

INITIAL GRAPHICS EXCHANGE SPECIFICATION:
Architecture-Engineering-Construction Applications and Extensions

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The Initial Graphics Exchange Specification (IGES) now is supported by most principal vendors of computer-aided design (CAD) systems. Commercial data translators implemented under IGES Version 1.0 have demonstrated their ability to exchange descriptions of relatively small-scale products, most notably discrete machine parts, between CAD systems of diverse manufacture. However, the ability of IGES-based data exchange translators to transfer the complexity characteristic of even simple architectural or construction engineering descriptions has yet to be demonstrated. Transfer of underlying geometric models and "intelligence," and also of nongeometric property data of various kinds, are central areas of concern. Also important is the need for project description data to be exchanged between CAD systems on which building geometries are established, and analysis systems by which these geometries are rigorously evaluated.

In November 1983, an IGES/AEC (architecture-engineering-construction) Subcommittee was established to evaluate current versions of the IGES standard in relation to AEC industry requirements, and to recommend specific extensions intended to maximize the usefulness of IGES to building design, construction, and related users of CAD systems. This paper presents basic IGES concepts, overviews AEC applications of CAD technology, and discusses the technical agenda for IGES/AEC.

IGES/AEC Subcommittee Mission

- **Test Capabilities of Available IGES Translators Against AEC Data Exchange Requirements.**
- **Propose Extensions and Repairs to IGES that Enhance the Standard's Applicability to AEC Problems.**
- **Develop Recommended Practices to Assist the Development of AEC-Oriented IGES Translators.**
- **Consider Implications of Data Exchange for Building Project Database Organization and Management.**

IGES/AEC Subcommittee Scope

Project Data Exchange Requirements of:

- **Architects/Engineers**
- **Building Contractors and Construction Managers**
- **Building Operators/Managers**

To Support:

- **Preliminary Design**
- **Detail Design**
- **Contract Document Development**
- **On-Site Fabrication**
- **Component Manufacture**
- **Post-Occupancy Management**
- **Project Archiving**

IGES/AEC Scope, Continued . . .

Project Description Data Exchange Between:

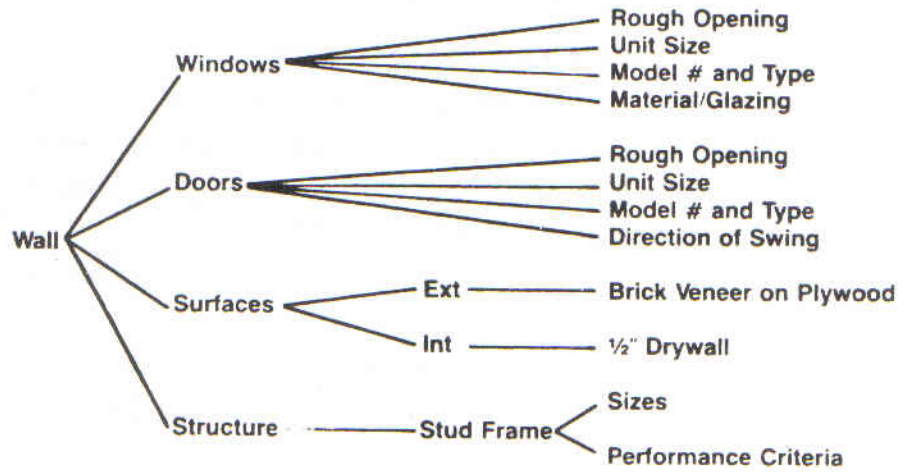
- **CAD Systems of Different Manufacture**
- **CAD Systems and A/E Analysis Software Systems**
- **CAD Systems and Fabrication Technologies**
 - **Plant Fabrication of Building Components**
 - **On-Site Fabrication**
- **CAD Systems and Construction Management Systems**
- **CAD Systems and Facility Management Tools**
- **CAD Systems and Project Archiving Systems**

IGES/AEC Scope, Continued . . .

IGES Enhancements to Ensure Communication of:

- **Both Geometric and Nongeometric Project Description Data**
- **"Intelligent" Relationships Among Building Description Data**
- **Links Between CAD System Databases and Relevant External Data:**
 - **Product Descriptions (Dimensions, Properties, etc.)**
 - **Construction/Fabrication Specifications**
 - **Performance Criteria**
 - **Regulatory Requirements**
 - **Symbol Libraries**

AEC Databases Stress Attachment of Non-Geometric Information to Geometric Entities



Attachment of Properties to Geometric Elements May be Enhanced Through Tabular (Relational) Data Management

Attachment of Windows to Walls:

Wall I.D. #	Window I.D. #
1	10
1	5
2	5
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8	7

Attachment of Properties to Windows:

Window I.D.	R.O.	Unit Size	Model No.	Material
1				
5				
7				
10				