

A photograph of a construction site at sunset. The sun is low on the horizon, casting a warm orange glow. In the foreground, there is a large, dark steel structure under construction, surrounded by scaffolding. Several tower cranes are visible, their silhouettes against the bright sky. The background shows a body of water and distant mountains.

# **VIRTUAL BUILDERS ROUNDTABLE WORKSHOP**

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June 13, 2005



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*Appendix A.*  
*Digital Building Product Models*  
*from the*  
*Code of Standard Practice for*  
*Steel Buildings and Bridges*  
*Prepared by the*  
*American Institute of Steel Construction*

June 13, 2005

# *From the Preface of the Code*

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**“This Code provides a useful framework for a common understanding of the acceptable standards when contracting for structural steel.”**

June 13, 2005



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*Did the Existing Code Reflect  
the Current State of Technology  
and Industry Practices?*

June 13, 2005

# *What the Previous Code Said*



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**“The CAD files or copies of the Design Drawings shall not be considered to be Contract Documents.”**

**“In the event of a conflict between the Design Drawings and the CAD files or copies thereof, the Design Drawings shall govern;”**

June 13, 2005

# *It was Time to Make a Change to the Code*



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**“Since the first edition of this Code was published in 1924, AISC has continuously surveyed the structural steel design community and construction industry to determine standard trade practices. Since then, this Code has been periodically updated to reflect new and changing technology and industry practices.”**

June 13, 2005



# Appendix A

16.3-65

## APPENDIX A. DIGITAL BUILDING PRODUCT MODELS

The provisions in this Appendix shall apply when the contract documents indicate that a three-dimensional digital building product model replaces contract drawings and is to be used as the primary means of designing, representing, and exchanging structural steel data for the project. When this is the case, all references to the Design Drawings in this Code shall instead apply to the Design Model, and all references to the Shop and Erection Drawings in the Code shall instead apply to the Manufacturing Model. The CIS/2 Logical Product Model shall be used as the building product model for structural steel.

If the primary means of project communication reverts from a model-based system to a paper-based system, the requirements in this Code other than in this Appendix shall apply.

### Commentary:

Current technology permits the transfer of three-dimensional digital building product model data among the design and construction teams for a project. Over the last several years, designers and fabricators have used CIS/2 as a standard format in the exchange of building product models representing the steel structure. This Appendix facilitates the use of this technology in the design and construction of steel structures, and eliminates any interpretation of this Code that might be construed to prohibit or inhibit the use of this technology. While the technology is new and there is no long-established standard of practice, it is the intent in this Appendix to provide guidance for its use.

## APPENDIX A. GLOSSARY

Add the following definitions to the Glossary:

**Building Product Model.** A digital information structure of the objects making up a building, capturing the form, function, behavior and relations of the parts and assemblies within one or more building systems. A building product model can be implemented in multiple ways, including as an ASCH file or as a database. The data in the model is created, manipulated, evaluated, reviewed and presented using computer-based design, engineering, and manufacturing applications. Traditional two-dimensional drawings may be one of many reports generated by the building product model (see Eastman, Charles M.: Building Product Models: Computer Environments Supporting Design and Construction, 1999 by CRC Press).

**CIS/2 (CIMSteel Integration Standards Version 2).** The specification providing the building product model for structural steel and format for electronic data interchange (EDI) among software applications dealing with steel design, analysis, and manufacturing.

**Logical Product Model (LPM).** The CIS/2 building product model, which supports the engineering of low-, medium- and high-rise construction, in domestic, commercial

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s. All elements of the structure are covered, including main and end connections. The components used can be of any variety of element.

It facilitates the exchange of data between structural steel applications. It is a heterogeneous set of applications over a fairly broad portion of the steel structure. It is organized around three different sub-models: the Analysis Model (data represented in structural analysis), the Design Model (data represented in detailing) and the Manufacturing Model (data represented in detailing).

**Performance (DMC).** The capability of the CIMSteel model to support entities for managing and tracking additions, deletions and modifications, including who made the change and when the change was made.

### References, Codes and Standards

See reference to Section 1.2:

American Institute of Steel Construction, Inc. (AISC), Steel Construction Manual, 14th Edition, Part 2: Second Edition, P265, CIS/2: Logical Product Model, 4.1.

### REQUIREMENTS AND SPECIFICATIONS

Section 1.2, the following requirements shall apply to the Logical Product Model:

1. The Logical Product Model shall:

a. be organized around three different sub-models: the Analysis Model, the Design Model, and the Manufacturing Model.

b. be organized around three different sub-models: the Analysis Model, the Design Model, and the Manufacturing Model.

c. be organized around three different sub-models: the Analysis Model, the Design Model, and the Manufacturing Model.

d. be organized around three different sub-models: the Analysis Model, the Design Model, and the Manufacturing Model.

e. be organized around three different sub-models: the Analysis Model, the Design Model, and the Manufacturing Model.

f. be organized around three different sub-models: the Analysis Model, the Design Model, and the Manufacturing Model.

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*Appendix A. is  
Applicable when:*

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**If the design documents indicate that a 3-dimensional electronic Logical Product Model is to be used for the project.**

**All reference to Design Drawings shall instead apply to the Design Model.**

**All reference to the Shop and Erection Drawings shall instead apply to the Manufacturing Model.**

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# *Glossary of New Terms*

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**CIS/2**

**CIMSteel Integration Standards/Version 2**

**LPM**

**Logical Product Model**

- Analysis Model
- Design Model
- Manufacturing Model

**DMC**

**Data Management Conformance**

June 13, 2005

# *Section A3.1 Design Drawings and Specification-Design Model*

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**Data Management Conformance Classes.**

**Include entites that define each steel element.**

**Include steel elements identified in the Contract Documents ... required for strength and stability...**

**Govern all other forms of information ...**

June 13, 2005

# *Section A3.2 Design Drawings and Specification-Model Admin.*

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**Control Access to the LMP**

**Maintain Security of the LPM**

**Guarantee against Data Lose of the LPM**

**Responsible for Updates to the LPM**

**Notify Project Group about Changes to the  
LPM**

June 13, 2005

# *Section A4.3 Fabricator Responsibility*

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## **When the Design Model is used to Develop the Manufacturing Model:**

- If there is a difference between the design drawings and the model the MODEL will control.

June 13, 2005

# *Section A4.3 Fabricator Responsibility*

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## **When the Design Model is used to Develop the Manufacturing Model:**

- If the contract is silent on the ownership of information added to the model by the Fabricator, the added information belongs to the fabricator.

June 13, 2005

# *Section A4.3 Fabricator Responsibility*

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## **When the Design Model is used to Develop the Manufacturing Model:**

- During the development of the Manufacturing Model as members need to be relocated to convert from the Design Model these relocations need to be approved by the EOR.

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# *Section A4.4 Approval*

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**When the approval is to be done on the Manufacturing Model, the Model's revisions will be tracked and any comments regarding the detailed elements will be tied to the individual element.**

**If the Model needs to be resubmitted, the revised Model will also be tracked.**

June 13, 2005

# *Free Down Load*



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**The Code and the Appendix A is a free  
down load from the AISC.**

**Go to [aisc.org](http://aisc.org) and look in the  
Bookstore**

June 13, 2005





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*Thank You*

June 13, 2005