Interviews – If necessary	January 8, 2024
Contract Award	February 16, 2024
Earliest Project Start Date	June 6, 2024
Project Completion	August 16, 2024

End of Section

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SECTION 00 40 10 - BID PROPOSAL FORM

OWNER: Armada Area Schools
74500 Burk St.
Armada, MI 48005

PROJECT: Wireless Network – RFP

NAME OF BIDDER: _____

BASE BID:

Lump sum bid for all work specified and shown on the drawings as indicated for base bid in the amount of:

_____ Dollars (\$ _____)

The Bid Proposal amount shall be shown in both words and figures. In the case of discrepancy, the amount shown in words shall govern.

BASE BID: The undersigned, having examined the Bid Documents and examined the conditions affecting the Work/Project, hereby proposes and agrees to furnish all of the labor, materials, and equipment and perform all work necessary to complete the Work/Project as required by the Bid Documents for the stipulated sum identified above and detailed in Supplemental A (Cost Analysis Worksheet). The Bid Documents set forth the terms and conditions upon which the Bidder will provide a "turnkey" solution for the installation and operation of the project for use by the Owner and represents and warrants that the design, operation and functionality of the project are in accordance with the Bid Documents. All prices provided by the Bidder on this Bid Proposal Form must include all cables, connectors, equipment etc. that are necessary to make the project fully operational for the intent and purpose stated in the Bid Documents

BID SECURITY

Enclosed herewith find (Certified Check)/ (Bid Bond) in the amount of \$ _____ being five percent (5%) of the maximum Bid Proposal herein, made payable to Anchor Bay School District or naming Anchor Bay School District as obligee. The proceeds of which are to remain the property of Anchor Bay School District, if the Bidder does not, within ten (10) days after notice of the acceptance of Bid Proposal, enter into the Contract.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

TAXES

Please identify the amount, if any, of this Bid Proposal that has been attributed to sales or use tax. If an amount has been attributed to such tax, please identify which components of the Bid to which the tax has been attributed.

SUBCONTRACTORS

Bidders must provide/attach complete list of proposed subcontractors (one per discipline), if any are proposed to be utilized on the project. Listing two or more subcontractors per discipline will be grounds for disqualification.

EXCEPTIONS

Any Exceptions to the terms and conditions contained in the RFP or contract are identified below:

ADDENDA

This RFP incorporates the following Addenda:

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

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

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

ARMADA AREA SCHOOLS
WIRELESS NETWORK

BID PROPOSAL FORM SUPPLEMENTS:

The following Bid Form Proposal Supplements are attached hereto and are considered an integral part of this Bid Proposal Form:

- SUPPLEMENTAL A – Cost Analysis Worksheet
- SUPPLEMENTAL B – Unit Pricing
- SUPPLEMENTAL C – Mandatory Alternates
- SUPPLEMENTAL D – Voluntary Alternates
- SUPPLEMENTAL E – Familial Disclosure Affidavit
- SUPPLEMENTAL F – Iran Economic Sanctions Act Compliance Affidavit

Vendor's USAC SPIN # _____

BIDDER NAME: _____

ADDRESS: _____

DATE: _____

TELEPHONE: _____

EMAIL ADDRESS: _____

If award is made to our firm based upon our Bid Proposal, we agree to enter into the form of Contract with the School District in accordance with this Request for Proposal, the contract and our Bid Proposal.

My signature certifies that the Bid Proposal as submitted complies with all terms and conditions as set forth in this Request for Proposal, unless specifically enumerated as an exception as part of this Bid Proposal Form.

I hereby certify that I am authorized to sign as a Representative for the Firm:

(Authorized Signature)

(Title)

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SUPPLEMENTAL A - COST ANALYSIS WORKSHEET

OWNER: Armada Area Schools
74500 Burk St.
Armada, MI 48005

BIDDER: _____

ADDRESS: _____

BASE BID BREAKDOWN

Building	COMPONENT	Cost
Armada High School		
Wireless Equipment	Material	
	Labor	
	Sub Total	
Copper Cabling	Material	
	Labor	
	Sub Total	
	Total	
Armada Middle School and Bus Garage		
Wireless Equipment	Material	
	Labor	
	Sub Total	
Copper Cabling	Material	
	Labor	
	Sub Total	
	Total	
Armada/Krause Elementary		
Wireless Equipment	Material	
	Labor	
	Sub Total	

ARMADA AREA SCHOOLS
WIRELESS NETWORK

Switches	Material	
	Labor	
	Sub Total	
Cabling	Material	
	Labor	
	Sub Total	
	Total	
Administration Building		
Wireless Equipment	Material	
	Labor	
	Sub Total	
Cabling	Material	
	Labor	
	Sub Total	
	Total	
	Performance and Payment Bond	
	Proposal Total	

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SUPPLEMENTAL B - UNIT PRICING

All bid proposals shall include a detailed Bill of Materials that notes each item, part number, and unit price.

Provide this Bill of Materials, attached to and submitted with the Bid Proposal. These unit costs, which shall be considered firm pricing during the contract period and not subject to change, will be used to determine costs (**Inclusive of both labor and material**) for additions and deletions during the contract period and for a period of one (1) year thereafter. The Owner reserves the right to adjust any or all quantities at any time.

In addition to the required Bill of Materials, include the following Unit Prices (also include cost of associated licenses).

Item	Part Number	Unit Price
802.11ax (WiFi 6E) access point consistent with base bid model		
New single Cat6 drop to access point		
1 foot Cat6 patch cable		
3 foot Cat6 patch cable		
10 foot Cat6 patch cable		
Cat6 Patch Panel – 24 Port		

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SUPPLEMENTAL C - MANDATORY ALTERNATES

Mandatory Alternate 1: None at this time

Add/Deduct _____ Dollars (\$ _____)

Mandatory Alternate 2:

Add/Deduct _____ Dollars (\$ _____)

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SUPPLEMENTAL D - VOLUNTARY ALTERNATES

VOLUNTARY ALTERNATE 1:

Add/Deduct/No Change

_____ Dollars (\$_____)

VOLUNTARY ALTERNATE 2:

Add/Deduct/No Change

_____ Dollars (\$_____)

VOLUNTARY ALTERNATE 3:

Add/Deduct/No Change

_____ Dollars (\$_____)

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SUPPLEMENTAL E - FAMILIAL DISCLOSURE AFFIDAVIT

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

List any Familial Relationships:

BIDDER:

By:

Title:

STATE OF MICHIGAN
COUNTY OF _____

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

_____.

Notary Public

_____ County, Michigan

My Commission Expires: _____

Acting in the County of: _____

SUPPLEMENTAL E FAMILIAL DISCLOSURE AFFADAVIT

00 40 15 - 1

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SUPPLEMENTAL F - AFFIDAVIT OF COMPLIANCE – IRAN ECONOMIC SANCTIONS ACT

Michigan Public Act No. 517 of 2012

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

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

APPLICANT:

Name of Applicant

By:

Title:

Date:

STATE OF Michigan

COUNTY OF _____)

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

_____.

_____, Notary Public _____ County, _____

My Commission Expires: _____

Acting in the County of: _____

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SECTION 27 10 00 - COMMUNICATIONS CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Related Sections:
 - 1. Division 27 Section 27 21 29 "Data Communications Switches"
 - 2. Division 27 Section 27 21 33 "Wireless Network Equipment"

1.2 SUMMARY

- A. Section Includes:
 - 1. Category 6 UTP horizontal cabling for wireless access points throughout the District buildings as indicated herein and on project drawings and documents

1.3 REFERENCES

- A. The contractor shall comply with the latest edition or revision of all codes, standards and regulations.
- B. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only. Regardless of the date shown for each reference below, the latest edition shall apply.
 - 1. ASTM INTERNATIONAL (ASTM)
 - a. ASTM D709 (2013) Laminated Thermosetting Materials
 - 2. ELECTRONIC COMPONENTS INDUSTRY ASSOCIATION (ECIA)
 - a. ECIA EIA/ECA 310-E (2005) Cabinets, Racks, Panels, and Associated Equipment
 - 3. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)
 - a. IEEE 100 (2000; Archived) The Authoritative Dictionary of IEEE Standards Terms
 - 4. INSULATED CABLE ENGINEERS ASSOCIATION (ICEA)
 - a. ICEA S-83-596 (2011) Indoor Optical Fiber Cables

ARMADA AREA SCHOOLS
WIRELESS NETWORK

5. NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA)
 - a. NECA/BICSI 568 (2006) Standard for Installing Building Telecommunications Cabling
6. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
 - a. ANSI/NEMA WC 66 (2013) Performance Standard for Category 6 100 Ohm Shielded and Unshielded Twisted Pairs
7. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
 - a. NFPA 70 (2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3-4 2014; AMD 4-6 2014) National Electrical Code
8. TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) - LATEST EDITION
 - a. TIA-1152 (2009) Requirements for Field Test Instruments and Measurements for Balanced Twisted-Pair Cabling
 - b. TIA-455-21 (1988a; R 2012) FOTP-21 - Mating Durability of Fiber Optic Interconnecting Devices
 - c. TIA-526-14 (2015c) OFSTP-14A Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant
 - d. TIA-568-D-0 (2015d) Generic Telecommunications Cabling for Customer Premises
 - e. TIA-568-D-1 (2015d) Commercial Building Telecommunications Cabling Standard
 - f. TIA-568-C.2 (2009; Errata 2010) Balanced Twisted-Pair Telecommunications Cabling and Components Standards
 - g. TIA-568-C.3 (2008; Add 1 2011) Optical Fiber Cabling Components Standard
 - h. TIA-569 (2015d) Commercial Building Standard for Telecommunications Pathways and Spaces
 - i. TIA-606 (2012b) Administration Standard for the Telecommunications Infrastructure
 - j. TIA-607 (2011b) Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
 - k. TIA/EIA-598 (2014d) Optical Fiber Cable Color Coding

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- I. TIA/EIA-604-10 (2002a) FOCIS 10 Fiber Optic Connector Intermateability Standard - Type LC
- 9. U.S. FEDERAL COMMUNICATIONS COMMISSION (FCC)
 - a. FCC Part 68 Connection of Terminal Equipment to the Telephone Network (47 CFR 68)
- 10. UNDERWRITERS LABORATORIES (UL)
 - a. UL 1286 (2008; Reprint Feb 2015) Office Furnishings
 - b. UL 1666 (2007; Reprint Jun 2012) Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts
 - c. UL 1863 (2004; Reprint Nov 2012) Communication Circuit Accessories
 - d. UL 444 (2008; Reprint Apr 2015) Communications Cables
 - e. UL 467 (2007) Grounding and Bonding Equipment
 - f. UL 514C (2014; Reprint Dec 2014) Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
 - g. UL 723 (2008; Reprint Aug 2013) Test for Surface Burning Characteristics of Building Materials
 - h. UL 969 (1995; Reprint Sep 2014) Standard for Marking and Labeling Systems
- 1.4 DEFINITIONS
 - A. Unless otherwise specified or indicated herein, electrical and electronics terms used in this specification shall be as defined in TIA-568, TIA-569, TIA-606 and IEEE 100 and herein.
 - B. BICSI: Building Industry Consulting Service International.
 - C. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
 - D. EMI: Electromagnetic interference.
 - E. IDC: Insulation displacement connector.
 - F. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
 - G. RCDD: Registered Communications Distribution Designer.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- H. TDMM (BICSI): Telecommunications Design Methods Manual
- I. UTP: Unshielded twisted pair.
- J. LAN: Local area network.

1.5 TELECOMMUNICATION SPACES DESCRIPTION

- A. Telecommunications spaces are the rooms and areas where telecommunications cabling systems are terminated, cross connected, and interconnected installed telecommunications equipment. Bonding and grounding (earthing), fire stopping in labeling of telecommunications infrastructure also occur in telecommunications spaces.

1.6 BACKBONE CABLING DESCRIPTION

- A. Backbone cabling system shall provide interconnections between telecommunications equipment rooms, main terminal space, and entrance facilities in the telecommunications cabling system infrastructure. Cabling system consists of backbone cables, intermediate and main cross-connects, terminations, and patch cords or jumpers used for backbone-to-backbone cross-connection.
- B. Backbone cabling cross-connects may be located in telecommunications equipment rooms or at entrance facilities. Bridged taps and splitters shall not be used as part of backbone cabling.
- C. General Performance: Backbone cabling system shall comply with transmission standards in TIA-568, when tested according to test procedures of this standard.

1.7 HORIZONTAL CABLING DESCRIPTION

- A. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the telecommunications equipment room. This cabling and its connecting hardware are called "permanent link," a term that is used in the testing protocols.
 - 1. Horizontal cabling shall contain no more than one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.
 - 2. Bridged taps and splices shall not be installed in the horizontal cabling.
 - 3. Splitters shall not be installed as part of the optical fiber cabling.
- B. The maximum allowable horizontal cable length is 295 feet. This maximum allowable length does not include an allowance for the length of 16 feet to the workstation equipment. The maximum allowable length does not include an allowance for the length of 16 feet in the horizontal cross-connect.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

1.8 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for equipment racks and cabinets. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
 - 1. Cable - Include the following installation data for each type used:
 - a. Nominal OD.
 - b. Minimum bending radius.
 - c. Maximum pulling tension.
- B. Shop Drawings: For telecommunications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Wiring diagrams to show typical wiring schematics including the following:
 - a. Patch panels.
 - b. Cross – connects and patch cords
 - 3. Equipment Racks and Cabinets: Include workspace requirements and access for cable connections.
 - 4. Cross-connects and patch panels: Detail mounting assemblies and show elevations and physical relationship between the installed components.
- C. Field quality-control reports.
- D. Maintenance Data: For splices and connectors to include in maintenance manuals.
- E. Qualification Data: For installer, qualified layout technician, installation supervisor, and field inspector.

1.9 QUALITY ASSURANCE

- A. Bidder qualifications:
- B. Work under this section shall be performed by and the equipment shall be provided by the approved telecommunications contractor and key personnel. Qualifications shall be provided

COMMUNICATIONS CABLING

27 10 00 - 5

ARMADA AREA SCHOOLS
WIRELESS NETWORK

for the telecommunications system contractor, the telecommunications system installer, and the supervisor (if different from the installer). A minimum of 30 days prior to installation, submit documentation of the experience of the telecommunications contractor and of the key personnel.

- C. The telecommunications contractor shall be a firm which is regularly and professionally engaged in the business of the applications, installation, and testing of the specified telecommunications systems and equipment. The telecommunications contractor shall demonstrate experience in providing successful telecommunications systems within the past 3 years of similar scope and size. Submit documentation for a minimum of three and a maximum of five successful telecommunication system installations for the telecommunications contractor.
- D. Minimum Manufacturer Qualifications
 - 1. Cabling, equipment and hardware manufacturers shall have a minimum of 3 years' experience in the manufacturing, assembly, and factory testing of components which comply with TIA-568, TIA-569, TIA 606 and TIA-607.
- E. Installer Qualifications
 - 1. Installers: installation personnel shall be certified by the manufacturer for the installed product.
 - 2. Installation Supervision: Installation shall be under the direct supervision of ITS Technician or ITS 2 Installer or equivalent certification, who shall be present at all times when Work of this Section is performed at Project site.
- F. Cable Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- G. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- H. Telecommunications Pathways and Spaces: Comply with TIA-569
- I. Bonding and Grounding: Comply with TIA-607
- J. Test Plan - Provide a complete and detailed test plan for the telecommunications cabling system including a complete list of test equipment for the components and accessories for each cable type specified, 30 days prior to the proposed test date for approval. Include procedures for certification, validation, and testing. Test plan shall include all test requirements detailed herein at a minimum.
- K. Regulatory Requirements - In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Equipment, materials, installation, and workmanship shall be in

COMMUNICATIONS CABLING

27 10 00 - 6

ARMADA AREA SCHOOLS
WIRELESS NETWORK

accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.

- L. Standard Products - Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship unless specific manufacturer and/or part numbers is included herein. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.
- M. Material and Equipment Manufacturing Date - Products manufactured more than 1 year prior to date of delivery to site shall not be used, unless specified otherwise.

1.10 CABLE DELIVERY, STORAGE, AND HANDLING

- A. Test cables upon receipt at Project site.
 - 1. Test optical fiber cable to determine the continuity of the strand end to end. Use optical fiber flashlight or optical loss test set.
 - 2. Test each pair of UTP backbone cable for open and short circuits.

1.11 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install cable, equipment frames and cable trays until spaces are enclosed and weather tight, wet work in spaces is complete and dry.

1.12 COORDINATION

- A. Coordinate layout and installation of telecommunications equipment with Owner's telecommunications and LAN equipment and service suppliers. Coordinate service entrance arrangement with local exchange carrier.
 - 1. Meet jointly with telecommunications and LAN equipment suppliers, local exchange carrier representatives, and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
 - 2. Record agreements reached in meetings and distribute them to other participants.
 - 3. Adjust arrangements and locations of distribution frames, cross-connects, and patch panels in equipment rooms to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

4. Adjust arrangements and locations of equipment with distribution frames, cross-connects, and patch panels of cabling systems of other telecommunications, electronic safety and security, and related systems that share space in the equipment room.
- B. Coordinate location of power raceways and receptacles with locations of telecommunications equipment requiring electrical power to operate.
- C. Coordinate layout and installation of telecommunications pathways and cabling with General Contractor and all associated trades.

PART 2 - PRODUCTS

2.1 Product Certification

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

2.2 PATHWAYS

- A. General Requirements: Provide telecommunications pathways in accordance with TIA-569 and as specified herein and on project drawings and associated documents. Provide system furniture pathways in accordance with UL 1286.
- B. Cable Support: NRTL labeled. Cable support brackets shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.
 1. Cable Tray.
 2. J-Hooks and Saddles
 3. Support brackets with cable tie slots for fastening cable ties to brackets.
 4. Straps and other devices.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

2.3 COMMUNICATIONS ROOM FITTINGS AND EQUIPMENT

- A. Provide connecting hardware and termination equipment in telecommunication equipment room to facilitate installation as shown on design drawings for terminating and cross-connecting permanent cabling. Provide telecommunications interconnecting hardware labeling and color coding in accordance with TIA-606.

- B. Manufacturers: Subject to compliance with requirements.
 - 1. Vertical and Horizontal Cable Management:
 - a. Metal, with integral wire retaining fingers.
 - b. Baked-polyester powder coat finish.
 - c. Vertical cable management panels shall have front and rear channels, with covers.

- C. Cable Guides and Fasteners
 - 1. Provide cable guides specifically manufactured for the purpose of routing cables, wires and patch cords horizontally and vertically on equipment racks and telecommunications backboards (to accommodate cross-connect wiring, etc.).
 - 2. Cable guides of ring or bracket type devices mounted on rack and backboard for horizontal cable management and individually mounted for vertical cable management. Mount cable guides with screws, nuts and lock washers.
 - 3. Hook and Loop (I.e. Velcro®) shall be used to fasten cables. Tie-wraps or similar type fasteners shall not be used.

- D. Patch Panels
 - 1. UTP Patch Panels – Provide in accordance with TIA-568 with ports for the number of cables terminated on the panel plus 25 percent spare.
 - a. Panels shall be third party verified and shall comply with TIA Category 6 requirements.
 - b. Panel shall be constructed of 0.09 inches minimum aluminum and shall be rack mounted and compatible with an ECIA EIA/ECA 310-E 19-inch equipment rack.
 - c. Panel shall provide non-keyed, 8-pin modular ports, wired to T568B. Patch panels shall terminate the building cabling on Type 110 IDCs and shall utilize a printed circuit board interface. The rear of each panel shall have incoming cable strain-relief and routing guides. Panels shall have each port factory numbered and be equipped with laminated plastic nameplates above each port.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

2.4 TELECOMMUNICATIONS OUTLET/CONNECTOR ASSEMBLIES

A. UTP Outlet/Connector

1. Outlet/connectors shall comply with FCC Part 68, and TIA-568. UTP outlet/connectors shall be UL 1863 listed, non-keyed, 8-pin modular, constructed of high impact rated thermoplastic housing and shall be third party verified and shall comply with TIA-568 Category 6 requirements.
2. Outlet/connectors provided for UTP cabling shall meet or exceed the requirements for the cable provided.
3. Outlet/connectors shall be terminated using a Type 110 IDC PC board connector, color-coded for both T568A and T568B wiring. Each outlet/connector shall be wired T568B.
4. UTP outlet/connectors shall comply with TIA-568 for 200 mating cycles.
5. UTP outlet/connectors installed in outdoor or marine environments shall be jell-filled type containing an anti-corrosive, memory retaining compound.

B. Patch Cords

1. Provide Category 6 patch cords in accordance with TIA-568
 - a. Telecommunication Rooms - Provide one (1) factory terminated Category 6 UTP patch cord per 8P/8C (RJ45) terminated cable in the following lengths and quantities:
 - 1) 25% - 1M, 50% - 2M and 25% 3M
 - b. Owner will advise as to the preferred color of patch cords

2.5 TELECOMMUNICATIONS CABLING

- A. Cabling shall be UL listed for the application and shall comply with TIA-568 and NFPA 70. Provide a labeling system for cabling as required by TIA-606 and UL 969. Ship cable on reels or in boxes bearing manufacture date for unshielded twisted pair (UTP) in accordance with ICEA S-90-661 and optical fiber cables in accordance with ICEA S-83-596 for all cable used on this project. Cabling manufactured more than 12 months prior to date of installation shall not be used.

2.6 CATEGORY 6 UTP HORIZONTAL CABLE

- A. Description: 100-ohm, 4-pair UTP, covered with a thermoplastic jacket.
1. Owner will advise as to the preferred cable color

ARMADA AREA SCHOOLS
WIRELESS NETWORK

2. Comply with ICEA S-90-661 for mechanical properties.
3. Comply with TIA-568 for performance specifications.
4. Comply with TIA-568, Category 6.
5. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
 - a. Communications Plenum Rated: Type CMP, complying with NFPA 262.

2.7 COPPER CABLING HARWARE

- A. General Requirements for Cable Connecting Hardware: Comply with TIA-568-C, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.
- B. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.
- C. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals.
- D. Patch Cords: Factory-made, 4-pair; terminated with 8-position modular plug at each end.
- E. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.

2.8 TELECOMMUNICATIONS OUTLET/CONNECTORS

- A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position eight-contact (8p/8c) modular. Comply with TIA-568.

2.9 GROUNDING

- A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- B. Comply with requirements in TIA-607 for grounding conductors and connectors.

2.10 LABELING

- A. Comply with TIA-606 and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- B. Identify system components, wiring, and cabling complying with TIA-606 and requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
 - 1. Grounding and bonding systems
 - a. Label connections with tags with the following minimum information "If this Connector or Cable is Loose or Must be Removed, Please Call the Building Telecommunications Manager" per TIA-607 and per TIA-569 requirements.
 - 2. Cable and terminations
 - 3. Pathway, including tray, through wall penetrations, fire stop and associated components
 - 4. Racks, cabinets, enclosures, blocks, patch panels etc.
- C. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA – 606.
- D. Cables use flexible vinyl or polyester that flexes as cables are bent.

PART 3 - EXECUTION

3.1 WIRING METHODS

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

3.2 INSTALLATION OF CABLES

- A. Comply with NECA 1.
- B. General Requirements for Cabling:
 - 1. Comply with TIA-568.
 - 2. Comply with BICSI TDMM, "Cable Termination Practices."
 - 3. Install 110-style IDC termination hardware unless otherwise indicated.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

4. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
 5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
 6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
 7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI TDMM, "Cabling Termination Practices". Install lacing bars and distribution spools.
 8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
 9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
 10. In the telecommunications equipment room, install a 10-foot-long service loop on the end of each optical fiber cable.
 11. Install a 12 inch long service loop on each horizontal cable at the workstation end.
 12. Pulling Cable: Comply with BICSI TDMM, "Pulling Cable." Monitor cable pull tensions.
- C. UTP Cable Installation:
1. Comply with TIA-568 and manufacturer's instructions.
 2. Do not remove more than the minimum of cable jacket required for termination. To maintain cable geometry do not untwist UTP cables more than 1/2 inch from the point of termination.
- D. Open-Cable Installation:
1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
 2. Suspend UTP cable not in a wire way or pathway a minimum of 8 inches above ceilings by approved cable supports not more than 60 inches apart.
 - a. Approved supports include Category 6 rated J – hooks, saddles etc.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- b. All cable shall be independently suspended from building structure using rated support components. The use of tie wraps and bridle rings is prohibited
 - 3. Cable shall not be supported directly by structural members or in contact with pipes, ducts, or other potentially damaging items.
- E. Group connecting hardware for cables into separate logical fields.
- F. Separation from EMI Sources:
 - 1. Comply with BICSI TDMM and TIA-569 for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
 - 2. Separation between open telecommunications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.
 - 3. Separation between telecommunications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.
 - 4. Separation between telecommunications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
 - a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
 - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
 - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.
 - 5. Separation between Telecommunications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
 - 6. Separation between Telecommunications Cables and Fluorescent Fixtures: A minimum of 5 inches.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

3.3 FIRESTOPPING

- A. Comply with TIA-569, "Firestopping."
- B. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.4 GROUNDING

- A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- B. Comply with TIA-607-A.
- C. Bond metallic equipment and cable shield to the grounding bus bar, using not smaller than No. 6 AWG stranded copper equipment grounding conductor.
- D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG stranded copper equipment grounding conductor.
 - 1. Bond the shield of shielded cable to the grounding bus bar in telecommunications rooms and spaces.

3.5 IDENTIFICATION

- A. Identify system components, wiring, and cabling complying with TIA-606.
- B. Paint and label colors for equipment identification shall comply with TIA-606 for Class 2 level of administration or as modified by owner.
- C. Label each cable within 4 inches (100 mm) of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
- D. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
 - 1. Individually number wiring conductors connected to terminal strips, and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
 - 2. Label each unit and field within distribution racks and frames.
- E. Label all components of the grounding system per TIA – 606 and TIA-607.
- F. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors.

COMMUNICATIONS CABLING

27 10 00 - 15

ARMADA AREA SCHOOLS
WIRELESS NETWORK

G. Cable and Wire Identification:

1. Label each cable within 4 inches (100 mm) of each termination, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
2. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware.

H. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.

I. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA-606.

1. Cables use flexible vinyl or polyester that flex as cables are bent.

J. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, pathways and cables, termination hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow convention of TIA-606. Furnish electronic record of all drawings, in software and format selected by Owner.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections

1. Visually inspect UTP and optical fiber jacket materials for NRTL certification markings. Inspect cabling terminations in telecommunications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA-568.
2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
3. Test instruments shall meet or exceed applicable requirements in TIA-568 for Category 6 Permanent Link. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for permanent link test configuration.
4. All horizontal UTP shall be tested using the Permanent Link Method.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- B. Data for each measurement shall be electronically documented. Data for submittals shall be printed in a summary report that is formatted similar to the example in the BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.
- C. Data shall be submitted to client in soft copy in PDF format.
- D. Remove and replace cabling where test results indicate that they do not comply with specified requirements.
- E. End-to-end cabling will be considered defective if it does not pass tests and inspections.
- F. Prepare and submit test and inspection reports for approval within 10 business days of substantial completion.

END OF SECTION

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SECTION 27 21 29 – DATA COMMUNICATIONS SWITCHES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Appendixes, drawings and general provisions, including General and Supplementary Conditions, apply to this Section.
- B. Related Sections:
 - 1. Division 27 Section 27 21 33 “Wireless Network Equipment”
 - 2. Division 27 Section 27 10 00 “Communications Cabling”

1.2 SUMMARY

- A. Provide one (1) 48 port POE++ (IEEE 802.3bt type 3) switch in each technology closet (MDF and IDF) shown on the project prints to support the new wireless network.
- B. Provide one (1) Cat6 patch cord for each populated switch port, length to be determined at the time of installation.
- C. The existing data network is all Cisco Networks equipment. Alternate manufacturers that provide the same functionality will be considered.
- D. The Owner has an existing IP scheme and VLAN topology deployed throughout the network. It shall be the Contractor’s responsibility to configure the network devices to integrate seamlessly with this scheme/topology or work with the Owner to devise a new scheme/topology if the Owner feels it would be beneficial to the network.
- E. The Contractor shall provide all network equipment, stacking/interconnect/expansion cables, miscellaneous parts and labor for a complete and operational network.
- F. Network electronics shall follow equipment manufacturer’s recommendations, the requirements of the Specifications and Drawings, and all current edition or revisions of all applicable codes and standards as previously listed.
- G. Awarded Contractor must include all other peripheral equipment to install a complete network.
- H. Owner provided asset tags must be placed in a visible area on all equipment.
- I. With input from the Owner’s personnel, review and recommend VLAN configurations and develop and implement a plan best suited to both meet the Owner’s needs, and work with the existing data network.
- J. Awarded Contractor will provide a detailed testing methodology used to ensure the sys-

ARMADA AREA SCHOOLS
WIRELESS NETWORK

tem/Project is functioning to manufacture specifications with its response. Other tests, specific to installed equipment, may be required to ensure functionality.

K. All Bidders must provide a proposal for the Base Bid that meets or exceeds the specifications set forth in this RFP. However, all Bidders may suggest Alternates if it is felt that the alternate proposal better suits the intent of this RFP. Any Alternate must be listed as such with separate pricing sheets. Any variance of the feature/functionality of the Base Bid must be identified in any Alternates proposed.

L. Bidder Qualifications

1. Bidder Background

a. A Contract to provide the network will only be entered with a Contractor qualified by experience and financial stability.

2. The Contractor doing this Work shall be a reputable firm regularly doing this type of work with skilled, fully trained technicians and equipment capable of performing a first-class installation in accordance with standard industry practices. All Contractor's technicians shall be factory certified for the Data Systems that they are to install and/or maintain.

3. The Contractor shall be a company that has installed medium to large Data Networking Systems for at least five years. All Bidders shall submit verifiable references including names and phone numbers of projects of a similar nature.

4. Manufacturer Affiliation

a. Bidder shall either be the manufacturer of the equipment proposed or a factory authorized distributor/contractor.

b. If not the manufacturer, the Bidders shall have a proven close and longstanding relationship with the manufacturer in order to demonstrate the Bidder's commitment to supporting the products proposed. Proof shall be supplied with the Bid Proposal in the form of a written guarantee from the manufacturer, stipulating that the manufacturer will provide support for the system if the Bidder is either unwilling or unable to do so at any time within 10 years of the installation of the LAN. This may also include documentation as to the number of years supplying the product, size of inventory, test and training center support, and etc.

M. Section Includes:

1. Data Switches

1.3 SUBMITTALS

A. Product Data: For each type of product indicated, include material descriptions, dimensions of individual components and any unique qualities that might necessitate a change in rack or cabinetry. Include rated capacities, operating characteristics, and electrical characteristics.

DATA COMMUNICATIONS SWITCHES

27 21 29 - 2

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- B. Complete set of Network Schematic drawings

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Cabling Installer must have personnel certified by Manufacturer.

- B. Project Manager

1. The Contractor will provide a full-time Project Manager who will act as a single point of contact for all activities regarding this Project.

- C. Status Reports, Meetings and Construction Coordination.

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

2. Project completion percentage.
3. Any and all problems that were encountered.
4. Any foreseeable problems that may arise.
5. General status of the Project

- D. The Owner reserves the right to hold additional status meetings on a regular basis with the Contractor's Project Manager.

1.5 COORDINATION

- A. Coordinate layout and installation of equipment with Owner's technology staff
- B. Meet jointly with Owner's technology staff to exchange information and agree on details of equipment arrangements and installation.
- C. Record agreements reached in meetings and distribute them to other participants.
- D. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

PART 2 - PRODUCTS

2.1 Data Switches

1. One (1) 48 port Power over Ethernet data switch shall be provided for each telecommunications closet shown on the project prints.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

2. Each switch shall provide 48 POE++ ports delivering POE++ (IEEE 802.3bt type 3) to all 48 ports simultaneously.
3. The switch must have a minimum of two (2) 10 Gbps SFP+ slots (unpopulated)
4. The data switch in each closet shall connect to the existing top of rack data switch either via a stacking cable, 10Gb SFP+ transceiver, or 10Gb Direct Attach Cable. The attachment method needs to be included in the response.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install all equipment in existing racks and cabinets per manufacturers recommendations and industry best practices.
- B. Provide and install new switches and equipment per the bill of materials and specifications.
- C. Connect the new switch to the existing switches/stack in each of the closets either via a stacking via a stacking cable, 10Gb SFP+ transceiver, or 10Gb Direct Attach Cable.
- D. Provide and install new CAT6 patch cables for all required connections for the new equipment.
- E. All patch cables shall be routed using cable management.
- F. Equipment shall be labeled as directed by the Owner's technology staff.
- G. Ensure that all equipment is grounded according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- H. Provide complete installation services integrating the products into the Network Management system.

3.2 TESTING AND ACCEPTANCE

- A. All Bidders will provide in the narrative section a complete detailed acceptance test procedure covering the offered equipment, services and any peripherals in their response to this RFP.
 1. Installation Tests
 - a. During the installation, the Awarded Contractor will perform all tests necessary to ensure that the portions of the system/Project being installed are ready
 - b. The Contractor shall have qualified engineers onsite during the cutover and for a minimal period of 2 days post cutover to address and implementation or technical issues.
 2. Acceptance Tests

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- a. After cut-over of any portion of the system/Project, the Awarded Contractor will conduct acceptance tests consistent with factory system performance specifications to be supplied with the system prior to installation.
- b. The Contractor will be required to identify testing procedures that validate system performance at the required performance levels as indicated in the specification. That may include but not be limited to testing multiple classrooms with the supported number of devices.
- c. Performance and reliability tests will be conducted, demonstrating acceptable performance over a full fourteen (14) day period after cut-over.
- d. Acceptance of the system/project will be granted after all equipment has passed the tests set forth by this RFP or the Contract, as well as all manufacturer recommended testing, and has been in operation fourteen (14) consecutive days without a major failure. The Owner and/or PSC shall be the sole judge of whether all conditions for final system/Project criteria have been met.

3.3 DOCUMENTATION

- A. Prior to final system/Project acceptance, the awarded Contractor will provide complete documentation formatted per the direction of the Owner, inventorying all hardware, to include but not limited to Model, location, MAC address, IP address. The exact format must receive sign off from the Owner. The Documentation package must provide the Owner with a comprehensive guide(s) for all operation, warranty, maintenance procedures for the "As-Built" system/Project.

3.4 TRAINING

- A. Awarded Contractor will provide, prior to cut-over, initial training in the use of the equipment for the technical staff including all installed systems. The cost of this initial training must be included in the Bid Proposal price.
- B. Training will be provided as part of the testing of the new system installation and configuration.
- C. Training will be required for approximately two of the Owner's employees on the operation and configuration of the equipment.
- D. Contractor will provide a recommended list of additional courses that it feels would be advantages for the Owner's technical staff to undertake.

END OF SECTION

ARMADA AREA SCHOOLS
WIRELESS NETWORK

SECTION 27 21 33 –WIRELESS NETWORK EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Appendixes, drawings and general provisions, including General and Supplementary Conditions, apply to this Section.
- B. Related Sections:
 - 1. Division 27 Section 27 10 00 “Communications Cabling”
 - 2. Division 27 Section 27 21 29 “Data Communication Switches”

1.2 SUMMARY

- A. This project is to replace all existing access points with new WiFi 6E access points and to add access points at certain locations in the buildings. The drawings in Appendix A show the locations of all access points. Green numbered locations are existing and will only require the removal of the old access point and installation of the new access point. The red locations are completely new and will require cabling in addition to the new access point.
- B. Provide wireless access points and wireless controllers as shown on the project prints and in the specifications.
- C. The Owner has an existing IP scheme deployed throughout the network. It shall be the Contractor’s responsibility to configure the network devices to integrate seamlessly with this scheme or work with the Owner to devise a new scheme if the Owner feels it would be beneficial to the network.
- D. The Contractor shall provide all wireless network equipment, wire management, mounting clips and brackets, miscellaneous parts and labor for a complete and operational network.
- E. Wireless network electronics shall follow equipment manufacturer’s recommendations, the requirements of the Specifications and Drawings, and all current edition or revisions of all applicable codes and standards as previously listed.
- F. The Contractor shall provide all patch cables required for a complete installation.
- G. Awarded Contractor must include all other peripheral equipment to install a complete network.
- H. Owner provided asset tags must be placed in a visible area on all equipment.
- I. With input from the Owner’s personnel, review and recommend VLAN configurations and develop and implement a plan best suited to both meet the Owner’s needs, and work with the existing network components.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- J. Awarded Contractor will provide a detailed testing methodology used to ensure the system/Project is functioning to manufacture specifications with its response. Other tests, specific to installed equipment, may be required to ensure functionality.
- K. All Bidders must provide a proposal for the Base Bid that meets or exceeds the specifications set forth in this RFP. However, all Bidders may suggest Alternates if it is felt that the alternate proposal better suits the intent of this RFP. Any Alternate must be listed as such with separate pricing sheets. Any variance of the feature/functionality of the Base Bid must be identified in any Alternates proposed.
- L. Bidder Qualifications
 - 1. Bidder Background
 - a. A Contract to provide the network will only be entered with a Contractor qualified by experience and financial stability.
 - 2. The Contractor doing this Work shall be a reputable firm regularly doing this type of work with skilled, fully trained technicians and equipment capable of performing a first class installation in accordance with standard industry practices. All Contractor's technicians shall be factory certified for the Data Systems that they are to install and/or maintain.
 - 3. The Contractor shall be a company that has installed medium to large Data Networking Systems for at least five years. All Bidders shall submit verifiable references including names and phone numbers of projects of a similar nature.
 - 4. Manufacturer Affiliation
 - a. Bidder shall either be the manufacturer of the equipment proposed or a factory authorized distributor/contractor.
 - b. If not the manufacturer, the Bidders shall have a proven close and long-standing relationship with the manufacturer in order to demonstrate the Bidder's commitment to supporting the products proposed. Proof shall be supplied with the Bid Proposal in the form of a written guarantee from the manufacturer, stipulating that the manufacturer will provide support for the system if the Bidder is either unwilling or unable to do so at any time within 10 years of the installation of the LAN. This may also include documentation as to the number of years supplying the product, size of inventory, test and training center support, and etc.
- M. Section Includes:
 - 1. Wireless Access Points
 - 2. Cloud Based Wireless Controllers

ARMADA AREA SCHOOLS
WIRELESS NETWORK

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated, include material descriptions, dimensions of individual components and any unique qualities that might necessitate a change in rack or cabinetry. Include rated capacities, operating characteristics, and electrical characteristics.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Installer must have personnel certified by Manufacturer.
- B. Project Manager
 - 1. The Contractor will provide a full-time Project Manager who will act as a single point of contact for all activities regarding this Project.
- C. Status Reports, Meetings and Construction Coordination.
 - 1. It shall be the Contractor's responsibility to provide the Owner with written weekly project status reports while actively engaged in craft work and a summary report at the beginning of periods of inactivity between phases or construction delays noting status at that time and expected date of return to work in addition to the requirements listed below. These reports are required and shall include, but not be limited to:
 - 2. Project completion percentage.
 - 3. Any and all problems that were encountered.
 - 4. Any foreseeable problems that may arise.
 - 5. General status of the Project
- D. The Owner reserves the right to hold additional status meetings on a regular basis with the Contractor's Project Manager.

1.5 COORDINATION

- A. Coordinate layout and installation of equipment with Owner's technology staff and/or PSC
- B. Meet jointly with Owner's technology staff and PSC to exchange information and agree on details of equipment arrangements and installation.
- C. Record agreements reached in meetings and distribute them to other participants.

PART 2 - PRODUCTS

2.1 Access Points – WiFi 6E

- 1. Indoor

ARMADA AREA SCHOOLS
WIRELESS NETWORK

2. Tri-Radio radio, 802.11ax 6Ghz, 5Ghz 4x4 MIMO and 2.4Ghz 802.11ax 2x2 MIMO
3. Support for up to 16 SSIDs per radio
4. Internal antenna
5. 802.11n high-throughput (HT) support: HT20/40
6. 802.11ac very high throughput (VHT) support: VHT20/40/80/160
7. 802.11ax high efficiency (HE) support: HE20/40/80/160
8. 802.11n/ac packet aggregation: A-MPDU, A-MSDU
9. 100/1000/2500BASE-T Ethernet network interface (RJ-45)
 - a. 2.5Gbps speed compliant with NBase-T and 802.3bz specifications.
10. Access points must be powered via industry standard 802.3bt POE++ Type 3 with all features available.
11. WiFi certified for WLAN interoperability
12. Access Point must support plug and play installation
13. System must support centrally-deployed configurations and upgrades
14. Access Points must support an 802.1x supplicant to prevent use by unwanted devices
15. Access Points must be securely configurable & monitored from a central location
16. Must support latest secure authentication and encryption standards

B. Wireless Controller

1. The District's preference is a cloud-based controller platform
 - a. Must support a customizable, centralized Captive Portal.
 - b. In the event that a cloud controller is unreachable, the system must operate autonomously and be able to authenticate users to the District's systems such as: RADIUS, active directory or other backend systems.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install all equipment per manufacturers recommendations and industry best practices.

ARMADA AREA SCHOOLS
WIRELESS NETWORK

- B. Provide and install new access points per the bill of materials and specifications.
- C. New access points will be clipped to the ceiling grid using clips specifically intended for that purpose.
- D. Provide and install new patch cables for all required connections for the new equipment.
- E. All patch cables shall be routed using cable management.
- F. Equipment shall be labeled as directed by the Owner's technology staff.

3.2 TESTING AND ACCEPTANCE

- A. All Bidders will provide in the narrative section a complete detailed acceptance test procedure covering the offered equipment, services and any peripherals in their response to this RFP.
 - 1. Installation Tests
 - a. During the installation, the Awarded Contractor will perform all tests necessary to ensure that the portions of the system/Project being installed are ready
 - b. The Contractor shall have qualified engineers onsite during the cutover and for a minimal period of 2 days post cutover to address and implementation or technical issues.
 - 2. Acceptance Tests
 - a. After cut-over of any portion of the system/Project, the Awarded Contractor will conduct acceptance tests consistent with factory system performance specifications to be supplied with the system prior to installation.
 - b. The Contractor will be required to identify testing procedures that validate system performance at the required performance levels as indicated in the specification. That may include but not be limited to testing multiple classrooms with the supported number of devices.
 - c. Performance and reliability tests will be conducted, demonstrating acceptable performance over a full fourteen (14) day period after cut-over.
 - d. Performance tests for the wireless network will include validation testing for the maximum number of classroom devices as specified in this RFP and ensuring performance at the specified levels. These tests will be held in adjacent classrooms using devices provided by the Owner.
 - e. Acceptance of the system/project will be granted after all equipment has passed the tests set forth by this RFP or the Contract, as well as all manufacturer recommended testing, and has been in operation fourteen (14) consecutive days without a major failure. The Owner and/or PSC shall be the sole judge of whether all

ARMADA AREA SCHOOLS
WIRELESS NETWORK

conditions for final system/Project criteria have been met.

3.3 DOCUMENTATION

- A. The Vendor will be required to provide a post installation survey and provide the Owner with heat maps showing the coverage and density of the installed system.
- B. Prior to final system/Project acceptance, the awarded Contractor will provide complete documentation formatted per the direction of the Owner, inventorying all hardware, to include but not limited to Model, location, MAC address, IP address. The exact format must receive sign off from the Owner. The Documentation package must provide the Owner with a comprehensive guide(s) for all operation, warranty, maintenance procedures for the "As-Built" system/Project.

3.4 TRAINING

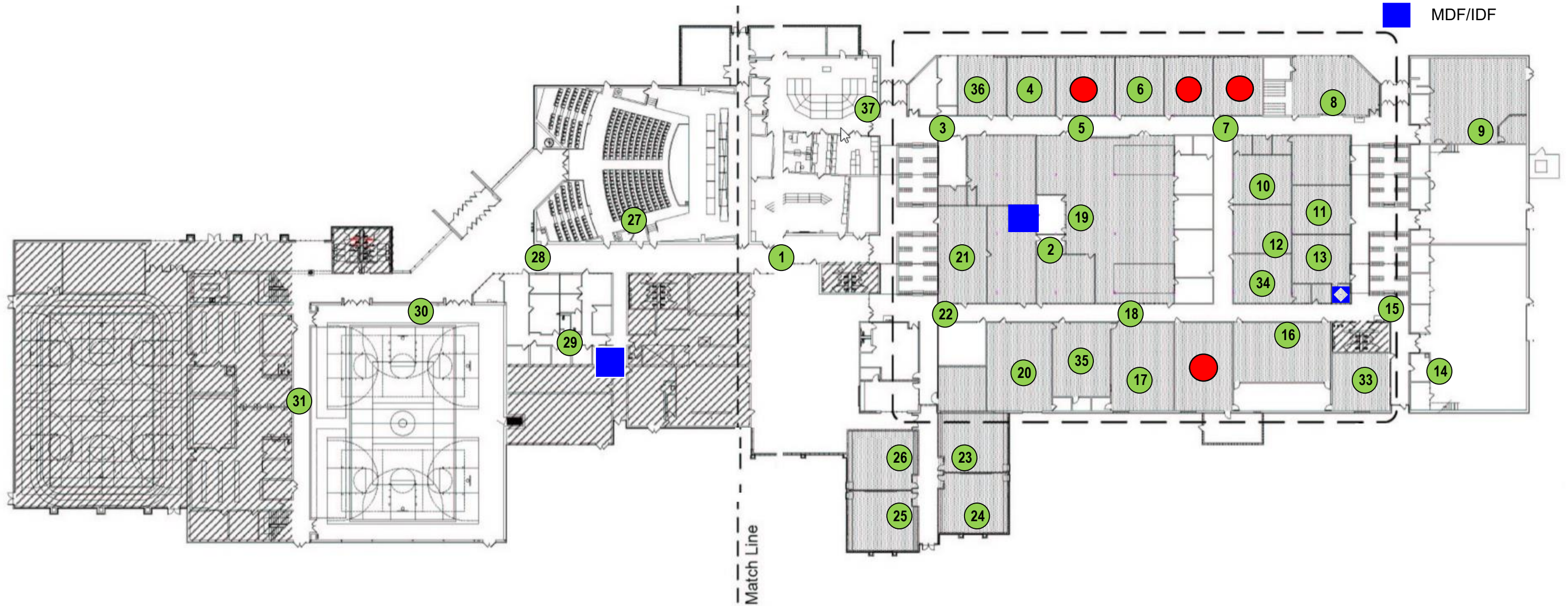
- A. Awarded Contractor will provide, prior to cut-over, initial training in the use of the equipment for the technical staff. The cost of this initial training must be included in the Bid Proposal price.
- B. Training will be provided as part of the testing of the new system installation and configuration.
- C. Training will be required for approximately two of the Owner's employees on the operation and configuration of the equipment.

END OF SECTION

ARMADA AREA SCHOOLS
WIRELESS NETWORK

APPENDIX A
PROJECT DRAWINGS

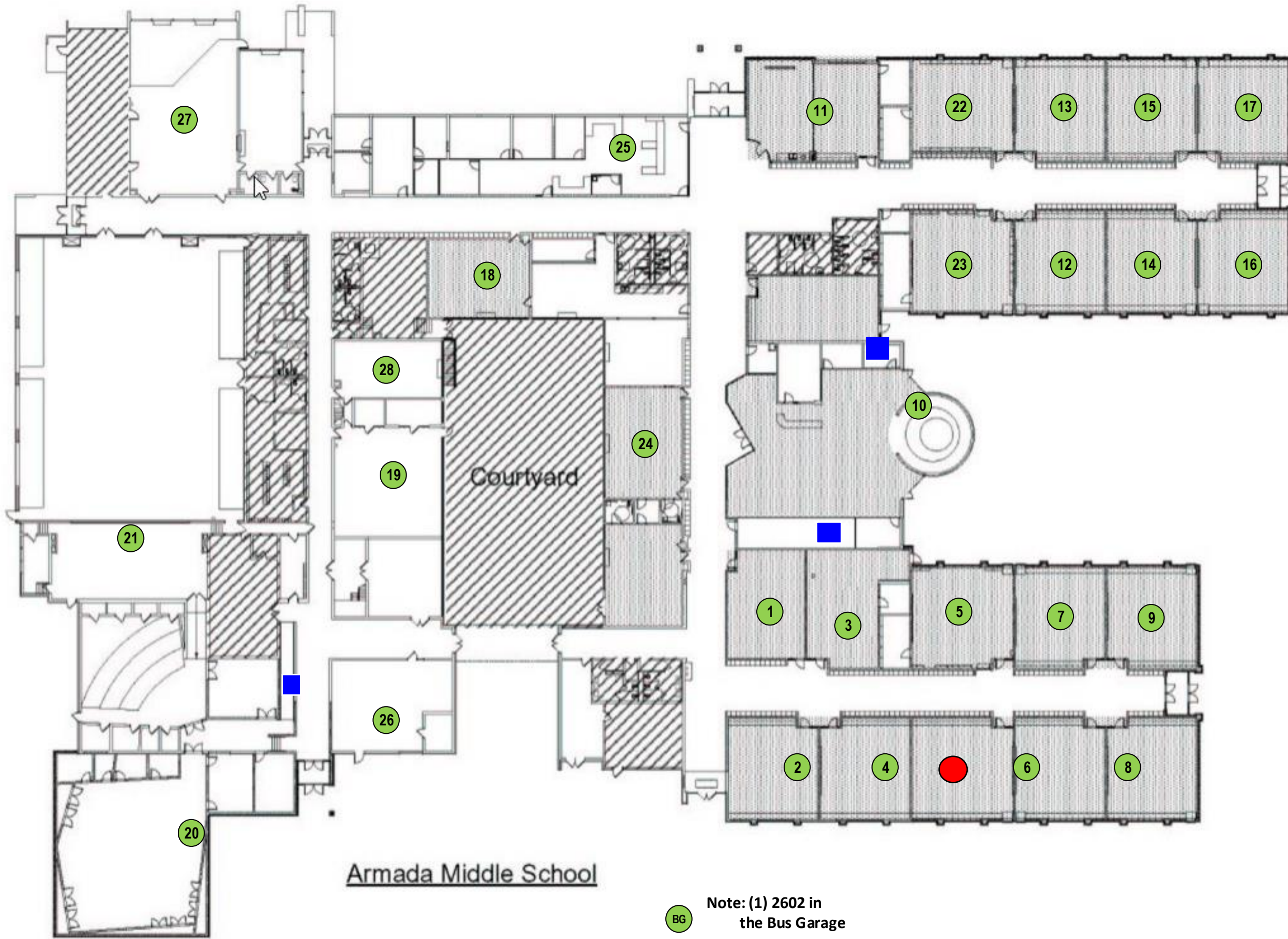
- Access Point
- New APs
- MDF/IDF



Armada High School

Page Name: Armada High School		Page: 1	
Customer: Armada Area Schools		Author:	
File Name: MASTER -Armada - Wireless AP Placement		Version: 1.0	Date: October 31, 2018

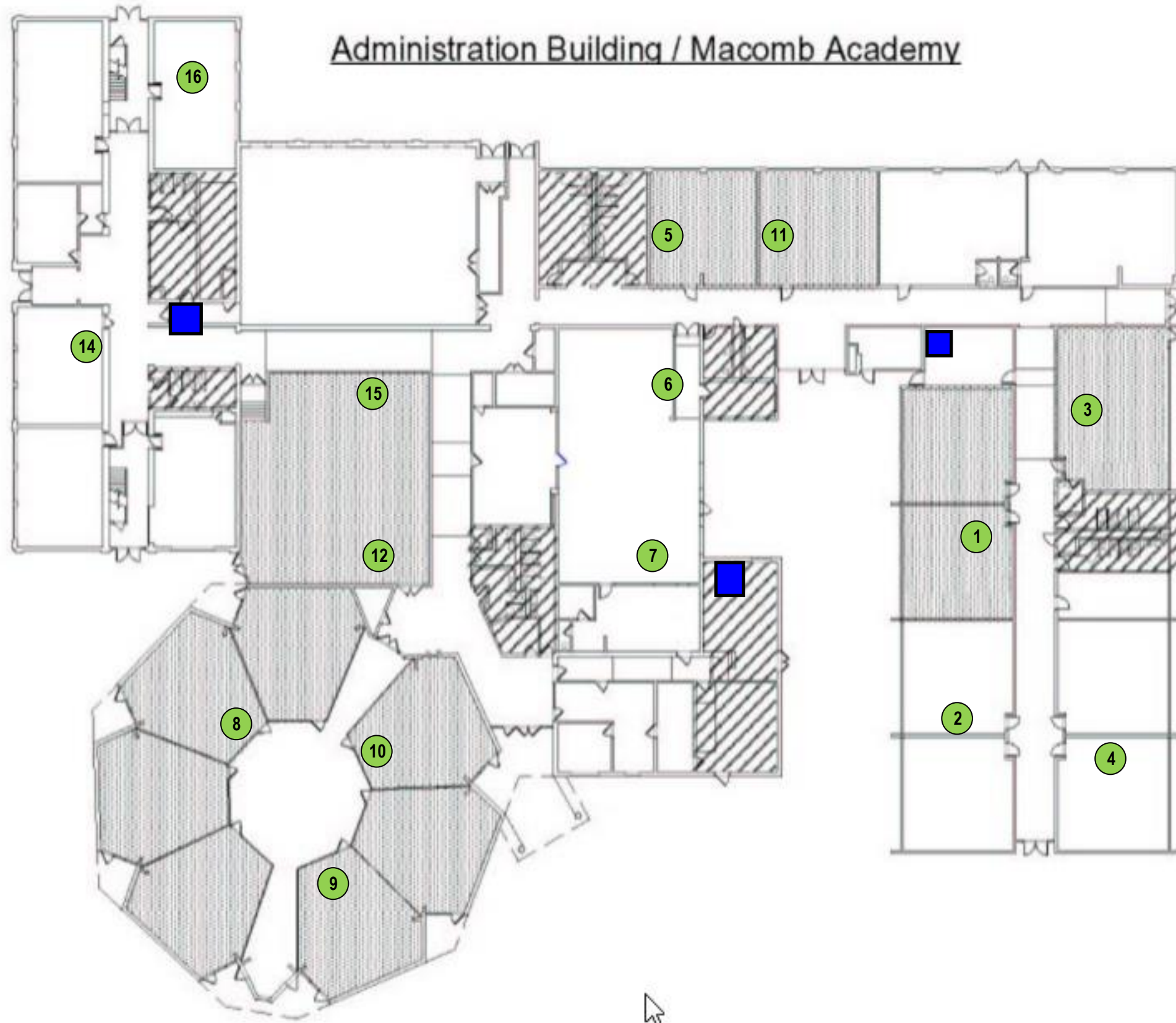
- Access Point
- New APs
- MDF/IDF



Page Name: Armada Middle School		Page: 2	
Customer: Armada Area Schools		Author:	
File Name: MASTER -Armada - Wireless AP Placement		Version: 1.0	Date: October 31, 2018

- Access Point
- MFD/IDF

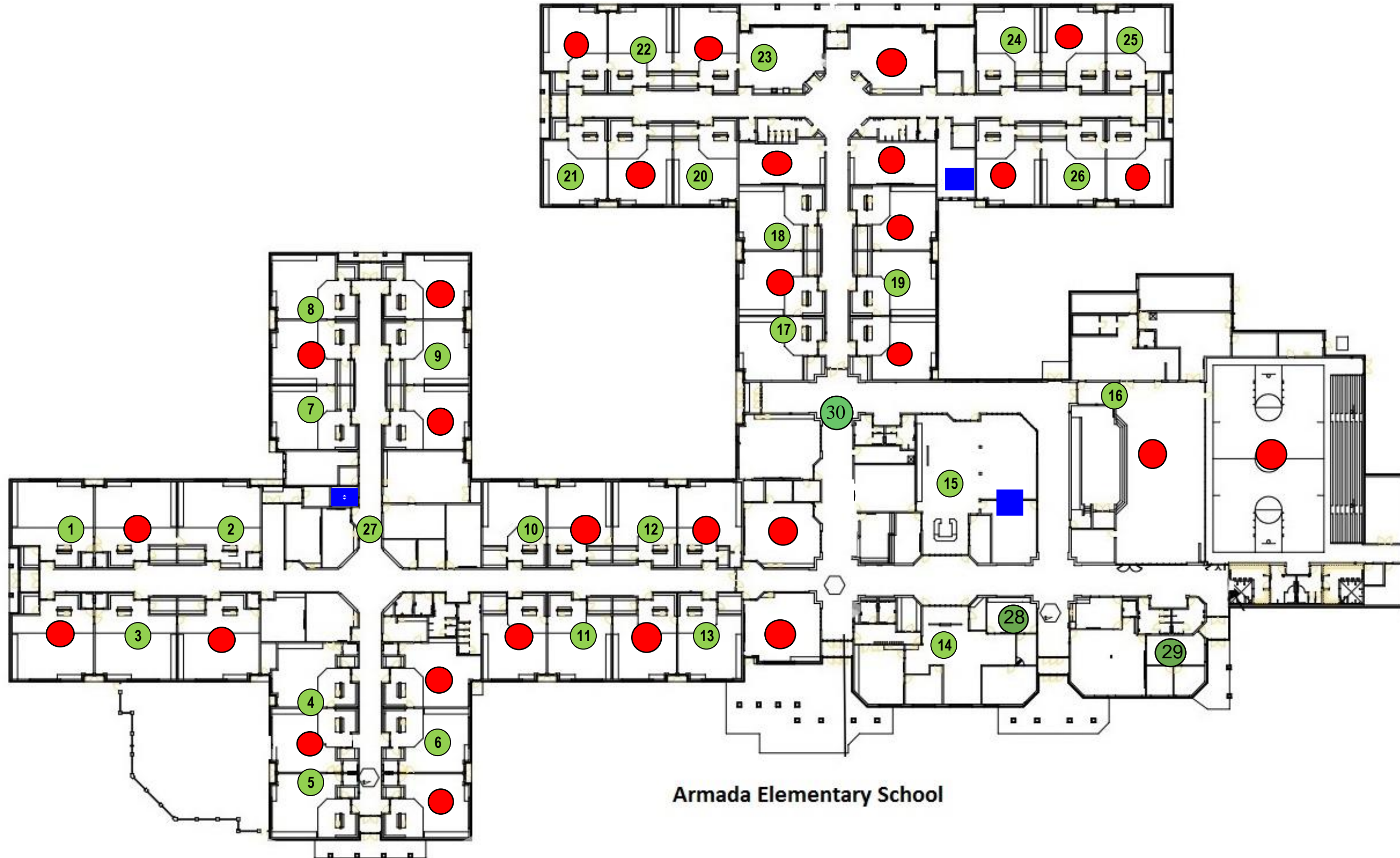
Administration Building / Macomb Academy



Administration Building
Second Floor

Page Name: Admin		Page: 3	
Customer: Armada Area Schools		Author:	
File Name: MASTER -Armada - Wireless AP Placement		Version: 1.0	Date: October 31, 2018

- Access Point
- New APs
- MDF/IDF



Page Name: Krause/Armada Elementary School	Page: 4
Customer: Armada Area Schools	Author:
File Name: MASTER -Armada - Wireless AP Placement	Version: 1.0 Date: October 31, 2018