



**POUDRE SCHOOL DISTRICT R-1  
INVITATION FOR BID**

**ETHERNET CABLING SERVICES**

**IFB 22-680-012**

**BID SCHEDULE**

**IFB Posted to BidNet**

**April 4, 2022**

**Contractor Questions Due**

**April 11, 2022 - 2:00 p.m.**

**IFB Closing Date**

**April 20, 2022 - 2:00 p.m.**

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## ETHERNET CABLING SERVICES IFB 22-680-012

Poudre School District (“the District”) is requesting bids from professional contractors to provide and install CommScope certified Category 5e or Category 6a Ethernet cabling punched down at District designated patch panel locations as specified in this Invitation for Bid (“IFB”).

The District will provide copies of this IFB to contractors through the Rocky Mountain E-Purchasing System (“BidNet”) electronic solicitation platform, <http://www.RockyMountainBidSystem.com>, where registered contractors are required to submit their electronic proposal responses.

Questions regarding this IFB must be in writing and directed to the District through the BidNet platform any time after the issuance of this IFB through and including 2:00 p.m. MST on April 11, 2022. Questions received after the deadline date/time and/or not submitted electronically through the BidNet platform may not be addressed. Each question submitted, as well as the District’s response thereto, shall be provided in an addendum through BidNet.

*Note: Every question must be submitted individually. Multiple questions per entry will not be answered.*

The District will accept and consider only electronically submitted bids. Bids must be submitted and received in BidNet’s electronic solicitation portal by 2:00 p.m. MST on April 20, 2022. At that time, the submission portal will close, and no further submissions will be allowed, nor considered.

During the solicitation process and until an award has been announced, communication regarding this IFB will only be permitted with the Procurement Agent named below. Communication with a district employee other than the Procurement Agent named below may disqualify your bid from consideration.

District staff shall review the bids received in response to this IFB during the bid consideration period commencing on April 20, 2022. During the bid consideration period, the District may ask questions of and/or request additional information from contractors who have submitted bids.

**Sales Prohibited/Conflict of Interest:** No officer, employee, or member of the School Board, shall have a financial interest in the sale to the school district of any real or personal property, equipment, material, supplies or services where such officer or employee exercises directly or indirectly any decision-making authority concerning such sale or any supervisory authority over the services to be rendered. This rule also applies to subcontracts with the District. Soliciting or accepting any gift, gratuity favor, entertainment, kickback, or any items of monetary value from any person who has or is seeking to do business with the District is prohibited.

**Collusive or sham bids:** Any bid deemed to be collusive, or a sham bid will be rejected and reported to authorities as such. Your authorized signature on the bid assures that such bid is genuine and is not a collusive or sham bid.

The District reserves the right to reject any and all bids and to waive any irregularities or informalities.

Sincerely,  
Karen Wailly, Senior Procurement Agent

## 1.0 **BACKGROUND**

The District is a high-performing district, covering more than 1,800 square miles in northern Colorado with diverse school settings. The District's instructional program is centered around District Ends, under the Policy Governance model, developed to support a comprehensive curriculum.

While more than 70% of District families choose to send their children to their neighborhood schools, the District does support school choice and offers a wide spectrum of educational programs to fit any child's needs. Program options include International Baccalaureate, Core Knowledge, Bilingual/Dual Language Immersion, Hybrid/Online, Expeditionary Learning, Science, Technology, Engineering and Math (STEM) along with extra-curriculars and athletics. The District has two LEED certified school buildings and over 30 Energy Star awards and supports operational sustainability in all areas of work.

Our Schools:

- 32 elementary schools
- 10 middle schools
- 4 comprehensive high schools
- 2 combination middle/high schools opening Fall 2022
- 6 option (100% choice) schools
- 3 alternative high schools
- 5 charter schools
- 1 online school

The District is fully accredited by the Colorado Department of Education Accreditation and Accountability Unit and is subject to periodic monitoring to ensure continued compliance with accreditation standards.

## **2.0 GENERAL TERMS AND CONDITIONS**

- 2.1 This is a solicitation for an offer from a prospective contractor (“Contractor”) and is not an offer from the District to enter into an agreement for goods or services.
- 2.2 These General Terms and Conditions apply to all offers made to the District by Contractors on behalf of District solicitations including, but not limited to, Invitation for Bids, Request for Quotes (“RFQ”), and Request for Proposals (“RFP”).
- 2.3 Submission of a bid is deemed as acceptance of all terms, conditions and specifications contained in the solicitation package provided to the Contractor. Any proposed modification must be accepted in writing by the District prior to award of the agreement.
- 2.4 Contractor must provide all requested information. Failure to do so may result in rejection of the bid at the option of the District.
- 2.5 Bids must meet or exceed specifications contained in the solicitation document.
- 2.6 Contractors are required to submit the name, address, phone number, email address and contact person for three (3) organizations that have purchased comparable products and services in the past 24 months.
- 2.7 There is no expressed or implied obligation for the District to reimburse Contractors for any expenses incurred in preparing bids in response to this solicitation.
- 2.8 All chemicals, equipment and materials proposed and/or used by Contractor in satisfaction of the terms of this solicitation shall conform to the standards required by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA). Safety Data Sheets (SDS) shall accompany each shipment, when applicable.
- 2.9 The District is exempt from City, County, State and Federal Sales/Excise Taxes. Tax Exempt Certificates will be issued upon request. The District’s Tax-Exempt Number is: 98-03335.
- 2.10 Contractor and its employees, representatives, and subcontractors agrees to abide by all applicable Federal, State and Local codes, laws, rules, and regulations.
- 2.11 The awarded Contractor shall furnish all supplies, which conform to all applicable safety codes and regulations.
- 2.12 Contractor agrees to provide the items covered in this solicitation in strict accordance with the District’s specifications and at the price noted for each item.
- 2.13 Unless otherwise agreed in writing by the District, delivery of products shall be FOB destination with all transportation and handling charges paid by the awarded Contractor.

- 2.14 The District's acceptance of any offer is made in reliance on Contractor's promised delivery date and/or installation of service performance time, as material and basic to the acceptance. If Contractor fails to deliver as and when promised, the District may, without liability and in addition to its other rights and remedies at law or in equity, cancel the order by notice effective when received by Contractor as to goods not yet delivered and services not yet rendered, and purchase substitute goods or service elsewhere and charge Contractor with any loss incurred.
- 2.15 For services requiring Contractor's presence on District property and the project site, the Contractor must provide proof of insurance that meets the insurance requirements stated in Section 9.0 of the IFB. Contractor must maintain the required insurance for the duration of the project.
- 2.16 The Contractor, by affixing his signature to this bid, certifies that his bid is made without previous understanding, agreement, or connection either with any persons, firms or corporations offering a bid for the same items or with the District. The Contractor also certifies that his bid is in all respects fair, without outside control, collusion, fraud, or otherwise illegal action.
- 2.17 The successful Contractor is not permitted to transfer any interest in the project whether by assignment or otherwise, without prior written consent of the District's Strategic Sourcing Department.
- 2.18 Contractor must note in the solicitation response any intent to use subcontractors.
- 2.18.1 The subcontractor's name, address, phone number and three client references, along with the type of work to be performed must be included.
- 2.18.2 Use of subcontractors may be considered as a factor in the District's evaluation process.
- 2.18.3 If the Contractor fails to notify the District of its intent to use subcontractors in the bid submittal, the bid may be considered a void offer.
- 2.18.4 Subcontractors will be allowed only by written consent of the District.
- 2.18.5 The Contractor agrees that it is fully responsible to the District for the acts or omissions of its subcontractors, or any persons employed by them, in the same way as it is for the acts and omissions of persons directly employed by the Contractor. Nothing contained in the contract, or any subcontract shall create any contractual relation between any subcontractor and the District.
- 2.19 A submission of a bid in response to this solicitation is an offer to contract with the District based upon the terms, conditions, scope of work and specifications contained in the IFB.

- 2.19.1 The successful Contractor will be required to enter into a negotiated District agreement prior to the start of project work.
- 2.19.2 The agreement language will control over any language contained within this IFB that conflicts with the signed and fully executed agreement.
- 2.20 Once the evaluation of responses received is complete and the intent to award is issued to the recommended Contractor, the recommended Contractor will have five (5) business days to successfully negotiate a contract with the District.
- 2.21 The agreement between the District and the awarded Contractor is planned to commence upon full execution of the agreement and issuance of a District purchase order and shall continue through and including June 30, 2023, unless terminated earlier by the District as in section 2.22 below.
- 2.22 Notwithstanding the planned term of an agreement and/or any extensions thereof as provided in sections 2.21 above, the District may terminate the agreement at any time in its sole discretion for any reason, with or without cause, upon written notice served on the Contractor no less than thirty (30) days prior to the date of termination. In the event of such early termination by the District, the Contractor shall be paid up to the date of termination for services performed under and in accordance with this agreement.
- 2.23 Notwithstanding any other term or provision of this IFB, the District's obligations hereunder are expressly subject to its budgeting and appropriation of sufficient funds for each fiscal year (July 1 - June 30) an agreement is in effect. In no event, shall the District's obligations in an agreement constitute a multiple-fiscal year direct or indirect debt or other financial obligation under Article X, Section 20(4)(b) of the Colorado Constitution.
- 2.24 In the event the District has reasonable grounds to believe that any individual assigned to perform work under this agreement has a criminal record, is a registered sex offender, is under the influence of alcohol or other substance, has exhibited violence or based upon other information the District deems reliable; the District may exclude such individual from any school building or grounds or impose reasonable conditions upon such individual's presence upon any school premises. In the judgment of the District, if the agreement cannot be performed as a result of such action, the agreement may be terminated.
- 2.25 The Contractor shall provide the services as an independent service contractor of the District. As such, the Contractor shall have the right to determine how and by whom the services will be provided, subject to and consistent with the terms and conditions of this solicitation.
- 2.25.1 The Contractor shall be exclusively responsible for: (a) all compensation, employment tax withholdings and payments, and all fringe benefits for its employees in full compliance with all applicable federal, state and local laws;

(b) all insurance coverage's and benefits for its employees in full compliance with all applicable federal, state and local laws, including but not limited to pension or retirement benefits, works' compensation, unemployment compensation, and Social Security benefits; and (c) all payments to its Contractors and subcontractors for goods and/or services directly or indirectly related to the solicitation.

2.25.2 Nothing in this solicitation or as a result of this solicitation shall be construed as creating a single enterprise, partnership, joint venture or employer-employee relationship between a future Contractor and the District. The future Contractor will not be considered a partner, agent or representative of the District and will not represent itself to be a partner, agent, or representative of the District. The District is not a partner, agent or representative of any future Contractor and shall not represent itself to be a partner, agent, or representative of the Contractor.

2.26 Contractor certifies, represents, warrants, and agrees that it will not knowingly employ or contract with a worker without authorization to provide services under this Agreement, and will not enter into a contract with a subcontractor that fails to certify to Contractor that the subcontractor will not knowingly employ or contract with a worker without authorization to provide services under this Agreement. Contractor also certifies, represents, warrants and agrees that it will confirm the employment eligibility of all its employees who are newly hired for employment to provide services under this Agreement through Contractor's participation in either: (a) the E-Verify Program created under federal law and jointly administered by the Department of Homeland Security and the Social Security Administration; or (b) the Colorado Department of Labor and Employment Program ("Department Program") established pursuant to C.R.S. § 8-17.5-102(5)(c).

2.26.1 Contractor shall not use either the E-Verify Program or the Department Program procedures to undertake pre-employment screening of job applicants while this Agreement is being performed. If Contractor obtains actual knowledge that a subcontractor providing services under this Agreement knowingly employs or contracts with a worker without authorization, Contractor shall notify the subcontractor and the District within three (3) days that Contractor has such actual knowledge and terminate the subcontract within three (3) days of providing the notice if the subcontractor has not stopped employing or contracting with the worker without authorization. Contractor shall comply with any reasonable request made by the Department of Labor and Employment in the course of an investigation undertaken pursuant to the authority of C.R.S. § 8-17.5-102(5). If Contractor participates in the Department Program, it shall: (a) notify the District and the Department of Labor and Employment of such participation as required by law; and (b) within twenty (20) days after hiring an employee to provide services under this Agreement, provide to the District a written notarized copy of an affirmation that it has examined the legal work status of such employee, retained file copies of the documents required by 8 U.S.C. § 1324a, and not altered or falsified the identification documents for such employee.



- 2.27 Contractor agrees to not refuse to hire, discharge, promote, demote, or to otherwise discriminate in matters of compensation against any person otherwise qualified solely because of race, creed, sex, national origin, ancestry, or physical handicap.
- 2.28 Governing Law. An agreement resulting from this solicitation shall be governed by and construed in accordance with the laws of the State of Colorado. Venue for any and all legal action regarding or arising out of transactions covered herein shall be solely in the District Court in and for Larimer County, State of Colorado.
- 2.29 Equal Opportunity. It is agreed that no otherwise qualified Contractor shall be excluded from participating in, be denied the benefits of, or be subject to discrimination, including harassment, under any provision of this Agreement on the basis of race; creed; color; national origin; age; sex; pregnancy; physical recovery from childbirth or a related condition; sexual orientation; marital status; veteran status; religion; genetic information; gender expression; gender identity; ancestry; or disability.
- 2.30 Bids shall contain a signature of an authorized representative in the space provided on the Bid Certification Form. Failure to properly sign bid may result in bid being considered non-responsive.
- 2.31 Where there appears to be variances or conflicts between the General Terms and Conditions and the Specific Conditions outlined in this solicitation, the Special Conditions shall prevail.
- 2.32 The District shall issue written addenda if substantial changes which impact the technical submission of bids are required. Copies of such addenda will be distributed via the BidNet system. In the event of conflict with the original agreement documents, addenda shall govern all other agreement documents to the extent specified. Subsequent addenda shall govern over prior addenda only to the extent specified.
- 2.33 All information and supplemental documentation required in conjunction with this IFB shall be furnished by the Contractor with its bid. If the Contractor fails to supply any required information or documents, its bid may be considered non-responsive and ineligible for award.
- 2.34 The accuracy of the bid is the sole responsibility of the Contractor. No changes in the bid shall be allowed after the submission deadline, except when the Contractor can show clear and convincing evidence that an unintentional factual mistake was made, including the nature of the mistake and the price actually intended.
- 2.35 The apparent silence or omissions within this solicitation regarding a detailed description of the materials and services to be provided shall be interpreted to mean that only the best commercial practices are to prevail and that only materials and workmanship of first quality are to be used.

- 2.36 Contractors may offer a cash discount for prompt payment; however, such discounts shall not be considered in determining the lowest net cost for bid evaluation purposes.
- 2.37 Payment for the goods and/or services furnished by the Contractor shall not constitute acceptance thereof. The District shall have the right to inspect such goods and the products of such services, and to reject any or all of which are in the District's judgment defective or nonconforming. In addition to the District's other rights, goods rejected, and goods supplied in excess of quantities specified in a purchase order, may be returned to the Contractor at the Contractor's expense.
- 2.37.1 In the event the District receives goods whose defects or nonconformity is not apparent upon examination, the District may require replacement and/or payment of damages upon discovery of the defects or nonconformity. Nothing contained herein shall relieve, in any way, Contractor from the obligation of testing, inspection, and quality control.
- 2.38 The District may, at its sole and absolute discretion:
- 2.38.1 Reject any and all or parts of any or all bids submitted by prospective Contractors.
- 2.38.2 Re-advertise this solicitation.
- 2.38.3 Postpone or cancel the bid process for this solicitation.
- 2.38.4 Waive any irregularities or technicalities that are not qualified as a requirement for responsiveness in this IFB or in bids received in conjunction with this IFB; and/or
- 2.38.5 Determine the criteria and process whereby bids are evaluated and awarded.
- 2.39 Information and materials submitted in response to this IFB may be considered public records subject to disclosure under the Colorado Open Records Act ("CORA"), C.R.S. §§ 24-72-200.1 to -205.5. Information and materials that Contractor believes are confidential and not subject to disclosure under CORA must be submitted separately with a citation to the section of CORA and any other relevant law under which Contractor believes they are confidential. The District, not Contractor, shall determine whether information and materials so identified will be withheld as confidential, but will inform Contractor in advance of disclosure to give it an opportunity to take legal action to protect its interests vis-à-vis the party making the CORA request.
- 2.40 For the purposes of solicitation evaluation, Contractor must indicate any variances to the specifications and terms and conditions, no matter how slight. If variations are not stated in the Contractor's response, it shall be construed that the bid fully complies with the specifications and terms and conditions.

2.40.1 Notwithstanding the above, it is hereby agreed and understood that the District reserves the right to reject these variations if they individually, or as a whole, do not meet the standards established in the specifications. Variations accepted by the District will be conveyed in writing.

## 2.41 Warranties

2.41.1 Notwithstanding prior acceptance of goods and services by the District, the Contractor shall expressly warrant all delivered goods and services provided, as properly functioning at the start of operations and compliant with the terms of the contract and industry standards thereafter. The warranty period will begin at the time the goods and services have been formally accepted in writing by the District.

2.41.2 Contractor warrants that all goods and services furnished under the contract shall be merchantable and shall be safe and appropriate for the purpose for which goods and services of like kind are normally used. If Contractor knows or has reason to know the particular purpose for which the District intends to use the goods and service, Contractor warrants that such goods and services shall be fit for that particular purpose. Contractor warrants that all goods furnished under the contract shall be new unless otherwise specified by the District, and that the title conveyed regarding such goods and services shall be complete and its transfer rightful. Contractor agrees to promptly replace or correct all defects and/or deficiencies in any goods and services not conforming to the foregoing warranties, without expense to the District, provided the District elects to allow Contractor the opportunity to do so.

2.41.3 The Contractor will correct all defects and/or deficiencies associated with the contract and replace incorrect or defective goods and services within five (5) business days of written notification from the District to the Contractor. If, within five (5) business days after written notice by the District to the Contractor, the Contractor has not corrected all defects and/or deficiencies, the District may correct all defects and/or deficiencies at the Contractor's expense.

2.41.4 During the warranty period, the Contractor shall be responsible and bear all costs to correct any problems, defects and/or deficiencies reported which do not meet the specifications set forth in the contract.

2.41.5 Defects and/or deficiencies properly noted in writing to the Contractor before expiration of the warranty period will be fully covered regardless of such expiration.

2.41.6 In the case of emergency, repairs and/or replacement may be made without notice being given to the Contractor if determined by the District that delay would cause certain loss or damage. The Contractor shall pay the cost of these emergency repairs and/or replacements. Contractor shall,

upon District request, provide proof as to the kind and quality of materials and equipment. Contracted work shall, likewise, be free of defects and in conformance with industry standards. Contractor also warrants that its workers will be sufficiently skilled to produce high quality work, free of faults and defects. Work not conforming to these requirements, including unauthorized substitutions, may be considered defective. Contractor further warrants that the construction processes and methods employed to perform the work shall be suitable for the results required and expected. If the Contractor proposes to use an unproved and untried method, process or product, the District must be advised of it in the bid in writing and give approval. The District may permit experimentation but may require special guarantees by the Contractor to cover the experimental work.

2.41.7 By acceptance of a contract as a result of this IFB, in addition to the guarantees and warranties provided by law, Contractor expressly guarantees and warrants as follows:

- a. That the items to be delivered hereunder will be manufactured, sold and/or installed in compliance with the provisions of all applicable Federal, State and Local laws and regulations.
- b. That nothing contained herein shall exclude or affect the operation of any implied warranties otherwise arising in favor of the District.

### **3.0 SPECIFIC CONDITIONS**

3.1 The Contractor shall have and maintain a set of protocols and guidelines to meet evolving health and safety requirements and implement communicable diseases protocols, which shall follow guidance and orders from state and/or local public health officials and shall be no less strict than the District's protocols.

3.1.1 Contractor shall ensure all individuals providing Services under this agreement for the Contractor wear appropriate personal protective equipment as designated at all times while on District property.

3.1.2 If the District is directed or the District determines to limit or restrict access to any or all of its facilities or District Location due to a public health or safety concern, the District may, at its discretion, temporarily delay or stop Contractor's services, with or without prior notice.

3.2 Contractor must maintain required insurance (Section 9.0) during the term of the contract.

3.3 The District will designate a primary representative prior to the commencement of work through which the Contractor will coordinate the project.

3.4 The District will provide access to the premises and related facilities for normal working hours or outside normal working hours and days as requested by the District.

All work will be coordinated with the District prior to commencement. The needs of specific areas, including controlled access and security concerns, may necessitate after-hour scheduling.

#### **4.0 PERFORMANCE AND PAYMENT BOND**

- 4.1 Colorado State Statutes require a Performance Bond and a Payment Bond on public projects more than \$50,000.00. Contractor is required to post bonds, executed by a surety company authorized to do business in the State of Colorado, upon notification of Bid award. Performance and Payment bonds will each be equal to 100% of contract price and must remain in effect until completion of contract.
- 4.2 Both the Performance Bond and the Payment Bond shall be written on AIA A312 Performance Bond and AIA A312 Payment Bond Forms, as issued by The American Institute of Architects. Dates of bonds shall coincide with the date of the Contract between the District and Contractor. Substitute forms may not be used.

#### **5.0 PROJECT SCOPE AND SPECIFICATIONS**

- 5.1 Contractor understands that this is a non-binding forecast subject to factors outside of the District's control, which may result in actual demand increasing or decreasing from figures provided.
- 5.2 To support a wireless access point replacement project, qualified Contractors shall provide and install CommScope certified Category 5e or Category 6a Ethernet cabling punched down at District designated patch panel locations. Category of Ethernet cabling required is determined by the incumbent cabling standard at each building. The cabling shall be installed and properly terminated on RJ45 Network Jack by the Contractor in classroom locations determined by the District and wireless access point system design plans.
  - 5.2.1 One (1) Category 5e or Category 6a, depending on the site specification drops, are required in the ceiling of each identified classroom. Contractor shall run these from the nearest or most logical telecom closet (MDF/IDF) as approved by the District.
  - 5.2.2 Cable lengths will vary.
  - 5.2.3 Contractor will utilize existing patch panels currently installed in the buildings' Comm rooms.
- 5.3 The Project consists of ten (10) school sites. The number of wire runs is listed in Section 7.0. Site maps will be provided upon request.
- 5.4 The District Technical Specifications outlining the requirements for the cable and patch panel installations are included as Exhibit A.

- 5.4.1 Contractor shall reference the sections of Exhibit A that pertain to Category 6a and Category 5e.
- 5.5 Work may begin immediately following the execution of the agreement.
  - 5.5.1 Off hour and weekend work may be required while school or other activities are in session.
- 5.6 Connecting the newly installed wiring to the District's network infrastructure (patching) will be completed by the District.
- 5.7 Contractors must be CommScope Certified Installers.

## **6.0 EVALUATION AND AWARD**

- 6.1 The bid award shall be made to the lowest responsive, responsible Contractor meeting the specifications and deemed to be in the best interest of the District. Final evaluation may be based on, but not limited to, any or all of the following: price, adherence to specifications, previous experience with similar projects, references, and delivery time.
  - 6.1.1 Those bids that are clearly non-responsive to the stated requirements may be eliminated prior to evaluation.
  - 6.1.2 Amendments or clarifications to the submitted bids not requested by the District evaluation committee will not be accepted, nor considered following the opening of the bid.

**7.0 COST PROPOSAL**

7.1 Provide line-item pricing for each charge below based on the ten (10) school sites listed.

<b>School/Site</b>	<b>New wire runs</b>	<b>Cable Standard</b>
Bacon Elementary	17	5e
Boltz Middle School	1	5e
Centennial High School	4	5e
Fort Collins High School	3	5e
Fossil Ridge High School	2	5e
Kinard Middle School	21	6a
Preston Middle School	3	5e
Putnam Elementary	15	5e
Rice Elementary	18	5e
Timnath Elementary	10	5e

7.2 Provide line-item pricing for each additional item deemed necessary for the Project.

7.3 Provide a sub-total price for each of the ten (10) schools.

7.4 Provide a grand total price for all ten (10) schools.

7.5 Provide line-item estimated timelines for the ten (10) schools.

7.6 Provide warranty information.

**8.0 REFERENCES**

**References are required** – List three references for which your company has completed similar services within the past two (2) years.

8.1 Company Name \_\_\_\_\_  
Address \_\_\_\_\_  
Contact Person \_\_\_\_\_  
Telephone \_\_\_\_\_  
Email \_\_\_\_\_  
Describe type of work/service performed or items supplied \_\_\_\_\_  
\_\_\_\_\_

8.2 Company Name \_\_\_\_\_  
Address \_\_\_\_\_  
Contact Person \_\_\_\_\_  
Telephone \_\_\_\_\_  
Email \_\_\_\_\_  
Describe type of work/service performed or items supplied \_\_\_\_\_  
\_\_\_\_\_

8.3 Company Name \_\_\_\_\_  
Address \_\_\_\_\_  
Contact Person \_\_\_\_\_  
Telephone \_\_\_\_\_  
Email \_\_\_\_\_  
Describe type of work/service performed or items supplied \_\_\_\_\_  
\_\_\_\_\_



## 9.0 INSURANCE

Contractor shall procure and maintain the required insurance specified below for the duration of this Agreement, which insurance shall be written for not less than the amounts specified or greater if required by law. The District's receipt of a Certificate of Insurance from the Contractor with limits and or coverages that do not meet the requirements does not waive the requirements and the Contractor shall still be responsible for the limits and coverages stated in this Agreement. Specified coverages and amounts may be provided by a combination of a primary policy plus an umbrella or following form excess policy. All insurance shall be with a carrier licensed in the state of Colorado and shall have a minimum A.M. Best rating of A-VII. Contractor shall furnish the District's Director of Records and Risk Management with certificates of the required insurance *prior to the District's approval and signing of this Agreement*, and with renewal certificates prior to the expiration of any required insurance that expires during the term of this Agreement. Memorandums of Insurance will not be accepted. Certificates of Insurance and all communication regarding insurance shall be sent to:

Poudre School District  
Attention: Risk Management  
2407 Laporte Ave  
Ft. Collins, CO 80521  
Please Email Certificate to: [COI@psdschools.org](mailto:COI@psdschools.org)

Any insurance and/or self-insurance carried by the District is excess of the coverage extended to the District by Contractor. Contractor shall provide at least thirty (30) days' advance written notice to the District prior to cancellation, change of coverage, or non-renewal. The insurance requirements specified in this section shall not reduce the indemnification liability that Contractor has assumed in section 9.1.

### **Commercial General Liability**

#### Minimum Limits

- Each Occurrence Bodily Injury & Property Damage \$2,000,000
- General Aggregate \$3,000,000
- Coverage must be written on an "occurrence" basis.
- Poudre School District R-1 and its elected officials, employees, agents, and volunteers shall be named as an additional insured or covered as an additional insured by way of a blanket endorsement and shall be insured to the full limits of liability purchased by the Contractor even if those limits of liability are in excess of those required by this Agreement.

### **Commercial Automobile Liability Providing Coverage for Owned, Non-Owned, and Leased or Hired Vehicles**

- Bodily Injury & Property Damage  
Combined Single Limit Minimum \$1,000,000
- If Contractor operates vehicles in performing any services under this Agreement, the policy shall be endorsed to include the following additional insured language: "Poudre School District R-1, its elected officials, employees, agents, and volunteers shall be

named as an additional insured with respect to liability arising out of the activities performed by, or on behalf of the Contractor” and shall be insured to the full limits of liability purchased by the Contractor even if those limits of liability are in excess of those required by this Agreement. Copy of policy endorsement must be attached to the Certificate of Insurance.

**Workers’ Compensation and Employers’ Liability**

If Contractor is exempt under the Colorado Workers’ Compensation Act, this requirement will be waived if proof a current Workers’ Compensation Coverage Rejection is on file with the Colorado Department of Labor and Employment, Division of Worker’s Compensation and a copy is submitted to the District.

Minimum Limits

- State of Colorado Statutory
- Employer’s Liability \$100,000 Each Accident  
\$500,000 Disease – Policy Limit  
\$100,000 Disease – Each Employee
- Waiver of subrogation in favor of Poudre School District R-1.

**Professional Liability**

Minimum Limits

- Each Occurrence or Wrongful Act Limit \$1,000,000
- Annual Aggregate Limit \$3,000,000
- In the event that the Professional Liability insurance required by this Agreement is written on a claims-made basis Contractor warrants that any retroactive date under the policy shall precede the effective date of this Agreement and that either continuous coverage will be maintained, or an extended discovery period will be exercised for a period of three (3) years beginning at the time work under this Agreement is completed.
- Contractor must provide evidence of the extended reporting period coverage at the end of the project and before all final payments to the Contractor is made.

**Technology Errors and Omissions Liability (Professional Liability, including Network Security and Privacy Liability)**

Minimum Limits

- Per Loss \$1,000,000
- Aggregate \$3,000,000
- Liability extends for a period of three (3) years beginning at the time work under this Agreement is completed. Contractor shall maintain continuous coverage, as required by the Agreement, for this period.

The insurance shall provide coverage for:

- Liability arising from theft, dissemination and/or use of confidential information (defined term including but not limited to bank account, credit card account, personal information such as name, address, social security numbers, etc. information) stored or transmitted in electronic form.
- Network Security Liability arising from the unauthorized access to, use of or tampering with computer systems including hacker attacks, inability of an authorized third party to

gain access to Contractor's services including denial of service, unless caused by a mechanical or electrical failure.

- Liability arising from the introduction of a computer virus into, or otherwise causing damage to, a District or third person's computer, computer system, network, or similar computer related property and the data, software, and programs thereon.

**Crime Coverage** (for Agreements allowing privileged access to network systems, valuable property, or sensitive data)

Minimum Limits

Per Loss

\$1,000,000

The policy shall include:

- Coverage for all directors, officers, agents, and employees of the Contractor.
- Employee dishonesty, forgery and alteration, monies and securities, and computer (cyber) crime.
- Extended theft and mysterious disappearance.
- The policy shall not contain a condition requiring an arrest and conviction.
- Policy must be endorsed to cover Third Party Fidelity and include Poudre School District R-1 as a Loss Payee.

9.1 Indemnification

Contractor shall indemnify and hold harmless the District and the District's Board members, employees, representatives, and agents from and against any and all liability arising from any suit, action, grievance, charge or proceeding brought in connection with or related to Contractor's operations, provision of services and/or conduct of any of its employees, volunteers, agents, or representatives. The indemnification and hold harmless obligation hereunder shall include all attorney fees, costs and expenses incurred by the District and/or the District's Board members, employees, representatives and/or agents in defense of said suits, actions, grievances, charges and/or proceedings. Nothing in this section or otherwise in this Agreement shall be construed in any way or applied in any manner as a compromise or waiver of the District's rights and protections under the Colorado Constitution or the Colorado Governmental Immunity Act.

**10.0 BID CERTIFICATION**

**ETHERNET CABLING SERVICES**

Bids must be submitted and received in BidNet’s electronic solicitation portal on or before 2:00 p.m. MST on April 20, 2022.

The undersigned hereby affirms that:

- He/she is a duly authorized agent of the company issuing this bid and that all information provided in the bid is true and accurate.
- He/she has read the conditions and technical specifications, which were made available to the company in conjunction with this IFB, and fully understands and accepts these terms unless specific variations have been expressly listed in the bid.
- The company will adhere to all terms and conditions and provide, at a minimum, all services as expressed in the IFB and/or the company’s bid responding to the IFB.
- The company meets or exceeds all of the required criteria as specified by this IFB, or if not, has submitted a Justification for Consideration addressing any failure to meet the criteria.
- The company’s bid is being offered independently of any other Contractor and in full compliance with the terms specified in Section 2 and 3 of the IFB.
- The company will accept any awards made to it, contingent on contract negotiation, as a result of this IFB for a minimum of ninety (90) calendar days following the date and time of the IFB opening.

Company Name: \_\_\_\_\_

Company address: \_\_\_\_\_

Signature of Agent: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

E-mail address: \_\_\_\_\_

Phone number: \_\_\_\_\_

Contact Person: \_\_\_\_\_

(If different from Agent – include e-mail address and phone number)

**NOTE: Bids submitted without the signature of an authorized agent of the company may be considered non-responsive and ineligible for the award.**

**ETHERNET CABLING  
IFB 22-680-012**

**EXHIBIT A**

**PSD TECHNICAL SPECIFICATION**

**DIVISION 27  
Communications**

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## **SECTION 27 00 00 – GENERAL REQUIREMENTS AND INFORMATION**

### **Part 1: General**

#### **1.01 INTENT**

- A. The purpose of this document is to outline the necessary specifications for Communications Systems throughout Poudre School District (PSD) facilities, as well as outline the requirements for installation of such systems.
- B. This document may be used as either a basic bid spec to be distributed to a Contractor or Vendor for design/build projects, or as a technical standard for reference by a Technology Consultant for design/bid/build projects.
- C. All specifications within this document shall be viewed as minimum compliance. Specific project conditions may dictate components beyond minimum characteristics specified.
- D. This document contains Communications Systems specs for buildings built prior to 2019, and buildings built in 2019 or later. Infrastructure requirements are different based on the construction date of the building.

#### **1.02 CODES & STANDARDS**

- A. Products, Installation and Methods shall comply with the following Codes and Standards:
  - 1. Applicable National Electrical Code (NEC)
  - 2. International Building Code (IBC)
  - 3. Americans with Disabilities Act (ADA)
  - 4. ANSI/TIA/EIA Standards
  - 5. Building Industry Consulting Services International (BICSI)
  - 6. Products must be UL Listed

#### **1.03 COORDINATION**

- A. Entity responsible for design of systems shall meet with PSD at various points throughout the design process to ensure systems are being designed in a direction consistent with PSD requirements, standards, and specifications, and to review and resolve issues where non-compliance is necessary.
- B. Communications Systems require careful and detailed coordination with Architectural, Structural, Mechanical, and Electrical systems.
- C. It is the responsibility of the Contractor/Vendor (design/build) or Technology Consultant (design/bid/build) to ensure Communications Systems are properly coordinated.

#### **1.04 CONTRACTOR PREQUALIFICATION**

- A. Contractors must be PREQUALIFIED by PSD prior to bid.
- B. Contractors may be prequalified for a specific project or bid by submitting the following to PSD for review:
  - 1. Manufacturer Certifications
    - i. **Buildings constructed in 2018 and earlier have Cat. 5e wiring infrastructure. Contractors for Cat. 5e structured cabling shall be Siemon Certified Installers. They must provide a Siemon end-to-end solution, with certification and application warranty to that end.**
    - ii. **New buildings constructed in 2019 and later will have Cat. 6a infrastructure. Contractors for Cat. 6a structured cabling shall be CommScope Certified Installers.**

**They must provide a Commscope end-to-end solution, with certification and application warranty to that end.**

2. Industry Certifications
  - i. The Contractor shall have BICSI Level 2 Commercial Installers on staff and involved with this specific project.
3. Similar Project Experience
  - i. The contractor will perform the communications wiring and needs to provide list of references for 5 completed cabling jobs self-performed (not subcontracted). Similar size/scope required. Contractor must be able to demonstrate that they have access to appropriate termination, testing, and installation equipment.
4. Project References
  - i. Name of company the work was performed for.
  - ii. Address of company.
  - iii. Contact person name and position.
  - iv. Brief description of the work performed (including the number of outlets), type of cable system, and testing performed.
  - v. Date of work completed

#### 1.05 WARRANTY

- A. All installed systems and solutions shall be guaranteed to be free from workmanship or manufacturers defects for a minimum period of one year, beginning at building turnover. Provide a written warranty, signed by the Contractor and the manufacturer, agreeing to repair or replace, within warranty period, inadequate and defective materials and workmanship, including leakage, breakage, improper assembly, or failure to perform as required, during warranty period.
- B. Structured Cabling Solutions shall be guaranteed under applicable "extended warranty".
  1. Products shall be procured from group of manufacturers required to obtain extended warranty for solution.
  2. Contractor shall carry proper certifications and training to offer extended warranty.
  3. Contractor shall perform necessary testing to obtain extended warranty.
  4. Documentation of extended warranty shall be turned over to PSD in Operations & Maintenance manuals.
- C. Responses to warranty problems shall be made within twenty-four hours after notification of such problems by Owner's Representative. The appropriate response shall include a physical visit and investigation of the warranty difficulty.
- D. Prior to leaving the job site, the contractor shall leave a written report of the following to the Owner's Representative:
  1. What was the malfunction?
  2. What repairs / improvements were made to rectify the problem?
  3. What can be done to prevent this from occurring again?
  4. Locations of service call.

#### 1.06 EXISTING SYSTEMS

- A. Additions to existing buildings: The existing Structured Cabling System design, components and installation need to be duplicated to the letter, unless otherwise directed by PSD.
- B. The Contractor will not connect any cables to an existing system; PSD will perform this task.

C. The Contractor will pull, terminate, test and label all cable; install all devices, and run to head end location.



## **SECTION 27 10 10 – STRUCTURED CABLING SYSTEMS (Locations built 2019 and after)**

### **Part 1: General**

#### 1.01 SUMMARY

##### A. System Description

1. The STRUCTURED CABLING SYSTEM for a school shall consist of any fiber optic cable, twisted pair cable, as well as supporting infrastructure required to establish voice and data facilities throughout the project site.
2. All communications rooms which serve as distribution points for the project site will maintain a consistent temperature of no greater than 80 degrees Fahrenheit, measured at the surface of the powered equipment in the equipment racks.
3. All communications rooms which serve as distribution points for the project site will be electrically connected to the emergency backup generator. All EM power outlets will be installed in close proximity to the data racks for easy access and connectivity.

### **Part 2: Products**

#### 2.01 PRODUCTS

##### A. General Materials Requirements

1. All materials shall be the most current model or type offered by each manufacturer, shall conform to current applicable industry standards, NEMA standards, approved by the Underwriter's Laboratory.
2. Equipment and materials shall comply with EIA/TIA, IEEE, NEC, NEMA, IPCEA< ANSI, and ASTM standards.
3. Additional Equipment: The contractor shall furnish and install all additional equipment and appurtenances required for a complete, ready for use, installation.

##### B. Materials Specification – Structured Cabling Systems

###### 1. Fiber Optic Cable & Connectivity:

###### i. Cables:

- a. Description: Multimode optical fiber, OM3 (50/125-micron), plenum rated non-conductive (OFNP) with aqua jacket.
- b. Strands Per Cable: Middle/High Schools - 12 minimum, Elementary Schools – 6 Minimum.
- c. Maximum Attenuation: -3.5 dB/km at 850 nm; -1.5 dB/km at 1300 nm.
- d. Operating Temperature Range: -20 to 70 deg C.
- e. Manufacturer: None Specified

###### ii. Cable Connectors: Simplex- and duplex-type SC couplers with self-centering, axial alignment mechanisms. Insertion loss not greater than 0.7dB.

###### iii. Patch Panels:

- a. A modular panel housing multiple-numbered duplex cable connectors with integral connection plates and pigtail splice tray.
- b. Permanent Connection: One end of each connector module is permanently connected to an installed cable fiber.

- c. Number of Connectors per Field: One for each fiber of cable or cables assigned to field, plus spares and blank positions adequate to satisfy specified expansion criteria.
- d. Mounting: Rack mounted.
- e. Manufacturer: CommScope end-to-end product selection and certification.

2. Unshielded Twisted Pair (UTP) Cable & Connectivity:

- i. Backbone Cable:
  - a. Description: 25-pair conductor cable of No. 24 AWG color-coded insulated conductors, plenum rated (CMP), gray jacket.
  - b. Manufacturer: Mohawk, CommScope equivalent.
- ii. Horizontal Cable:
  - a. Description: 4-pair twisted pair conductor cable of No. 24 AWG color-coded insulated conductors, Category 6a compliant, white, plenum rated (CMP).
  - b. Manufacturer: CommScope end-to-end product selection and certification.
- iii. UTP Patch Panels:
  - a. Horizontal Cable: Category 6a, 48 port, RJ45, EIA 568 with 110 type IDC connectors. Modular panel mounting with multiple, numbered jack units. Part # UNP-6A-DM-2U-48 and UNP-6A-DM-1U-24
  - b. Copper Backbone: Category 6a, 48 port, RJ45, EIA 568 with 110 type IDC connectors. Modular panel mounting with multiple, numbered jack units. Part # UNP-6A-DM-1U-24
  - c. Number of Jacks per Field: 1 for each 4-pair cable indicated in the design, plus spares and blank positions adequate to satisfy specified expansion criteria.
  - d. Manufacturer: CommScope end-to-end product selection and certification.
- iv. Workstation Outlets
  - a. Voice/Data Outlet Faceplate:
    - 1. Single Gang modular faceplate, number of ports as required, white color. Manufacturer: CommScope end-to-end product selection and certification. Part # M10L-262(1 Port Face plate) M12L-262 (2 port Face Plate) M14L-262 (4 Port Face Plate) M16L-262(6 Port Face plate) M20AP-262 (Blank insert for Plates)
  - b. Wall Phone Outlet Faceplate and Outlet:
    - 1. Stainless Steel for Keystone Modules.
    - 2. Manufacturer: CommScope end-to-end product selection and certification.
  - c. Voice/Data Outlet Modules:
    - 1. Category 6a modules, white color.
    - 2. Manufacturer: CommScope end-to-end product selection and certification. Part #UNJ10G-WH
  - d. Mounting: Flush, with jacks flush mounted.

C. Materials Specification – Supporting Hardware

- 1. Horizontal Cable Supports:
  - i. Supports similar to Caddy Multi-function Clip No. 4-Z-3-4 and Bridle Ring No. 2-BRT-20.
  - ii. Attach cable supports to new suspension wires, separate from ceiling suspension wires.

2. Telecommunications Terminal Board (TTB):
  - i. ¾-inch AC-grade, fire-resistant-treated plywood mounted the entire length of the wall.
3. Equipment Racks:
  - i. EIA-standard 19" two-post with 12/24 tapped holes (or equivalent).
  - ii. Freestanding modular steel units designed for telecommunications terminal support and coordinated with dimensions of the units to be supported.
  - iii. Equipment rack shall be fastened to floor with anchor bolts.
  - iv. Manufacturer: Chatsworth Products Inc., Part #55053-7031.
  - v. 6" double-sided cable management outside racks, 10" double-sided cable management between racks.
4. Ladder Rack (Cable Runway):
  - i. Provide horizontally mounted ladder rack where cable is to be run horizontally in each telecommunication room.
  - ii. Provide horizontally mounted ladder rack from wall of telecommunication room to each equipment rack.
  - iii. Provide vertically mounted ladder rack where cable is to be run vertically in each telecommunication room.
  - iv. All ladder rack shall be 12" wide nominal, black powder coated. Chatsworth Products Universal Cable Runway. Provide all necessary mounting brackets, supports, and appurtenances.
  - v. Provide radius dropouts to each rack.
5. Outlet and Junction Boxes:
  - i. Outlet boxes shall be sheet metal type, 4-11/16" square x 2-1/2" deep, unless noted otherwise. Provide single-gang device ring.
  - ii. Junction and pull boxes shall be sheet metal type, sized as necessary for quantity of conduits applicable.
    - a. Junction or pull boxes may NOT be used to change pathway direction.
6. Conduit:
  - i. Refer to Electrical Specifications (Division 26).
  - ii. EMT conduits are preferred for above ground installation.
  - iii. Schedule 40 PVC conduits are preferred for underground/buried installation.
  - iv. Provide ENT (Carlon) innerduct for optical fiber through pathways where fiber backbones are to be installed. Innerduct shall be minimum 1".

### **Part 3: Execution**

#### **3.01 Installation**

##### **A. INSTALLATION**

1. Install structured cabling system in accordance with the following:
  - i. Applicable edition of the National Electrical Code (NEC)
  - ii. National Electrical Contractors Association's "Standard of Installation"
  - iii. ANSI/TIA/EIA standards
  - iv. BICSI recommended practices
2. Label all pull and junction boxes with clearly marked "VOICE/DATA".
3. Install 1-inch conduit, minimum, from each voice/data outlet to nearest above ceiling space.

- i. Conduits shall be appropriate for the purpose, and as otherwise required or permitted in Electrical Raceways.
  - ii. Provide protective bushings on all ends of conduits.
- 4. Install a 200-pound nylon pull cord in each empty raceway.
- 5. All Voice and Data cable from the outlet location to the communication closet shall be in separate bundles and shall be terminated on separate terminal hardware.
- 6. Wiring hardware, D-rings, mushroom spools, and appurtenances shall be provided as needed.
- 7. IDF Closets:
  - i. Data Termination Patch Panels are to be mounted in relay racks located in the Equipment Rooms.
  - ii. "D" Rings are to be installed on the backboards to accommodate proper wire, jumper and patch cord management to the "Voice" punch down blocks and to the "Data Termination Patch Panels".
- 8. Installation above ceilings:
  - i. Where conduit is required, the minimum size shall be 1 inch.
  - ii. Each conduit run shall be from the wall outlet and terminated in the ceiling space.
  - iii. Conduit is required only above non-accessible ceiling.
  - iv. Where conduit is not required, the cable is to be run using cable supports.
  - v. Hangers must be at least 18" above ceiling tiles and light fixtures. Rings must be a maximum of 4' on center.
  - vi. No more than 6 cables may be placed in a single 1 ¼" ring.
  - vii. Rings used may not exceed 1 ¼" diameter when suspended from suspension wires.
  - viii. Larger rings with more cables may be used in areas where space does not permit installation of cable tray.
  - ix. Rings must be run perpendicular to tray and parallel to walls.
  - x. No more than 1 clip may be used on each suspension wire.
  - xi. Ceiling must not be distorted or pulled out of alignment by clip installation.
  - xii. Never under any circumstances use water pipes, sprinkler pipes, electrical conduits, or HVAC ducts as a method of cable supports.
  - xiii. All cables can be installed perpendicular (across) electrical conduits, but never parallel.
  - xiv. Cables installed through firewalls should be "sleeved" with a metallic nipple, adequately cemented in place and filled with an approved fire seal.
  - xv. The bridle rings used are not to exceed 60% fill.
- 9. Conduit: For conduit use where cable makes a 90 degree turn, a junction box is to be installed. Junction boxes shall be minimum 8x8 in size.
- 10. All trash and refuse shall be removed at the completion of each workday.
- 11. Plenum rated cable is to be used in all return air spaces.

## B. HORIZONTAL DISTRIBUTION

1. Furnish and install a local area network secondary cable support system and install/terminate/test/label the cable, station jacks and patch panels.
2. Pull cables without exceeding cable manufacturer's recommended pulling tensions. Do not bend cable in handling or installation to smaller radii than minimums recommended by manufacturers.
3. Details on the number and location of voice/data outlets are required on the premises TO BE ON THE DRAWINGS. Note that each outlet location is distinct and may be wired with more than one cable.
4. Cables shall be routed starting at the patch panels and leave the equipment rooms through the ceiling and terminate at the designated station jack. Cables shall be run to each location. Where cables enter the conduit, the cables shall have a gradual curve secured with a cable tie outside the entrance.
5. Cable Ties – Cables shall be bundled and attached to the primary and secondary support system at least every 3 feet. Cable ties shall be plenum rated.
6. Cable Support System – The Contractor shall install a cable support system that will eliminate cable sag and tension. This system shall consist of cable tray, raceways, bridal rings, J-hooks or catenary wire. These cable bundles must be attached to the support system at least every 3 feet.
7. Certification – Certify each cable to meet Category 6a standards in accordance with the wire type installed, and the field test specifications defined in ANSI/TIA-568-C.2 "Commercial balanced twisted-pair telecommunications cabling and components standard."
8. Zone wiring using 25-pair or longer cable runs is not permitted for horizontal wiring. Use of bridges or multiples is not permitted.
9. Examine pathway elements to receive cable. Check raceways and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation. Do not proceed with installation until unsatisfactory conditions have been corrected.
10. Install exposed cable parallel and perpendicular to surfaces or exposed structural members and follow surface contours where possible.

## C. INSTALLATION IN WALLS

1. Install  $\frac{3}{4}$ " conduit down wall and connect to box secured to wall studs. Where conduit is installed above ceiling, this shall be an extension of that conduit.

2. If conduit is not installed above ceiling, the conduit in the wall shall extend 8" above ceiling and turn 90 degrees into ceiling space. Install a bushing on conduit end to protect wire.
3. No more than (6) six, 4-pair cables may be placed in 1" conduit.

#### D. INSTALLATION OF FIRE SEALS

1. When installing sleeves, conduit, or cable through an existing fire barrier and the existing fire barrier is to remain or be patched, the fire and smoke sealant to be installed shall be of the same manufacturer as the existing.
2. After installation of sleeves, wall penetrations, and cores, install sealant to contain smoke and fire up to 2,000 degrees Fahrenheit for 2 hours.
3. Remove damming materials after curing if made of other than fire resistant materials.
4. Protect materials from damage on surfaces subject to traffic.
5. Environmental Requirements;
  - i. Keep flammable materials away from sparks or flame.
  - ii. Provide masking and drop cloths to prevent contamination of adjacent surfaces by fire stopping materials.

#### E. PULL CORD

1. A pull cord is to be left in all conduit runs and cable supports. (jetline #232) or equivalent.

#### F. CABLE LABELING

1. Each cable shall be labeled with the corresponding alphanumeric information in the following format: CR-PP-PT, where CR is the Communication Room Number, PP is the patch panel letter, and PT is the patch panel port. The CR number shall be as follows:
  - i. The patch panels shall be lettered starting with "A" at the top of the rack. The port numbers shall correspond to the port number on the patch panel.
2. Labels – each cable shall be labeled on both ends using a vinyl overwrap label. All station jacks (wall bezel) and patch panels shall also be labeled. Labels shall be printed in a 10 point or greater font and shall be applied not less than 3-inches or more than 4-inches from each termination connector. The clear portion of the label shall completely overwrap the label data.

#### G. TELECOMMUNICATIONS INTERIOR DISTRIBUTION

1. The cross-connect hardware must be designed for flexibility to allow the system to expand up to 50% without the addition of racks, panels, etc.
2. The distribution system design must allow the customer to administer the communication system. Easy station arrangements must be built in.
3. Codes and Standards: The work shall comply with codes and standards applicable to each type of work and as listed these specifications.

4. Equipment: Prior to ordering equipment, verify dimensions and functions of equipment proposed for use. Be certain the equipment is compatible with the structural and architectural features of the work, avoids conflicts with equipment of other crafts, and that it will fit in the space provided.

#### H. TERMINATION BACKBOARDS (TTBs)

1. Install A-face of backboard plywood facing into room.
2. Finish paint termination backboards with durable enamel prior to installation of wall-mounted equipment.
  - i. Paint backboard area designated for service provider demarcations ORANGE.
  - ii. Paint all other backboard surfaces WHITE.
3. Install termination backboards plumb, and attach securely at each corner.
4. Install #200 nylon pull cord in each empty telephone conduit containing bends or over 10 feet in length.
5. Paint all backboards for demarcation equipment orange.

### 3.02 GROUNDING & BONDING

#### A. Grounding and Bonding system shall comply with ANSI J-STD-607.

1. All racks, frames and miscellaneous equipment shall be grounded together using green, No. 6 insulated copper ground wire (low smoke, plenum rated, 6 AWG, 600V, UL listed, 90C) so that all equipment, communications racks and frames are at the same ground potential. A VOM measurement between any two points on racks and equipment cases in the communications room shall be less than 1.25 volts dc or ac potential.
2. The MDF shall have a Telecommunications Main Grounding Busbar (TMGB). All metallic components shall be bonded to this TMGB with compression-style connectors.
3. Each IDF shall have a Telecommunications Grounding Busbar (TGB). All metallic components shall be bonded to this TGB with compression-style connectors.
4. Each TMGB and TGB shall be bonded to building steel.
5. Each TGB shall be bonded to the ground bus in the electrical panel serving power to IDF.
6. The TMGB shall be bonded to the building's main electrical distribution panel ground bus.
7. Separate ground rods are NOT allowed.
8. Bond circuit and service protectors to TMGB.
9. Bond cable shields, drain conductors, and equipment to eliminate shock hazard and to minimize ground loops, common mode returns, noise pickup, cross talk and other impairments. Bond shields and drain conductors to ground at only one point in each circuit.

### 3.03 SYSTEM INSPECTION AND TESTING

#### A. Minimum of one (1) week written notice before all testing.

#### B. Before any testing begins all voice and data station cables for wall and modular furniture installation shall be terminated in the IDF closet.

#### C. First Testing Inspection:

1. Testing shall be in the presence of the Owner's Representative.
2. Testing shall begin before overhead cover-up, and only wall outlet installations and overhead cabling shall be tested and inspected.

3. A complete log of these testing results shall be submitted before the Second Testing Inspection and use of cable.

D. Second Testing Inspection:

1. Shall be in the presence of the Owner's Representative.
2. Shall begin after all outlet installations are completed.
3. A complete log of these testing results shall be submitted before the use of cable.

E. Any cable deficiency shall be corrected at the time that it has been discovered.

F. A complete log of the test results shall be submitted to Owner's Representative and the Owner's designated Agent.

G. CABLE TESTING

1. Upon installation of cable and connectors, demonstrate product capability and compliance with requirements. Test each signal path for end-to-end performance. Remove temporary connections when tests have been satisfactorily completed.
2. Category 6a cables should be tested for: wire map, length, insertion loss, NEXT loss, PS NEXT loss, ACR-F loss, PS ACR-F loss, return loss, propagation delay, delay skew using a level IIe field tester and certified to meet Category 6a standards in accordance with the wire type installed, and the field test specifications defined in ANSI/TIA-568-C.2 "Commercial balanced twisted-pair telecommunications cabling and components standard." Backbone cables that are not Cat. 6 should at least be tested for signal path continuity and shorts and wire map.
3. Fiber-Optic Cable Procedures: Perform each visual and mechanical inspection and electrical test, including optional procedures, stated in NETA ATS. Certify compliance with test parameters and manufacturer's recommendations.
4. All test results must be submitted to Owner's Representative prior to the Substantial Completion of the project.



## **SECTION 27 10 20 – STRUCTURED CABLING SYSTEMS (Locations built prior to 2019)**

### **Part 1: General**

#### **1.01 SUMMARY**

##### **A. System Description**

1. The STRUCTURED CABLING SYSTEM for a school shall consist of the fiber optic cable, twisted pair cable, and coaxial cable, as well as supporting infrastructure, required to establish voice, data, and CATV/closed-circuit television facilities throughout the project site.
2. The primary communications room which serves as the head end for the project site will maintain a consistent temperature of no greater than 80 degrees Fahrenheit, measured at the surface of the powered equipment in the equipment racks.

### **Part 2: Products**

#### **2.01 PRODUCTS**

##### **A. General Materials Requirements**

1. All materials shall be the most current model or type offered by each manufacturer, shall conform to current applicable industry standards, NEMA standards, approved by the Underwriter's Laboratory.
2. Equipment and materials shall comply with EIA/TIA, IEEE, NEC, NEMA, IPCEA< ANSI, and ASTM standards.
3. Additional Equipment: The contractor shall furnish and install all additional equipment and appurtenances required for a complete, ready for use, installation.

##### **B. Materials Specification – Structured Cabling Systems**

###### **1. Fiber Optic Cable & Connectivity:**

###### **i. Cables:**

- a. Description: Multimode optical fiber, OM3 (50/125-micron), plenum rated non-conductive (OFNP) with aqua jacket.
- b. Strands Per Cable: Middle/High Schools - 12 minimum, Elementary Schools – 6 Minimum.
- c. Maximum Attenuation: -3.5 dB/km at 850 nm; -1.5 dB/km at 1300 nm.
- d. Operating Temperature Range: -20 to 70 deg C.
- e. Manufacturer: Corning Fiber, Siemon equivalent.

###### **ii. Cable Connectors: Simplex- and duplex-type SC couplers with self-centering, axial alignment mechanisms. Insertion loss not greater than 0.7dB.**

###### **iii. Patch Panels:**

- a. A modular panel housing multiple-numbered duplex cable connectors with integral connection plates and pigtail splice tray.
- b. Permanent Connection: One end of each connector module is permanently connected to an installed cable fiber.
- c. Number of Connectors per Field: One for each fiber of cable or cables assigned to field, plus spares and blank positions adequate to satisfy specified expansion criteria.

- d. Mounting: Rack mounted.
  - e. Manufacturer: Siemon, Part #FCP3-DWR.
2. Unshielded Twisted Pair (UTP) Cable & Connectivity:
- i. Backbone Cable:
    - a. Description: 25-pair conductor cable of No. 24 AWG color-coded insulated conductors, plenum rated (CMP), gray jacket.
    - b. Manufacturer: Mohawk, CommScope equivalent.
  - ii. Horizontal Cable:
    - a. Description: 4-pair twisted pair conductor cable of No. 24 AWG color-coded insulated conductors, Category 5e compliant, plenum rated (CMP).
    - b. Manufacturer: Mohawk MegaLAN M55988, CommScope Ultra11 5504M equivalent.
  - iii. UTP Patch Panels:
    - a. Horizontal Cable:
      - 1. Category 5e, 48 port, RJ45, EIA 568 with 110 type IDC connectors. Modular panel mounting with multiple, numbered jack units.
    - b. Copper Backbone:
      - 1. Category 5e, 48 port, RJ45, EIA 568 with 110 type IDC connectors. Modular panel mounting with multiple, numbered jack units.
    - c. Number of Jacks per Field: 1 for each 4-pair cable indicated in the design, plus spares and blank positions adequate to satisfy specified expansion criteria.
    - d. Manufacturer:
      - 1. Siemon, Part #HD5-48 for Horizontal Cable and for Copper Backbone Cable patchpanels.
  - iv. Workstation Outlets
    - a. Voice/Data Outlet Faceplate:
      - 1. Single Gang modular faceplate, number of ports as required, white color.
      - 2. Manufacturer: Siemon #MX-FP-S-o\*-02 (\* indicates number of ports).
    - b. Wall Phone Outlet Faceplate and Outlet:
      - 1. Stainless Steel for Keystone Modules.
      - 2. Manufacturer: Siemon Part #MX-WP-CS-SS.
    - c. Voice/Data Outlet Modules:
      - 1. Category 5e modules, white color.
      - 2. Manufacturer: Siemon Part #MX5-FO2.
    - d. Mounting: Flush, with jacks flush mounted.
3. Coaxial Cable & Connectivity:
- i. Backbone Cable:
    - a. Description: Series 11 (RG11/U) coaxial cable with copper-plated center conductor, plenum rated (CMP/CATVP), black jacket.
    - b. Manufacturer: CommScope or Belden
  - ii. Horizontal Cable:
    - a. Description: Series 6 (RG6/U) coaxial cable with copper-plated center conductor, plenum rated (CMP/CATVP), black jacket.
    - b. Manufacturer: CommScope or Belden

- iii. Outlet:
  - a. 75-ohm F-type self-terminating outlet with coverplate.
  - b. Manufacturer: Blonder Tongue 3184.

C. Materials Specification – Supporting Hardware

- 1. Horizontal Cable Supports:
  - i. Supports similar to Caddy Multi-function Clip No. 4-Z-3-4 and Bridle Ring No. 2-BRT-20.
  - ii. Attach cable supports to new suspension wires, separate from ceiling suspension wires.
- 2. Telecommunications Terminal Board (TTB):
  - i. ¾-inch AC-grade, fire-resistant-treated plywood mounted the entire length of the wall.
- 3. Equipment Racks:
  - i. EIA-standard 19" two-post with 12/24 tapped holes (or equivalent).
  - ii. Freestanding modular steel units designed for telecommunications terminal support and coordinated with dimensions of the units to be supported.
  - iii. Equipment rack shall be fastened to floor with anchor bolts.
  - iv. Manufacturer: Chatsworth Products Inc., Part #55053-7031.
  - v. 6" double-sided cable management outside racks, 10" double-sided cable management between racks.
- 4. Ladder Rack (Cable Runway):
  - i. Provide horizontally mounted ladder rack where cable is to be run horizontally in each telecommunication room.
  - ii. Provide horizontally mounted ladder rack from wall of telecommunication room to each equipment rack.
  - iii. Provide vertically mounted ladder rack where cable is to be run vertically in each telecommunication room.
  - iv. All ladder rack shall be 12" wide nominal, black powder coated. Chatsworth Products Universal Cable Runway. Provide all necessary mounting brackets, supports, and appurtenances.
  - v. Provide radius dropouts to each rack.
- 5. Outlet and Junction Boxes:
  - i. Outlet boxes shall be sheet metal type, 4-11/16" square x 2-1/2" deep, unless noted otherwise. Provide single-gang device ring.
  - ii. Junction and pull boxes shall be sheet metal type, sized as necessary for quantity of conduits applicable.
    - a. Junction or pull boxes may NOT be used to change pathway direction.
- 6. Conduit:
  - i. Refer to Electrical Specifications (Division 26).
  - ii. EMT conduits are preferred for above ground installation.
  - iii. Schedule 40 PVC conduits are preferred for underground/buried installation.
  - iv. Provide ENT (Carlton) innerduct for optical fiber through pathways where fiber backbones are to be installed. Innerduct shall be minimum 1".

**Part 3: Execution**

3.01 Installation

## A. INSTALLATION

1. Install structured cabling system in accordance with the following:
  - i. Applicable edition of the National Electrical Code (NEC)
  - ii. National Electrical Contractors Association's "Standard of Installation"
  - iii. ANSI/TIA/EIA standards
  - iv. BICSI recommended practices
2. Label all pull and junction boxes with clearly marked "VOICE/DATA".
3. Install 1-inch conduit, minimum, from each voice/data outlet to nearest above ceiling space.
  - i. Conduits shall be appropriate for the purpose, and as otherwise required or permitted in Electrical Raceways.
  - ii. Provide protective bushings on all ends of conduits.
4. Install a 200-pound nylon pull cord in each empty raceway.
5. All Voice and Data cable from the outlet location to the communication closet shall be in separate bundles and shall be terminated on separate terminal hardware.
6. Wiring hardware, D-rings, mushroom spools, and appurtenances shall be provided as needed.
7. IDF Closets:
  - i. Data Termination Patch Panels are to be mounted in relay racks located in the Equipment Rooms.
  - ii. "D" Rings are to be installed on the backboards to accommodate proper wire, jumper and patch cord management to the "Voice" punch down blocks and to the "Data Termination Patch Panels".
8. Installation above ceilings:
  - i. Where conduit is required, the minimum size shall be 1 inch.
  - ii. Each conduit run shall be from the wall outlet and terminated in the ceiling space.
  - iii. Conduit is required only above non-accessible ceiling.
  - iv. Where conduit is not required, the cable is to be run using cable supports.
  - v. Hangers must be at least 18" above ceiling tiles and light fixtures. Rings must be a maximum of 4' on center.
  - vi. No more than 6 cables may be placed in a single 1 ¼" ring.
  - vii. Rings used may not exceed 1 ¼" diameter when suspended from suspension wires.
  - viii. Larger rings with more cables may be used in areas where space does not permit installation of cable tray.
  - ix. Rings must be run perpendicular to tray and parallel to walls.
  - x. No more than 1 clip may be used on each suspension wire.
  - xi. Ceiling must not be distorted or pulled out of alignment by clip installation.
  - xii. Never under any circumstances use water pipes, sprinkler pipes, electrical conduits, or HVAC ducts as a method of cable supports.

- xiii. All cables can be installed perpendicular (across) electrical conduits, but never parallel.
  - xiv. Cables installed through firewalls should be “sleeved” with a metallic nipple, adequately cemented in place and filled with an approved fire seal.
  - xv. The bridge rings used are not to exceed 60% fill.
9. Conduit: For conduit use where cable makes a 90 degree turn, a junction box is to be installed. Junction boxes shall be minimum 8x8 in size.
10. All trash and refuse shall be removed at the completion of each workday.
11. Plenum rated cable is to be used in all return air spaces.

#### B. HORIZONTAL DISTRIBUTION

1. Furnish and install a local area network secondary cable support system and install/terminate/test/label the cable, station jacks and patch panels.
2. Pull cables without exceeding cable manufacturer’s recommended pulling tensions. Do not bend cable in handling or installation to smaller radii than minimums recommended by manufacturers.
3. Details on the number and location of voice/data outlets are required on the premises TO BE ON THE DRAWINGS. Note that each outlet location is distinct and may be wired with more than one cable.
4. Cables shall be routed starting at the patch panels and leave the equipment rooms through the ceiling and terminate at the designated station jack. Cables shall be run to each location. Where cables enter the conduit, the cables shall have a gradual curve secured with a cable tie outside the entrance.
5. Cable Ties – Cables shall be bundled and attached to the primary and secondary support system at least every 3 feet. Cable ties shall be plenum rated.
6. Cable Support System – The Contractor shall install a cable support system that will eliminate cable sag and tension. This system shall consist of cable tray, raceways, bridge rings, J-hooks or catenary wire. These cable bundles must be attached to the support system at least every 3 feet.
7. Certification – Certify each cable to meet Category 5e standards in accordance with the wire type installed, and the field test specifications defined in ANSI/TIA-568-C.2 “Commercial balanced twisted-pair telecommunications cabling and components standard.”
8. Zone wiring using 25-pair or longer cable runs is not permitted for horizontal wiring. Use of bridges or multiples is not permitted.
9. Examine pathway elements to receive cable. Check raceways and other elements for compliance with space allocations, installation tolerances, hazards to cable installation,

and other conditions affecting installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

10. Install exposed cable parallel and perpendicular to surfaces or exposed structural members, and follow surface contours where possible.

#### C. INSTALLATION IN WALLS

1. Install  $\frac{3}{4}$ " conduit down wall and connect to box secured to wall studs. Where conduit is installed above ceiling, this shall be an extension of that conduit.
2. If conduit is not installed above ceiling, the conduit in the wall shall extend 8" above ceiling and turn 90 degrees into ceiling space. Install a bushing on conduit end to protect wire.
3. No more than (6) six, 4-pair cables may be placed in 1" conduit.

#### D. INSTALLATION OF FIRE SEALS

1. When installing sleeves, conduit, or cable through an existing fire barrier and the existing fire barrier is to remain or be patched, the fire and smoke sealant to be installed shall be of the same manufacturer as the existing.
2. After installation of sleeves, wall penetrations, and cores, install sealant to contain smoke and fire up to 2,000 degrees Fahrenheit for 2 hours.
3. Remove damming materials after curing if made of other than fire resistant materials.
4. Protect materials from damage on surfaces subject to traffic.
5. Environmental Requirements;
  - i. Keep flammable materials away from sparks or flame.
  - ii. Provide masking and drop cloths to prevent contamination of adjacent surfaces by fire stopping materials.

#### E. PULL CORD

1. A pull cord is to be left in all conduit runs and cable supports. (jetline #232) or equivalent.

#### F. CABLE LABELING

1. Each cable shall be labeled with the corresponding alphanumeric information in the following format: CR-PP-PT, where CR is the Communication Room Number, PP is the patch panel letter, and PT is the patch panel port. The CR number shall be as follows:
  - i. The patch panels shall be lettered starting with "A" at the top of the rack. The port numbers shall correspond to the port number on the patch panel.
2. Labels – each cable shall be labeled on both ends using a vinyl overwrap label. All station jacks (wall bezel) and patch panels shall also be labeled. Labels shall be printed in a 10 point or greater font and shall be applied not less than 3-inches or more than 4-inches from each termination connector. The clear portion of the label shall completely overwrap the label data.

#### G. TELECOMMUNICATIONS INTERIOR DISTRIBUTION

1. The cross-connect hardware must be designed for flexibility to allow the system to expand up to 50% without the addition of racks, panels, etc.
2. The distribution system design must allow the customer to administer the communication system. Easy station arrangements must be built in.
3. Codes and Standards: The work shall comply with codes and standards applicable to each type of work and as listed these specifications.
4. Equipment: Prior to ordering equipment, verify dimensions and functions of equipment proposed for use. Be certain the equipment is compatible with the structural and architectural features of the work, avoids conflicts with equipment of other crafts, and that it will fit in the space provided.

#### H. TERMINATION BACKBOARDS (TTBs)

1. Install A-face of backboard plywood facing into room.
2. Finish paint termination backboards with durable enamel prior to installation of wall-mounted equipment.
  - i. Paint backboard area designated for service provider demarcations ORANGE.
  - ii. Paint all other backboard surfaces WHITE.
3. Install termination backboards plumb, and attach securely at each corner.
4. Install #200 nylon pull cord in each empty telephone conduit containing bends or over 10 feet in length.
5. Paint all backboards for demarcation equipment orange.

#### I. CABLE RELOCATIONS

1. Cables and outlets to be relocated for any reason must be preapproved by a PSD IT Dept. representative.
2. Cables and outlets approved for relocation will not be moved to locations outside of the room number in which they already reside.
3. Cables approved for relocation, which are too short to reach their new location, will be completely removed from walls, ceiling space and patch panel. New cables will be installed in their place, and terminated on the same patch panel and port to retain their wire numbers.

#### J. CABLE REMOVAL

1. Cables to be removed for any reason must be preapproved by a PSD IT Dept. representative.
2. Cables approved for removal will be completely removed from the walls, ceiling space and patch panels.
3. Cables approved for removal will be documented with their corresponding wire numbers on a spreadsheet, and submitted to Owner's Representative prior to the Substantial Completion phase of a project.

### 3.02 GROUNDING & BONDING

- A. Grounding and Bonding system shall comply with ANSI J-STD-607.

1. All racks, frames and miscellaneous equipment shall be grounded together using green, No. 6 insulated copper ground wire (low smoke, plenum rated, 6 AWG, 600V, UL listed, 90C) so that all equipment, communications racks and frames are at the same ground potential. A VOM measurement between any two points on racks and equipment cases in the communications room shall be less than 1.25 volts dc or ac potential.
2. The MDF shall have a Telecommunications Main Grounding Busbar (TMGB). All metallic components shall be bonded to this TMGB with compression-style connectors.
3. Each IDF shall have a Telecommunications Grounding Busbar (TGB). All metallic components shall be bonded to this TGB with compression-style connectors.
4. Each TMGB and TGB shall be bonded to building steel.
5. Each TGB shall be bonded to the ground bus in the electrical panel serving power to IDF.
6. The TMGB shall be bonded to the building's main electrical distribution panel ground bus.
7. Separate ground rods are NOT allowed.
8. Bond circuit and service protectors to TMGB.
9. Bond cable shields, drain conductors, and equipment to eliminate shock hazard and to minimize ground loops, common mode returns, noise pickup, cross talk and other impairments. Bond shields and drain conductors to ground at only one point in each circuit.

### 3.03 SYSTEM INSPECTION AND TESTING

- A. Minimum of one (1) week written notice before all testing.
- B. Before any testing begins all voice and data station cables for wall and modular furniture installation shall be terminated in the IDF closet.
- C. First Testing Inspection:
  1. Testing shall be in the presence of the Owner's Representative.
  2. Testing shall begin before overhead cover-up, and only wall outlet installations and overhead cabling shall be tested and inspected.
  3. A complete log of these testing results shall be submitted before the Second Testing Inspection and use of cable.
- D. Second Testing Inspection:
  1. Shall be in the presence of the Owner's Representative.
  2. Shall begin after all outlet installations are completed.
  3. A complete log of these testing results shall be submitted before the use of cable.
- E. Any cable deficiency shall be corrected at the time that it has been discovered.
- F. A complete log of the test results shall be submitted to Owner's Representative and the Owner's designated Agent.
- G. CABLE TESTING
  1. Upon installation of cable and connectors, demonstrate product capability and compliance with requirements. Test each signal path for end-to-end performance. Remove temporary connections when tests have been satisfactorily completed.
  2. Category 5e cables should be tested for: wire map, length, insertion loss, NEXT loss, PS NEXT loss, ACR-F loss, PS ACR-F loss, return loss, propagation delay, delay skew using a



level IIe field tester and certified to meet Category 5e standards in accordance with the wire type installed, and the field test specifications defined in ANSI/TIA-568-C.2 “Commercial balanced twisted-pair telecommunications cabling and components standard.” Backbone cables that are not Cat. 5e should at least be tested for signal path continuity and shorts and wire map.

3. Fiber-Optic Cable Procedures: Perform each visual and mechanical inspection and electrical test, including optional procedures, stated in NETA ATS. Certify compliance with test parameters and manufacturer’s recommendations.
4. All test results must be submitted to Owner’s Representative prior to the Substantial Completion of the project.