



**Technology Infrastructure, Category 5e, Category 6 Augmented, &
Fiber to the Desktop Cabling Standard
Rev.3, 12/5/2014**

1.0 GENERAL

1.0.A

Northern Kentucky University follows all current ANSI/TIA/EIA 568, 569, 570, 607 and 758 standards, National Electrical Code, National Electrical Safety Code, and all local jurisdiction codes.

1.1 STANDARDS

1.1.A.

Building structured cabling systems shall meet Northern Kentucky University's (NKU) Office of Information Technology cabling conventions to include adherence to the most currently available BICSI Building Industry Consulting Service International TDM Telecommunications Distribution Methods Manual, TIA/EIA Telecommunications Building cabling Standards, NFPA National Electrical Code manuals (ANSI/TIA/EIA) and also meet a minimum of 25 year warranty standards of the manufacturer. This includes addendums to TIA standards such as 568-B.2 addendums 1, 2, 3, and 4. Contractors shall be fully acquainted with the above referenced standards and be fully qualified, as outlined in the NKU Technology Infrastructure contractor qualifications. Contractors shall have demonstrated qualifications to install and test a 10-Gigabit intra/inter-building backbone. All station and riser cabling shall be tested and certified by the contractor to support 10-Gigabit technology. Additionally, the contractor will be required to meet NKU conventions and standards. The following specified Technology Infrastructure Cabling Standards are to be used as a minimum required guide.

1.2 COMMUNICATION CABLING SYSTEM CONTRACTOR QUALIFICATIONS

1.2.A.

The NKU Office of Information Technology requires that only qualified and experienced Communication cabling system contractors perform project management and installation services in the construction or remodel of University buildings. Pursuant to this, NKU's Office of Information Technology wants to ensure that successful contractors have the capabilities, qualifications, financial stability, resources, equipment, and experience to complete communication cabling system installations using common industry practices (i.e. Current BICSI TDM, ANSI/TIA/EIA 568, 569, 570, 607 and 758 standards, National Electrical Code, National Electrical Safety Code, and all local jurisdiction codes, etc.), while meeting all NKU Office of Information Technology guidelines.

1.2.B.

Contractor (prime and any subs) must meet the requirement of having continuously performed communication cabling system installation work for a period of at least the last five years. Contractor must provide manufacturer technician certification information, customer references, and documentation

supporting this requirement. Contractor shall provide at least 2 references from similar installations, one within the last 6 months and one from at least 2 years ago.

1.2.C.

Communication cabling system contractor, at all times during performance and until work is completed and accepted, shall have on the premises a competent supervisor, satisfactory to NKU's Office of Information Technology and with authority to act for the communication cabling system contractor regarding work schedules and any changes to the scope of work. The supervisor must be a BICSI certified Technician and a BICSI member in good standing.

1.2.D.

Contractor and their installers must be a local, manufacturer-certified integrator/installer, able to obtain a minimum 25 year warranty.

1.2.E.

Communication cabling system contractor must have a current BICSI certified RCDD (Registered Communication Distribution Designer) on staff as a full-time employee. A copy of the RCDD certificate and BICSI member number must be provided with bid documents.

1.2.F.

Communication cabling system contractor must provide at least one project manager or lead technician on a project who is a BICSI certified Technician and a BICSI member in good standing. A copy of their certificate and BICSI member number must be provided with bid documents.

1.2.G.

Communication cabling system contractor must be skilled and proficient in both inside cable plant (copper and fiber) design, installation, as well as outside cable plant (copper and fiber) design, installation, termination, splicing, and testing. Communication cabling system contractor must provide a list of equipment owned (i.e. fusion splicer, OTDR, excavation equipment, cable testers, etc.)

1.3 PROGRESS MEETINGS

1.3.A.

The contractor will be required to meet with and coordinate with a representative of the NKU Office of Information Technology prior to work beginning, and weekly during the installation process. Weekly meetings will include a site inspection to ensure compliance with established standards. The successful electrical and Communication cabling system contractor will follow appropriate installation guidelines, as contained in the most currently available BICSI TDM, ANSI/TIA/EIA Wiring Standards, and NFPA National Electrical Code manuals. Additionally, contractor will work with NKU's Office of Information Technology to ensure proper placement, routing, labeling, and documentation of cable and support hardware.

1.4 DOCUMENTATION

1.4.A.

Prior to system acceptance, the contractor shall submit to the owner fully documented and scaled drawings of the entire fiber optic and copper distribution system. Documentation shall be provided in both a hard copy binder and a soft copy on CD capable of being viewed and edited in Visio Professional.

This will include building and floor layouts with workstation information outlet locations and labeling, MDF (Main Distribution Frame room), IDF (Intermediate Distribution Frame room), cable routes, interconnect locations, intermediate and main distribution frame locations, riser locations, and all other information pertinent to the installation.

1.4.B.

The contractor will be responsible for accurately labeling and identifying all relevant components of the cabling system, including, but not limited to: Workstation outlet faceplate labeling; workstation cable labeling; patch panel and port labeling; Telecom block labeling; Riser cable labeling; backbone cable labeling at entrance to MDF or IDF; fiber optic patch panel labeling and strand labeling. The contractor will consult with NKU's Office of Information Technology representative in regards to labeling and identification. The labeling nomenclature is as follows:

All Voice and data cabling for the university will follow one simple labeling plan: room # - Jack# - Outlet #. Data, voice ports will be distinguished in the second Integer where data ports will use a number, voice ports will use a letter, (A,B,C).

Other list of possible extensions to be included:

- Security Camera = C
- Crestron Panel = CR
- Elevator = E
- Fire Panel = F
- Projector = P
- Wireless Access = W

EXAMPLE: 208-1-1 ='s room #208, data jack # 1, outlet # 1

EXAMPLE: 549-A-1 ='s room #549, voice jack # 1, outlet # 1

EXAMPLE: 128-3-3 ='s room #128, data jack # 3 and outlet # 3 in that room

EXAMPLE: 745-C-3 ='s room #745, voice jack # 3 and outlet # 3 in that room

EXAMPLE: 609-P-1 ='s room #609, projector jack and outlet # 1 for projector

EXAMPLE 332-W-1 ='s room #332, wireless access jack # 1 for wireless access point

The jack colors below shall be installed for the intended service they will support:

White = Voice, Blue = Data, Orange = Video Conference, Yellow = Switch Port in Student Union, Black = Non NKU network service

Outlets will be numbered from the primary entrance into a room in a clockwise fashion, left to right. Numbering the wall outlets first, floor outlets second and the ceiling outlets last.

This simple nomenclature denotes three integers for all voice and data labeling where, the first integer is the room number, the second integer is either voice, data or projector jack or other (denoted by a number or letter) and the third integer is the outlet in the room.

Northern Kentucky University also requires that each individual cable be labeled at both ends with the same numbering plan explained above, per BICSI standards. All labels must be machine printed and permanent.

Contractor should consult with NKU for proper labeling standards prior to installation.

1.4.C

The contractor will be responsible to affix cable tags on all cables that are installed through the NKU manhole systems. These cable tags will be affixed to each cable in each manhole and clearly state the: To & From locations, pair counts, strand count, cable type and use. Examples:

AST>NC-12ST-MM-D = AST building to Norse Commons, 12 strand, multimode, data.

NCS>LA-400PR-CP-V = Natural Science Center to Landrum, 400 pair, Copper, Voice.

1.5 MATERIALS LIST

Items are not substitutable. Contractors should present quotes based on the following materials list:

1.5.A.

Workstation Outlet - New work:

NKU prefers to utilize modular faceplates that allow for a variety of modules such as fiber, copper, USB, and audio/visual connections in both flat and sloped configuration. NKU would also like to flexibility to use keyed modules for both copper and fiber to enhance physical security in certain areas.

Single Gang Angled Wall Plate, Fog White. Ortronics PN: OR-40300664 plus (1) OR-40300749 plus (1) OR-40300191(2-port); OR-40300664 plus(2) OR-40300749 (4-port) -or- Panduit PN CFPSL2IWY (2-port), CFPSL4IWY (4-port), CFPSL6IWY (6-port)

RJ45 Jack, 10 Gigabit, RJ45, T568A/B, Snap-In Module, Fog White. Ortronics PN OR-TJ6A used for voice outlets -or- Panduit PN CJ6X88TGIW

RJ45 Jack, 10 Gigabit, RJ45, T568A/B, Snap-In Module, Blue. Ortronics PN OR-TJ6A-36 -or- Panduit PN CJ6X88TGBU used for data outlets

RJ45 Jack, 10 Gigabit, RJ45, T568A/B, Snap-In Module, Orange. Ortronics PN OR-TJ6A-42 -or- Panduit PN CJ6X88TGOR used for video conferencing outlets

RJ45 Jack, 10 Gigabit, RJ45, T568A/B, Snap-In Module, Black. Ortronics PN OR-TJ6A-00 -or- Panduit PN CJ6X88TGBL used for non-NKU services outlets

Blank Module, Fog White. Ortronics PN OR-42100002 -or- Panduit PN CMBIW-X

Cat5e

Ortronics TracJack Single Gang/4-Port Wall Plate, PN: OR-40300546 fog white.

Ortronics TracJack, Category 5e, RJ45, T568A, Snap-In Module, PN OR-TJ5E00 fog white used for voice outlets
 Ortronics TracJack, Category 5e, RJ45, T568A, Snap-In Module, PN OR-TJ5E00-36 blue used for data outlets
 Ortronics TracJack, Category 5e, RJ45, T568A, Snap-In Module, PN OR-TJ5E00-42 orange used for video conferencing outlets
 Ortronics TracJack, Category 5e, RJ45, T568A, Snap-In Module, PN OR-TJ5E00-00 black used for non-NKU networks services outlets
 Ortronics TracJack, Blank Module, PN OR-42100002 fog white

Workstation Outlet - Renovation Work:

Wiremold WallSource Box Series - Specification sheet ED864R5
 Wiremold WSB42-2 two gang box
 Wiremold WSB07-2A device mounting bracket
 Wiremold DR20A-V duplex receptacle
 Wiremold 5507D faceplate

In areas where fiber to the desktop will be deployed:

Keystone Fiber Optic Adapter, Single Mode, Duplex, SC. Ortronics PN OR-63700067
 -or- Panduit PN CMDBUSCZBU
 Keystone Fiber Optic Adapter, Single Mode, Duplex, LC. Ortronics PN OR-63700076
 -or- Panduit PN CMDJLCZBU

1.5.A.1.

Patch Cordage - Copper:

Maximum length of Cat6a patch cords is 15 feet. As such, design and implementations shall consider same by ensuring outlet locations are no more than 15 ft from devices to be network connected.

Ortronics Cat6A Patch Cord, PN: OR-MC610LL-CC where "LL" equals length in feet and "CC" denotes the color. Standard lengths are 3, 5, 7, 9, 15, 20 and 25 feet. Standard colors are white, red, orange, yellow, green, blue and gray.
 Panduit Cat6A Patch Cord, PN: UTP6ALLCC where "LL" equals length in feet and "CC" denotes the color. Standard lengths are 3, 5, 7, 10, 14, 20 and 25 feet. Standard colors are gray, black, blue, green, red, yellow, orange and violet.

Cat6A Patch Cord, 50ft, blue. Ortronics PN OR-MC61050-06 -or- Panduit PN UTP6A50BU

Cat6A Patch Cord, 75ft, yellow. Ortronics PN OR-MC61075-04 -or- Panduit PN UTP6A75YL/N

Cat6A Patch Cord, 100ft, yellow. Ortronics PN OR-MC610100-04 -or- Panduit PN UTP6A100YL/N

CAT5e

Ortronics Clarity Patch Cord, White PN: OR-MC5EXX-YY, where "XX" equals length in feet, and YY denotes the color. Standard lengths are 3,5,7,9,15 & 25 feet.

Ortronics Clarity Patch Cord, 3,5,7,9,15,25ft White PN: OR-MC5EXX-09

Available colors are -00 Black, -02 Red, -03 Orange, -04 yellow, -05 Green, -06 Blue, -07 Violet, -08 gray, -09 white

Ortronics Clarity Patch Cord, 25ft Green PN: OR-MC5E25-05

Ortronics Clarity Patch Cord, 50ft Blue PN: OR-SC5ER50DB-06

Available colors 50 ft: -03,-05,-06,-09

Ortronics Clarity Patch Cord, 75ft Yellow PN: OR-SC5ER75DB-04 (only color available)

Ortronics Clarity Patch Cord, 100ft Yellow PN: OR-SC5ER100DB-04 (-09 also available)

Patch Cordage - Fiber:

Single Mode: Utilized in backbone & workstation applications

Single mode Fiber Optic Jumpers SC-SC (Ortronics PN: OR-P1DC2IRRZRZXXXM where "XXX" equals length in meters) -or- Panduit PN: F9D3-3MXY (where "X" equals length in meters)

Single mode Fiber Optic Jumpers SC-LC (Ortronics PN: OR-P1DC2IRRZSZXXXM where "XXX" equals length in meters) -or- Panduit PN: F9E3-10MXY (where "X" equals length in meters)

Single mode Fiber Optic Jumpers LC-LC (Ortronics PN: OR-P1DC2IRSZSZXXXM where "XXX" equals length in meters) -or- Panduit PN: F9E10-10MXY (where "X" equals length in meters)

1.5.B.

Station Cable- (Horizontal)

Augmented Category 6, 4 twisted pair, 24 AWG, CMP Plenum, Blue Station Wire for Data. Superior Essex PN: 6A-272-2B -or- General Cable PN: 7131819 -or- Panduit PN: PUP6A04BU-UG

Augmented Category 6, 4 twisted pair, 24 AWG, CMP Plenum, White Station Wire for Voice. Superior Essex PN: 6A-272-4B -or- General Cable PN: 7131820 -or- Panduit PN: PUP6A04WH-UG

Augmented Category 6, 4 twisted pair, 23 AWG, non-continuous metallic tape, CMP Plenum, Blue Station Wire for Data. Superior Essex 10GainXP PN: 6H-272-2B -or- General Cable PN: 7131849

Augmented Category 6, 4 twisted pair, 23 AWG, non-continuous metallic tape, CMP Plenum, White Station Wire for Voice. Superior Essex 10GainXP PN: 6H-272-4B -or- General Cable PN: 7131850

Fiber to the desk cable, 6 strand armored plenum indoor single mode. (Superior Essex PN: L4006K401 -or- General Cable PN: AP0061PNU-ILPA -or- Panduit PN: FSPP906Y -or- Corning PN: 006E88-31131-A3A

CAT5e

Superior Essex, Category 5E, 4 twisted pair, 24 AWG, CMP Plenum, Blue Station Wire for DATA, PN: 52-241-2B

Superior Essex, Category 5E, 4 twisted pair, 24 AWG, CMP Plenum, White Station Wire for Voice, PN: 52-241-4B

1.5.C.

Riser Cable-

Category 3 copper cable, 25 twisted pair, 24 AWG, PVC, CMR non-plenum Riser Cable. (Superior Essex PN: 18-475-33 -or- General Cable PN: 2133033)

Category 3 copper cable, 25 twisted pair, 24 AWG, CMP Plenum Cable. (Superior Essex PN: 18-475-36 -or- General Cable PN: 2131505)

Indoor only fiber optic installations will utilize plenum-rated single mode 12 strand premise distribution cable (Superior Essex PN: 44012KG01 - or- General Cable PN: AP0121PNU -or- Panduit PN: FSDP912Y -or- Corning PN: 012E88-33131-29

Outdoor or indoor/outdoor fiber optic installations will utilize plenum-rated single mode 12 strand armored indoor/outdoor plenum-rated cable (Superior Essex PN: L4012K201 -or- General Cable PN: AP0121ANU-ILPA 3 -or- Panduit PN: FSGP912Y -or- Corning PN: 012E8P-31131-A3)

Fiber optic cable construction, glass type and manufacturer shall remain constant through any variation of fiber optic strand count.

1.5.D. MDF/IDF Data station cable termination and equipment:

By default, all data cabling media shall be terminated in equipment racks with adequately sized cable management. Minimum 6" wire management is required but will utilize higher capacity (12" and 15") managers in high density situations. The goal is to not exceed a 40% fill rate at installation. The Contractor should review all racks and bring any that will exceed this rate to the attention of the University project manager.

NKU prefers to utilize 110 punch down style panels for most situations, but will require modular panels for high density applications. All panels shall be offered in both flat and angled versions. The high density panels shall be angled to eliminate the need for horizontal cable managers and shall support up to 48 ports in 1RU. Each patch panel port shall be 100% tested to ensure NEXT and RL performance.

Patch Panel, 48-port, 10 Gigabit, T568A/B Wired, Category 6 Augmented.
 Ortronics PN: OR-PHD610U48 -or- Panduit PN: DP486X88TGY
 Patch Panel, Angled, 48-port, 10 Gigabit, T568A/B Wired, Category 6 Augmented.
 Ortronics PN: OR-PHA610U48 -or- Panduit PN: DPA486X88TGY
 Patch Panel, 24-port, 10 Gigabit, T568A/B Wired, Category 6 Augmented.
 Ortronics PN: OR-PHD610U24 -or- Panduit PN: DP246X88TGY
 Patch Panel, Angled, 24-port, 10 Gigabit, T568A/B Wired, Category 6 Augmented.
 Ortronics PN: OR-PHA610U24 -or- Panduit PN: DPA246X88TGY

Rack, 7ft, 19" mounting, 16.25" channel depth. Ortronics PN: OR-MM6716
 Rack, EIA, 7ft, 19" mounting, aluminum. Ortronics PN: OR-10-84-T2SDB -or-
 Panduit PN: CMR19X84

Wire Management as specified in section 1.5.H.

**1.5.E.
 MDF/IDF Voice station cable & Voice riser cable termination and equipment:**

By default, all voice cabling media shall be terminated on wall mounted backboards.
 Category 6 96-pair 110 IDC type punch down blocks with mounting legs. Panduit GPKBW24Y -or- Ortronics PN: OR-110ABC6100

CAT5e

Ortronics, T568A Wired, Category 5E, 48-Port High Density Patch Panel, PN: OR-PHD5E6U48
 Ortronics, T568A Wired, Category 5E, 24-port High Density Patch Panel, PN: OR-PHD5E6U24

Ortronics Mighty Mo 6 7ft Cable Management Rack w/16.25in deep channels, PN: OR-MM6716
 Ortronics Mighty Mo Wall-Mount Cable Management Cabinet, PN or-40500131
 Ortronics Wall-Mount Relay Rack, PN: OR-604045450

1.5.F.

MDF/IDF, Fiber Optic entrance cable, Copper entrance cable termination and equipment:

Indoor only fiber optic installations will utilize plenum-rated armored single mode 12 strand premise distribution cable (Superior Essex PN: L4012K401 -or- General Cable PN: AP0121PNU-ILPA -or- Panduit PN: FSPP912Y -or- Corning PN: 012E88-33131-A3

Outdoor or indoor/outdoor fiber optic installations will utilize plenum-rated single mode 12 strand armored indoor/outdoor plenum-rated cable (Superior Essex PN: L4012K201 -OR- General Cable PN: AP0121ANU-ILPA -or- Panduit PN: FSGP912Y -or- Corning PN: 012E8P-31131-A3)

Fiber optic cable construction, glass type, and manufacturer shall remain constant through any variation of fiber optic strand count.

Fiber Distribution Center termination cabinet, 4 rack units with capacity of 12 adapter panels (Ortronics PN: OR-FC04U-P -or- Panduit PN: FRME4)
 Fiber Distribution Center termination cabinet, 3 rack units with capacity of 9 adapter panels (Ortronics PN: OR-FC03U-P -or- Panduit PN: FRME3)
 Fiber Distribution Center termination cabinet, 2 rack units with capacity of 6 adapter panels (Ortronics PN: OR-FC02U-P -or- Panduit PN: FRME2U)
 Fiber Distribution Center termination cabinet, 1 rack unit with capacity of 3 adapter panels (Ortronics PN: OR-FC01U-P -or- Panduit PN: FRME1U)

Single mode SC connector 6 strand (3 duplex) pre-loaded panel (Ortronics PN: OR-OFP-SCD06AC -or- Panduit PN: FAP3WBUDSCZ)
 Single mode SC connector 12 strand (6 duplex) pre-loaded panel (Ortronics PN: OR-OFP-SCD12AC -or- Panduit PN: FAP6WBUDSCZ)
 Single mode LC connector 12 strand (6 duplex) pre-loaded panel (Ortronics PN: OR-OFP-LCD12AC -or- Panduit FAP6WBUDLCZ)

Single mode Fiber Connectors shall be Anaerobic SC or LC:

SC individual - Ortronics PN: OR-205KAN9FA-SM -or- Panduit PN: FSCSBUY -or- Corning PN: 95-201-41-SP
 LC individual -Ortronics PN: OR-205KAN9GA-SM -or- Panduit PN: FLCSSBUY -or- Corning PN: 95-201-98-SP

Fan Out Kit (6 fiber) -Ortronics PN: OR-61500858 -or- Panduit PN: FO6CB -or- Corning PN: FAN-BT25-06
 Fan Out Kit (12 fiber) -Ortronics PN: OR-61500868 -or- Panduit FO12CB -or- Corning PN: FAN-BT25-12

24AWG, PE-89 Type REA, direct bury cable with foam skin/filled core, gopher proof sheath, polyethylene jacket, outside plant copper cable - numerous manufacturers.
 Circa BET Building Entrance terminal - (110 type) 100 pair increments. Circa PN: 1880ECA1-100 or equivalent.

Circa 5-pin plug in protector units, Digital/Solid State. Circa PN: 4B1FS-240 or equivalent.

1.5.G.

Grounding and Bonding:

All grounding must be on an independent, standalone system ground.

Telecommunications Main Grounding Busbars (TMGB) Ortronics PN: OR-GB4X12TMGB - or- Panduit PN: GB4B0612TPI-1

Telecommunications Grounding Busbars (TGB) Ortronics PN: OR-GB2X12TGB -or- Panduit PN: GB2B0306TPI-1

1.5.H.

Wire management:

For use with Ortronics OR-MM6716 rack:

For end racks, Vertical Cable Management 84"H x 6"W x 8"D w/Door. Ortronics PN: OR-MM6VMD706

For adjoining racks, Vertical Cable Management 84"H x 10"W x 13"D w/Door. Ortronics PN: OR-MM6VMD710

For use with Panduit CMR19X84 rack:

For end racks, Vertical Cable Management 83.9"H x 6"W x 16.4"D. Panduit PN: PRV6

Door for Panduit PRV6 above. Panduit PN: PRD6

For adjoining racks, Vertical Cable Management 83.9"H x 10"W x 16.4"D. Panduit PN: PRV10

Door for Panduit PRV10 above. Panduit PN: PRD10

Other:

Underground duct application: MaxCell, 3 inch, 3 cell, inner duct. Maxcell PN: MXC3456XX5001 (last four characters vary based on needed length) or equivalent

Indoor application: FEP orange Eastern corrugated inner duct. Eastern PN: PDPUI1000 or equivalent (plenum rated as required by code).

Ortronics Tubular Runway 12"W Black. Ortronics PN: OR-TRT10-12B or equivalent

Ortronics Cable Runway to rack mounting brackets. Ortronics PN: OR-MM6CRB16 or equivalent

Ortronics overhead cable pathway rack kit. Ortronics PN: OR-604010010 or equivalent

Ortronics overhead runway cable drop out. Ortronics PN: TRP11-CM or equivalent

Ortronics Transition Pan for 12" runway. Ortronics PN: OR-TRP11-CM or equivalent

Panduit Hook & Loop Cable Ties-continuous roll. Panduit PN: HLS15R0 or HLS75R0
Cable Tray (basket style) shall be Cablofil or equivalent

1.5.I.

Summary:

The spreadsheet below summarizes the entire list of NKU approved materials:

2.0 CABLE PLANT

2.1 TELECOMMUNICATIONS ROOM REQUIREMENTS

2.1.A.

Each MDF/IDF shall be a (stand-alone wiring room) located such that no single UTP (Unshielded Twisted Pair) horizontal cable run shall exceed **90 meters** in total length including service loops. MCRs must be located on the lowest floor of the building. Every floor must have a IDF or MDF to serve outlets on that same floor. All such rooms must be vertically stacked. Telecommunication Rooms shall not be co-located in custodial, mechanical or other shared space where damage to critical electronics may occur. Each room shall be sized according to use, and meet the below listed criteria. Coordinate with a representative of NKU's Office of Information Technology prior to the installation of backboards, grounding systems, bonding systems, and electrical service.

Floor Size: MDF Rooms 12' x 15' minimum or ANSI/TIA/EIA 569 specification.

Floor Size: IDF Rooms 12' x 12' minimum or ANSI/TIA/EIA 569 specification.

Floor Surface: Treated / sealed concrete.

Floor loading: 50 lbf/ft² minimum or as required by applicable codes.

Riser sleeves/conduits between floors shall be a minimum of 6 inches and provide pulls strings.

Prefer no false / drop ceiling be installed. If drop ceiling must be installed, Ceiling Height: Minimum of 8.5 ft clear height above finished floor.

Door Size: 3' wide and 6.7' tall w/180 swing out.

Wall Lining (backboard): AC-grade 3/4" x 4' x 8' sheets plywood, with no voids, covered on all sides, with two coats white fire retardant paint, cut outs to allow access to any wall boxes for communications or power.

Lighting: Minimum 500 lux measured at 3' above finished floor throughout the room.

Overhead fluorescent light fixtures must be installed at minimum nine (9) feet above finished floor or at least two (2) feet away from copper cable pathways, rack tops, and overhead cable runways.

Power: Provide dedicated, isolated, non-switched, 4-way, 120Vac 20Amp, circuits, installed every four (4) feet around room walls. On the bay of data racks provide two (2) each 220Vac, 20 AMP, twist lock, dedicated circuits on standard building electrical power. Also, provide two (2) each 220Vac, 20 AMP, twist lock, dedicated circuits on UPS power.

UPS Power : UPS power should be provided by a single UPS, located in the maintenance area , near the building electrical switching gear and backup generator. UPS power is to be provided for all network equipment in the MDF/IDF's.

Overhead runway: Provide overhead cable runway to ring the room and, at minimum, cross the room over data racks. Drop out devices (water falls) shall

be installed at locations where cables drop down out of runway or horizontal conduit or sleeves.

Grounding and Bonding: Install a contiguous Intra-building grounding and bonding system in compliance with NEC Article 250 and TIA/EIA-607 using a minimum conductor size of 6 AWG to be located on each plywood backboard with Ground Bus Bar as directed.

Service slack: All MDF / IDF closet cables must have industry standard amount of service slack, at each end, within the wiring room. No service loop is required in the racks when CAT 6a is used.

Security: Unique telecom key compatible University standard for data closets.

Location: Room shall be located such that no single horizontal workstation cable shall exceed 90 meters in total length including service loops.

HVAC and Humidity : Separate HVAC units need to be designed and strategically placed to serve all data/communications rooms with year-round temperature and humidity control and maintain a constant temperature of 64 - 75 F with one air change per hour.

Fire Protection: As required by applicable codes.

Equipment Rack: 7' x 19" x 16.25 cable management rack (**see 1.5.D**) with wire management (**see 1.5.H**) shall be provided and installed as directed. All other specifications of ANSI/TIA/EIA 569 apply.

Other Network devices: All equipment housed in the MDF/IDF will be required to have separate data outlets installed to the patch panel and labeled. No equipment will be permitted to plug directly into a network switch.

Network Equipment Installation: No network equipment is to be installed before the MDF/IDF rooms are inspected for electrical power and UPS, HVAC, security (NKU locks installed) and free of dust and debris.

2.1.B.

No copper communication cabling shall be run adjacent and parallel to power cabling. A minimum of 18" distance is required from any fluorescent lighting fixture or 6" from power lines up to 2kVA and 24" from any power line over 5kVA. Similarly, cable should be routed and terminated as far as possible from sources of EMI or RFI, such as ballasts, generators, fans, motor control units, motors, etc.

2.1.C.

The MDF/IDF shall be constructed using 110 wiring distribution systems for voice. Use patch panels, equipment racks and distribution systems for fiber optics as specified in the materials list. Cable terminations, order of terminations, groupings, numbering plans and labeling shall be performed in accordance with NKU's Office of Information Technology conventions (per paragraph P.1.4.b.). See sections pertaining to Horizontal and Vertical Cable. Coordinate with a representative of the NKU Office of Information Technology prior to installation of MDF/IDF distribution and termination hardware.

2.2 ENTRANCE FACILITIES

2.2.A

Outside plant facility requirements shall be coordinated with the NKU Office of Information Technology. A minimum of (4) 4" inside diameter schedule 40 PVC conduits shall be run from the MDF to the designated vault or tunnel system. Conduits shall be buried a minimum of 24" from the surface on a foundation of 10" wet sand fill. A metallic locator ribbon shall be installed above and parallel to the conduits. There shall be a minimum horizontal separation of 24" from co-located buried electrical service. One pull string shall be installed in every conduit.

2.2.B.

Outside copper cable pair count shall be a minimum of 100 pair. (Building specific, to be determined in conjunction with building occupancy and purpose) Use only 24AWG, PE-89 Type REA, direct bury cable with foam skin/filled core, 8-mil aluminum shield, polyethylene jacket, where applicable. See material list. Copper cable shall be terminated in a minimum of (100) pair increments in its entirety for the count of the specific cable at the MDF in a Building Entrance Termination (BET) system.

2.2.C.

The other end of the copper cable shall be terminated in a minimum of (100) pair increments in its entirety at the MDF of its origin as determined by the NKU Office of Information Technology. See materials list.

2.2.D.

Copper inter and intra connection cable facilities shall be tested and documented at 100ohm with maximum 0% failure allowed.

2.2.E.

Outside fiber optic cable strand count shall be determined by the NKU Office of Information Technology. Fiber optic cables shall be terminated in their entirety at the MDF in a Fiber Patch Cabinet. See materials list in 1.5.F. Cable shall be manufactured by Superior Essex, General Cable, Panduit or Corning. See materials list. Fiber optic fan-out and terminations shall be performed using fan out kits with LC style connectors.

2.2.F.

Fiber optic cable shall be terminated in its entirety at the TR/ICR/MCR of both its origin and final destination in a Fiber Patch Cabinet. See materials list. Fiber optic fan-out and terminations shall be done using LC or SC style connectors.

2.2.G.

Single Mode Fiber optic facilities shall be OTDR and bi-directional insertion loss tested and documented at 1310nm/1550nm with maximum 0% failure allowed. Max cable attenuation is .4/.3 for loose tube and .7/.7 for tight buffer.

Test results for single fiber shall not exceed maximum attenuation allowed based on EIA/TIA loss calculation formulas. Test results must be provided to NKU in .pdf format.

2.2.H.

Grounding and Bonding shall conform to NEC Article 250 and ANSI/TIA/EIA-607 using a minimum conductor size of 6 AWG. See material list.

2.3 HORIZONTAL WORKSTATION CABLES AND POWER REQUIREMENTS PER LOCATION.

2.3.A

If IP phones are in use , covert Voice outlet for a Data outlet in all spaces.

Single Occupant Office

Minimum 2, Duplex (Data & Voice) Outlets (1 each on opposing walls)
Duplex Power Outlet adjacent to each Data & Voice Outlet.

Cubicle Space

Minimum 2, Duplex (Data & Voice) Outlets
Duplex Power Outlet adjacent to each Data & Voice Outlet.

Shared Offices

Minimum 1, Duplex (Data & Voice) Outlet per Occupant
1 Duplex (Data & Voice) Outlet for Shared Printer and
Duplex Power Outlet adjacent to each Data & Voice Outlet.

Reception/Support Areas

Minimum 1, Duplex (Data & Voice) Outlet per Occupant
Minimum 1, Duplex (Data & Voice) Outlet for Shared Printer
And Duplex Power Outlet adjacent to each Data & Voice Outlet.

Copy Room/Storage Rooms

Minimum 2, (Data & Voice) Duplex Outlets and
Duplex Power Outlet adjacent to each Data & Voice Outlet.

Lounge Space, Café, Study Areas

Layout and quantity depends on design.
Data Duplex Outlets for Laptop Access and
Duplex Power Outlet adjacent to each Data Outlet.

Non-Classroom Instructional Spaces/ Seminar Rooms/ Conference Rooms

Minimum 4 Data & 2 Voice Faceplates (opposing walls) and
Duplex Power Outlet adjacent to each Data & Voice Outlet
Preferred: Level 2 Smart Classroom Technology (scaled to room size and use). See below.

Classrooms and Labs

Minimum 6 Data at instructor station and 2 data at the ceiling mounted projector.
Duplex Power Outlet adjacent to each Data and/or Voice Outlet.
Preferred: Level 2 Smart Classroom Technology. See below.

Computer Labs

Minimum 4 Data and 2 voice Outlets. Three (3) Data & one (1) Voice at instructor station (1 at the ceiling mounted projector and 1 voice location to be determined by NKU).
Duplex Power Outlet adjacent to each (Data & Voice) Outlet.
Level 2 Smart Classroom Technology, See below
Remainder of layout depends on design.

Level 2 Smart Classroom

Minimum 4 data outlets to be located at the podium location
2 Projector outlets to be located in the ceiling
Regular room layout depending on the room classification and

Duplex Power Outlet adjacent to each Data & Voice Outlet.

Vending Areas

- 1 Data outlet per vending machine
- 2 data outlets (minimum) per vending area

MultiMedia Outlets (Fiber To the Desktop) Location TBD by NKU

- 4 Data & 2 Voice outlets per location
- 2 Fiber outlets

2.3.B.

Provide (1) Black Category 6 Augmented 4-Pair UTP cable for every voice outlet and (1) Black Category 6 Augmented 4-Pair UTP cable for every data outlet as specified in materials list. Cables shall be distributed in a horizontal star topology to the MDF/IDF. Total length of cable from workstation information outlet jack to the MDF/IDF shall not exceed 90 meters total length including service loops. This length includes a 12" service loop at the outlet and a 10' service loop in the telecommunications room. Each horizontal cable shall be installed in a "home-run" configuration. No "daisy chained" conduit or cables shall be allowed. All workstation cables are to be terminated using the T568A wiring standard.

2.3.C.

All cables shall be installed in conduit, cable tray, or "J" hooks. Minimum size of conduit should be no less than a 1" conduit. Fill ratios not to exceed the ANSI/TIA/EIA 569 specification. Where cables are not installed in conduit or cable tray, the cable shall not be pulled or installed directly across suspended ceiling tiles or fluorescent lights without proper suspension and consideration of possible electrical interference. If "J" hooks are used, avoid placing any pressure or creating stress points on the cable. Maximum spacing between "J" hooks shall not exceed five feet.

2.3.D.

At no time shall pulling tension exceed 25 lbs. on horizontal cables. Exceeding the maximum recommended pulling tension during installation of cables will compromise the wire integrity. If wire integrity is compromised, the wire may not pass testing and certification standards required for a 10-Gigabit infrastructure. The installing contractor will be responsible for replacement of any cable system that does not pass required certification standards. A representative from the NKU Office of Information Technology may randomly test cable installations during weekly coordination meetings.

2.3.E.

Traditional nylon synch style Tie Wraps shall not be used to bundle cables in a MDF/IDF. Only Velcro Tie Wraps are acceptable to bundle cables within these rooms. See material list. Traditional nylon synch style tie wraps are acceptable in all other areas. The tie wraps must be installed as directed in the ANSI/TIA/EIA 568 specification.

2.3.F.

No Intra-building telecommunications cable shall be run adjacent and parallel to power cabling. A minimum of 6" distance is required from any fluorescent lighting fixture or power line up to 2kVA and 24" from any power line over 5kVA. Similarly, cable should be routed and terminated as far as possible from sources of EMF, such as ballasts, generators, fans, motor control units, motors, etc.

2.3.G.

Horizontal UTP station cable shall be terminated at the MDF/IDF in a manner such that each workstation location will be numbered and terminated in sequential order (see 1.4.b.). Voice (white) cable shall be terminated in 96 pair IDC blocks as specified in materials list. Each 96 pair IDC block will support (24) 4-pair cables. Designator strips shall be blue in color. Data (Blue) cable shall be terminated in patch panels as specified in materials list and shall be located in 19" stand alone rack as specified in materials list. Horizontal and vertical fiber optic cable shall be terminated at MDF/IDF in fiber optic distribution cabinets as specified in materials list. Coordinate with a representative of the NKU Office of Information Technology prior to installation of MDF/IDF distribution and termination cable hardware.

2.3.H.

Each workstation information outlet location shall use hardware as specified in materials list. The white Category 6 Augmented cable shall be terminated T568A in a Fog White Category 6 Augmented RJ45 jack. The Blue Category 6 Augmented cable shall be terminated ANSI/TIA/EIA T568A in a Blue Category 6 Augmented RJ45 jack. Striping of cable jacket, untwisting of conductor pairs and termination shall be done using ANSI/TIA/EIA conventions. 12" of excess, jacketed, cable shall be coiled in ceiling above the drop location or as near as possible to accommodate future re-termination. Maintain UTP cable pair twists up to the point of termination (maximum of up to 1/4" jacket removal allowed) at both the station/outlet end as well as patch panel/ block end for each horizontal cable. Take caution as to refrain from physically changing or damaging the shape or geometry of the cable during installation, i.e., do not cinch cable ties too tightly; no kinks are allowed and avoid bends of cable. Do not place bundles in such a way that the weight of large bundles is damaging the cables on the bottom of the bundle. Each workstation information outlet jack wall plate shall be numbered sequentially, consistent with the MDF/IDF numbering layout plan. See section 1.4.B for description of cable labeling requirements.

2.3.I

Cables shall be dressed in to patch panels directly from vertical wire managers and not run through any horizontal cable managers in order to limit small bend radius.

2.3.J.

Contractor shall test and certify, in writing, building wiring meets or exceeds all applicable ANSI/TIA/EIA 568, 569, 607, 758 or others as applicable conventions and standards for Cat6a. Contractor shall test and certify, in writing, building wiring shall support 10 Gigabit Ethernet technologies. Contractor shall warrant Communication cabling system wiring for a period of not less than 25 years, upon acceptance.

2.4 VERTICAL RISER CABLE**2.4.A.**

A minimum of (4) 4" conduit paths shall be provided between the MDF/IDF's & B IDF.

2.4.B.

For each (12) workstation locations there shall be a (25) pair copper riser from the MDF/IDF to the MDF/IDF as applicable. Copper riser cable shall be of a

25 Pair Category 3 riser rated FEP construction as specified in materials list. All riser cable shall be terminated using 110 IDC wiring distribution systems as specified in materials list. Riser cable shall be terminated on a separate 100 pair block from horizontal station cable. Labeling of all riser and workstations cables shall be labeled in accordance with the NKU Technology Infrastructure labeling documentation. Coordinate with a representative of the NKU Office of Information Technology prior to installation and termination of riser cable and hardware.

2.4.C.

Each MDF/IDF shall have a 12 or 24 strand count single mode Fiber optic cable

Indoor only fiber optic installations will utilize plenum-rated armored single mode 12 strand premise distribution cable

Outdoor or indoor/outdoor fiber optic installations will utilize plenum-rated single mode 12 strand armored indoor/outdoor plenum-rated cable.

See materials list. Coordinate with a representative of the NKU Office of Information technology prior to installation of fiber optic riser cable.

2.5 PATHWAY SUPPORT SYSTEM

2.5.A.

All horizontal cable shall be installed using a home-run configuration. Conduit and cable tray are acceptable in any combination to support the cable system and not violate Cat6a rules.

2.5.B.

Conduits shall be dedicated, using no smaller than a 1 1/2" inside diameter per workstation outlet. There shall be no daisy-chain conduit runs. Each workstation location shall require one 1 1/2" conduit, which is a home run back to the appropriate MDF/IDF or cable tray. Provide pull boxes in communications conduit runs spaced not greater than 100 feet apart, and also provide a pull box located at half the distance of the length on any conduit with more than two right angle bends. If more than two bends are in any 100-foot section, increase the conduit by one trade size. See ANSI/TIA/EIA-569-A Section 4.4 Place **TELECOMMUNICATIONS** label on all pull and junction boxes. If a cable tray system is installed, the conduit shall be a home run from the workstation outlet jack to the tray. Conduit runs shall comply with cable fill capacity and bend design as specified in ANSI/TIA/EIA-569-A documents.

2.5.C.

Traditional nylon synch style Tie Wraps shall not be used in MDF/IDF's to bundle cables. Velcro style Tie Wraps are the only acceptable method to secure cable bundles in TR/ICR/MCR's. See materials list. At no time shall pulling tension exceed 25 lbs. on horizontal cables. Exceeding the maximum recommended pulling tension on Category 6 Augmented cables will compromise cable integrity. If wire integrity is compromised, the wire may not pass testing and certification standards required for a 1000BaseTX infrastructure. The installing contractor will be responsible for replacement of any cable system that does not meet required standards.

2.5.D.

No intra/inter-building telecommunications cable shall be run adjacent and parallel to power cabling. A minimum of 6" distance is required from any fluorescent lighting fixture or power line up to 2kVA and 24" from any power

line over 5kVA. Similarly, cable should be routed and terminated as far as possible from sources of EMF, such as generators, motors etc.

3.0 Warranty

3.1.A All work is to be covered by minimum of a twenty-five year warranty supplied by the manufacturer.

3.2.B Ortronics/Superior Essex nCompass™ Structured Cabling System Warranty

Superior Essex Communications LP and Ortronics, Inc. (a/k/a Legrand Data Communications, a division of Legrand North America, Inc., hereinafter "LDC") (collectively, the "Supplier") warrant to the end-user ("Buyer") that (i) the nCompass CAT 5e+ U/UTP, CAT 6+ U/UTP, CAT 6e+ U/UTP, CAT 6A+ U/UTP, CAT 6+ F/UTP, CAT6A+ F/UTP Copper and OM3/OM4 and OS1/OS2 Fiber Optic certified network cabling system installations will exceed the defined TIA-568 series industry specifications in effect at the time of product purchase and (ii) the products that comprise the certified nCompass Cabling System will meet or exceed the applicable performance specifications in effect at the time of manufacture (the "Limited Lifetime Warranty").

The Limited Lifetime Warranty will be extended to include the entire channel provided that the applicable LDC patch cords and LDC equipment cords are utilized, and all products are installed within areas protected from outside elements. Channel warranties will support current or future applications that are approved by industry recognized organizations (IEEE, ANSI/TIA) for transmission over structured cabling systems defined by the TIA-568 standard in effect at the time of the installation. Channel warranties will perform to the specifications listed in the nCompass system data sheets in effect at the start of the installation. Supplier will honor claims on the Lifetime Warranty for the expected usable life of the building which shall not exceed forty years from the installation of the nCompass Cabling System (the "Limited Lifetime Warranty Period").

QUALIFICATIONS AND REQUIREMENTS

To qualify for the Limited Lifetime Warranty, all of the following conditions must be met:

1. Products used in the network cabling system for which warranty support is requested must be qualifying Supplier products. System components must be new (never used before).
2. The network cabling infrastructure must be designed in accordance with TIA-568 and other relevant premises series standards in effect at the start of the time of purchase.
3. The network cabling infrastructure must be installed by Supplier approved designers and Certified Contractors at the Certified Installer Plus-Enterprise Solutions Partner (CIP-ESP) tier or Certified Installer Plus (CIP) tier in accordance with manufacturer's installation instructions and specifications. Supplier is not liable for third party design errors or improper construction.

4. Each permanent link or channel in the network must be field tested in accordance with the TIA-568 series industry standard AND nCompass testing requirements in force at the time of purchase (nCompass testing requirements take precedence over TIA when differences exist). The installed permanent links and channels must have passed all applicable TIA and nCompass performance requirements. Minimum testing for copper systems includes Wire Map, Length, Attenuation, Near End Crosstalk, Far End Crosstalk, Return Loss, PS NEXT, ELFEXT, and PS ELFEXT. Minimum testing for Fiber Optic links includes horizontal and backbone, Bi-Directional Dual Wavelength, Insertion Loss and Length.
5. Special consideration for Category 6A+ Solutions: Designed specifically to mitigate the effects of Alien Crosstalk (ANEXT) between cable segments, Alien Crosstalk field testing is not required for certification of Category 6A+ systems. Alien Crosstalk testing requirements are only waived if the installed system is comprised entirely of nCompass approved Category 6A+ cabling and components including horizontal cabling, patch cords, equipment cords, and associated connectivity. This exception is exclusive to Category 6A+ Alien Crosstalk testing parameters. All Category 6A testing requirements must be performed to certify the installation.
6. Appropriate Warranty Applications should be properly completed online through the Ortronics ConCert certified contractor website prior to initiating the installation.
7. The Warranty Submittal must be completed online within 10 days of installation completion. Copies of all certification test reports must be submitted as part of the Warranty Submittal, and be kept on file by the registrant to be re-submitted when requested by Supplier. Data must be saved and submitted in raw data and summary formats. Test data must be submitted via online upload to the Ortronics ConCert Certified Contractor website. E-mail or disc may be used if the online upload is unsuccessful (please contact the Warranty Administrator for detailed instructions).
8. The Limited Lifetime Warranty will be void if (i) the system is not maintained in accordance with industry standards (ii) a third party has changed, modified or attempted maintenance or repair on otherwise qualifying Supplier products, or (iii) changes are made after warranty issuance and acceptance date, unless Supplier grants written consent for such changes and installation records are updated and forwarded to the Supplier reflecting these approved changes. All changes must be submitted for approval following the original warranty application process.
9. Supplier has issued a registered warranty certificate to Buyer for the Limited Lifetime Warranty. Buyer may not sell, assign or transfer the Limited Lifetime Warranty.

ADMINISTRATION

Limited Lifetime Warranty applications will be approved or disapproved by Supplier with a response sent to the applicant. Access to the Limited Lifetime Warranty application information can be obtained by contacting the Warranty Administrator at +1-860-405-2988, or by e-mailing your request to contractor.cert@legrand.us. All warranty applications must be completed on Certified Contractor website.

CLAIMS AND EXCLUSIVE REMEDIES

The validity of any warranty claim under this Limited Lifetime Warranty shall be determined by the Supplier in its sole discretion. A claim will be reviewed by Supplier only if all of the following are satisfied:

1. Reported within ten (10) days of date of defect discovery;
2. ALL system design and installation records are readily available to be provided when requested (original network installation design prints, test results, maintenance records, warranty submittal documentation);
3. Copies of all original receipts for materials and labor from the date of initial installation; and
4. Supplier has full and open access to inspect and evaluate the installation site.

If system performance or material fails to meet the Limited Lifetime Warranty, the Buyer must notify Supplier, in writing, within ten (10) days of the discovery of any non-conformity. Notification shall be made/sent to the Warranty Administrator (above). If a warranty claim is determined by Supplier in its sole discretion to be valid, as Buyer's sole and exclusive remedy, Supplier will, at its option and using Certified Contractor(s) of its choosing, replace or repair the non-compliant qualifying components of the permanent link or channel and cover reasonable cost of labor to affect necessary work. If the Buyer provides a quote from a Certified Contractor of its choosing, the Warranty Administrator, in its sole discretion, may alternatively elect to allow such Certified Contractor to affect the warranty repair and reimburse the Buyer for reasonable labor costs, provided prior written approval is obtained from the Warranty Administrator for proposed materials and labor. If the cause of any error is determined to be improper installation, maintenance or third party repair, the Buyer may be referred back to the appropriate contractor or third party for support.

WARRANTY EXCLUSIONS

1. The Limited Lifetime Warranty does not cover:
2. The installation and maintenance of any other non-performing portions of the Buyer's System;
3. Products not specifically designated as being eligible for the Limited Lifetime Warranty coverage;
4. Products not supplied directly by the Supplier or through channels not approved by Supplier;
5. Products used in the cabling system, which were falsely represented as being in compliance with the Limited Lifetime Warranty registration requirements and procedures;
6. Products that are exposed to moisture, liquids (such as paint), or water;

7. Defects resulting from environmental or third party materials, including but not limited to work areas, patching or equipment cords, or from moves, additions and changes by parties other than a Certified Contractor; and
8. Defects resulting from a noncompliant or improper system design, installation, use, repair, or any system alterations, misuse, neglect, accident or abuse.

THE FOREGOING LIMITED LIFETIME WARRANTY IS EXCLUSIVE AND IS GIVEN AND ACCEPTED IN LIEU OF A) ANY AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ARISING OUT OF THE CONDUCT OR THE PARTIES, AND (B) ANY OBLIGATION, LIABILITY, RIGHT, CLAIM OR REMEDY FOR SUPPLIER'S NEGLIGENCE, ACTUAL OR IMPUTED.

The remedies of the Buyer for breach of the Limited Lifetime Warranty arising hereby, expressed or implied, or by operation of law, or for breach of any duty of Supplier, expressed or implied or arising out of any conduct of the parties, shall be strictly limited to those provided herein to the exclusion of any and all other remedies including, without limitation, claims for incidental or consequential damages. No agreement varying or extending the foregoing Limited Lifetime Warranty, remedies or these limitations will be binding upon Supplier unless in writing, signed by an authorized officer of Supplier.

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3.2.A Panduit Certification Plus™ System Warranty

The Certification Plus™ System Warranty is a 25-year standards-based performance warranty covering cable, components and labor to repair or replace cable and/or components on any registered link and/or channel failing to meet minimum performance requirements as specified in the Commercial Building Telecommunications Cabling Standards. This warranty provides a single point-of-contact for registrations and system issues. All cable and components must be installed only by skilled PCI's (Panduit Certified Installers) who have a RCDD or Panduit-approved equivalent on staff and the required amount of trained technicians.

Eligible installations are warranted as follows:

1. That each registered link and/or channel will meet or exceed the performance requirements of the designated link and/or channel classification defined in the Commercial Building Telecommunications Cabling Standards listed on the warranty certificate.
2. That each registered link and/or channel will support all current and all future network applications designed to run on the designated link and/or channel classification defined in the Commercial Building Telecommunications Cabling Standards listed on the certificate.
3. That all connectivity hardware and cable used in the structured cabling system will be free of defects in material and workmanship under normal handling and use.

In the event that any of Panduit's connectivity hardware and/or cable used in the structured cabling system fails to perform as specified above in #'s 1 - 3, Panduit will repair and/or replace the defective connectivity hardware and/or cable ourselves or will contract a Panduit Certified Installer to complete this work in accordance with the limitations set forth in this Certification Plus™ System Warranty.

The Certification Plus™ System Warranty registration requirements are as follows:

1. A signed SCS Installer Agreement at Panduit (required prior to registration).
2. A RCDD or Panduit recognized equivalent on staff of the installing agent.
3. A completed application for warranty.
4. Standards based test results, taken with an approved field tester and test leads.
5. As-built floor plans indicating work-area outlets and telecommunication closet(s).

For this warranty to be valid:

1. The customer must verify that the structured cabling system has been designed, installed and maintained throughout the warranty period per the following standards:
 - a) TIA/EIA-568-B.1, Commercial Building Telecommunications Cabling Standard Part 1: General Requirements, May 2001.
 - b) TIA/EIA 568-B.2, Commercial Building Telecommunications Cabling Standard Part 2: Balanced Twisted Pair Cabling Components, May 2001.
 - c) TIA/EIA568-B.2-1, Commercial Building Telecommunications Cabling Standard Part 2: Balanced Twisted Pair Cabling Components. Addendum 1 - Transmission Performance Specifications for 4-pair 100 Ω Category 6 Cabling, June 2002.
 - d) SP-3-4426-AD10-B, draft 5.0, 07/28/06 (to be published as ANSI/TIA/EIA-568-B.2-10) Commercial Building Telecommunications Cabling Standard. Part 2: Balanced Twisted Pair Cabling Components. Addendum 10 - Transmission Performance Specifications for 4-pair 100 Ω Augmented Category 6 Cabling.
 - e) TIA/EIA 568-B.3, Optical Fiber Cabling Components Standard, April, 2000.
 - f) TIA/EIA-569-B, Commercial Building Standard for Telecommunications Pathways and Spaces, October, 2004.
 - g) TIA/EIA-606, Administration Standard for Commercial Telecommunications Infrastructure, May, 2006.
 - h) IEEE Std 802.3(tm)-2002 Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications.
 - i) IEEE 802.3an-2006, Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications. Amendment 1: Physical Layer and Management Parameters for 10 Gb/s Operation, Type 10GBASE-T.
2. Each registered cable link and/or channel must be 100% constructed of Panduit connectivity hardware and cable approved for the designated link and/or channel classification defined in the Commercial Building Telecommunications Cabling Standards listed on this certificate.
3. The PCI (Panduit Certified Installer) must submit to Panduit a certified passing test report for each link and/or channel.

In the event of a warranty claim:

In the event of a performance problem the customer must resolve all non-connectivity hardware and non-cable related causes and contact the original Panduit Certified Installer to verify that the system has been designed, installed and maintained per the applicable Commercial Building

Telecommunications Cabling Standards except where the Certification Plus™ System Warranty Program Manager has previously authorized exceptions to these standards in writing. If the performance problem persists, the customer should contact the Certification Plus™ System Warranty Program Manager for corrective action within 10 days of the original performance problem.

Warranty Exclusions and Limitations:

1. This warranty does not cover defects where the structured cabling system has been subjected to misuse, abuse, neglect, accidental damage, fire, flood, water submersion, explosion, acts of God, war or terrorism, improper repair, alteration, installation or design, or any other events outside of Panduit's control.
2. This warranty does not cover the installation or maintenance of the system or products not specifically designated for use under the terms of the Certification Plus™ System Warranty. This warranty is void if the defective link and/or channel is comprised of counterfeit products.
3. Under no circumstance shall Panduit be obligated to pay for repairs which exceed the original amount paid by the customer for the Panduit connectivity hardware and/or cable in the structured cabling system. Subject to the foregoing and to the other terms and limitations of this warranty, repair and/or replacement of the connectivity and/or cable used in the defective link and/or channel is Panduit's sole and exclusive obligation and customer's sole and exclusive remedy.
4. This warranty is made in lieu of and excludes all other warranties, expressed or implied, arising by law or custom, including without limitation, implied warranties of merchantability, fitness for particular use, non-infringement or any other matter. Panduit shall not be liable for any other injury, loss or damage, whether direct or consequential, arising out of the use of, or the inability to use, the system. In no event will Panduit be liable for any incidental, exemplary or consequential damages, including, but not limited to damages for lost data, time, profits, revenues or any other economic damages arising out of the use of or the failure of a system.
5. This Agreement shall be governed by and construed in accordance with the laws of the State of Illinois, USA and any disputes hereunder or relating hereto shall be subject to the jurisdiction of the courts of the State of Illinois, USA.

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