PART 1- GENERAL

1.01 SUMMARY

A. Furnish and install wire, cable, devices, equipment, and accessories for a complete system of telecommunication wiring for voice and data transmission from the Telecommunications Room (TR) to each voice/data outlet in the building. Every aspect of the EIA/TIA and BICSI standards must be followed for the duration of this project.

B. The cabling system must be engineered, designed and installed by a Systimax Value Added Reseller (VAR) contractor. This contractor must be a Systimax VAR at the time of bid submission. This contractor shall have overall project management responsibility but must keep UT Southwestern Infrastructure Services personnel informed of all progress and of all problems expeditiously for the issues to be resolved. UT Southwestern Medical Center personnel shall be able to perform MAC's, provided all design, installation, and testing procedures outlined in the current Systimax Solutions Visipatch 360 Certified Channel Cabling System guidelines and EIA/TIA and BICSI standards are followed.

C. The purpose of this document is to define the work standard for UT Southwestern cabling installation work to be performed and to identify all products and their part numbers. These guidelines apply to all installation and maintenance personnel.

1.02 SUBMITTALS

A. Submit complete catalog and other descriptive information on each of the components and devices proposed to be supplied for the system.

B. Submit contractor’s qualifications and proof of contractor’s certification as a Systimax VAR Installation Company.

C. Submit proof of full-time RCDD on staff.

D. Submit diagrams showing the arrangement of each TR.

E. Submit schedules of completion for each TR.
2.01 QUALITY ASSURANCE

Equipment and accessories shall be the standard products of the named manufacturer and shall be equal in all respects to those manufactured by the named manufacturer. Catalog numbers and model designations which appear herein indicate design, quality, and type of material as well as required operating characteristics.

2.02 CABLELING

Station Cable Category-6

Station cables shall be Systimax Category-6 cable, part number 2071, blue in color with a plenum rated jacket.

Station Cable Category-6a

Station cables shall be Systimax Category-6a cable, part number 2091, light blue in color with a plenum rated jacket.

Copper Feeder Cable

The copper building feeder cables shall be 22 to 24 gauge as specified (pair count to be announced), shielded twisted pair, and must be plenum rated and armored where required.

Copper Riser Cable

The copper riser cables shall be plenum rated where required, 22 to 24 gauge as specified (pair count to be announced), twisted pair cables

Fiber Optic Feeder Cable (Singlemode)

The fiber optic feeder cables shall be Systimax armored aluminum, Zero Water Peak single-mode armored (strand count to be announced). All fiber must be tight buffered. In the event loose tube outdoor is used it must be terminated using fan out kits. All fiber must be plenum rated where required. All fiber installations shall conform to EIA/TIA standards for loss. All fiber must be fusion spliced to Systimax LC pigtails modules. Unless otherwise mentioned in a contractual agreement all fiber optic installations must be continuous runs from end to end without any splicing with the exception of transitioning from outdoor to indoor fiber where it enters a building. Any miscalculations on the part of the contractor will require that a new cable be installed at the expense of the contractor.

Fiber Optic Riser Cable (Singlemode)

The riser fiber optic cables shall be Systimax, Zero Water Peak single mode. All fiber optic riser cable must be tight-buffered and plenum rated. All fiber installations must conform to EIA/TIA loss per kilometer standards. The fiber shall be fusion spliced to Systimax LC pigtails modules.

Max Cell

All 4” conduits that will house any fiber optic cables must be fully populated with two 3 cell ducts. This must be installed by a certified Max Cell installer.

ADDITIONAL PARTS

Furnish devices, equipment, and accessories necessary for a complete system. Additional parts include but are not limited to the following:

360G2 Modular Cartridges

12-LC-SM-PT (Pigtail Modules)

Visipatch 360 fiber enclosures sized to fit
Visipatch Connector System Category-6 and Category-6a
Visipatch 360 connector system

VP360-4U
VP360-12U
VP360-19PNL-KT (For copper riser and feeder cable)

Work Area Outlets Category-6
All horizontal cable will be terminated on Systimax RJ45 information outlets, Systimax part number MGS400-262 white in color. These information outlets will be placed inside Systimax faceplates Systimax Part number M14LE-262. The unused port on the faceplate will be covered with Systimax dust covers Systimax part number M20AP-262. All outlets will be white, unless otherwise specified by project scope.

Work Area Outlets Category-6a
All horizontal cable will be terminated on Systimax RJ45 information outlets, Systimax part number MGS500, blue in color. These information outlets will be placed inside Systimax faceplates Systimax Part number M14LE-262. The unused port on the faceplate will be covered with Systimax dust covers Systimax part number M20AP-262. Although information outlet colors are determined by the category of cable they are attached to, the final color could be determined by building location. Contractors should verify color of outlets on a per project scope BEFORE outlets are terminated.

19 Inch Equipment Racks
There will be a minimum of two 19” racks black in color installed and bolted to the floor in each TR. Chatsworth Part number 66353-X03.

19 Inch Rack Mounted Shelf
There shall be one 19” rack mounted shelf which extends to the rear and the front of at least one 19” rack in each TR. The shelf will be installed on bottom of rack per “Attachment 1”.

Patch Cords
All patch cords in the TR for data applications must be Systimax RJ45 to Visipatch 360, gray in color for Category-6 applications, and Visipatch RJ45 to Visipatch 360, light blue in color for Category-6a applications, both sized to fit without excessive slack. All patch cords in the TR for voice applications must be single pair Visipatch 360 to Visipatch 360 gray in color for Category 6 applications, 360 to 360 gray in color for Category-6a applications, and Visipatch to 360 gray in color for mixed applications.

All patch cords at the station end must be Systimax RJ45 to RJ45 568B, gray in color for Category-6 and light blue in color for Category-6a, both 10 feet in length.

There must be one complete set of the above mentioned patch cords for every work area outlet. One set is equal to Visipatch360 to R45, Systimax RJ45 to RJ45, and a 1-pair Visipatch 360 to Visipatch 360.

Wire Managers
Vertical wire managers must be Systimax Enhanced vertical wire managers with hinged covers silver in color, part number, VCM-DS-84-10. All horizontal and vertical wire managers must be mounted so they are flush with each other. Wire managers should be installed per “Attachment 1.”
Horizontal wire managers must be Systimax covered wire managers part number HTK-19-SS-2U and HTH-19-SS-1U, black in color and installed per "Attachment 1."

Horizontal and vertical wire managers should be installed so they are as flush as possible as viewed from the front.

**Grounding Busbar**
The TMGB Telecommunications Main Grounding Busbar must be solid copper, Chatsworth part number 40153-012. (*Must be BICSI & ANSI/EIA/TIA approved.*)

**Cable Ladder Rack**
Cable Ladder Rack installed inside the TR must be Chatsworth part number 10250-712 with associated connecting hardware black in color.

**Cable Radius Drop Kit**
Strain relief must be added to keep cabling from being routed in a direct 90 degree angle. The following part numbers are for Comscope products.

- 760083949 CRDK-6W Cable radius drop kit for 6" (152mm) wide ladder rack
- 760083596 CRDK-12W Cable radius drop kit for 12" (305mm) wide ladder rack
- 760083964 CRDK-18W Cable radius drop kit for 18" (457mm) wide ladder rack
- 760083931 CRSMCRDK Side mount cable radius drop kit for all ladder rack widths

**Firestop Material**
For adding cable into existing pathways these material should be used with the correct Hilti System.

- Firestop Putty Stick CP618 (314721)
- 2” Firestop Plug CP658T (378287)
- 4” Firestop Plug CP658T (378288)
- Fire Block FS657 (306242)
- Flexible Firestop Sealant CP606 (337756) **Only to seal outside of new conduits to gypsum**

**Mechanical Firestop Devices**
For cable entry into the TR using cable tray, the Hilti W-L-4011 system should be used. Other firewall penetrations must use the following:

- 2” Hilti Speed Sleeve CP 653 2” (02008603)
- 4” Hilti Speed Sleeve CP 653 4” (02008604)

**PART 3- EXECUTION**

**3.01 STATION CABLES**
All station cable installations will be done in accordance with EIA/TIA 568B and Systimax standards. Per EIA/TIA standards, no cable may exceed 90 meters in length, including slack required to dress cables in the IT room. Where cable tray is not present, all horizontal cable must be properly and independently supported every 4 feet. No cable will be allowed to be connected to ceiling grid wires. Final placement of horizontal cable will not be allowed to come in contact with any other building utility. Each work station outlet will have either one or two Systimax Category-6 or 6a cables. Exact counts per jack will be indicated on the floor plans. All station cable in the TR must be routed through the back side of the horizontal wire managers.
Work Area Outlets
Each outlet will include either one or two Systimax RJ45, information outlets. They shall be mounted on Systimax faceplates. The unused outlet of the faceplate shall be covered with Systimax dust covers. All work area outlets will be white in color.

Wireless Locations Access Points
One AP (access point) will be installed every 50 feet in every corridor in a hospital or clinical type environment for high density coverage areas and one AP every 80 feet in every main corridor in low density coverage areas. This equates to approximately one AP for every 1,900 square feet of space for high density coverage and one AP for every 5,000 square feet of space for low density coverage.

Each AP will require one Category-6 cable and one flush mounted box (j-box or MPLS) installed in the ceiling for hard ceilings. The cable should be pulled through the mounted box with an RJ-45 termination. For suspended ceilings cable will be terminated above the tile using a biscuit jack. Both the biscuit jack and the ceiling grid will be properly labeled as outlined in this document. Also, there should be a 20 ft. service loop above grid for suspended ceilings. For both mounting options the ceiling or grid should be labeled with “closet jack” location (this is to locate cable above tile and to correspond to the closet termination point).

Jack Labeling Work Area Outlets
All jacks will be labeled with the exact room number for which it is in, and then a period, followed by the position number it is terminated on the Visipatch field.

Wireless Labeling
Jacks for wireless will be labeled the same as the Work Area Outlets with one exception. The room number will be preceded by a W. The ceiling grid where the wireless cable is installed needs to be P-touch labeled with the same information.

Jack Labeling TR End
The cables will be labeled in the TR with the jack room number, followed by a period, and followed by its position on the Visipatch. Wireless cables will be labeled using the same method with one exception. The room number will be preceded by a W.

Contractor ID Tag
Contractors and UT installers will place a tag on each cable identifying their company. This tag must be placed on the cable just behind the point of termination on the Visipatch 360.

3.02 TR SPECIFICATIONS
For TR layout and design please see “Attachment 2.” Each TR will have a minimum of two 19” racks installed. Room must be left for the addition of a third rack while still maintaining three feet of clearance. There will be three vertical wire mangers installed on these racks. One on each end will be 10” wide and one in between the two racks will be 10” wide. All feeder, riser and horizontal cable in the TR will terminate on the Visipatch 360 connector systems. All Visipatch 360 systems will be mounted on the right most 19” rack. In each TR the feeder cable will terminate first, followed by two empty rows for expansion, followed by the riser cable, followed by two empty rows for expansion, followed by the start of the horizontal cable. All copper cabling
in the TR will be terminated on the right most rack as viewed from the front per "Attachment 1.”
All fiber cabling will be terminated in the top of the left most rack as viewed from the front per
“Attachment 1.” Fire retardant plywood must cover all four walls, floor to ceiling, using complete
sheets of plywood where possible. All plywood must be painted white with fire retardant white
paint.

Cable entry into each TR must be achieved through the use of cable tray through the wall using
**Hilti W-L-4011 system** outlined in the products section of this document and should be sized
to fit the application. Conduit sleeves will not be accepted for this purpose.

**TR Room Size**
If the square footage of the floor is 5,000 Square feet or less, then the Telecom Room must be
no smaller than 10’X8” to support that area.

If the floor space is between 5,000 Square feet and 10,000 Square feet, then the room must be
10’X10’ to support that area. All TRs must be free from angles and columns and the door must
open outward. All TRs must be located so they can be accessed from a main corridor. All TRs
should be centrally located on the floor and stacked one on top of the other.

If the distance from the work area outlet, including slack is greater than 90 meters, then there
**MUST** be multiple Telecom Rooms per floor.

**Cable Ladder Rack**
Cable ladder rack will be installed around the inside perimeter of the TR. This ladder rack will be
installed above and bolted the top of the data racks. There shall also be ladder rack installed
from the data racks to the back wall of the TR. Any changes in elevation of ladder rack
must be achieved through the use of Chatsworth products designed for this
application. All cable residing inside the TR must be supported by the ladder rack. All ladder
rack must be black in color

**Data Rack and Fiber Rack Layout**
Exact Physical layout of the room will be determined according to requirements for each project.
Layouts shown in this document is for guidance in the bidding and design process.

The fiber optic enclosures are to be located at the top of the left data rack or per “Attachment 1.”
Single mode fiber optic cable must be installed in their own enclosures and a 1U horizontal wire
manager will be located below the top enclosure and in between every enclosure or Visipatch 360
installed on the rack per “Attachment 1.” This will alternate down the frame ending with a wire
manager.

The rack area specified for data switch installs will be maintained and consistent per “Attachment
1.” All patch cords, fiber jumpers, or any other type of cable must be run within the wire
management system in such a way as to not be damaged by the patch cords. Under no
circumstance is a wire or cable to be run outside of the wire management system.

**Grounding**
All TRs’ will be provided with an exposed copper Telecommunications Main Grounding Busbar
(TMGB). The busbar must be grounded to building steel using no less than a number 4-grounding
wire. All metallic components in the TR must be grounded to the TMGB.

**Pathways**
Pathways will be outlined per construction project, however for design and bidding purposes it should be understood that a basket type cable tray, sized to fit, will be installed from the TR following every major corridor. All cable trays will pass through firewalls using Hilti system W-L-4011. If Cat 6A is being pulled on a job with Cat 6 or Cat 5E in the cable tray, then the Cat 6A will need to run with J hooks attached to the sides of cable tray.

**Conduit Size**
Conduit size for station cable should be a minimum of 1” in diameter. The actual size may vary by project. Cat6 and Cat 6A will need to have separate conduits installed for work area outlets. Flex conduit is not allowed on UT communications projects.

**Fire Stopping**
All conduits, core holes, and penetrations used for telecommunications, regardless of their location must be fire stopped, this includes any unused conduit. If the conduits purpose is for communications then the responsibility of fire stopping falls on the communications contractor. For the purpose of the horizontal cable, all entry points into TRs or any pathway where a cable tray pass through a wall should use Hilti System W-L-4011. Hilti Speed Sleeves should be used for individual bundles of cables passing thru walls. Installations around existing cabling must refer to Hilti Systems such as: W-L-3065, W-L-3272, C-AJ-3208, C-AJ-3181, and W-J-3143.

**Core Holes**
All core holes must be (metal) sleeved and grouted to keep water from leaking between floors. All sleeves must extend 4” above the finished floor. Under no circumstance will any cable be installed in an un-sleeved core hole. If any core holes are found to be un-sleeved, Infrastructure Services personnel must be notified. In the event that a contractor runs cable through an unsleeved core hole, they will be required to re-install the cable at their own expense. Under no circumstances are contractors allowed to drill core holes between floors or through any structural support beams. Core holes must be firestopped using the correct CP658T Firestop Plug or correct Hilti system product.

**Horizontal Core Hole and Floor Pedestal Cables**
All core holes that will support horizontal cabling through walls must be sleeved and fire stopped. All floor pedestals must be dual electric/communications and must be of a type that will readily accept Systimax jacks. All core holes in any TR or through any wall must be sleeved and fire stopped.

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**3.03 TR ENVIRONMENTAL CONTROLS**

**Electrical**
Each TR must have two standard electrical outlets on opposite walls. There must also be one 20 amp quad on a dedicated breaker outlet, and a NEMA L5-30 located in close proximity (within 2 feet) of back of rack that will service network hardware. If the facility has a backup generator, each dedicated circuit, including the (L5-30) in the TR will be wired from the generator panel.

Note: Electrical requirements for a MDF IT Room will be specified and outlined in the construction overview for each project.

**HVAC**
Each TR must be provided with HVAC and a means to control the temperature in the TR.
**Lighting**
Each closet must be provided with adequate lighting to enable easy installation and maintenance of all components within the TR.

3.04 **TESTING**

Each cable shall be tested with a scanner capable of testing to EIA/TIA standards for Category-6 or 6a cabling. The results of these tests shall be provided to the IR Infrastructure Services Manager before acceptance and payment of the job.

Each riser and feeder cable pair shall be tested for continuity and the results provided to the IR Infrastructure Services Manager before acceptance.

Each fiber optic strand (multi-mode and single-mode) shall be tested with an OTDR. All fiber must be tested with both wavelengths and in both directions for each fiber and a hard copy of the traces provided to the IR Infrastructure Services Manager before acceptance.

Also, all fiber must be tested with power meters to verify continuity. The results of this test shall be provided to the IR Infrastructure Services Manager before acceptance of the job.

**PART- 4 Additional Information**

4.01 **NOTE**

UT Southwestern Medical Center is one of the country’s leading academic medical centers, patient-care providers and research institutions. Because of this there are special measures which contractors working on campus must be aware of. Patient safety and privacy is of the utmost concern. Before entering rooms in clinical and hospital areas, all contractors must contact the charge nurse for that area. Also all contractors must yield to patients and care givers at all times. Clean traffic cones should be placed around all cable trees, ladders and other obstacles at all times. Ceiling tiles or access points should not be opened while anyone is underneath. Certain areas of the hospital require the use of containment tents and HEPPA filters and at all times infectious control procedures must be followed. Before any work is performed in the hospitals a permit must be issued by Physical Plant. Photos of all penetrated walls must be taken and submitted to assure compliance to fire stop procedures. Please refer to Contractor Guidelines, University Hospitals, UT Southwestern Physical Plant.

While working in research areas contractors should be aware of their environment. They should take notice to all placards and signs posted on lab doors and notify occupants of their presence before entering lab areas. Should a problem or concern arise Environmental Health and Safety can be contacted at 8-2250 from any campus phone or from off campus at 214-648-2250. It is also the responsibility of the contractor to obtain parking permits and temporary UT identification badges from the university parking office. It is also the responsibility of the contractor to determine all distances. The university will not be held responsible for miss calculations on the part of the contractor. The contractor must determine all job difficulties before submitting bids.

**Attachments 1 and 2**
Attachments 1 and 2 are for reference only. These designs could change for each project. The IT room layout of racks, runway and electrical outlets will vary depending on where the core holes can be placed.

**All cabling bids should include the following additions when applicable**

1. One cable per elevator per construction drawings.
2. Four cables for “Fire Alarm panel” per construction drawings.
3. Four cables for “Lenel Control Panel” per construction drawings.

**Additional Contractor Responsibilities**

It is the responsibility of the contractor to review the full construction blueprints to verify cable pathways do not conflict with any other trades (plumbing, duct work, electrical, etc.).
ATTACHMENT 1

Fiber Distribution  Switches  Switches
Feeder Cable  Feeder Cable
Station Cabling  Station Cabling

NOT TO SCALE
ATTACHMENT 2

- 4-4” sleeved core holes
- Quad, dedicated 120vac outlet 20 amp breaker and NEMA-L5-30
- Courtesy electrical outlet
- Gray represents plywood installed floor to ceiling.
- 2-19” relay racks and 3 vertical wire managers
- Cable tray entry into TR using Hilti System W-L-4011

Ground Bar