

Data Center Standards Making Progress on Many Fronts

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- Co-chair TIA TR-42.1.1 Data Center working group – ANSI/TIA-942
- Co-chair BICSI Data Center subcommittee – ANSI/NECA/BICSI 002
- Vice-Chair TIA TR-42.6 telecom administration subcommittee
- US National Committee Project Manager ISO/IEC 24764 Data Centre standard
- Data Centre & Administration Section Editor – ISO/IEC 14763-2 cabling planning & installation

Organizations developing data center standards

- TIA - Telecommunications Industry Association (www.tiaonline.org) – North America
- BICSI (www.bicsi.org) - Global
- CENELEC - European Committee for Electrotechnical Standardization (www.cenelec.org) – European Union
- ISO - International Organization for Standardization (www.iso.org) - International
- IEC - International Electrotechnical Commission (www.iec.ch) - International

ANSI/TIA-942 – what is it?

- *ANSI/TIA-942 Telecommunications Infrastructure Standard for Data Centers*
- American National Standard
- Approved in 2005
- Provides requirements on a wide range of subjects related to the design of data centers
- Available from global.ihs.com
- Encourages early participation of telecommunications designers and information technology professionals in the data center design process

TIA-942 Content – normal standards stuff

- Structured cabling system design using standardized topology and components
- Data center space requirements (temperature, humidity, doors, lighting, floor loading, finishes, ceiling height, grounding, etc)
- Data center cabling pathway design requirements (entrance pathways, raised floor systems, cable trays)

TIA-942 Content – other interesting stuff

- Informative annexes on a wide variety of subjects
- Separation of power and telecommunications cabling
- Circuit lengths for applications – T-1, E-1, T-3, E-3s in data centers
- Access provider (local carrier) coordination and demarcation
- Site selection
- Electrical, mechanical, architectural design

ANSI/BICSI-002

- ANSI/BICSI-002 *Data Center Design Standard and Recommended Practices*
- Best practices design standard that will complement, not replace TIA-942
- Recommended practices that exceed the requirements specified in TIA-942
- Extensive guidance on other the design of other data center systems, including architectural, security, fire protection, electrical, and mechanical systems
- Currently over 480 pages
- Publication 2009/2010 (1st complete draft will be balloted shortly)

CENELEC EN 50173-5

- ▶ EN 50173-5 *Generic Cabling Systems Part 5: Data Centres* - the European standard for data center telecommunications cabling infrastructure
- ▶ Provides requirements for the data center telecommunications cabling system
- ▶ Minimum of Category 6 for twisted pair cabling except at the external network interface (entrance room) also permits Cat 6A, 7, 7A.
- ▶ No requirements for data center telecommunications spaces, pathways, or provide guidance on other data center systems
- ▶ Approved for publication Feb 2007

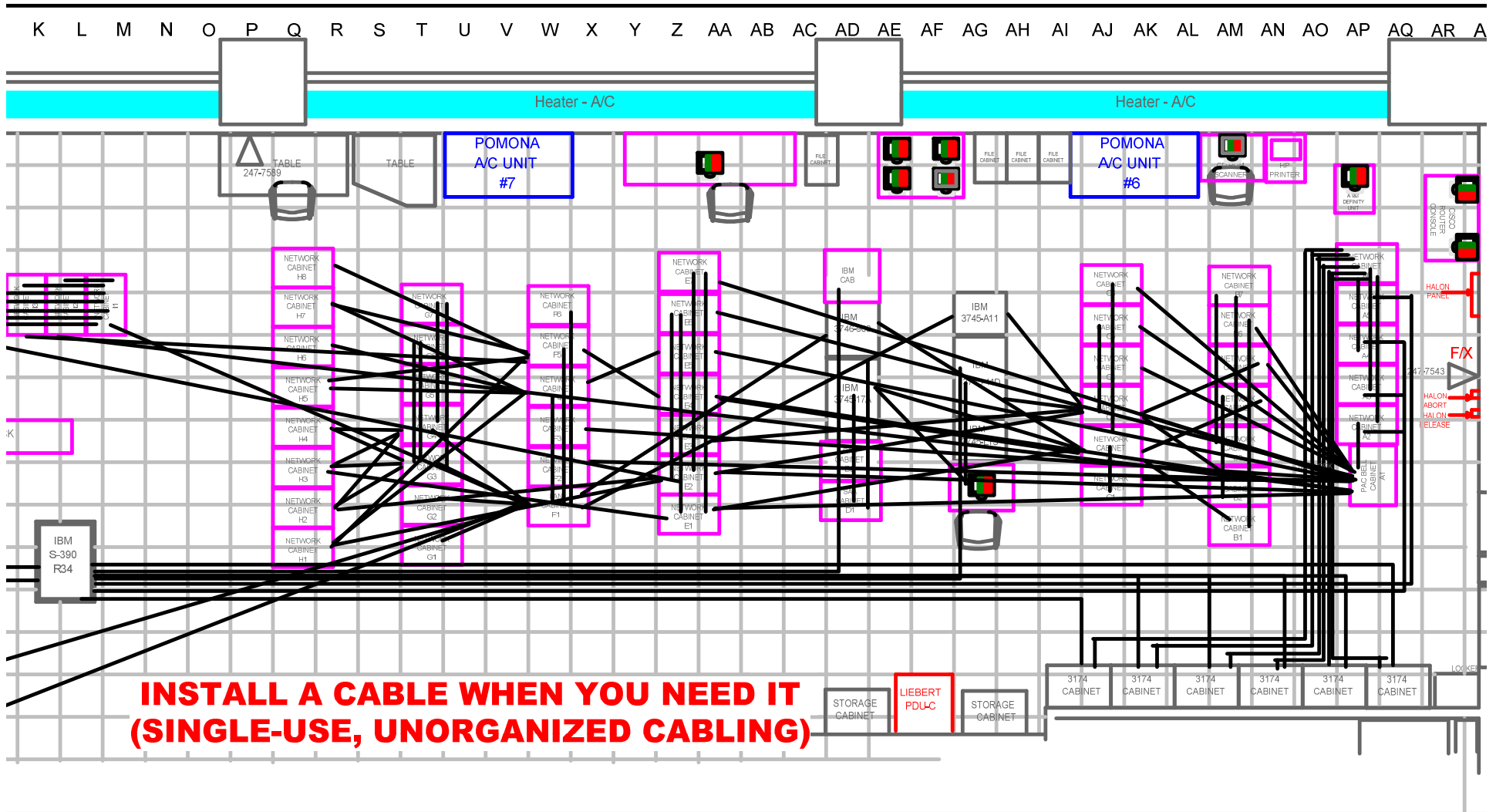
ISO/IEC 24764

- International standard for data center telecommunications cabling infrastructure
- Based on CENELEC EN 50173-5 (European data center telecom cabling standard)
- Minimum of Category 6A for twisted pair cabling except at the external network interface (entrance room) permits Cat 7 and 7A
- minimum of OM3 laser-optimized 50/125 μm for multimode fiber
- Standardizes on LC and MPO
- No requirements for data center telecommunications spaces, pathways, or guidance on other data center systems
- Publication 2009 / 2010

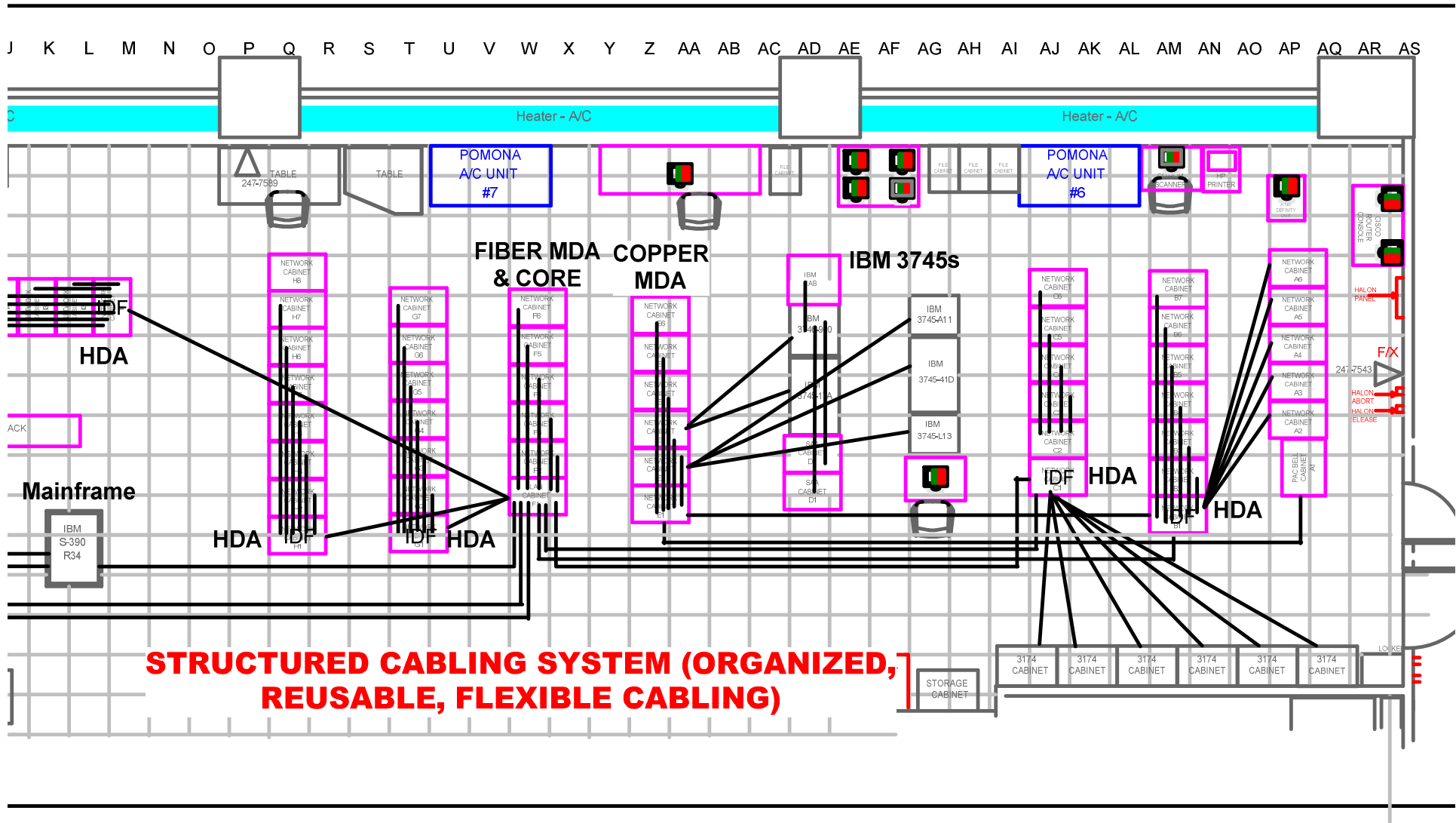
Why Use Structured Cabling in Data Centers

- Cabling can be used for multiple applications rather than installed for one application and then removed (or probably just left under the floor)
 - Saves money
 - Flexibility to deploy connections quickly
 - Helps minimize under floor mess
- Support for future high speed protocols
- Simpler troubleshooting & administration (improves uptime)

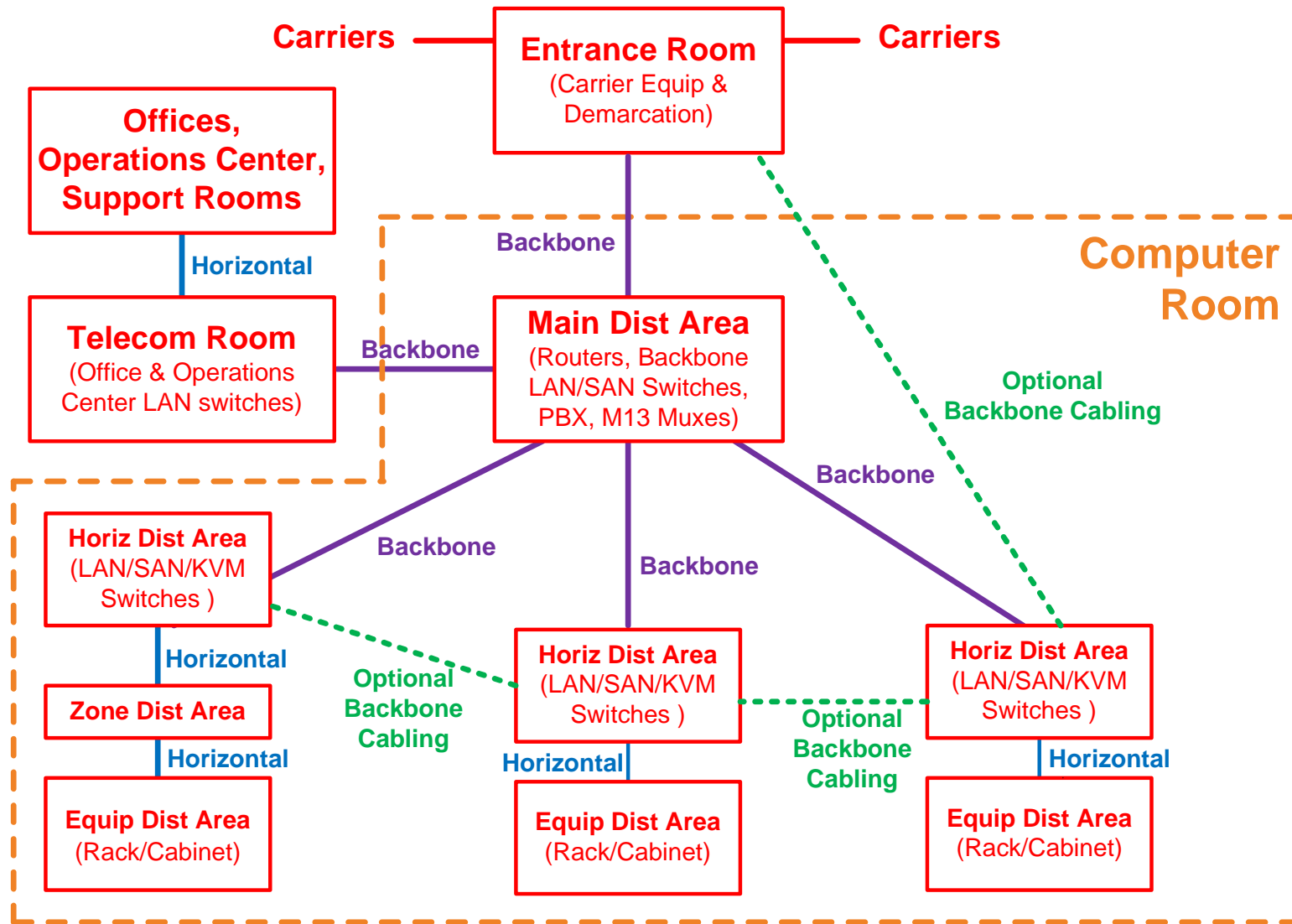
Point-to-Point → Structured Cabling Topologies (Point-to-Point Example)



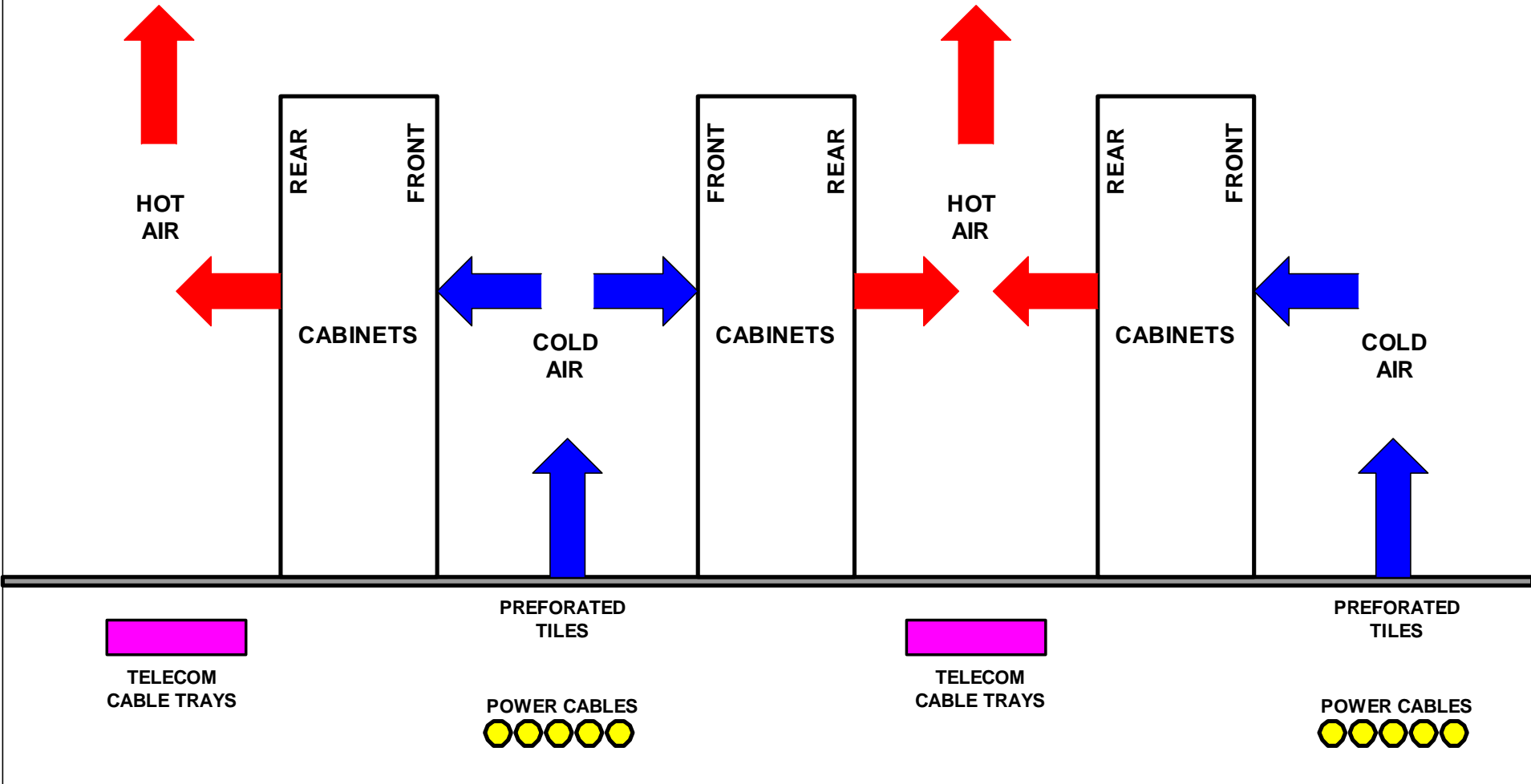
Point-to-Point → Structured Cabling Topologies (Structured Example)



Data Center Structured Cabling Topology



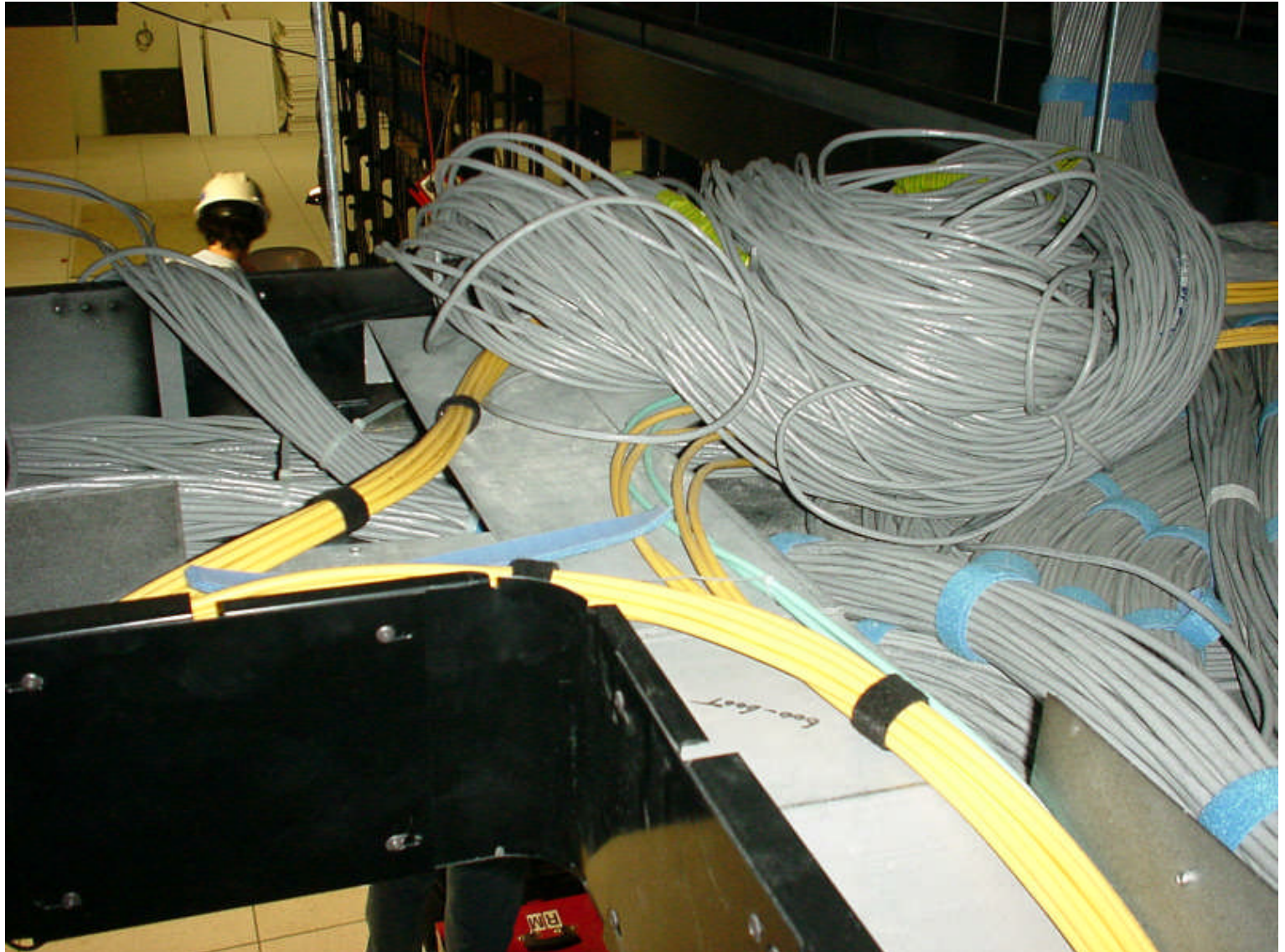
HOT AND COLD EQUIPMENT AISLES



These electrical trays commonly used in Europe have sharp edges that damage cables

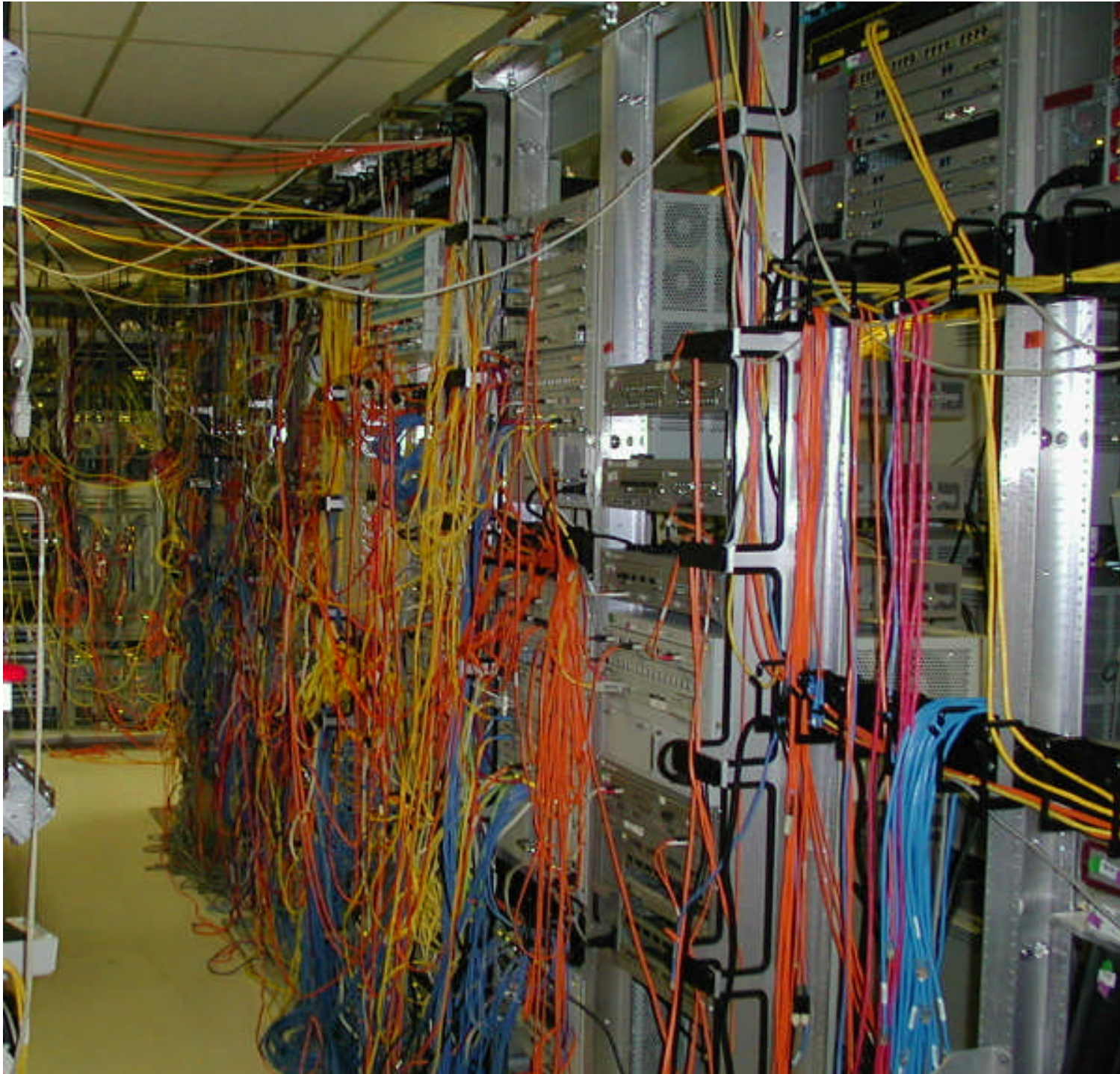


More than 40% fill and more than 6" depth of cable tray in these solid bottom trays in Sydney



Equipment Racks & Cabinets

- ▶ Adequate width and/or depth for cable management, patch panels, and power strips
- ▶ Minimum 3 ft preferably 4 ft in front for equipment installation
- ▶ Cabinets and racks should be aligned with one edge along the edge of the floor tile.
- ▶ Arrange cabinets and racks on raised floor to permit tiles along the front and rear of the cabinets and racks to be lifted
- ▶ Floor tile cuts should be no larger than necessary to minimize air pressure loss



Inadequate
Cable
manage-
ment

Equipment Cabinets



- ▶ Front rails of cabinets must be recessed to provide adequate room for patch cables and wire managers
- ▶ Adequate space for cable management
- ▶ Arrange switches and patch panels to minimize patching between cabinets & racks
- ▶ Perforated tiles at front of cabinets
- ▶ One edge of cabinets placed at edge of tile

TIA-942 Addendum 1

- ▶ TIA-942-1: Data Center Coaxial Cabling Specifications and Application Distances
- ▶ Additional requirements for 75-ohm coaxial cable connectors to for T-3, E-3, and E-1s
- ▶ Testing requirements for 75-ohm coaxial cabling in data centers
- ▶ Allowance for longer horizontal cabling for coaxial cables originating from the main distribution area
- ▶ amends the E-1, T-1, E-3, and T-3 maximum circuit distances specified in Annex A of TIA-942

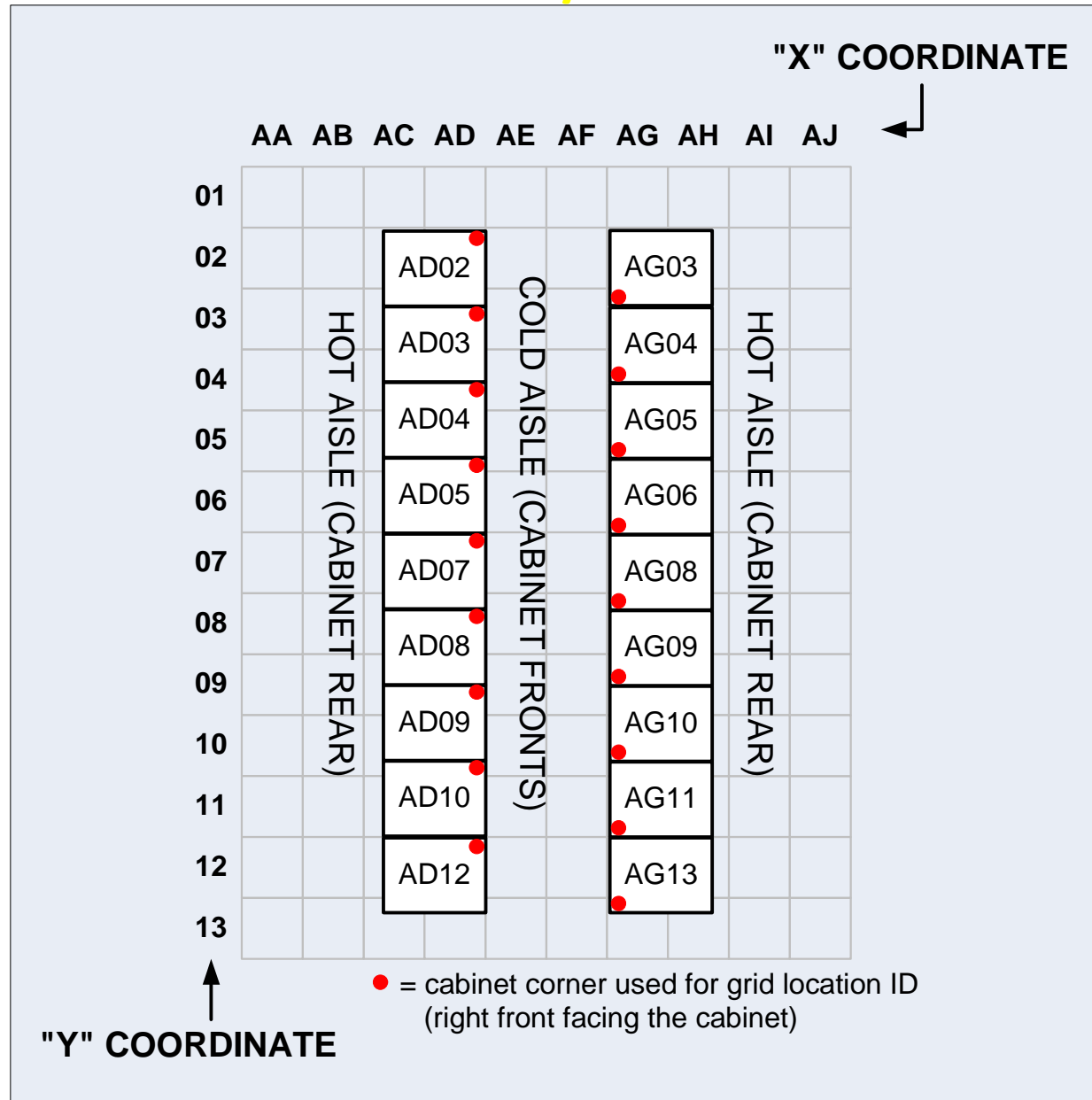
TIA-942 Addendum 2

- Addition of other media types (Cat 6A & possibly OM4)
- Updates to tiering table
- Increased temperature and humidity operating ranges to reduce energy consumption
- Lighting recommendations to reduce energy consumption
- Other energy saving measures may be addressed here or in other documents (e.g. virtualization, overhead cable trays, sealing of openings, no windows)

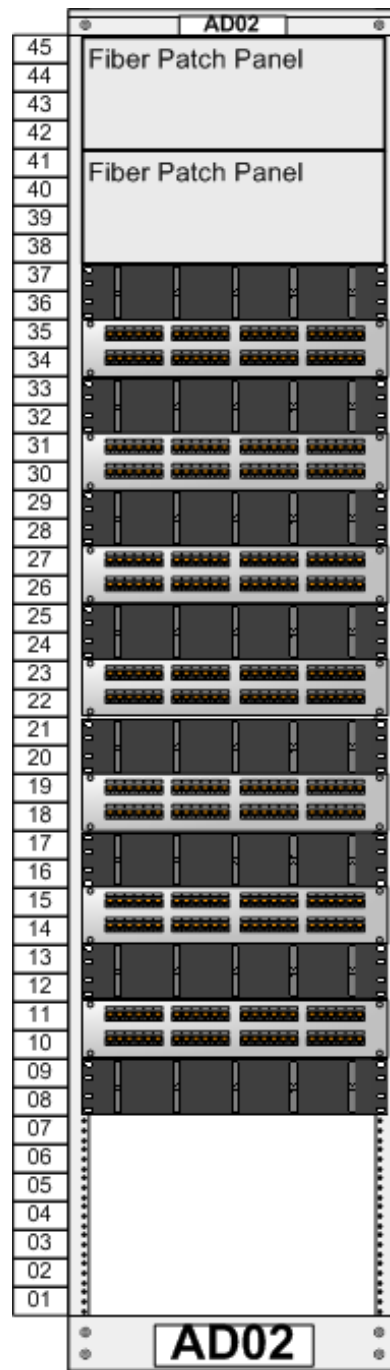
TIA-606-A Addendum 1

- Addendum to TIA-606-A – *Administration Standard for Commercial Telecommunications Infrastructure*
- Provides a comprehensive administration scheme for identification and labeling of cabinets, racks, patch panels, and cables in computer rooms and equipment rooms
- Principals in this addendum will be extended to other spaces in TIA-606-B
- Approved for publication Publication Oct 2008

606-A-1 Cabinet/Rack ID Scheme



606-A-1 Patch Panel ID Scheme



Panel AD02-45

Panel AD02-41

Panel AD02-35

Panel AD02-31

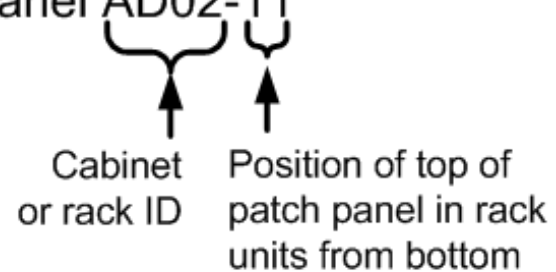
Panel AD02-27

Panel AD02-23

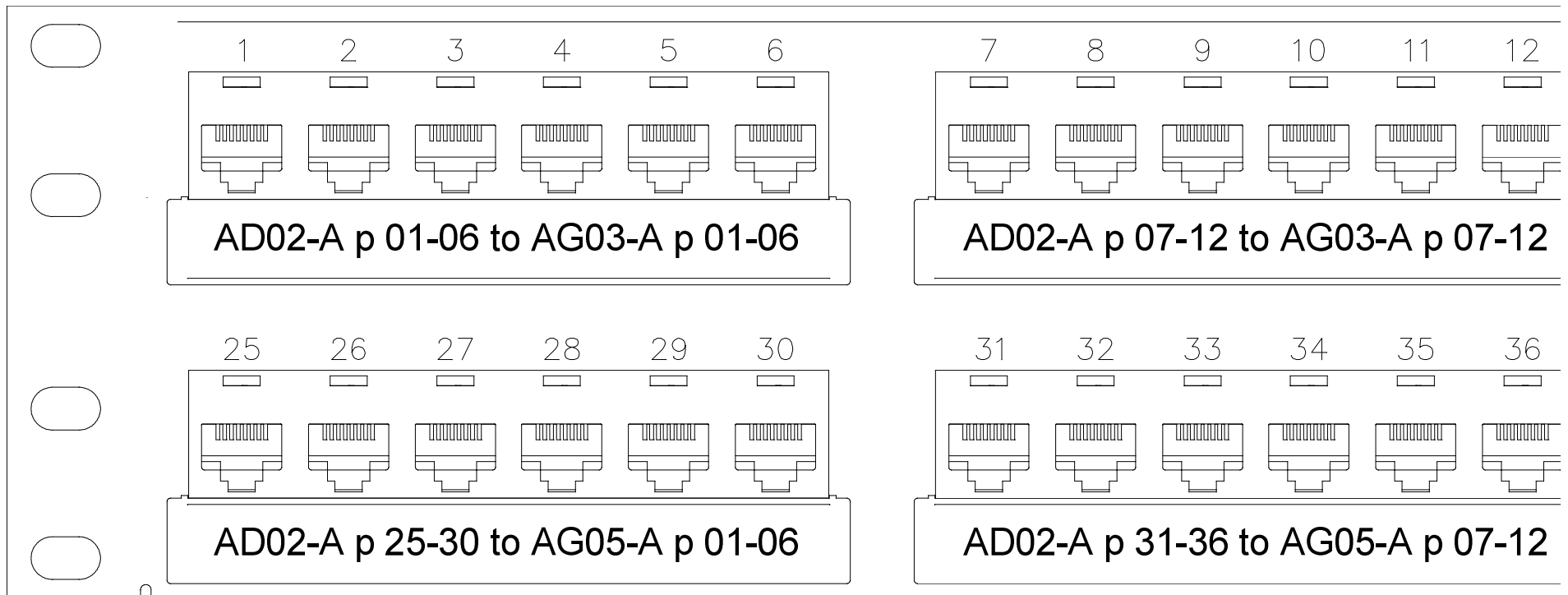
Panel AD02-19

Panel AD02-15

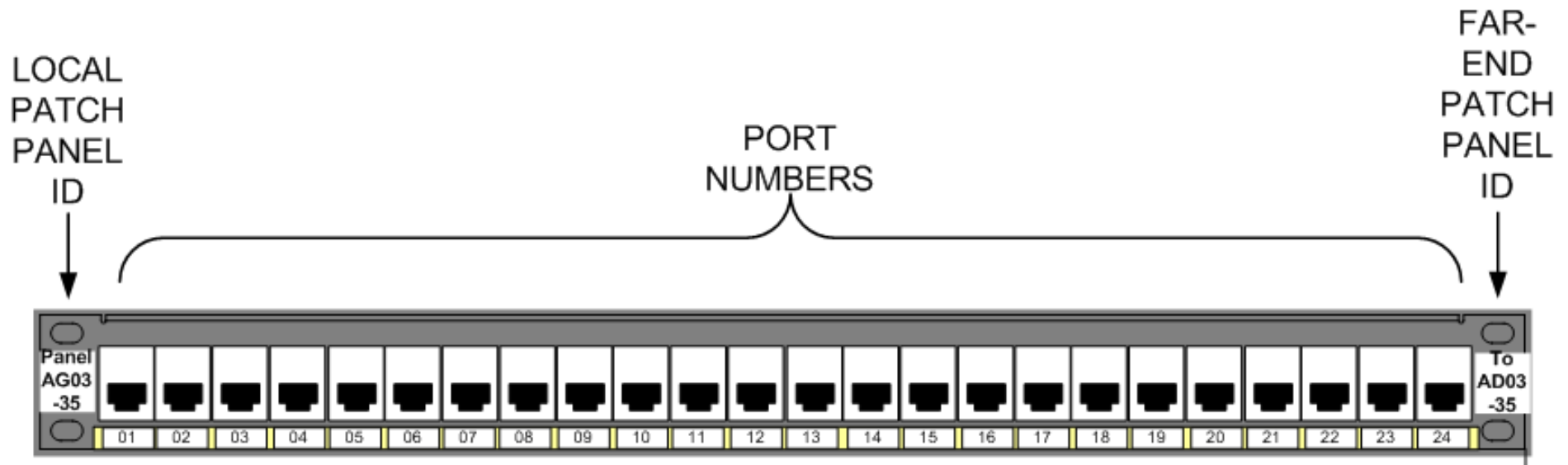
Panel AD02-11



TIA 606-A-1 Patch Panel Labeling



TIA 606-A-1 Patch Panel Labeling



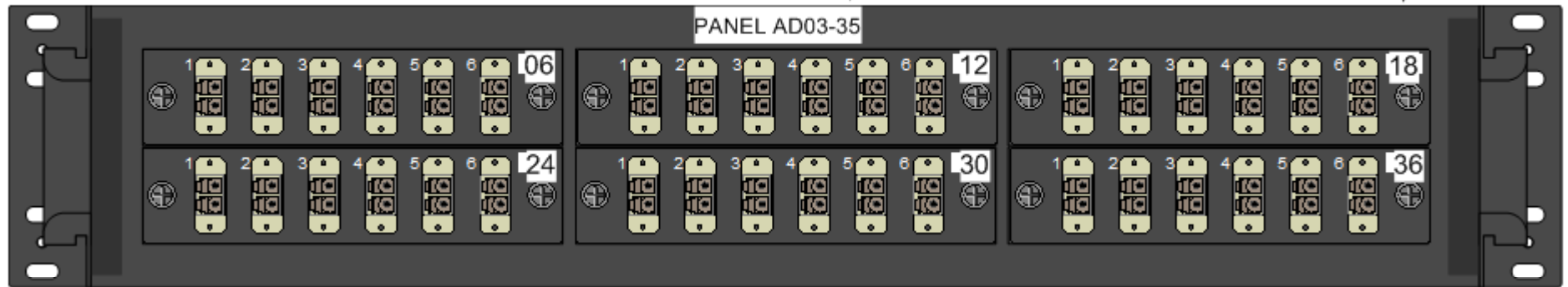
- ▶ At minimum label patch panel with ID of patch panel and 1st or last port of every subpanel
- ▶ Preferably also provide ID of far end patch panel(s) and space(s) (e.g. MDA or HDA)

TIA 606-A-1 Patch Panel Labeling

FIBER PATCH PANEL LABELING

PATCH PANEL NAME

LAST PORT NUMBER ON
EVERY ADAPTER PANEL



NEAR-END LOCATION, CABLE TYPE,
NEAR-END PORTS & FAR-END PORTS

HDA03 Multimode Fiber Patch Panel AD03-35

Ports 01-12 to AG10-41 Ports 01-12

Ports 13-24 to AG11-41 Ports 01-12

Ports 25-36 to AG13-41 Ports 01-12

FIBER PATCH PANEL DOOR LABELING

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