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**Telecommunications Specifications and
Installation Standards
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Part 1 – General

1.01 Introduction

The following specifications are intended to assist in the development of a telecommunications system for accommodating present and future technologies within the Lodi Unified School District. They provide a set of instructions and materials needed to install a telecommunications system within parameters set by industry standards. The requirements for the structured cabling systems within the facilities are continued in this document.

1.02 Work Included

- Contractor shall design and provide all materials in order to install a complete and functional data/telecommunications and cable television infrastructure.
- Only one (1) Contractor shall be responsible for providing a complete and functional infrastructure, including necessary components and documentation.
- Documentation will include MS Visio drawings showing room drop locations, cable runs, and conduit pathways. Data, voice, and coax cables are all part of the same infrastructure and shall all be installed, terminated, labeled, and documented by only one contractor (no exceptions). Test results and drawings will be delivered in one package on a USB drive. If corrections/revision are made, a new package is required.

1.03 Contractor Qualifications

- Must be a Panduit Certified Installer and have an Anixter account in good standing.
- Must possess a valid C-7 California State contractor's license. This license must have been issued 2 years prior to the date of the bid. No other license classification is acceptable.
- Must be able to prove to the satisfaction of LUSD that they have significant experience in the installation of fiber optic systems.
 - Proper installation of fiber optic cable
 - Fiber termination
 - Interconnecting equipment
 - Test procedures with appropriate documentation.
- Must prove employees have been trained in the proper handling and cleanup of small quantities of lead paint. Contractor must contact Technology Services, prior to any work starting for an updated list of sites that require drilling work to be handled by a dedicated asbestos vendor. In the event Contractor encounters asbestos, stop work and notify district.
- Must be in trade of installing telecommunication systems, continuously, for a period of at least 3 years prior to the date of this bid.



- Must submit at least one project reference for each of the three years prior to the date of this bid.
- Must provide a minimum of 3 references supporting a claim of experience for a similar project within 2 years prior to this bid. These project references shall contain the starting and ending contract price, the project foreman or superintendent's name, and the name, address, and telephone number of a project contact.
- Must also provide a list of key installation personnel, their hire dates and a resume of their experience. Key installation personnel shall include at least one foreman and two journey level installers or technicians. By submitting the names of these personnel, contractor is committing them to the execution of the project outlined in this specification.

1.04 Requirements

Drawings and General Provisions of the contract, including General and Supplementary Conditions and Division 1 Specifications Sections shall apply to work specified, in this Section.

Rules and Regulations

All work and materials shall be in full accordance with the latest rules and regulations of the following:

- EIA/TIA Standards
- BICSI Standards
- NEC Standards
- Title 24 (California Code of Regulation)
- All Local Codes
- LUSD Standards
- NFPA Standards
- ADA Requirements
- Safety, Health and Environmental Standards

Permits, Fees, and Inspections

Contractor shall be responsible for all fees and permits required to any governmental agency having jurisdiction over the work of this section. Contractor shall arrange inspections required by any local ordinances during construction. Upon completion of the work, satisfactory evidence shall be furnished to LUSD to show that all work has been installed in accordance with the code(s).

Examination of Site

Contractor shall be held to have visited the site and been satisfied with the conditions under which the work is to be performed. Contractor shall check existing conditions that may affect the work. If the contractor retains services of other firms, those firms shall investigate existing systems and determine labor and other materials required to add devices or modify systems.



No allowance shall subsequently be made on the contractor's behalf, for any extra expense resulting from a failure or neglect to discover conditions affecting the work.

Cleaning and Cleanup

All work areas shall be cleaned to remove all dust, dirt, grease, paint, or other marks. All electrical equipment shall be left in a clean condition inside and out, satisfactory to LUSD. Buildings and premises will be kept free from accumulated waste materials, rubbish and debris resulting from work. Upon completion of work: tools, appliances, surplus and waste materials, rubbish and/or debris will be removed and/or legally disposed of offsite.

Interruption of Services

- The underground route may run through areas of existing underground irrigation, signal, power, gas, water and sewer.
- Contractor must take precautions to avoid damaging/killing the root systems of existing trees. Contractor shall hand-dig as necessary to prevent disruption to existing systems, and make all repairs as required if damage occurred, at no additional cost to LUSD.
- LUSD will make every effort to assist contractor in locating existing underground routes. However, contractor will be required to pothole and inspect as needed. Contractor is responsible for USA surveys (Underground Service Alert).
- Power and signal services to existing buildings and related circuits are to remain in operation and shall not be interrupted, except by specific written approval from LUSD.
- If it is deemed necessary to shutdown circuits for the installation of new work, such shutdowns shall be scheduled with LUSD who may at its choosing, have a representative present during shutdown. Shutdowns shall be scheduled "after hours" or on weekends when an interruption would not cause a disturbance to school activities. Any accidental interruption of service to circuits or equipment as a result of work performed by the contractor shall be restored immediately in a manner acceptable to LUSD, at the contractor's expense.

Cooperation and Coordination

Contractor shall be solely responsible for instituting and maintaining safe working conditions for the project area under construction. Noise, dust, and other nuisance control measures will be implemented as effectively as possible. Work will be executed at a time when the space required by this installation is accessible. Adequate barrier and trench covers will be provided, and no equipment will be left unattended, ensuring the safety of students and staff.

Inspection

Contractor shall cooperate with the LUSD Designer/Inspector and provide assistance at all times for inspection of the work performed under this contract. Work that will be contained behind or under access covers, ground covering, or similar impediments shall be left exposed until inspected by LUSD. Contractor shall remove covers, operate devices, or perform any reasonable work that, in the opinion of LUSD, will be necessary to determine the quality and adequacy of the work.



Manufacturers Direction

Contractor shall follow manufacturer's directions that cover points not included in the drawings or specifications.

Workmanship

Contractor shall take all precautions necessary to protect existing structures. Structures or items to remain that are damaged during the course of work, shall be repaired or replaced by the contractor. Good workmanship shall be evident by the proper installation of all materials and equipment. Equipment shall be level, plumb and true with the structure and other equipment. All materials shall be firmly secured in place, adequately supported and permanent.

Contractor's Supervision

Contractor shall personally, or through an authorized and competent representative, constantly supervise the work from its commencement to its completion and acceptance. Contractor shall have the same foreman and workers on the job from its commencement to its completion, as much as possible. LUSD shall be notified of any personnel changes and supplied with the proper documents for any new personnel (I.e. lead certificates). All non-LUSD personnel shall be identified either by an ID tag or uniform with a company logo when on school grounds.

Scheduling of Work

Due to its nature, this work will have to proceed with a definite sequence of operations to minimize outages and continue facilities to all areas. The site will remain in operation during the work, and the contractor shall make every effort to maintain required services.

Guarantees

- Acceptance of the contract for this work includes this guarantee: Contractor guarantees that he has performed the work in accordance with the contract documents. Contractor also agrees to replace or repair, as new, any defective work, materials, or parts which appears within 4 years of final payment. LUSD will make the final determination of whether any defects are the responsibility of the contractor to replace or repair.
- Warranties, guarantees and certificates shall be provided for equipment and materials furnished and installed, as of the date of final payment and be delivered to LUSD. A set of "As Built" Visio drawings and test results for all installed cabling shall be provided to LUSD, before the project will be considered complete.
- Panduit Pan-Net Performance Guarantee - Contractor shall provide a 25 year application performance warranty for all Panduit Pan-Net copper cable and connectivity products. The system must be installed to meet all TIA/EIA commercial building wiring standards and installed per appropriate Panduit instruction sheets. If any Panduit product fails to perform as stated above, Panduit will provide new components at no charge.



1.05 Submittals and Substitutions

LUSD has evaluated and approved all the approved items listed in the LUSD Parts List. Substitutions to this list are possible but must be approved before a bid is accepted. Substitutions must be submitted to LUSD 10 working days before a bid is due and will either be approved or rejected 5 working days before a bid is due. The substitution documentation shall include the comparative specification listing for the approved product and the proposed product, including a complete listing of the characteristics of the equipment in the specification.

Within 10 working days after the date of the award of the contract, contractor shall submit to 3 copies of a complete submission to LUSD for review. The submission shall consist of 5 major sections, with each section separated with index tabs:

1. Section 1 shall be the Index, which will include the project title, address, name of the firm submitting the proposal and name of the architect. Each page in the submission shall be numbered chronologically and summarized in the index.
2. Section 2 shall include a copy of the contractor's valid C-7 California State Contractor's License, documentation outlined in Section 1.02 and a list of instrumentation to be used for system testing.
3. Section 3 shall contain the pre-approved substitution submittal and the written approval from LUSD. If no substitutions are planned, it will be noted in this section as well.
4. Section 4 shall contain samples of proposed cable markers and labeling.
5. Section 5 shall contain a complete and detailed satellite cable count, workstation count, bill-of-materials and Visio drawing showing proposed work ("As Planned"). Any contractor failing to include all of the required information shall be deemed non-responsive and may be disqualified, at the discretion of LUSD.



PART 2 – Products and Procedures

2.01 Approved LUSD Parts List

An approved parts list is detailed in “Enclosure C” of this document. Preferred education pricing provided for this list is available through Anixter Inc. (1-800-ANIXTER, reference Lodi Unified).

All products must be selected from the “LUSD Parts List,” unless substitutions have been approved by LUSD.

2.02 Labeling

- Shall follow the “LUSD Labeling Format” specified in Enclosure B, with the exception of workstation cables (i.e. patch cords).
- Shall never be hand-written.
- Shall be machine printed on clear or opaque tape, stenciled onto adhesive labels, or type written onto adhesive labels.
- Shall have font that is at least 1/8” in height, block characters, and legible.
- Shall have text that is of a color contrasting with the label so that it may be easily read. If labeling tape is utilized, the font color shall contrast with the background.
- Patch panels shall exhibit workstation numbers, in a sequential order, for all workstations served by the MDF or IDF.
- Shall be completed before testing commences. Labeling discrepancies found during inspection will void all test results.

2.03 Copper Backbone Cable

Description: The backbone cabling used to connect all IDF’s to the MDF, used for voice/data.

- Shall be Category 5e and installation must be in compliance with all EIA/TIA standards.
- The number of available wire pairs to each IDF must account for a minimum of 2 pairs per classroom. A minimum of 25 pairs of cable shall be used to any building encompassing an office. Each pathway, upon the population of cable, shall have enough wire pairs to accommodate all existing and future IDF’s in that pathway’s route.
- Cable must be rated for the environment that it will be installed in, such as plenum, riser or outdoor rated.
- Only Cat 5e 110 punch blocks will be allowed for terminations. Backbone pairs shall be terminated at the top left of the blocks installed in the IDF.
- Each copper backbone cable shall be machine labeled and printed EIA/TIA 606 Section 8 compliant at each end with its respective IDF number/letter. All binder groups shall be tied off with their respective identifying ribbon at every breakout point.



2.04 Wi-Fi Cable

Description: Cabling between Wi-Fi jacks and IDF/MDF's.

- Shall be blue Category 6A - 802.3bt Type 4 and installation must be in compliance with all EIA/TIA standards.
- Each blue cable shall be terminated at both ends with white Panduit Cat 6A RJ45 jacks.
- Panduit Executive style faceplate shall be used at access point location.
- Wireless access points shall be in every classroom, common areas, and exterior for full campus coverage.

2.05 Workstation Cable

Description: Cabling between workstations and IDF/MDF's.

- Installation must be in compliance with all EIA/TIA standards.
- Each standard classroom must have a minimum of three workstations:
 - Each workstation shall consist of 2 purple Cat 6A cables and 1 grey Cat 6A cable.
 - Workstations shall be disbursed around the room and not within 10 feet of the main door.
 - Each purple cable shall be terminated at both ends with a beige Panduit Cat 6A RJ45 jacks.
 - Each gray cable shall be terminated, with slack loop at IDF/MDF location with a Cat 6A Blue RJ45 for VOIP and 110 punch block for non-VOIP. District will identify where to use VOIP and where to non-VOIP. Workstation terminates with a Blue Panduit Cat 6A RJ45 jack for Voip and a Cat6A Black RJ45 for non-VOIP.
- Panduit LDP series or Panduit T-70 series (both Cat 6A compliant) raceway shall be used on interior walls where raceway is required for station drops. Panduit T -70 shall be used for computer labs and have access points every 5 feet (an access point shall consist of one duplex outlet 110 VAC receptacle and two beige Cat 6A data jacks).
- Copper station cabling may run outside of conduits and above T-Bar suspended ceilings when available. Cables installed in this fashion must follow these guidelines:
 - Run horizontally in bundles and tie down neatly without the use of zip-ties.
 - Be well clear of any light fixtures or other electrical appliances that may affect data transmissions.
 - Have their own support system, such as J-Hooks or a cable tray
 - Cable tray shall be a minimum of 12"x4" wire mesh and UL listed.
 - Cannot be supported by other items in the ceiling such as conduit, ducts and ceiling grids.

2.06 Intercom Cable

Description: Cabling between Intercom Speakers/Horns and IDF/MDF's.

- Green Cat6A cable shall be used for new IDF's/buildings.

- Indoor Speakers:
 - Indoor speakers shall have a Green Jack at the patch panel and at designated indoor speaker locations using a Panduit executive faceplate.
 - Locations shall be 18 inches away from Access Points , 4 inches below ceiling, and 4 feet away from HVAC vents.
- Outdoor Horns:
 - Shall have a green Jack at the patch panel and a Panduit Field Terminable RJ45 plug in a dual gang double-deep weatherproof bell box (w/ wire-wrap label).
 - Bell boxes shall be 4 inches away from ceilings, soffits, other devices, etc. and be protected with a wire cage, allowing protected interior space of 14 (h) x 14 (w) x 16 (d) or more. Note: Outdoor horns should be used in gyms, locker rooms, multi-purpose rooms, and other noisy areas. Boxes are to be mounted so the device mounting holes are vertical. All exterior boxes are to be covered with a weatherproof blank to protect wiring and building from weather. Picture below shows correct orientation.



2.07 Access Control & Cameras

Description: Cabling between cameras or access control devices and IDF/MDF's.

- Yellow Cat6A cable shall be used with yellow jacks.
- Access Control:
 - Shall be terminated with a yellow jack at each end of cable.
- Cameras:
 - Camera location shall be terminated with a Panduit Field Terminable RJ45 plug in a flush mount four square box w/ a single gang mud ring or an 8x8 weather tight NEMA rated box with screw on lid. (Don't forget Wire-Wrap Label)
 - Cameras should be mounted in locations shielded from the sun when possible.
 - All exterior boxes are to be covered with a weatherproof blank to protect wiring and building from weather.

2.08 Promethean Boards/LCD Displays

Description: Cabling between Promethean Boards/Displays and IDF/MDF's.



- Purple Cat6A cable shall be used with beige jack.
 - Beige jack shall be mounted in a Panduit Executive faceplate, located 29 inches below the ceiling, directly above the display (unless specified otherwise).
 - HDMI receptacle/faceplate shall also be mounted below the display, 14 inches above the floor, and terminate with an HDMI cable coiled behind the display.

2.09 Fiber Inner Duct

Description: Ducting specifically manufactured to enclose and protect fiber optic cable.

- Must be used for all fiber installations, with exceptions where conduits are too small to run inner duct.
- LUSD will be notified, in writing, that conduits might be too small to run inner duct. LUSD must approve, in writing, any fiber run not in inner duct.

2.10 Fiber Distribution

Description: The backbone cabling used to connect all IDF's to the MDF.

- Only 50 um-multimode fiber (OM4) shall be used and installation must comply with all EIA/TIA standards.
- Singlemode fiber (OS2) shall be used as needed due to distances.
- Only 62.5/125 um-multimode fiber shall be used for fire alarm applications
- A minimum of 12-strand fiber shall be used from the IDF's to the MDF.
- Each fiber cable shall homerun from the IDF's to the MDF without the use of interconnects.
- Each pathway, upon the population of fiber, shall have enough fibers to accommodate all existing and future IDF's in that pathway route, and also be accompanied by a coax cable.
- SC style connectors shall be used for all fiber termination.
- All fiber strands shall be terminated and labeled at both ends with its respective IDF identifier.
- All fiber interconnect devices shall be labeled with their respective IDF identifier.
- At each location where the fiber cable is exposed to human intrusion, it shall be marked with warning tags. These tags shall be yellow or orange in color, and shall contain the warning: "CAUTION FIBER OPTIC CABLE." The text shall be black, block characters and at least 3/16" high. A warning tag shall be permanently affixed to each exposed cable or bundle of cables.

2.11 Main Distribution Facility (MDF)



Description: A location within a building or complex of buildings, where the entire telecommunications system originates. EIA/TIA-569 standards refer to the room housing the MDF as the "Equipment Room."

- Must be in compliance with all EIA/TIA standards.
- Must have fire treated ¾" plywood on all walls.
- Must have (1) 4-post rack and (2) 2-post racks in secured dedicated rooms
- NEMA 5-20 power outlets must be mounted 8 inches above any ladder racks and be less than 8 feet from two post stand-up 19 inch data racks.
- Cabinets must have a dedicated power outlet mounted inside.
- Cabinet shall be load tested with no less than 200 pounds and up to rated shear strength.
- Ladder racking must be mounted on the perimeter of all walls and above cabinets.
- A Panduit wire manager must be mounted in-between every patch panel (must use one wire management panel for every patch panel).
- A 3-foot slack loop shall be required at MDF for all cables.
- MDF room sizing:
 - High School – 15'x10'
 - Middle School – 10'x8'
 - Elementary School – 9'x8'

2.12 Intermediate Distribution Facility (IDF)

Description: A location in a building that interconnects and manages the telecommunications wiring between the MDF and workstation devices.

- Must be in compliance with all EIA/TIA standards.
- Must have fire treated ¾" plywood on all walls.
- Cabinets must have a dedicated power outlet mounted inside.
- Must have (2) lockable 90" tall, 19-inch / 40 RU, front and rear swing cabinets in unsecured locations.
- Must have (2) 2-post racks in secured dedicated rooms.
- Cabinet shall be load tested with no less than 200 pounds and up to rated shear strength.
- Ladder racking must be mounted on the perimeter of all walls and above cabinets.
- Cabinets must adhere to ADA requirements. See Enclosure G
- A Panduit wire manager must be mounted in-between every patch panel (must use one wire management panel for every patch panel).
- A 3-foot slack loop shall be required at IDF for all cables.

2.13 Backboard



Description: Generally, refers to the plywood sheeting lining the walls of telecommunications facilities. Backboard may also refer to the entire wall-mounted assembly including wire management, wiring blocks, and equipment cabinets.

- Must have fire treated $\frac{3}{4}$ " plywood on all walls.
- Dimensions shall be no larger than the cabinet/IDF when installed in a classroom.
- Shall be fastened to two separate wall studs with 4 lag bolts.
- Shall be no thinner than $\frac{5}{8}$."

2.14 Grounding and Bonding

Description: Generally, refers to the grounding and bonding requirements for telecommunications rooms, including data cabinets, racks, and ladder racking systems. Strictly adhere to all Building Industry Consulting Service International (BICSI), Telecommunications Industry Association (TIA) recommended installation, best practices, codes, and standards when installing the grounding and telecommunications bonding infrastructure.

- Telecommunications Main Grounding Busbar (TMGB) shall be located in the MDF: busbar placed in convenient and accessible location and bonded by means of bonding conductor for telecommunications to building service equipment (power) ground.
 - Telecommunications Main Grounding Busbar (TMGB) shall be constructed of .25" (6.4 mm) thick solid copper bar. The busbar shall be 4" (100 mm) high and 20" (510 mm) long and shall have 30 attachment points (two rows of 15 each) for two-hole grounding lugs. The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607-A and shall accept 27 lugs with $\frac{5}{8}$ " (15.8 mm) hole centers and 3 lugs with 1" (25.4 mm) hole centers. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall. The busbar shall be UL Listed as grounding and bonding equipment.
- Telecommunications Grounding Busbar (TGB) shall be located in the IDF: interface to building telecommunications grounding system generally located in telecommunications room. Common point of connection for telecommunications system and equipment bonding to ground, and located in telecommunications room or equipment room.
 - Telecommunications Grounding Busbar (TGB) shall be constructed of .25" (6.4 mm) thick solid copper bar. The busbar shall be 2" (50 mm) high and 12" (300 mm) long and shall have 9 attachment points (one row) for two-hole grounding lugs. The hole pattern for attaching grounding lugs shall meet the requirements of ANSI-J-STD – 607-A and shall accept 6 lugs with $\frac{5}{8}$ " (15.8 mm) hole centers



and 3 lugs with 1" (25.4 mm) hole centers. The busbar shall include wall-mount stand-off brackets, assembly screws and insulators creating a 4" (100 mm) standoff from the wall. The busbar shall be UL Listed as grounding and bonding equipment.



2.15 Testing and Documentation

Testing: Contractor shall test each fiber strand and each pair of twisted pair copper cable after labeling is 100% complete. LUSD reserves the right to have a representative present during testing.

- **Fiber Optics Cable:** Each strand shall undergo bi-directional testing for signal attenuation losses.
 - Test Equipment:
 - Multi-mode: Fluke DSP 4000 for equivalent.
 - Single-mode: Laser Precision TD2000 OTDR with appropriate modules, or equivalent.
 - Tests:
 - Multi-mode: Bi-directional signal attenuation at 850 and 1300 nm.
 - Single-mode: Bi-directional signal attenuation at 1310 and 1550 nm.
 - Test Criteria:
 - Signal loss less than the link loss budget as determined by the tables below.

SC Connector Pair	0.5dB
Multi-Mode Cable	
Wavelength (nm)	Maximum Attenuation (dB/km)
850	3.5
1300	1.5

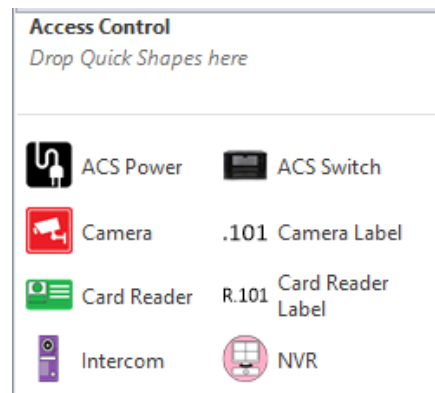
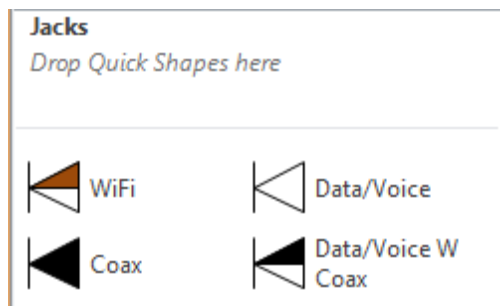
Example: A link with 3 connectors and a total length of 500m should have a maximum attenuation of 3.25dB at 850nm and 2.25dB at 1300nm

SC Connector Pair	0.5dB
Single-Mode Cable	
Wavelength (nm)	Maximum Attenuation (dB/km)
850	1.0
1300	1.0

- **Workstation Cable:** Each workstation cable shall be tested from the Jack Panel to the data outlet after labeling is completed.
 - Test Equipment: Fluke DSP-4000 or equivalent.
 - Tests: Conform to EIA/TIA Standards for Category 6A.
 - Test Criteria: Tested to Category 6A for permanent link compliance.
- **Wi-Fi Cable:** Each Wi-Fi cable shall be tested from the Jack Panel to the data outlet after labeling is completed.
 - Test Equipment: Fluke DSP-4000 or equivalent.
 - Tests: Conform to EIA/TIA Standards for Category 6A and 802.3bt Type 4.
 - Test Criteria: Tested to Category 6A for permanent link compliance.

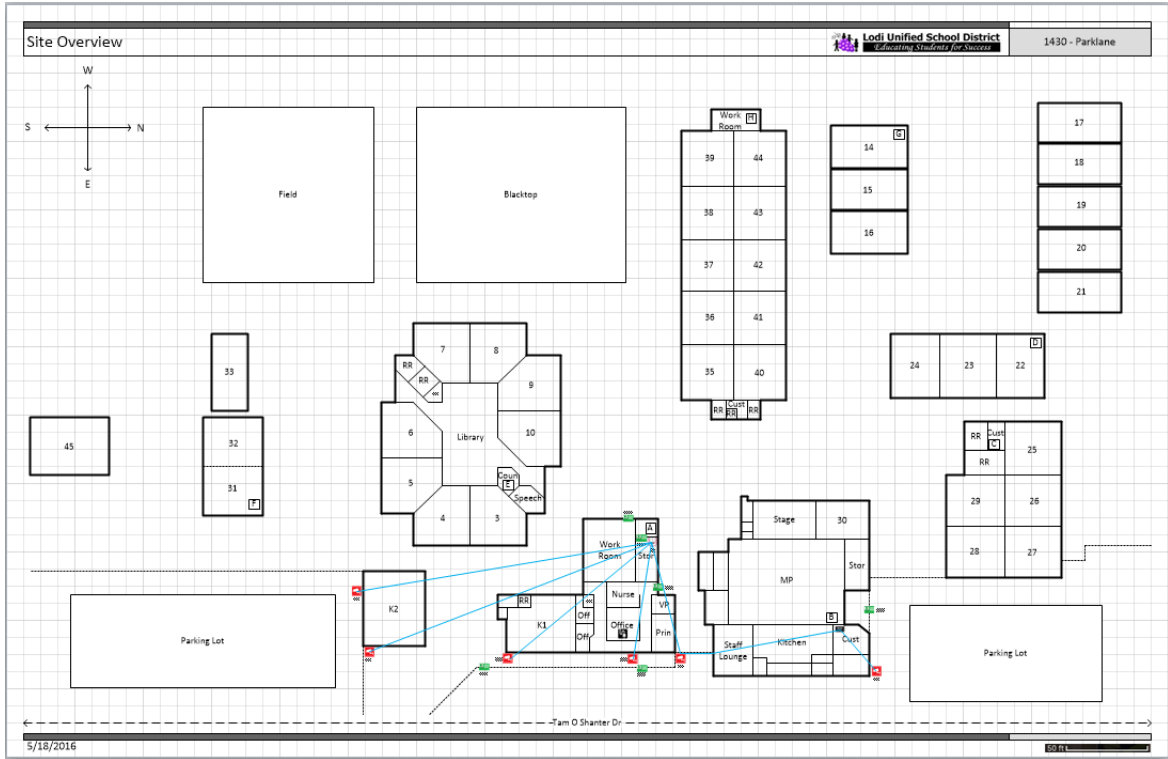
Documentation: Contractor shall provide documentation to include test results and Visio “As-Built” drawings in both soft and hard copy format.

- **Fiber Test Results:** Shall be entered onto the attached form "Fiber Test Results."
 - Only original signed copies will be acceptable.
 - Hand written results are not acceptable.
 - Copies of test results are not acceptable.
 - Test results shall be in PDF format.
- **Workstation/Wi-Fi Test Results:** Shall be provided in the form of printouts from the test equipment, as well as computer file copies on CD including the software needed to read the results.
 - Only original signed copies will be acceptable.
 - Hand written results are not acceptable.
 - Copies of test results are not acceptable.
 - Test results shall be in PDF format.
- **As-Built Drawings:** Contractor shall produce drawings while adhering to the following guidelines:
 - Always use icons from the Visio stencils provided by LUSD. Not all available icons are shown below.



- Depiction of backbone cable routing.
- Locations of access points, card readers, distribution cabinets, intercoms, jacks, NVRs, security cameras and workstations.
 - Active components between an end point and NVR/switch, must be documented (power injectors, switches/repeaters, hubs, etc.).
 - Access Control components must have power sources identified.
 - Jacks must be accompanied by a jack label.
 - Nodes must be accompanied by an IP address.
- Submit before final inspection for punch list. Incorrect Visio drawings are punch list items and are to be corrected before re-inspection.
- Additional copies corresponding to the appropriate IDF/MDF, shall be posted in the MDF's and IDF's.

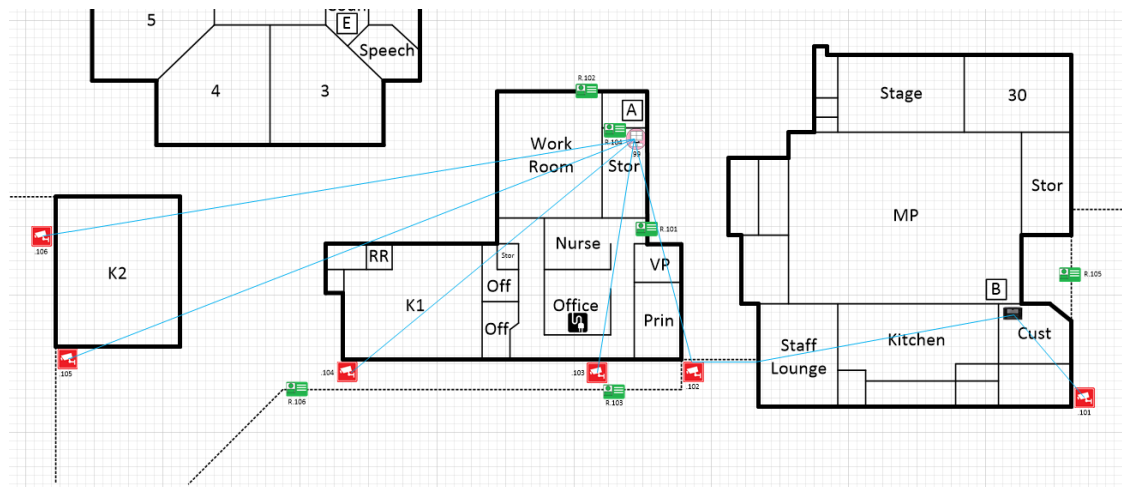
Sample of LUSD Visio drawing



Sample of LUSD Visio Backbone

2.16 Acceptance

Acceptance of the Data Communications System, by LUSD, shall be based on the results of testing, functionality, and the receipt of documentation.



- With regard to testing, all fiber segments and workstation data cables must meet the testing criteria established in Section 2.12 above.



- With regard to functionality, contractor must demonstrate to LUSD that Gigabit Ethernet data signals can be successfully transmitted bi-directionally, from the MDF/IDF to and from a number of individual data outlets.
 - No more than 5% of the data jacks will be tested.
 - If any locations fail, an additional 5% will be tested until no more links fail.
- With regard to documentation, all required documentation shall be submitted to LUSD

PART 3 – Execution

3.01 Division of Work

Contractor shall design and install the data communications system as described in the preceding documentation. Installation shall result in a functional system. The scope of work shall include:

- All necessary conduit and raceway with a Visio drawing showing proposed cable routes, existing conduit to be used, new conduit being installed, equipment racks and approximate drop location. (Note: The EIA/TIA specifies at least 2 drops per workstation location, back to the IDF/MDF).
- Necessary trenching, backfill, replacement of landscape material, repair of damage to utilities or structures, replacement of asphalt and base, and replacement or repair to concrete work resulting from conduit or raceway installation.
- Provide and install all equipment.
- Test and document system upon completion. Copies of all other forms and enclosures shall be included.
- Supply and install all necessary materials resulting in a safe, complete and functional system. The scope of work shall be reviewed by no less than 1 person for completeness from the following departments: Facilities & Planning, Maintenance & Operations.

PART 4 – Conduit

4.01 Underground

- Contractor will use PVC schedule 40 underground, with rigid 90-degree elbows and tracer tape placed 6" to 12" over the top of the PVC portions. Elbows shall have a radius of at least 10 times the diameter of the conduit used.
- See NEC for appropriate depths and pull box sizes.
- Should be next to existing underground where possible.
- All new underground conduits shall be (2) 4" plus (1) 4" spare, PVC to support data/voice/intercom/PA. All new underground conduits shall be 2" PVC to support fire alarm.
- Areas near tree roots and other underground utilities will need to be hand dug. LUSD will identify those areas. Pull boxes are to have traffic lid covers (that say Data). The bottom will be grooved with drains installed. LUSD will provide diagrams upon request.



4.02 Aboveground

- All roof penetrations shall be approved by LUSD, before actual penetration is made.
- All exterior conduit that is accessible shall be in rigid conduit.
- A pull rope will be installed in all new and existing conduits used, including underground and interior conduit.

- Firewall penetrations will extend through the wall a minimum of 12 inches.
 - Shall be sealed around the outside with firecaulk.
 - Shall be sealed around the inside with firecaulk duct seal (the depth shall be 50% diameter of the conduit).
 - No innerduct shall be installed in a firewall penetration.
- Conduit size to be determined by EIA/TIA Standards leaving room for future expansion.
- EMT conduit shall be used in the following interior areas:
 - Gyms.
 - Multi-Purpose rooms.
 - Industrial Arts buildings.
- LB's shall not be used in new and existing conduit for data applications.
- All exterior boxes/mud rings shall be protected by a weather-proof cover.
- Data/Voice conduits shall service LUSD's voice and managed IP network only.

4.03 Portable Classrooms

- All conduits to be installed on the exterior of a portable will be approved by LUSD personnel before installation.
- The center beam of a portable shall not be penetrated.

PART 5 – Concrete

- ALL concrete and asphalt repair shall be included in the scope of work and will be replaced from joint to joint (no patching, except when done temporarily for safety).
- Soft patch may not be used as a permanent patch for asphalt or concrete.

PART 6 – Change Orders



ALL change orders shall be routed to the department originating the project. Departments are typically Facilities & Planning and Technology Services and will be approved or disapproved on a case by case basis.

Approved change order form will be added to the scope of work and completed as a part of the contract.

PART 7 – Departure from Specifications

During unusual or unique situations, a departure from specifications (DFS) may be granted for specific locations and/or equipment. Approval is granted or denied in writing by Technology Services. See section 1.05 for materials substitutions.

The contractor will keep all forms on file until the warranty on the installation expires.

PART 8 – Asbestos and Lead Containing Paint Waiver

Asbestos work must be performed by M&O approved certified remediation company. Contractor must contact LUSD’s Maintenance and Operations (M&O) department for a current list of Asbestos Hazard Emergency Response Act (AHERA) sites, requiring work to be performed by a remediation company.

All District sites will be considered to be a lead containing paint facility unless the area of work has been sampled and determined to be otherwise. All work including but not limited to cutting and/or hole drilling will be performed by a lead awareness trained individual that is also trained in HW collection and disposal activities. Otherwise the contractor must employ the services of an environmental company approved by M&O and certified to perform these duties. All environmental activity will be reported to the Maintenance & Operation Structural Supervisor at (209) 331-7193 prior to the commencement of work.

PART 9 – Access Control & Video Safety

9.01 Introduction

In addition to LUSD Infrastructure Wiring Specifications, the following guidelines apply to access control card readers, security cameras, and other access devices installed within LUSD.

A site walk must also be performed with a Technology Services staff member before work begins.

9.02 JAESC/Transportation/Warehouse Specific Guidelines

- Access control devices and security cameras will be:
 - Connected directly on the LUSD network.
 - Operations, VLAN 99.



- Powered by LUSD POE switches.
- All access control nodes should be fed from the MDF, when the run is within EIA/TIA specifications.
- NVR will be housed in the Data Center and rack mounted.

9.03 School Site Specific Guidelines

- Access control card readers and other access devices will be:
 - Connected directly on the LUSD network.
 - Operations, VLAN 99.
 - Powered by LUSD POE switches.
- Security cameras will be placed on their own private network.
- The installation location of the NVR is to be coordinated with Technology Services. Ideally, the NVR will be installed in the MDF where security and environmental conditions are monitored.
 - NVR's are to have two NICs
 - One placed on the private network
 - The other on LUSD's Operations network.

9.04 District Wide Guidelines

- Network Video Recorder (NVR), GateKeeper, and other full OS devices (Windows/Mac), will have the LUSD's Anti-Virus and LanRev agents installed on the systems. In addition, the device name and description are setup according to LUSD specifications.
- All power supplies shall be housed in a cabinet or communications closet.
- All cable runs shall be terminated at a jack, not a modular plug.
- No faceplate needed in ceiling jacks and utilize yellow patch cables.
- Contractor shall receive approval from LUSD before sharing any cabling pathways with existing LUSD infrastructure.
- Yellow Cat 6A cable shall be used for infrastructure cabling runs, terminated into yellow Panduit jacks.
- 19" Patch Panel required for all cabinets (both existing or new cabinets).
- Repeaters/switches used where a 90 meter run is exceeded, are to be located 5 feet from an existing MDF/IDF.
- All jacks shall be labeled in accordance with LUSD specifications.
- Technology Services Network Operations Center (NOC) shall be contacted before anything is patched into LUSD's network. The NOC will be able to verify connectivity and ensure there are no other issues.
 - NOC can be reached at: (209)331-8324, press *0 when at the option menu, then press 6.

9.05 Documentation Guidelines

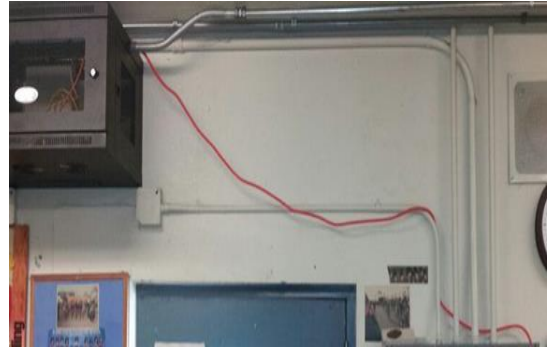
- Please see section 2.15 for cable testing and Visio drawing guidelines

9.06 Power

All Cabinets will have a dedicated circuit/breaker and power sources must be mounted per NEC requirements.

During the initial walk with Technology Services, power sources will be identified. If power source is not available, Technology Services will work with M&O to coordinate the installation of power source.

Powering cabinets with extension cords is not permissible.



Temporary Power

If active components are not operating off a dedicated power outlet/source, then it needs to be noted on the drawing with building/location. All active components mounted in a cabinet must have a dedicated power outlet within the cabinet. Do not affix raceway to walls for temporary power/extension cords.

9.07 Miscellaneous

- All wires must be labeled w/ wire-wrap style labels within 3 inches of the jacks.
- Jacks should be labeled and tested at both ends of each smallest segment according to Specifications. This type of passive cross connect is no longer allowed.



- As of July 1st, 2016, single gang boxes are not permitted in IDFs.
- This photo depicts what **not** to use anymore.
 - Jacks are now placed in a 24 port patch panel
 - Panduit part #CP24BLY



PART 10 – Promethean Boards, Displays, & A/V Projectors

10.01 Mounting Guidelines

- For new construction, DSA approved drawings on following pages must be observed by both architect and installer.
- DSA standards must be followed
- Any non-standard mounts must be approved by F&P.
- All mounts must be tagged with contractor’s name and date of installation. See DSA approved mounting documentation.
- HDMI cables mounted in raceway must be able to pass a clean digital signal, with an allowance for a standard quality user patch cable to span 35 feet.
 - For example: If the user connects a 35-foot cable to the user interface/wall plate and the length of the infrastructure cable between the wall plate and the projector is 10 feet, then the total length of digital transmission is 45 feet; therefore, the installer must demonstrate that the infrastructure cable can deliver a clear picture while being extended with a 35-foot HDMI male-to-male patch cable. Sound must also be demonstrated through jacks in faceplates.
- User connection interface/wall plate will contain, one VGA, one HDMI, and one 1/8 stereo audio jack. Active faceplates will be used for VGA/HDMI connection.
- User connection interface/wall plate will contain one VGA, one HDMI, and one 1/8 stereo audio jack. Active faceplates will be used for VGA connection.
- Power will be installed high on the wall within two feet of the projector.

10.02 Short Throw Projectors

- Mounted to a plate/backboard that spans two studs.
- Secured to wall studs with 4 lag bolts.
- Head clearance from bottom of projector must be a minimum of 78 inches from floor.
- All CAT6A network connections, AV connections, and power shall be installed behind the short throw wall mount bracket.



- The use of short throw projectors shall be determined per project, and with District approval.

10.03 Ceiling Mount Projectors

- For T-Bar Ceiling: Two drop ceiling T-bar rods must be attached to opposite corners of the T-bar projector mount panels.
- For Hard Lid Ceiling: Mount must be bolted to cross-members(or ceiling joist) with no less than two bolts and some additional mounting brackets.
- All CAT6A network connections, AV connections, and power shall be installed above the ceiling mount bracket.
- The use of ceiling mount projectors shall be determined per project, and with District approval.

10.04 Promethean Boards

- Wall mounted Promethean Boards shall be installed in all classrooms
- HMDI cabling shall be from Promethean Board to the teaching station with a CAT6A connection. An additional HMDI connections shall be installed directly below the board with a CAT6A connection mounted in an accessible location behind the board.

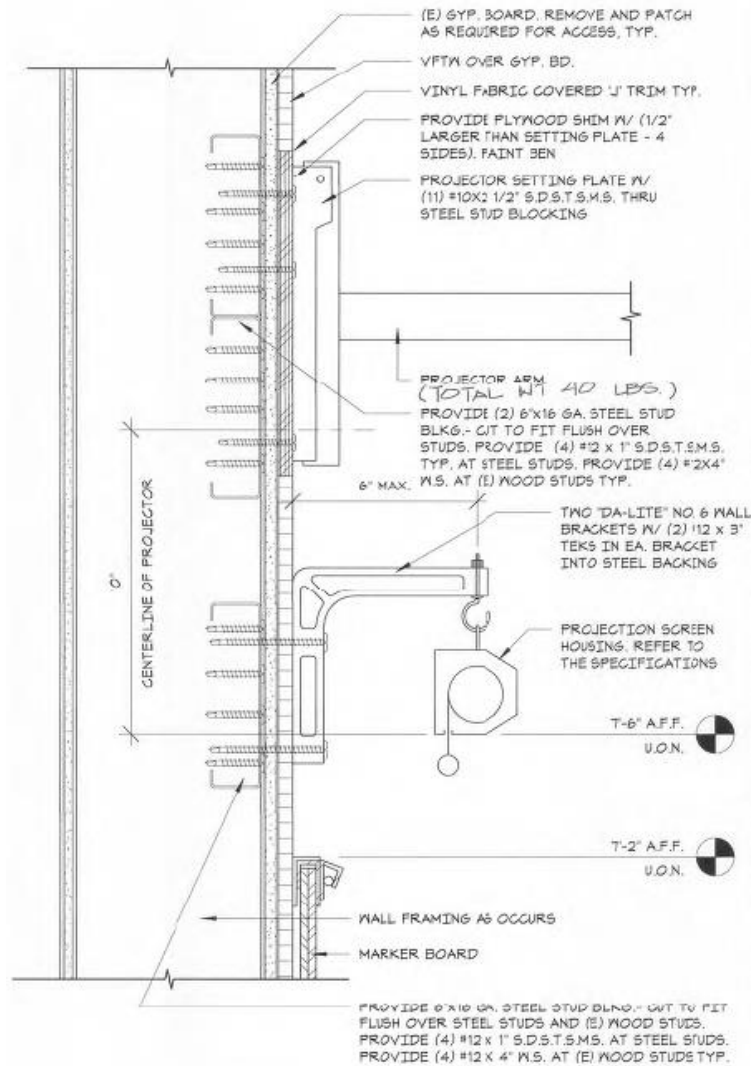
10.05 Multipurpose Rooms/Gyms

- Large assembly areas shall receive electric large format projection screens and lamp less ceiling mounted projectors. Refer to current District standards for current manufacture and model number.
- Large assembly areas shall have a dedicated AV cabinet to facilitate local presentations and house wireless microphones and AV amplifiers.
- Large assembly areas shall have separate sound systems.
- AV wall controls shall be based on Extron Electronics and control all AV in the space, with the capability to integrate lighting and shades.
- Sizing of screens, throw distance of projector, and locations shall be engineered by AV Contractor and approved by the District.

10.06 DSA Mounting Documentation

Projector Anchor – Wood/Metal Studs (Sample)

- Electric screens shall be used, where applicable.



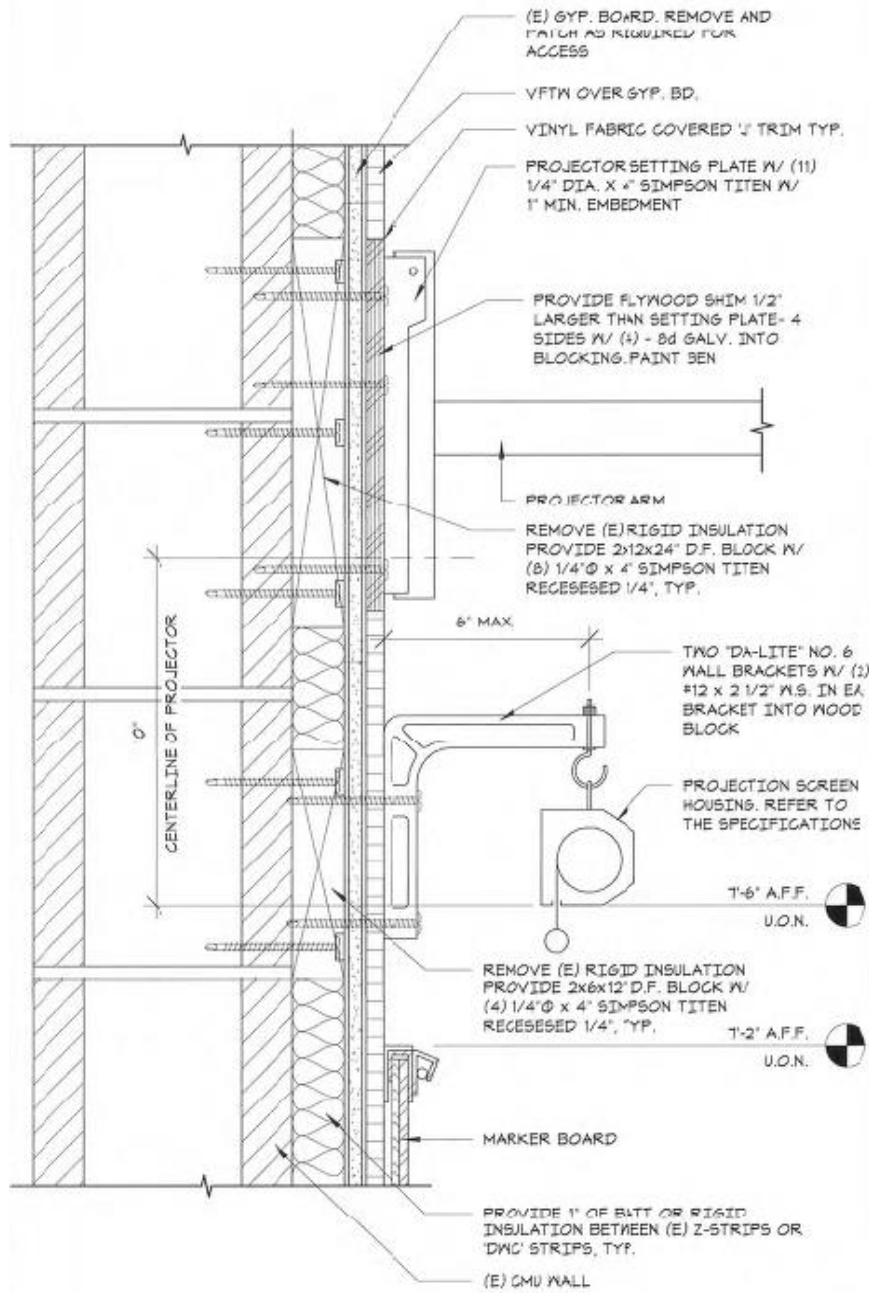
SCALE 3/8" = 1'-0"

16

PROJECTOR ANCHOR - WOOD/METAL STUDS

FILENAME: 11_52_16_dwg

Projector Anchor – CMU (Sample)



SCALE 3" = 1'-0"

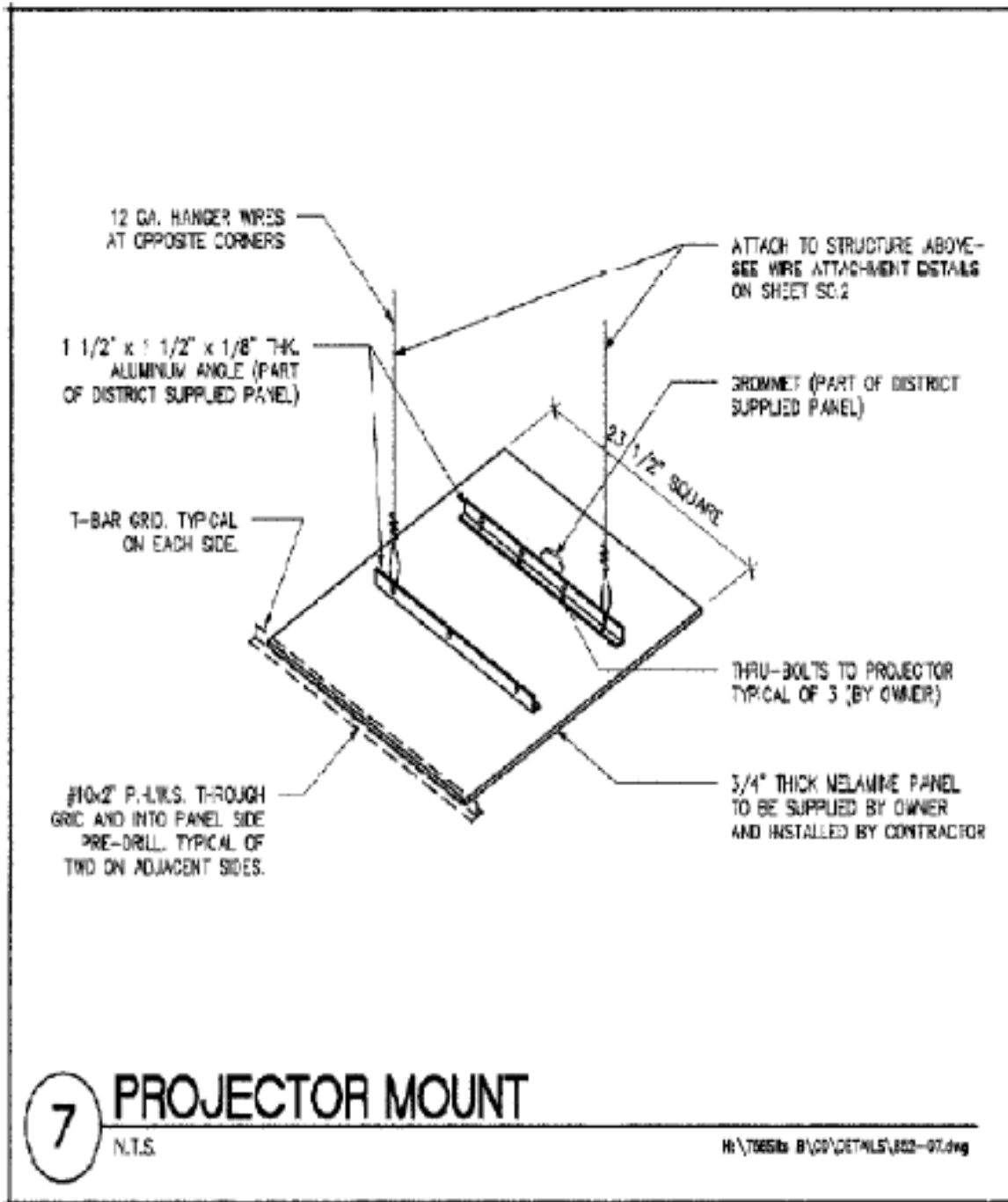
13

PROJECTOR ANCHOR - CMU

FILENAME: 11_52_11_dwg

Projector Mount (Sample)

Panel must have two drop ceiling suspension wires.





PART 11 – Intrusion Alarm

11.01 System

- The system is based on Ademco panels, keypads, and devices
- No door contacts

11.02 Telco Interconnect

- Shall be clearly identified by the CSID noted on the keypad for each COM panel.
- Each new COM panel shall have a dedicated Measured Business Line.
- 3-pair 66 block style biscuit-blocks are preferred at point of termination for COM panel phone lines (No RJ31X's).
- LUSD will only test Measured Business Line to 66 block style biscuit-block.

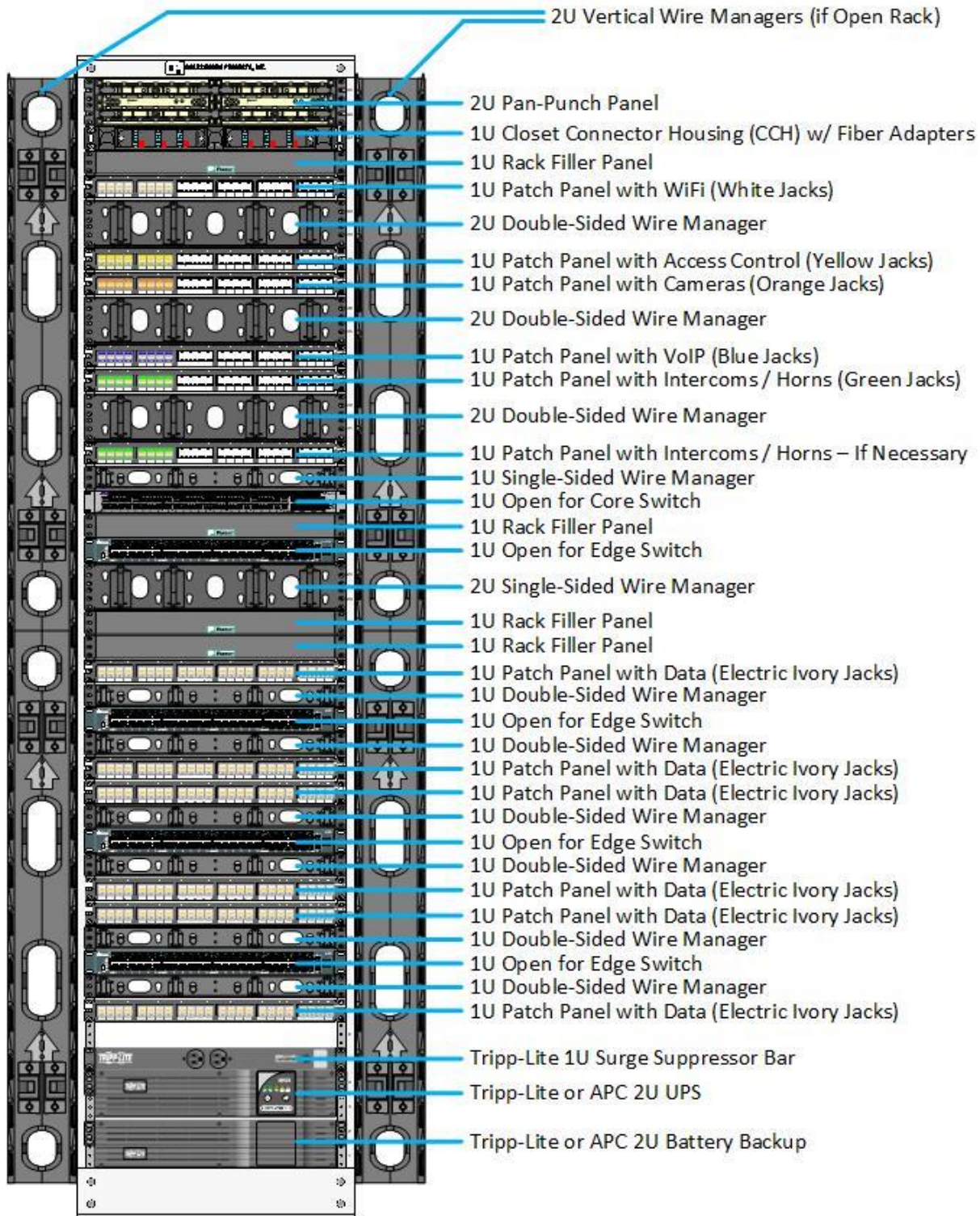
11.03 Wiring

- Shall be supported by D rings, Velcro, or J hooks.
- Pathways should not be shared with data cabling.
- When overriding existing voice or data cables in a box or conduit, Technology Services must be contacted and give approval to do so.

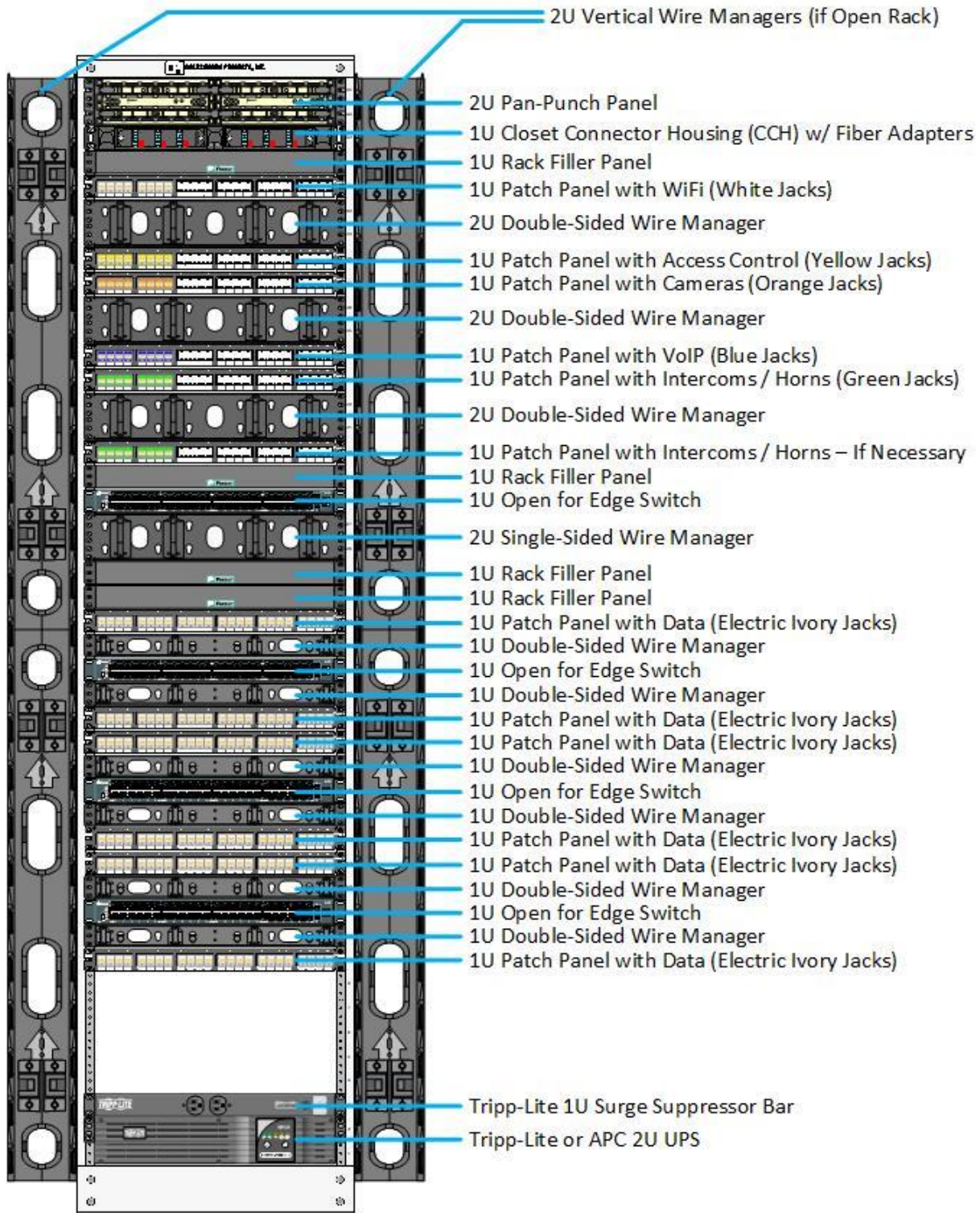
PART 12 – Enclosures

- A. LUSD IDF Layout
- B. LUSD IDF Layout
- C. LUSD Double 2-Post Rack Lay-out
- D. LUSD Previous IDF Layout
- E. LUSD Labeling Format
- F. JAESC Labeling Format
- G. Approved LUSD Parts List
- H. LUSD Basic Telecommunications Jack Legend
- I. Data/Camera System Install Inspection Check List
- J. Projector System Install Inspection Check List – Sample Continued
- K. Accessible Requirements for Cabinet Mounting

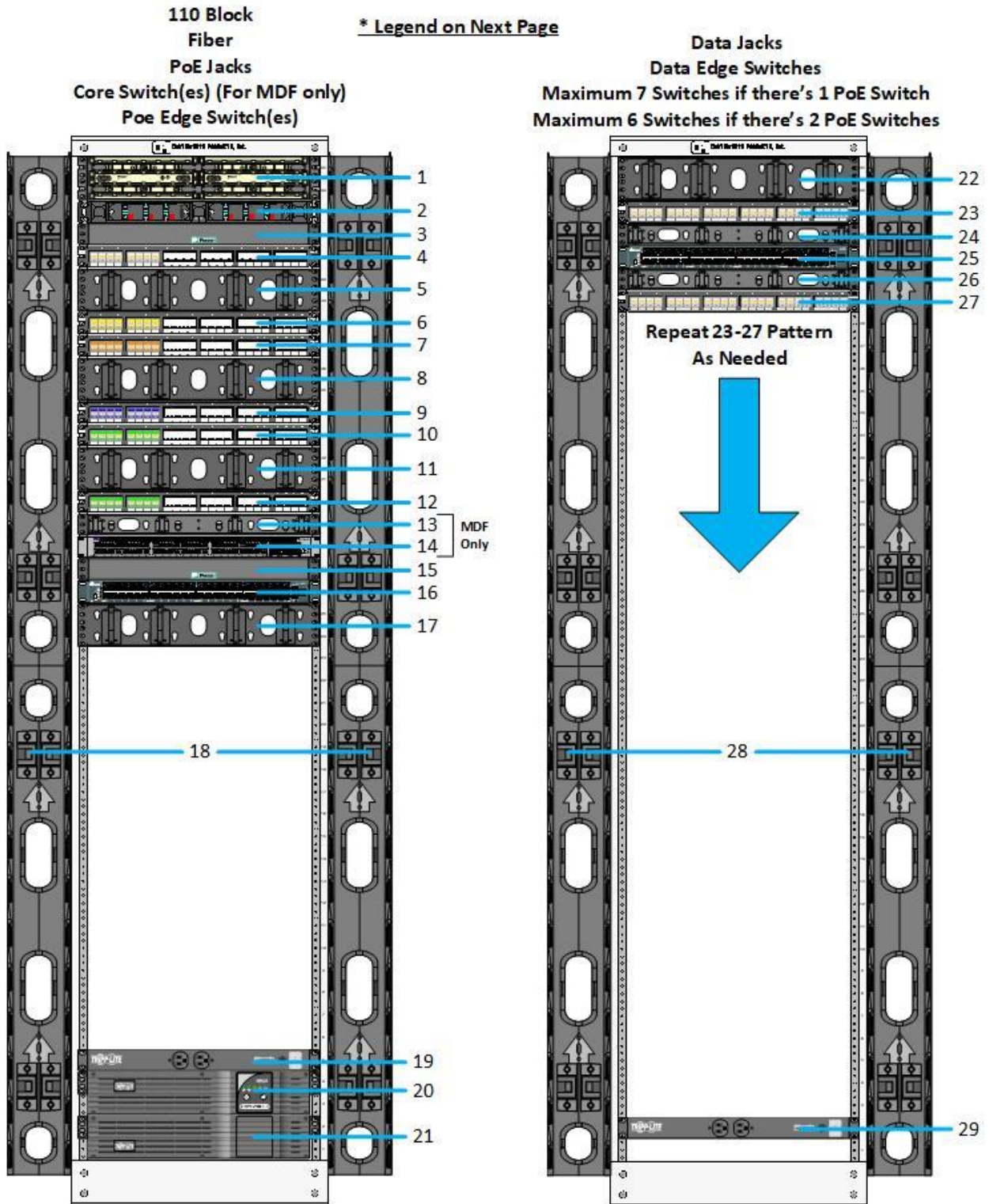
Enclosure A - LUSD MDF Layout



Enclosure B - LUSD IDF Layout



Enclosure C - LUSD Double 2-Post Rack Layout



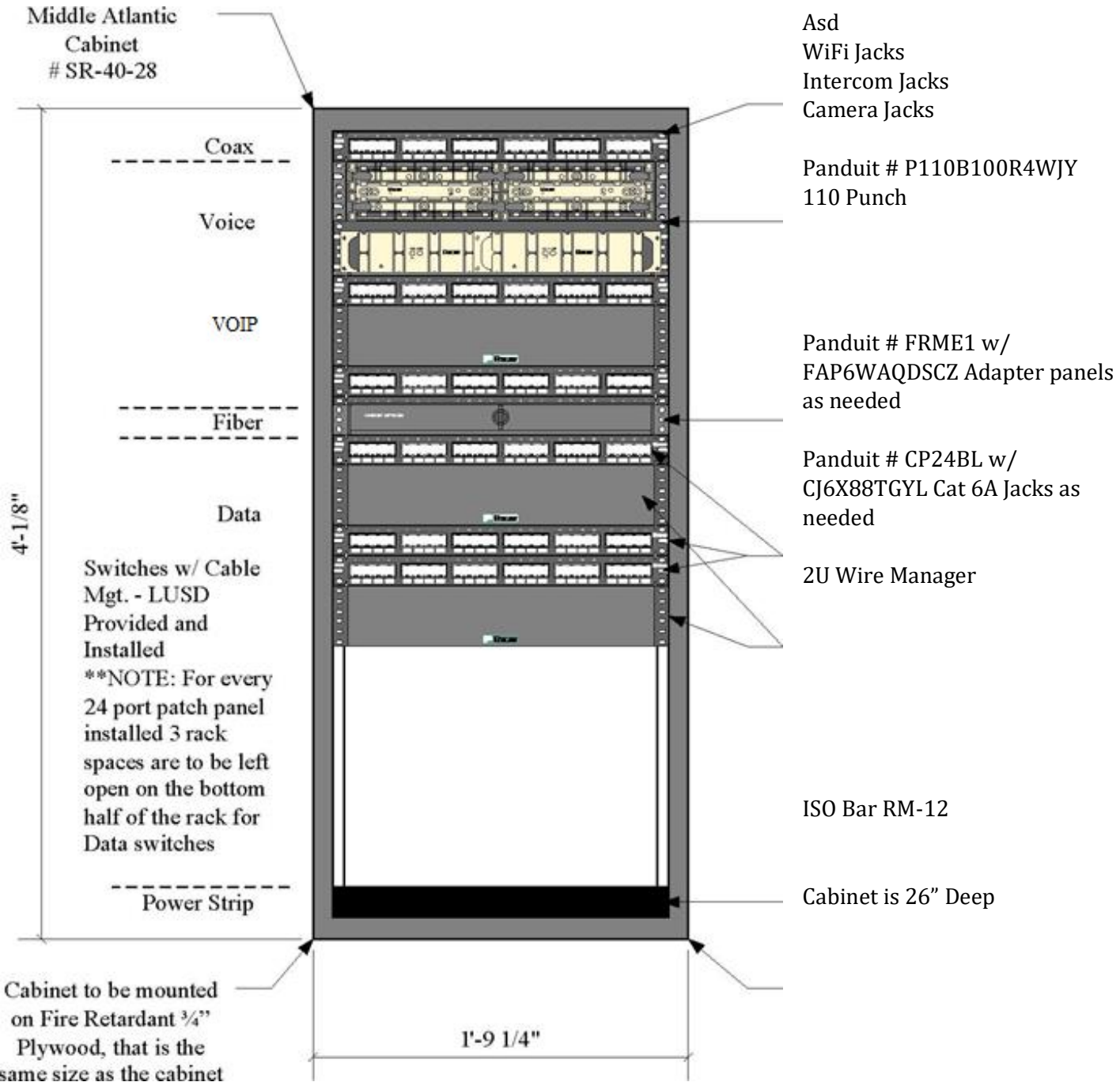


Enclosure C Continued – 2-Post Legend

- | | |
|--|---|
| 1) 2U Pan-Punch Panel | 16) 1U Open for Edge Switch |
| 2) 1U Closet Connector Housing (CCH) w/ Fiber Adapters | 17) 2U Single-Sided Wire Manager |
| 3) 1U Rack Filler Panel | 18) 2U Vertical Wire Managers |
| 4) 1U Patch Panel with WiFi (White Jacks) | 19) Tripp-Lite 1U Surge Suppressor Bar |
| 5) 2U Double-Sided Wire Manager | 20) Tripp-Lite or APC 2U UPS |
| 6) 1U Patch Panel with Access Control (Yellow Jacks) | 21) Tripp-Lite or APC 2U Battery Backup |
| 7) 1U Patch Panel with Cameras (Orange Jacks) | 22) 2U Single-Sided Wire Manager |
| 8) 2U Double-Sided Wire Manager | 23) 1U Patch Panel with Data (Electric Ivory Jacks) |
| 9) 1U Patch Panel with VoIP (Blue Jacks) | 24) 1U Double-Sided Wire Manager |
| 10) 1U Patch Panel with Intercoms / Horns (Green Jacks) | 25) 1U Open for Edge Switch |
| 11) 2U Double-Sided Wire Manager | 26) 1U Double-Sided Wire Manager |
| 12) 1U Patch Panel with Intercoms / Horns – If Necessary | 27) 1U Patch Panel with Data (Electric Ivory Jacks) |
| 13) 1U Single-Sided Wire Manager | 28) 2U Vertical Wire Managers |
| 14) 1U Open for Core Switch | 29) Tripp-Lite 1U Surge Suppressor Bar |
| 15) 1U Rack Filler Panel | |

Enclosure D – LUSD Previous IDF Layout

The Intended layout of ALL 19-inch racks and/or patch panels need to be verified and approved by the LUSD wiring inspector of the I.S. Department before any racks, jacks, or patch panels are mounted.





Enclosure E – LUSD Labeling Format

The LUSD labeling format is a 4-part identifier that indicates the campus, type of jack, IDF location, room, and jack. Below is a key to determine the jack information and name new locations.

WW-XX-YY-ZZ

CAMPUS AND VOICE OR DATA	MDF OR IDF DESIGNATION	ROOM # OR ABBREVIATION	JACK # (TWO DIGITS)
Data = Even # (Purple) Voice = Odd # (Grey) Video = C (Coax) Card Readers = CR Camera = VS NVR = NVR	MDF = A IDF-B = B IDF-C = C etc.	West Admin Office = WA East Admin Office = EA Library = Lib 15 = 15 M2 = M2 10 = 10 etc. Determined by Campus Architect or IT Staff.	01 (1 st Jack in Room) 02 (2 nd Jack in Room) 03 (3 rd Jack in Room) etc. Starts in corner of room and counts clockwise. New jacks increase from last jack.
See Next Page for Voice and Data numbers for each campus.			

VOICE EXAMPLE: The first voice jack in room M1 = "09-G-M1-01"

DATA EXAMPLE: The first data jack in room M2 = "10-G-M2-01"

DATA EXAMPLE: The first data jack in room E1 = "10-F-E1-01"

VOICE EXAMPLE: The first voice jack in room E1 = "09-F-E1-01"

DATA EXAMPLE: The first data jack in the West Admin Office = "10-A-WA-01"

CARD READER EXAMPLE: IDF Alpha ID + "CR" + IP address node # = DCR101

VIDEO SURVEILLANCE CAMERA EXAMPLE: IDF Alpha ID + "VS" + IP address node # = BVS101

NVR SECURITY EXAMPLE: IDF Alpha ID + "NVR" + IP address node # = ANVR101

*Dashes do not need to be included. However, the jack number must be two numeric characters
Example: "10GM201" instead of "10GM21"

MDF/IDF'S & WORKSTATIONS ALL JACKS ARE TO BE IDENTIFIED WITH THE APPROPRIATE NUMBERING SCHEME.

All numbers must be legibly written on the jacks (or 110 punch panels, etc.) with a black permanent marker and then labeled.



Enclosure E Continued – LUSD Labeling Format

Site Location	Site Numbers	
	Data	Voice
Nutrition Services Operations Center	3	4
Bear Creek High	6	5
Lodi High	8	7
Tokay High	10	9
M&O	12	11
Julia Morgan	14	13
Liberty High	16	15
Plaza Robles High	18	17
Delta Sierra	20	19
Lodi Middle	22	21
Millswood	24	23
Woodbridge	26	25
Morada	28	27
Beckman	30	29
Clairmont	32	31
Creekside	36	35
Davis	38	37
Henderson	40	39
Heritage	42	41
Houston	44	43
John Muir	46	45
Lakewood	48	47
Larson	86	85
Lawrence	50	49
Live Oak	52	51
Lockeford	54	53
Lois Borchardt	56	55
Nichols	58	57
Oakwood	60	59
Parklane	62	61
Reese	64	63
Sutherland	66	65
Tokay Colony (Turner Academy)	68	67
Turner School	70	69
Victor	72	71
Vinewood	74	73
Wagner Holt	76	75
Washington	78	77
Christa McAuliffe	80	79
Westwood	82	81
Heritage Int.	84	83
Children's Center	86	85
Transportation	88	87
Warehouse	90	89
Lincoln Tech	92	91
Mosher	94	93
Elkhorn	96	95
Serna	98	97
Silva	100	99
Podesta	134	133



Enclosure F – JAESC Labeling Format

Data Jack Matrix

Site	Floor	IDF	Zone	Jack#
01 (Phone)	1	A	01	01
02 (Data)	2	B	02	02
	3	C	03	03
		D	04	04
		E	05	05

Note: New VoIP jacks are 02, not 01
 Only old phone jacks are 01

Wireless Jack Matrix

Site	Floor	IDF	Zone	Jack#
02 (Data)	1	A	01	W1
	2	B	02	W2
	3	C	03	W3
		D	04	W4
		E	05	W5



Enclosure G – Approved LUSD Parts List

CABINET and GROUNDING			
Manufacturer	Part Number	Description	Location
Middle Atlantic	SR-40-28	40 space, black, 90" tall swinging cabinet (must order solid door separately)	MDF/IDF
Middle Atlantic	Lace-44LP	Vertical Lacing Bar	MDF/IDF
Middle Atlantic	QFAN	Accessory Quiet fan for cabinet	MDF/IDF
Chatsworth	66353-703	Standard 2-Post Rack 84" Height - Black	MDF/IDF
Panduit	RGW-100-1Y	Paint piercing grounding washer kit	MDF/IDF
Panduit	RGS134-1Y	Rack Grounding Strip Kit	MDF/IDF
Panduit	RGEJ624PHY	Equipment Jumper Grounding Kit, 24" jumpers	MDF/IDF

FIBER PRODUCTS			
Manufacturer	Part Number	Description	Location
Panduit	FRME4	Holds up to 12 FAP or FMP adapter panels	MDF
Panduit	FRME3	Holds up to 9 FAP or FMP adapter panels	MDF
Panduit	FRME2U	Holds up to 6 FAP or FMP adapter panels	MDF
Panduit	FRME1U	Holds up to 3 FAP or FMP adapter panels	IDF
Panduit	FAP3WAQDSCZ	OM4 SC FAP loaded with 3 SC duplex multimode couplers (aqua)	MDF/IDF
Panduit	FAP3WBUDSCZ	OS2 SC FAP loaded with 3 SC duplex singlemode couplers (blue)	MDF/IDF
Panduit	<i>OPTI-ADAPTER</i>	Corning/Panduit Modular Fiber Closet Connector Housing (CCH) Adapters/Converters	MDF/IDF
General Cable	BL0061PNU	OM4 6F 50um MM TB OFNP	Backbone
General Cable	AP0061PNU	OS2 6F SM TB OFNP	Backbone
General Cable	BL0061PNU	OM4 6F 50um MM TB OFNP	Backbone
General Cable	BL0061ANU.BK	OM4 6F 50um MM TB OFNP I/O	Backbone
General Cable	AP0061ANU.BK	OS2 6F SM TB OFNP I/O	Backbone
General Cable	BL0064M1A-DWB	OM4 6F 50um MM LT SINGLE JKT	Backbone
General Cable	AQ0064M1A-DWB	OS2 6F SM LT SINGLE JKT	Backbone



WIRE MANAGEMENT			
Manufacturer	Part Number	Description	Location
Panduit	WMPSE	1U Dual-Sided Horizontal Wire Management	MDF/IDF
Panduit	WMPH2E	2U Dual-Sided Horizontal Wire Management	MDF/IDF
Panduit	WMPFSE	1U Single-Sided Horizontal Wire Management	MDF/IDF
Panduit	WMPF1E	2U Single-Sided Horizontal Wire Management	MDF/IDF
Panduit	WMPV45E	Dual-Sided Vertical Wire Management	MDF/IDF
Panduit	DPFP1	1U Rack Filler Panel	MDF/IDF

Enclosure G Continued – Approved LUSD Parts List

TWISTED PAIR PRODUCTS			
Manufacturer	Part Number	Description	Location
Panduit	CP24BL	24 Port Mini-Com patch panel	MDF/IDF
Panduit	CP48BLY	48 Port Mini-Com patch panel (Metal panel)	MDF/IDF/WS
Panduit	CPPL24WBLY	24 Port Mini-Com modular patch panel (Plastic)	MDF/IDF/WS
Panduit	FP6X88MTG	TX6A™ Category 6A UTP Field-Term RJ45 Plug	MDF/IDF/WS
Panduit	CJ6X88TGIG	GRAY CAT6A MOD JACK (for Server Locations)	MDF/IDF
Panduit	CJ6X88TGYL	Yellow 6A Mini-Com Jack (Access Control)	Access Control System/Camera
Panduit	CJ6X88TGW	White 6A Min-com Jack (Ceiling WAPs)	Ceiling WS
Panduit	CJ6X88TGBU	Blue Cat 6A Mini Com Jack (for VoIP)	MDF/IDF/WS
Panduit	CJ6X88TGGR	Green Cat 6A Mini Com Jack (for Intercom)	MDF/IDF/WS
Panduit	CJ6X88TGEI	Electric Ivory Cat 6A Mini Com Jack	WS
Panduit	FPUD6X88MTG	Up/Down Field Term Plug (for Intercom Horn/Speaker Weather Tight Bell Boxes Only; terminate using down orientation diagram)	Horn, Hallway, & Flush Mount Speakers
Panduit	FP6X88MTG	Field Term Plug for Camera locations.	
Panduit	UTP6XXYL	Non- Shielded Yellow 6A Patch Cord, XX is length	MDF/IDF/WS
Panduit	UTP28X*YL	Cat.6A, 28AWG, Yellow, * = length: 1,3,5,7,19,14 feet	MDF/IDF/WS



Panduit	P110B100R4WJY	19" Rack Mount Panel w 2 100pr 110 punch-down blocks and jumper troughs	MDF/IDF
Panduit	P110B100R2Y	2U Pan-Punch Rack Mount Panel with 2 100-Pair pre-mounted bases	MDF/IDF
Panduit	P110CB4-XY	4pr 110 Connecting Clips 10pk	MDF/IDF
Panduit	P110CB5-XY	5pr 110 Connecting Clips 10pk	MDF/IDF
General Cable	7133825	Purple CAT 6A CMR (for Data at workstations)	Horizontal
General Cable	7133819	Blue CAT 6A CMR (for WAPs)	Horizontal
General Cable	7131823	Green CAT 6A CMP (for Intercom drops, closets)	Horizontal
General Cable	7131822	Yellow CAT 6A CMP (for Cameras, Closets)	Horizontal
General Cable	7133821	Gray CAT 6A CMR 4 Pair wire (for Voice)	Horizontal
Commscope	CM-00424SMX-CF6A-02	SystiMax, Black CAT 6A OSP (Voice and Data)	Horizontal
General Cable	2131550E	Cat.5e, 25 pair CMP, White	MDF/IDF
General Cable	2133269E	Cat.5e, 25 pair CMP, Gray	MDF/IDF
Superior Essex	04-097-31	CAT 5 25 Pair OSP	MDF/IDF

Enclosure G Continued – Approved LUSD Parts List

COAX PRODUCTS			
Manufacturer	Part Number	Description	Location
Belden	6139B8	RG-11 Coax Dou-foil w/100% Shielding Plenum	Backbone
Belden	1523A	RG-11 Coax Dou-foil w/100% Shielding Non-Plenum	Backbone
Belden	1525A	RG-11 Coax Dou-foil w/100% Shielding OSP	Backbone

RACEWAY PRODUCTS			
Manufacturer	Part Number	Description	Location
Panduit	LD-5	Raceway for Data/Wi-Fi/Access Control System	Wi-Fi/ACS
Panduit	LDP-10	Raceway for Data/Voice/Coax	WorkStation
Panduit	T-70	Raceway for Comp. Lab That will accept communications and power	WorkStation
Panduit	CMBEI-X	Mini-Com Blank Ivory	WorkStation
Panduit	CFPSL4EIY	Classic Executive Faceplate, Sloped (anti-shear)	WorkStation
Panduit	JBX3510EI-A	Single gang Junction box	WorkStation

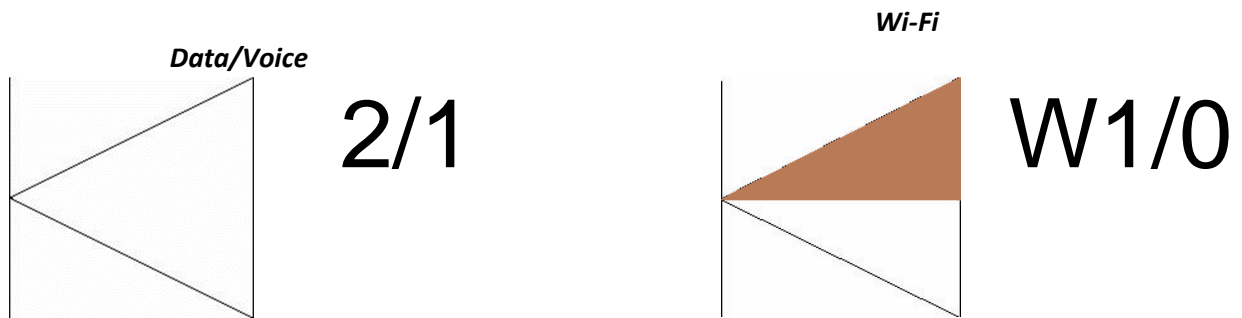


INTERCOM PRODUCTS			
Manufacturer	Part Number	Description	Location
Algo	8188	PoE SIP Ceiling Speaker	Recessed Locations
Algo	8188MEM	Hydrophobic Membrane Screen for 8188	Bathrooms, Kitchens, etc.
Algo	8186	LUSD Supplied; Not installed by contractor; contractor installs Panduit Up/Down Field Term plug in double gang double-deep weather tight bell box w/ cap.	Outdoor Locations, Multi-Purpose Rooms, Gyms, Locker Rooms, etc.
Algo	8180	Not installed by contractor; contractor installs green data jack in Panduit Executive faceplate	Classrooms

Enclosure G Continued – Approved LUSD Parts List

CAMERA PRODUCTS			
Manufacturer	Part Number	Description	Location
WiseNet	QNV-8080R	5 Megapixel H.265 DOME IP CAMERA	Interior / Exterior

Enclosure H - LUSD Basic Telecommunications Jack Legend



This example has "2" for two data and "1" for one voice.

Data only would be d/0 with "d" as the number of data jacks.

Voice only would be 0/v with "v" as the number of voice jacks.

Category 6A cabling/jacks are indicated by a "W" preceding the number (or jack count)

Jack Color Code	
White - Wi-Fi	Electric Ivory - Data
Black - Voice	Yellow - Access Control
Blue - VOIP	Green - Intercom



Enclosure I – Data/Camera System Install Inspection Check List - Sample

Data/Camera System Install Inspection Check List

	Yes	No	N/A or Undetermined
1. Does the work done match the scope of work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Notes:			
2. Does the Visio match what was installed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Notes:			
3. Are all of the test results completed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Notes:			
4. Cabinet			
a. Is it mounted to the backboard and firmly affixed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Does the cabinet block anything and open?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Is there dedicated 115 VAC?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Are the cables bundled neatly and labeled in the back?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Are all of the parts used in the Lodi USD specifications?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Is everything labeled in front to Lodi USD specifications?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Notes:			
5. Wiring			
a. Spot check the wire in the ceiling – is it supported every 4' to 8' per EIA/TIA?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. No black tape is to be used. Is there any black tape?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. No zip ties are to be used. Are there any zip ties?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Is the pipe/raceway not overfilled per EIA/TIA?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Was slack-loop provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Notes:			
6. Stations			
a. Is each device labeled and have a wraparound label on the wire as per EIA/TIA?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Is each device mounted with approved hardware?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Notes:			



Enclosure I – Data/Camera System Install Inspection Check List – Sample Continued

	Yes	No	N/A or Undetermined
7. Pipe/Raceway			
a. Is all raceway Panduit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Are all pipe runs are rigid when below 8' or on the roof as per Lodi USD specifications?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Does the firewall have 3' on each side of the wall as per building code?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. No set screw fitting shall be used. Is there any set screw fitting?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Whenever pulling into a pipe/raceway, a pull string is required per Lodi USD specifications. Is there a string?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Notes:			
8. Penetrations			
a. Do penetrations to an outside wall have a nipple and is it sealed with silicon on both the outside and inside?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Were the penetrations approved by the Lead and Asbestos Manager?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Notes:			
9. Does the Site Administrator approve and are they happy?			
Notes:			
Additional Notes:			



Enclosure J – Projector System Install Inspection Check List - Sample

Projector System Installation Inspection Check List

1. Does the work done match the scope of work?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Notes:		
2. Does the Visio match what was installed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Notes:		
3. Are all of the test results completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Notes:		
4. SmartBoard		
a. Is existing whiteboard re-mounted correctly w/ white block style trim butted against end-cuts?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Notes:		
5. Projector		
a. Is it mounted to the backboard and firmly affixed (back-board reaches studs)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
b. Is it ceiling mounted in an approved manner (2 T-bar rods per mount)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
c. Is there dedicated 115 VAC?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
d. Are the cables bundled neatly in the raceway?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
e. Are all of the parts used in the Lodi USD specifications?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
f. Is everything labeled in front to Lodi USD specifications?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Notes:		
6. Wiring (if it is run in the ceiling)		
a. Spot check the wire in the ceiling – is it supported every 4' to 8' per EIA/TIA?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
b. No black tape is to be used. Is there any black tape?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
c. No zip ties are to be used. Are there any zip ties?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
d. Is the pipe/raceway not overfilled per EIA/TIA?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
e. Was slack-loop provided?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Notes:		

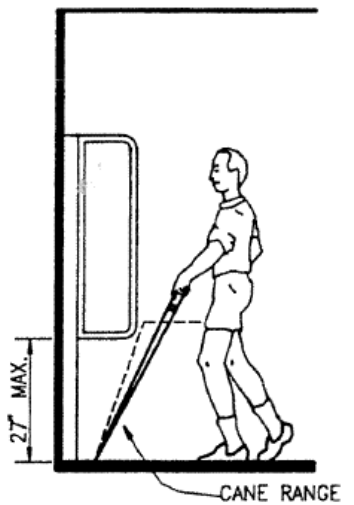
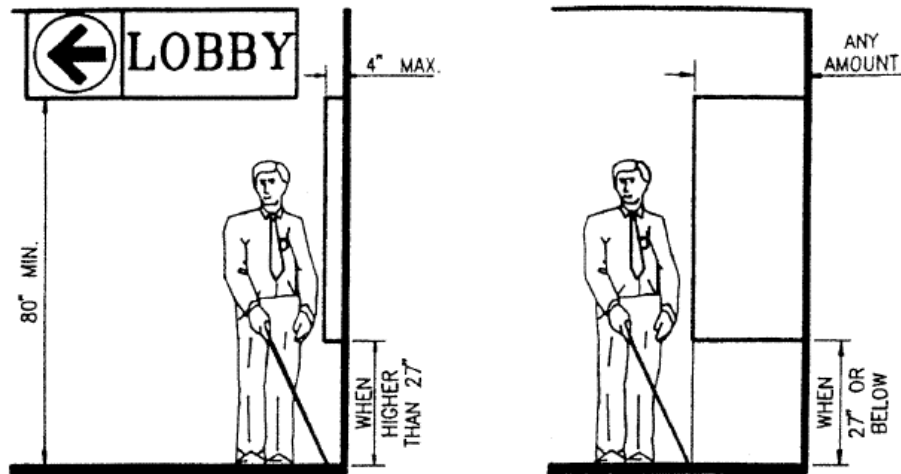


Enclosure J – Projector System Install Inspection Check List – Sample Continued

7. Stations (if Cat5/6 wire and applicable)		
a. Is each device labeled and have a wraparound label on the wire as per EIA/TIA?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
b. Is each device mounted with approved hardware?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Notes:		
8. Pipe/Raceway (if applicable)		
a. Is all raceway Panduit?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
b. Are all pipe runs rigid when below 8' or on the roof as per Lodi USD specifications?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
c. Does the firewall have 3' of pipe on each side of the wall as per building code?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
d. No set screw fitting shall be used. Is there any set screw fitting?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
e. Whenever pulling into a pipe/raceway, a pull string is required per Lodi USD specifications. Is there a string?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Notes:		
9. Penetrations (if applicable)		
a. Do penetrations to an outside wall have a nipple and is it sealed with silicon on both the outside and inside?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
b. Were the penetrations approved by the Lead and Asbestos Manager?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Notes:		
10. Does the Site Administrator approve and are they happy?		<input type="checkbox"/> Yes <input type="checkbox"/> No
Notes:		
Additional Notes:		

Inspected by: _____ Print Name: _____ Date: _____

Enclosure K – Accessible Requirements for Cabinet Mounting
(Images below for reference only)



WALKING PERPENDICULAR TO WALL

THESE DIAGRAMS ILLUSTRATE THE SPECIFIC REQUIREMENTS OF THESE REGULATIONS AND ARE INTENDED ONLY AS AN AID FOR BUILDING DESIGN AND CONSTRUCTION.

FIGURE 11B-7A—PROTRUDING OBJECTS