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# **ANSI/BICSI 002-2014**

**Data Center Design and  
Implementation Best Practices**



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## ***Data Center Design and Implementation Best Practices***

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## PREFACE

### Revision History

**June 18, 2010** First publication of this standard, titled BICSI 002-2010, *Data Center Design and Implementation Best Practices*

**March 15, 2011** Revision of BICSI 002-2010 published as ANSI/BICSI 002-2011, *Data Center Design and Implementation Best Practices*

*Major revisions include:*

- Addition of Section 9, *Electrical*
- Addition of Section 14, *Telecommunications*

*Minor revisions include:* definitions, updating of graphics for printing and readability, other editorial corrections

**December 9, 2014** Revision of ANSI/BICSI 002-2011 published as ANSI/BICSI 002-2014, *Data Center Design and Implementation Best Practices*

*Major revisions include:*

- Revision of Class F0 – F4 electrical infrastructure, including the removal of the requirement for a second power utility connection in Section 9, *Electrical*.
- Revised telecommunications Availability Classes C3 and C4 concerning the redundancy of main and horizontal distributors in Section 14, *Telecommunications*.
- Added, expanded and revised Availability Class structure to mechanical, telecommunications and network infrastructure (see Sections 9, 14, and 15 respectively).
- Addition of Appendix C, *Alignment of Data Center Services Reliability with Application and System Architecture*.
- Addition and revision of content for modular and containerized data centers in Section 6, *Space Planning* and Section 9, *Electrical*.
- Introduced content on DCIM and renamed Section 13 to *Data Center Management and Building Systems*.
- Expanded content regarding DC power and safety in Section 9, *Electrical*.
- Addition of hot and cold aisle containment in Section 6, *Space Planning* and Section 11, *Fire Protection*.
- Added and expanded content regarding designing for energy efficiency in multiple sections and added Appendix G, *Design for Energy Efficiency*.
- Addition of Appendix D, *Data Center Services Outsourcing Models*.
- Addition of Appendix E, *Multi-Data Center Architecture*.
- Updated cabinet door air flow and cable capacity calculations in Section 14, *Telecommunications*.

*Minor revisions include:*

- Moved former Section 5, *Space Planning* to directly after former Section 6, *Site Planning*.
- Restructuring of Section 5, *Site Planning*, Section 14, *Telecommunications*, and Section 16, *Commissioning*.
- Expansion of content to reflect both new and international design practices.
- Revisions to Appendix B, *Reliability and Availability*, to accommodate extension of availability classes.
- Update Section 8, *Structural*, to align with revisions to the *IBC* and related standards.

<List continues on next page>

- Updated Section 10, *Mechanical*, to reflect expanded ASHRAE guidelines for temperature and humidity.
- Updated Section 11, *Fire Protection* section to reflect changes in NFPA 75 and NFPA 76.
- Updated Section 14, *Telecommunications*, to reflect updates to ISO, TIA, and CENELEC data center cabling standards including cable types (removed OM1 and OM2, recommend OM4, added Category 8) and addition of intermediate distributor.
- Revised content regarding zinc whiskers and moved to Section 7, *Architectural*.
- Added content on testing equipment, system testing, acceptance testing, equipment operations and maintenance manuals, and system training to Section 16, *Commissioning*.
- Revised and moved system availability information to Appendix B, *Reliability and Availability*. (content formerly in Section 17, *Maintenance*).
- Added new content on maintenance plans and service contracts in Section 17, *Maintenance*.
- General content relocation and editorial corrections to improve readability and reduce ambiguity.

### **Document Format (Usability Features)**

This standard has the following usability features as aids to the user:

- Additions and changes, other than those for editorial purposes, are indicated with a vertical rule within the left page margin.
- Deletion of one or more paragraphs is indicated with a bullet (•) between the content that remains

NOTE: The relocation of content, within or between sections (e.g., Section 5, *Site Selection* and Section 6, *Space Planning*), due to structure, readability, or content alignment is not indicated.

### **Translation Notice**

This standard may have one or more translations available as a reference for the convenience of its readers. As that act of translation may contain inconsistencies with the original text, if differences between the translation and the published English version exist, the English text shall be used as the official and authoritative version.