

February 1, 2019

# **Request for Proposal Communications Cabling Bid Pack**

For

**TSD Bid # 9877  
Troy School District  
4400 Livernois  
Troy, MI 48098**

**Prepared by**

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TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

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SECTION 00 30 00 – BIDDING REQUIREMENTS – INSTRUCTION TO BIDDERS

PART 1 - GENERAL

- A. Troy School District is seeking proposals for cabling infrastructure installation for the new Early Childhood Center. The infrastructure will support wired devices and wireless access points
- B. **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](http://www.troy.k12.mi.us).**
- C. **Due on or before 10:00 A.M. (local time) on February 28, 2019 ("Due Date")**, the Owner will receive bid proposals for the project. The Owner will not consider or accept a bid proposal received after the due date for bid proposal submission. 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 School District  
Administration Building  
4400 Livernois  
Troy, Michigan 48098  
Attn: Todd Hensley, Purchasing Supervisor

- D. Proposals/Quotes
  - 1. Three (3) hard copies of the proposals and one electronic copy on a thumb drive are to be submitted in sealed envelopes, clearly marked: **"Communication Cabling Bid #9877 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.
  - 2. Proposals will be opened publicly immediately following the due date of the proposals
- E. Proposal Format
  - 1. The Bid response shall be structured as follows:
    - a. Section 1 – Submittal Letter, Executive Summary
    - b. Section 2 – Proposal Forms, Bid Bond and Pricing
    - c. Section 3 – Narratives, System Description, Information, and Brochures
    - d. Section 4 - Bidder Qualifications, References
    - e. Section 5 – Bidder's Maintenance Contract
  - 2. 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.

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3. 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.
- F. Security
1. 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
- G. Familial Disclosure Affidavit
1. 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.
- H. Affidavit of Compliance – Iran Economic Sanctions
1. 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.
- I. Reservation of Rights
1. 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.
- J. Withdrawal of Bid Proposals/Quotes
1. 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.
- K. Requests for clarification
1. Bidders may request that the Owner clarify information contained in this RFP. All such requests must be made in writing via email to Mr. Brandon Julian, Convergent Technology Partners, at [bjulian@ctpartners.net](mailto:bjulian@ctpartners.net). Requests for clarifications and inquiries may only be made via email.

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### L. Restriction on communication

1. 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.

### M. Contract

1. The form of contract that the successful Bidder ("Contractor") will be expected to sign with Troy School District will be available to all Bidders on the BidPro web site at [www.ctpartners.net/rfp](http://www.ctpartners.net/rfp).

### N. Universal Service Fund Schools (E-Rate) and Board of Education Approval

1. Implementation of the proposed project is fully contingent on E-Rate funding approval and approval of the Troy School District Board of Education.

### O. Release of claims

1. 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.

### P. Proposal Cost

1. 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.

### Q. Collusive bidding

1. 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.

## 1.2 DEFINITIONS

- A. Bid Documents are defined as the Instructions to Bidders, Schedule of Events, this RFP, including all Supplementals, 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 Troy School 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".

### 1.3 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.

### 1.4 EXAMINATION OF BID DOCUMENTS

- A. Before submitting a Bid Proposal, each Bidder shall examine the RFP documents carefully and shall read the Specifications and the Bid Documents. Each Bidder shall gather complete information prior to bidding as to existing conditions and limitations under which the Work/Project is to be performed, and shall include in its Bid Proposal a sum to cover the cost of items necessary to perform the Work/Project as set forth in the Bid Documents.
- B. No allowance or additional fees will be made to a Bidder because of lack of such examination or knowledge. The submission of a Bid Proposal will be considered as conclusive evidence that the Bidder has made such examination. An on-site-inspection of the Sites during the Bidder's Conference will be for all Bidders and their subcontractors, if any. Vendors may use subcontractors in connection with the Work/Project performed under this RFP provided the Owner has approved the subcontractors. In using subcontractors, the Vendor agrees to be responsible for all their acts and omissions to the same extent as if the subcontractors were employees of the Vendor.
- C. Bidders may make written request to the PSC for interpretation or correction of any ambiguity, inconsistency or error in the Bid Documents that are discovered. These questions shall be submitted to the PSC no later than 5:00 P.M., February 22, 2016. Only a written interpretation or correction by Addendum shall be binding on Bidders. No explanations or interpretations requested or made orally will be considered binding. All questions will be responded to in writing.

### 1.5 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

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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, a complete description of the proposed substitute, the cost savings or advantages, 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.

### 1.6 BIDDING PROCEDURES

- A. All Bids Proposal must be submitted, in triplicate, 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 three (3) days prior to the due date for bid proposals. It is each Bidders responsibility to ascertain prior to submitting a Bid Proposal that he/she has received all Addenda issued and shall acknowledge their receipt in their Bid Proposal Form.
- D. All Bids must be signed as follows:
  - 1. Corporations: Signature of an officer of the firm who is authorized to bind the corporation.
  - 2. Partnerships: Signature of one partner who is authorized to bind the firm and all 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.

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- 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 “Communications Cabling Bid #9877”
- 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.
- J. All Bidders must complete, sign and return the attached “FAMILIAL DISCLOSURE AFFIDAVIT” with their Bid Proposal.
- K. Bidders must include a Bill of Material (BOM), along with line item pricing for all components proposed, including, but not limited to, access points, electronics, peripherals, maintenance and support with the total listed where indicated in the Bid Proposal Forms. Failure to provide the BOM with line item pricing will result in disqualification of the Bid proposal. This does not preclude filling out the unit pricing Form Attachment B.
- 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

### 1.7 CONSIDERATION OF BIDS



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- 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
  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.
- 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 and E-Rate funding 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.
- 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.

### 1.8 BID SECURITY

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

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

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

### 1.9 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.

### 1.10 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.

### 1.11 PERMITS AND FEES

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

### 1.12 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.

### 1.13 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.

### 1.14 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.

### 1.15 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.

### 1.16 TIME OF COMPLETION

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

### 1.17 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. This site is a new building and the contractor will be required to work with and coordinate activities with the Construction Manager.
- B. Certain areas of the building may not be available immediately, but a final schedule will be negotiated with the awarded contractor prior to start of installation activities.
- C. Installation Guidelines
  - 1. All Work performed on this Project will be installed in accordance with the current edition of the National Electrical Code®, the current edition of the National Electrical Safety Code®, the current edition of the BICSI Telecommunications Distribution Methods Manual, the current edition of the BICSI Cabling Installation Manual, the latest issue of the ANSI/TIA/EIA Standards as published by Global Engineering Documents as TIA/EIA Commercial Building Telecommunications Standard, and all local codes and ordinances.

#### 2.2 QUALITY ASSURANCE

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

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

### C. Federal Communications Commission

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

### D. Codes, Standards, and Ordinances

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

## 2.3 Safety

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

## 2.4 Inspection, Acceptance, and Title

- A. Inspection and Acceptance will be upon successful installation unless otherwise provided. Title to/or risk of loss or damage to all items shall be the responsibility of the Contractor until acceptance by the Owner, unless loss or damage results from negligence by the Owner. If the materials or services supplied to the Owner are found to be defective or do not conform to the specifications, the Owner reserves the right to cancel the Contract upon written notice to and return products at the Contractor's expense, based upon the terms of the Contract.
- 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.

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2.5 Status Reports, Meetings and Construction Coordination

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

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SECTION 00 30 10 - SCHEDULE OF EVENTS

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

<b>EVENT</b>	<b>DATE</b>
Bid Release	February 1, 2019
Final Date and time for Questions – 5:00 PM	February 11, 2019
Final Addendum	February 13, 2019
Bid Due Date/time and Public Opening – 10:00 AM	February 28, 2019
Contract Award	March 19, 2019
Project Start Date	March 26, 2019
Project Completion	Phased based on construction

End of Section

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SECTION 00 40 10 - BID PROPOSAL FORM

**OWNER:** Troy School District  
Administration Building  
4400 Livernois  
Troy, Michigan 48098  
Attn: Todd Hensley, Purchasing Supervisor

**PROJECT:** Communications Cabling – Bid # 9877

**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.

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**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:

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**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:**

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

**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 – EARLY CHILDHOOD CENTER

SUPPLEMENTAL A - COST ANALYSIS WORKSHEET

**OWNER:** Todd Hensley, Purchasing Supervisor  
 Troy School District  
 Purchasing Department  
 Facility Operations Building  
 1140 Rankin  
 Troy, Michigan 48083

**BIDDER:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_  
 \_\_\_\_\_

**BASE BID BREAKDOWN**

<b>Building</b>	<b>COMPONENT</b>	<b>Cost</b>
Early Childhood Center	Material	
	Labor	
	Sub Total	
	Performance and Payment Bond	
	<b>Proposal Total</b>	

TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

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 for additions and deletions during the contract period. 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.

Section 27 10 00 – COMMUNICATIONS CABLING

UP1	Cost to provide and install (1) Category 6 data drop including cable, jacks, terminations, testing and labeling	\$
UP2	Cost to provide and install (2) Category 6 data drops including cable, jacks, terminations, testing and labeling	\$
UP3	Cost to provide and install (1) 48 port Category 6 patch panel	\$
UP4	Cost to provide on HDMI from floorbox to projector location including cable, connectors, terminations, testing and labeling	\$

TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

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 (\$ \_\_\_\_\_)

Mandatory Alternate 5:

Add/Deduct \_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

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 – EARLY CHILDHOOD CENTER

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 "School District") Request For Proposals, 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 \_\_\_\_\_, 2019, by

\_\_\_\_\_.

\_\_\_\_\_  
, Notary Public

\_\_\_\_\_ County, Michigan

My Commission Expires: \_\_\_\_\_

Acting in the County of: \_\_\_\_\_

TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

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 “School District”) Request For Proposals for Data Network and Wireless Upgrades (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 \_\_\_\_\_, 2019, by

\_\_\_\_\_.

\_\_\_\_\_, Notary Public \_\_\_\_\_ County, \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

Acting in the County of: \_\_\_\_\_



TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

SECTION 27 10 00 - COMMUNICATIONS CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Related Sections:
  - 1. None

1.2 SUMMARY

- A. Section Includes:
  - 1. 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
  - 2. Category 6 UTP horizontal cabling for data outlets and wireless access as indicated herein and on project drawings and documents

1.3 REFERENCES

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

TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

- b. ICEA S-90-661 (2012) Category 3, 5, & 5e Individually Unshielded Twisted Pair Indoor Cables for Use in General Purpose and LAN Communications Wiring Systems Technical Requirements
- 5. NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA)
  - a. NECA/BICSI 568 (2006) Standard for Installing Building Telecommunications Cabling
- 6. NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
  - a. ANSI/NEMA WC 66 (2013) Performance Standard for Category 6 100 Ohm Shielded and Unshielded Twisted Pairs
- 7. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
  - a. NFPA 70 (2014; AMD 1 2013; Errata 1 2013; AMD 2 2013; Errata 2 2013; AMD 3 2014; Errata 3-4 2014; AMD 4-6 2014) National Electrical Code
- 8. TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) - LATEST EDITION
  - a. TIA-1152 (2009) Requirements for Field Test Instruments and Measurements for Balanced Twisted-Pair Cabling
  - b. TIA-455-21 (1988a; R 2012) FOTP-21 - Mating Durability of Fiber Optic Interconnecting Devices
  - c. TIA-526-14 (2015c) OFSTP-14A Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant
  - d. TIA-568-D-0 (2015d) Generic Telecommunications Cabling for Customer Premises
  - e. TIA-568-D-1 (2015d) Commercial Building Telecommunications Cabling Standard
  - f. TIA-568-C.2 (2009; Errata 2010) Balanced Twisted-Pair Telecommunications Cabling and Components Standards
  - g. TIA-568-C.3 (2008; Add 1 2011) Optical Fiber Cabling Components Standard
  - h. TIA-569 (2015d) Commercial Building Standard for Telecommunications Pathways and Spaces
  - i. TIA-606 (2012b) Administration Standard for the Telecommunications Infrastructure
  - j. TIA-607 (2011b) Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
  - k. TIA/EIA-598 (2014d) Optical Fiber Cable Color Coding

## TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

- I. TIA/EIA-604-10 (2002a) FOCIS 10 Fiber Optic Connector Intermateability Standard - Type LC
- 9. U.S. FEDERAL COMMUNICATIONS COMMISSION (FCC)
  - a. FCC Part 68 Connection of Terminal Equipment to the Telephone Network (47 CFR 68)
- 10. UNDERWRITERS LABORATORIES (UL)
  - a. UL 1286 (2008; Reprint Feb 2015) Office Furnishings
  - b. UL 1666 (2007; Reprint Jun 2012) Test for Flame Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts
  - c. UL 1863 (2004; Reprint Nov 2012) Communication Circuit Accessories
  - d. UL 444 (2008; Reprint Apr 2015) Communications Cables
  - e. UL 467 (2007) Grounding and Bonding Equipment
  - f. UL 514C (2014; Reprint Dec 2014) Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
  - g. UL 723 (2008; Reprint Aug 2013) Test for Surface Burning Characteristics of Building Materials
  - h. UL 969 (1995; Reprint Sep 2014) Standard for Marking and Labeling Systems

### 1.4 DEFINITIONS

- A. Unless otherwise specified or indicated herein, electrical and electronics terms used in this specification shall be as defined in TIA-568, TIA-569, TIA-606 and IEEE 100 and herein.
- B. BICSI: Building Industry Consulting Service International.
- C. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
- D. EMI: Electromagnetic interference.
- E. IDC: Insulation displacement connector.
- F. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
- G. RCDD: Registered Communications Distribution Designer.
- H. TDMM (BICSI): Telecommunications Design Methods Manual

## TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

- I. UTP: Unshielded twisted pair.
- J. LAN: Local area network.
- K. 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.

### 1.5 TELECOMMUNICATION SPACES DESCRIPTION

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

### 1.6 BACKBONE CABLING DESCRIPTION

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

### 1.7 HORIZONTAL CABLING DESCRIPTION

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

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### 1.8 SUBMITTALS

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

### 1.9 QUALITY ASSURANCE

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

## TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

documentation of the experience of the telecommunications contractor and of the key personnel.

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

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

### 1.10 CABLE DELIVERY, STORAGE, AND HANDLING

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

### 1.11 PROJECT CONDITIONS

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

### 1.12 COORDINATION

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

## TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

- B. Coordinate location of power raceways and receptacles with locations of telecommunications equipment requiring electrical power to operate.
- C. Coordinate layout and installation of telecommunications pathways and cabling with General Contractor and all associated trades.

### PART 2 - PRODUCTS

#### 2.1 PRODUCT CERTIFICATION

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

#### 2.2 CABINETS

- A. Cabinets for the MDF will be provided by the owner. These units may be inspected by the awarded contractor for suitability of purpose.
- B. Cabinets for the 2 IDF closets shall be Tripp Lite 12U Wall Mount Rack Enclosure Server Cabinet, Hinged, 20.5" Deep, Switch-Depth (SRW12US) or equivalent.

#### 2.3 PATHWAYS

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



2.4 COMMUNICATIONS ROOM FITTINGS AND EQUIPMENT

- A. Provide connecting hardware and termination equipment in telecommunication equipment room to facilitate installation as shown on design drawings for terminating and cross-connecting permanent cabling. Provide telecommunications interconnecting hardware labeling and color coding in accordance with TIA-606.
- B. Manufacturers: Subject to compliance with requirements.
  - 1. Vertical and Horizontal Cable Management:
    - a. Metal, with integral wire retaining fingers.
    - b. Baked-polyester powder coat finish.
    - c. Vertical cable management panels shall have front and rear channels, with covers.
- C. Cable Guides and Fasteners
  - 1. Provide cable guides specifically manufactured for the purpose of routing cables, wires and patch cords horizontally and vertically on equipment racks and telecommunications backboards (to accommodate cross-connect wiring, etc.).
  - 2. Cable guides of ring or bracket type devices mounted on rack and backboard for horizontal cable management and individually mounted for vertical cable management. Mount cable guides with screws, nuts and lock washers.
  - 3. Hook and Loop (I.e. Velcro®) shall be used to fasten cables. Tie-wraps or similar type fasteners shall not be used.
- D. Patch Panels
  - 1. UTP Patch Panels – Provide in accordance with TIA-568 with ports for the number of cables terminated on the panel plus 25 percent spare.
    - a. Panels shall be third party verified and shall comply with TIA Category 6 requirements.
    - b. Panel shall be constructed of 0.09 inches minimum aluminum and shall be rack mounted and compatible with an ECIA EIA/ECA 310-E 19 inch equipment rack.
    - c. Panel shall provide non-keyed, 8-pin modular ports, wired to T568B. Patch panels shall terminate the building cabling on Type 110 IDCs and shall utilize a printed circuit board interface. The rear of each panel shall have incoming cable strain-relief and routing guides. Panels shall have each port factory numbered and be equipped with laminated plastic nameplates above each port.
  - 2. Fiber Optic Patch Panels – Provide panel for termination and cross-connecting of optical fiber cables.

## TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

- a. Panel shall be constructed of 16 gauge steel or 11 gauge aluminum minimum and shall be rack mounted and compatible with an ECIA EIA/ECA 310-E 19 inch equipment rack.
  - b. Each panel shall provide multimode adapters as alignment sleeves. Provide dust cover for unused adapters.
  - c. The rear of each panel shall have a cable management tray a minimum of 8 inches deep with removable cover, incoming cable strain-relief and routing guides.
  - d. Panels shall have each adapter factory numbered and be equipped with laminated plastic nameplates above each adapter.
  - e. As practical use existing fiber optic patch panels in the existing MDF, providing couplers, panels and other hardware as required.
3. Optical Fiber Adapters (Couplers)
    - a. Provide optical fiber adapters suitable for duplex LC in accordance with TIA-604-10 with zirconia ceramic alignment sleeves, as indicated. Provide dust cover for adapters.
    - b. Optical fiber adapters shall comply with TIA-455-21 for 500 mating cycles.
  4. Optical Fiber Connectors
    - a. Provide in accordance with TIA-455-21.
    - b. Optical fiber connectors shall be duplex LC in accordance with TIA-604-10 with zirconia ceramic alignment sleeves, ferrule, epoxy-less crimp style.
    - c. The connectors shall provide a maximum attenuation of 0.3 dB at 850 nm with less than a 0.2 dB change after 500 mating cycles.

### 2.5 TELECOMMUNICATIONS OUTLET/CONNECTOR ASSEMBLIES

#### A. Workstation Outlets

1. UTP Outlet/Connector
  - a. Outlet/connectors shall comply with FCC Part 68, and TIA-568. UTP outlet/connectors shall be UL 1863 listed, non-keyed, 8-pin modular, constructed of high impact rated thermoplastic housing and shall be third party verified and shall comply with TIA-568 Category 6 requirements.
  - b. Outlet/connectors provided for UTP cabling shall meet or exceed the requirements for the cable provided.

## TROY SCHOOL DISTRICT – EARLY CHILDHOOD CENTER

- c. Outlet/connectors shall be terminated using a Type 110 IDC PC board connector, color-coded for both T568A and T568B wiring. Each outlet/connector shall be wired T568B.
  - d. UTP outlet/connectors shall comply with TIA-568 for 200 mating cycles.
  - e. UTP outlet/connectors installed in outdoor or marine environments shall be jell-filled type containing an anti-corrosive, memory retaining compound.
2. Cover Plates
- a. Telecommunications cover plates shall comply with UL 514C, and TIA-568, TIA-568; flush design constructed of stainless steel to match electrical receptacle/switch cover plates.
  - b. Provide labeling in accordance with the paragraph LABELING in this section.
  - c. Cover plates for Projector locations shall have keystones for CAT6 copper, HDMI and an open keystone for pulling speaker cable through as part of a later project.

### B. Patch Cords

- 1. Provide Category 6 patch cords in accordance with TIA-568
  - a. Telecommunication Rooms - Provide one (1) factory terminated Category 6 UTP patch cord per 8P/8C (RJ45) terminated cable in the following lengths and quantities:
    - 1) 25% - 1M, 50% - 2M and 25% 3M
  - b. Patch cords shall be the same color as the associated horizontal cabling. See Section 2.6, A.5.
- 2. Provide two (2) factory terminated Duplex LC Optical Fiber patch cord per terminated optical fiber in the following lengths and quantities: 50% - 1M and 50% 2M.

## 2.6 TELECOMMUNICATIONS CABLING

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

## 2.7 CATEGORY 6 UTP HORIZONTAL CABLE

- A. Description: 100-ohm, 4-pair UTP, covered with a thermoplastic jacket.
  - 1. Comply with ICEA S-90-661 for mechanical properties.

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2. Comply with TIA-568 for performance specifications.
3. Comply with TIA-568, Category 6.
4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
  - a. Communications, Plenum Rated: Type CMP, complying with NFPA 262.
5. Customer has requested coloring of cables as indicated below.
  - a. Blue – General data infrastructure
  - b. Purple – Access Points
  - c. Green – Security cameras/devices

### 2.8 OPTICAL FIBER CABLE

1. Description: Multi-mode (OM4), dielectric armor, tight-buffered, optical fiber cable.
2. Manufacturer: Corning model MIC® Tight-Buffered Cable, Plenum, 6 F, single-mode (OS2) or approved equal
3. Comply with ICEA S-83-596 for mechanical properties.
4. Comply with TIA-568 for performance specifications.
5. Comply with TIA/EIA-492AAAC-B for detailed specifications.
6. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 1651, and NFPA 70 for the following types:
  - a. Plenum Rated, Nonconductive: Type OFNP, complying with NFPA 262.
7. Maximum Attenuation: 2.8 dB/km at 850nm; 1.0 dB/km at 1300nm.
8. Jacket:
  - a. Jacket Color: Aqua
  - b. Cable cordage jacket, fiber, unit, and group color shall be according to TIA-598.
  - c. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches (1000 mm).

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### 2.9 COPPER CABLING HARWARE

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

### 2.10 TELECOMMUNICATIONS OUTLET/CONNECTORS

- A. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position eight-contact (8p/8c) modular. Comply with TIA-568.
- B. Workstation Outlets: One, Two and Four port-connector assemblies mounted in single or double-gang faceplate.
  - 1. Stainless Steel Faceplate: Coordinate with electrical faceplates.
  - 2. For use with snap-in jacks accommodating any combination of UTP, optical fiber, and coaxial work area cords.
    - a. Flush mounting jacks, positioning the cord at a 90-degree angle.
  - 3. Legend: Machine printed, in the field, using adhesive-tape label.

### 2.11 OPTICAL FIBER CABLE HARDWARE

- A. Cross-Connects and Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors.
- B. Patch Cords: Factory-made, dual-fiber cables.
- C. Cable Connecting Hardware:
  - 1. Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12. Comply with TIA-568.
- D. Quick-connect, simplex and duplex Type LC connectors. Insertion loss not more than 0.75 dB

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### 2.12 GROUNDING

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

### 2.13 LABELING

- A. Comply with TIA-606 and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- B. Identify system components, wiring, and cabling complying with TIA-606 and requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
  - 1. Grounding and bonding systems
    - a. Label connections with tags with the following minimum information "If this Connector or Cable is Loose or Must be Removed, Please Call the Building Telecommunications Manager" per TIA-607 and per TIA-569 requirements.
  - 2. Cable and terminations
  - 3. Pathway, including tray, through wall penetrations, fire stop and associated components
  - 4. Racks, cabinets, enclosures, blocks, patch panels etc.
- C. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA – 606.
- D. Cables use flexible vinyl or polyester that flexes as cables are bent.

## PART 3 - EXECUTION

### 3.1 WIRING METHODS

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

3.2 INSTALLATION OF PATHWAYS

- A. Cable Trays: Hallway cable trays are provided by others. Trays or ladder racks in the telecommunication closets will be provided per the project drawings.
- B. Comply with requirements for demarcation point, pathways, cabinets, and racks. Drawings indicate general arrangement of pathways and fittings.

3.3 INSTALLATION OF CABLES

- A. Comply with NECA 1.
- B. General Requirements for Cabling:
  - 1. Comply with TIA-568.
  - 2. Comply with BICSI TDMM, "Cable Termination Practices."
  - 3. Install 110-style IDC termination hardware unless otherwise indicated.
  - 4. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
  - 5. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
  - 6. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
  - 7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI TDMM, "Cabling Termination Practices". Install lacing bars and distribution spools.
  - 8. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
  - 9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
  - 10. In the telecommunications equipment room, install a 10-foot-long service loop on the end of each optical fiber cable.
  - 11. Install a 12-inch-long service loop on each horizontal cable at the workstation end.
  - 12. All Access Points and Camera locations shall be terminated in the ceiling on a 1-port, plenum rated, surface mount box. The cable shall have a 10-foot long service loop coiled and left attached to the ceiling structure.

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13. Pulling Cable: Comply with BICSI TDMM, "Pulling Cable." Monitor cable pull tensions.
- C. UTP Cable Installation:
1. Comply with TIA-568 and manufacturer's instructions.
  2. Do not remove more than the minimum of cable jacket required for termination. To maintain cable geometry do not untwist UTP cables more than 1/2 inch from the point of termination.
- D. Optical Fiber Cable Installation:
1. Comply with TIA-568 and manufacturer's instructions.
  2. Cable shall be terminated on connecting hardware that is rack mounted.
- E. Open-Cable Installation:
1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
  2. Suspend UTP cable not in a wire way or pathway a minimum of 8 inches above ceilings by approved cable supports not more than 60 inches apart.
    - a. Approved supports include Category 6 rated J – hooks, saddles etc.
    - b. All cable shall be independently suspended from building structure using rated support components. The use of tie wraps and bridle rings is prohibited
  3. Cable shall not be supported directly by structural members or in contact with pipes, ducts, or other potentially damaging items.
- F. Group connecting hardware for cables into separate logical fields.
- G. Separation from EMI Sources:
1. Comply with BICSI TDMM and TIA-569 for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
  2. Separation between open telecommunications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
    - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
    - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
    - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.



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3. Separation between telecommunications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
  - a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
  - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
  - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.
4. Separation between telecommunications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
  - a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
  - b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
  - c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.
5. Separation between Telecommunications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
6. Separation between Telecommunications Cables and Fluorescent Fixtures: A minimum of 5 inches.

### 3.4 FIRESTOPPING

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

### 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.
  1. 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.

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- B. Paint and label colors for equipment identification shall comply with TIA-606 for Class 2 level of administration or as modified by owner.
- C. Label each cable within 4 inches (100 mm) of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
- D. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
  - 1. Individually number wiring conductors connected to terminal strips, and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
  - 2. Label each unit and field within distribution racks and frames.
- E. Label all components of the grounding system per TIA – 606 and TIA-607.
- F. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors.
- G. Cable and Wire Identification:
  - 1. Label each cable within 4 inches (100 mm) of each termination, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
  - 2. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware.
- H. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.
- I. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA-606.
  - 1. Cables use flexible vinyl or polyester that flex as cables are bent.
- J. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets, pathways and cables, termination hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow convention of TIA-606. Furnish electronic record of all drawings, in software and format selected by Owner.

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections

1. Visually inspect UTP and optical fiber jacket materials for NRTL certification markings. Inspect cabling terminations in telecommunications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA-568.
2. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cords, and labeling of all components.
3. Test instruments shall meet or exceed applicable requirements in TIA-568 for Category 6 Permanent Link. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cords and adapters that are qualified by test equipment manufacturer for permanent link test configuration.
4. All horizontal UTP shall be tested using the Permanent Link Method.
5. Optical Fiber Cable Tests:
  - a. 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.
  - b. Link End-to-End Attenuation Tests:
    - 1) Optical link measurements: Test at 850 and 1300 nm bi-directionally according to TIA-526-7-A, Method B, One Reference Jumper.
    - 2) Attenuation test results for backbone links shall be less than calculated according to equation in TIA-568 "Passive Cable System Attenuation Loss".

B. Data for each measurement shall be electronically documented. Data for submittals shall be printed in a summary report that is formatted similar to the example in the BICSI TDMM, or transferred from the instrument to the computer, saved as text files, and printed and submitted.

C. Data shall be submitted to client in soft copy in PDF format.

D. Remove and replace cabling where test results indicate that they do not comply with specified requirements.

E. End-to-end cabling will be considered defective if it does not pass tests and inspections.

F. Prepare and submit test and inspection reports for approval within 10 business days of substantial completion.