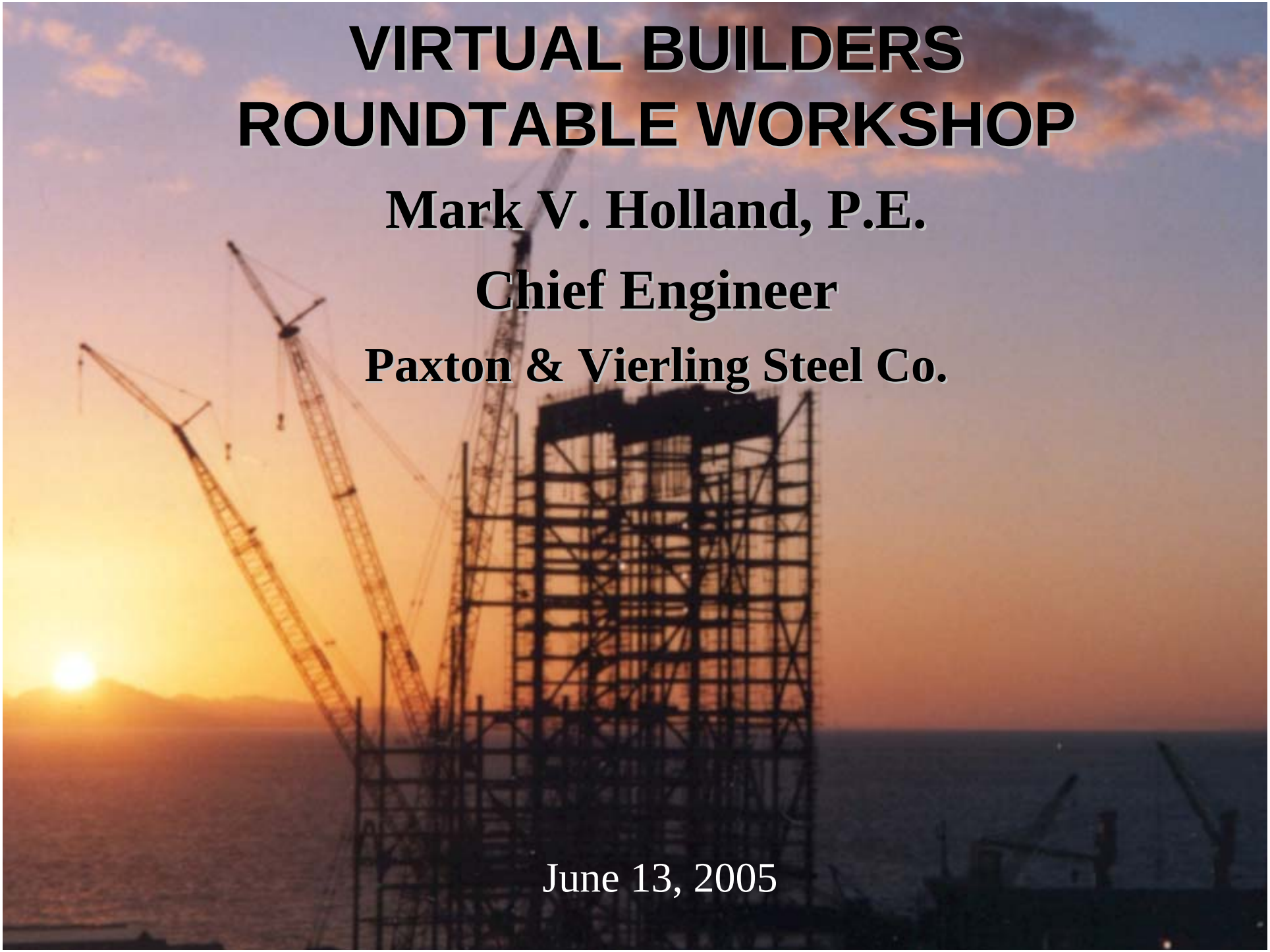

VIRTUAL BUILDERS ROUNDTABLE WORKSHOP

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Chief Engineer

Paxton & Vierling Steel Co.

June 13, 2005

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

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

June 13, 2005

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

June 13, 2005

What the Previous Code Said

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

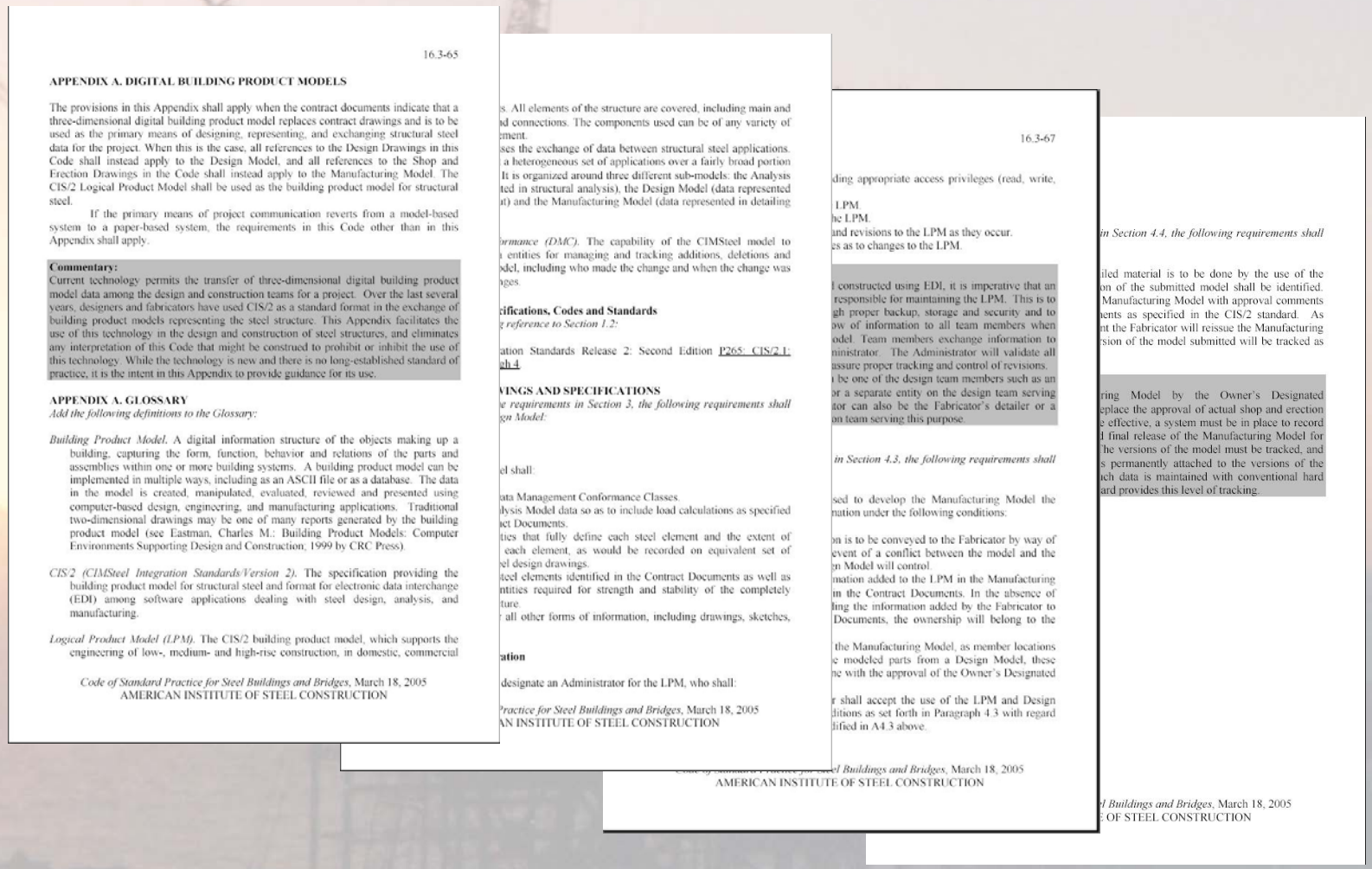
"In the event of a conflict between the Design Drawings and the CAD files or copies thereof, the Design Drawings shall govern;"

It was Time to Make a Change to the Code

"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



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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 ASCII 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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ding appropriate access privileges (read, write,

LPM.
he LPM.
and revisions to the LPM as they occur.
es as to changes to the LPM.

l constructed using EDI, it is imperative that an
responsible for maintaining the LPM. This is to
gh proper backup, storage and security and to
ow of information to all team members when
odel. Team members exchange information to
ministrator. The Administrator will validate all
assure proper tracking and control of revisions.
be one of the design team members such as an
or a separate entity on the design team serving
tor can also be the Fabricator's detailer or a
on team serving this purpose.

in Section 4.3, the following requirements shall

sed to develop the Manufacturing Model the
nation under the following conditions:

n is to be conveyed to the Fabricator by way of
event of a conflict between the model and the
n Model will control.
mation added to the LPM in the Manufacturing
in the Contract Documents. In the absence of
ing the information added by the Fabricator to
Documents, the ownership will belong to the

the Manufacturing Model, as member locations
e modeled parts from a Design Model, these
ne with the approval of the Owner's Designated

r shall accept the use of the LPM and Design
ditions as set forth in Paragraph 4.3 with regard
lified in A4.3 above.

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s. All elements of the structure are covered, including main and
d connections. The components used can be of any variety of
ement.
ses the exchange of data between structural steel applications.
a heterogeneous set of applications over a fairly broad portion
It is organized around three different sub-models: the Analysis
ted in structural analysis), the Design Model (data represented
t) and the Manufacturing Model (data represented in detailing

ormance (DMC). The capability of the CIMSteel model to
entities for managing and tracking additions, deletions and
del, including who made the change and when the change was
ges.

cifications, Codes and Standards
g reference to Section 1.2:

ation Standards Release 2: Second Edition P265: CIS/2.1:
ch 4

VINGS AND SPECIFICATIONS
e requirements in Section 3, the following requirements shall
gn Model:

el shall:

ata Management Conformance Classes.
lysis Model data so as to include load calculations as specified
ct Documents.
ties that fully define each steel element and the extent of
each element, as would be recorded on equivalent set of
el design drawings.
teel elements identified in the Contract Documents as well as
ntities required for strength and stability of the completely
ture.
all other forms of information, including drawings, sketches,

ation

designate an Administrator for the LPM, who shall:

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in Section 4.4, the following requirements shall

iled material is to be done by the use of the
on of the submitted model shall be identified.
Manufacturing Model with approval comments
nents as specified in the CIS/2 standard. As
nt the Fabricator will reissue the Manufacturing
sion of the model submitted will be tracked as

ring Model by the Owner's Designated
eplace the approval of actual shop and erection
e effective, a system must be in place to record
l final release of the Manufacturing Model for
he versions of the model must be tracked, and
s permanently attached to the versions of the
ch data is maintained with conventional hard
ard provides this level of tracking.

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E OF STEEL CONSTRUCTION

Appendix A. is Applicable when:

- **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.**

Glossary of New Terms

CIS/2

CIMSteel Integration Standards/Version 2

LPM

Logical Product Model

- Analysis Model
- Design Model
- Manufacturing Model

DMC

Data Management Conformance

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Section A3.1 Design Drawings and Specification-Design Model

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 …

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

- **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**

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Section A4.3 Fabricator Responsibility

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.

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Section A4.3 Fabricator Responsibility

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.

Section A4.3 Fabricator Responsibility

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

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.

Free Down Load

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

Go to aisc.org and look in the Bookstore

June 13, 2005

Thank You

June 13, 2005