# U.I.T. POLICIES AND PROCEDURES

## DIVISION 27 11 00

### STANFORD TELECOMMUNICATIONS ROOMS STANDARD

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>AUTHOR, DATE</th>
<th>APPROVED BY, DATE</th>
<th>EFFECTIVE DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Erich Snow, 9/10/03</td>
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<td>2</td>
<td>Erich Snow, 10/22/03</td>
<td>Bob Moya, 10/22/03</td>
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<tr>
<td>3</td>
<td>James E. O'Connor, 2/8/16</td>
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</tbody>
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### Issue History

- **Erich Snow, 9/10/03**
- **Bob Moya, 10/22/03**
- **James E. O'Connor, 2/8/16**
1.0 PURPOSE

This document describes the Stanford Telecommunications Rooms (formerly known as MDF/IDF’s) Standard (STRS) of methods and procedures for planning, designing and installation of telecommunications rooms including but not limited to size of the rooms, electric requirements, HVAC requirements, etc. on the Stanford University Campus.

2.0 GENERAL

2.1 All labor, materials apparatus, tools, equipment, transportation, temporary construction, and special or occasional services shall be provided as required to make a complete communications utilities installation as shown on the drawings and described in the specifications.

2.2 This section describes the requirements for the building telecommunications rooms in University buildings specified under this division and includes, but is not limited to:
   - Size requirements
   - Electric requirements
   - HVAC requirements
   - Plywood backboards

2.3 Related Stanford University –Facilities Design & Construction Guidelines
   - Section 26.05.xx: Basic Electrical Material and Methods
   - Section 27.00.00: Telecommunications
   - Section 00.73.19 / 01.35.00: Environmental Health and Safety

2.4 Others shall install ladder racking, freestanding relay racks and associated telecommunications hardware in telecommunications rooms at the conclusion of the construction of the telecommunications rooms.

2.5 The STRS applies to all Stanford University Information Technology Services Project Engineers, other support personnel and Contractors involved in the design, construction and maintenance of campus telecommunications rooms.

2.6 References – Most current versions of each
   - American Society for Testing and Materials (ASTM)
   - National Electric Manufacturers Association (NEMA)
• California Occupational Safety and Health Administration (CALOSHA)
• American National Standards Institute (ANSI)
• Telecommunications Industry Association (TIA)
• Electronic Industries Alliance (EIA)
• Building Industries Consulting Services International (BICSI)
• American Institute of Architects (AIA)
• Ceilings and Interior Systems Construction Association (CISCA)
• Construction Specifications Institute (CSI)
• Institute of Electrical and Electronics Engineers, Inc. (IEEE)
• Underwriters Laboratories (UL)
• Uniform Building Code (UBC) (also see International Conference of Building Officials [ICBO])

2.7 Submittals
- Design Drawings: The Design Consultant shall provide detailed design drawings to the Stanford University Information Technology Services Project Engineer that show the telecommunications rooms’ layout and details of all the components to be installed.
- Shop drawings and Project Data: The Contractor shall submit six (6) copies of shop drawings, manufacturers data, and materials list to the Stanford University Information Technology Services Project Engineers for compliance review before purchase of such materials. All material and equipment shall be new and shall bear the manufacturers name, stamp and rating. If the contractor proposes to use substitute materials for an item where a particular manufacturers product is specified followed by the phrase “or approved equivalent”, the Contractor must submit six (6) copies of the manufacturers product data for the proposed substitution.

2.8 Quality Control
- Materials: All materials shall be new and the best of their respective kinds, free from all defects and as specified on the plans and the specifications or as accepted by the Stanford University Information Technology Services Project Engineers. Whenever, under the contract, it is provided that the Contractor shall furnish materials or manufactured articles or shall do work for which no detailed specifications are set forth, the materials or manufactured articles shall be of the best grade in quality and workmanship obtainable on the market from firms of established good reputation, or if not ordinarily carried in stock, shall conform to the usual standards of first-class materials or
articles of the kind required, with due consideration of the use
to which they are to be put. In general, the work performed
shall be in full conformity and harmony with the intent to secure
the best standard of construction and equipment of the work as
a whole or in part.

- Manufacturer’s recommendations: Whether specifically
  mentioned or not in the Specifications, all materials,
equipment, devices, etc., shall be installed in a manner
meeting the approval of the manufacturer of the particular item.
The Contractor shall obtain all installations manuals,
brochures, and procedures that the manufacturer issues for the
equipment and materials. The particular manufacturer shall
certify any reason for deviation from the manufacturer’s
recommendations in writing. The Contractor shall be held
responsible for all installations contrary to the accordance with
the manufacturer’s recommendations, the Contractor shall
make all necessary changes and revisions to achieve such
compliance.

2.9 Site Conditions

- General: Telecommunications Rooms (TR’s) are used to
  conceal, protect, distribute, support and provide voice, data
and CATV services to the Telecommunications Services
Outlets (TSO’s). These TR’s were formerly referred to as Main
Distribution Frames (MDF’s) or Intermediate Distribution
Frames (IDF’s).

- Salvage: The Contractor shall take care when removing
  salvageable material to avoid damaging the material itself or
the adjacent or adjoining structures that are to remain.

- Existing Facilities: Any known existing facilities are shown on
  the plans to help the Contractor avoid damage to essential
utilities, which must remain in service. The Contractor shall
determine the exact location of all existing facilities prior to
doing work that may damage such facilities. If the Contractor
discovers existing facilities not indicated on the plans or in a
location different from what is indicated on the plans, the
Contractor shall protect such facilities, notify the Owner’s
Representative and the Stanford University Information
Technology Services Project Engineers immediately, and
record actual conditions found onto the record drawing.

3.0 TELECOMMUNICATION ROOMS DESIGN SPECIFICATIONS

3.1 MAIN TELECOMMUNICATIONS ROOM (MTR)
Every building has a Main Telecommunications Room (MTR). The
MTR is the main point of entry and distribution for communications
media. The MTR should contain only the facility for cable/wire
distribution. Additionally, the MTR contains the building's communications multiplexing and distribution equipment. The MTR is a windowless room with a single entry.

3.1.1 The floor space required in the MTR will vary depending on communications requirements of the building. The minimum amount of floor space required for an MTR is 150 square feet. The Stanford University Information Technology Services Project Engineers shall define floor space requirements for a particular project during the program phase.

3.1.2 The MTR door lock shall be equipped with a card access device. Currently the two (2) options are an offline lock or an on line electronic lock. Currently we are using the Onity off line lock and the Diebold system for on line.

3.1.3 No other utility, including fire alarm equipment, electrical panels, office supplies, janitorial supplies, etc. shall be co-located in the MTR.

3.1.4 Do not locate the MTR near transformers.

3.1.5 There is no requirement for a drop or false ceiling in the MTR. These spaces shall be dedicated to communications systems; air ducts, plumbing, fire alarms, or any other mechanical or electrical distribution systems shall not be installed in the MTR unless they are providing services to the MTR.

3.1.6 Every MTR shall have ¾” x 8’ high fire rated plywood, painted with white intumescent paint on all six (6) sides, with the certification label left visible on all walls. This plywood shall be affixed in such a manner that it will support the weight of cable, terminals and other equipment. Use flush hardware and supports to mount plywood. The strength and placement of hardware shall be sufficient to handle the total anticipated load (static and dynamic) and mounting of cabling components. All voids must be filled. The placement of the plywood shall be on top of the wall covering, i.e. sheet-rock, etc. and is not a substitute for the wall covering.

3.1.7 Minimum height requirement for all telecommunications rooms is 8’ 6” high above finished floor.

3.1.8 Door(s) to the MTR shall open outward. The door(s) shall be a minimum of 3’ wide by 6’8” tall.

3.1.9 Slots/sleeve must be located in places where pulling and termination of communications wire is easy. Consult the Stanford University Communications and Networking Services Project Engineer for quantity and location.

3.1.10 Flooring shall be 12” x 12” square Static Dissipative Tiles (SDT) (anti static vinyl tiles) with a copper ground stubbed 18” above the floor near the telecommunications ground busbar.

3.1.11 The MTR shall have a minimum floor rating of 50lbf/ft².

3.1.12 Use a light-colored paint to enhance room lighting.
3.1.13 Pulling eyes shall be installed in the Main TR. The Stanford University Information Technology Services Project Engineer shall determine the location(s).

3.1.14 Location –

3.1.14.1 To minimize the horizontal cable lengths, locate the MTR as close as possible to the center of, and on the same floor as the area it is intended to serve.

3.1.14.2 The MTR shall be accessible from a hallway or other common area. Other areas shall not gain access through the MTR.

3.1.14.3 The MTR in Multi story buildings shall have the TR’s stacked vertically above the MTR.

3.1.15 HVAC Requirements –

3.1.15.1 Maintain continuous and dedicated environmental control (24 hours per day, 365 days per year). If emergency power is available, consider connecting it to the HVAC system serving the MTR.

3.1.15.2 Maintain positive pressure with a minimum of one air change per hour in the MTR.

3.1.15.3 Dissipate heat generated by the active devices. The Stanford University Information Technology Services Project Engineer shall provide heat loads of individual pieces of equipment.

3.1.15.4 Satisfy the applicable building codes.

3.1.15.5 Maintain the temperature in the following ranges:

- 64 – 75 degrees Fahrenheit for MTR’s containing active equipment. The humidity shall be 30% to 55% relative normal.
- 50 – 95 degrees Fahrenheit for MTR’s containing no active equipment. It is preferable to that the temperature be maintained within +/- 9 degrees Fahrenheit of the adjoining office and that humidity be kept below 85% relative normal.

3.1.16 Electrical Requirements –

3.1.16.1 Wall switches must not control receptacles.

3.1.16.2 The MTR shall have a dedicated electrical panel located in the MTR if possible. This panel shall house only electrical circuits for the telecommunications rooms. Location of this panel must be pre approved by the Stanford University Information Technology Services Project Engineer. If emergency power is available or required this panel shall be tied into the emergency power.

3.1.16.3 The MTR shall have a minimum of one (1) duplex, twenty (20) ampere, 120 volt isolated "U" ground dedicated
electrical circuit for each 19" data relay rack vertical wire manager equipped with a hard-wired multi-outlet strip mounted on the vertical wire manager (see drawing CM-01). The Stanford University Information Technology Services Project Engineer shall determine the exact number of outlets/circuits and their locations. It is recommended that these outlets/circuits be on emergency power.

3.1.16.4 The MTR shall have a minimum of one (1) thirty (30) ampere, 120 volt isolated "U" ground dedicated electrical circuit (LC30) for each 19" data relay rack vertical wire manager mounted on the vertical wire manager (see drawing CM-01). The Stanford University Information Technology Services Project Engineer shall determine the exact number of outlets/circuits and their locations. It is recommended that these outlets/circuits be on emergency power.

3.1.16.5 The MTR shall have minimum of one (1) duplex, twenty (20) ampere, 120 volt isolated "U" ground dedicated electrical circuit for the Card Access System. The Stanford University Information Technology Services Project Engineer shall determine the exact number of outlets/circuits and their locations. It is recommended that these outlets/circuits be on emergency power.

3.1.16.6 The MTR shall have minimum of one (1) duplex, twenty (20) ampere, 120 volt isolated "U" ground dedicated electrical circuit for the CATV system. The Stanford University Information Technology Services Project Engineer shall determine the exact number of outlets/circuits and their locations. It is recommended that these outlets/circuits be on emergency power.

3.1.16.7 The MTR shall have minimum of one (1) duplex, 120 volt convenient outlet. The Stanford University Information Technology Services Project Engineer shall determine the exact number of outlets/circuits and their locations. It is recommended that these outlets/circuits be on emergency power.

3.1.16.8 The MTR shall have a Telecommunications Main Grounding Busbar (TMGB).

- The TMGB shall be connected the buildings main electrical ground with a minimum #6 AWG stranded copper grounding conductor.
- The TMGB shall be 4" x 20" x ¼" copper grounding busbar.
- The TMGB shall be a predrilled copper busbar provided with holes for use with standard sized lugs.
• It is desired that the TMGB be electro tin plated for reduced contact resistance.
• A nationally recognized testing laboratory shall list the TMGB.
• An approved TMGB is the Chatsworth Grounding Kit Part# 13622-020. See drawing CM-02.

3.1.16.9 Lighting –
• Provide a minimum equivalent of 50 foot-candles measured 3 feet above the finished floor.
• Do not use dimmer switches.
• It is preferred to use a motion-activated switch for lighting.
• Coordinate closely with the 19" relay rack placements.
• Locate light fixtures a minimum of 8'6" above finished floor.
• Emergency lighting is recommended. Place emergency lighting so ensure that the loss of power to normal lights will not hamper an emergency exit from the MTR.
• Power for the lighting should not come from the power panel located in the MTR. At least one light should be on normal power, and one light should be on emergency power, if available.

3.1.17 Fire Protection –
3.1.17.1 Provide Fire Protection to the MTR, if required by applicable codes.
3.1.17.2 If sprinkler heads are provided, install wire cages to prevent accidental operation.
3.1.17.3 For wet pipe systems, drainage troughs are recommended to protect equipment from any leakage that may occur.
3.1.17.4 To prevent water damage, consider using “dry pipe” sprinkler system.
3.1.17.5 A fire extinguisher shall be placed in each MTR.

3.2 TELECOMMUNICATIONS ROOM (TR)
Every floor shall have a minimum of one (1) Telecommunications Room (TR). Each TR is the distribution point for communications media to the work stations/TSO’s. Each TR should contain only the facility for cable/wire distribution. Additionally, each TR may contain the building’s communications multiplexing and distribution equipment. Each TR is a windowless room with a single entry.
3.2.1 The floor space required in each TR will vary depending on communications requirements of the building. The minimum amount of floor space required for each TR is 80 square feet. The Stanford University Information Technology Services Project Engineers shall define floor space requirements for a particular project during the program phase.

3.2.2 Each TR door lock shall be equipped with a card access device. Currently the two (2) options are an offline lock or an on line electronic lock. Currently we are using the Onity off line lock and the Diebold system for on line.

3.2.3 No other utility, including fire alarm equipment, electrical panels, office supplies, janitorial supplies, etc. shall be co-located in each TR.

3.2.4 Do not locate the MTR near transformers.

3.2.5 There is no requirement for a drop or false ceiling in each TR. These spaces shall be dedicated to communications systems; air ducts, plumbing, fire alarms, or any other mechanical or electrical distribution systems shall not be installed in TR’s unless they are providing services to a TR.

3.2.6 Each TR shall have ¾” x 8’ high fire rated plywood, painted with white intumescent paint on all six (6) sides, with the certification label left visible on all walls. This plywood shall be affixed in such a manner that it will support the weight of cable, terminals and other equipment. Use flush hardware and supports to mount plywood. The strength and placement of hardware shall be sufficient to handle the total anticipated load (static and dynamic) and mounting of cabling components. All voids must be filled. The placement of the plywood shall be on top of the wall covering, i.e. sheet-rock, etc. and is not a substitute for the wall covering.

3.2.7 Minimum height requirement for all telecommunications rooms is 8’ 6” high above finished floor.

3.2.8 Door(s) to each TR shall open outward. The door(s) shall be a minimum of 3’ wide by 6’8” tall.

3.2.9 Slots/sleeve must be located in places where pulling and termination of communications wire is easy. Consult the Stanford University Information Technology Services Project Engineer for quantity and location.

3.2.10 Flooring shall be 12” x 12” square Static Dissipative Tiles (SDT) (anti static vinyl tiles) with a copper ground stubbed 18” above the floor near the telecommunications ground busbar

3.2.11 Each TR shall have a minimum floor rating of 50lb/ft².

3.2.12 Use a light-colored paint to enhance room lighting.

3.2.13 Location –
3.2.13.1 To minimize the horizontal cable lengths, locate each TR as close as possible to the center of, and on the same floor as the area it is intended to serve.

3.2.13.2 Each TR shall be accessible from a hallway or other common area. Other areas shall not gain access through a TR.

3.2.13.3 TR's in Multi story buildings shall be stacked vertically.

3.2.14 HVAC Requirements –

3.2.14.1 Maintain continuous and dedicated environmental control (24 hours per day, 365 days per year). If emergency power is available, consider connecting it to the HVAC system serving the TR(s).

3.2.14.2 Maintain positive pressure with a minimum of one air change per hour in each TR.

3.2.14.3 Dissipate heat generated by the active devices. The Stanford University Information Technology Services Project Engineer shall provide heat loads of individual pieces of equipment.

3.2.14.4 Satisfy the applicable building codes.

3.2.14.5 Maintain the temperature in the following ranges:

- 64 – 75 degrees Fahrenheit for IDF’s containing active equipment. The humidity shall be 30% to 55% relative normal.
- 50 – 95 degrees Fahrenheit for IDF’s containing no active equipment. It is preferable to that the temperature be maintained the within +/- 9 degrees Fahrenheit of the adjoining office and that humidity be kept below 85% relative normal.

3.2.15 Electrical Requirements –

3.2.15.1 Wall switches must not control receptacles.

3.2.15.2 The TR shall have a dedicated electrical panel located in the TR if possible. This panel shall house only electrical circuits for the telecommunications rooms. Location of this panel must be pre approved by the Stanford University Information Technology Services Project Engineer. If emergency power is available or required this panel shall be tied into the emergency power.

3.2.15.3 The TR shall have a minimum of one (1) duplex, twenty (20) ampere, 120 volt isolated "U" ground dedicated electrical circuit for each 19” data relay rack vertical wire manager equipped with a hard-wired multi-outlet strip mounted on the vertical wire manager (see drawing CM-01). The Stanford University Information Technology Services Project Engineer shall determine the exact number of outlets/circuits and their locations. It is
recommended that these outlets/circuits be on emergency power.

3.2.15.4 The TR shall have a minimum of one (1) thirty (30) ampere, 120 volt isolated "U" ground dedicated electrical circuit (LC30) for each 19" data relay rack vertical wire manager mounted on the vertical wire manager (see drawing CM-01). The Stanford University Information Technology Services Project Engineer shall determine the exact number of outlets/circuits and their locations. It is recommended that these outlets/circuits be on emergency power.

3.2.15.5 The TR shall have minimum of one (1) duplex, twenty (20) ampere, 120 volt isolated "U" ground dedicated electrical circuit for the Card Access System. The Stanford University Information Technology Services Project Engineer shall determine the exact number of outlets/circuits and their locations. It is recommended that these outlets/circuits be on emergency power.

3.2.15.6 The TR shall have minimum of one (1) duplex, twenty (20) ampere, 120 volt isolated "U" ground dedicated electrical circuit for the CATV system. The Stanford University Information Technology Services Project Engineer shall determine the exact number of outlets/circuits and their locations. It is recommended that these outlets/circuits be on emergency power.

3.2.15.7 The TR shall have minimum of one (1) duplex, 120-volt convenient outlet. The Stanford University Information Technology Services Project Engineer shall determine the exact number of outlets/circuits and their locations. It is recommended that these outlets/circuits be on emergency power.

3.2.15.8 Each TR shall have a Telecommunications Grounding Busbar (TGB).

- The TGB shall be connected the TMGB with a minimum #6 AWG stranded copper grounding conductor.
- The TGB shall be 4" x 20" x ¼" copper grounding busbar.
- The TGB shall be a predrilled copper busbar provided with holes for use with standard sized lugs.
- It is desired that the TGB be electrotin plated for reduced contact resistance.
- A nationally recognized testing laboratory shall list the TGB.
- An approved TGB is the Chatsworth Grounding Kit Part# 13622-020. See drawing CM-02.
3.2.15.9 Lighting –

- Provide a minimum equivalent of 50 foot-candles measured 3 feet above the finished floor.
- Do not use dimmer switches.
- It is preferred to use a motion-activated switch for lighting.
- Coordinate closely with the 19” relay rack placements.
- Locate light fixtures a minimum of 8'6" above finished floor.
- Emergency lighting is recommended. Place emergency lighting so ensure that the loss of power to normal lights will not hamper an emergency exit from the TR.

Power for the lighting should not come from the power panel located in each TR. At least one light should be on normal power, and one light should be on emergency power, if available.

3.2.16 Fire Protection –

3.2.16.1 Provide Fire Protection to the TR, if required by applicable codes.

3.2.16.2 If sprinkler heads are provided, install wire cages to prevent accidental operation.

3.2.16.3 For wet pipe systems, drainage troughs are recommended to protect equipment from any leakage that may occur.

3.2.16.4 To prevent water damage, consider using “dry pipe” sprinkler system.

3.2.16.5 A fire extinguisher shall be placed in each TR.

4.0 INSPECTION AND TESTING

4.1 All work and materials covered by these specifications shall be subject to inspection at all times by the Stanford University Communications Project Engineer. Any work concealed before the Stanford University Information Technology Services Project Engineer has inspected shall be re-opened or uncovered and any required corrective modification made to that portion shall be at the Contractor’s expense.

INSPECTION AND TESTING

- Drawing CM-01: Power Strips for Vertical Cable Sections
- Drawing CM-02: Grounding Busbar Detail - Typical
- Drawing CM-07: Typical Telecommunications Room
- Drawing CM-08: Typical Vertical Sleeve
• Drawing CM-09: Typical Horizontal Sleeve