



Telecom Room Design and Construction Checklists

March 28, 2024

*Prepared for School District staff, and its
Architects, Electrical Engineers, and other contractors*

Prepared by MasterLibrary Professional Services



Checklists: TR Design Review & Construction Management

This section is designed to assist the following professionals in the design and construction of Telecommunications Rooms (TRs):

- Architects
- Electrical Engineers
- Construction Managers
- School district management and staff
- Contractors

Refer to the previous sections of this *TR Master Plan* for specifications and other details required to design and construct an industry-compliant TR.

Instructions



Scan this QR code to download additional versions of this PDF.

The checklist that follows (pp. 3 – 9) can be used for quality control of:

1. Telecom Room (TR) design during the Design Review phase
2. Construction Management—Technology Construction Management (TCM), in this case—during the Build phase.
3. Final Punchlist prior to project hand-off.

These pages are intended for use by Construction firms, contractors and especially district IT and Facilities professionals to ensure that the construction of TRs does not deviate from the final design and construction drawings.

You will need checklist (3) sets for each of these three phases.

1. Save a copy of this checklist master PDF and rename it for the project with the building name and TR designation (e.g., HS-ITRD).
2. Either use Adobe Acrobat®'s "Fill and Sign" function to complete the checklist electronically (preferred method) or print the PDF for hard-copy use.
3. Provide the following information at the top of each checklist page:
 - Building name (if multiple buildings are involved)
 - TR Designation and Room Number (e.g., TR-3, 1326)
 - Applicable building phase.
4. During the appropriate phase, review drawings, specs, and construction for every item, checking off those that follow all the guidance provided in this Master Plan.
5. For deficient items, use the Comments/Notes field to briefly state the deficiency and what party is responsible for correction.
6. While electronic PDF versions of completed checklists are preferable for collaboration, storage, and future access, paper-based completed lists should be scanned and uploaded to a secure project folder as part of the project archive.

Telecommunications Room Design/TCM/Punchlist Review Checklist

BUILDING	TR DESIGNATION & ROOM NO.	PHASE <input type="checkbox"/> DESIGN <input type="checkbox"/> TCM <input type="checkbox"/> PUNCHLIST
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A. Room Construction

	COMMENTS/NOTES
<p>LOCATION & ROOM SIZING</p> <p>The room meet these minimum sizes based on its functionality.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Entrance Facility ≥ 6’w x 4’d <input type="checkbox"/> Main Telecommunications Room (MTR) ≥ 10’w x 12’d <input type="checkbox"/> Intermediate Telecommunications Room (ITR) ≥ 9’w x 10’d <input type="checkbox"/> The distance from each data outlet to the patch panel in the TR does not exceed 295’. 	
<p>FLOORS</p> <ul style="list-style-type: none"> <input type="checkbox"/> Floor loading capacity in the TR shall be designed for a minimum distributed load rating of 50 lbf/ft². <input type="checkbox"/> Anti-static/grounded VCT to be installed early in the project schedule. Completion to coincide with the start of low-voltage cable installations. 	
<p>WALLS</p> <ul style="list-style-type: none"> <input type="checkbox"/> Walls extend to the deck and are rated per local code requirements. <input type="checkbox"/> There are no interior or exterior windows in the space. <input type="checkbox"/> Drywall is finished and painted with Interior finishes that are a light color (linen) to enhance room lighting. <input type="checkbox"/> Fire retardant, void-free, ¾-inch AC-grade plywood 8’ in length is installed per construction drawings and painted as directed leaving the fire-retardant stamps visible and legible. <input type="checkbox"/> Plywood completion to coincide with the start of low-voltage cable installations. The plywood must be securely fastened to the wall-framing members and mounted vertically starting at 12” above the finished floor. 	
<p>ENTRANCE DOORS</p> <ul style="list-style-type: none"> <input type="checkbox"/> The door shall be a minimum of 36”w x 80”h. <input type="checkbox"/> There shall be no windows in the door. <input type="checkbox"/> Out-swinging door preferred (code permitting). <input type="checkbox"/> TR doors shall be equipped with Card Access. <input type="checkbox"/> Door seals, door sweep, automatic closet, and storeroom lock are all installed. 	

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Telecommunications Rooms: Design Review Checklist (cont.)

BUILDING	TR DESIGNATION & ROOM NO.	PHASE <input type="checkbox"/> DESIGN <input type="checkbox"/> TCM <input type="checkbox"/> PUNCHLIST
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A. Room Construction (cont.)	COMMENTS/NOTES
<p>CEILING</p> <ul style="list-style-type: none"> <input type="checkbox"/> Drop ceilings shall not be installed and shall be open to the deck above. <input type="checkbox"/> If a ceiling is installed, the minimum height Above Finished Floor shall be 9'. Ceiling protrusions must be placed to assure a minimum clear height of 8'6 inches to provide space over the equipment facilities for cables and suspended racks. 	
<p>ELECTRICAL</p> <ul style="list-style-type: none"> <input type="checkbox"/> Dedicated Electric Panel (generator power if available) installed in the TR that only serves technology devices within the room. <input type="checkbox"/> Each equipment rack shall have two dedicated 20A circuits, one normal and one emergency power. Larger circuits may be required for specialized equipment. <input type="checkbox"/> Lights and convenience outlets (at minimum two locations) in the room should not be connected to the in-room panel. 	
<p>LIGHTING</p> <ul style="list-style-type: none"> <input type="checkbox"/> Provide a min of 50 fc. candles measured 3' above the finished floor. <input type="checkbox"/> Suspended light fixtures should be mounted at 8'6" above the finished floor. <input type="checkbox"/> Position the light fixture(s) above an aisle area, front and back only, and not directly over equipment racks or cabinets. <input type="checkbox"/> Wall-mounted fixtures are permissible if lighting standards are met. Wall mounts should be placed in such a manner that they will not interfere with infrastructure pathways, protective equipment, and cables. <input type="checkbox"/> Emergency lighting should be installed. 	

Telecommunications Rooms: Design Review Checklist (cont.)

BUILDING	TR DESIGNATION & ROOM NO.	PHASE <input type="checkbox"/> DESIGN <input type="checkbox"/> TCM <input type="checkbox"/> PUNCHLIST
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A. Room Construction (cont.)	COMMENTS/NOTES
<p>ENVIRONMENTAL</p> <ul style="list-style-type: none"> <input type="checkbox"/> Environmental controls must be dedicated to the room. <input type="checkbox"/> The recommended operating temperature should be set between 60°F to 80°F. <input type="checkbox"/> The recommended humidity level should fall between 30% and 65%. Humidity should be a concern if it is anticipated that normal level within the TR would fall outside these parameters. <input type="checkbox"/> Heating, ventilation, and air-conditioning sensors related to the environment within the TR must be located in the TR. Alarms should be sent to facilities and IT departments via text or email. <input type="checkbox"/> Cooling equipment should be on emergency power, if available. <input type="checkbox"/> Cooling equipment must not be mounted over technology equipment within the room. FCUs or similar should be mounted outside the room and ducted in. Water lines to cooling equipment must not route over technology equipment. <input type="checkbox"/> Roof penetrations must not be located above or near the equipment. 	
<p>BONDING AND GROUNDING</p> <ul style="list-style-type: none"> <input type="checkbox"/> Bonding and Grounding shall conform to ANSI/TIA-J-STD-607-B Generic Telecommunications Grounding and Bonding (Earthing) for Customer Premises, NEC Article 250 and hardware manufacturer’s grounding requirements. <input type="checkbox"/> The telecommunications grounding main busbar must be connected to the electrical system building ground electrode. <input type="checkbox"/> The IT bonding and grounding system shall be dedicated to the TRs within the building. <input type="checkbox"/> All TRs must be provided with a Telecommunications Grounding Busbar (TGB) that is ANSI approved and UL listed. 	
<p>FIRE PROTECTION</p> <ul style="list-style-type: none"> <input type="checkbox"/> Sprinkler pipes and heads must be 18” away from equipment racks. (Side-wall mounted sprinklers are preferred) 	
<p>MISCELLANEOUS</p> <ul style="list-style-type: none"> <input type="checkbox"/> Mechanical, electric and plumbing that does not serve the TR shall not be in or pass through the TR. 	

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Telecommunications Rooms: Design Review Checklist (cont.)

BUILDING	TR DESIGNATION & ROOM NO.	PHASE <input type="checkbox"/> DESIGN <input type="checkbox"/> TCM <input type="checkbox"/> PUNCHLIST
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B. Cable Pathways

COMMENTS/NOTES

PRIMARY PATHWAYS

- Cables tray installed in corridors.
- Cable trays do not run through walls; instead, they transition through sleeves.
- Cable trays and J-hooks transition to conduit in areas of inaccessible ceilings.
- Pull boxes installed for every 100' of conduit or 180° of bends.
- Grommeted sleeves or fire-rated pathway assemblies are installed where cables pass through wall assemblies.
- All primary pathways shall be designed so as not to exceed a maximum fill ratio of 32%.
- Maintain the following distances from EMI sources:
 - Fluorescent Lights: 12"
 - Power cables: 6"
 - Transformers: 36"
- All metallic pathways are bonded to complete continuity back to the building ground.
- Radius fittings shall be used when changing cable tray direction.

PRIMARY PATHWAYS (CONT.)

- Dual hanger or trapeze type with 3/8"-minimum threaded rod are the approved mounting methods for cable trays. Center-hung hangers are not permitted.
- Cable trays will be installed in accordance with NFPA 70 article 392.
- Maintain 6" clearance from bottom of cable tray to the top of accessible ceiling tile, and 12" clearance above cable trays to facilitate access to the cable tray for cable installation.
- Provide threaded rod covers to prevent damage to cables during installation.
- All pathways must have a 250-lb. pulling tension pull string/tape installed.

Telecommunications Rooms: Design Review Checklist (cont.)

BUILDING	TR DESIGNATION & ROOM NO.	PHASE <input type="checkbox"/> DESIGN <input type="checkbox"/> TCM <input type="checkbox"/> PUNCHLIST
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B. Cable Pathways (cont.)

	COMMENTS/NOTES
<p>SECONDARY PATHWAYS</p> <ul style="list-style-type: none"> <input type="checkbox"/> Closed metallic pathways will be used in exposed visible areas of egress. <input type="checkbox"/> All pathways, pull boxes and junction boxes shall have an adequate access space provided to ensure the contractor or installer a safe means of entry. <input type="checkbox"/> J-Hooks <ul style="list-style-type: none"> <input type="checkbox"/> 4' spacing with hooks staggered 2 - 3" off center. <input type="checkbox"/> J Hooks shall be supported from the building structure utilizing wall adapters, beam clamps and or threaded rods. <input type="checkbox"/> J-Hooks are to be used only where cable counts are fewer than 30. Where cable counts exceed 30 cables, use a cable tray. <input type="checkbox"/> Metallic Surface Raceways <ul style="list-style-type: none"> <input type="checkbox"/> Raceways shall be installed with entrance end fittings <input type="checkbox"/> When the raceway is divided and shared, separate offset single-gang device brackets shall be used. <input type="checkbox"/> All raceways will be installed using mechanical fasteners. Velcro and adhesive tape are not permitted. <input type="checkbox"/> Radius fittings shall be installed at changes in direction. <input type="checkbox"/> Outlet/device locations <ul style="list-style-type: none"> <input type="checkbox"/> Whenever possible, outlets shall be flush mounted. In existing buildings when walls cannot be fished, surface outlets will be acceptable. <input type="checkbox"/> Recessed install or exposed in Mechanical Spaces: Use 4" x 4" x 2.5" with single-gang mud ring as applicable. <input type="checkbox"/> Surface Mount: Use 4" x 4" x 2.25" <input type="checkbox"/> Surface-Mount Wall Phone/Call Switch: Use 2" x 4" x 1.75" 	

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Telecommunications Rooms: Design Review Checklist (cont.)

BUILDING	TR DESIGNATION & ROOM NO.	PHASE <input type="checkbox"/> DESIGN <input type="checkbox"/> TCM <input type="checkbox"/> PUNCHLIST
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Cabling

COMMENTS/NOTES

INTER-BUILDING BACKBONE CABLES AND CONNECTION HARDWARE

Fiber Cable

- Type: Single-Mode Fiber
- Loose Tube
- 96 strands for CORE cables
- 12 strands between buildings
- Transition from outdoor to indoor cable to meet local code requirements
- Splices - fusion not mechanical
- Connectors - fusion spiced pigtails or splice-on
- 30ft of service loop coiled in each building entrance location
- Maintenance holes
 - Rout fiber around the internal perimeter to create a 20' service coil.
 - Secure fiber to cable-management racking.
- Cable construction appropriate for installation environment.
- Cable installations coincide with drywall finishing and are completed prior to ceiling grid installation.

Copper Cable

- Pair count: Determined by project need. 25 pair minimum
- Cable construction appropriate for installation environment
- Lightning protection installed within 50ft of building entry
- Cable installations coincide with drywall finishing and are completed prior to ceiling grid installation.

Telecommunications Rooms: Design Review Checklist (cont.)

BUILDING	TR DESIGNATION & ROOM NO.	PHASE <input type="checkbox"/> DESIGN <input type="checkbox"/> TCM <input type="checkbox"/> PUNCHLIST
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B. Cable Pathways/Cabling (cont.)

	COMMENTS/NOTES
<p>INTRA-BUILDING BACKBONE CABLES CONNECTION HARDWARE</p> <p>Fiber Optical Cable</p> <ul style="list-style-type: none"> <input type="checkbox"/> Type: 50um Multimode OM4 or Single-Mode <input type="checkbox"/> Strand count: To be determined by project need. Min 12 strands between CER/TRs <input type="checkbox"/> Cable construction: Armored Plenum rated <input type="checkbox"/> Connector type: LC or owner preference <input type="checkbox"/> Enclosures: 4U in MTR, 2U in TRs <input type="checkbox"/> 20' of service loop shall be coiled in each TR. <input type="checkbox"/> Splices - fusion not mechanical <input type="checkbox"/> Connectors - fusion spiced pigtailed or splice-on connectors <input type="checkbox"/> Labeling requirements <ul style="list-style-type: none"> <input type="checkbox"/> All cables shall be labeled on both ends within 1' of the termination enclosure. <input type="checkbox"/> All Connector Panels shall be labeled with the to and from end points generally the TR No. and/or the Room No. <input type="checkbox"/> Cable installations coincide with drywall finishing and are completed prior to ceiling grid installation. 	
<p>HORIZONTAL CABLES AND CONNECTION HARDWARE</p> <ul style="list-style-type: none"> <input type="checkbox"/> UTP (Unshielded Twisted Pair) <input type="checkbox"/> Category 6 or 6a Plenum rated <input type="checkbox"/> Patch Panels: 48 port, modular <input type="checkbox"/> Outlet connectors <ul style="list-style-type: none"> <input type="checkbox"/> Cat6 or Cat6a <input type="checkbox"/> Horizontal UTP and fiber optic cables will be tested for full compliance with ANSI/TIA/EIA 568-C and addenda. <input type="checkbox"/> (2) Cat6A cables installed per Wireless Access Point. <input type="checkbox"/> Cable shall be loosely bundled to minimize crosstalk and Power Over Ethernet heat loads <input type="checkbox"/> Tie wraps and Velcro/hook-and-loop closures are not permitted <input type="checkbox"/> Labeling requirements: <ul style="list-style-type: none"> <input type="checkbox"/> Each Cable must have a unique cable identification. <input type="checkbox"/> Cable IDs shall be preprinted or computer printed. Label printing area and font shall contrast. <input type="checkbox"/> Label shall be secured to the cable within 4" of each end. <input type="checkbox"/> Handwritten labels are not permitted. 	