

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

**Design Guidelines for Facilities Construction:**

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**DESIGN GUIDELINE DG17-12 System Terminology, Definitions, & Design Rationales:**

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**I. GENERAL**

This document contains information that is intended to clarify the interpretation of items that may be found in any or many of the WMU DG17 series.

This entire set of specifications covers systems that have been traditionally referred to by several other terms: telephone, telecommunications, data communications computer networking, and others. Since WMU is conscientiously working to evolve most of these into a single digital communications system carrying all forms of information (voice, data, video), this document has purposely totally avoided the use of virtually all previously used terms and refers to the

system described as simply the *communications system*. Similarly, other terms have been carefully avoided and new ones substituted, most notably the term *communications distribution room* (CDR) instead of IDF, telecommunications room, or any traditional term.

## II. DEFINITIONS

### A. General

Many terms and abbreviations in communications technology have meanings which evolve with the technology or which mean different things to different people or in different situations. This list is supplied to help clarify the intended meaning of terms and abbreviations used in the WMU DG17 series.

This list is intended to contain descriptions only for terms which are unique to WMU, for which WMU has usages which may differ from general use, or which the meaning may be unclear for other reasons.

### B. Terms

#### 1. *Approved*

Beyond its basic meaning, this term has different specific meanings in this document depending on context:

Basic meaning, commonly accepted in most contexts per BICSI and others: acceptable to the authority having jurisdiction” with a wide range of possible authorities, depending on product and/or circumstances. Intent of usage should be obvious to most telecommunications contractors.

“UL-approved” (and UL-listed) is (are) used in the document in broad form, meaning full acceptance by UL Under whatever program is applicable to the particular product.

“Approved by owner” requires written explicit specifics for the desired product or procedure be submitted to the owner and written approval received before substitution may be made for the requirement specified in this document.

#### 2. *Backbone Cable System*

The cable system connecting the building to external facilities and the riser system within the building interconnecting TCs (essentially EIA/TIA 568-B, etc.)

#### 3. *Building Entry Facility(BEF)*

Building entry facility- center for communications distribution for an individual building. In WMU buildings, this is the communications space containing the communications service entry and the central access to the building riser system. This space serves as the demarcation point between the inter-building and intra-building cabling systems. It may also in some cases contain horizontal

distribution facilities, thus simultaneously serving the purpose of a TC. (In most current buildings, this space is referred to as the BDF.)

4. *Bonding*

The electrical interconnection of conductive parts designed to maintain a common electrical potential. Bonding conductors are not intended to current except under fault conditions.

5. *Cable Tray*

Any mechanical system intended to support multiple communications cables, often a large quantity of individual 4-pair cables and fiber optic innerducts or cables. Most common physical forms of such systems are included in this term without prejudice: ladder-tray, basket tray, spine-and-rib.

- Implied in the general cable tray concept used in this document are the specifics associated in BICSI's glossary with a "trough (cable)": A pathway constructed so cables readily installed and removed without injury after the trough (tray) is fully installed.
- In concept, in-floor trench-duct and other similar systems would be included in the broad form view of "cable tray".
- While included in the term, overhead electrical-style closed-wall (possibly covered) wireway is not allowed for general-use horizontal communications cable distribution.

6. *Communications Distribution Room (CDR)*

Used in place of telecommunications closet (TC), telecommunications room (TR), IDF, etc., which are terms commonly used in many constructions specifications.

A secondary communications distribution closet. In WMU's communications architecture, CDRs are directly connected to the BEF or primary closet by riser cables and act as the demarcation point between the intra-building riser system and the horizontal cabling system for the area served by the CDR.

This is essentially the same as what is sometimes called an LDF, IDF, TC, or TR in similar documents and is often currently referred to at WMU as an IDF.

7. *Data, Data Network*

Communications system designed to support primarily digital information in packetized digital form. In the past, such systems have been used primarily to carry "computer data," but they are now being adapted to carry digitized audio (voice) and video communications, confusing the terminology. At WMU, the data system has used fiber optic cables for inter-building communications, either fiber or copper for internal building riser level distribution and copper UTP originally considered as part of the telephone system for horizontal distribution. Current understanding is that the traditional telephone system will be absorbed into the current data system. This document reflects this attitude in its specifications.

8. *EDUcable*

The WMU owned and operated cable-TV style system that serves all buildings on the campus.

9. *Grounding*

(Nothing unique to WMU) Grounding is the electrical connection of telecommunications hardware to an effective electrical ground. The effective electrical ground can be a power system MGN, a grounded neutral of a secondary power system or a specially constructed grounding system meeting appropriate safety code definitions.

10. *Horizontal Cable System*

Cabling used to serve work area outlets from TCs (as in TIA 568-B, etc.) For WMU horizontal cables:

- Each individual jack, no matter what technology, will have a separate jacket from the WAO to the TC.
- In most cases, the served WAO and TC are on the same floor. Exceptions must be made in some cases where outlet density is very light on one or more levels and the nearest TC is on a different level (e.g., large basement mechanical rooms, sports facilities).

11. *Main Communications Closet*

Used synonymously with “building entrance facility’ (BEF).

12. *Telecommunications Closet (TC)*

Replaced by the term communications distribution closet (CDR) in these documents.

13. *Jack*

The physical connection jack for a single communications link or connection. In the WMU usage, this generally refers to a single RJ-45 style female jack, but may sometimes be broadened to refer to various fiber or RF connectors.

14. *Outlet*

Generally, a wall outlet box in the wall that will support a faceplate with one to four individual jacks when cabling is completed. More generally, the termination point for one or more communication circuits- a demarcation point between the user jacks and the user service jumper. In addition to normal work area outlets, special outlets, such as high or above-ceiling video and wireless data outlets are also included.

15. *Trunk cable tray system*

The portion(s) of the horizontal cabling pathway that is used to collect and carry a number of horizontal distribution cables to the supporting TC. Generally expected to be a cable tray over hallway ceilings leading from the outer areas of the

building to the central TC or one interconnecting multiple TCs. There may be any number of trunk cableways associated with a given TC.

16. *User outlet*

The point of access at the user end of horizontal communications circuits. A communications outlet may contain one or several jacks or various sorts, including RJ, video, or fiber optic. The term “user” does not necessarily imply the requirement of an actual human user; the term as used includes all types of access to the communications system including management systems, hallway video monitors, LCD projectors, wireless access points, etc. More current usage is to refer to this as the work area outlet (WAO).

17. *Voice*

Telecommunications service specifically designed to support primarily telephone-standard voice-range frequencies. Included are legacy analog telephone service, proprietary digital voice service, ISDN, T-1, DS1, etc. Traditional data systems are now being adapted to carry telephone-style voice communications, confusing the terminology.

18. *VOIP*

Voice over IP (Internet Protocol)- a system in which legacy voice-grade communications are encoded in IP packetized form at a user location and transmitted across what has been considered the “data” network along with other packetized digital information.

19. *WMUnet*

The WMU owned and operated digital data network that serves all buildings and users on the WMU campus. WMUnet primarily refers to the physical system serving the Kalamazoo campuses, but is sometimes extended to functions serving WMU’s regional centers. (This is best applied to centers at Grand Rapids and Battle Creek, which are connected to Kalamazoo by links leased and operated by WMU. Regional centers other than these two are actually served using links leased or owned and operated by Merit.)

20. *Work area outlet*

More current standard term for what is usually referred to as the “user outlet” in this document. (See User outlet)

### **III. RATIONALE FOR VARIOUS NUMBERS / REQUIREMENTS**

#### **A. Heat Load for closet**

325 W or 1100 BTU per hour per 25 jacks served by the closet is based on the power requirements for C3524-PWR

**B. Number of racks per closet**

Assumption that single rack can hold 3 48-jack panels and associated electronics along with 3 48-jack riser panels, 2-u FO termination cabinet and 5-u of UPS if necessary. With horizontal cable mgt, approx 2/3 of rack should be required.

**C. Exterior fiber backbone**

Add 6f for 250 additional users: a guess.

**D. Fiber Riser System**

12f for 200 users, add 6 for each additional 100

- Based on 200 jack → 4 48-port units → 4 FO feeds = 8f
- Each additional 100 users would take 4f
- Max of 24f → 10 ckts +4 spare ← 500 users
  - At this density local 10 Gigabit switch probably required.

**END OF SECTION**