



## **INVITATION TO BID**

**#21358**

**For**

## **STRUCTURED CABLING**

FOR THE CLEVELAND MUNICIPAL SCHOOL DISTRICT  
DBA: CLEVELAND METROPOLITAN SCHOOL DISTRICT  
BOARD OF EDUCATION, 1111 SUPERIOR AVENUE E, SUITE 1800  
CLEVELAND, OHIO 44114

UNDER THE DIRECTION OF INFORMATION TECHNOLOGY DEPARTMENT OF THE BOARD OF EDUCATION OF THE  
CLEVELAND METROPOLITAN SCHOOL DISTRICT - CUYAHOGA COUNTY, OHIO

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## Part I: ITB Submission & Process Requirements

Part I of the ITB provides a detailed set of directions which the service provider will use to prepare their bid.

Schedule for posting and service provider selection for the Structured Cabling ITB 21358

Step	Date*
ITB Posted	August 26, 2022
Pre-Bid Meeting(Virtual)	September 2, 2022
All final questions from service providers to the District	September 6, 2022
Answers to service providers from the District and all addenda issued (if necessary)	September 8, 2022
ITB Responses Due	September 14, 2022
Bid Opening	September 14, 2022
Contract Negotiation	October 20-October 25, 2022
Contract Start	November 1, 2022

\*Dates listed are subject to change at discretion of the District. Service Providers will be notified of changes to the schedule, as appropriate.

### Section A: Bid Submission & Format Requirements

#### Bid Submission Requirements

- a. In order for the District to evaluate bids fairly and completely, service providers should follow the format set forth herein and provide all of the information requested. The District discourages costly bids.
- b. All bids shall include all bid format requirements found below. All information requested in the district related forms must be filled in legibly and completely with blue ink signatures, or the bid may be considered non-responsive. **Structured Cabling and #21358 must be on the outside of the envelope of submittals including shipping labels.**
- c. Sealed Responses are due at the Cashier's Office of the Cleveland Metropolitan School District, 1111 Superior Ave E. Cleveland, Ohio 44114 on or before 1:00 PM current local time on September 14, 2022. Mailing of Bids are encouraged. However, hand deliveries will be accepted from 12:00 PM to 1:00 PM on September 14, 2022. The bids will be opened following the bid cut off time at 1111 Superior Ave. E. Cleveland, Ohio 44114
- d. There will be a Pre-Bid Meeting at **11:00 AM on September 2, 2022**. The meeting will be held Via Zoom. The Zoom link is as follows:  
<https://clevelandmetroschools-org.zoom.us/meeting/register/tZEpcuqpzqoqH9LgVNB2ay50lhtVCbk76HTX>  
Suppliers are encouraged to submit questions prior to the Pre-Bid Meeting so they may be addressed.
- e. All submissions must include one(1) original with blue signatures, one(1) copy, and one(1) electronic bid on a USB B Flash Drive. Original Copy should be easily identifiable. Electronic bid should include all documents. Service Providers not complying with this requirement shall be notified that they have twenty-four(24) hours in which to comply with this requirement or their bid may be disqualified. This applies to copies only. All materials are submitted as is.
- f. All written questions shall be directed to the Purchasing Division via email to: [amanda.joyce@clevelandmetroschools.org](mailto:amanda.joyce@clevelandmetroschools.org). Written questions will be accepted via email until 12:00 pm on September 8, 2022. Under no circumstances should any firm interested in

providing the services identified in the ITB, their designees, or anyone affiliated with their firm, contact any other District employee or official during the ITB process, in an attempt to lobby or influence the selection of a service provider pursuant to this ITB

- g. The District reserves the right to reject any and all proposals, to waive any and all informalities or irregularities, and to disregard all non-conforming responsive conditional proposals. Each Proposer is liable for all proposal errors or omissions. A proposer shall not be permitted to alter or amend any proposal documents after the Proposal deadline time and date detailed in the RFP unless such is formally requested, in writing, by the District.

## **Bid Format Requirements**

- a. The Structured Cabling specifications for ITB #21358 is described in Part III. Service Providers are required to provide the information below as well as complete the District Related Forms in Appendix A.
- b. Bid Responses are to include the documents as follows:
  - i. **Transmittal Cover Letter:** Prepare a letter transmitting the bid on business letterhead. The letter should identify the business name, phone number, and business web address along with the name, phone number, and email address of the key contact person. The letter must have the signature of a person with authority to obligate the business. The transmittal cover letter shall also contain a statement that the bid is a firm offer for a ninety (90) day period.
  - ii. **Bid Cost Form**, including evidence of State certification to perform the work required.
  - iii. **Completed District Related Forms** set forth in Appendix A of this ITB.
  - iv. **Bid Guaranty:** A Certified Check for 10% of the total amount of the bid payable to the Treasurer of the Cleveland Metropolitan School District, or satisfactory bid bond executed by the bidder or a Surety company on a form supplied by the bondsman.

## **Section B: Bid Constraints**

- i. The service provider must comply with all laws, rules and regulations dictated by the Board of Education of the Cleveland Metropolitan School District, City of Cleveland, the State of Ohio and the United States Federal Government.
- ii. Purchases funded by federal grant funds must adhere to regulations found in Uniform Guidance "Super Circular", 2 CFR 200 (UGG), as a condition of receiving funds and to meet annual audit compliance. In an effort to keep policy for all grants consistent, the District implemented the new federal guidelines regarding procurement utilized with federal grants immediately.
- iii. The District will only accept proposals that cover all of the major components requested in the RFP.
- iv. Service provider shall not include Ohio Sales Tax in the price quoted. The District will provide tax exempt certificate to the successful Proposer.
- v. Service provider's personnel and subcontractors on the District site will be required to meet security requirements. Service provider agrees to successfully complete background checks on all of its employees, agents and subcontracts, if necessary, who provide services on site under this scope of work. Each person on site must wear an identification badge that clearly identifies and makes visible the person's name and company.
- vi. No response may be withdrawn for at least ninety(90) days after receipt of bids.
- vii. Bidder understands and agrees that subsequent to submission of the bid, any District resolution authorizing the award of a contract or agreement does not vest any contractual rights to the bidder.
- viii. Bidder understands and agrees that such District resolution operates only to encumber funds necessary for the project and does not create a binding contract.
- ix. Bidder further acknowledges and agrees that any such District resolution may be revoked, at any time

- prior to execution of a formal, written contract.
- x. Bidder acknowledges and agrees that it has no vested contractual right until such time as a purchase order or contract have been issued.
  - xi. Bidder further acknowledges and agrees that execution of a contract and issuance of a purchase order is not a ministerial function but is a formal requirement for acceptance of a bid.
  - xii. Bidder must present evidence to the District, upon request, that they are fully competent and have the necessary facilities, equipment and financial resources to perform the work required in the specifications within the time frame required.
  - xiii. The District reserves the right to award the bid in whole or in parts, by item, by group of items, to a single service provider or to multiple service providers, where such action serves the best interests of the District.
  - xiv. The successful Service provider and their subcontractor(s), including organizations having personnel, equipment and vehicles on District property, shall provide evidence of insurance as follows:
    - a. Commercial General Liability Including limited contractual liability \$2,000,000.00 Limit of Liability (Per occurrence)
    - b. Automobile Liability Including non-owned and hired \$2,000,000.00 Limit of Liability (Per occurrence)
    - c. Worker's Compensation Worker's compensation and employer's insurance to full extent required by applicable law
  - xv. This requirement must be fulfilled by the successful service provider providing the District with a current Certificate of Insurance (standard ACORD form), showing the Board of Education of the Cleveland Municipal School District as an additional insured (Certificate Holder does not constitute being an additional insured), within five(5) days of Notice of Intent to Award Agreement. The certificates of insurance shall contain a provision that the policy or policies shall not be cancelled without thirty (30) days' prior written notice to the District.
  - xvi. The required insurance must be provided by a company licensed by the State of Ohio, which company must be financially acceptable to the Administration of the Cleveland Municipal School District
  - xvii. The District is not liable for vandalism which results in damage(s) to the property or vehicles of the Vendor. The school District will not reimburse for private insurance deductibles for such vandalism.
    - a. Vandalism damage is defined as damage resulting from criminal conduct for which an individual may (but not necessarily be processed under the Ohio Revised Code
  - xviii. In submitting a bid, service providers agree, unless specifically authorized in writing by an authorized representative of the District on a case by case basis, that it shall have no right to use, and shall not use, the name of Cleveland Metropolitan School District, its officials or employees, in any advertising, publicity, promotion, nor to express or imply any endorsement of service provider's services.
  - xix. The Diversity Business and Service Provider Contract Compliance Programs shall make every good faith effort to ensure that certified diversity business enterprises in the District's relevant geographic market area shall be afforded the maximum opportunity to compete for contracts, services, and purchases. The general goals for diversity business participation are: 15% for services, 20% for goods and supplies, and 30% for maintenance, construction, and repair. Non-diversity vendors will have their diversity business participation counted toward their goal attainment only with minority vendors who are certified and demonstrate previous experience in the respective business classification of the prime contractor. Only direct participation in the subcontract will be counted toward diversity business enterprise goal attainment. Service Providers shall refer to <https://bit.ly/3wvVApK> for further information and requirements on the District's diversity goals.

## Section C: Evaluation Process

- i. **Responsiveness**: Bids will be evaluated, first, as responsive or non-responsive to the Bid specifications. A preliminary review will be conducted of all bids submitted on time to ensure the bid adheres to the material submission requirements specified in the Bid. Bids that do not meet the material submission requirements may be deemed non-responsive and rejected. In the event that all bidders do not meet one or more of the material submission requirements, the District reserves the right to continue the qualitative evaluation of the bids and select the bid(s) which most closely meets the specifications in the ITB. Bids must include, or meet, the following submission requirements:
  - a. Timely Submission
  - b. Transmittal Cover Letter
  - c. Bid Cost Form
  - d. District Related Forms
  - e. Bid Guaranty
- ii. **Qualitative Evaluation** – The Bids will be evaluated to determine the lowest responsive and responsible bidder.

## Section D: All District Related Forms

There are a number of REQUIRED forms in Appendix A of the ITB that must be completed and submitted with the bid response. These forms include

- a. Addendum Acknowledgement
- b. Certificate of Debarment
- c. Conflict of Interest
- d. Proposer Qualification Form
- e. Non-Collusion Affidavit
- f. DBE Forms – A, B, C, D, E, F, G, & H
- g. EOA Contractual Declaration Forms
- h. References

## Section E: Award of Contract

- i. The terms of this agreement will begin immediately upon selection, approval, and contract execution through completion of the lowest responsive and responsible service provider.
- ii. The contract documents consist of the following:
  - a. District Contract
  - b. Certified Purchase Order or Supplier Contract
  - c. ITB Submission Requirements
  - d. Bid Cost Form
  - e. Bid Guaranty
  - f. All Required District Related Forms
  - g. All applicable addenda
- iii. The awarded bidder shall perform all work described in the contract documents, including without limitation, all terms and conditions of the specifications contained herein or otherwise stated in the bid documents and reasonably inferable therefrom by the bidder as necessary to produce the results intended thereby for specifications requested herein by the District.
- iv. CMSD reserves the right to reject all bids and deviate from this purchasing process to utilize other purchasing mechanisms available to the district under Ohio Law. Scope review and follow-up discussions with the apparent low bidder may be requested. CMSD reserves the right to interview or to seek additional information related to criteria already specified in the Invitation to Bid after opening the bids prior to issuance a certified Purchase Order or Supplier Contract

## Part II: Overview, Background, and Specifications

### Section A: Overview

The Cleveland Metropolitan School District (hereafter the “District”) under ITB #21358 is seeking service providers to provide Structured Cabling to the District.

The District is seeking a service provider to install Cat 6 “Home Runs” 9008 in district facilities. Runs will consist of terminating at the patch panel and will end in each classroom as a wall jack for: Classroom Equipment, Wireless Access Point, Library, Computer Lab, Office Equipment, etc.

To facilitate submission and evaluation of bids, the following provides relevant background information and specifications. Instructions on how to submit a bid can be found in Part I. Service providers may submit a bid in response to the specifications below.

### Section B: Background

The District is a large urban school system with over 100 instructional non-instructional sites, approximately 6,000 teachers and administrative staff, 36,000 District students, and 3,500 classrooms.

The Department of Information Technology’s mission is to provide technology services that enables our students to succeed in a global society with support from our educators and community. The Department of Information Technology strategy seeks to enable and support growth, innovative teaching and learning, enhancing technology systems and infrastructure, information transparency, and easily accessible enterprise services. In pursuing the strategy, there are principles that promote industry best practices, encourage common approaches that enable integration and interoperability, and assure accountability in all aspects of IT implementation and operation.

### Section C: Specifications

- i. Existing cable conduits should be utilized for the new runs only after the existing cat5e or coax cable have been removed.
- ii. Use the existing wire mold. (A change order will be needed only if the molds are broken or worn out.)
- iii. The service provider should provide “as-built” drawings showing the cable runs, and cable numbering as per the “Standards Document” which is attached.
- iv. The service provider should provide an inventory of installed cables documenting the numbering scheme for cable runs with the end-point, the closet that it terminates in, and the patch panel termination (in electronic form)
- v. Complete demo of old coaxial and cat5(e) cabling
- vi. Removal of any old wireless access point.
  - a. Cisco 2602 or earlier model
  - b. Non-Cisco brand type APs
- vii. Removal of old patch panel equipment in the network closet racks.
- viii. Abandoned cabling
- ix. Upgrade fiber at schools that have closets that don’t have LC connections. Specs are as listed below:
  - a. Fiber inter-building
    - i. Main equipment room (er) to main equipment room (er) inter-building
      - a. Provide a minimum 12-strand single-mode Optical Fiber Backbone System between all buildings

- on the same campus.
- ii. Utilize indoor/outdoor rated fiber to eliminate the need for transition points. Utilize armored fiber for any runs which have a segment not installed in a fixed pathway (cable tray or conduit).
  - iii. Upgrade existing Optical Fiber Backbone Systems to the following requirements.
    - a. Provide a Single-Mode, Optical Fiber Cable between the Main Equipment Room (MER) of the Network Center and each associated Building's Main Equipment Room (MER).
    - b. The Single-Mode, Fiber Optic cable shall be an OS2 9/125-micron fiber.
    - c. The Single-Mode, Optical Fiber cable shall be a minimum 12 strands between buildings -- MER to MER.
    - d. The Single-mode fibers shall be terminated with fusion-spliced, factory-polished, LC Pigtails or pre-terminated backbone fiber with associated fiber cassettes capable of 10 Gbps operation. LC connectors shall be utilized on all Single-mode fibers
- HORIZONTAL CABLE GENERAL



**Part III: Bid Cost Form**  
**ITB #21358 Structured Cabling**

The Bidder proposes to furnish all labor, materials, and equipment necessary to complete Structured Cabling in 93 buildings. The undersigned proposes to install Cat 6 "Home Runs" 9008 in district facilities for Cleveland Metropolitan School District in accordance with the Specifications and to the entire satisfaction of, and acceptance by, the District and for the following prices.

The Agreement will begin **November 1, 2022** pending authorization of funds at the discretion of the District.

Removal of old coaxial, cat5(e) cabling,  
old wireless access points,  
old patch panel equipment, abandoned cabling: \_\_\_\_\_

Installation of Cat 6 "Home Runs" 9008: \_\_\_\_\_

**Vendors are required to complete the signatory section below.**

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

Address: \_\_\_\_\_

City, State, Zip Code: \_\_\_\_\_

Telephone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

Email Address: \_\_\_\_\_

Signature: \_\_\_\_\_

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

Date: \_\_\_\_\_

**Appendix A: District Related Forms**  
**Addendum Acknowledgement Form for ITB #21358**

Having read and examined the Request for Proposal Documents, including the specifications, prepared by the Cleveland Metropolitan School District for the above-referenced Project, and the following Addenda:

Addendum Number

Date of Receipt

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Bidder: \_\_\_\_\_.

The undersigned Vendor proposes to perform all work for the applicable contract, in accordance with the contract document for the proposed sums.

***Failing to acknowledge a published Addendum may cause your bid to be rejected.***

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

# Certificate of Debarment



## Certification Regarding Debarment, Suspension, and Other Responsibility Matters Primary Covered Transactions

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 13 CFR Part 145. The regulations were published as Part VII of the May 26, 1988 *Federal Register* (pages 19160-19211). Copies of the regulations are available from local offices of the U.S. Small Business Administration.

### (BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

- (1) The prospective primary participant certifies to the best of its knowledge and belief that it and its principals:
  - (a) Are not presently debarred, suspended, proposed for disbarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
  - (b) Have not within a three-year period preceding this application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
  - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
  - (d) Have not within a three-year period preceding this application had one or more public transactions (Federal, State, or local) terminated for cause or default.
- (2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective primary participant shall attach an explanation to this proposal.

Business Name \_\_\_\_\_

Date \_\_\_\_\_

By \_\_\_\_\_

Name and Title of Authorized Representative

\_\_\_\_\_  
Signature of Authorized Representative

## Certificate of Debarment Pg. 2

- 2 -

### INSTRUCTIONS FOR CERTIFICATION

1. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
2. The inability of a person to provide the certification required below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such person from participation in this transaction.
3. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.
4. The prospective primary participant shall provide immediate written notice to the department or agency to which this proposal is submitted if at any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
5. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations (13 CFR Part 145).
6. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
7. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
8. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the ineligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
9. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
10. Except for transactions authorized under paragraph 6 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

# Conflict of Interest Form

## Statement of Potential Conflicts of Interest

Vendor Name:	Primary Contact:
Address 1:	Telephone #:
Address 2:	Fax #:
City:	Email:
State, Zip:	Website:

Cleveland Metropolitan School District (CMSD) adheres to Ohio Ethics Law and strictly follows the opinion of the Ohio Ethics Commission. As such, each vendor is requested to submit this statement declaring any potential conflicts of interest in doing business with the District. Please answer the following two questions providing all requested information.

1. Are any current Cleveland Metropolitan School District (CMSD) employees, Cleveland Board of Education members, or any of their immediate family members, also members of the vendor's board of directors, hold any officer position with the vendor, or own any shares of any stock issued by the vendor?

Yes \_\_\_\_\_ No \_\_\_\_\_

If **Yes**, and if the CMSD employee, CMSD board member, or immediately family member is a member of the vendor's board of directors or holds an office with the vendor, please state the person's name and position with the vendor.

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

Position: \_\_\_\_\_

If **Yes**, and if the CMSD employee, CMSD board member, or immediate family member owns share of any stock in the vendor organization or company, state the percentage of all outstanding company shares owned by the CMSD employee or board member.

\_\_\_\_\_ %

2. Are any current CMSD employees, CMSD board members, or any immediate family members also employees of the vendor?

Yes \_\_\_\_\_ No \_\_\_\_\_

If **Yes**, please state the person's name and provide a description of their job duties for the provider:

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

Job Duties: \_\_\_\_\_

If **Yes**, please describe the contact that the vendor will have with the CMSD employee or CMSD board member in the course of providing services to the District:

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**CERTIFICATION**

I do hereby certify that the foregoing statements are true and accurate, and that my signature below attests to the authenticity of my identity as the person actually signing this form. This document is not a contract. In order for a binding Agreement to exist, a signed Agreement will be required prior to any legally binding commitment by the District.

**NOTARIZED STATEMENT**

\_\_\_\_\_ being duly sworn and deposes says

That he/she is the \_\_\_\_\_ of  
(title)

\_\_\_\_\_, and answers to all the  
(organization)  
foregoing questions and all statements therein contained are true and correct.

\_\_\_\_\_  
(signature)

Subscribed and sworn before me this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

Notary Public: \_\_\_\_\_

My commission expires: \_\_\_\_\_

## Bidder Qualifications Form

Bidder must answer all questions or attach a written explanation for each question.

PROPOSER NAME: \_\_\_\_\_

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

CITY; STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_

TITLE: \_\_\_\_\_

TELEPHONE: (    ) \_\_\_\_\_ TOLL FREE: (    ) \_\_\_\_\_

TAXPAYER IDENTIFICATION NUMBER: \_\_\_\_\_

1. What type of organization? (i.e. corporation, partnership, etc.)
  
2. How many years has your organization been in business?
  
3. How many years has your organization been in business under its current name?
  
4. List any other aliases your organization has utilized in the last two years and the form of Business
  
5. If you are currently a corporation, list the following:
  - a. State of incorporation
  
  - b. Date of incorporation
  
  - c. President's name
  
  - d. Secretary's name
  
  - e. Treasurer's name
  
  - f. Statutory agent's name
  
  - g. Name of shareholders, if less than 10

- h. Principal place of doing business
- 
- 6. If you are currently in a partnership, list the following:
    - a. Name and address of all general and limited partners.
  
    - b. Original name and date of organization's inception
- 
- 7. If you are neither a corporation nor a partnership, please describe your organization and list principals.
- 
- 8. Are you legally qualified to do business in the State of Ohio?
- 
- 9. Are you legally qualified to do business in Cuyahoga County and licensed by the City of Cleveland?
- 
- 10. Has your organization ever been (i) declared by a customer to be in default under a contract and/or (ii) sued by a customer for failure to completely a contract or properly perform services in a timely manner? If yes, please state where, when, and why.
- 
- 11. Has your organization ever been cited by a local, county, state, or federal authority for violation of a regulation or statute or failing to timely complete a contract in accordance with specifications? If yes, please state date, agency, and final disposition.
- 
- 12. Has your organization ever filed for bankruptcy? If yes, please state where, when and why?
- 
- 13. On a separate sheet, list the major customers for whom your organization has provided this type of equipment or service in the past five years. Include owner's name and type of work performed.
- 
- 14. Has your organization ever been sued by a supplier for failure to timely pay for materials or equipment provided? If yes, please provide details.
- 
- 15. What is the dollar limit of your firm's General (CLS) Liability Insurance?  
  
Name of insuring company: \_\_\_\_\_  
  
Policy number: \_\_\_\_\_
- 
- 16. What is the dollar limit of your firm's Automotive Liability Insurance?



Owned vehicles\_\_\_\_\_

Non-Owned vehicles\_\_\_\_\_

Name of insuring company\_\_\_\_\_

Policy number\_\_\_\_\_

17. List the name and address of every person having an interest in this ITB.
  
  
  
  
  
  
  
  
  
  
18. Has any federal, state or local government entity ever cited or taken any action against your organization or any of its principals for failure to pay or remit any taxes including but not limited to income, withholding, sales, franchise, or personal property taxes? If yes, please give name of agency, date and amount of taxes overdue and resolution of the issue.
  
  
  
  
  
  
  
  
  
  
19. Is your organization and its' principals current in payment of personal property taxes?
  
  
  
  
  
  
  
  
  
  
20. The prospective lower tier participant certifies, by submission of this ITB, that neither it nor its principals is presently debarred, suspended, proposed, for debarment or suspension, declared ineligible, or voluntarily excluded from participation in this transaction by any State and/or Federal Department or Agency.
  
  
  
  
  
  
  
  
  
  
21. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participants shall attach an explanation to this ITB.

## Notarized Statement

\_\_\_\_\_ being duly sworn and deposes says

that he/she is the \_\_\_\_\_ of  
(title)

\_\_\_\_\_, and answers to all the  
(organization)

foregoing questions and all statements therein contained are true and correct.

\_\_\_\_\_  
(signature)

Subscribed and sworn before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

Notary Public: \_\_\_\_\_

My commission expires: \_\_\_\_\_

## Non-Collusion Affidavit

This Affidavit must be executed and shall accompany the proposal in order for the proposal to be considered.

NON-COLLUSION AFFIDAVIT  
State of Ohio, Cuyahoga County

\_\_\_\_\_, being first duly sworn, deposes and says that

he/she is \_\_\_\_\_ of \_\_\_\_\_

of the party making the foregoing proposal; that such proposal is genuine and not collusive or sham; that said proposer has not colluded, conspired, connived, or agreed, directly or indirectly, with any proposer or person, to put in a sham proposal, or that such other person shall refrain from proposing, and has not in any manner, directly or indirectly sought by agreement or collusion, or communication or conference, with any person, to fix the proposal price of affiant or any other proposer, to fix any overhead, profit or cost element of said proposal price, or of that of any proposer, or to secure any advantage against the Board of Education of the Cleveland Metropolitan School District, or any person or persons interested in the proposal; and that all statements contained in said proposal are true; and further that such proposer has not, directly or indirectly, submitted this proposal, or the contents thereof, or divulged information or data relative thereto to any Association or to any member or agent thereof.

\_\_\_\_\_  
Affiant

Sworn to and subscribed before me this \_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public in and for Cuyahoga County, Ohio

My commission expires: \_\_\_\_\_

## Diversity Business Enterprise Forms

Information about the District's Diversity Business Enterprise Program can be found at <https://bit.ly/3wvVApK>.

### DBE Form A

Name of Firm: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip Code: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Type of Business (Product or Service): \_\_\_\_\_

Date of Proposed Contract Award: \_\_\_\_\_

Amount of Proposed Contract Award: \_\_\_\_\_

Diversity Business Enterprise Subcontractor(s):  
\_\_\_\_\_

Dollar Amount Subcontract Award: \_\_\_\_\_

Percent of Subcontract Award: \_\_\_\_\_

D.B.E. Participation: \_\_\_\_\_ \$ \_\_\_\_\_

F.B.E. Participation: \_\_\_\_\_ \$ \_\_\_\_\_

Name of EEO Officer: \_\_\_\_\_

\_\_\_\_\_  
(Signature of owner, partner, or authorized officer)

Name: \_\_\_\_\_ (printed) Dated: \_\_\_\_\_

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

DO NOT COMPLETE BELOW THIS LINE

\_\_\_ Compliant \_\_\_ Compliance Pending \_\_\_ Non-Compliant

Compliance Date: \_\_\_\_\_

\_\_\_\_\_  
(signature, DBE Department)

\_\_\_\_\_  
(date)

## DBE Form B

### NOTICE OF REQUIREMENT TO ENSURE DIVERSITY BUSINESS ENTERPRISE (DBE) OPPORTUNITY

Note: All eligible proposers for award of the contract should comply with the Requirements, Terms, and Conditions of this Notice.

The undersigned proposer hereby agrees that the goal it has established for DBE participation in this project through either subcontracting or entering into a joint Venture with DBEs in conformity with the Requirements. Terms and Conditions of this Notice is a goal of thirty (30%) percent for a construction/repair/ maintenance contract, twenty (20%) percent for a supply contract, and fifteen (15%) for a service contract of the total contract amount of this project. In no event will the absence of goals as stated above be deemed as compliance with the requirements, terms and conditions of this notice.

In addition, the undersigned will complete and attach hereto the DBE (Form C) Schedule for DBE participation, showing all DBE/FBE that will participate as subcontractors or joint ventures in this contract and a DBE (Form D), DBE Letter of Intent form for each DBE/FBE listed on the Schedule.

Proposer: \_\_\_\_\_

Date: \_\_\_\_\_

By: \_\_\_\_\_

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

#### Definition of DBE: A Diversity Business Enterprise (DBE)

"Small Diversity business concern" means a small business concern that is a least (51) percent unconditionally owned by one or more individuals who are both socially and economically diverse, or a publicly owned business that has at least (51) percent of its stock unconditionally owned by one or more socially and economically diverse individuals and that has its management and daily business controlled by one or more such individuals. This term also means a small business concern that is at least (51) percent unconditionally owned by an economically diverse Indian tribe or Native Hawaiian Organization, or a publicly owned business that has least (51) percent of its stock unconditionally owned by one of these entities, that has its management and daily business controlled by members of an economically diverse Indian tribe or Native Hawaiian Organization.

**DBE Form C**

**SCHEDULE MBE/FBE PARTICIPATION**

Project Name: \_\_\_\_\_

Name of Non-DBE Contractor: \_\_\_\_\_

Identification Number: \_\_\_\_\_

Location: \_\_\_\_\_

Name of Minority Contractor: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Type of work to be performed and work hours involved:  
\_\_\_\_\_

Projected commencement and completion dates for work:  
\_\_\_\_\_

Agreed price in dollars or percentage:  
\_\_\_\_\_

The undersigned will enter into a formal agreement with DBE for work listed in this schedule conditioned upon execution for a contract with the Cleveland Municipal School District

TO BE RETURNED WITH THE PROPOSAL

\_\_\_\_\_  
Signature of Non-DBE Prime Contractor

Date: \_\_\_\_\_

# DBE Form D

## DBE LETTER OF INTENT

To: \_\_\_\_\_  
*Non-DBE Prime or General Proposer*

Project: \_\_\_\_\_

### NON-DBE PRIME OR GENERAL PROPOSER

The Undersigned intends to perform work in connection with the above-referenced project as (check one):

an individual     a corporation     a partnership     a joint venture

DBE status of the undersigned is confirmed in the Cleveland Municipal School District's DBE file of bona fide enterprises with a certification date of: \_\_\_\_\_

The Undersigned is prepared to perform the following described work in connection with the above referenced project. Specify in detail particular work items or parts thereof to be performed:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

at the following price or percent of contract: \$ \_\_\_\_\_

You have projected the following commencement date of such work, and the undersigned is projecting completion of such work as follows:

**Items** \_\_\_\_\_

**Projected Commencement Date** \_\_\_\_\_

**Projected Completion Date** \_\_\_\_\_

\_\_\_\_\_ % (percent) of the dollar value of the subcontract will be sublet and/or awarded to NON-DBE contractor (s) and/or NON-FBE SUPPLIERS. The undersigned will enter into a formal agreement for the above work with you conditioned upon your execution of a contract with the Cleveland Municipal School District.

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Name of DBE Firm (where applicable)**

\_\_\_\_\_  
Signature of DBE (where applicable)

\_\_\_\_\_  
Signature of MBE Firm

(TO BE RETURNED WITH ITB)

\_\_\_\_\_  
**Name of FBE Firm**

\_\_\_\_\_  
**Signature of FBE Firm**

**DBE Form E**

**DBE Unavailability Certification**

I, \_\_\_\_\_,  
*Name Title*

Of \_\_\_\_\_, certify that on \_\_\_\_\_  
*Date*

I contacted the following DBE to obtain a Proposal for work items to be performed on:

Board Project: \_\_\_\_\_

Minority Contractor: \_\_\_\_\_

Work Items Sought: \_\_\_\_\_

Form of Proposal Sought: \_\_\_\_\_

Female Contractor: \_\_\_\_\_

Work Items Sought: \_\_\_\_\_

Form of Proposal Sought: \_\_\_\_\_

To the best of my knowledge and belief said minority business enterprise was unavailable (exclusive of the unavailability due to lack of agreement on price) for work on this project or unable to prepare a proposal for the following reason (s):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
*Signature, Non-DBE prime Proposer Date*

\_\_\_\_\_ was offered an opportunity to proposal on the above-referenced work on \_\_\_\_\_  
\_\_\_\_\_ by \_\_\_\_\_  
*Date Non-DBE Prime Proposer*

\_\_\_\_\_  
*Signature, Non-DBE Prime Proposer*

The above statement is a true and accurate account of why I did not submit a Proposal on this project.

\_\_\_\_\_  
*Signature, Non-DBE prime Proposer*



**DBE Form F**

**Non-Minority Prime Affidavit For DBE**

STATE OF            }  
COUNTY OF        } SS.

**AFFIDAVIT**

The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the items and operation of our subcontract and the intended participation by each party in the undertaking. Further, the undersigned covenant and agree to provide to the Cleveland Municipal School District current, complete, and accurate information regarding actual subcontract work and the payments thereof, and any proposed changes in any of the subcontract arrangements and to permit the audit and examination of the books, records and files of the subcontract or those of each party relevant to the subcontract, by authorized representatives of the Cleveland Municipal School District. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under federal and state laws concerning false statements.

Name of Firm: \_\_\_\_\_

Signature: \_\_\_\_\_

Name and Title: \_\_\_\_\_

Date: \_\_\_\_\_

STATE OF            }  
COUNTY OF } SS.

On this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_, before me appeared \_\_\_\_\_

\_\_\_\_\_, to me personally known, who being duly sworn,

did execute the foregoing affidavit, and did state that they were properly authorized by \_\_\_\_\_

\_\_\_\_\_ to execute the affidavit and did so as their free act and deed.

(Seal)

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

Commission expires \_\_\_\_\_

## DBE Form G

**This form need not be completed if all joint venture firms are diversity business enterprises**

1. Name of Joint Venture: \_\_\_\_\_

2. Address of Joint Venture: \_\_\_\_\_

3. Phone Number of Joint Venture: \_\_\_\_\_

4. Identify the firms which comprise this joint venture. (The DBE partner must complete DBE Form A or have current DBE Certification)

---

---

a. Describe the roll of the DBE firm in the joint venture: \_\_\_\_\_

---

b. Describe briefly the experience and business qualifications of each non-DBE Joint Venture: \_\_\_\_\_

---

5. Nature of Joint Venture's Business: \_\_\_\_\_

---

6. Provide a copy of the Joint Venture Agreement.

7. What is the percentage of DBE Ownership? DBE \_\_\_\_\_% FBE \_\_\_\_\_%

8. Ownership of Joint Venture: (This need not be completed if described in the Joint Venture agreement provided in response to question 6).

a. Profit and loss sharing: \_\_\_\_\_

---

b. Capital contributions, including equipment: \_\_\_\_\_

---

c. Other applicable ownership interest: \_\_\_\_\_

---

9. Control of and participation in this contract. Identify by name, race, and "firm" those individuals and their titles who are responsible for day-to-day management and policy decision making, including, but not limited to, those prime responsibility form:

a. Financial decisions: \_\_\_\_\_

\_\_\_\_\_

b. Management decisions, such as:

i. Estimating: \_\_\_\_\_

ii. Marketing and Sales: \_\_\_\_\_

iii. Hiring and firing of management personnel: \_\_\_\_\_

\_\_\_\_\_

iv. Purchasing of major items or supplies: \_\_\_\_\_

\_\_\_\_\_

c. Supervision of field operations: \_\_\_\_\_

\_\_\_\_\_

Note: If after complete the DBE Form B and before the completion of the joint venture's work on any contract awarded, there is any significant change in the information submitted, the joint venture must inform the Cleveland Municipal School District, either directly or through the non-DBE prime subcontractor if the joint vendor is a subcontractor.

**DBE Form H**

**Non-Minority Prime Affidavit (Joint Venture)**

**STATE OF OHIO**

**CUYAHOGA COUNTY**

**AFFIDAVIT**

The undersigned swear that the forgoing statements are correct and include all material information necessary to identify and explain the items and operation of our subcontract and the intended participation by each joint venture in the undertaking. Further, the undersigned covenant and agree to provide to the Cleveland Municipal School District current, complete, and accurate information regarding actual joint venture work and the payments thereof and any proposed changes in any of the subcontract arrangements and to permit the audit and examination of the books, records and files of the joint venture or those of each party relevant to the joint venture, by authorized representatives of the Cleveland Municipal School District. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under federal and state laws concerning false statements.

\_\_\_\_\_  
*Name of Firm (Prime)*

\_\_\_\_\_  
*Name of Firm (DBE)*

\_\_\_\_\_  
*Signature*

\_\_\_\_\_  
*Signature*

\_\_\_\_\_  
*Name and Title*

\_\_\_\_\_  
*Name and Title*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*Date*

STATE OF

] COUNTY OF

]SS.

On this \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_ , before me appeared \_\_\_\_\_, to me personally known, who being duly sworn, did execute the foregoing affidavit, and did state that they were properly authorized by \_\_\_\_\_ to execute the affidavit and did so as their free act and deed.

*(Seal)*

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

\_\_\_\_\_  
*Commission expires*

## EOA Contractual Declaration Forms

Information about the District's Affirmative Action Program can be found at <https://bit.ly/3wwVApK>.

### Service Provider Contract Compliance Form

Name of Firm: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip Code: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Standard Metropolitan Statistical Area: \_\_\_\_\_

Recruitment Area: \_\_\_\_\_

Type of Business (product or service): \_\_\_\_\_

Name of EEO Officer: \_\_\_\_\_

Signature of Owner, Partner, or Authorized Officer: \_\_\_\_\_

Name (type or print): \_\_\_\_\_

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

---

Do not complete below this line

---

Status of Vendor:

Compliance

Conditional Compliance

Non-Compliance

Compliance Pending

Comments: \_\_\_\_\_

\_\_\_\_\_

Date: \_\_\_\_\_ Signature: \_\_\_\_\_



## Employment Data Form

Please note this data may be obtained by visual survey or post-employment record. Neither visual surveys nor post-employment records are prohibited by any federal, state or local law. All specified data is required to be filled in by District policy.

Job Categories	All EMPLOYEES			MALES					FEMALES				
	TOALS MALES & FEMALES	MALES	FEMALES	WHITE (NOT OF HISPANIC ORIGIN)	BLACK (NOT OF HISPANIC ORIGIN)	ASIAN AMERICAN OR PACIFIC ISLANDER	AMERICAN INDIAN OR ALSKAN NATIVE	HISPANIC	WHITE (NOT OF HISPANIC ORIGIN)	BLACK (NOT OF HISPANIC ORIGIN)	ASIAN AMERICAN OR PACIFIC ISLANDE	AMERICAN INDIAN OR ALSKAN NATIVE	HISPANIC
OFFICIALS, MGRS & SUPERVISORS													
PROFESSIONALS													
TECHNICIANS													
SALES WORKERS													
OFFICE/CLERICAL													
CRAFTWORKERS (SKILLED)													
OPERATIONS (SEMI-SKILLED)													
LABORERS (UNSKILLED)													
SERVICE WORKERS													
APPRENTICES													
TOTAL													

**Additional information (optional):**

Describe any other actions taken which show that all employees are recruited, hired, or trained or promoted without regard to their race, religion, color, sex, handicap, age or national origin. Use second sheet if additional space is needed:

The undersigned certifies that they are legally authorized by the proposer to make the statements and representations contained in this report, and that they have read all of the foregoing statements and representations which are true and correct to the best of their knowledge and belief.

FIRM OR CORPORATE NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

TITLE: \_\_\_\_\_

## References

Include below three references of equal or larger size to this current ITB project. Public sector experience is preferred, but not required. Please attach relevant supporting documentation, such as project plans, scope of work.

### **Reference #1:**

Company/School Name: \_\_\_\_\_

Address: \_\_\_\_\_

Type of Business: \_\_\_\_\_

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

Telephone and Fax#: \_\_\_\_\_

Dates of Service: \_\_\_\_\_

Description of Services Provided: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### **Reference #2:**

Company/School Name: \_\_\_\_\_

Address: \_\_\_\_\_

Type of Business: \_\_\_\_\_

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

Telephone and Fax #: \_\_\_\_\_

Dates of Service: \_\_\_\_\_

Description of Services Provided: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**Reference #3:**

Company/School Name: \_\_\_\_\_

Address: \_\_\_\_\_

Type of Business: \_\_\_\_\_

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

Telephone and Fax#: \_\_\_\_\_

Dates of Service: \_\_\_\_\_

Description of Services Provided: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Appendix B: Service Provider Checklist

To assist service providers in the preparation of their proposals to ensure compliance with all document requirements

- Cover Page
- Transmittal Cover Letter, signed
- Table of Contents
- Bid Cost Form
  - Signatory
- District Related Forms
  - Addendum Acknowledgement, checked: <https://www.clevelandmetroschools.org/purchasing> for any addendums
  - Certificate of Debarment
  - Conflict of Interest
  - Bidder Qualification Form
  - Non-Collusion Affidavit
  - DBE Forms- A, B, C, D, E, F, G, & H, for more information: <https://bit.ly/3wvVApK>
  - EOA Contractual Declaration Forms 1 &2, for more information: <https://bit.ly/3wvVApK>
  - Employment Data Form
  - References
- Bid Guaranty

### Copies

- Original, marked
- Copies (1), marked
- USB B/Flashdrive

## Appendix C: CMSD Tech and Security Standards

### GENERAL

CMSD personnel will be consulted during the planning stages of any building construction or building renovation. In some cases, current Entrance Facilities (EF), Equipment Rooms (ER), Main Equipment Room (MER) and Technology Rooms (TR) may need to be enlarged or redesigned to accommodate changes in the use of building space.

CMSD will review drawings and specifications on construction and renovation projects for compliance with the District Communications Cabling Standard. CMSD will approve drawings and specifications through the Facilities Department.

The project contractor will request CMSD to connect, disconnect, and/or move communication cables connected to the campus communication network, in the EF, MER and TR(s), following established guidelines before project commencement. CMSD will be responsible to perform the work once the request is received. The project contractor will be responsible to remove all cabling back to the EF/MER/TR once disconnected.

Any project that requires moving or rerouting of networking cables will bear the cost of said moves.

All pathway work will be paid by project funding. The Project Contractor will be responsible for pathway to new/renovated building from the nearest manhole/tunnel or point of feed designated by CMSD Information Technology Department. These pathways shall meet CMSD standards and meet all applicable codes. These pathways are for low voltage cables only. It will be the responsibility of the project contractor to coordinate with CMSD to schedule site visits.

All work specified shall be UL listed and in accordance with the most current versions of the following codes and agencies:

The National Electrical Code, Article 800 National Fire Code (N.F.P.A. 72A)

Life Safety Code (N.F.P.A. 101)

National Electronic Manufacturer's Association (NEMA) Institute of Electronic and Electrical Engineers (IEEE) EIA/TIA 568, Commercial Building Telecommunications Wiring Standard which includes EIA/TIA 568C series, 569, 598, 606, 607, 758-B.

BICSI TDMM Latest Edition

Marked up field drawings will be turned over to the CMSD Information Technology Department at first Life Safety Inspection. The marked-up field drawings will contain all riser diagrams and cable counts along with all technology outlets.

To enable CMSD to inspect networking facilities work, the contractor must:

Provide a progress schedule with the installation of networking raceways and spaces shown as a separate item.

Immediately notify CMSD of any change in architectural drawings and/or plans affecting CMSD facilities.

Allow that all underground work be approved by CMSD and Facilities Operations and Development before the site is covered with dirt or concrete. Failure to have the work inspected shall result in uncovering the area at the contractor's expense.

Provide proper access and facilities for inspections.

Each remodel and new build will need to assess the wired versus wireless connection needs. Specific requirements for each room and each project shall be collected during the Program of Requirement (POR) stage and the Design Development stage. The design team will coordinate with the department and CMSD in the planning stages of any project, to better understand and plan for the best method of deployment of connectivity.

All projects will have a minimum 20-year warranty for the cabling infrastructure offered by the connectivity solution. Warranties provided by cabling partners to cover the system will not be accepted. Contractor shall offer three-year warranties for all other components including AV and Security.

For questions concerning this document, please contact CMSD Information Technology Department.

## **SECTION I Contractor Qualifications:**

### **Cabling Contractor**

A BICSI certified RCDD, listed on the BICSI website with current credentialing. Contractor submittals shall include copies of all certificates of staff to work on the project.

The Contractor must hold a current certification from the manufacturer of the proposed connectivity solution. This certification must be valid for both installation and testing and shall enable the Contractor to offer the full manufacturer's product and applications warranties as specified. All technicians working on the project will have manufacturers training and training certificates.

The cabling contractor must have a minimum of five (5) years of documented experience installing structured cabling systems.

Installation personnel shall consist of 100% BICSI certified staff and listed on the BICSI website. There shall be at least one BICSI certified Technician during all cable installation work.

A Fluke Certified Cabling Test Technician (CCTT) will perform all testing on the project.

CMSD may approve or deny contractor based on contractor qualifications and work history at CMSD.

## **SECTION II Submittal Guidelines**

Contractor submittals will include the entire contractor qualifications based on Section 1 of this document, if these qualifications are incomplete or do not meet the standard the contractor will not be approved.

Product submittals must be received by CMSD no more than 10 days after the award of the company's contract. Prior to start of any project or ordering of materials selected contractor shall turn in submittals with an adequate amount of time to allow for review in advance for CMSD to review and comment. Submittals are to include the following at a minimum:

### **Division 27 contractor**

All product material for a complete and operable system to include but not limited to:

Cable

Ladder rack (within the TR)

Support systems

Jacks

Faceplates

Patch cords

Patch panels

Fiber patch cords

Fiber termination housings

Fiber panels and types

Firestop and UL systems being used

Racks/Cabinets

All BICSI certificates for installation technicians.

If installation staff change, the contractor shall inform the university and provide updated documentation.

Manufacturers training certificates for each technician

RCDD certificate

Fluke CCTT certificate

Factory calibration sheets for all testers being used on project

**Division 26 contractor to include but not limited to:**

Cable tray (outside the TR)

Backbone pathway

Conduit

Firestop and UL systems being used for project.

Any ancillary support items for the Division 27 contractor

Ground bars for both the ER and TR

## **SECTION III Technology Pathways**

### **GENERAL**

Cable facilities (conduit, cable trays, raceways etc.) are required for connecting laboratory, classroom, office areas, Entrance Facilities (EF) and Technology Rooms (TR). Cable facilities are furnished by project funding.

Upon completion, riser pathway (conduits/sleeves) shall have one additional empty conduit/sleeve in place for future.

CMSD should be consulted before removal of telephone wire and equipment, i.e., when office partitions are relocated. All wiring must be removed back to the source by the contractor.

The electrical contractor shall provide a pull string in all empty conduits.

Conduit will be used in inaccessible environments such as: drywall ceilings/walls or any location where pathway is not readily accessible. This includes but not limited to above HVAC ductwork, fume hoods, lab counters, cabinets and height issues not being able to safely access pathway from a stepladder.

Conduit types can vary per building the use of PVC or metallic conduits are acceptable as long as they meet code. If at any time metallic flex or non-metallic flex is used it shall be sized ½" larger than what is required to meet finished fill at 40%.

J-Hooks and/or cable tray will not be placed above hard ceiling or areas where there is no access or limited access (HVAC ducts or piping) Pull boxes, if needed, must be accessible. (See Exhibit A).

Hooks will be placed only above drop tile ceiling with a minimum clearance of 6" between T-bar and j-hook; at no time will the cable clearance be less than 3" to the T-bar. J-hooks will be placed at intervals no longer than 4'. At no point, will the cable contact the ceiling or any other trades work.

Any cable pathway shall be at 40% fill rate or less at project completion, if cable pathway is greater than 40% additional pathway will be added by the project.

At no time is it acceptable to place any other low voltage cabling within any pathway intended for voice and data cabling.

Plastic "zip-ties" are strictly prohibited for use of cable support.

All cable pathway shall be placed parallel and perpendicular to building lines.

**ALL CABLE PATHWAYS:**

Shall maintain the following clearances from possible sources of Electromagnetic Interference exceeding 5 kVA:

Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to grounded metal conduit pathway: 6"

Unshielded power lines or electrical equipment in proximity to a grounded metal conduit pathway: 12"

Unshielded power lines or electrical equipment in proximity to open or nonmetal pathways: 24"

Electrical motors and transformers: 47"

**Technology Outlet Pathway**

Open Air (low voltage cabling with j-hooks and no conduit stub ups within walls- fishable walls)

J-hooks

Only acceptable if walls are fishable, if any of the conditions below exist conduit "stub ups" shall be placed:

Fixed casework

lab counters

fume hoods

horizontal bracing in walls

firewall

J-hooks shall not be routed along walls, pathway will run to center of room and out to hallway if drywall is extended to ceiling a sleeved hole will be placed. Pathway fill ratios shall be adhered to.

J-hooks shall not be placed more than 18" above drop ceiling.

**Conduit Stub Ups & J-hooks**

J-Hooks are an acceptable method of installation from the cable tray to the communications stub up with spacing 5' on center or less to the "stub ups" located within the rooms.

Conduits to the technology outlets are to be a minimum of one inch based on fill. A dedicated conduit will serve each outlet box. Conduit "stub ups" will extend 2' from the wall, angle to the center of the room which it feeds and must have conduit bushings on the ends.

Conduit will be used in any open ceiling environment, unless CMSD has approved an alternate method of delivery.

Do not support cable from designated ceiling system or system tie wires or grid in fire rated systems. Tie wires installed specifically for IT with breakaway grid clips are acceptable upon approval.

**Technology Outlet boxes/low voltage mounting brackets**

Technology outlet boxes will be H-4 11/16" X W-4 11/16" X D-2 1/8", equipped with a 2-gang cover/plaster ring when installed with conduit.

Wall-phone outlets will be equipped with a single-gang cover/plaster ring. The height of these boxes will be determined by the use of the box.

For wireless AP installs in the ceiling requiring conduit, basis of design is: Randall Product # T- 55017 with a single gang mud ring or CMSD approved equal.

## **Conduit**

No conduit run, without a pull box, is to exceed 100 feet with no more than (2) 90 degree bends.

No LB(s) are to be used in lieu of pull boxes for communications.

40% fill at turnover and one additional conduit if fill ratio is at 40% or greater within that pathway.

All riser pathway will have at a minimum one empty conduit upon project completion.

All conduits that extend more than 25' will be required to be bonded/grounded per the NEC.

All conduit will have bushings installed.

Do not place pull boxes above fixed ceilings, HVAC ducts or piping

## **Electrical Non-Metallic (ENT) conduit is acceptable.**

ENT is only to be used for TOs (technology outlet) not main pathway.

When ENT style conduit is used size shall be increased by ½".

ENT will be securely fastened to tray and TOs.

Bushings shall be installed at each end.

Not acceptable in exposed conditions

## **Basket Tray**

A basket tray will be placed above drop ceilings in the hallways/corridors; it will not be placed above offices or classrooms. At no time is it acceptable to have basket tray above a hard ceiling or HVAC ducts. At no time does an access panel constitute an accessible space.

This tray will provide a path back to the Technology Room (TR). Cable trays and conduits must be properly grounded. All NEC codes for grounding of cable trays will be adhered to. Tray supports will be installed per the heaviest load rating per the manufacturer and NEMA Standards Publication VE- 2000.

If basket tray changes elevations and travels above other mechanicals for more than 5', conduit must be placed in lieu of tray. The conduit will be sized per the max fill on the tray.

Center Support Hangers shall only be used due to space restrictions and must be approved by owner.

Conduit sleeves shall be installed over rod and extend 8" above tray wall to protect cabling from damage during installation.

Tray may not be altered or notched to allow structural or other mechanicals passage.

## **Fire stopping**

An approved UL fire stop system must be used when penetrating fire rated walls or floors. All firestopping devices will be of the mechanical type, if for some reason a mechanical firestop solution is not available firestop will be a non-hardening pliable putty. All firestop penetrations will be an UL listed system, with labels adjacent to each penetration. Close out documents will include pictures of each penetration and the label affixed to the wall.

## **SECTION IV Entrance Facilities (EF), AND Technology Rooms (TR)**

All new EF(s)/MER(s), or TR(s) will utilize modular patch panels mounted on racks for connectivity of all CAT 6A/6A cabling.

All EF(s)/MER(s)/TR(s) will be connected via cable pathway that shall consist of basket tray or conduit.

Cable tray will be sized in each EF/TR so that no cable will hang over the edge and that all bend radii are met per the cabling manufacturer's specifications. The minimum size shall be an 18" cable tray (basket tray is not acceptable within any EF/TR).

In existing buildings, the new installation will be built according to the new guidelines

All cables will be secured with Velcro style ties; plastic cable ties of any type are not acceptable.

All TRs should be vertically stacked above and below each other to reduce cost and impact to business for new and future technology installations.

There must be at least one EF, MER, or TR per floor. One EF is required per building and shall not be placed above the second floor of any building. An MER is required if the building exceed five floors and shall not be placed below the 5th floor of any building. A TR should be placed centrally. If any cable length exceeds 90m (295 ft), including slack, from the TR an additional TR is required to support the total area.

Spaces for connection of the building communication cable to equipment will be provided in a separate room and not shared with other utility services, particularly the electrical service. When possible, this room will not be adjacent to the electrical distribution room. EF(s)/MER(s)/TR(s) will be a secure room directly accessible from a hallway, public access space, or within a mechanical room built out to meet CMSD Cabling Standards. All TR(s) require the design, installation, and commissioning of an appropriately sized HVAC system. Room temperature must be maintained between 65 to 85 degrees Fahrenheit, with a relative humidity range of 20 to 60 percent. System should be designed to allow a 30% increase to the overall British Thermal Unit count of the finalized design.

Janitor's closets and electrical closets are not considered appropriate EF/MER/TR spaces.

Unless approved otherwise by CMSD the EF/MER room size shall be a minimum 10'x14' and located not more than 50' from the outside plant cable main point of entry (MPOE). Threaded rigid metallic conduit shall be placed from the MPOE to the EF. TR(s) minimum room size shall be 10'x10'. Larger EF/TR(s) may be required based on the number of Work Areas that will feed from the EF/TR(s). EF/TR(s) will be environmentally controlled to insure proper reliability of electronic equipment.

All walls of EF(s)/MER(s)/TR(s) shall have backboards. Backboards for EF(s)/MER(s)/TR(s) are to be ¾"x48"x96" fire retardant treated plywood with the A side facing the room, mounted vertically, and placed within 12" of floor. At no time is it acceptable to run/mount anything on backboard within any ER/MER/TR other than communications cabling or equipment. All electrical outlets and switches will be installed within wall cavities. Backboards are to remain unpainted or they will have to be replaced at projects expense.

At no time will any water or sanitary pipes be run through an EF/MER/TR, unless these items are needed for equipment within this room. If required, drip pans shall be installed to minimize damage to equipment below the pipes in the event of a leak. Sprinkler heads will be provided with guards.

At no time is it acceptable to have a transformer within the EF/MER/TR, the only time an electrical panel is acceptable is if feeds equipment within the EF/MER/TR. At no time shall any liquid or sanitary pipes be run through an EF/MER/TR, unless required for equipment directly serving the room. If required, drip pans shall be installed to minimize damage to equipment below the pipes in the event of a leak.



EF(s)/TR(s) can house Security equipment, AV, and Fire Alarm controls if clearances are maintained for all racks and wall mount equipment and all codes are met for equipment.

EF(s)/MER(s)/TR(s) will be designed as to allow 3' of room at the back of the racks (measured from the back of installed switches) and 3' on the front and side (one) of the racks.

All EF(s)/MER(s)/TR(s) will be secured with a card swipe whether a remodel or new. The door will swing out. There will be no ceiling, and walls finished to deck.

At all EF/MER/TR locations a double duplex electric outlet will be provided on a dedicated circuit placement of these circuits shall be at the top of each data rack (on the outside of the cable tray). A 20- amp courtesy outlet will be placed on each usable wall of the room.

Lighting for all EF/MER/TRs will be 50-foot candles 3' off finished floor, including behind and in front of racks.

In large buildings, more than one TR per floor may be required. A large building is defined as any building in which the physical layout of a floor would require cable "runs" (EF/TR to Telecommunications Outlet (TO)) in excess of 90 meters.

The floor of the EF/MER/TR can be tile or sealed concrete.

### **Equipment Racks:**

Any racks that are floor mounted will be supported at the top by the cable tray system. The cable tray system will be engineered at such a height that cable water falls work properly.

All racks must be grounded to the Telecommunications Main Ground Bar (inside the EF) or the Telecommunications Ground Bar (TGB) in each MER/TR. The connection in the rack must be connected by a rack grounding busbar with no less than fourteen mounting holes.

Provide a multi-outlet AC plug strip. Provide enough outlets to accommodate all electronic devices in the relay rack. The strips shall be mounted on standoff brackets to provide 6 inches of separation from the cable management system. Strips shall be mounted on the rear of the rack. If UPS systems are being used, AC power must be evenly distributed between UPS and other source of AC power.

### **Wire Managers:**

The wire manager shall be sized to match cabling requirements.

A single vertical wire manager may be used in between bayed racks/frames if it is sized to match cable requirements for both racks/frames.

Finish shall be powder coat paint in the color as specified.

### **Patch panels**

24 port modular patch panels

Colors for **data jacks**:

HVAC = Orange

Fire Alarm = Red

Security = Purple/Lavender

WAP = Blue

Voice/Data = Black

Patch Panels shall be sized to accommodate current project requirements plus 30% growth capacity. Patch panels shall not exceed 10 x 24 port (maximum total of 240 connections) in a rack.

Patch cables shall be CAT 6A 1-foot in length and shall be blue in color

### **Enclosed cabinets:**

Enclosed cabinets shall have a roof mounted cable fan and cable entry

Enclosed cabinets must be at least 7Ft H x 32 inches D to accommodate a rack mounted UPS.

Wall mounted racks:

All wall mounted racks will be mounted on ¾ inch" type APA A-D Group 1 plywood, fire retardant treated, with the A side facing the room.

For each Work Area Outlet, the project is to provide one 1'(tech room) and one 10' (work area outlet) CAT 6A patch cord of the same manufacturer and level of the Structured Cabling System being installed.

All terminations will be labeled left to right in sequential/alpha order.

Build out of terminations will be left to right.

Technology Rooms must be periodically cleaned after being turned over for equipment installs and construction in the room is completed to ensure a clean environment during the rest of the construction process.

### **GROUNDING**

All grounding and bonding is to be done in Accordance with the NFPA/NEC codes and ANSI/TIA/EIA standards, for new construction and renovations.

At each EF there will be one TMGB grounded and bonded to the buildings main ground. The gauge of the grounding conductor will be a minimum of a 3/0 AWG. This conductor shall be in conduit to each TR.

At each MER/TR, there will be one TGB (size based on the number of grounds within TR and backbone needs). Size of ground/bonding conductor to each TR is based on footage This conductor will be in a separate conduit from the EF to each MER/TR.

All grounding/bonding connectors will be 2-hole compression style connectors or Cad welded. Each connector will be secured to the TMGB/TGB with a minimum of two bolts and antioxidant inhibitor applied.

Each rack will contain a horizontal ground bar and will be grounded/bonded to the TMGB/TGB.

All tray will be bonded with a bonding jumper and bonded to the ground bar within each EF/MER/TR.

Install Bonding Equalizer where required per ANSI/TIA/EIA-607.

For TBB/GE size, see Exhibit J.

All TBB/GE will be run in conduit between EFs/MERs/TRs.

Daisy chaining or serial connections from one rack or cabinet to another will not be accepted.

Each individual patch panel shall be installed with at least one green thread-forming bonding screw.

All TMGB(s) and TGB(s) will be predrilled and the wall mounting brackets shall provide a minimum of 2" separation from the wall to the back of the busbar.

All Equipment shall be bonded to the rack ground bar.

## **SECTION V Life Safety Circuits, Wireless Access Points, Network and Security**

Verify with fire department to move to VOIP line

### **WIRELESS ACCESS POINTS GENERAL**

AP Cable shall be CAT 6A (1 cable per WAP) – gives 10GB capacity (25’ coil in the center of the classroom for future flexibility)

WAP per classroom and around the Common Area

Wireless access points shall be laid out in a zig-zag pattern, below the ceiling

Wireless Coverage 802.11ax (Wi-Fi 6) wireless specifications: Meraki AP

A predictive survey (Heat Map) is required prior to ordering any equipment—Ekahau Software

An Active (As-Built) survey is required following installation, after occupancy while school is in session—Ekahau Software.

Capacity – CMSD standard is 25 devices per access point for state testing. Each student should have 3MB throughput for testing. 4:1 device ratio, with 30 students per classroom, including public spaces such as the gymnasium.

Horizontal modeling and mounting. No vertical mounting.

Outdoor AP--Utilize mesh topology with Meraki

NEMA rated enclosures for Outdoor APs and Gymnasium Aps

Meraki Cloud Based System

### **NETWORK**

CMSD shall have the ability to compare and choose between leasing and purchasing the network equipment

A 20GB fiber uplink from each IDF access switch stack to the MDF is acceptable

Single-Mode SFP if the distance is greater than 350 Meters

Network Equipment – WAN Router supplied by WAN Service provider for duration of WAN contract

Aggregation Switch – Cisco 425 Meraki 16 port Switch; Functionality – Layer 3 Distribution switch to provide OSPF

Support with 10G uplink to access switches; optics = SFP.

Access Switches – Cisco 225 Meraki 48 port Stackable model with full Power over Ethernet (PoE+) on all ports. Minimum of 2 – 10G Uplinks per MDF closet; any additional Meraki 225 48 port switches in the closet to be 10G; Optics = SFP.

Access Switches should be stacked up to 4 units

Example: 4 switches would be a single stack, 7 switches would be two stacks, a stack of four and a stack of 3 viewing of cameras

## **SECTION VI Technology Outlets (to), Jack, Cable Design & Performance Guidelines**

### **GENERAL**

All components of the structured cabling system will be Component Certified to meet the appropriate category of cabling being installed. The manufacturer shall provide CAT 6A component compliance certificates from a recognized third-party testing organization upon request. All jacks, faceplates, patch panels, and patch cords will be of one manufacturer and supplied by the contractor. At no time are “modular plugs” for terminations acceptable.

Minimum Requirements for work area Technology Outlets (TOs) is CAT 6A, RJ45 jacks.

Minimum Requirements for Wireless Access Point (Wireless Access Points) will be one CAT 6A, RJ45 jack. The jack will be terminated within a single opening surface mount box. A 1’ CAT 6A patch cord will be supplied for each end and will be channel tested for Performance. Please see Exhibit F & G for installation guidelines.

Wall phone outlets will be stainless steel, equipped with a flush CAT 6A data jack, and designed for modular mounting of wall phones. The mounting must be ADA compliant.

Patch cords:

Shall be CAT 6A and blue in color

For TOs two patch cords will be included, one 1’ in the tech room and one 10’ for each data outlet, for bid purposes, contractor will work with customer/project A/E/CMSD for sizing prior to ordering.

i) For Wireless Access Point two patch cords will be included one 1’ and one 1’. for each outlet.

Floor mounted outlets will be coordinated with the architect, user, and CMSD during the planning stages of each project. All floor boxes and poke throughs must be approved by the CMSD. Approval of any outlets (jacks) on shop drawings shall be approved by the CMSD.

The faceplate will be stainless steel or plastic in accordance with architectural design. The faceplate shall have four or six modular openings. Openings without jacks installed, will have blank inserts installed. Stainless steel covers shall be used in auditoriums, classrooms, and where frequent use or abuse is more likely.

Colors for **data jacks**:

HVAC = Orange

Fire Alarm = Red

Security = Purple/Lavender

WAP = Blue

Voice/Data = Black

### **TECHNOLOGY CABLE**

#### **BACKBONE CABLE GENERAL**

All riser cable pathways whether horizontal or vertical will be based upon on all sleeves with 40% fill plus as a minimum of 1 empty new pathway for future.

There will be no splicing of riser cables in the pathway, all cables will be direct home runs from each EF to each MER/TR. The only splicing allowed will be inside the EF/MER/TR for fiber pigtailed within each housing.

### **COPPER**

Riser cables will be 24-gauge, Category 5, twisted solid annealed copper conductors, individually insulated and color coded in accordance with telephone industry standards. Cables having more than 25 pairs will be assembled in individual color-coded binders. All communications wire or cable installed in a building must meet requirements of Article 800 of the National Electrical Code.

During renovation, projects where an EF, MER or TR is being created or relocated splicing the riser cables shall be reviewed by CMSD. Upon approval, splicing may be permitted in the copper riser cables only. Modular splicing devices that are to be used must also be approved.

Minimum size is 25 pairs.

Six copper CAT 6 cables will be placed for "link lines" from each EF/MER to each TR if the distance is within 90 meters. These link lines will be terminated on separate patch panels in each EF/MER/TR and labeled with TR number and patch panel position.

metallic armored.

#### FIBER INTER-BUILDING

#### MAIN EQUIPMENT ROOM (ER) TO MAIN EQUIPMENT ROOM (ER) INTER-BUILDING

#### HORIZONTAL CABLE GENERAL

#### HORIZONTAL CABLE

In accordance with ANSI/EIA/TIA 568B & C all horizontal data cable shall be:

UL listed, 4-pair 100-ohm, twisted pair CAT 6A compliant.

Cable shall be CMP rated.

Consider use of shielded cable based upon application and Owner preference.

Designer to meet with Owner and determine specific needs for structured cabling during programming phase. Wired drop locations should be specifically targeted for discussion. Typical wired drop locations should be considered for the following applications:

Fixed walled offices with fixed Computers, copiers, and fax machines.

Outlets supporting video displays.

IP based Security Cameras.

Media Presentation Station in Classrooms and Educational Spaces consisting of a fixed Workstation and/or printer.

Locations supporting desktop or wall mounted phones.

Electrical and Mechanical spaces with monitoring and control equipment.

Administrative spaces with fixed multifunction copiers, faxes, printers, etc.

Miscellaneous Network Attached Devices

Wall and ceiling mounted Projectors (large common areas)

Security and Access Control Systems

Telecommunication outlet/connectors that serve an individual work area may be in multiple faceplates.

Classrooms shall have the following data drops:

(8) Ethernet drops per classrooms with the following purposes:

(4) Drops for student workstations (Locally Funded Initiative)

## SECTION VII Cable Installation & Termination Guidelines

### **General:**

During the POR and DD phase, it shall be decided on the quantity of cables needed at each Technology Outlet (TO). Each wall phone outlet will be cabled with one 4 pair unshielded (CAT 6A) cable. All communication cable installed in a building must meet the requirements of ARTICLE 800 of the National Electrical Code.

Splicing in station cable is not permitted cable must be continuous from the nearest TR to the Telecommunications Outlet (TO). MUTOAS or Consolidation Points shall not to be used.

Each Wireless Access Point (WIRELESS ACCESS POINT) will be cabled with one unshielded CAT 6A cable, gray in color and terminated on a gray CAT 6A jack. All WIRELESS ACCESS POINT terminations will be on their own patch panel. These will be continuous runs from the nearest TR to the TO. These will be Cat6A channel tested.

Any cabling that is kinked, stretched, punctured, ripped, twisted, discolored, deformed or painted (even overspray) will be removed and reinstalled at contractor/project cost, regardless if it passes testing.

No low voltage cabling will touch ceiling tile, ceiling grids, conduits, walls, or any other structure/trade. Cable will only rest in the pathway that it was designed to be installed in.

All cables from the TO will be terminated on the modular patch panels located in the EF/MER/TR that the cables run to. All category cabling shall be terminated 568A.

The proper rated cable shall be used for its intended environment. Cable will be riser rated, plenum, or riser/filled for floor boxes/emergency phones. If it is a plenum environment and floor boxes/emergency phones are installed, each run will be required to be placed in conduit to the nearest EF/MER/TR. The conduit will be placed from the technology outlet to the nearest EF/MER/TR with a riser rated/filled cable application and meet the conduit specifications within this document.

In new building installations riser cables will terminate on the rack one pair per port except for the last jack and it will be terminated with both the violet/brown and violet/slate pair on pins 4/5 and 1/2.

#### **LABELING STANDARDS**

Labeling for classroom:

Closet Type-Rack #-Patch Panel Label-Port number

Examples:

RM100-ER-R1-A-01

RM100-ER-R2-B-23

Labeling tech closets:

RM#-ports for the Room

Examples:

RM215 A1-6

RM120 A9-26

Labeling for classroom AP: Note: (Because the drop is behind the AP you should put the drop location on the AP underneath the name of the AP as well as the drop)

RM#-Closet Type-Rack #-Patch Panel Label-Port number

Examples:

RM200-TR1-R1-D-01

RM220-TR2-R1-B-23

Labeling for APs in TR patch panels:

RM#-AP-Port number

Examples:

RM215-AP 1

RM120-AP 27

## **SECTION VIII IPTV Outlet Design & Performance Guidelines**

General:

IPTV

IPTV locations shall be treated as a CAT 6A data drop and follow the standards for installation, labeling and testing.

## **SECTION IX Testing General**

Upon completion of installation and acceptance by the CMSD, the cabling contractor will contact the CMSD to witness testing. The CMSD will be given at least one week (5 working days) advanced notice for testing. This testing will be arranged through the University Project Manager/CMSD at no time will contractor dictate the time/date for testing.

To be tested the system must be complete, this includes all pathway, cabling dressed, labeling, faceplates secured and fire stopping.

All testing will be done with a CCTT (Certified Cable Testing Technician); the CCTT shall perform all testing. The approved test instrument is the Fluke Versiv™ (DSX-5000) or CMSD approved equal.

**MARGINAL TESTS WILL NOT BE ACCEPTED.**

Test instrument shall be within its 12-month calibration period and have the latest software and firmware versions installed. If the test instrument is not within calibration period testing will not take place.

Permanent Link test results, including individual frequency measurements, shall be recorded in the test instrument for subsequent uploading to a PC, using Fluke software, from which administrative documentation (testing reports) may be generated

Testing shall be performed on each cabling segment (connector to connector). Sampling is not acceptable.

CMSD will witness all setup and referencing of test instruments prior to testing.

Permanent Link adapters made from twisted pair Category 5e, 6, 6A, 7 or 7A cords are not permitted as their performance degrades with use and can cause false Return Loss failures.

The installer shall build a reference link. All components shall be anchored so it is not possible to disturb them. The technician is to conduct a CAT 6A Permanent Link test each day to ensure no degradation of the test instrument or its Permanent Link adapters.

The detailed test results documentation data is to be provided in an electronic database for each tested balance twisted pair and shall contain the following information:

- The overall Pass/Fail evaluation of the link under test
- The date and time the test results were saved in the memory of the tester
- The identification of the customer site as specified by the end-user
- The name of the test limit selected to execute the stored test results
- The name of the personnel performing the test
- The version of the test software and the version of the test limit database held within the test instrument
- The manufacturer, model and serial number of the field-test instrument
- The adapters used
- The factory calibration date

Provide actual test results in Fluke software form and PDF copies to the CMSD upon completion of project.

### **TESTING**

**COPPER- Cat 6 rise**

Riser cable will be tested one pair at a time with the Fluke Versiv with a single pair block adapter.

All tests will be saved and turned in upon completion of project with other test results.

### **COPPER CAT6A**

All testing procedures and field test instruments shall comply with applicable requirements of:

ANSI/TIA-1152, Requirements for Field Test Instruments and Measurements for Balanced Twisted-Pair Cabling

ANSI/TIA-568-0. D, Generic Telecommunications Cabling for Customer Premises.

ANSI/TIA-568-1. D, Commercial Building Telecommunications Cabling Standard

ANSI/TIA 568 C.2, Balanced Twisted-Pair Telecommunications Cabling and Components Standards.

All cables will be tested for the following:

Wire Map

Length

Propagation Delay

Delay Skew

DC Loop Resistance

DC Resistance Unbalance within a pair

DC Resistance Unbalance between pairs

Insertion Loss

NEXT (Near-End Crosstalk)

PS NEXT (Power Sum Near-End Crosstalk)

ACR-N (Attenuation to Crosstalk Ratio Near-End)

PS ACR-N (Power Sum Attenuation to Crosstalk Ratio Near-End)

ACR-F (Attenuation to Crosstalk Ratio Far-End)

PS ACR-F (Power Sum Attenuation to Crosstalk Ratio Far-End)

Return Loss

TCL (Transverse Conversion Loss)

ELTCTL (Equal Level Transverse Conversion Transfer Loss)

PS ANEXT (Power Sum Alien Near-End Crosstalk)

Average PS ANEXT (Average Power Sum Alien Near-End Crosstalk)

PS AACR-F (Power Sum Alien Attenuation to Crosstalk Ratio Far-End)

Average PS AACR-F (Average Power Sum Alien Attenuation to Crosstalk Ratio Far-End)

All installed cabling Permanent Links shall be field-tested and pass the test requirements and analysis. Any Permanent Link that fails these requirements shall be diagnosed and corrected. Any corrective action that must take place shall be documented and followed with a new test to prove that the corrected Permanent Link meets performance requirements. The final and passing result of the tests for all Permanent Links shall be provided in the test results documentation. No Permanent Link will exceed 295'.

Acceptance of the test results shall be given in writing after the project is fully completed and tested in accordance with Contract Documents and to the satisfaction of the CMSD

### **FIBER OPTIC**

All testing procedures and field-test instruments shall comply with applicable requirements of:

ANSI Z136.2, ANSI for Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources

ANSI/EIA/TIA-455-50B, Light Launch Conditions for Long-Length Graded-Index Optical Fiber Spectral Attenuation Measurements

ANSI/TIA/EIA-455-59A, Measurement of Fiber Point Discontinuities Using an OTDR

ANSI/TIA/EIA-455-60A, Measurement of Fiber or Cable Length Using an OTDR



Great care will be taken when testing fiber. All cleaning procedures will be adhered to during testing. At no time is it acceptable not to clean connectors when mating.

Each strand will be verified for continuity with a VFL prior to light meter testing.

All strands will have an end face connector test performed with a pass/fail automated result. Riser cables will be tested with light source and power meter. Fiber will be tested at 850 nm and 1300 nm for multimode cable, 1310 nm and 1550 nm for singlemode cable. Factory calibration must be current for the fiber optic testers; factory documentation must be provided in submittals.

Each strand will be tested and results electronically stored. Once testing is complete results will be downloaded and turned over to the CMSD Electronically with manufacturer viewing software accompanying results.

Multimode testing will be performed using TIA/EIA-526-14-B Method B for in building riser cables Encircled Flux testing is a requirement, proper mandrels must be used.

Single mode testing will be performed using TIA/EIA-526-7 Method A.1 for in building riser cables. For outside plant cables, TIA/EIA-52607 Method A.1 and Method B will be used. If issues arise in the building riser cables it will be the responsibility of the contractor to supply an OTDR for further testing and trouble shooting.

All fiber testing will be bidirectional

All installed cabling links and channels shall be field-tested and pass the test requirements and analysis. Any link or channel that fails these requirements shall be diagnosed and corrected. Any corrective action that must take place shall be documented and followed with a new test to prove that the corrected link or channel meets performance requirements. The final and passing result of the tests for all links and channels shall be provided in the test results documentation.

Acceptance of the test results shall be given in writing after the project is fully completed and tested in accordance with Contract Documents and to the satisfaction of the CMSD.

## **SECTION X Outside Plant Standards**

### **GENERAL**

Conduit sizing and quantities between buildings shall be determined by CMSD and will be communicated to the University Project Manager/CMSD for inclusion in the project specifications. Minimum requirements are outlined in the following paragraphs.

Prior approval and coordination with CMSD, University Project Manager/CMSD, and other concerned parties is necessary when the situation requires any modification to the conduit system.

Repair or replacement of damaged conduit is the responsibility of the party involved in causing the damage. All damages shall be reported to CMSD Construction Management and Facilities Management immediately.

Since communications and networking is vital to departments, redundant entrances to new, buildings/renovations will be looked at during the initial design phase to be included in the overall scope of the project.

It is the responsibility of the contractor to notify O.U.P.S. at 1-800-362-2764, 72 hours prior to start of construction, excluding holidays (recognized University holidays) and weekends, for all utility markings. Those utilities that are not listed with O.U.P.S. must also be notified by the contractor.

It will be the responsibility of the project to obtain the necessary permits involved in placing CMSD conduit/cable through public right of ways. Costs for this process must be preapproved by the project prior to obtaining the permits.

When crossing privately owned properties with CMSD facilities, easements shall be coordinated by CMSD Outside Plant Department and The Ohio State University's Property and Real Estate (PARE) Department.

It will be the responsibility of the contractor to inform the University mapping department to take shots of the installation throughout the installation. They can be reached at 614.292.HELP or service2facilities@osu.edu .

## **OSP REQUIREMENTS**

All new facilities or renovations will be subject to meet minimum requirements. 2-4" (I.D.) PVC encased will be required for every new building for the placement of voice, data, and video. Conduit is to be placed at 36" below grade to top of encasement. Variances must be approved by CMSD, for each entrance.

Conduits will not feed building to building.

Duct banks will be placed as straight as possible, if turns or offsets need to be made, manhole/hand holes will be used for this function. From manhole/handhole to the building entrance one 90-degree bend is acceptable. All runs will be proofed with a mandrel with the CMSD or CMSD representative in attendance. CMSD Outside Plant Department must approve all duct bank/manhole installations prior to start.

A Kevlar pull string, or a measure tape shall be installed and tied off in each conduit. Pull wires used in outside conduit shall be stainless steel or copper; #12 AWG or strings shall be of the Kevlar type. CMSD shall be contacted for final dimension approval. Each duct bank will have a locator wire installed after conduits have been "proofed".

All underground conduits and ducts, rigid or PVC, added to a project shall be added in groups of 2, 4, 6, 8, 10, 12 or more.

All underground conduit, duct bank and raceways shall be concrete encased (2500psi minimum).

The minimum separation for communications ducts and power ducts in a joint trench environment is 3" (8 cm) of concrete, 4" (10 cm) of masonry or 12" (30 cm) of well-tamped earth. All communications ducts shall also be a minimum of 48" from steam pipes and condensation lines when running parallel. If crossing perpendicular (min of 24" of clearance), Gillsulate insulation (or CMSD/FOD approved equal) must be placed over the top or underneath the encasement to reduce the risk of damage due to heat.

PVC schedule 40, encased in reinforced concrete with 5/8" rebar placed on 5" on center shall be used in any location subject to abuse, such as under roadways, slabs or foundations.

In new construction, all conduit duct banks will enter the lowest bottom bay of the manhole. In existing structures, ducts will be placed in the next available bay.

All necessary precautions shall be taken by the contractor during construction to prevent the lodging of dirt, plaster, concrete or trash in all conduit. All conduit in floors, concrete or below grade shall be swabbed free of debris and moisture before wires are pulled. All conduit shall have duct plugs (expandable mechanical) installed at both the manhole and building entrance to prevent water migration into the building. All building entrances will be sloped to drain back towards the manhole. Under no circumstances will a manhole be placed above the entrance to a building allowing it to drain towards the building. Off campus locations conduit shall be extended to the property line. A handhole shall be installed at the property line to receive conduits and service providers conduits.

## **AERIAL**

1. Most university low voltage cabling is underground. No aerial cabling shall be installed on campus unless approved by the University Project Manager/CMSD.

## **TUNNELS**

1. Where conduit, ducts, or cable trays are in tunnels, they shall be kept as far away as possible from parallel runs of flues, steam pipes, hot gas pipes, hot water pipes, or any other utility line which is hot during normal operation of the facility it serves. It is the preference of CMSD Outside Plant Department that all communication cabling is placed opposite the steam side of tunnels. All conduit sections crossing steam lines shall be rigid and shall be provided with a means of insulation from the steam lines, unless a written exception is provided by the University Project Manager/CMSD and CMSD Outside Plant Department.

## **TRAPS**

All conduit, tubing, raceways, ducts, and duct banks shall be installed in such manner to insure against collection of trapped condensation. Raceway runs shall be arranged to be void of traps.

When conduit passes through exterior concrete walls of any facility, the entrance shall be watertight. Pipe sleeves, at the conduit entrance, shall be sized large enough to place Link Seals between the sleeves and entrance conduit. Link Seals will be placed on both sides of the entrance.

## **TYPES**

Abandoned gas, water, steam and any pipes that might contain asbestos insulation shall not be used as telecommunications and networking conduit under any circumstances.

Four types of conduit are accepted for underground conduit systems. Project specifications will detail the types of conduit to be used in the various locations covered by the project.

Rigid galvanized steel conduit with threaded fittings.

This conduit shall be installed with concrete casing in areas subject to abuse. This conduit will have an epoxy coating that has been applied by the manufacturer. Coating shall extend to 6" above ground level where conduit is installed by a pole, or side structure, or inside a pedestal.

Schedule 40 PVC conduit. This conduit shall be installed with concrete encasement. No PVC conduit is acceptable without concrete, unless specified by CMSD Outside Plant Department.

"C"-Duct conduit: This conduit shall be installed only with concrete encasement.

HDPE SDR11 or Bore Guard schedule 40: To be used for only directional boring. Boring must be preapproved by CMSD/FOD

The duct encasement shall be rectangular in the cross section and have a minimum concrete thickness of 2" around any conduit. The duct encasement shall be sized and placed as shown on construction documents.

All conduit and ducts must be terminated with bell ends at the manhole, facility, or other termination point.

Duct spacers shall be provided at a maximum of 5' intervals. Conduit shall be anchored at 3'-6" intervals and at each spacer to prevent duct floating during concrete installation.

## **ENTRANCE FACILITY**

The Entrance Facility (EF) in the building must be placed within 50' of the Main Point of Entry (MPOE). At the MPOE of the building, rigid metallic conduit (number of rigid metallic conduits equal the number of conduits entering the building) must be placed to the EF. All unlisted OSP cables will be placed in rigid conduit. Conduit will have expandable plugs installed at each end to prevent water intrusion.

### **MANHOLES GENERAL**

Manhole sizes may vary depending on space limitations. All manholes shall be placed in accordance with the manufacturer's specifications and all required safety regulations. All manholes shall be placed with a collar height of 18" minimum. Locking lids are required and shall be 30" in diameter with "COMMUNICATIONS" engraved on the lid. Manhole lids will not have recessed handles that pull out. All manholes will be precast. See material list for acceptable manufacturer and part numbers.

The CMSD outside Plant Designer must approve Handholes on campus.

The maximum distance between manholes connected in any one run shall not exceed 500', unless approved by CMSD Outside Plant Department.

All telecommunication manholes/handholes must be placed in accordance with manufacturer's specifications unless special conditions are approved by CMSD Telecommunications and Networking Outside Plant Department.

All Telecommunication Precast manholes/handholes shall include the associated hardware package (for racking), ladder, frame, cover, and collar (neck) for the specific structure being placed. Note: Lids must be marked as Communications. Manhole Interior

All materials used in a manhole shall be resistant to corrosion. All steel shall be galvanized, or zinc coated. All racking in manholes shall be in accordance with manufacturers' specifications.

Manholes shall have pulling rings opposite to the conduit entrance on each wall.

Each manhole will be grounded

### **Restoral**

All surfaces must be restored to like or better condition as soon as possible. Where settling occurs, it is the responsibility of the contractor to correct the given area and take appropriate measures to reseed and regrade as necessary at no additional charge to the project or CMSD. The contractor is responsible for 1 year from project completion date.

All restoral must meet Division 31, 32 & 33 of the Building Design Standards.