

Meeting of ISO/TC184/SC4  
**Bordeaux June 26-30 2000**

**Update on STEP-CDS initiative**

Wolfgang R. Haas  
Haas+Partner Ingenieurgesellschaft

© 2000 Haas+Partner Ingenieurgesellschaft mbH

**Contents**

- Review of current CAD usage and requirements for data exchange and data sharing in the Building&Construction industry
- Reasons for the initiative
- Participating organizations
- Embedding in ISO-10303
- Architecture and functionality
- Agreement with participating system vendors
- Time schedule
- Available information

© 2000 Haas+Partner Ingenieurgesellschaft mbH

## Current state of CAD application

- Approx. 90 % of CAD application is 2D even if 3D systems are used
- 2D-CAD data exchange is basically done using proprietary formats such as DXF, DWG, DGN
- Main application for 3D-CAD is visualization/animation
- In Building&Construction so called data-pools are increasingly used to enable concurrent engineering and design
- One of the goals is to reduce design/construct time
- Technology is to use central servers and store and retrieve 2D-CAD files in an organized manner

© 2000 Haas+Partner Ingenieurgesellschaft mbH

## STEP-CDS - reasons for the initiative

- The topic “high quality data exchange” was extensively discussed in the working group “CAD for factory design and facility management” of VDA
- Almost all factory design is currently done based on 2D-CAD
- High priority to achieve high quality 2D-CAD data exchange.
- STEP is strategic technology for data exchange/sharing
- Future migration to advanced design paradigm (virtual factory) using STEP technology (strategic goal)

© 2000 Haas+Partner Ingenieurgesellschaft mbH

## Members and objectives of the CAFM Working of VDA

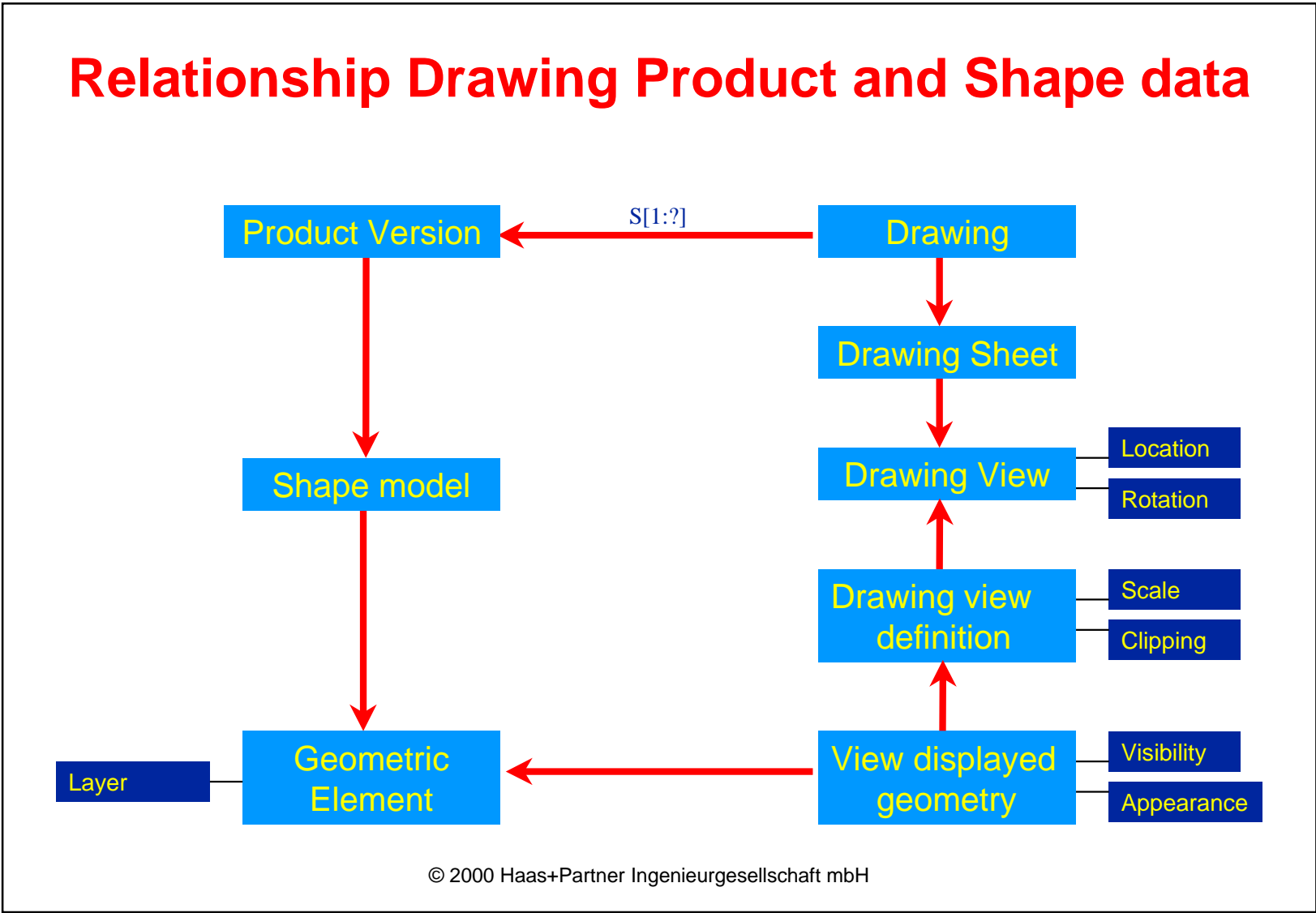
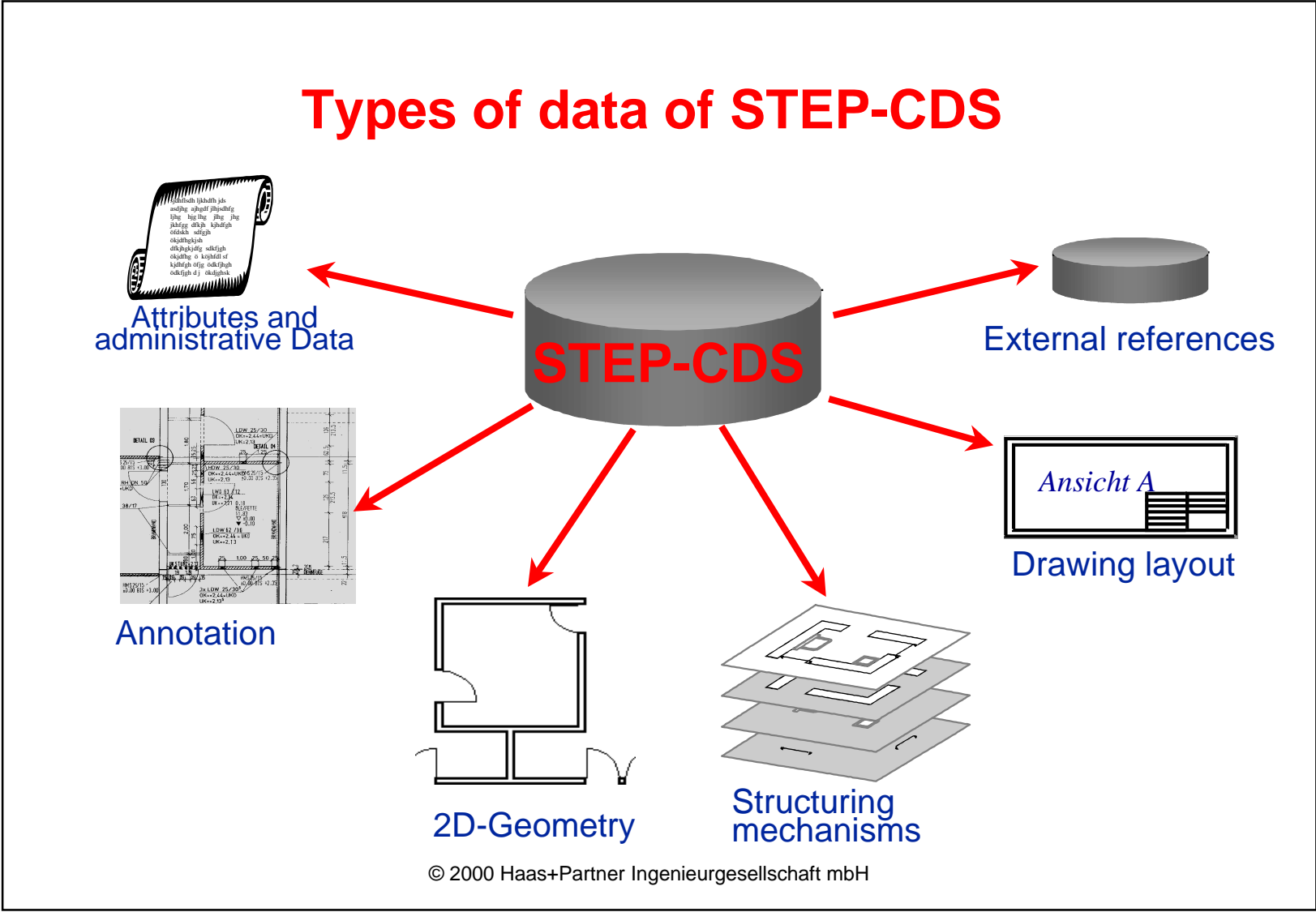
- **Members:** ABB, Audi, Betek, BMW, Bosch, Daimler Benz, Ford, Haas+Partner, Iveco, Kuka, MAN, Porsche, REFA, Schneider+Partner, Volkswagen
- **Objectives:** Promote the efficient use of CAD for factory design and facility management based on STEP technology.
- **Current focus:** STEP CDS initiative

© 2000 Haas+Partner Ingenieurgesellschaft mbH

## Approach

- Memorandum of understanding signed by high level management (Sept. 1997).
- Quotation: "STEP-CDS will therefore be the basis for CAD data exchange and archiving of construction drawings"
- „Kick off“ presentation to construction industry and system vendors (Oct. 7, 1997 at DaimlerChrysler
- Results: Current CAD data exchange is unsatisfactory, users make clear statements of requirement of better 2D-CAD data exchange.
- Establishment of a round table of implementers, starting 1998

© 2000 Haas+Partner Ingenieurgesellschaft mbH



## Some aspects if this architecture

- Includes generic product and shape model
- Includes viewing pipeline
- Clear interface to product and shape model
- “Lines” of the shape model can be represented differently in different drawings
- A concrete beam underneath a concrete slab is represented differently in an architectural drawing and an engineering drawing
- Referencing mechanism to these “lines” is available (and required)

© 2000 Haas+Partner Ingenieurgesellschaft mbH

## Round table of implementers

- **Members of VDA and other users:** Daimler Benz, Volkswagen, Ingenieurbüro Schneider+Partner (representing VBI), Coplan,
- **System vendors:** Autodesk, Bentley, Graphisoft, Nemetschek, WeltWeitBau (WWB)
- **Moderation:** Haas+Partner

© 2000 Haas+Partner Ingenieurgesellschaft mbH

## Results of the STEP-CDS Round Table

- ◆ **1998: Start with problems:** Explain STEP-CDS, Discussion of „Issues“, basically due to the different architectures of the participating CAD systems. Delayed start of implementations
- ◆ **DXF-II:** Proposal - alternative to enhance DXF to cover the functionality of STEP-CDS.
- ◆ **1999:** DXF-II proposal no longer discussed. Good progress of implementations. Start of testing (practical test files and synthetical test files)
- ◆ **First half year 2000:** Continuation of testing, Pilot implementations at users (Audi, BMW, DaimlerChrysler, IVECO, Volkswagen, BOSCH, Elektroanlagebau Wismar, Haas+Partner, KUKA)
- ◆ **July 2000:** Start sale of implementations for Autocad, Microstation and ALLPLAN
- ◆ **October 2000:** Start sale of implementations for ArchiCAD
- ◆ **Future:** Improvement of implementations, VDA Guidelines for CAD-Data exchange using STEP-CDS, increase functionality (non geometric properties, 3D)

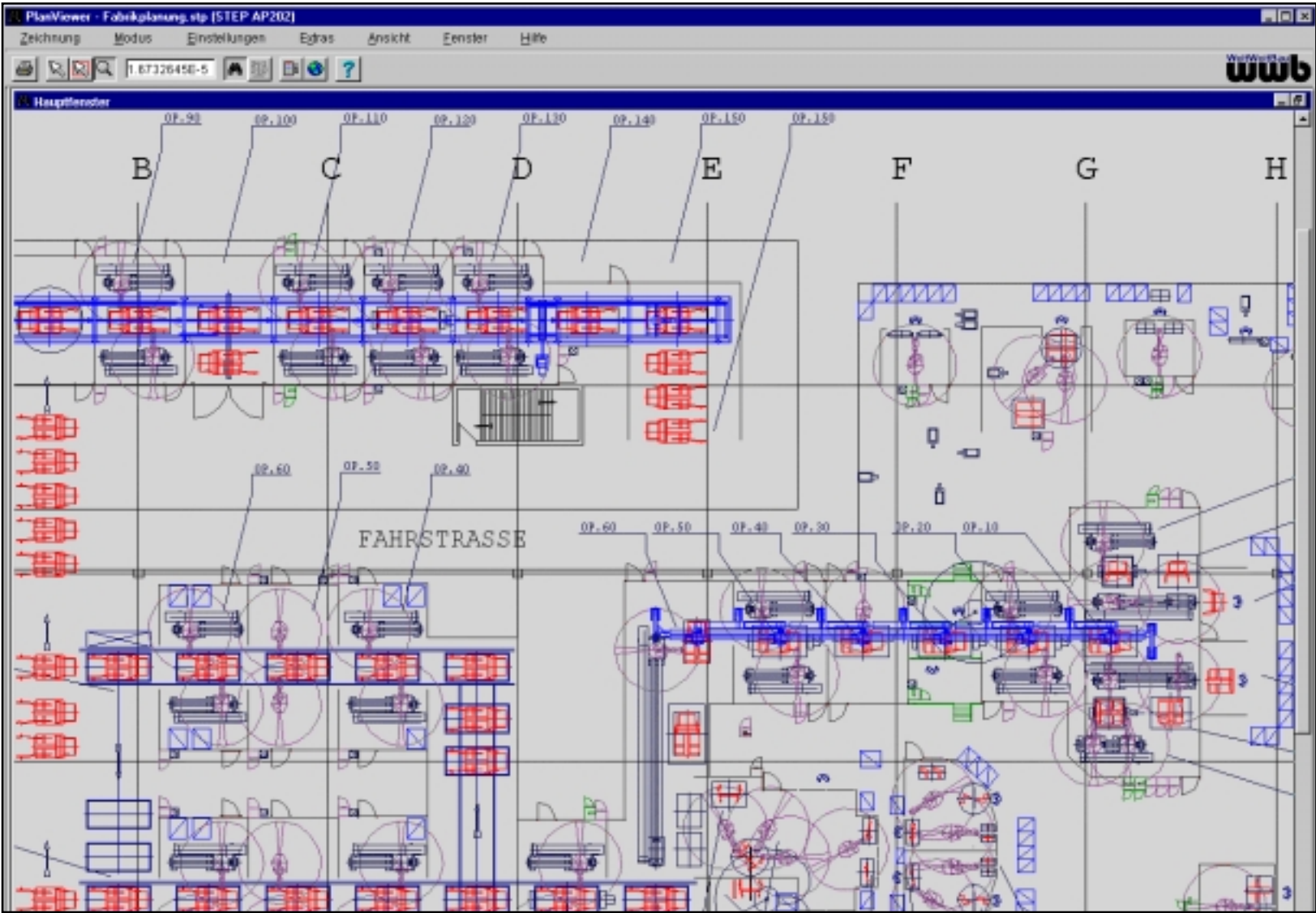
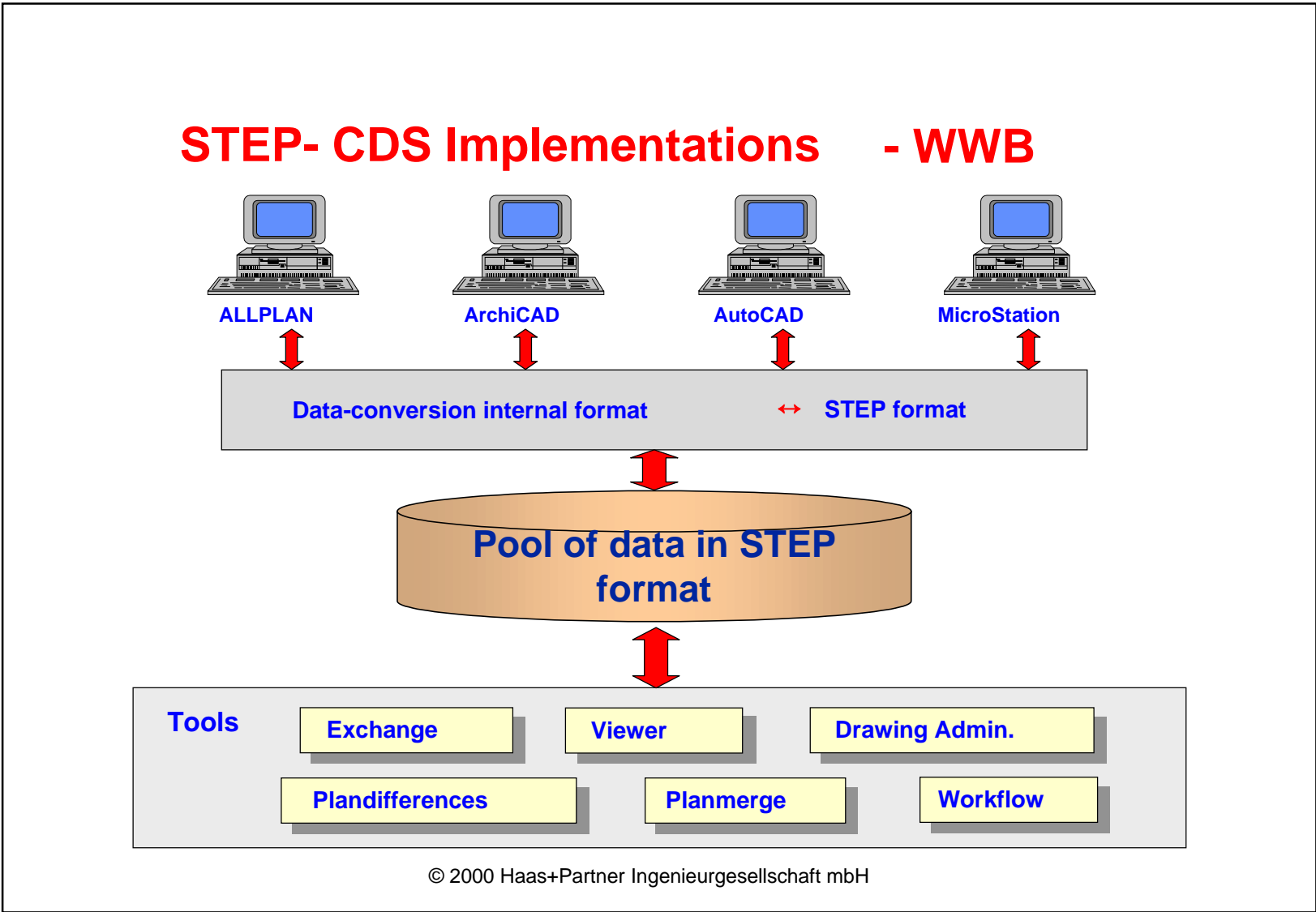
© 2000 Haas+Partner Ingenieurgesellschaft mbH

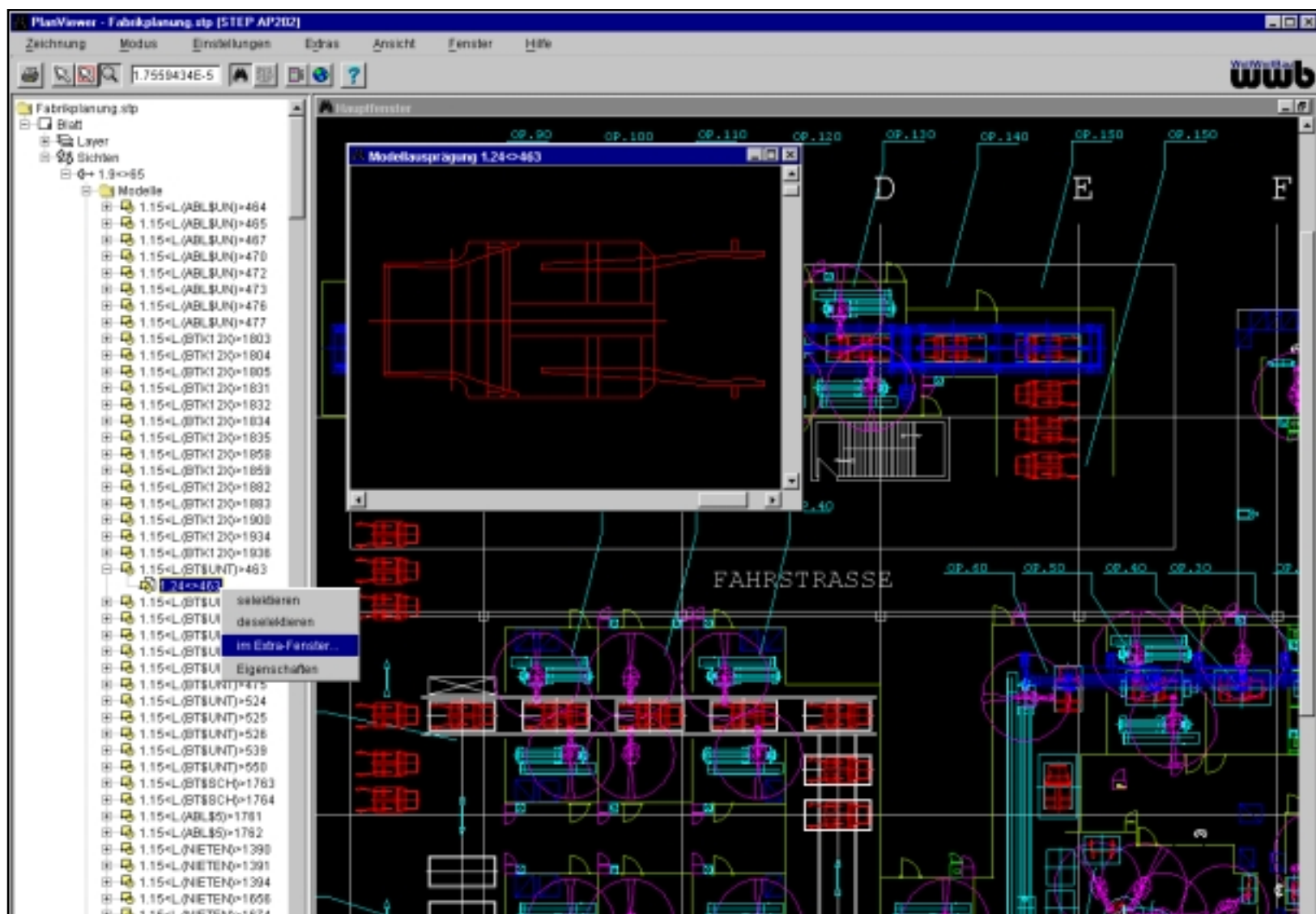
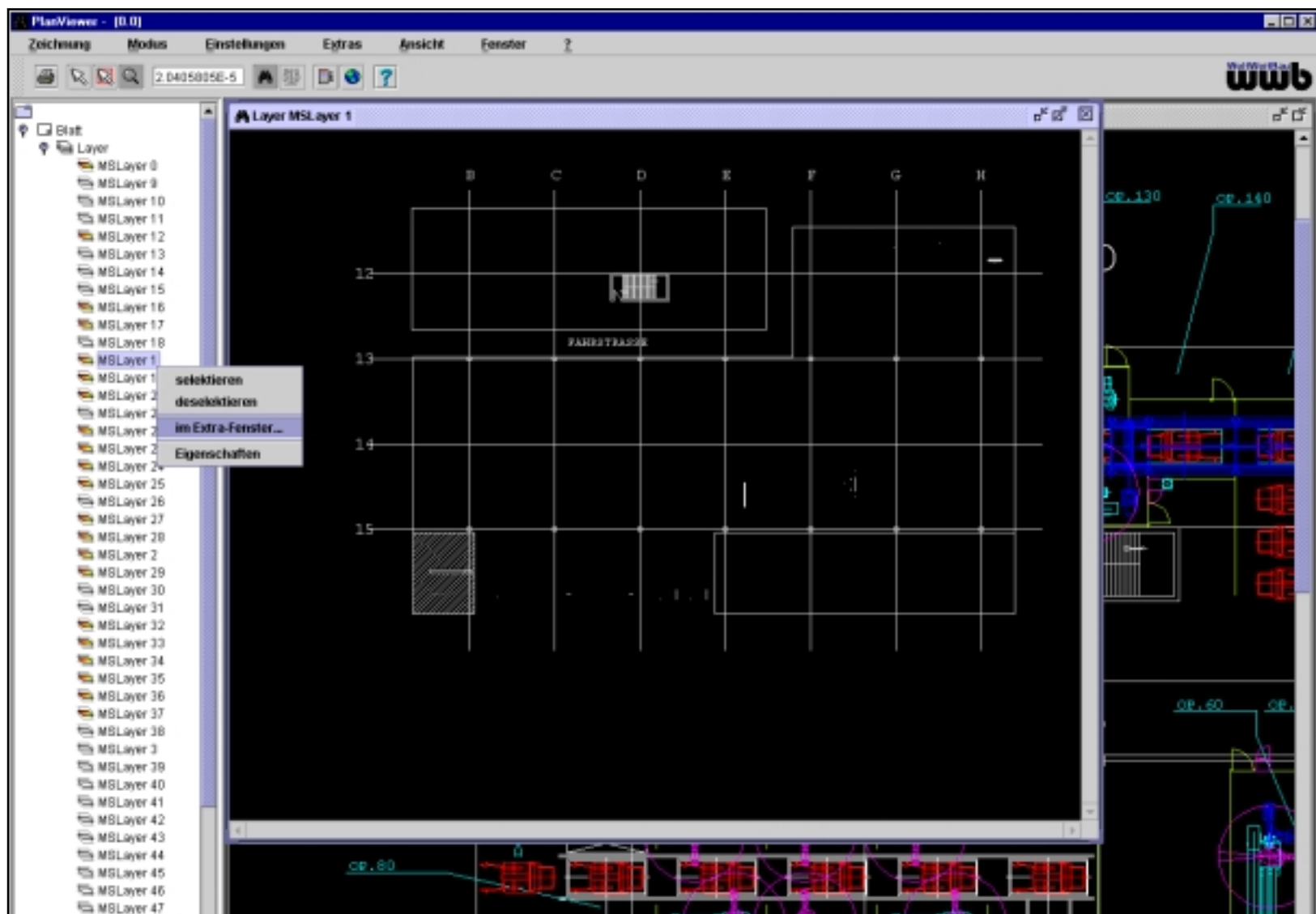
## Implementations

- ◆ **AutoCAD Implementation from WWB:** Import, Export, complete specification including admin data
- ◆ **MicroStation Implementation from WWB:** Import, Export, complete specification including admin data
- ◆ **Allplan Implementation from WWB:** Import, Export, complete specification including admin data
- ◆ **ArchiCAD Implementation from WWB:** Import, Export, incomplete specification Export,
- ◆ There exist co-operation agreements between WWB and these system vendors
- ◆ In addition, Autodesk and Bentley Systems are currently implementing STEP-CDS independent of WWB

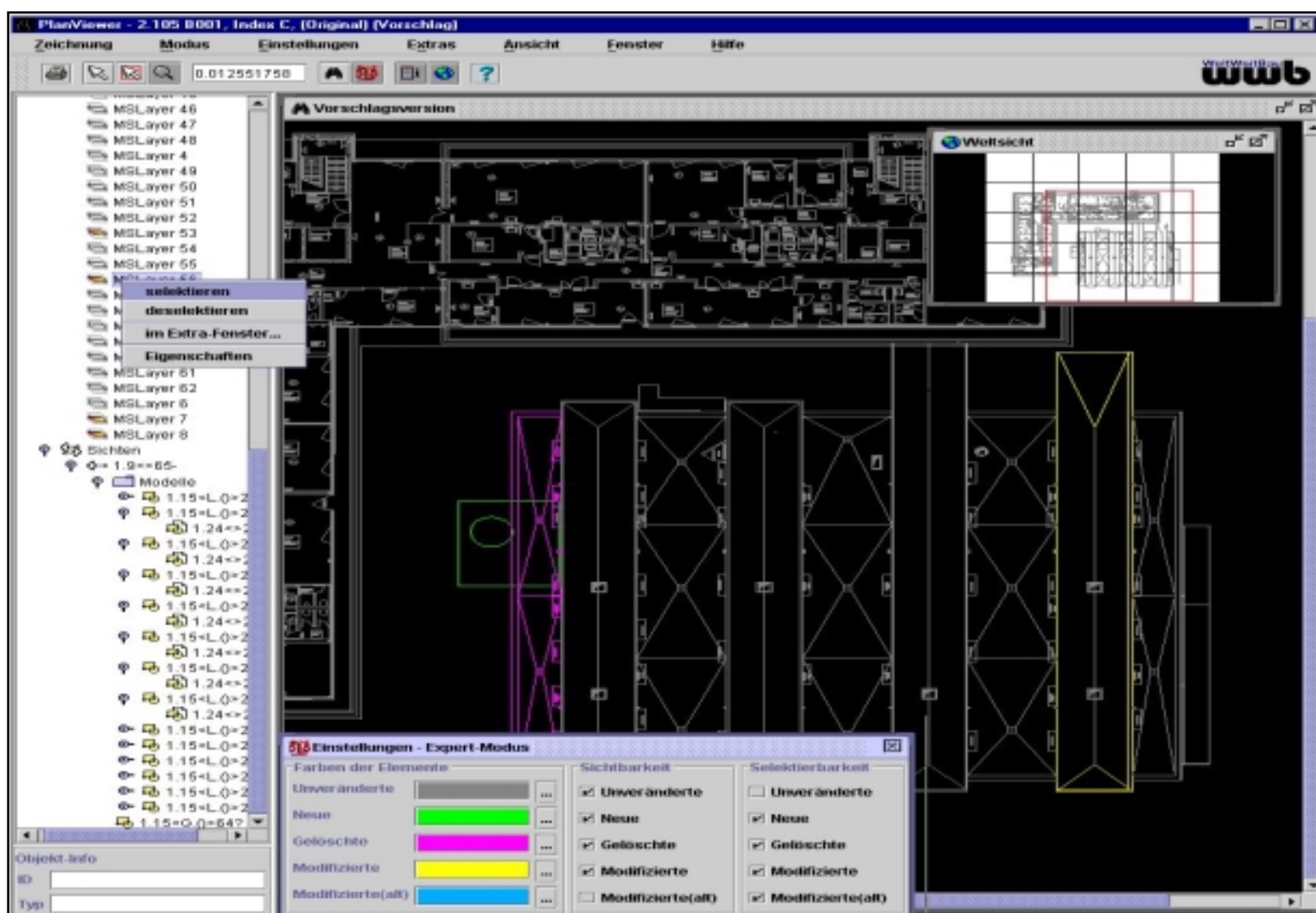
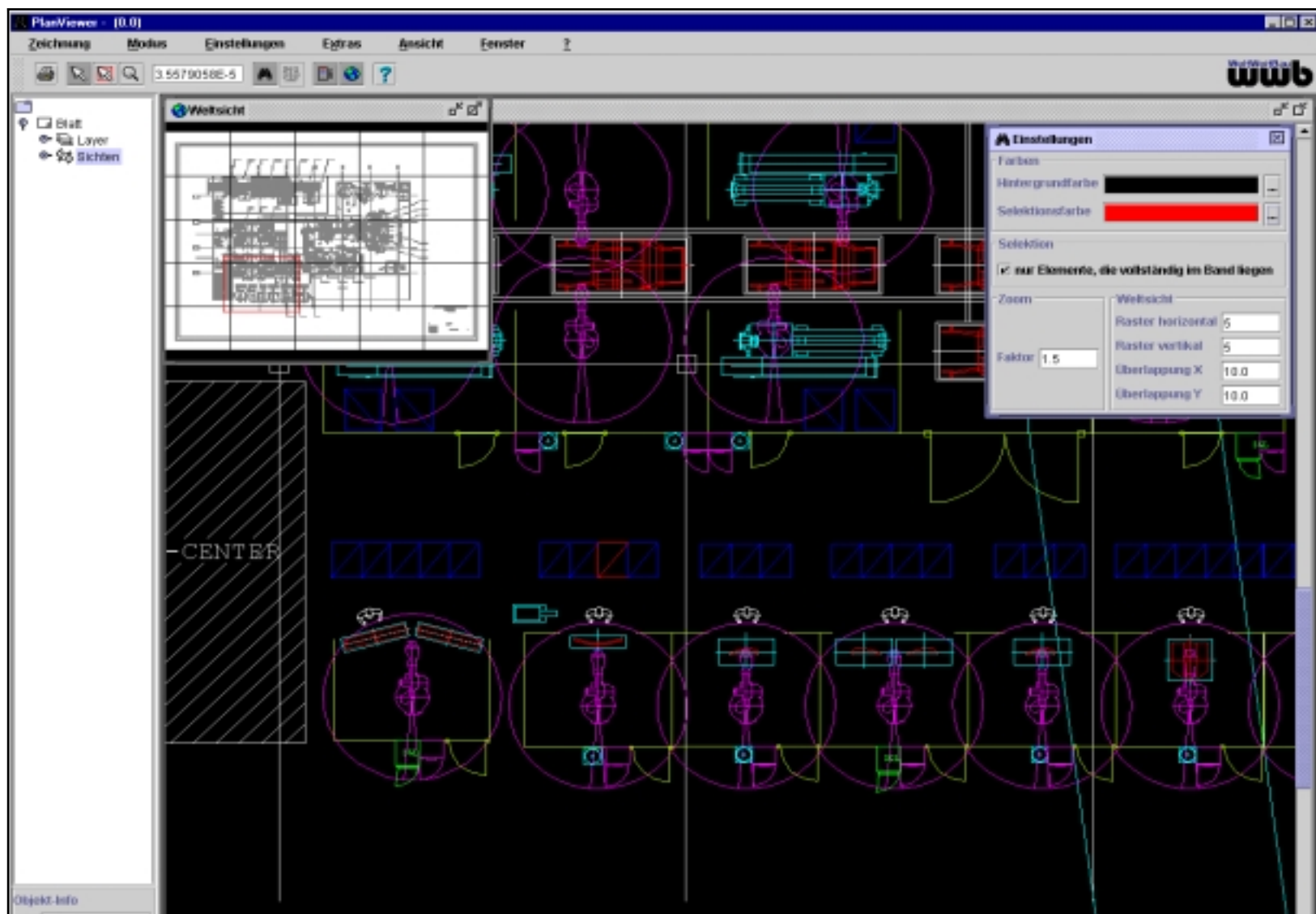
© 2000 Haas+Partner Ingenieurgesellschaft mbH











**Progress since Melbourne meeting (Feb. 2000)**

- ◆ 1 Round Table since the last STEP meeting in Melbourne
- ◆ Intensive testing using basically practical test files
- ◆ Start of using “synthetical” test files to test viewing pipeline
- ◆ PR Material in English language
- ◆ Participation at a convention, one CDS related session
- ◆ Publication in “consulting engineer” journal
- ◆ Successful round trip demo (AutoCAD, Microstation, Allplan, AutoCAD) at CATBAU Fair/Convention May 2000 in Stuttgart
- ◆ Set up of a WWW site for STEP-CDS ([www.step-cds.de](http://www.step-cds.de))
- ◆ Technical cooperation agreements between WWB and Autodesk, Bentley Systems, Nemetschek and Graphisoft
- ◆ Marketing Agreement between WWB and Nemetschek
- ◆ Start sales of Translators and related software (Planviewer, PlanNet) by 1. July 2000

© 2000 Haas+Partner Ingenieurgesellschaft mbH

**Agreements between WWB and system vendors**

Type of Agreement	Autodesk	Bentley Systems	Graphisoft	Nemetschek
Techn. coop.	Yes	Yes	Yes	Yes
Sales coop.	-	-	-	Yes

© 2000 Haas+Partner Ingenieurgesellschaft mbH

## Progress since Melbourne - continued

- ◆ Start work on properties as non geometric attributes
- ◆ Set up of an implementers issue log
  - ◆ Microstation: (True type fonts, associative dimensions via mdl, line style engine, handling of models in views)
  - ◆ ALLPLAN: (Embedded submodels, only 30 colours, macros, several dimension types, position of dimension text, no variable units)
- ◆ DXF-II continues to be inactive
- ◆ First short discussion with Rasso Steinmann concerning the topic "CDS and IFC"

© 2000 Haas+Partner Ingenieurgesellschaft mbH

## STEP-CDS related information and documents

- Memorandum of Understanding
- EXPRESS of CDS
- EXPRESS-G as A0 wall paper
- EXPRESS-G of SCADEC IL2 as A0 wall paper
- Detailed comparison of CDS with CC2 of AP202
- 6 issues against AP214
- Issue log as Access database
- Instance diagrams for viewing pipeline and non geometric properties (draft), to be continued
- CDS FTP site with CDS related documents such as minutes of the round tables, data base of issue log, test files etc.
- CDS Web site
- printed PR material in English and German language
- Instance diagrams for viewing pipeline and non geometric properties (draft), to be continued
- Various publications in English and German language

© 2000 Haas+Partner Ingenieurgesellschaft mbH

# Start Demo

© 2000 Haas+Partner Ingenieurgesellschaft mbH