

Local Area Network Infrastructure Upgrade Project

Attachment B - Bid Specifications

Note to Bidders: While the District has formulated Specifications for each project component, the District encourages interested parties to include in their proposals recommendations or solutions, based on industry best practices, that may enhance, improve, or supplement these Specifications.

Project Component 1: Local Area Network Equipment, Materials and Software Upgrade

MDF and IDF equipment must support 10GB connections to Fiber backbone and 1GB connections to all classrooms, offices and Wireless Access points.

Technical Overview – CORE/EDGE

The core switch will support dual connectivity to all IDF switches. All IDFs switches will be connected via multiple 10GB connections. All existing servers will be connected via 10/100 base-T links based upon the existing servers' capabilities. The core switch is built for future 10GB links to servers and storage (Phase II). The district will release a separate bid for servers and storage (phase II). The awarded bidder may be asked to provide a separate quote to complete the switch configuration for phase II.

Each IDF will be connected to the core using 2 x 10GB connections to a primary network module in the core switch and 2 x 10GB connections to a secondary module in the core switch. All 4 connections will look like one physical link (i.e. LACP).

Network Discovery

The awarded bidder shall work with the District to gather all necessary information regarding the current network configuration, including, but not limited to:

Switch Configurations

Router Configurations

Server Configurations

IP addressing schematic

IP Addressing and Proposed VLANS

The bidder shall work with the District to redesign the IP addressing schematic. The new IP addressing schematic shall consider the following proposed vlans:

VLAN – Network Management

VLAN – Students

VLAN – Administration

VLAN – VoIP

VLAN – Wireless Access Points

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VLAN – Wireless guest
VLAN – Servers
VLAN – Instructor/Teacher
VLAN – iSCSI
VLAN – Vmotion

Server Configuration

The bidder shall reconfigure the existing servers according to the IP design.

Network Management Device

The bidder shall install Network Management software on the dedicated network management console Personal Computer provided by bidder.

Testing and Verifying Connectivity

The bidder shall test and verify network connectivity to all network connected devices (servers, switches, routers, firewall, workstations, wireless, printers, Internet, WAN...etc.)

Cabling Infrastructure

All fiber runs to each IDF consist of 12 strands (6 pairs) of 50/125 multimode fiber except for IDF – R5. The fiber run to IDF-R5 will be single mode fiber.
All copper (CAT6) patch cables will be provided by the bidder.

UPS

The bidder will be responsible for the configuration and mounting of specified UPS unit in cabinets provided by the District.

The UPS unit in the MDF is sized to provide power to the core switch, 4 servers, 1 iSCSI storage array, 1 firewall, 1 WAN router, with a total estimated draw of 4400W of power and 1hr:8mins of run time.

The UPS unit in each IDF is sized for under 1500W of power draw for 1 PoE+ switch and 20 minutes of run time.

Acceptance Period

The awarded bidder shall provide written certification to the District of final completion of this Project Component in accordance with these Specifications. District shall have thirty (30) days to determine that the work is complete and in conformance with the Specifications. The awarded bidder shall provide all necessary and appropriate follow-up work and service during this period.

Basic Initial System Operator Training (Optional)

Bidders shall provide a quote for optional detailed instruction to district selected personnel. Training to center on the basic operation of the system for the District's system's operators, and shall include, but not necessarily limited to:

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- Principles of networks, network administration, Wireless components
- Use of peripherals
- Minor troubleshooting in peripherals, and network electronics
- Other basic operational skills
- Network operation
- Uploading and downloading of software
- Basic troubleshooting of Network

Bidder shall provide the following information pertaining to training:

- Name of Trainer
- Qualifications and experience of Trainer
- Copies of training outlines
- Whether or not the vendor will furnish a training kit with copies of training materials and software
- Descriptive definition of the areas of training
- Outcomes that participants will have upon completion of the training
- Number of hours of training to be provided with this bid

On-going Support (Optional)

The awarded bidder shall provide 1 year service and support for the network equipment, materials, software and products supplied pursuant to this RFP. The support period shall be Monday through Friday, 8am -5pm (PST), with an on-site response within 4 hours. Service and Support shall include, but not limited to: unlimited service calls for network related issues, minor configuration changes (excludes changes associated with a major project such as implementation of VoIP). The District will provide remote access capabilities.

Warranties

All equipment, materials, software and products furnished shall be new equipment of the latest model, and free from defects in material and workmanship, and shall be guaranteed by the awarded bidder for a period of three (3) year. The bidder is required to replace defective or faulty equipment, materials, software or products promptly with a minimum loss of operating time, and without charge to the District. This includes labor and services related to replacement and installation. The warranty period shall commence after all systems have been placed in working operation and accepted by the District.

The District's requirement is to receive "onsite" factory authorized warranty service.

Assumptions

The bidder can assume:

1. All cable runs (fiber/copper infrastructure) are new and tested.
2. Cabinets/Racks are of adequate size and space to accommodate the network components.

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Network Documentation

Upon completion of the project, the bidder shall provide to District all project related documentation including but not limited to: Electronics, materials and software, diagrams, IP addressing, passwords, support documentation, configurations, and user manuals necessary for the installation and use of the product. The documentation shall also be provided in electronic format.

Accessories

Each device and/or software package must include all interface cards (if required) cables, documentation and other necessary accessories.

Work Hours

All work shall be performed during normal business hours.

Project Component 2: Implementation of New Wireless Local Area Network

Mounting of Access Points

The District will be responsible for cabling and mounting of access points.

The awarded bidder will be responsible for connecting the access point to a specific port on the switch that will be configured for the wireless Vlan. Patch cables will be provided by the District.

Controller Configuration

The awarded bidder will be responsible for configuring the WLAN controller to include, but not limited to: SSIDs to support: Guest Access, Staff Access, Student Access AAA, Active Directory Integration and/or Radius, Client load balancing and other applicable features relevant to the District

Acceptance Period

The awarded bidder shall provide written certification to the District of final completion of this Project Component in accordance with these Specifications. District shall have thirty (30) days to determine that the work is complete and in conformance with the Specifications. The awarded bidder shall provide all necessary and appropriate follow-up work and service during this period.

Basic Initial System Operator Training (Optional)

Bidders shall provide a quote for optional detailed instruction to district selected personnel. Training to center on the basic operation of the system for the District's system's operators, and shall include, but not necessarily limited to:

- Principles of networks, network administration, Wireless components
- Use of peripherals

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- Minor troubleshooting in peripherals, and network electronics
- Other basic operational skills
- Network operation
- Uploading and downloading of software
- Basic troubleshooting of Network

Bidder shall provide the following information pertaining to training:

- Name of Trainer
 - Qualifications and experience of Trainer
 - Copies of training outlines
 - Whether or not the vendor will furnish a training kit with copies of training materials and software
 - Descriptive definition of the areas of training
 - Outcomes that participants will have upon completion of the training
- Number of hours of training to be provided with this bid

On-going Support (Optional)

The awarded bidder shall provide 1 year service and support for the network equipment, materials, software and products supplied pursuant to this RFP. The support period shall be Monday through Friday, 8am -5pm (PST), with an on-site response within 4 hours. Service and Support shall include, but not limited to: unlimited service calls for network related issues, minor configuration changes (excludes changes associated with a major project such as implementation of VoIP). The District will provide remote access capabilities.

Warranties

All equipment, materials, software and products furnished shall be new equipment of the latest model, and free from defects in material and workmanship, and shall be guaranteed by the awarded bidder for a period of three (3) years. The bidder is required to replace defective or faulty equipment, materials, software or products promptly with a minimum loss of operating time, and without charge to the District. This includes labor and services related to replacement and installation. The warranty period shall commence after all systems have been placed in working operation and accepted by the District.

The District's requirement is to receive "onsite" factory authorized warranty service.

Network Documentation

Upon completion of the project, the bidder shall provide to District all project related documentation including but not limited to: Electronics, materials and software, Diagram, IP Addressing, Passwords, Support Documentation, and Configurations. The documentation shall also be provided in electronic format.

Work Hours

All work shall be performed during normal business hours.

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Project Component 3: Local Area Network Fiber and Cable Upgrade

It is the District's preference that this work is to be performed while school is not in session. However, if substantial discounts are afforded the District to allow work during school hours then the District may consider the waiver of this provision.

All materials should come with a 25 year performance and application warranty.

Installer must be fiber certified.

Bidder must have experience in Category 6 cable termination and Testing. Testing procedures must be completed with a Microtest Penta Scanner or equivalent and a detailed record for each Cat 6 cable provided, in hard copy.

MDF and IDF equipment must support 10GB connections to Fiber backbone and 1GB connections to all classrooms, offices and Wireless Access points.

Installation Overview

The successful bidder shall furnish all racks, mounting brackets, RF cables, network electronics, etc., enumerated in this Specification and that may be identified in the Mandatory Pre-Bid Conference. In addition:

- The bidder is required to provide cable test results for each data and fiber optic cable. As-built drawings are required, which identify the telecommunication space locations, workstation outlet locations and cabling pathways. All documentation must be provided in hard and electronic copy.
- Cables shall be installed and terminated per IEEE and FCC standards for their intended use. All cables shall be plenum rated. All cables shall be installed in conduits, D-Rings or cable trays.
- Bidder shall ring out and identify, with sturdy ty-wraps clearly marking every cable in the system (both ends) all markings shall include purpose destination and origination of the wire or cable.
- Cable lengths at every outlet will have a minimum of four feet (4 ') of slack and fifteen (15') at the head-end if applicable.
- Bidder shall use standard cable practices in the installation process and follow Telecommunication industry standards including the ANSI/EIA/TIA 568 (Telecommunication Cabling Standard), ANSI/EIA/TIA 569 (Pathways and Spaces) and the ANSI/EIA/TIA942 (Standard for Data Centers) as well as federal, state and local codes.

Racks

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At each IDF location, there will be a free standing mounted aluminum rack. The bidder should utilize existing mounts where possible for IDFs. At the Mandatory Pre-Bid Conference locations are to be identified where new racks will be required. The bidder will be required to provide and install new freestanding aluminum racking where required.

Mount Wireless Access Points

The District will provide drawings to the awarded bidder specifying where District provided Wireless Access Points (WAPs) are to be mounted. WAPs will be mounted by winning vendor in locations specified.

Cable Specifications

Bidder shall furnish and install all wiring and associated electronics indicated in this RFP or by virtue of the Mandatory Pre-Bid Conference. The data system shall consist of a 10GB Fiber backbone with 1GB Category 6 UTP Ethernet LAN system. All wiring and terminations shall be in conformance with IEEE requirements of the specific LAN.

Ethernet cabling shall be installed as indicated on the drawings and design submitted by the bidder as part of their bid. Bidder shall provide unshielded twisted pair Category 6 data cabling, RJ-45 Category 6 data outlets, device plates, data punch down racks, and all terminations at the punch down blocks.

Bidder shall provide circuit number designation tags on the conductors in each outlet box and at each punch down block and each distribution rack. Further, the bidder shall provide cable tags on each cable as they enter the room where they get punched down and the room where the outlets are located. Cable tags shall identify cable punch down room and cable outlet room.

Fiber Cable Backbone

A 12 strand indoor/outdoor plenum rated multi-mode fiber optic cable must be installed between each IDF and the MDF. Optical fibers will be tightly buffered 50 micron, multi-mode fiber. Fiber must meet specification for FDDI operation at 10GB. Fiber optic cable must be installed in a PVC innerduct. A pull string must be left in the innerduct.

All twelve strands are to be terminated with connectors at both ends. LC connectors preferred.

Category 6

A four pair UTP plenum rated 24 gauge Category 6 cable will be required for each data location. Three data drops will be required into each classroom and/or office location. Color selection must be consistent throughout the installation.

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General Guidelines for Cable Installation

- 1) Neatly dress all voice and data cables.
- 2) Meet or exceed installation requirements dictated by applicable federal, state and local codes.
- 3) Maintain all minimum bend radius requirements
- 4) Cable shall be protected from contact with sharp metal edges.
- 5) Replace crushed, kinked, or stretched cable or cable with damaged sheath or insulation.
- 6) Avoid routing cable near source of interference, power lines, motors, radio interference, fluorescent lights, heavy machinery, HVAC, etc.

The following routing guidelines shall be adhered to:

Interference Source	Distance from Cable
Power Lines <2KVA	5 inches
Power Lines < 2-5 KVA	12 Inches
Power Lines <5KVA	36 inches
Fluorescent Lights	5 inches
Motors\Generators	40 Inches

Testing

- Each cable pair shall be tested to include terminations at each end.
- Each cable pair shall be tested for abnormal electrical noise and interference.
- Each cable pair must be tested for infinite resistance between each conductor and an established earth ground
- Each cable pair shall be tested for proper end-to-end polarity.

Fiber Optic Backbone Testing

- Test each optical fiber from both ends using an optical time domain reflectometer. Testing will be conducted at both 850 and 1300MM wavelengths/ The ODTR test will determine the following:
 - The overall length of each segment
 - Proper termination
 - Continuity in the fiber
 - Total segment attenuation
 - Irregularities in the Fiber

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Category 6 Testing

All Category 6 Cable testing shall be conducted from both ends of the link using a PentaScanner or equivalent in accordance with the following:

- Cable performance shall meet the standards outline in EIA/TIA 568-A
- Each cable run shall be tested to include all outlets throughout to the closest patch panels
- Each station cable shall be tested for abnormal electrical noise and/or interference
- Each pair must be tested for infinite resistance between the conductors in the pair
- Each pair must be tested for signal attenuation and crosstalk.

Testing Documentation

Cabling bidder shall deliver testing documentation to District upon completion and include the hard copy test results produced by the testing instruments

Labeling Requirements

- All cables shall be visibly labeled with the room number of where the outlet is located. Since most rooms will have more than one outlet then label the cable with the room number plus a letter (IE D4-A, D4-B, D4-C, etc.)
- Each cable shall be labeled with a wraparound permanent tag. Additionally the designation stops, and patch panels shall be labeled with a permanent typed or silk screened method, with the same number/letter designation
- Handwritten labels on the outlet face plates, cables, patch panels, etc., are not acceptable.
- Bidder shall provide cable tags on each cable as they enter the room where they get punched down and the room where the outlets are located. Cable tags shall identify cable punch down room and cable outlet rooms.

Acceptance Period

The awarded bidder shall provide written certification to the District of final completion of this Project Component in accordance with these Specifications. District shall have thirty (30) days to determine that the work is complete and in conformance with the Specifications. The awarded bidder shall provide all necessary and or appropriate follow-up work and service during this period.

Warranty

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All installed materials, equipment and products shall carry a manufacturer, vendor and bidder warranty for all parts and labor of at least 25 years. Any additional warranty option (for no charge or for a fee) should be noted in the bid proposal.

All materials, equipment and products furnished shall be new and of the latest model, and free from defects in material and workmanship. The bidder is required to replace defective or faulty equipment, materials, software or products provided promptly with a minimum loss of operating time, and without charge to the District. This includes labor and services related to replacement and installation. The warranty period shall commence after all systems have been placed in working operation and accepted by the District.

Project Documentation

Bidder will provide complete as-built diagrams to the district upon completion.