

January 31, 2024

Request for Proposal Network Equipment and Fiber Infrastructure

For

**TSD Bid # 2324-16
Troy School District
4400 Livernois
Troy, MI 48098**

Prepared by

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Network Equipment and Fiber Infrastructure- Bid #2324-16

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SECTION 00 30 00 – BIDDING REQUIREMENTS – INSTRUCTION TO BIDDERS

PART 1 - GENERAL

1.1 REQUEST FOR PROPOSALS

- A. Troy School District is requesting proposals for network equipment and fiber optic infrastructure. Bidders shall provide, install, configure, test and commission a fully operational network for all School District buildings as outlined in this RFP. This project is also requesting E-rate funding for switches, firewalls and fiber optic cabling and equipment under Category 2.
- B. A complete list of the buildings (“Sites”) is provided in Appendix A and is incorporated herein by reference. **Bid documents may be obtained from the purchasing page (under Departments, Business Services) of the District’s web site at www.troy.k12.mi.us as well as the USAC website.**

- 1.2 **Bids are due on the date and time specified in SECTION 00 30 10 – 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:

Troy Wissink, Director of Technology
Troy School District
Troy Resource Center
4420 Livernois
Troy, Michigan 48098

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: **“NETWORK EQUIPMENT SEALED BID”** for Troy School District 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

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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 SECURITY

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

1.6 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 Troy School District. The Board of Education will not accept a bid proposal that does not include this sworn and notarized disclosure statement.

1.7 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.

1.8 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.

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.

1.10 REQUESTS FOR CLARIFICATION

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- 1.11 Bidders may request that the School District clarify information contained in this RFP. All such requests must be made in writing via email to Rich Kuehnle, Convergent Technology Partners, at rkuehnle@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 Purchasing page of the District website and on the USAC website 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
- 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.

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- 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. **A non-mandatory Bidder's conference will be held on February 6, 2024, at 1:00 p.m. (EST)** for the purpose of explaining the project, reviewing critical dates and answering questions from the Bidders. The location of the Bidder's conference is:

Troy School District
Services Building
4420 Livernois
Troy, Michigan 48098
Technology Conference Room

- B. Before submitting a Bid Proposal, each Bidder shall examine the RFP documents carefully and shall read the Specifications and the Bid Documents. Each Bidder shall gather complete information prior to bidding as to existing conditions and limitations under which the Work/Project is to be performed, and shall include in its Bid Proposal a sum to cover the cost of items necessary to perform the Work/Project as set forth in the Bid Documents.
- C. No allowance or additional fees will be made to a Bidder because of lack of such examination or knowledge. The submission of a Bid Proposal will be considered as conclusive evidence that the Bidder has made such examination. An on-site-inspection of the Sites during the Bidder's Conference will be for all Bidders 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.
- D. Bidders may make written request to the PSC for interpretation or correction of any ambiguity, inconsistency or error in the Bid Documents that are discovered. These questions shall be submitted to the PSC per the Schedule of Events. Only a written interpretation or correction by

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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 Purchasing page of the District website at www.troy.k12.mi.us as well as the USAC website.

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 that identified in the Schedule of Events. 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.

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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. Bids shall be submitted in a sealed envelope. Identified on the face of the envelope:
1. Project name
 2. Name and address of Bidder
 3. Notation **"NETWORK EQUIPMENT - SEALED BID"**
- G. No responsibility shall attach to the PSC, the Owner, or the authorized representatives of either one, for the premature opening of any Bid Proposal which is not properly addressed, delivered and/or identified. In such event, that Bid Proposal will not be considered and the Bidder will be automatically disqualified from consideration.
- H. Negligence in preparation, improper preparation, errors in and/or omissions in the Bid Proposal shall not relieve the Bidder from fulfillment of any and all applicable obligations and requirements of contained in the Bid Documents.
- I. The Owner or PSC in making copies available of the Bid Documents to Bidders do so only for the purpose of obtaining bid proposals on the project and do not confer a license or grant of use to a Bidder for any other purpose.

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- J. All Bidders must complete, sign and return the attached “FAMILIAL DISCLOSURE” and “IRAN ECONOMIC SANCTIONS AFFIDAVITS” with their Bid Proposal.
- K. Bidders must include a Bill of Material (BOM), in Excel format, 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 BOM must be broken down into the following categories:

Category 2 – Switching and Cabling Products

These items must be broken down by 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.

- L. The Owner considers this RFP legally binding and will require that this Request for Proposal and the Bid Proposal be incorporated by reference into any subsequent Contract between the Contractor and the Owner. It should be understood by the Bidder that this means that the Owner expects the Bidder to satisfy all 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. The USF eligible products and/or services identified on the USAC FY2024 Eligible Services List, and must be identified separately from any and all “ineligible” products and/or services in the Bid.

1.22 CONSIDERATION OF BIDS

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

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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 on the basis of the sum of the base bid and the alternates accepted.
- C. Once the contract is awarded to the Contractor, the contract is contingent upon Troy School District Board of Education approval and the Contractor providing the Owner with any and 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.

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

1.24 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);

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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.
- 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 may proceed with the Work/Project. Failure or refusal to provide Bonds, Certificates of Insurance or any other documents required by this RFP in a form(s) satisfactory to the Owner shall subject the Contractor to loss of time from the allowable construction period equal to the time of delay in furnishing the required material.

1.30 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

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- 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

- 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. Refer to SECTION 27 05 00 – Common Work Results for Communications.

2.2 QUALITY ASSURANCE

- A. Project Manager
 - 1. The Contractor will provide a full-time Project Manager who will act as a single point of contact for all activities regarding this Project. The Project Manager must be a management employee and will not be involved in personally performing craft installation Work
 - 2. The Project Manager is required to attend necessary technology and construction meetings for coordination before Work is started and construction meetings once Work is in progress.
 - 3. The Project Manager will be required to make on-site decisions regarding the scope of the Work and any changes required by the Work.

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4. The Project Manager will be totally responsible for all aspects of the Work and shall have the authority to make immediate decisions regarding implementation or Owner approved changes to the Work.

B. Compliance with Laws and Regulations

1. The Contractor performance of the Work shall comply with all applicable federal, state, and local laws, rules, and regulations and Owner policies, procedure, rules and regulations. The Contractor shall give required notices, shall procure necessary governmental licenses and inspections, and shall pay without burden to the Owner, all fees and charges in connection therewith unless specifically provided otherwise. In the event of violation, the Contractor shall pay all fines and penalties; including attorney's fees and other defense costs and expenses in connection therewith.

C. Federal Communications Commission

1. Equipment requiring FCC registration or approval shall have received such approval and shall be appropriately identified.

D. Codes, Standards, and Ordinances

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

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specifications, the Owner reserves the right to cancel the Contract upon written notice to and return products at the Contractor's expense, based upon the terms of the Contract.

1. When the Owner is referred to in this section of the RFP relative to inspections, the Owner has designated the PSC as the party to perform such inspections on behalf of the Owner. Notwithstanding the above, the Owner may also perform such inspections along with the PSC.
- B. The Owner shall at all times have access to the Work wherever it is in preparation or progress, and shall provide proper facilities for such access and for inspection.
- C. The Contractor shall not close up any Work until the Owner 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:
 1. Project completion percentage.
 2. Any and all problems that were encountered.
 3. Any foreseeable problems that may arise.
 4. General status of the project
- B. The Owner / PSC reserves the right to hold additional status meetings on a regular basis with the Contractor's Project Manager.

END OF SECTION

Troy School District
Network Equipment and Fiber Infrastructure – Bid #2324-16

SECTION 00 30 10 - SCHEDULE OF EVENTS

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

EVENT	DATE
Bid Release	January 31, 2024
Bidder's Conference Date and time – 1:00 PM	February 6, 2024
Final Date and Time for Questions – 5:00 PM	February 14, 2024
Final Addendum	February 19, 2024
Bid Due Date/time and Public Opening - 10:00 AM	February 28, 2024
Contract Award	March 19, 2024
Earliest Project Start Date	April 1, 2024
Project Completion	August 10, 2024

End of Section

Troy School District
Network Equipment and Fiber Infrastructure - Bid #2324-16

SECTION 00 40 10 - BID PROPOSAL FORM

OWNER: Troy School District
4400 Livernois
Troy, Michigan 48098

PROJECT: Network Equipment – Bid #2324-16

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 Troy School District or naming Troy School District as obligee. The proceeds of which are to remain the property of Troy School District, if the Bidder does not, within ten (10) days after notice of the acceptance of Bid Proposal, enter into the Contract.

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.

BID PROPOSAL FORM

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Troy School District
Network Equipment and Fiber Infrastructure - Bid #2324-16

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 _____

BID PROPOSAL FORM SUPPLEMENTS:

BID PROPOSAL FORM

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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)

Troy School District
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SUPPLEMENTAL A - COST ANALYSIS WORKSHEET

OWNER: Troy School District
4400 Livernois
Troy, MI 48098

BIDDER: _____

ADDRESS: _____

Provide a spreadsheet that itemizes each product category as follows:

- Item
- Quantity
- Unit Price
- Extended Price
- E-rate Eligible or In-Eligible

Troy School District
Network Equipment and Fiber Infrastructure - Bid #2324-16

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
Multi-Mode 2 Meter LC-LC Patch Cable		
Single Mode 2 Meter LC-LC Patch Cable		
10GBASE-CU SFP+ Cable 3 Meter		

Troy School District
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SUPPLEMENTAL C - MANDATORY ALTERNATES

Mandatory Alternate 1: ***None at this time***

Add/Deduct _____ Dollars (\$ _____)

Mandatory Alternate 2:

Add/Deduct _____ Dollars (\$ _____)

Mandatory Alternate 3:

Add/Deduct _____ Dollars (\$ _____)

Mandatory Alternate 4:

Add/Deduct _____ Dollars (\$ _____)

SUPPLEMENTAL C – MANDATORY ALTERNATES

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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 (\$_____)

Troy School District
Network Equipment and Fiber Infrastructure - Bid #2324-16

SUPPLEMENTAL E - FAMILIAL DISCLOSURE AFFIDAVIT

The undersigned, the owner or authorized officer of _____ (the "Bidder"), pursuant to the familial disclosure requirement provided in the Troy School District (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

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Troy School District
Network Equipment and Fiber Infrastructure - Bid #2324-16

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 Troy School District (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: _____

Troy School District
Network Equipment and Fiber Infrastructure – Bid #2324-16

SECTION 27 00 00 – PROJECT SUMMARY

PART 1 - GENERAL

1.1 CURRENT ENVIRONMENT

- A. The Owner has an existing data and wireless network that provides access to faculty, staff and students throughout the buildings/Sites.
- B. The Owner has an existing IP scheme deployed throughout the network. It shall be the Contractor's responsibility to configure the new network devices for a fully functioning system.

1.2 SUMMARY OF WORK

- A. Deploy a SD-WAN solution throughout the district which will provide an additional active connection over 5G/LTE cellular. The client's primary WAN connection is a high-speed private fiber network owned by the district.
- B. Bidders Responsibility:
 - 1. Project Management
 - 2. Project Kickoff
 - 3. Design Workshops and development of implementation and testing plans
 - 4. Deploy (24) new layer 3 building core network switches throughout the district
 - 5. Migrate all layer 3 routing functionality currently configured on the district core network switches to the new building core network switches
 - 6. Staging of all network hardware
 - 7. Deploy (1) Firewall unit at the district headend location
 - 8. Configure routing policies to accommodate 5G/LTE WAN connection for the remote sites
 - 9. Deploy (24) Firewall units
 - 10. Configure routing policies to utilize the private fiber WAN as the primary path for all traffic during normal operations and to utilize the 5G/LTE WAN for all life safety and mission critical applications at all times
 - 11. Physically install (25) 5G/LTE antennas at each building location
 - 12. Physically install (25) low-loss antenna cables from the MDF to each antenna
 - 13. Final Documentation

1.3 QUALITY ASSURANCE

- A. 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.
- B. See also individual section quality assurance and test requirements.

PROJECT SUMMARY

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Troy School District
Network Equipment and Fiber Infrastructure – Bid #2324-16

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide products as indicated in individual sections.

PART 3 - EXECUTION

3.1 GENERAL

- A. As indicated in individual sections.

PROJECT SUMMARY

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TROY SCHOOL DISTRICT
NETWORK EQUIPMENT AND FIBER INFRASTRUCTURE RFP #2324-16

SECTION 27 05 00 COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 - GENERAL

1.1. SUMMARY

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

1.2. RELATED SECTIONS

- A. Section 27 15 23 – Communications Optical Fiber Horizontal Cabling

1.3. RELATED DOCUMENTS

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

1.4. REFERENCES

- A. Local Codes and Standards - all applicable
 - 1. Anywhere Standards conflict with electrical or safety Codes, Integrator shall defer to applicable local codes or ordinances, or default to the most stringent requirements listed by either. Knowledge and execution of applicable codes is the sole responsibility of the Integrator. Any code violations committed at the time of installation shall be remedied at the Integrator's expense. Integrator is responsible to bring any perceived conflicts between project documents and referenced Standards or Codes to the attention of the PSC for resolution.
- B. Integrators shall adhere to latest ratified editions of the following: this list is not all inclusive:
 - 1. American Society for Testing and Materials (ASTM)
 - 2. American National Standards Institute (ANSI)
 - 3. Insulated Cables Engineers Association (ICEA)
 - 4. National Electrical Manufacturers Association (NEMA)
 - 5. Institute of Electrical and Electronics Engineers (IEEE)
 - a. National Electric Safety Code (NESC IEEE C2)
 - 6. American National Standards Institute (ANSI) Telecommunications Industry Association (TIA)
 - a. ANSI/TIA-568- Commercial Building Telecommunications Cabling Standard
 - b. ANSI/TIA-568: Optical Fiber Cabling Components
 - c. ANSI/TIA-569 - Telecommunications Pathways and Spaces

COMMON WORK RESULTS FOR COMMUNICATIONS

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NETWORK EQUIPMENT AND FIBER INFRASTRUCTURE RFP #2324-16

- d. ANSI/TIA-598- Optical Fiber Cable Color Coding
 - e. ANSI/TIA-606 - Administration Standard for Telecommunications Infrastructure
 - f. ANSI/TIA-607 - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
 - 7. ISO/IEC 11801– Information Technology – Generic Cabling For Customer Premises
 - 8. IEC 61280 - International Electrotechnical Commission Fiber optic test procedures
 - 9. NFPA 70 -National Electrical Code (NEC)
 - 10. Michigan Electrical Code
 - 11. Restriction of Hazardous Substances Directive 2002/95/EC (RoHS)
 - 12. Underwriters Laboratories (UL)
 - 13. Building Industry Consulting Services International (BICSI)
 - a. Telecommunications Distribution Design Manual (TDDMM)
 - b. Information Technology Systems Installations Methods Manual (ITSIMM)
 - C. Federal, state, and local codes, rules, regulations, and ordinances
 - 1. The Integrator shall perform all work according to Federal, State, and local codes, rules, regulations, and ordinances governing the work. Where the requirements of other sections of the specifications are more stringent than applicable codes, rules, regulations, and ordinances, the specifications shall apply.
 - D. Others as indicated in each section.
- 1.5. QUALITY ASSURANCE
- A. Electrical Components, Devices, and Accessories: Listed and labeled, meeting the National Electrical code, Michigan Electrical Code and/or National Building Code and tested by a qualified testing agency, and marked for intended location and application
 - B. Telecommunications Pathways and Spaces: Comply with TIA-569, the National Electrical Code and the National Building Code.
 - C. Grounding: Comply with ANSI/TIA-607, NECA and the Michigan Electrical Code.
 - D. Underwriter’s laboratory – For each component listing this requirement.
 - E. Industry Norms and Best Practices
 - F. Manufacturer Requirements
- 1.6. GENERAL PROJECT CONDITIONS
- A. Environmental Limitations: Do not deliver or install interior equipment cable until spaces are enclosed and weather-tight, wet work in spaces is complete and dry, and work above ceilings in IT spaces is complete.
 - B. This Integrator shall examine the conditions under which the system installation is to be performed and notify the Owner's Representative or Design Professional in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to provide a workmanlike installation.
 - C. Review areas of potential interference and resolve conflicts before proceeding with the work. Coordinate ceiling layout and wall layout and other work that penetrates or is supported throughout the space of the building. All work shall be flush and workmanlike in all finished areas.

TROY SCHOOL DISTRICT
NETWORK EQUIPMENT AND FIBER INFRASTRUCTURE RFP #2324-16

1.7. COORDINATION

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

1.8. PERMITS, FEES, and CERTIFICATES OF APPROVAL.

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

1.9. DEFINITIONS

- A. AHJ - Authority Having Jurisdiction
- B. ANSI - American National Standards Institute
- C. BICSI - Building Industry Consulting Service International
- D. CMP - Communications Multipurpose Cable, Plenum
- E. dB - Decibel(s)
- F. IBDN - Integrated Building Distribution Network
- G. IDC - Insulation displacement contact
- H. IEC - International Electrotechnical Commission
- I. IEEE - Institute of Electrical and Electronics Engineers
- J. ISO - International Organization for Standardization
- K. MHz - Megahertz
- L. NLT – No Later Than
- M. SCS - Structure Cabling System
- N. TBD – To be determined
- O. TIA Telecommunications Industry Association
- P. PSC – Professional Services Contractor (Convergent Technology Partners)
- Q. UNO – Unless Notified/Noted Otherwise
- R. UL - Underwriters Laboratories

1.10. SUBMITTALS

- A. General:
 - 1. As required by individual Sections herein
- B. Shop Drawings:
 - 1. Provide cable routing diagrams.

TROY SCHOOL DISTRICT
NETWORK EQUIPMENT AND FIBER INFRASTRUCTURE RFP #2324-16

2. Show panel labeling for all optical fiber panels.
 3. Provide a schedule of materials list with quantities and manufactures indicated for all materials installed in the project.
- C. Product Data:
1. Provide manufacturer's product data specifications sheets indicating products being submitted and any long lead time items.
 2. Provide submittals for products with long lead times as soon as possible for ordering the materials.
 3. Provide submittals (1) week after receiving notice to proceed and prior to installation of any of the product.
- D. Schedule
1. Submit a coordinated schedule no later than (2) weeks after "notice to proceed" to include the following.
 - a. Preconstruction meeting and walkthrough.
 - b. Start and duration of system milestones.
 - c. Punch List.
 - d. Final Punch List.
 - e. Completion and Acceptance
- E. Cable Test Results Format
1. Provide information for the certified cable testers used, including certification/level of the tester and last calibration date.
 2. Test results shall be submitted in electronic format, both as a summary of all tests and individual tests – downloaded directly from tester. If specialized software is required to read results, provide software.
 - a. Any cables shown as a marginal pass (*) will not be accepted.
- F. Cable Tests (Optical Fiber)
1. Per ANSI/TIA 568 C Tier 1 test
 - a. Using a Certified and calibrated OLTS
 - b. As indicated in each section
- G. Project Record Drawings
1. Submit project record documents at Contract Closeout.
 2. The Integrator shall deliver one (1) set of hard-copy and one (1) set of electronics as-built drawings per building to the PSC/owner within two (2) calendar weeks of completion of the project. A set of as-built drawings shall be provided to the owner in approved electronic form (i.e., USB) and utilizing software that is acceptable to the owner and PSC. The Integrator shall deliver the digital media to the owner/PSC within two (2) calendar weeks of completion of the project.
 - a. As-built Drawings must contain.
 - 1) Main Cable Routes
 - 2) Cable locations by type
- H. Submit, within two (2) weeks after notice to proceed, the names and qualifications of those persons who will have management and supervisory positions over the employees on the job site. Submit the name of the supervisory person who will be on the job site daily and have responsibility for day-to- day decisions. Submit the name of

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the Project Manager who will attend meetings and have authority to make decisions for issues and requirements that arise from such meetings.

- I. Upon request by the engineer/designer (PSC), the Owner, and/or the Owner's representative will furnish a list of references with specific information regarding the type of project and involvement in providing other products and/or support equipment used on this project.
- J. Where equipment and materials have industry certification, labels, or standards (i.e., NEMA-National Electrical Manufacturer's Assn.), this equipment shall be labeled as certified or complying with the standards.
- K. Material and equipment shall be new, and conform to grade, quality, and standards specified. Equipment and materials of the same type shall be a product of the same manufacturer throughout.
 - 1. All hardware proposed must be the current offering of the manufacturer and receive the highest level of standard support offered by the manufacturer.
 - 2. Factory refurbished hardware which is in "new condition" as well as used, shopworn, prototype, demonstrator models, etc. are not acceptable.
 - 3. The System must consist of standards-based products or components whose performance, reliability, and maintainability can be demonstrated.

1.11. QUALITY ASSURANCE

- A. Submit documentation with the bid listing the names of employees that may be used on this project indicating their experience, level of expertise, and certificates of training.
- B. The Integrator's project manager shall make periodic inspections to assure quality, code, standards, and RFP compliance.
- C. Comply with directives from the PSC regarding quality, codes, standards, and RFP compliance

1.12. WARRANTY

- A. Provide one-year Contractor labor and material warranty.
- B. Submit at project closeout, a signed and registered manufacturer product warranty and applications assurance. The warranty period shall be 25 years.
- C. All software required to run or view the test data must accompany the application.
- D. Copies of as-built drawings must be submitted to the manufacturer via electronic or hard copy. (Drawings must be in AutoCAD or Visio)
- E. Submit a statement, at notice to proceed, of any Integrator warranties in addition to the manufacturer's stated and supplied warranties. Submit at closeout signed copies of the Integrator provided warranties that are in addition to manufacturer's stated and supplied warranties.

1.13. DELIVERY, STORAGE, AND HANDLING

- A. Protect equipment during transit, storage, and handling to prevent damage, theft, soiling, and misalignment. Coordinate with the owner for availability of secure storage of equipment and materials.
- B. Do not store equipment where conditions fall outside manufacturer's recommendations for environmental conditions.

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- C. Follow manufacturer's recommended procedures for storage of materials & equipment.
- D. Do not install damaged equipment; remove from site and replace damaged equipment with new equipment.

1.14. USE OF THE SITE

- A. The sites are both educational and administrative in nature. Access to the sites shall be at the owner's direction in matters in which the owner deems it necessary to place restriction.
- B. Access to building wherein the work is performed shall be as directed by the owner.
- C. The owner will occupy the premises during the entire period of construction for conducting his or her normal business operations. Cooperate with the owner to minimize conflict and to facilitate the owner's operations.
- D. Proceed with the work without interfering with ordinary use and operations of the owner.

1.15. CONTINUITY OF SERVICES

- A. Take no action that will interfere with, or interrupt, existing building services unless previous arrangements have been made with the owner's representative. Arrange the work to minimize shutdown time
- B. Owner's personnel will perform shutdown of operating systems. The Integrator shall give three (3) days' advance notice for systems shutdown.
- C. Should services be inadvertently interrupted, immediately furnish labor, including overtime, material, and equipment necessary for prompt restoration of interrupted service at no cost to Owner.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

- A. Provide products as indicated in individual articles.
- B. Where no manufacturer is specified, provide products of manufacturers in compliance with requirements.
- C. Provide proof the manufacturer selected has successfully had these same products installed at other facilities and provide references with name, title, address, phone number & e-mail address of each point of contact within each referenced account.
- D. Provide proof the manufacturer has 20 years or more of designing, manufacturing and providing fiber optic cables, within the continental United States.
- E. Provide proof the manufacturer is located within the U.S., is incorporated within the U.S. and that the major products (fiber optic cables, cable assemblies and termination hardware) are manufactured within the U.S.
- F. Substitutions: Substitution requests will be considered only if submitted to Owner's Representative not less than 7 working days prior to project bid date. Acceptance or rejection of proposed substitution is at Owner's Representatives sole discretion. No exceptions. Requests for substitutions shall be considered not approved unless approval is issued in writing by Owner's Representative.
- G. Rejection: For equipment, cabling, wiring, materials, and all other products indicated or specified as no substitutions or no alternates, Owner does not expect nor desire requests for substitutions and alternate products other than those specified. Owner

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reserves right for Owner's Representative to reject proposed substitution requests and submissions of alternates without review or justification.

PART 3 - EXECUTION

3.1. PRE-INSTALLATION SITE SURVEY

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

3.2. HANDLING AND PROTECTION OF EQUIPMENT AND MATERIALS

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

3.3. CLEANUP

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

3.4. PROTECTION OF OWNER'S FACILITIES

- A. Effectively protect the owner's facilities, equipment, and materials from dust, dirt, and damage during construction.
- B. Protect installed products until completion of project
- C. Remove protection at completion of work.
- D. Should it be found by the engineer that the materials, or any portion thereof, furnished and installed under this contract fail to comply with the specifications and drawings, with respect or regard to the quality, amount of value of materials, appliances, or labor used in the work, it shall be rejected and replaced by the Integrator, and all work distributed by changes necessitated in consequence of said defects or imperfections shall be made good at the Integrator's expense.

3.5. INSTALLATION

- A. Prior to pulling cable through conduit, mandrel the conduits to remove foreign material before pulling commences.
- B. Beginning installation means that the Integrator accepts existing conditions.
- C. Integrator shall furnish all required installation tools to facilitate Cable installation without damage to the cable jacket. Such equipment is to include, but not be limited to, sheaves, winches, cable reels, cable reel jackets, duct entrance funnels, pulling

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tension gauges, and similar devices. All equipment shall be of substantial construction to allow steady progress once pulling has begun. Makeshift devices that may move or wear in a manner to pose a hazard to the cable or employees shall not be used.

- D. Cable pulling shall be done in accordance with cable manufacturer's recommended procedures and ANSI/IEEE C2 standards. Manufacturer's recommendations shall be a part of the cable submittal. Recommended pulling tensions and minimum bending radii shall not be exceeded. Any cable bent or kinked to a radius less than recommended shall not be installed.
- E. During cable pulling operation, an adequate number of workers shall be present to allow cable observation at all points of duct entry and exit as well as to feed cable and operate pulling machinery.
- F. Pulling lubricant shall be used to ease pulling tensions. Lubricant shall be of a type that is non-injurious to the cable material used. Lubricant shall not harden or become adhesive with age.
- G. Avoid abrasion and other damage to cables during installation.
- H. All exposed cable shall be labeled at 35-foot (maximum) intervals with tags indicating ownership, cable type, and fiber type installed.
- I. As indicated in individual sections.

3.6. LABELING

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

3.7. TESTING AND ACCEPTANCE

- A. As indicated in each section.
- B. Test procedures must meet manufacturer's standards.
- C. The Integrator shall correct, in a timely manner, any failure to comply with Contract Documents as reasonably determined by Owner.
- D. If final acceptance is significantly delayed because of defective new equipment or because the installation is not in accordance with the Contract Documents, the Integrator shall pay for all the Owner's additional time and expenses resulting from the delay and any extensions of Acceptance Testing.
- E. As additionally indicated in each Section.
 - 1. The Integrator shall provide written reports of all test data in written form to the owner. At such time the Integrator turns over test data to the PSC.
 - 2. In the event that test results are not satisfactory, the Integrator shall make adjustments, replacements, and changes as necessary and shall then repeat the test or tests that disclosed faulty or defective material, equipment, or installation method, and shall perform additional tests as the PSC deems necessary.
 - a. Tests related to connected equipment of others shall only be done with the permission and presence of the Integrator involved. The Integrator shall

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perform only that testing as required to prove the fiber connections and loss are correct.

- b. One (1) record copy of all test data shall be submitted to the PSC/engineer for approval. The Integrator shall notify the PSC/engineer at least one week in advance of the test date so that the PSC/engineer may be present.

END OF SECTION

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SECTION 27 15 23 – COMMUNICATIONS OPTICAL FIBER BACKBONE CABLING

PART 1 - GENERAL

1.1. SUMMARY

A. All hardware, enclosures, racks, equipment and other equipment as indicated herein and on project drawings and documents, and as required for a complete installation per industry norms, standards and best practices.

B. Section Includes:

1. Indoor armored single mode and multi-mode optical fiber cable, termination and testing
2. Panels and accessories
3. Patch Cords

1.2. RELATED SECTIONS:

- A. Section 27 05 00 – Common Work Results for Communications
- B. Section 27 21 13 – Data Communications Firewalls
- C. Section 27 21 29 – Data Communications Switches

1.3. RELATED DOCUMENTS

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

1.4. CODES, STANDARDS AND REFERENCES

A. The Contractor shall adhere to the latest edition of the following codes, standards, and references. Additionally, the Contractor shall adhere to all other codes, regulation and standards not stated here:

1. As listed in Section 27 05 00
2. Manufacturers Recommendations and Requirements
3. Best Practices and Industry Norms

1.5. SUBMITTALS

A. Coordinate with Division 0 & 1.

B. As indicated in each section.

C. 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.

D. Shop Drawings: For communications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Wiring diagrams to show typical wiring schematics including the following:
 - a. Patch panels.

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

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- F. 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.
 - G. Regulatory Requirements - In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.
 - H. 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.
 - I. Material and Equipment Manufacturing Date - Products manufactured more than 1 year prior to date of delivery to site shall not be used, unless specified otherwise.
- 1.7. CABLE DELIVERY, STORAGE, AND HANDLING
- A. Test cables upon receipt at Project site.
 - B. Test optical fiber cable to determine the continuity of the strand end to end. Use optical fiber flashlight or optical loss test set.
- 1.8. PROJECT CONDITIONS
- A. Environmental Limitations: Do not deliver or install cable, equipment frames and cable trays until spaces are enclosed and weather tight, wet work in spaces is complete and dry.
- 1.9. COORDINATION
- A. Coordinate layout and installation of telecommunications equipment with Owner's telecommunications and LAN equipment and service suppliers. Coordinate service entrance arrangement with local exchange carrier.
 - B. Meet jointly with telecommunications and LAN equipment suppliers, local exchange carrier representatives, and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
 - 1. Record agreements reached in meetings and distribute them to other participants.
 - 2. Adjust arrangements and locations of distribution frames, cross-connects, and patch panels in equipment rooms to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.

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3. 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.
4. Coordinate layout and installation of telecommunications pathways and cabling with Owner, PSC and all associated trades.

1.10. SYSTEM DESCRIPTION

A. General Description

1. Remove existing optical fiber backbone infrastructure (Fiber, innerduct, termination hardware, etc.) and replace with new six-strand single mode (OS2) and six-strand multi-mode (OM4) armored optical fiber infrastructure between all IDFs and MDFs in each building – reference project drawings for locations.

B. Indoor armored optical fiber cable, termination and testing

C. IT rooms

1. Optical Fiber Panels or enclosures
2. Couplers and coupler panels
3. Connectors
4. Patch Cords

1.11. DEFINITIONS AND ABBREVIATIONS

1. Unless otherwise specified or indicated herein, electrical and electronics terms used in this specification shall be as defined in TIA-568, TIA-569, TIA-606 and IEEE 100 and herein.
2. BICSI: Building Industry Consulting Service International.
3. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
4. EMI: Electromagnetic interference.
5. MM: Multi-mode
6. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
7. RCDD: Registered Communications Distribution Designer.
8. TDMM (BICSI): Telecommunications Design Methods Manual
9. LAN: Local area network.
10. LC: A type of small form factor optical fiber connector
11. Cable tray: A fabricated structure consisting of sides and bottom constructed of steel with dimensions not exceeding 12" x 4" or a basket tray consisting of sides and bottom constructed of wire mesh not exceeding 2" x 4" (50mm x 100mm) spacing.
12. PSC – Professional Services Contractor (Convergent Technology Partners)
13. SCS – Structured Cabling System
14. SM – Single Mode
15. APC – Angle Polished Connector
16. UPC – Uniform Polished Connector

PART 2 - PRODUCT

STRUCTURED CABLING SYSTEMS

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- 2.1. Components shall be UL or third party certified. Where equipment or materials are specified to conform to industry and technical society reference standards of the organizations, submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing, and approved by the Owner. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard. Provide a complete system of telecommunications cabling and pathway components using star topology. Provide support structures and pathways, complete with outlets, cables, connecting hardware and telecommunications cabinets/racks. Cabling and interconnecting hardware and components for telecommunications systems shall be UL listed or third-party independent testing laboratory certified and shall comply with NFPA 70 and conform to the requirements specified herein.
- 2.2. SINGLE MODE OPTICAL FIBER CABLE
- A. Single Mode Optical Fiber Cable, Armored
1. 6-strand tight buffered cable
 2. Interlocking armor with yellow outer OFCP rated jacket.
 3. Approvals and Listings:
 - a. National Electrical Code® (NEC®) OFCP, CSA FT-6, ICEA S-83-596
 - b. Free of hazardous substances according to RoHS 2011/65/EU
 4. Maximum Attenuation 0.4 dB/km / 0.4 dB/km / 0.4 dB/km at Wavelengths 1310 nm / 1383 nm / 1550 nm
 5. Fiber Category G.652.D
- B. Approved Manufacturers
1. Corning
 2. CommScope
 3. Belden / Mohawk
 4. Equivalent
- 2.3. MULTI-MODE OPTICAL FIBER CABLE
- A. Multi-Mode Optical Fiber Cable, Armored
1. 6-strand tight buffered cable
 2. Interlocking armor with aqua outer OFCP rated jacket.
 3. Fiber Category 50 µm MM (OM4)
 - a. Minimum Effective Modal Bandwidth (EMB) 4700 MHz*km
 - b. Maximum Attenuation 2.8 dB/km / 1.0 dB/km
 - c. Min. Overfilled Launch (OFL)
 - d. Bandwidth 3500 MHz*km / 500 MHz*km
 - e. Serial 1 Gigabit Ethernet 1000 MHz*km / 600 MHz*km
 - f. Serial 10 Gigabit Ethernet 550 MHz*km
 - g. Wavelengths 850 nm / 1300 nm
 4. Approvals and Listings:
 - a. National Electrical Code® (NEC®) OFCP, CSA FT-6, ICEA S-83-596
 - b. Free of hazardous substances according to RoHS 2011/65/EU

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- B. Approved Manufacturers
 - 1. Corning
 - 2. CommScope
 - 3. Belden / Mohawk
 - 4. Equivalent
- 2.4. PANELS, COUPLERS, CONNECTORS AND ACCESSORIES
 - A. Approved manufacturers above. Components shall be of the same manufacturer as the optical fiber cable, or optical fiber cable manufacturer approved for use in an end-to-end, manufacturer warranted solution.
 - B. Connector and coupler type: UPC / LC
 - 1. Field fusion spliced manufacturer terminated pigtails or modules.
 - C. Rack mountable fiber optic housings, panels, hardware, and splice cassettes.
 - 1. Single mode cable(s) shall be terminated in dedicated Single mode panels or shelves.
 - 2. Multi-mode cable(s) shall be terminated in dedicated multi-mode panels or shelves.
 - D. Panels shall have all couplers installed and all empty slots with blank panels as required.
- 2.5. PATCH CORDS
 - A. Provide 2M long OS2 and OM4 patch cords per each strand of terminated fiber. All fiber in a cable shall be terminated.
 - B. Patch cords shall match the optical characteristics of the optical fiber cable and shall match the manufacturer of the cable.
- 2.6. PATHWAYS
 - A. General Requirements: Provide telecommunications pathways in accordance with TIA-569 and as specified herein and on project drawings and associated documents. Provide system furniture pathways in accordance with UL 1286.
 - B. Cable Support: NRTL labeled. Cable support brackets shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.
 - C. Cable Guides and Fasteners
 - 1. Provide cable guides specifically manufactured for the purpose of routing cables, wires and patch cords horizontally and vertically on equipment racks and telecommunications backboards (to accommodate cross-connect wiring, etc.).
 - 2. Cable guides of ring or bracket type devices mounted on rack and backboard for horizontal cable management and individually mounted for vertical cable management. Mount cable guides with screws, nuts and lock washers.
 - 3. Hook and Loop (I.e. Velcro®) shall be used to fasten cables. Tie-wraps or similar type fasteners shall not be used.
- PART 3 - EXECUTION
 - 3.1. WIRING METHODS
 - A. Wiring Method: Install cables in raceways and cable trays (if available) 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.

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- B. Install plenum cable in environmental air spaces, including plenum ceilings.
- C. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.
- 3.2. INSTALLATION OF PATHWAYS
 - A. Comply with requirements for demarcation point, pathways, cabinets, and racks. Drawings indicate general arrangement of pathways and fittings.
- 3.3. INSTALLATION OF CABLES
 - A. Summary
 - 1. Optical fiber backbone cable shall be installed between each IDF and the MDF in each building included in project drawings or as otherwise specified. Cable shall be terminated in new housings, panels or shelves using new connectors, couplers or pre-terminated modules. Connectors shall be fusion spliced and factory pre-terminated.
 - 2. All replaced cable infrastructure shall be completely removed from site and properly disposed of by the contractor. This includes, but is not limited to, cable, innerduct, housings, panels or shelves, couplers and coupler panels, connectors and associated hardware.
 - B. Comply with NECA 1.
 - C. General Requirements for Cabling:
 - 1. Comply with TIA-568.
 - 2. Comply with BICSI TDMM, "Cable Termination Practices."
 - 3. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
 - 4. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
 - 5. 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.
 - 6. Do not install bruised, kinked, scored, deformed, or abraded cable. Remove and discard cable if damaged during installation and replace it with new cable.
 - 7. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
 - 8. In each telecommunications equipment room, install a 10-foot-long service loop on the end of each optical fiber cable.
 - D. Pulling Cable: Comply with BICSI TDMM, "Pulling Cable." Monitor cable pull tensions.
 - 1. Open-Cable Installation:
 - a. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.

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- b. Suspend cable not in a wire way or pathway a minimum of 8 inches above ceilings by approved cable supports not more than 60 inches apart.
 - c. Approved supports include J – hooks, saddles etc.
 - d. All cable shall be independently suspended from building structure using rated support components. The use of tie wraps and bridle rings is prohibited
 - e. Cable shall not be supported directly by (I.e. laid directly upon) structural members or in contact with pipes, ducts, or other potentially damaging items.
- 3.4. FIRESTOPPING
 - A. Comply with TIA-569, "Firestopping."
 - B. Comply with BICSI TDMM, "Firestopping Systems" Article.
 - C. Firestop all new and reused or abandoned existing fire partition penetrations to meet or exceed the partitions fire rating.
- 3.5. GROUNDING
 - A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
 - B. Comply with TIA-607-A.
 - C. Bond metallic equipment and cable shield to the grounding bus bar, using not smaller than No. 6 AWG stranded copper equipment grounding conductor.
 - D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG stranded copper equipment grounding conductor.
 - E. Bond the shield of shielded cable to the grounding bus bar in telecommunications rooms and spaces.
- 3.6. IDENTIFICATION
 - A. Identify system components, wiring, and cabling complying with TIA-606.
 - B. Label each cable within 4 inches (100 mm) of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
 - C. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
 - D. Individually number wiring conductors connected to terminal strips and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
 - E. Label each unit and field within distribution racks and frames.
 - F. Label all components of the grounding system per TIA – 606 and TIA-607.
 - G. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors.
 - H. Cable and Wire Identification:
 - 1. Label each cable within 4 inches (100 mm) of each termination, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.

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2. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware.
 3. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware.
 4. 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.
 5. Cables use flexible vinyl or polyester that flex as cables are bent.
 - I. 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, 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.
- 3.7. FIELD QUALITY CONTROL
- A. Perform tests and inspections
 1. Visually inspect 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.
 - B. Optical Fiber Cable Tests:
 1. Optical Fiber testing shall use an Optical Loss Test Set. Test instruments shall meet or exceed applicable requirements in TIA-568. Use only test cords and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
 2. Link End-to-End Attenuation Tests:
 - a. Optical link measurements, Multimode - Test at 850 nm and 1300 nm bi-directionally per TIA-526-14-A, Method B, One Reference Jumper.
 - b. Optical link measurements, Single mode - Test at 1310 nm and 1550 nm bi-directionally per TIA-526-7-A, Method B, One Reference Jumper.
 - c. Attenuation test results for backbone links shall be less than calculated according to equation in TIA-568 "Passive Cable System Attenuation Loss".
 3. Data for each measurement shall be electronically documented by the test equipment. 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.
 - a. Data shall be submitted to client in soft copy in PDF format.
 4. Remove and replace cabling where test results indicate that they do not comply with specified requirements.

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5. End-to-end cabling will be considered defective if it does not pass tests and inspections.
6. Prepare and submit test and inspection reports for approval within 10 business days of substantial completion.

END OF SECTION

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SECTION 27 20 00 – DATA COMMUNICATIONS SWITCHES

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 27 05 00 – Common Work Results for Communications
- B. Section 27 15 23 – Communications Optical Fiber Horizontal Cabling
- C. Section 27 21 13 – Data Communications Firewalls

1.2 RELATED DOCUMENTS

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

1.3 CODES, STANDARDS AND REFERENCES

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

1.4 SCOPE OF WORK

- A. The bids must provide the following:
 - 1. Hardware, software, and services which meet the stated requirements.
 - 2. Professional services required to manage the project and complete the basic installation and configuration of the solution. To include:
 - A. The review and migration of the current configuration to the new solution.
 - B. Basic training for the Owner's IT Staff.
 - C. Access to OEM vendor training materials.

1.5 SUBMITTALS

- A. Proposal submittals:
 - 1. Product catalog sheets for brochures.
 - 2. Product guide specifications.
 - 3. Product technical specifications.
 - 4. Bill of Materials (BOM).

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1.6 QUALITY ASSURANCE

A. Bidder Qualifications

1. 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.
2. 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.

B. Manufacturer Affiliation

1. Bidder shall either be the manufacturer of the equipment proposed or a factory authorized distributor/contractor.
2. 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.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Basis of design is Cisco
- B. The Owner will accept bids for the equipment listed in Appendix C or equivalent.

PART 3 - EXECUTION

3.1 General

- A. Contractor shall provide all materials, equipment and labor necessary to install, test, and cut-over the system/project and ancillary equipment. This includes, but is not limited to, delivery, unloading, storage, installation, inspection and testing of the system and components, and management of all Contractor and any subcontractor personnel.
- B. Any equipment proposed in response to this RFP must be installed and tested at least five working (business) days prior to the scheduled cut-over date.
- C. If any proposed equipment must interface to existing installed equipment, the Awarded Contractor must agree to be responsible for providing any necessary interface requirements to the installed equipment.

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- D. Notwithstanding the written certification by the Contractor that the equipment has been installed and ready for use, the equipment will not be deemed installed within the terms of the contract until such installation is confirmed by the Owner through successful performance.
- E. Contractor must make arrangements for access to the Owner's facilities outside of the normal business hours, or on days when the Owner's offices are closed, by contacting the Information Services Office or the Owner's designated Project Manager. Operations that disrupt service must be performed outside of normal working hours ONLY.

3.2 Contractor Responsibilities

- A. Make all reasonable efforts to minimize disruption to normal Owner activities. The Owner reserves the right to determine if the Awarded Contractor's Work is causing undue disruption to the Owner's normal business operations, and, if so, arrange with the Awarded Contractor alternate times and/or methods for completing the Work causing the disruption.
- B. Awarded Contractor will provide weekly (or as requested) project status reports to the Owner as to the progress and performance of all portions of the Work. Awarded Contractor will cooperate fully to ensure that the Owner's identified critical facilities and services are maintained through the installation and minimal disruption is incurred when cut-over to the new system.
- C. Awarded Contractor will designate a Project Manager for the Contract, who will submit and coordinate a schedule of installation activities with the Owner's designated Project Manager. The Project Manager will be the prime point of contact with the Owner and will provide regular status update reports and attend coordination meetings with the Owner.

3.3 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.
- B. Installation Tests
 - 1. During the installation, the Awarded Contractor will perform all tests necessary to insure that the portions of the system/project being installed are ready.
- C. Acceptance Tests
 - 1. 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.
 - 2. Performance and reliability tests will be conducted, demonstrating acceptable performance over a full thirty (30) 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

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been in operation fourteen (14) consecutive days without a major failure. The Owner shall be the sole judge of whether all conditions for final system/project criteria have been met.

- E. Due to the critical nature of the service being affected by this cut-over, the Awarded Contractor will be required to validate that the system/project is performing at the levels required to support quality data communications.

3.4 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.
- B. The vendor must also perform both pre and post installation wireless surveys. The pre-survey will assist with the identification of quantities and locations of access points to be installed. The post-survey will include heat maps showing the location, coverage and density for the installed system.

3.5 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.

3.6 Warranty and Support

- A. All manufacturer warranty information for each system shall be provided to the Owner upon job completion.
- B. The Owner desires high quality maintenance services, parts, materials and workmanship so as to sustain peak operating service.
- C. The goal of the Owner is prompt resolution of problems, not merely prompt response to calls for service. This RFP does not specify response times to service calls as measurements because time limits for problem resolution are difficult to prescribe. The Contractor must strive for resolution of problems as promptly as possible under all conditions.
 - 1. The Contractor shall provide system technicians/personnel who have been fully trained and qualified on the equipment to be serviced and/or certified by the equipment manufacturer.

Troy School District
Network Equipment and Fiber Infrastructure – Bid #2324-16

- D. The Contractor must warrant at a minimum that on the cut-over date the equipment shall be in good working order and installed in a workmanlike manner, shall be free of defects, shall be installed and conform to manufacturer's official published specifications, and shall be installed and operate in full compliance with this RFP.
 - 1. The Contractor must warrant at a minimum that the equipment shall be free of all defects in material and workmanship for a minimum period of one (1) year from the Cut-over Date (the Warranty Period). Vendor must identify any warranty periods in excess of one year.
 - 2. All costs for Warranty service must be included in the Bid Proposal price.
 - E. During the Warranty and Maintenance Periods, the Contractor shall provide the necessary labor, parts, material, and transportation to maintain all equipment in good working order and in compliance with the equipment manufacturer's specifications.
 - F. The Contractor shall not be held responsible for repairs or replacements made necessary by misuse, negligence, accident, theft or unexpected loss, abuse, connection to foreign electrical current, fire, water, flood, wind storms, lightning, and any acts of God or public enemy, failure to provide and maintain a suitable operating environment, unauthorized attachments or modification, or improper software changes, wiring, installation, repair or alteration by anyone other than the Contractor. If the Owner requests the Contractor to perform repairs necessitated by any of the above causes, the Contractor will perform said repairs at the Contractor's then prevailing rates for similar services and material.
- 3.7 Maintenance Requirements
- A. A copy of an optional one-year post warranty Contractor contract to maintain the equipment must be included in the Contractor's Bid Proposal.
 - B. The Contractor must provide full maintenance logistical support, including performance of all tests, system documentation, spare parts inventory, special tools, and test equipment required to promptly and properly perform the work.
 - C. During the Warranty and Maintenance Periods, the Contractor shall provide the necessary labor, parts, material, and transportation to maintain all equipment bid in good working order and in compliance with the equipment manufacturer's specifications.
 - D. The Contractor shall not be held responsible for repairs or replacements made necessary by misuse, negligence, accident, theft or unexpected loss, abuse, connection to foreign electrical current, fire, water, flood, wind storms, lightning, and any acts of God or public enemy, failure to provide and maintain a suitable operating environment, unauthorized attachments or modification, or improper software changes, wiring, installation, repair or alteration by anyone other than the Contractor. If the Owner requests the Contractor to perform repairs necessitated by any of the above causes, the Contractor will perform said repairs at the Contractor's then prevailing rates for similar services and material.
 - E. Each Bidder shall provide, with their Bid Proposal, a complete escalation plan for maintenance situations that includes names, addresses, titles, and phone numbers of the people to be

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contacted, in ascending order, in the event of a maintenance crisis. This plan shall also include descriptions of the circumstances and procedures to be used under various maintenance scenarios including, but not limited to, catastrophic failure, major failures, and major and minor failures that regular maintenance personnel are unable to resolve in a timely manner.

- F. The Contractor shall provide personnel who have been fully trained and qualified on the equipment to be serviced and/or certified by the equipment manufacturer. The Owner desires that the Contractor directly employ such personnel. Contractor must state whether any installation personnel or maintenance technicians that are to be used to perform the contract are employed by subcontractors or other third party companies. Bidders must provide the number of Bidder employed technicians in the area that are factory certified to work on the proposed equipment. The Bidder must provide the name and a summary of qualifications of the lead maintenance technicians that will be responsible maintenance at the Owner's Sites.

3.8 Support Requirements

- A. After the cut-over date and as long as the Contractor is obliged to perform maintenance services, the Contractor shall make all additions, deletions, moves and other changes of equipment, materials or software as the Owner may reasonably request.
- B. The Contractor shall make changes only upon receipt of a change form signed by such person or persons as the Owner may from time to time designate in writing, or upon oral requests from such person as the Owner may from time to time designate in writing.

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SECTION 27 21 30 – Firewall

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 27 05 00 – Common Work Results for Communications
- B. Section 27 15 23 – Communications Optical Fiber Horizontal Cabling
- C. Section 27 21 29 – Data Communications Switches

1.2 RELATED DOCUMENTS

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

1.3 CODES, STANDARDS AND REFERENCES

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

1.4 SCOPE OF WORK

- A. The bids must provide the following:
 - 1. Hardware, software, and services which meet the stated requirements.
 - 2. Professional services required to manage the project and complete the basic installation and configuration of the solution. To include:
 - a. The review and migration of the current configuration to the new solution.
 - b. Basic training for the Owner's IT Staff
 - c. Access to OEM vendor training materials

1.5 SOLUTION REQUIREMENTS:

- A. Security features such as SSL decryption, application awareness, application visibility, advanced malware protection, URL filtering, security intelligence, intrusion detection, intrusion prevention, quality of service, address translation, data loss prevention, and centralized administration will be fully implemented.
- B. The solution shall be compatible with other security solutions or security monitoring solutions using common / industry standard protocols.
- C. The solution shall have the capability to store at least 90 days of logs, natively.

1.6 SUBMITTALS

FIREWALL

27 21 30 1 -4

Troy School District
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- A. Proposal Submittals:
 - 1. Product catalog sheets or brochures.
 - 2. Product guide specifications.
 - 3. Product technical specifications.
 - 4. Bill of Materials (BOM)

1.7 WARRANTY AND SUPPORT

- A. Beyond the standard product warranty, the Owner is requesting pricing for 3 years of hardware and software support.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide products as indicated in individual sections and with the solution and product requirements as outlined.
- B. Basis of design is the Fortinet 601F Firewall for the Head End and the Fortinet 61F Firewall for the satellites.
- C. The Owner will accept bids for the equipment listed in Appendix C or equivalent.

PART 3 - EXECUTION

3.1 GENERAL

- A. As indicated in individual sections
- B. Follow all manufacturer requirements and best practices.

3.2 DELIVERY, STORAGE AND HANDLING

- A. Handle and operate products and systems according to the manufacturer's instructions.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with original identification labels.
- C. Protect stored materials from environmental and temperature conditions following the manufacturer's instructions.

3.3 INSTALLATION

- A. The Integrator's or subcontractor's main resources within the project shall carry proper professional certification issued by the manufacturer and verified by a third-party organization to confirm product and technology knowledge.
- B. The Integrator shall carefully follow instructions in the documentation provided by the manufacturer to ensure all steps have been taken to provide a reliable, easy-to-operate system.
- C. The database shall be reviewed by the Owner and approved before the Integrator enters it into the system.
- D. All equipment shall be tested and configured in accordance with instructions provided by the manufacturer prior to installation.

FIREWALL

27 21 30 2 -4

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- E. All firmware found in products shall be the latest and most up to date provided by the manufacturer.
- F. All equipment requiring users to log on using a password shall be configured with user/site-specific password/passwords. No system/product default passwords shall be allowed.

3.4 TESTING

- A. The Integrator shall demonstrate the functionality of the firewall upon completion of installation, documenting the result of all tests and providing these results to the Owner.

3.5 MAINTENANCE

- A. Installing integrator shall maintain proper manufactures certification and training during the warranty period. The availability of expansion, replacement and spare parts shall be accessible during the warranty period at standard pricing.

3.6 TRAINING

- A. User training of the Tech Staff shall be available at the time of acceptance at the owner's location. Additional user e-training shall be available from the manufacturer during the warranty and license periods.

3.7 ACCEPTANCE AND TESTING

- A. The equipment must meet or exceed the agreed acceptance criteria during a 30-day acceptance period, which begins on the installation (cut-over) date. The system will then be accepted following this successful 30-day period.
- B. The Contractor shall correct, in a timely manner, any failure to comply with the Contract Documents as reasonably determined by Owner.
- C. If final acceptance is significantly delayed because of defective new equipment or because the installation is not in accordance with the Contract Documents, the Contractor shall pay for all the Owner's additional time and expenses resulting from the delay and any extensions of Acceptance Testing.
- D. Installation Tests
 - 1. During the installation, the Contractor shall perform all tests necessary to ensure that the portions of the system being installed are ready for pre-cut-over tests. The installation tests shall include, but not be limited to, all manufacturer recommendations and requirements.
- E. Acceptance Testing
 - 1. Acceptance testing shall be performed confirming the system requirements have been met.
 - 2. After cut-over of any portion of the system, the Contractor shall conduct acceptance tests consistent with factory system performance specifications to be supplied with the system prior to installation.

3.8 CLOSEOUT

- A. All Closeout submittals shall be completed, Hard and electronic copies of installation, maintenance and operations manuals shall be provided at the time of acceptance.

FIREWALL

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B. Punch List:

1. The Contractor shall perform required remedial work, without claim for additional labor or other costs. Where required, the Contractor shall re-test and submit a revised Test Report.
2. The Contractor shall notify the Owner of completion of the Punch List.

3.9 OWNER'S RIGHT TO USE

- A. Acceptance of the work of this section will occur after completion of corrections and adjustments required by "Punch List" (as generated during on-site inspections and review of testing documentation).
- B. The Owner reserves the right to use equipment, material and services provided as part of the work of this section, prior to acceptance, without incurring any obligation to accept any equipment or completed systems until Punch List work is complete and systems comply with the Contract Documents.

END OF SECTION

Troy School District
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APPENDIX A – SITES

Services Building (District Head-End)

4420 Livernois Rd. Troy, MI 48098

Barnard Elementary

3601 Forge, Troy, MI 48083

Bemis Elementary

3571 Northfield Pkwy, Troy, MI 48084

Costello Elementary

1333 Hamman, Troy, MI 48085

Hamilton Elementary

5625 Northfield Pkwy, Troy, MI 48098

Hill Elementary

4600 Forsyth, Troy, MI 48085

Leonard Elementary

4401 Tallman Dr. Troy, MI 48085

Martell Elementary

5666 Livernois, Troy, MI 48098

Morse Elementary

475 Cherry St. Troy, MI 48083

Schroeder Elementary

3541 Jack Dr. Troy, MI 48084

Troy Union Elementary

1340 East Square Lake Rd. Troy, MI 48085

Wass Elementary

2340 Willard Dr. Troy, MI 48085

Wattles Elementary

3555 Ellenboro, Troy, MI 48083

Baker Middle School

1359 Torpey Dr. Troy, MI 48083

Boulan Park Middle School

3570 Northfield Pkwy, Troy, MI 48084

Larson Middle School

2222 E. Long Lake Rd. Troy, MI 48085

Smith Middle School

5835 Donaldson, Troy, MI 48085

Athens High School

4333 John R, Troy, MI 48085

Troy High School

4777 Northfield Pkwy, Troy, MI 48098

International Academy: East

1291 Torpey Dr. Troy, MI 48083

Central Office

4400 Livernois Rd. Troy, MI 48098

Transportation Building

120 Hart St. Troy, MI 48098

Facility Operations Building

1140 Rankin, Troy, Michigan 48083

Early Childhood Center

W. Square Lake Rd. Troy, MI 48098

Troy College & Career High School

1522 E. Big Beaver Rd., Troy, MI 48083

APPENDIX A – SITES

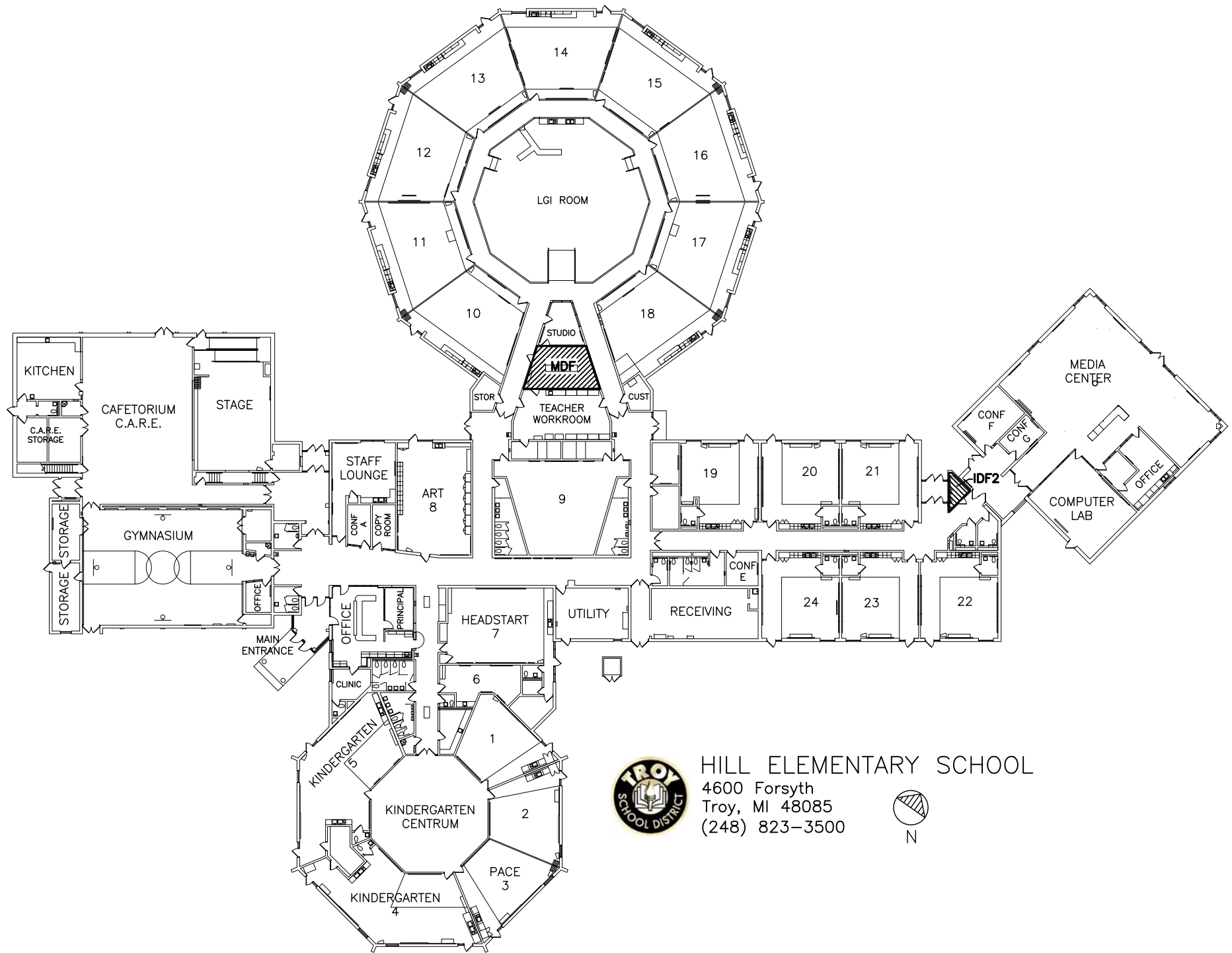
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Troy School District
Network Equipment and Fiber Infrastructure – Bid #2324-16

APPENDIX B – FIBER PROJECT DRAWINGS

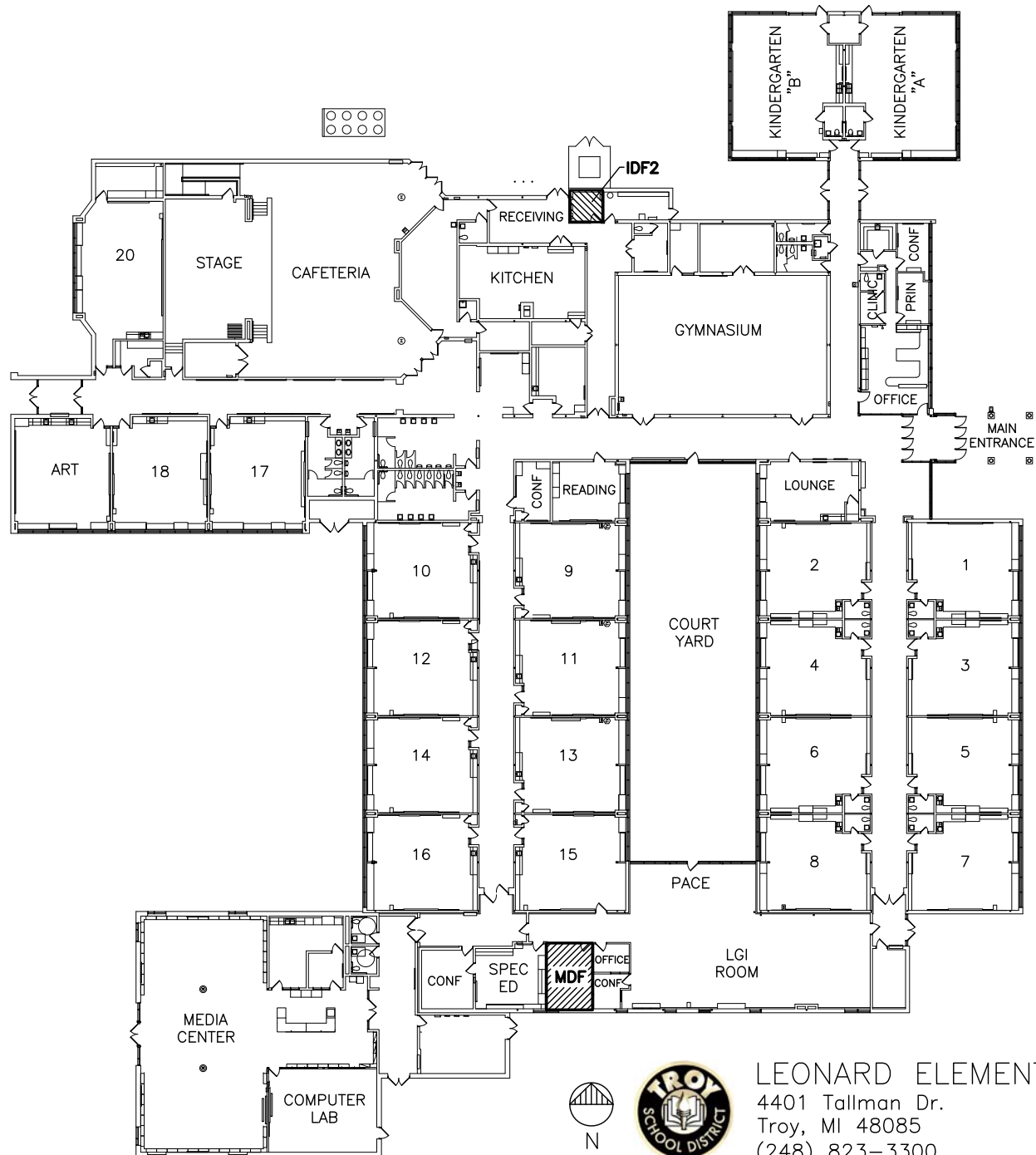
APPENDIX B – FIBER PROJECT DRAWINGS

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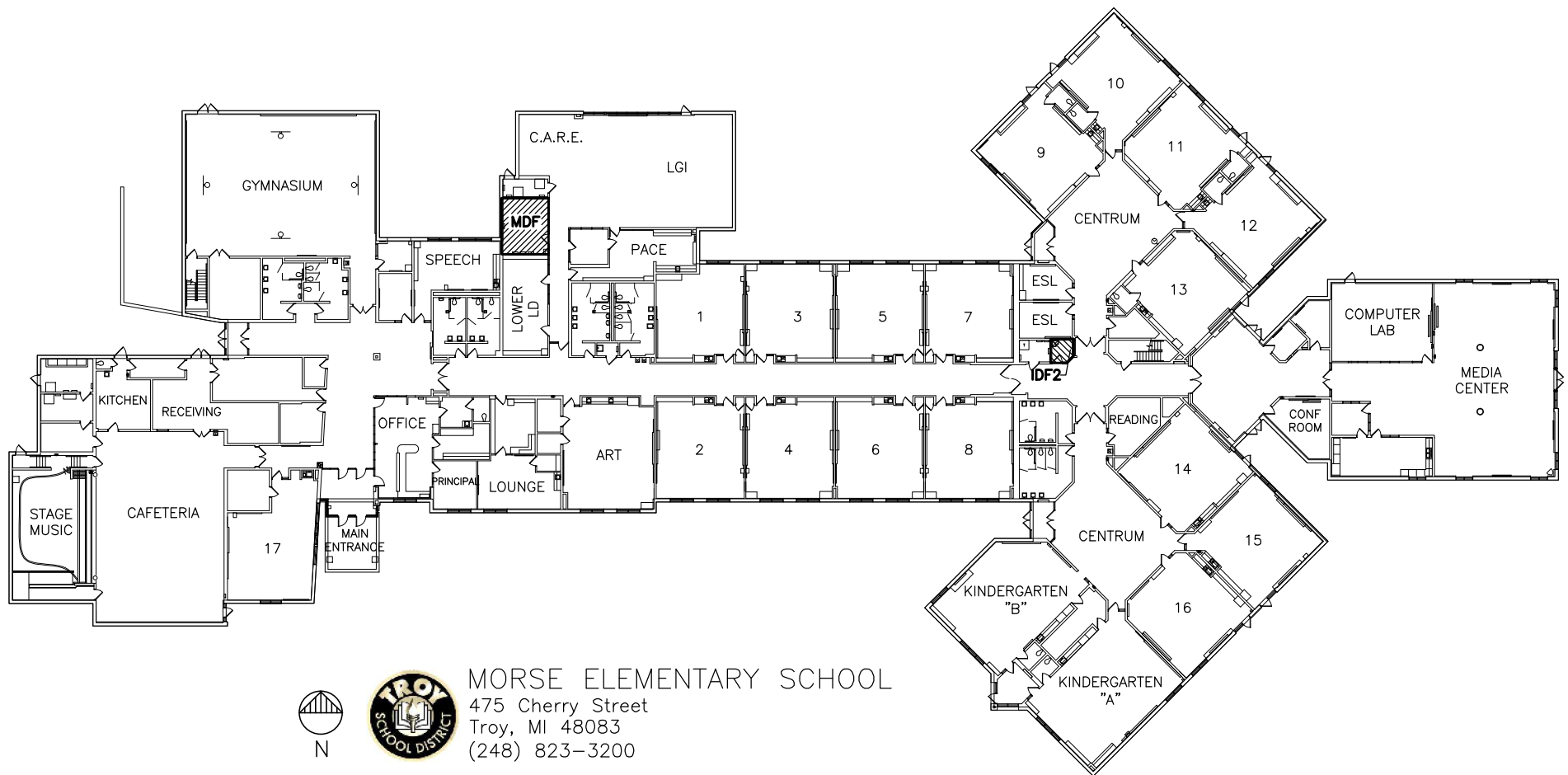


HILL ELEMENTARY SCHOOL
 4600 Forsyth
 Troy, MI 48085
 (248) 823-3500



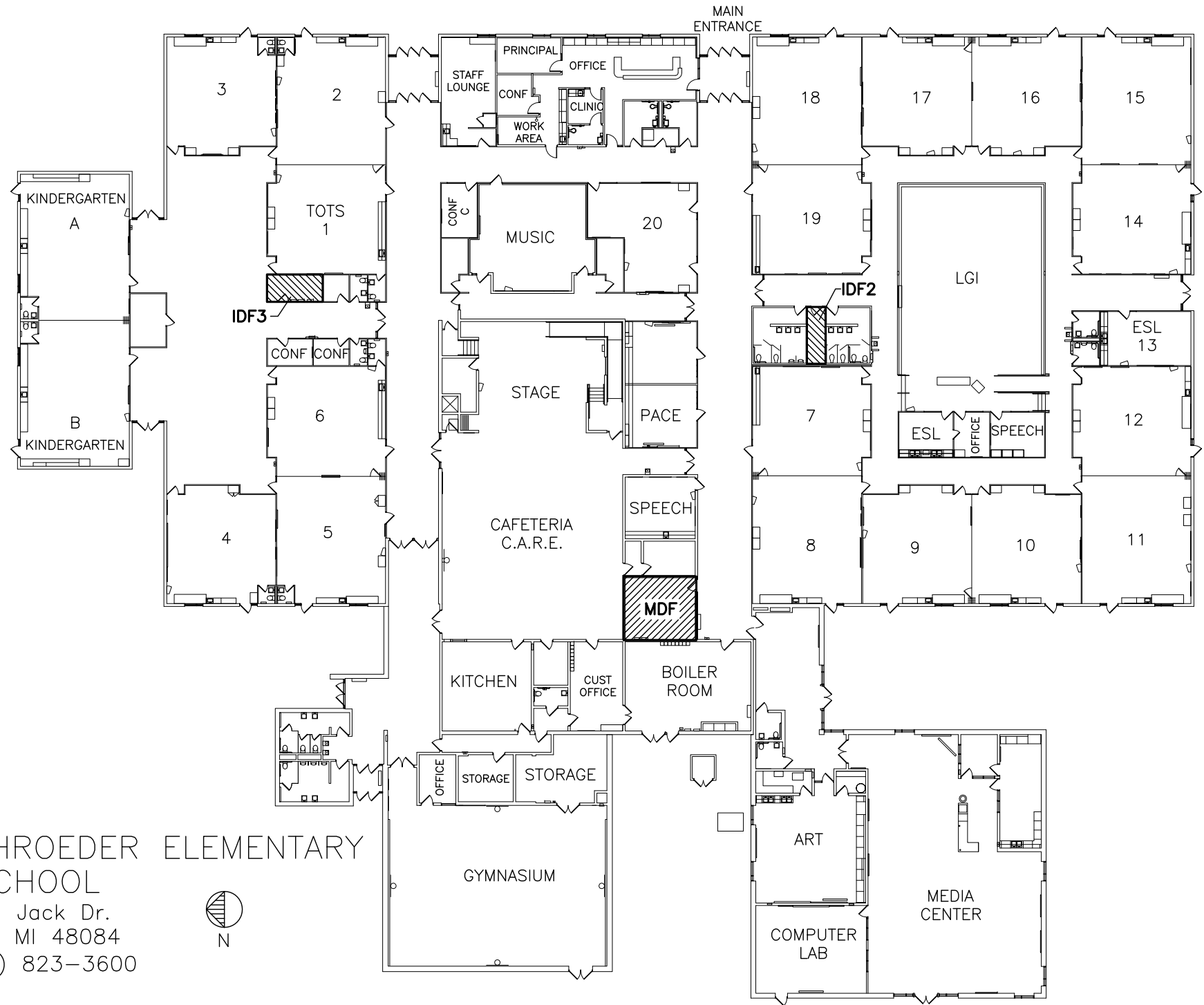


LEONARD ELEMENTARY SCHOOL
 4401 Tallman Dr.
 Troy, MI 48085
 (248) 823-3300



MORSE ELEMENTARY SCHOOL

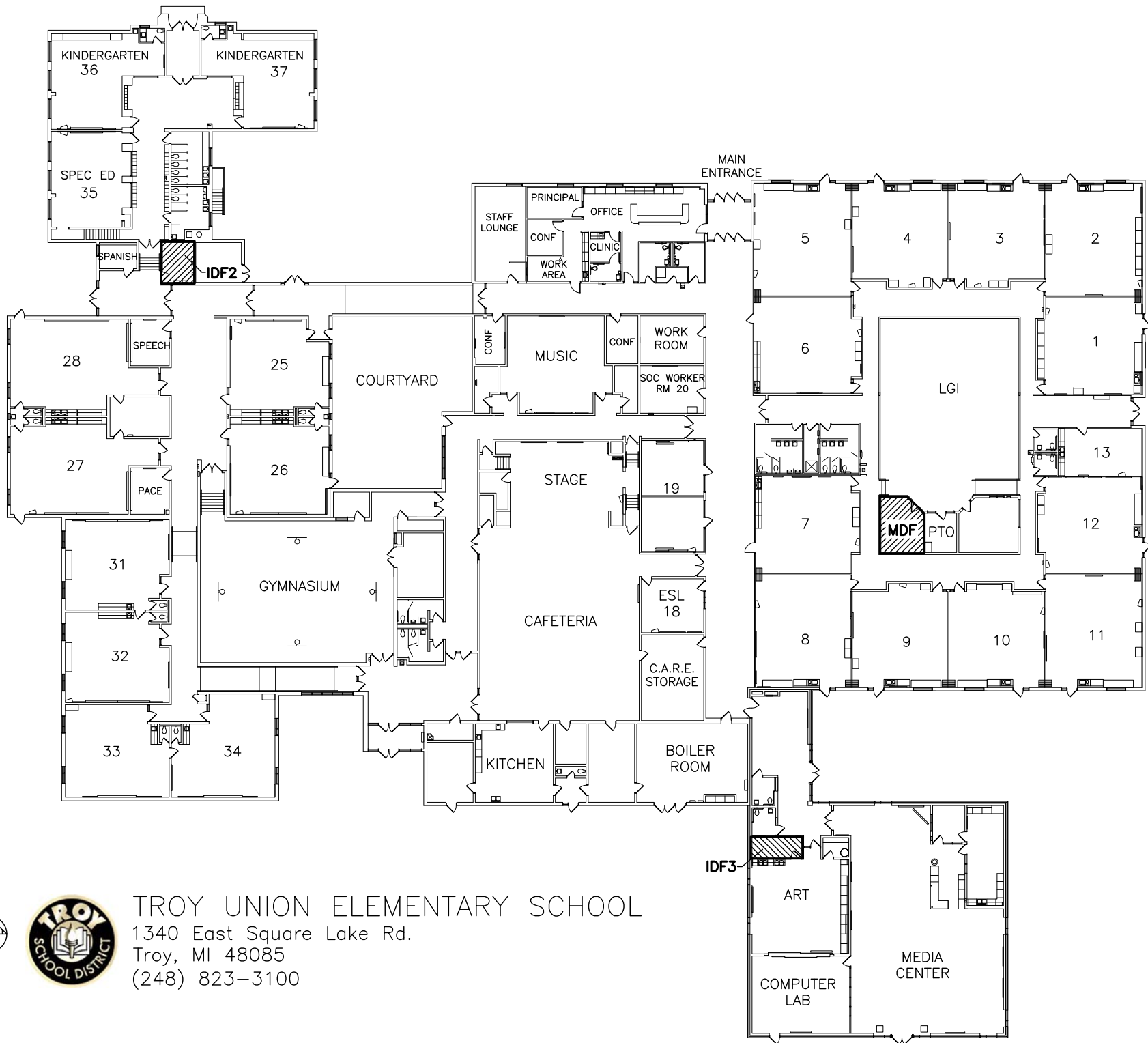
475 Cherry Street
Troy, MI 48083
(248) 823-3200



SCHROEDER ELEMENTARY SCHOOL

3541 Jack Dr.
Troy, MI 48084
(248) 823-3600



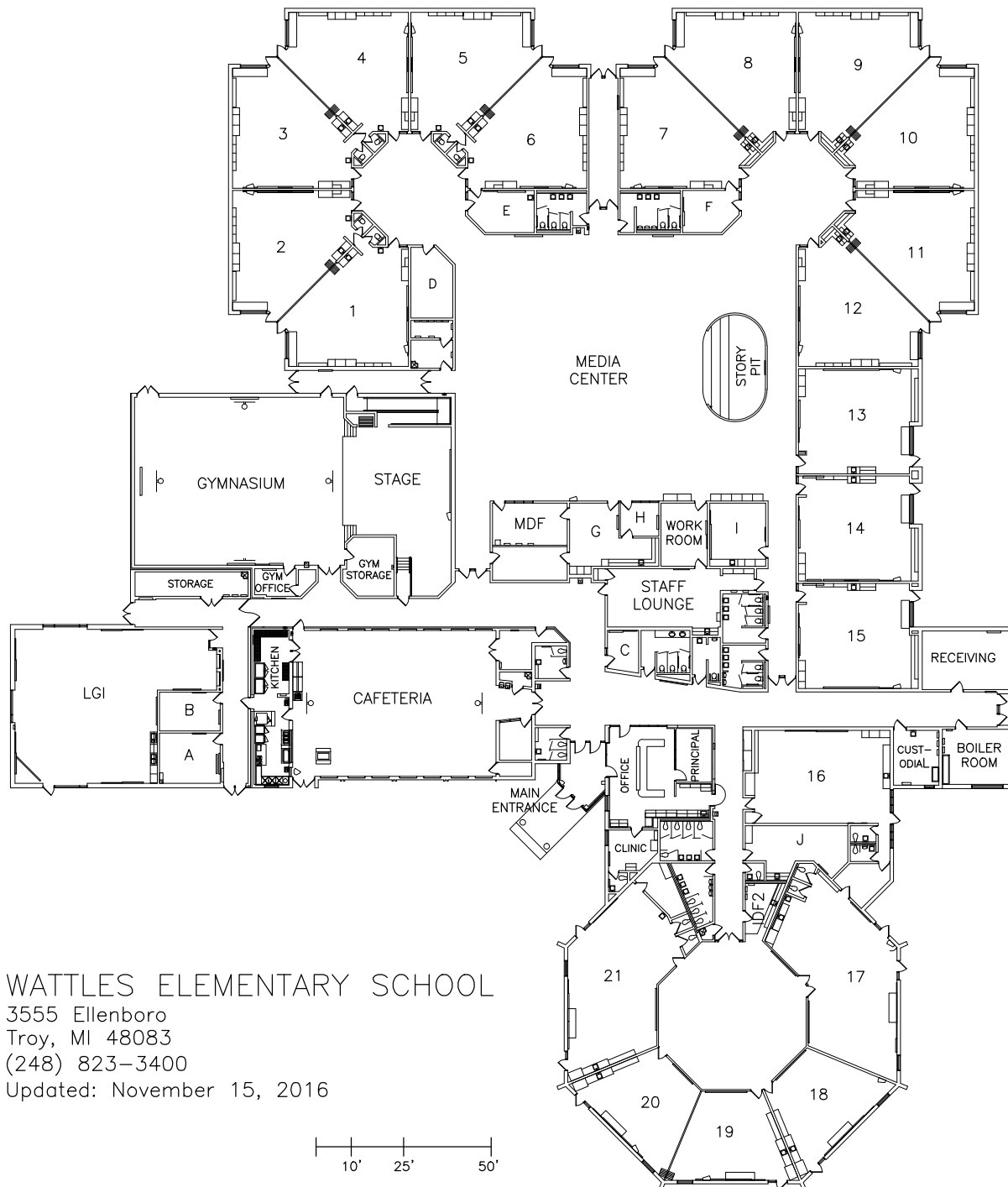


TROY UNION ELEMENTARY SCHOOL

1340 East Square Lake Rd.

Troy, MI 48085

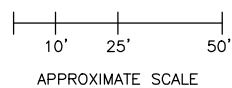
(248) 823-3100

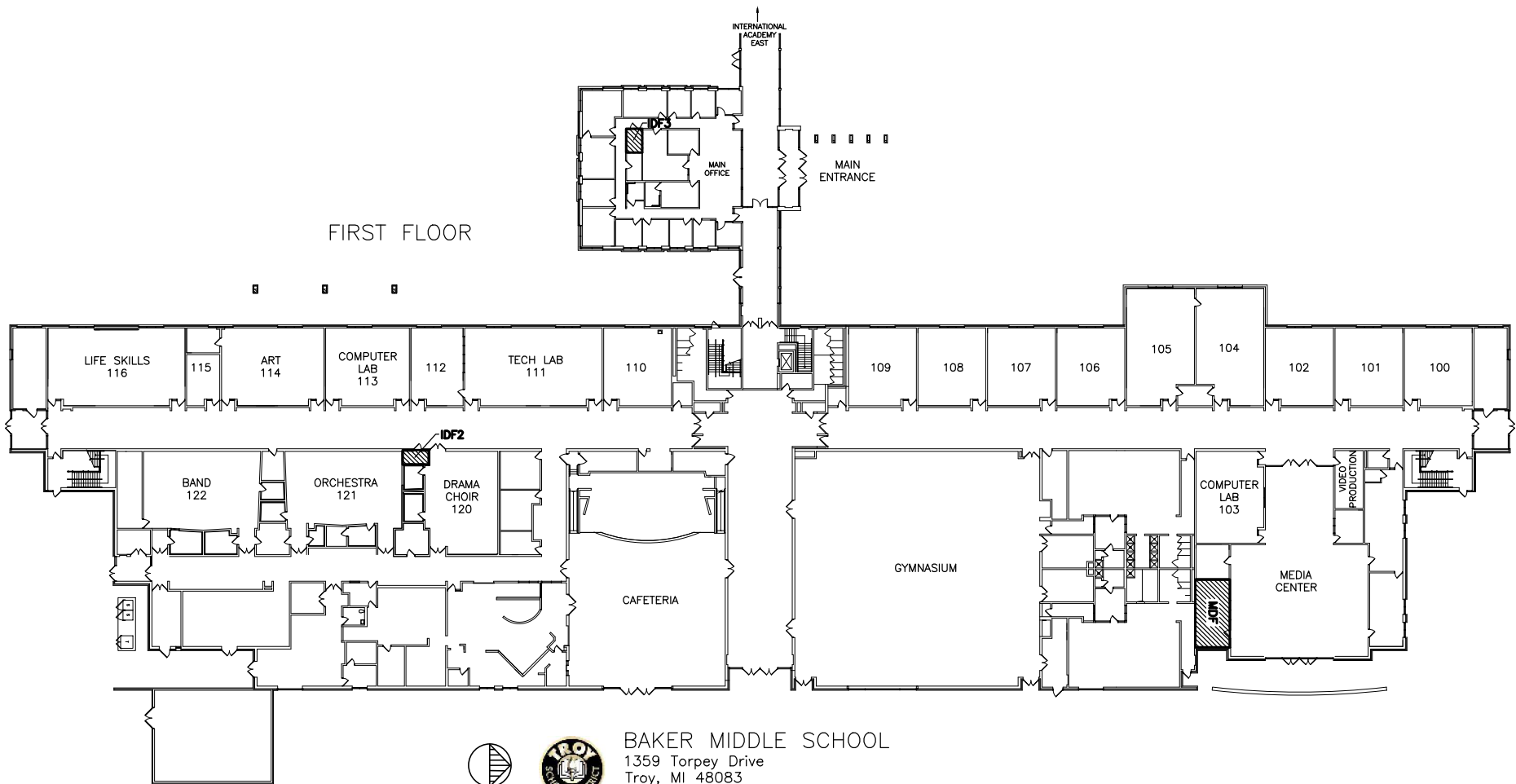


WATTLES ELEMENTARY SCHOOL

3555 Ellenboro
Troy, MI 48083
(248) 823-3400

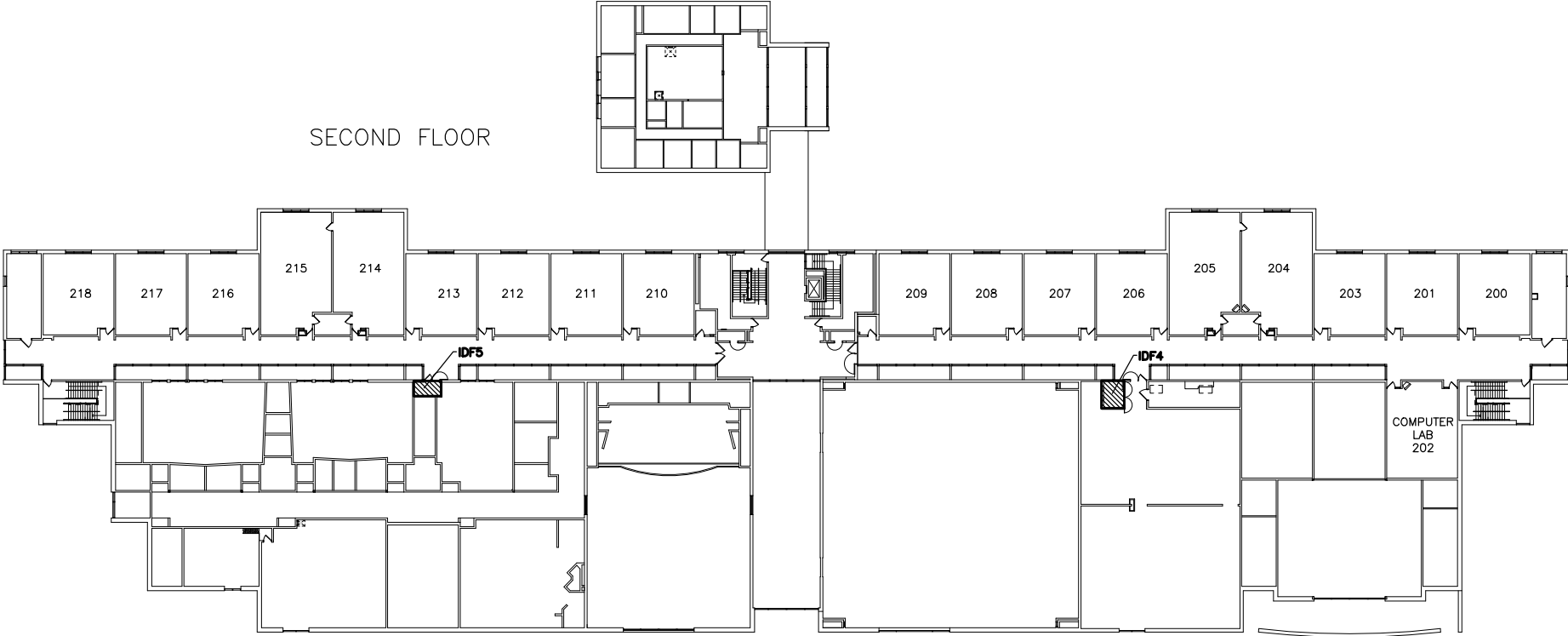
Updated: November 15, 2016



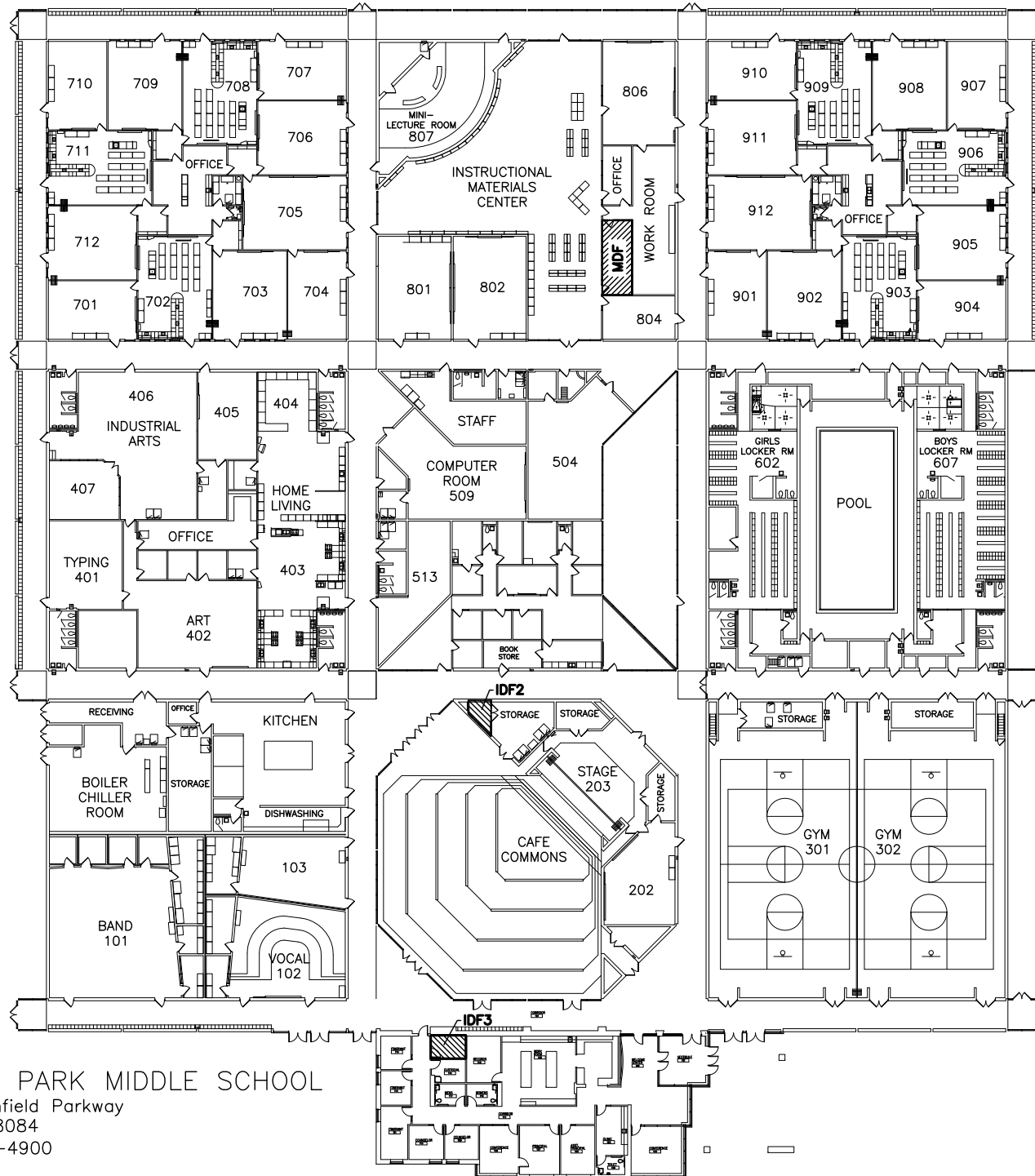


BAKER MIDDLE SCHOOL
1359 Torpey Drive
Troy, MI 48083
(248) 823-4600

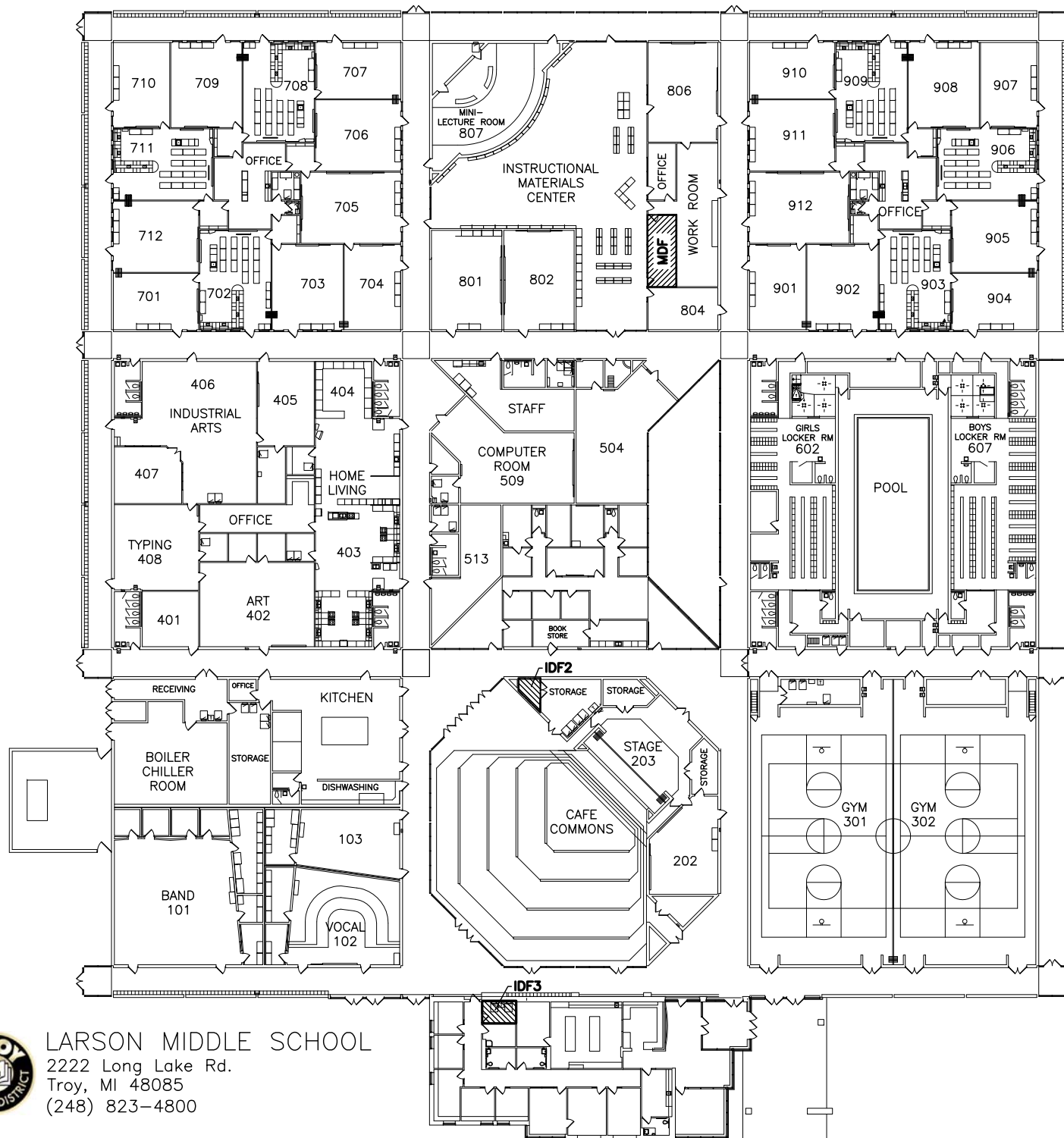
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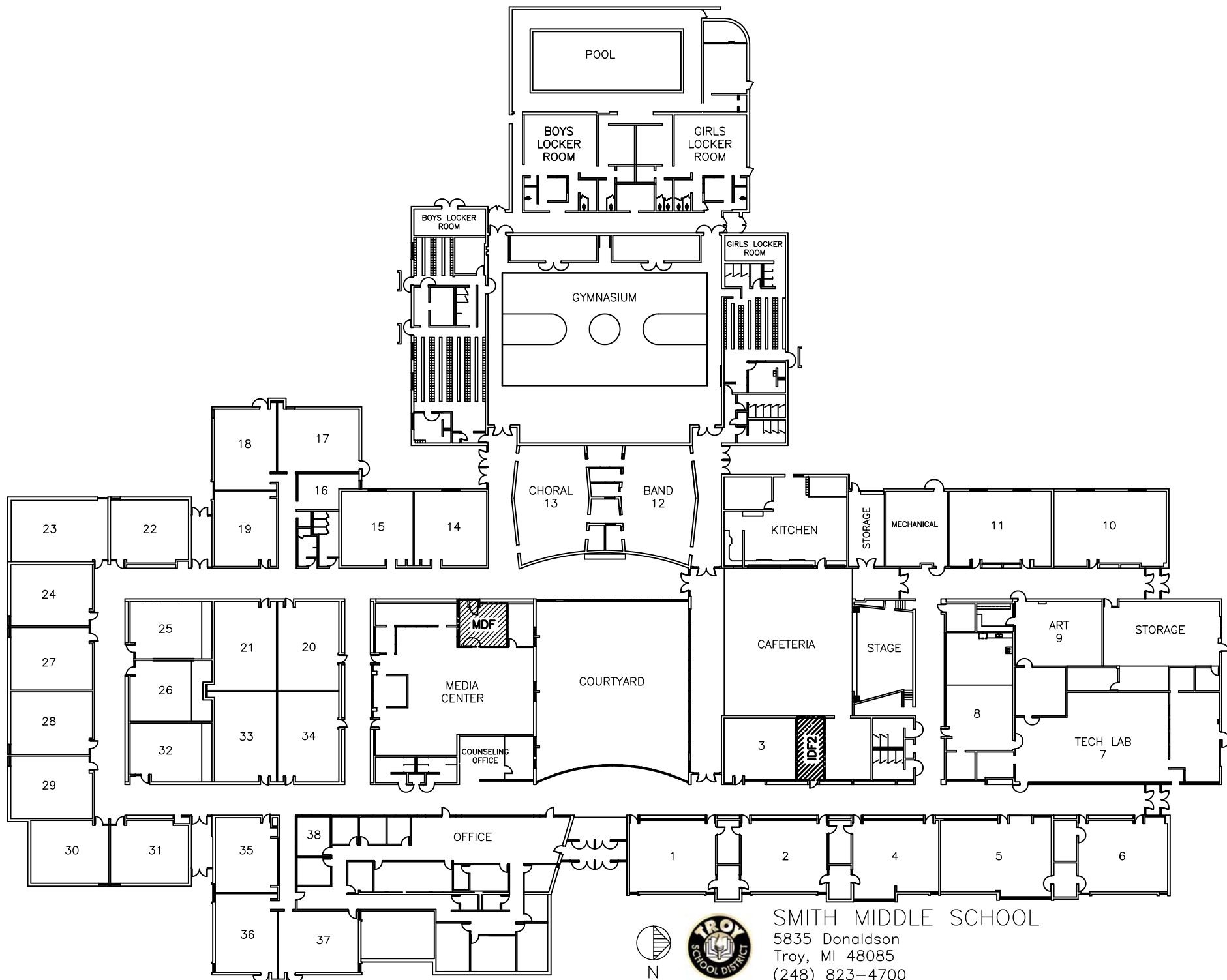
BAKER MIDDLE SCHOOL
1359 Torpey Drive
Troy, MI 48083
(248) 823-4600



BOULAN PARK MIDDLE SCHOOL
 3570 Northfield Parkway
 Troy, MI 48084
 (248) 823-4900

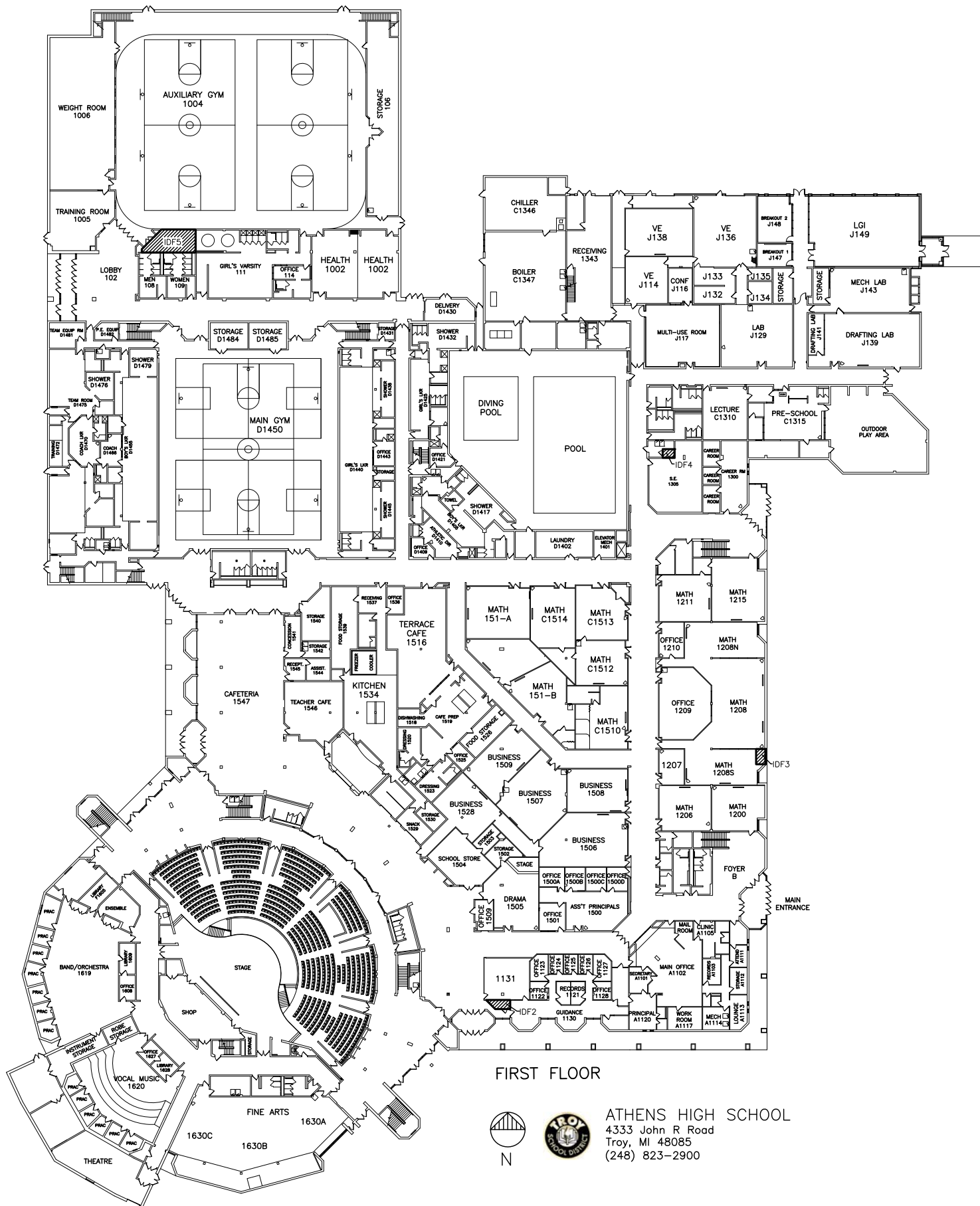


LARSON MIDDLE SCHOOL
 2222 Long Lake Rd.
 Troy, MI 48085
 (248) 823-4800



SMITH MIDDLE SCHOOL

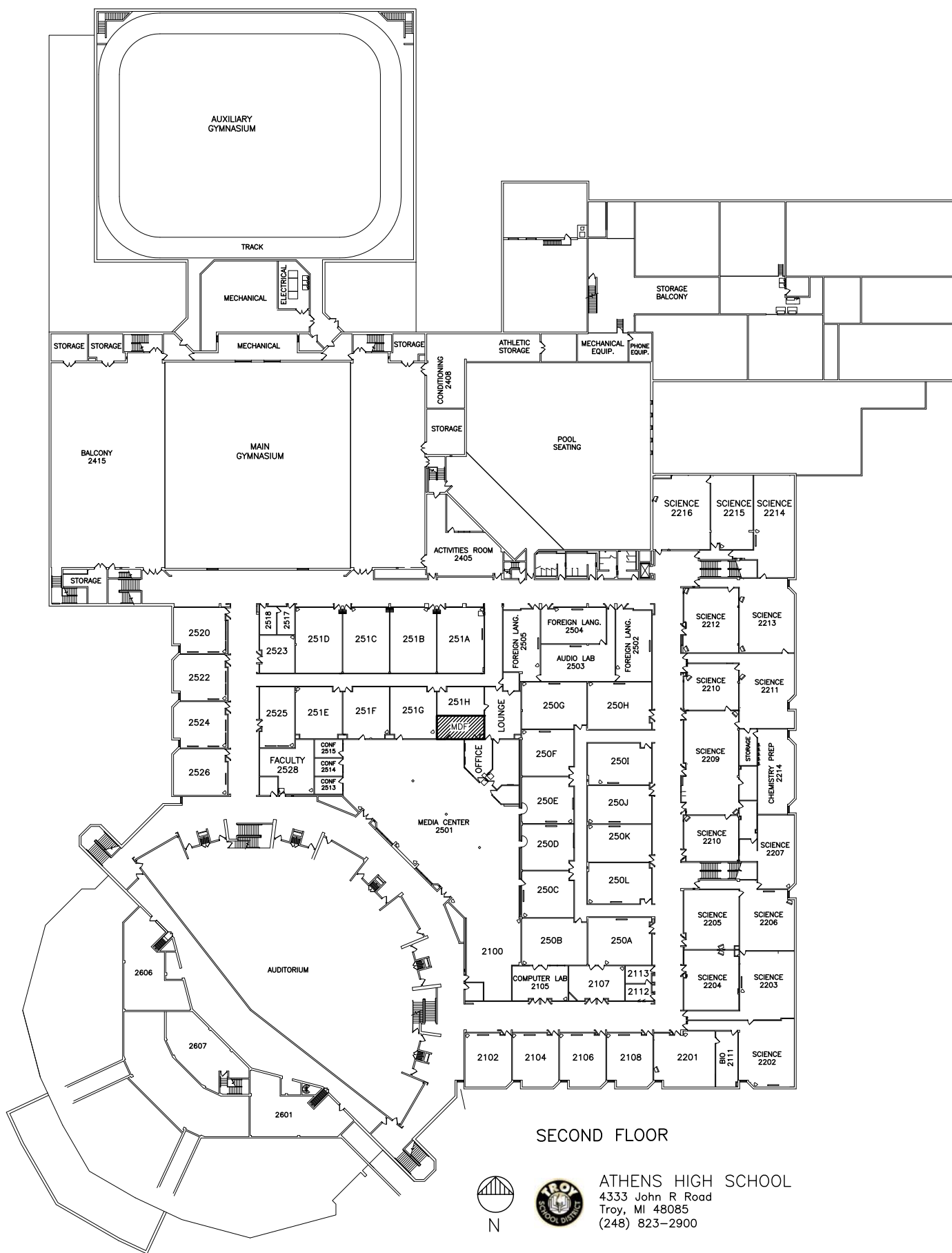
5835 Donaldson
Troy, MI 48085
(248) 823-4700



FIRST FLOOR



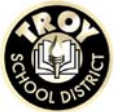
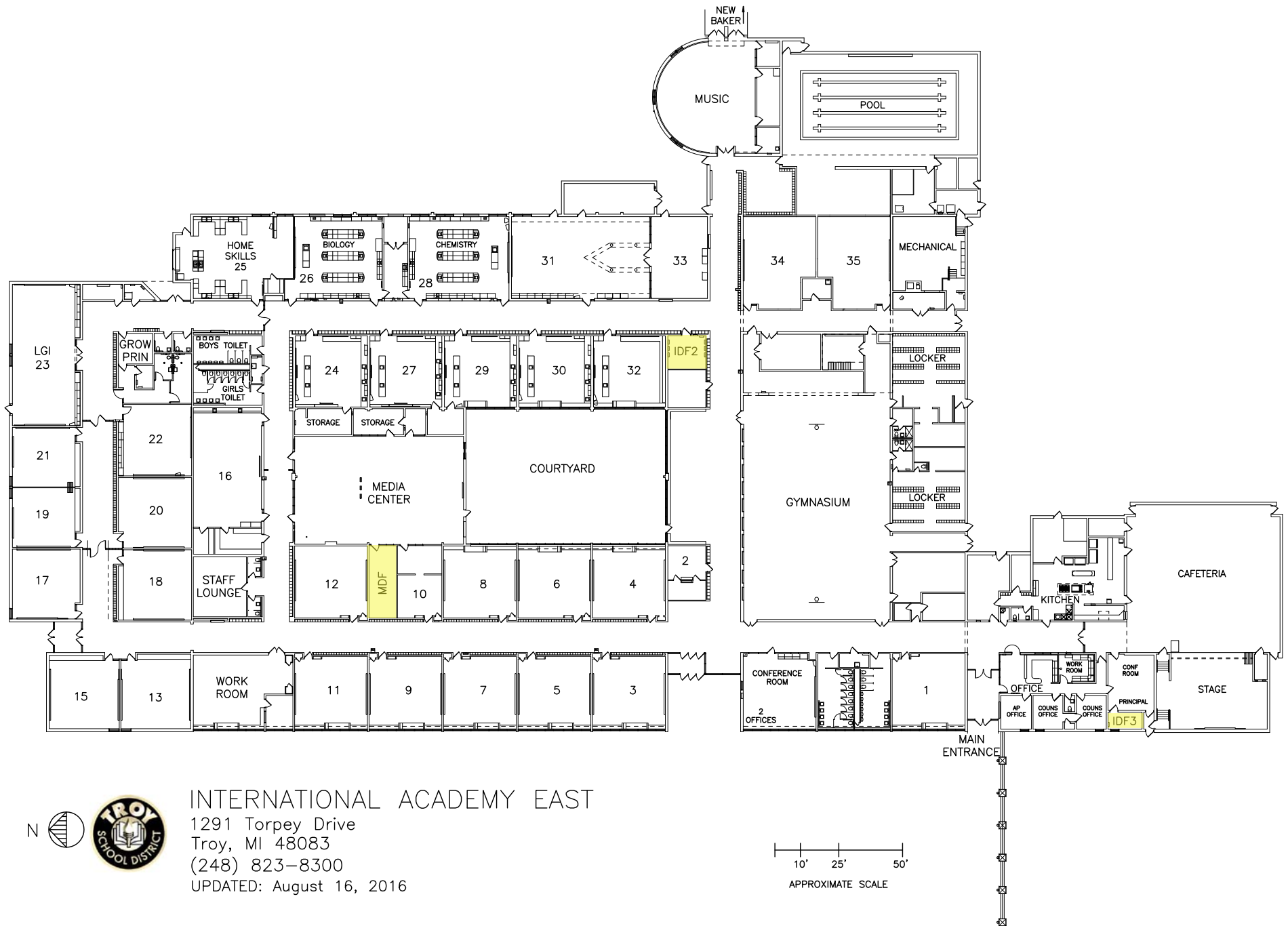
ATHENS HIGH SCHOOL
4333 John R Road
Troy, MI 48085
(248) 823-2900



SECOND FLOOR



ATHENS HIGH SCHOOL
4333 John R Road
Troy, MI 48065
(248) 823-2900



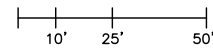
INTERNATIONAL ACADEMY EAST

1291 Torpey Drive

Troy, MI 48083

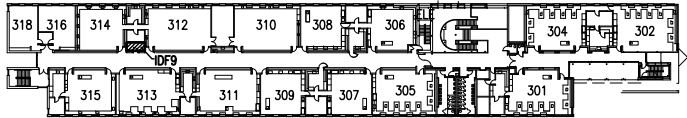
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UPDATED: August 16, 2016

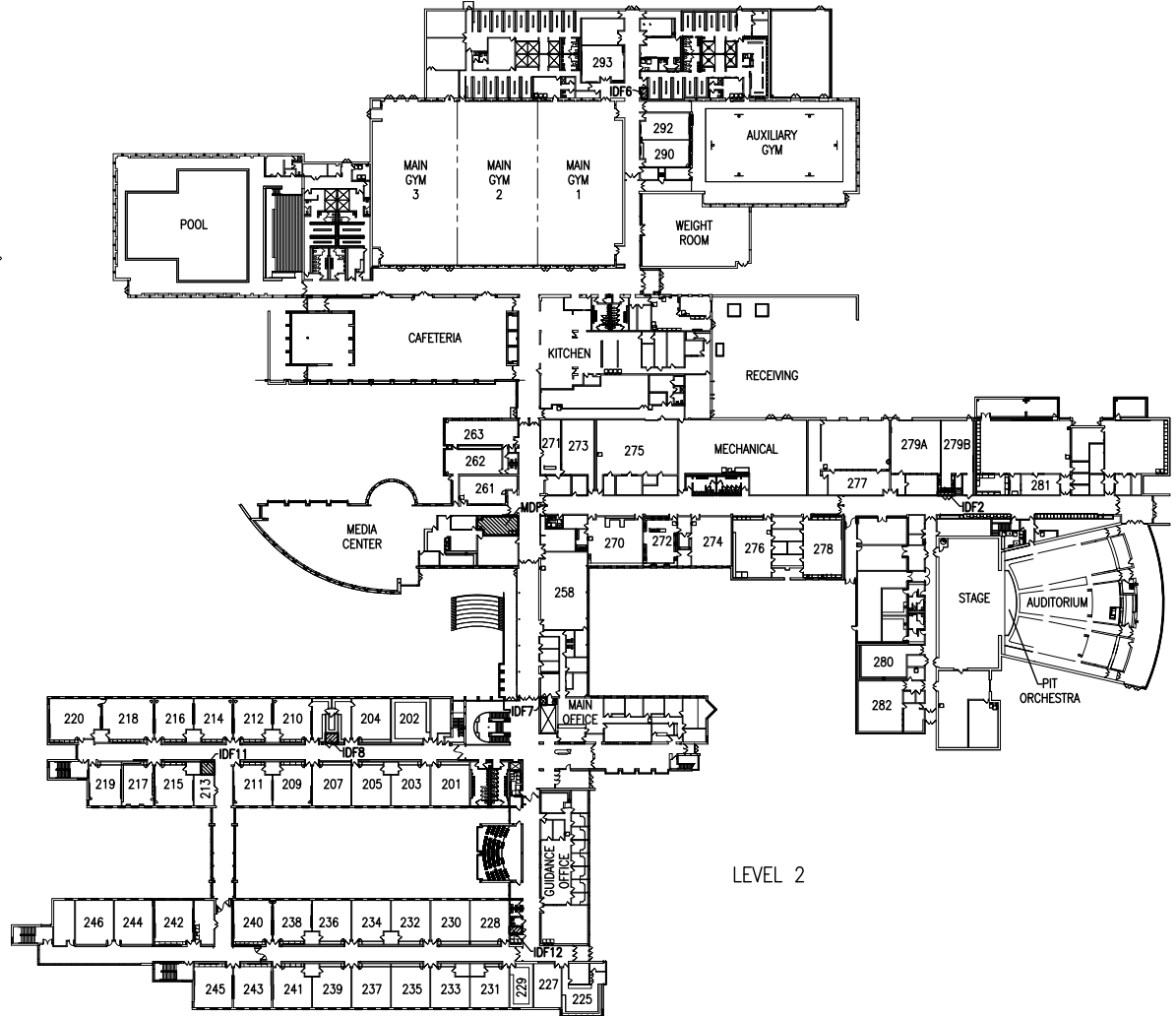
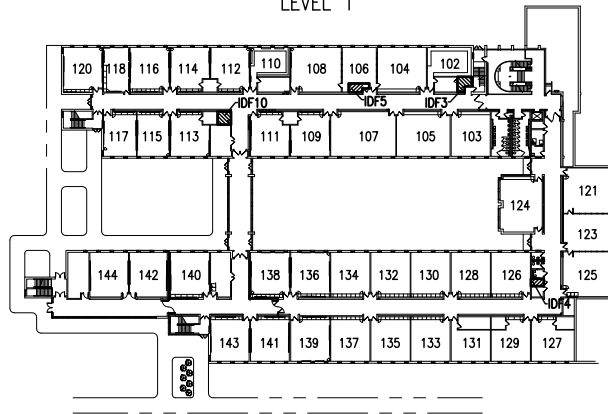


APPROXIMATE SCALE

LEVEL 3



LEVEL 1



TROY HIGH SCHOOL
4777 Northfield Parkway
Troy, MI 48098
(248) 823-2700

Troy School District
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Appendix C

Part Number	Description	Qty
FG-61F-BDL-950-36	FortiGate-61F Hardware plus 3 Year FortiCare Premium and FortiGuard Unified Threat Protection (UTP)	24
SP-RACKTRAY-02	Rack mount tray for all FortiGate E series and F series desktop models and backward compatible with SP-RackTray-01. For list of compatible FortiGate products, visit Documentation website.	24
FG-601F-BDL-950-36	FortiGate-601F Hardware plus 3 Year FortiCare Premium and FortiGuard Unified Threat Protection (UTP)	1
ATS-OO-5in1-2812-5SP-18	GPS/LTE/CBRS/WIFI 9 ELEMENT INDOOR/OUTDOOR OMNI ANTENNA WITH SMA AND RPSMA	24
SVCS	Installation of single run low loss antenna cable with 4 LTE leads from building MDF to antenna on roof	24
SVCS	Installation and project management	1

Appendix C - Firewall

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Appendix D

Part#	Description	Qty
C9500-48Y4C-EDU	Catalyst 9500 48-port x 1/10/25G and 4-port 40/100G , EDU	2
CAB-9K12A-NA	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America	4
C9K-PWR-650WAC-R	650W AC Config 4 Power Supply front to back cooling	2
C9K-PWR-650WAC-R/2	650W AC Config 4 Power Supply front to back cooling	2
C9K-F1-SSD-BLANK	Cisco pluggable SSD storage	2
C9K-T1-FANTRAY	Catalyst 9500 Type 4 front to back cooling Fan	4
C9500-NW-A	C9500 Network Stack, Advantage	2
S9500UK9-179	Cisco Catalyst 9500 XE 17.9 UNIVERSAL	2
C9500-SSD-NONE	No SSD Card Selected	2
C9500-DNA-48Y4C-A	C9500 DNA Advantage, Term License	2
C9500-DNA-A-5Y	DNA Advantage 5 Year License	2
NETWORK-PNP-LIC	Network Plug-n-Play Connect for zero-touch device deployment	2
C9500-24Y4C-EDU	Catalyst 9500 24x1/10/25G and 4-port 40/100G, K12	1
CAB-9K12A-NA	Power Cord, 125VAC 13A NEMA 5-15 Plug, North America	2
C9K-PWR-650WAC-R	650W AC Config 4 Power Supply front to back cooling	1
C9K-PWR-650WAC-R/2	650W AC Config 4 Power Supply front to back cooling	1
C9K-F1-SSD-BLANK	Cisco pluggable SSD storage	1
C9K-T1-FANTRAY	Catalyst 9500 Type 4 front to back cooling Fan	2
C9500-NW-A	C9500 Network Stack, Advantage	1
S9500UK9-179	Cisco Catalyst 9500 XE 17.9 UNIVERSAL	1
C9500-SSD-NONE	No SSD Card Selected	1
C9500-DNA-24Y4C-A	C9500 DNA Advantage, Term License	1
C9500-DNA-L-A-5Y	DNA Advantage 5 Year License	1
NETWORK-PNP-LIC	Network Plug-n-Play Connect for zero-touch device deployment	1
GLC-TE=	1000BASE-T SFP transceiver module for Category 5 copper wire	3
C9300-24UX-EDU	Catalyst 9300 24-port mGig and UPOE, K12	21
C9300-NW-A-24	C9300 Network Advantage, 24-port license	21
SC9300UK9-176	Cisco Catalyst 9300 XE 17.6 UNIVERSAL UNIVERSAL	21
PWR-C1-1100WAC-P	1100W AC 80+ platinum Config 1 Power Supply	21
PWR-C1-1100WAC-P/2	1100W AC 80+ platinum Config 1 Secondary Power Supply	21
CAB-TA-NA	North America AC Type A Power Cable	42
C9300-SSD-NONE	No SSD Card Selected	21
C9300-STACK-NONE	No Stack Cable Selected	21
C9300-SPWR-NONE	No Stack Power Cable Selected	21
TE-C9K-SW	TE agent for IOSXE on C9K	21
C9K-ACC-RBFT	RUBBER FEET FOR TABLE TOP SETUP 9200 and 9300	21
C9K-ACC-SCR-4	12-24 and 10-32 SCREWS FOR RACK INSTALLATION, QTY 4	21
CAB-GUIDE-1RU	1RU CABLE MANAGEMENT GUIDES 9200 and 9300	21
C9300-DNA-A-24	C9300 DNA Advantage, 24-port Term Licenses	21
C9300-DNA-A-24-5Y	C9300 DNA Advantage, 24-Port, 5 Year Term License	21
D-DNAS-EXT-S-T	Cisco DNA Spaces Extend Term License for Catalyst Switches	21
D-DNAS-EXT-S-5Y	Cisco DNA Spaces Extend for Catalyst Switching - 5Year	21
TE-EMBEDDED-T	Cisco ThousandEyes Enterprise Agent IBN Embedded	21
TE-EMBEDDED-T-5Y	ThousandEyes - Enterprise Agents	21
C9300-NM-8X	Catalyst 9300 8 x 10GE Network Module	21
NETWORK-PNP-LIC	Network Plug-n-Play Connect for zero-touch device deployment	21
SFP-H10GB-CU3M=	10GBASE-CU SFP+ Cable 3 Meter	22

Appendix D - Switches

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