

**Western Michigan University – Office of Information Technology & Campus  
Planning, Design & Construction**

**Design Guidelines for Facilities Construction:**

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**DESIGN GUIDELINE DG17-7 FIBER OPTIC HORIZONTAL DISTRIBUTION**

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**I. GENERAL**

Currently WMU has very few horizontal (user) connections using fiber optics. Where user needs include a number of fiber optic connections, such as in server rooms, these connections are installed to riser cable standards, since they are more appropriate and well defined.

These guidelines provide basic information for horizontal fiber user connections when they may be appropriate. Many of the general requirements are the same as for UTP horizontal cabling, since they apply to horizontal distribution regardless of media.

**II. GENERAL DESIGN CONSIDERATIONS**

The horizontal cabling system connects all individual user outlets to the CDRs where communications are interfaced to the backbone system. There must be an individual cable connecting each user outlet jack to a corresponding individual jack or other access point in the CDR serving it. The horizontal cables use the horizontal cable pathways normally installed by the electrical contractor augmented as required by the communications contractor.

Individual user connections may be implemented using fiber optic cables in a few selected situations in order to provide greater distance capability, bandwidth, noise immunity or other benefit.

Individual horizontal user connections will be served by individual two-fiber cables.

Fiber cable connections with more than two fibers intended for distribution use rather than individual end user connections will be treated as part of the fiber

optic backbone / riser system rather than as horizontal connections. Such cables should terminate in the BEF unless program requirements indicate a more appropriate location.

Since fiber optic cables have much longer distance capabilities than UTP cables, horizontal fiber cables need not be routed to the closest CDR in all cases. The distribution termination point for such cables should be defined based on program or other defined requirements when appropriate, in consultation with WMU OIT. If horizontal fiber outlets are being installed for future potential with no driving requirement, they will be routed to the BEF if that can be done within TIA horizontal fiber distance limits. If this cannot be done, they will be routed to the closest CDR or the most central CDR on the floor. OIT should be consulted on termination locations.

WMU has adopted the Panduit Mini-Com series of jacks and mounting hardware for horizontal connections University-wide. There has been no standard miniature connector for fiber connections selected yet. Work area outlet and closet fiber connectors, including small form factor connectors, may be selected to suit user requirements as long as they can be implemented with Panduit Mini-Com modules. Inclusion of horizontal fiber user connections in a project will require more thought and discussion than most aspects of the communications system.

### **III. SPECIFIC REQUIREMENTS**

#### **A. Products**

Horizontal cable will be plenum rated.

Fiber cable will be Corning brand of a type intended for horizontal distribution. Acceptable types include, but are not limited to 2-fiber DIB, Zipcord, Fan-Out, Ribbon Interconnect, or MIC class cables.

- Multimode fibers will be 900-micron tight-buffered 50/125 Infinicor 600 quality or better.

Terminating connectors will be Corning brand or Panduit brand compatible with Panduit Mini-Com panels.

#### **B. Execution**

##### *1. General*

All fiber system work will be carried out by Corning certified installers using Corning-recommended procedures. Complete fiber system is to qualify for Corning EWP warranty as described in separate DG.

##### *2. Cabling*

Install all horizontal cabling using cable path system. All cabling will be neatly and appropriately dressed and retained within cable pathway. Bend radius, tensions, and other physical parameters for all cables will adhere to manufacturer

specifications and appropriate standards at all times during installation and after completion.

Horizontal fiber cables will be installed in innerduct providing additional protection unless they are of a type, which makes them comparable to horizontal UTP cables in size, crush and abrasion resistance, etc.

Where appropriate, horizontal fiber cables not in innerduct will be bundled separately from UTP cables. If only a few such fiber cables are present, they should be bundled with UTP cables in a way so their presence is obvious.

At CDRs, each group of cables connected to an individual 48-jack panel will be bundled and dressed into a service excess of approximately 5 feet near the panel to allow re-location of panel if required at a later date. The loop will be placed so it will not interfere with installation of electronics in the rack.

Horizontal fiber user cables will be routed to the designated CDR.

Cables will be directly terminated to jacks at TC and user ends with no intervening splices, junctions, or connectors.

- At each closet jack, cable will be dressed so sufficient slack is available to allow re-termination, if necessary, without requiring unbundling and significant adjustments.
- At each user outlet, a service loop of approximately 8" will be left for future re-terminations. This slack will be neatly coiled in the box in a manner adhering to cable bend requirements.

### 3. *User Outlets*

User fiber jacks will be installed in sloped panels with openings facing down whenever practical.

### 4. *Terminations*

Fiber connectors will be installed in accordance with manufacturer specifications.

Jack designations will be integrated into the scheme used for copper outlets. Jacks will be labeled in a manner identical to that used for UTP user jacks, as specified in separate DG.

### 5. *Complete Connection*

Complete connection will be certified as specified in separate DG.

Jacks at both ends will be labeled and system will be documented as specified in separate DG.

**END OF SECTION**