ProSteel Solutions

Integrated Structural Engineering Solutions

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Bentley
Sustaining Infrastructure

Agenda

- Workflow
- What is ProSteel 3D
- See in action
- What is new in ProSteel V8i
- Examples
- Conclusion

The Vision

Bentley's vision is to be the global Interoperability leader In CAD & Engineering Design Solutions

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Sustaining Infrastructure

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Introduction

- Bentley acquired the STAAD, RAM and ProSteel/ProConcrete product lines over the past 24 months
- From engineers for engineers - **Over 100 global** structural engineers on staff providing local customization, support and training
- Over 20,000 companies (170,000 seats) using our products worldwide
- With the integration of AutoPIPE, AutoPLANT/PlantSpace, ProSteel/ProConcrete, Bentley Structural and ProjectWise Navigator, we have the most comprehensive plant solution in the market today

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Goal:
Enhance Interoperability During Engineering

- Interoperating structural and piping analysis
- Integration of structural and connection design
- Interoperability with 3D Plant Design (physical models) and analysis models
- New design review tool to streamline CAD and engineering decision making

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Solution:
Integrated Plant Design Workflow Scenario

- CAD Designer - 3D CAD Model in *PlantSpace/AutoPLANT* & *Bentley Structural/ProSteel*
- Pipe Stress Engineer - *AutoPIPE*
- Structural Engineer - *STAAD.Pro, STAAD.foundation* and *RAM Connection*
- Reviewer - *ProjectWise Navigator XM*
- CAD Designer - Modify in *PlantSpace/AutoPLANT* & *Bentley Structural/ProSteel*

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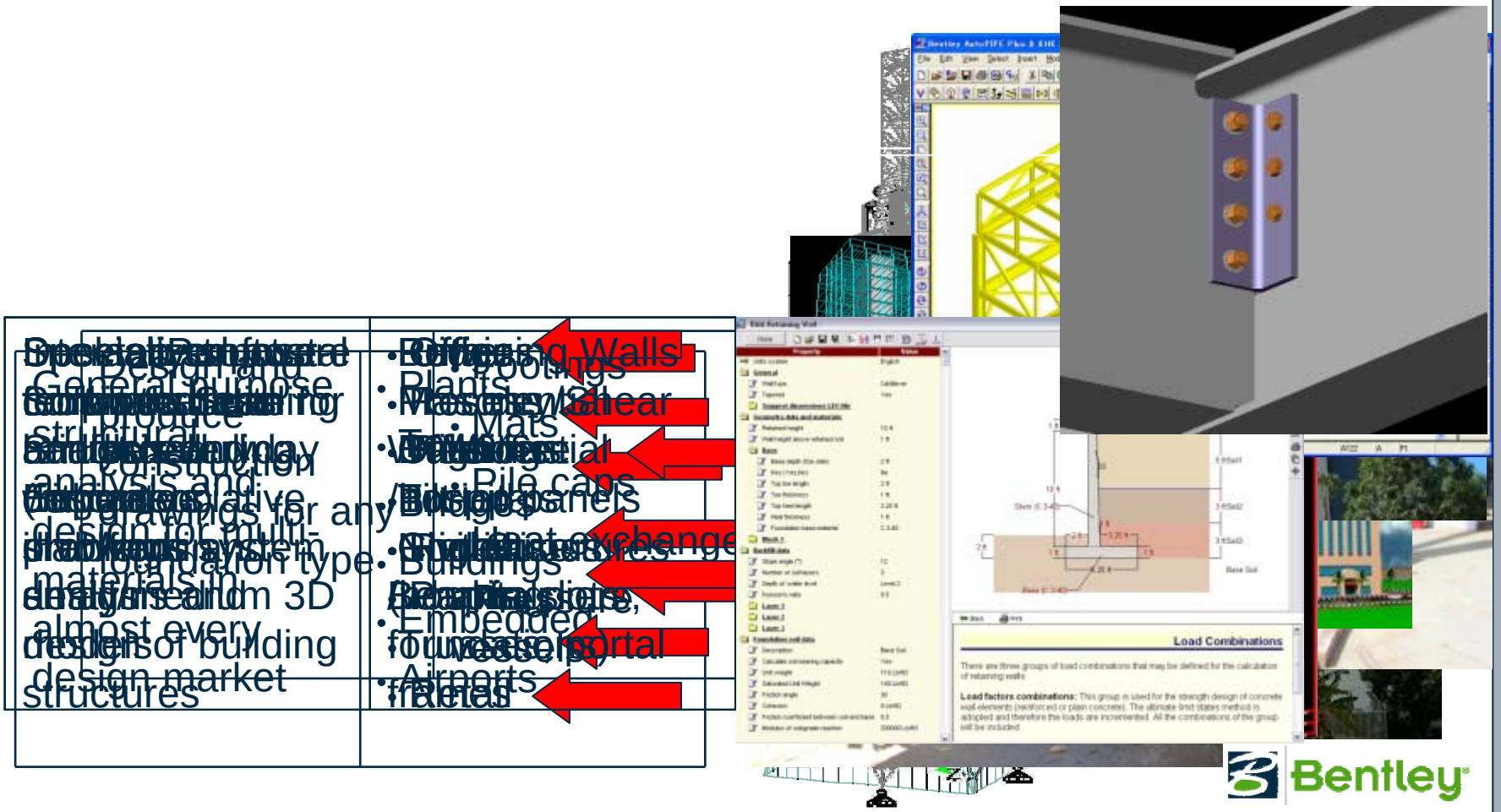
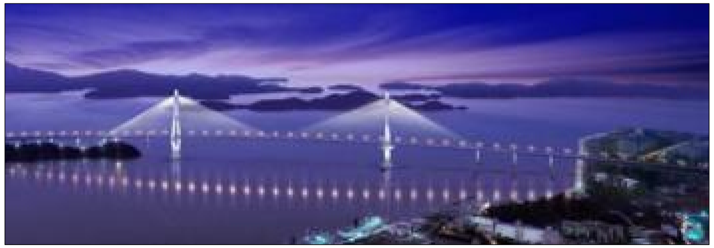
Bentley's New Structural Group…

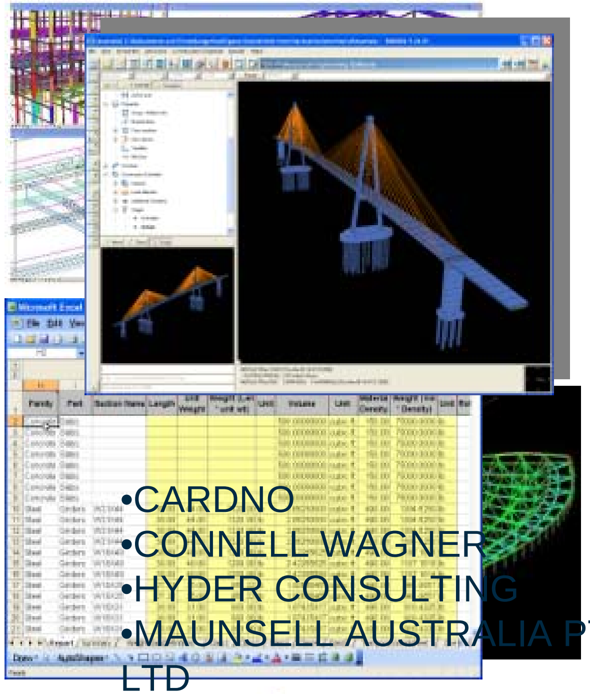
STAAD.Pro | RAM Advanse & Connection | STAAD foundation | RAM Structural System | RAM Concept | Bentley REBAR | AutoPIPE



New additions to the family...

ProSteel 3D | Bentley Structural | TDV RM2006 | ProConcrete 3D





3D Structural Steel Modelling and Detailing engineering. Runs on AutoCAD and MicroStation; 3D Automated Bridge Modelling, Analysis and Design Software for long span bridges	•Steel, concrete, arch, membrane, cable stayed bridges •Static and dynamic analysis, RAM and STAAD •Multi-material •Model construction sequence, generation of construction stages •Automatic drawings, detailing, BIM analysis

•CARDNO
•CONNELL WAGNER
•HYDER CONSULTING
•MAUNSELL AUSTRALIA PTY LTD
•QUEENSLAND GOVERNMENT
•Department of Main Roads (Structures Division)
•RTA BRIDGE SECTION
•TAYBRIDGE CONSULTING PTY LTD
•URS AUSTRALIA PTY LTD

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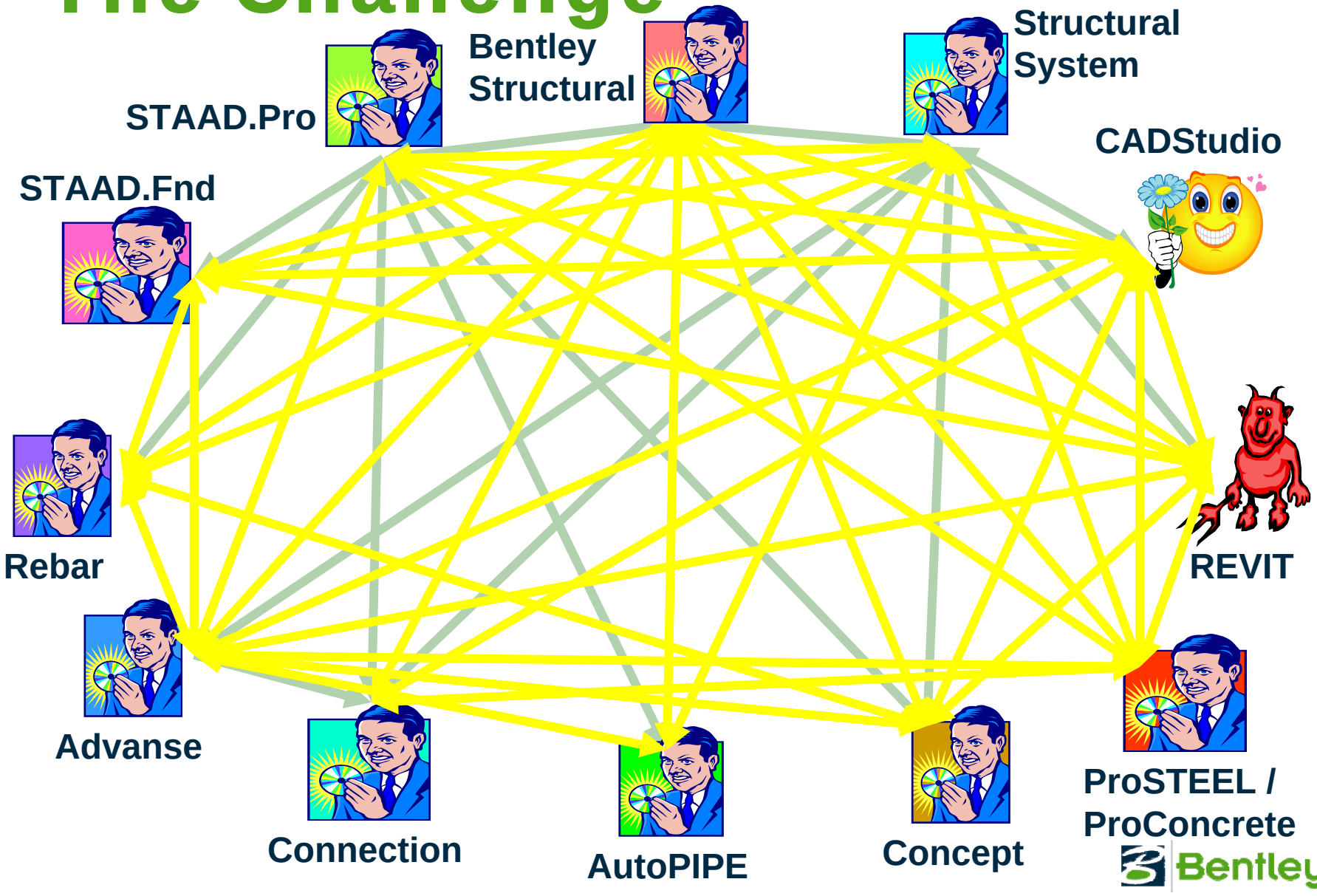
Dynamic creation of a fabrication model

Two major benefits over a manual system

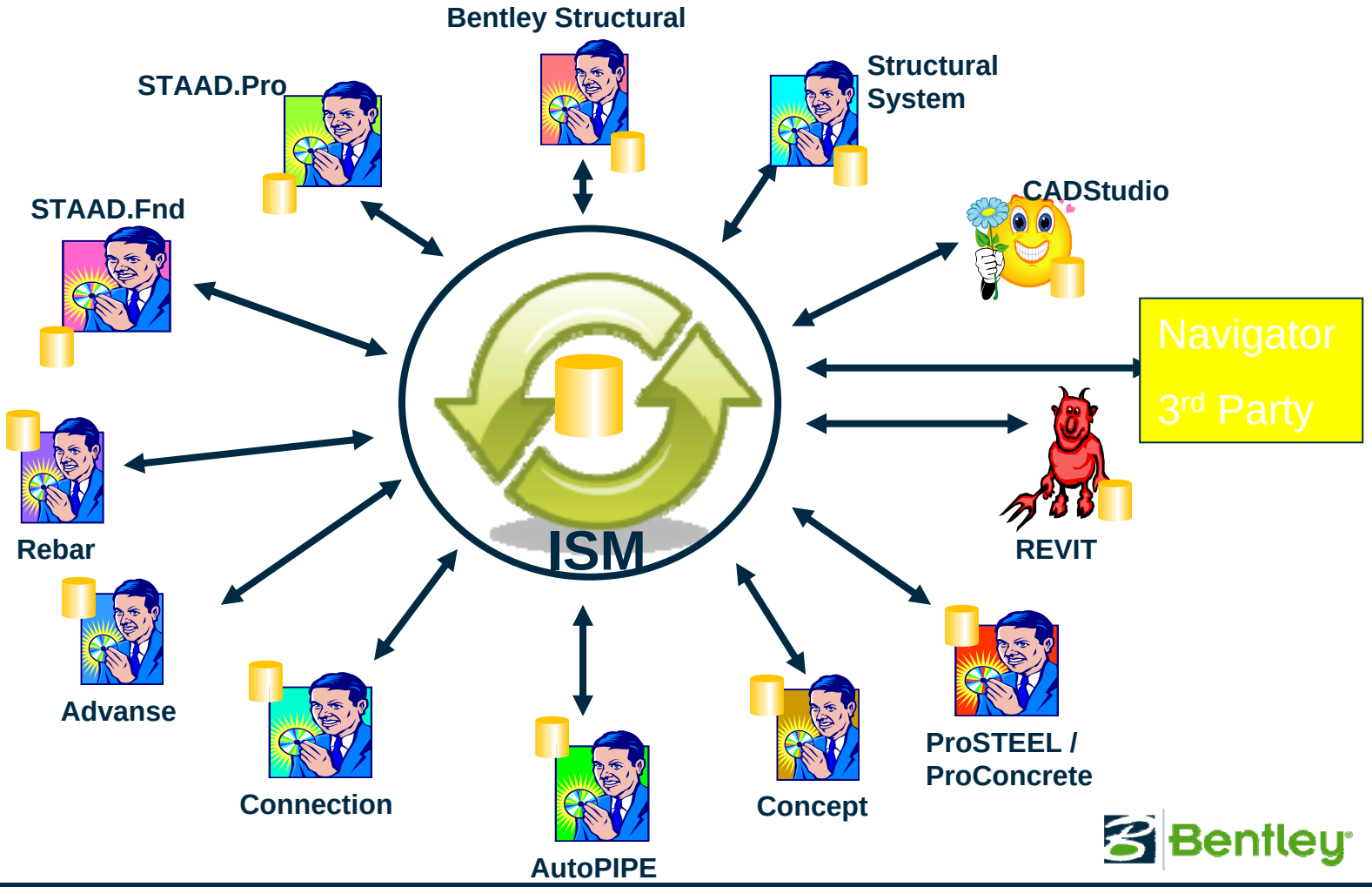
- Eliminate the introduction of data entry errors.
- Increase productivity as the model is ready at the click of a button.

The Challenge



The Solution

Middle Layer Neutral Persistent Schema



Summary

What is the principal benefit?

- By exchanging the data model with the physical model, there will be faster and safer production of the fabrication documents.

What is ProSteel 3D

- 3D-Structural Modelling and / or Detailing Application for AutoCAD and Microstation
- ProSteel 3D = AutoPLANT Structural
- ProSteel 3D is a part of the Bentley Structural Team

What does ProSteel offer?

- Globally recognized solution for structural steel detailing and fabrication
- Produces customizable detailed drawings
  - For shop drawings, isometric and elevation / plan views
  - Including automatically Update
- Produces Bill of Material
  - Including Cutting- and Order Lists
- Direct link to CNC equipment

- Two way integration with STAAD, RAM and Bentley Structural
  - And other International data exchange formats
- Intuitive 3D modelling with powerful modification tools
- Automated generation of specialized assemblies like stairs, handrails, trusses, bracings, catwalks, platforms and more
- Advanced block manager
- User specified connection types for automatic assignment of connections
- Programming interface to allow for customization

ProSteel 3D Interoperability

- **Multi platform:** MicroStation and AutoCAD
- **Exchange of models within the platforms without loss of data or intelligence**
- **Analysis / Design:** STAAD, RAM, CIM Steel, PXF, SDNF, Dlubal RSTAB, SCIA ESA-PT, KISS ...
- **Steel Fabrication:** CNC Format, DXF
- **Pricing / Inventory:** PPS
- **Programming:** COM Interface for customization

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ProSteel 3D

- Provides an interoperable solution that supports multiple structural analysis and design applications
- Creates an integrated model for deign and fabrication documentation
- Automates construction documentation across a project or company for consistency, standardization and accuracy

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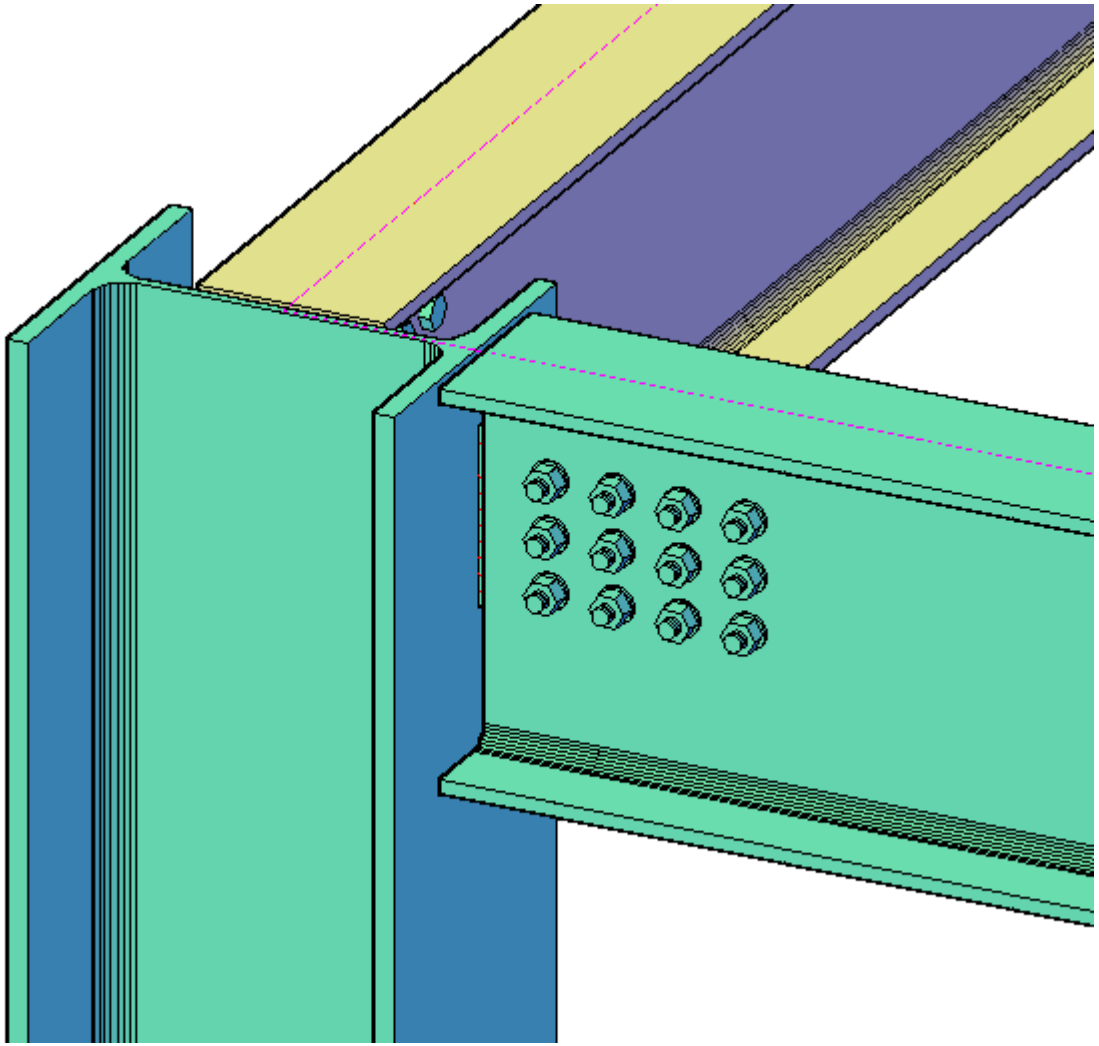
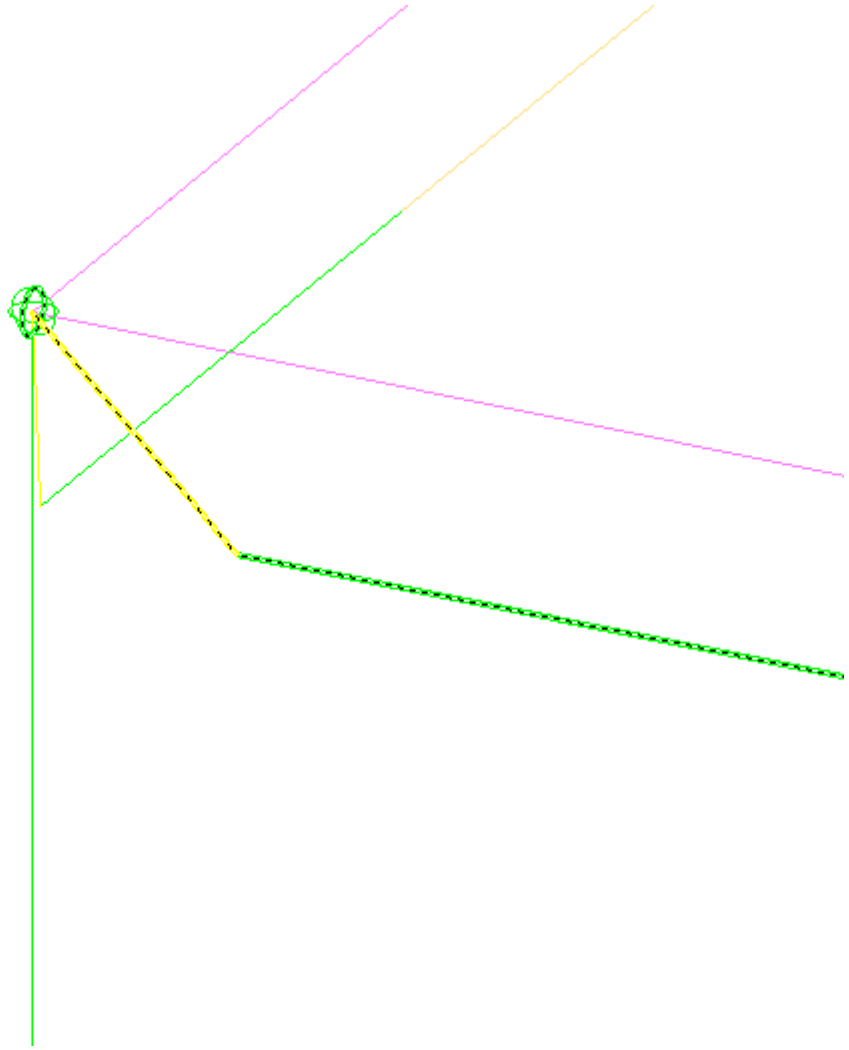
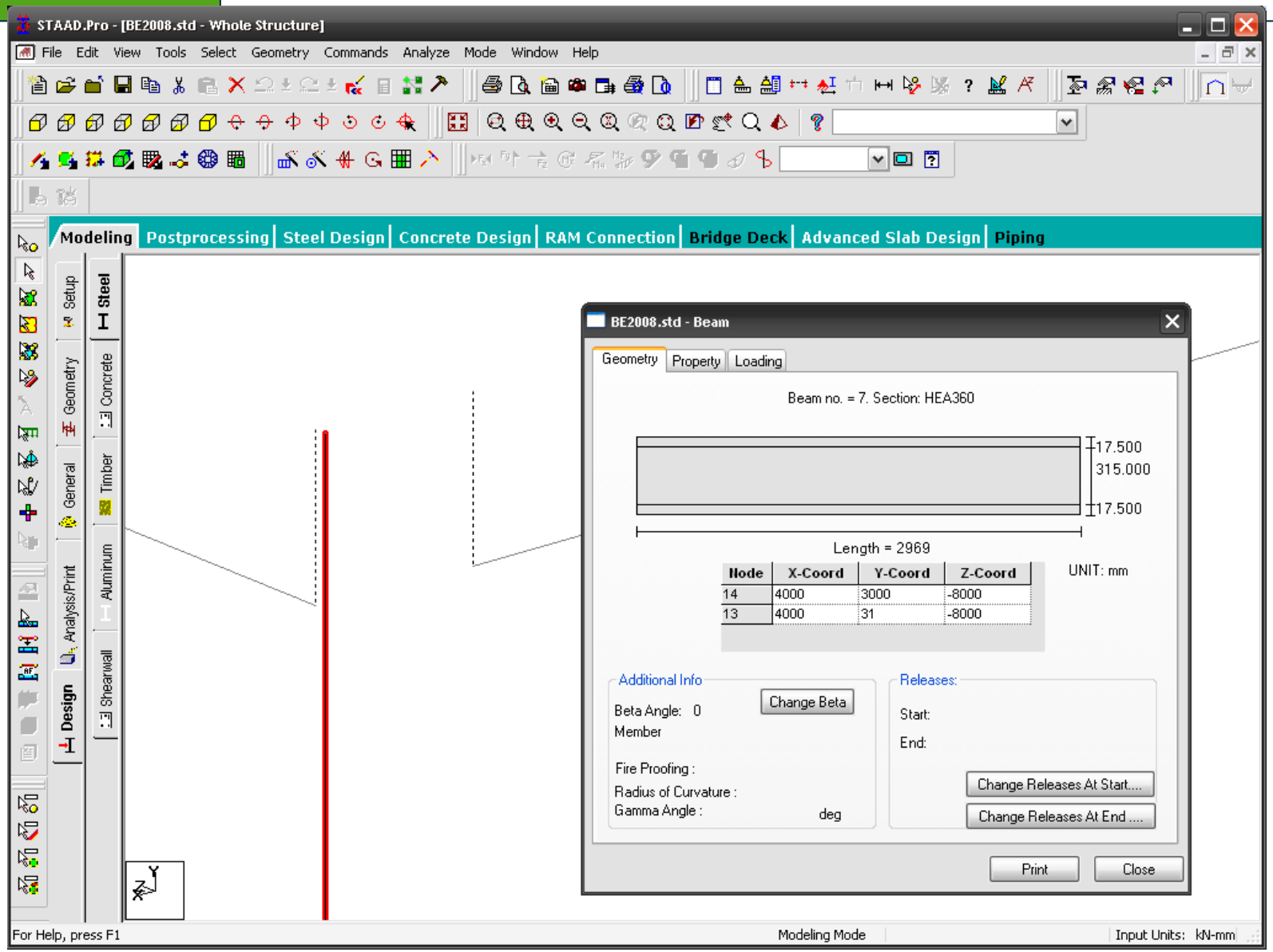
What is different

- SDNF 2
- SDNF 3
- CIS/2
- KISS
- other







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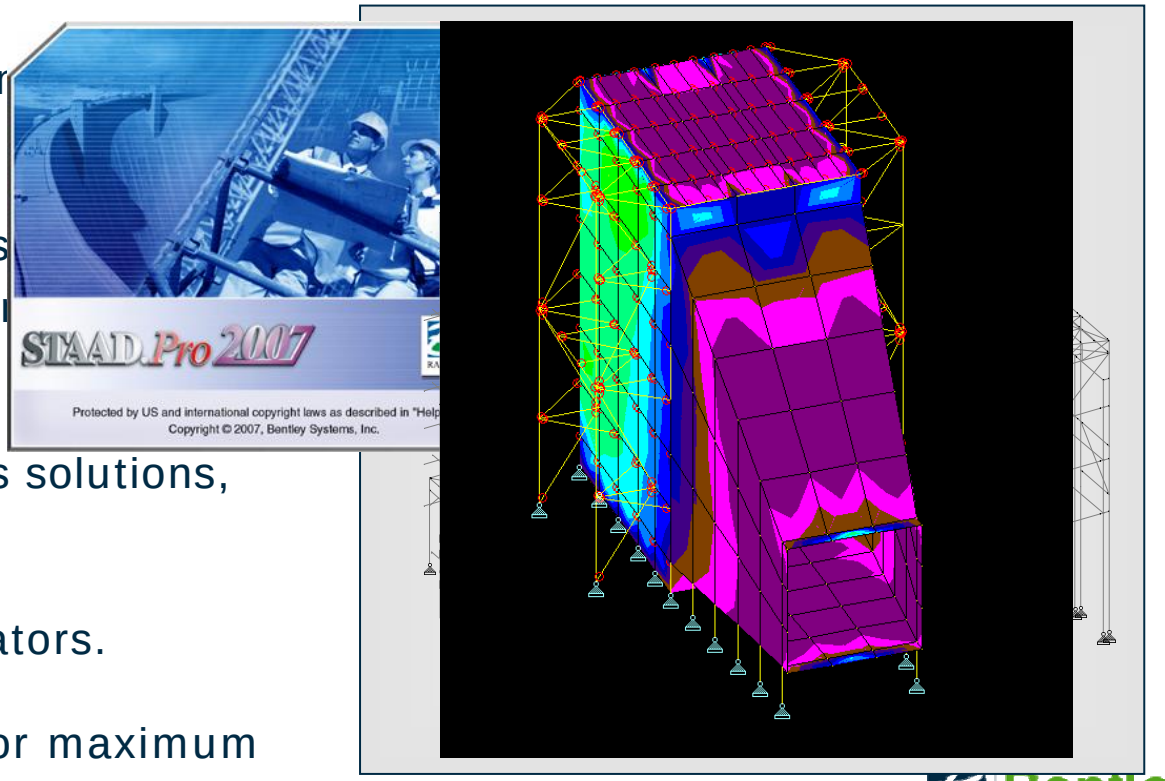
What is STAAD.Pro?

- The worlds #1 structural analysis and design software.
- State of the art graphical environment.
- Full range of finite eler types.
- Broad spectrum of des including British, US ar Eurocodes.
- Wide range of analysis solutions, static, dynamic.
- Automatic load generators.
- Integrated solutions for maximum performance.



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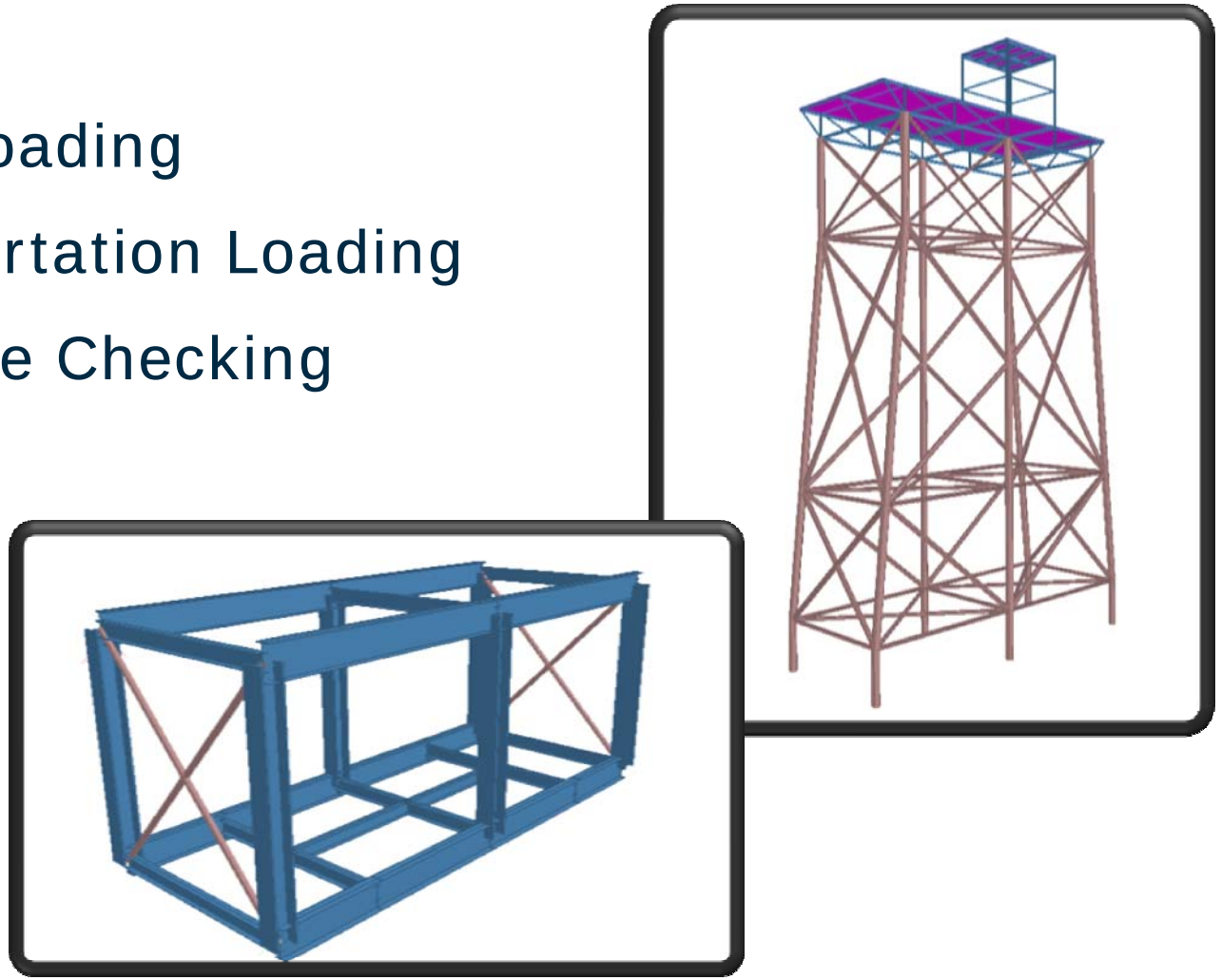
Specific Benefits to the Design of Offshore Steel Structures

- Full library of standard section profiles, user tables and section property calculator.
- STAAD.offshore wave load calculator.
- STAAD.offshore transportation inertia loading.
- Punching checks to the API 2A WSD design.
- Static, elastic, seismic and dynamic analysis
- STAAD.Pro meets the rigid requirements of NUPIC/NRC (Nuclear Regulatory Commission) by conforming to the 10CFR PART 50, APPENDIX B, Section II, "Quality Assurance Program" and ASME NQA-1-2000 (Quality Assurance Requirements for Nuclear Facility Applications) standards.

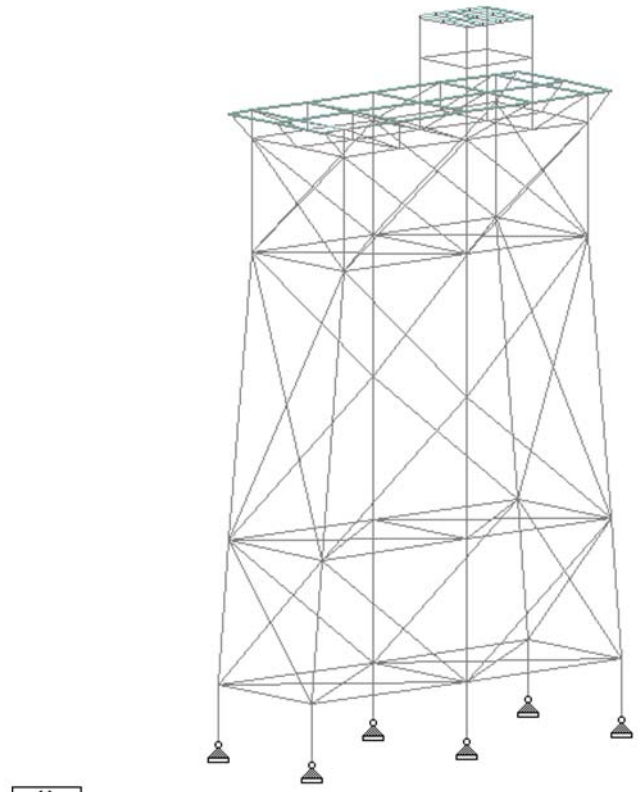
Who is using STAAD.*Pro*?

Offshore Tools

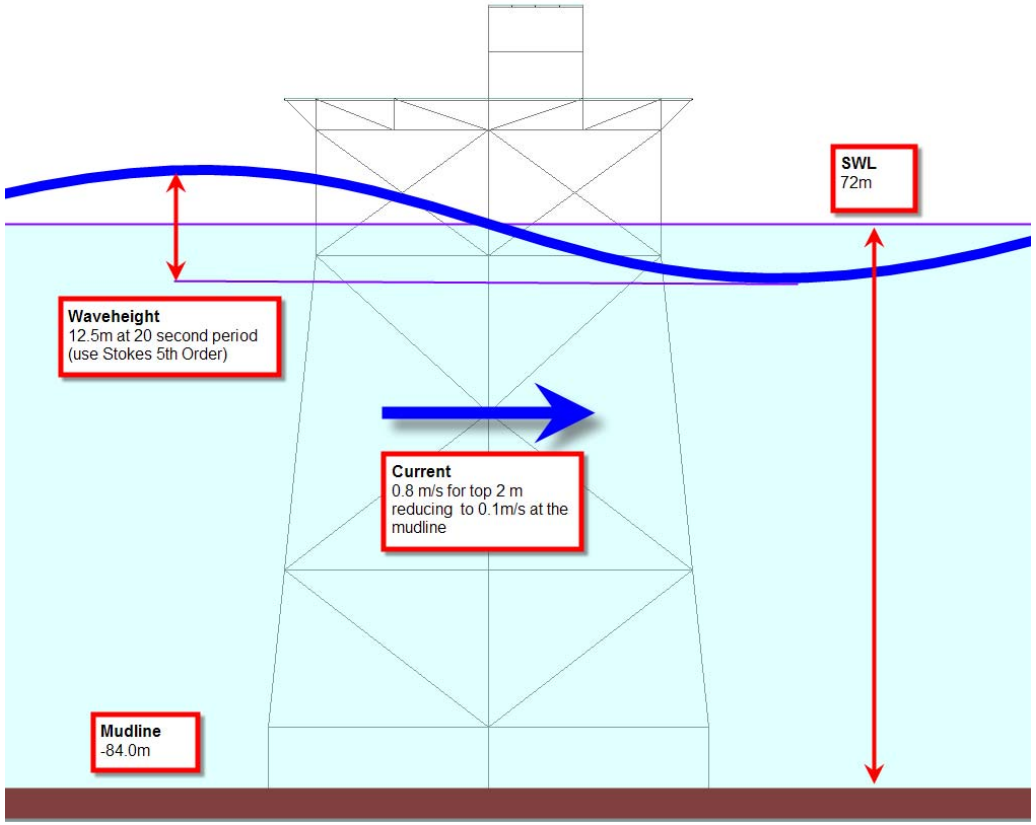
- Wave Loading
- Transportation Loading
- API Code Checking



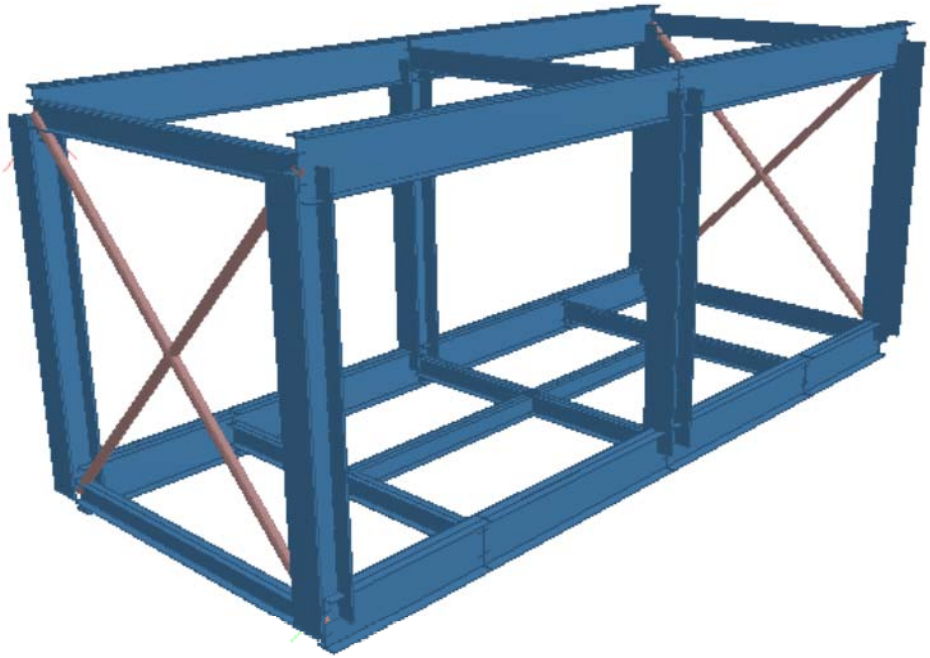
Wave Loading Example Model



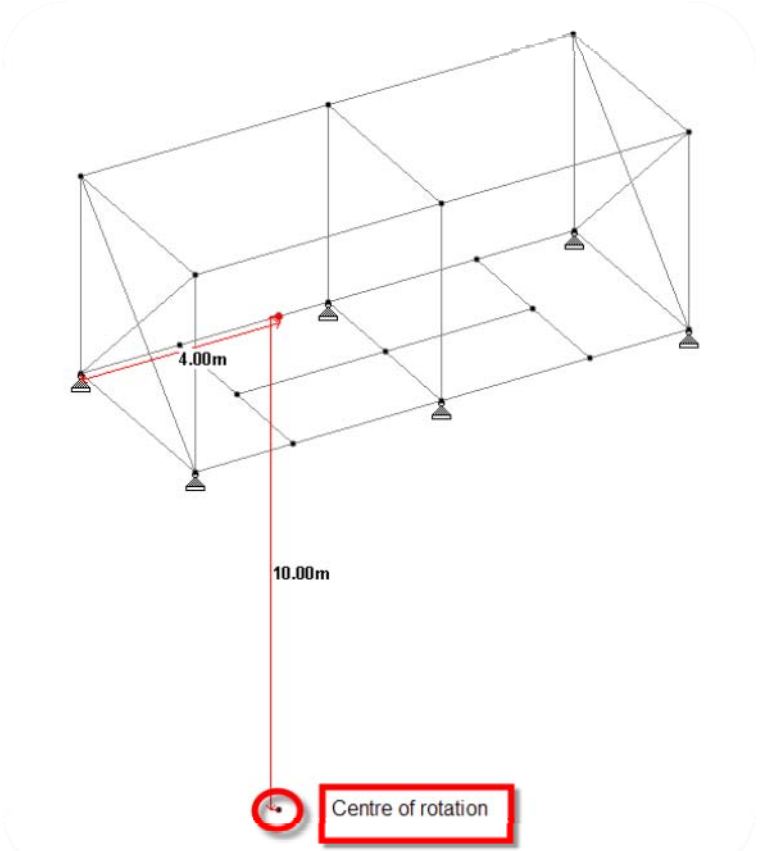
STAAD.Offshore Wave Loading



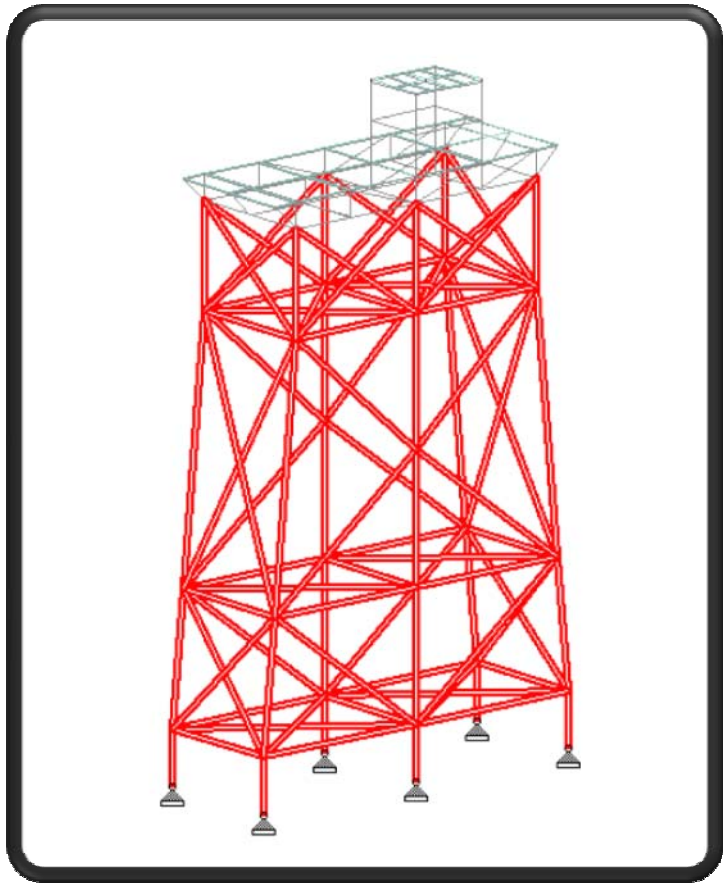
Transportation STAAD Model



STAAD.Offshore Transportation



Design criteria



See ProSteel 3D in action

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Interoperability with STAAD and Bentley Structural

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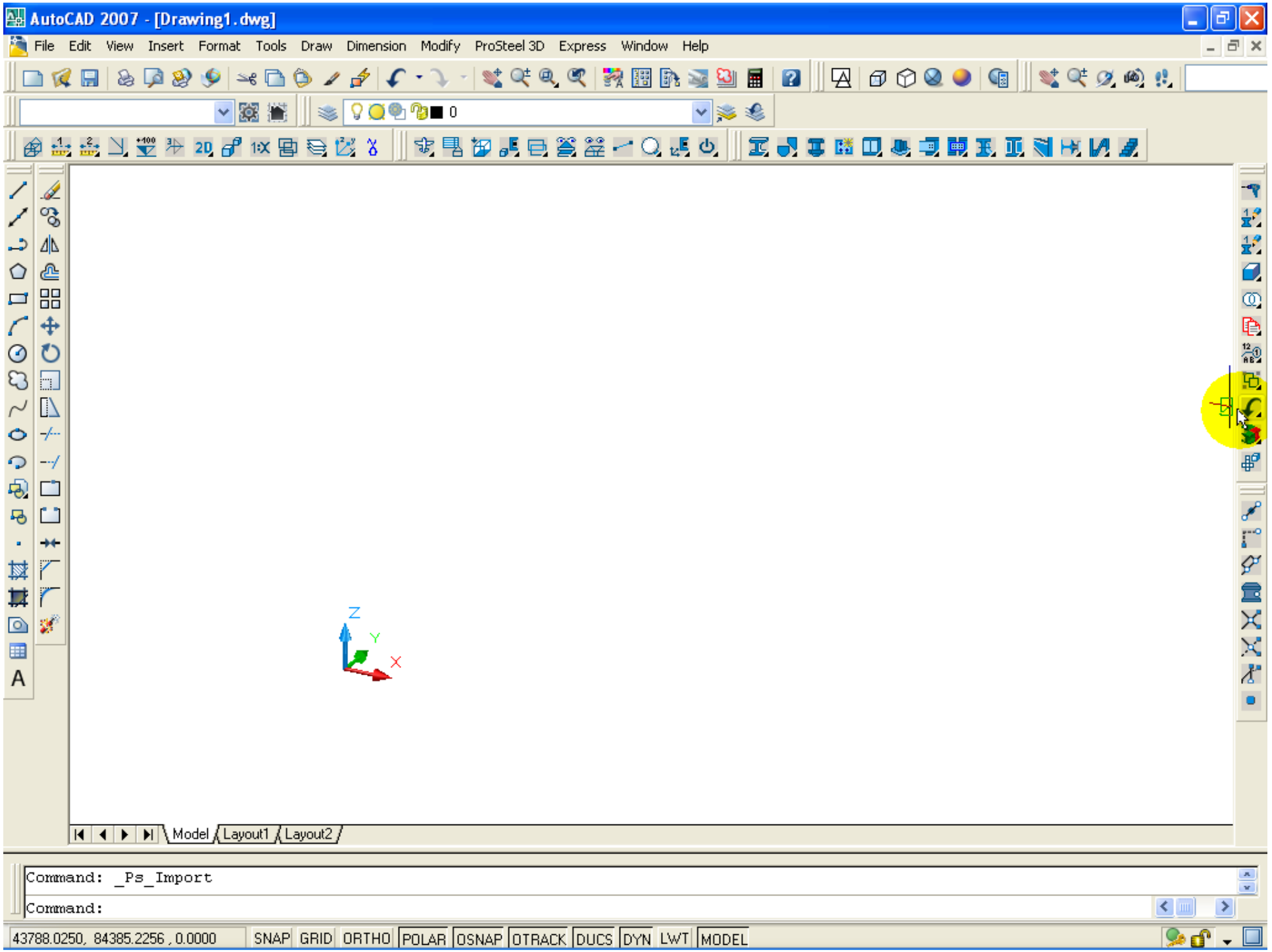
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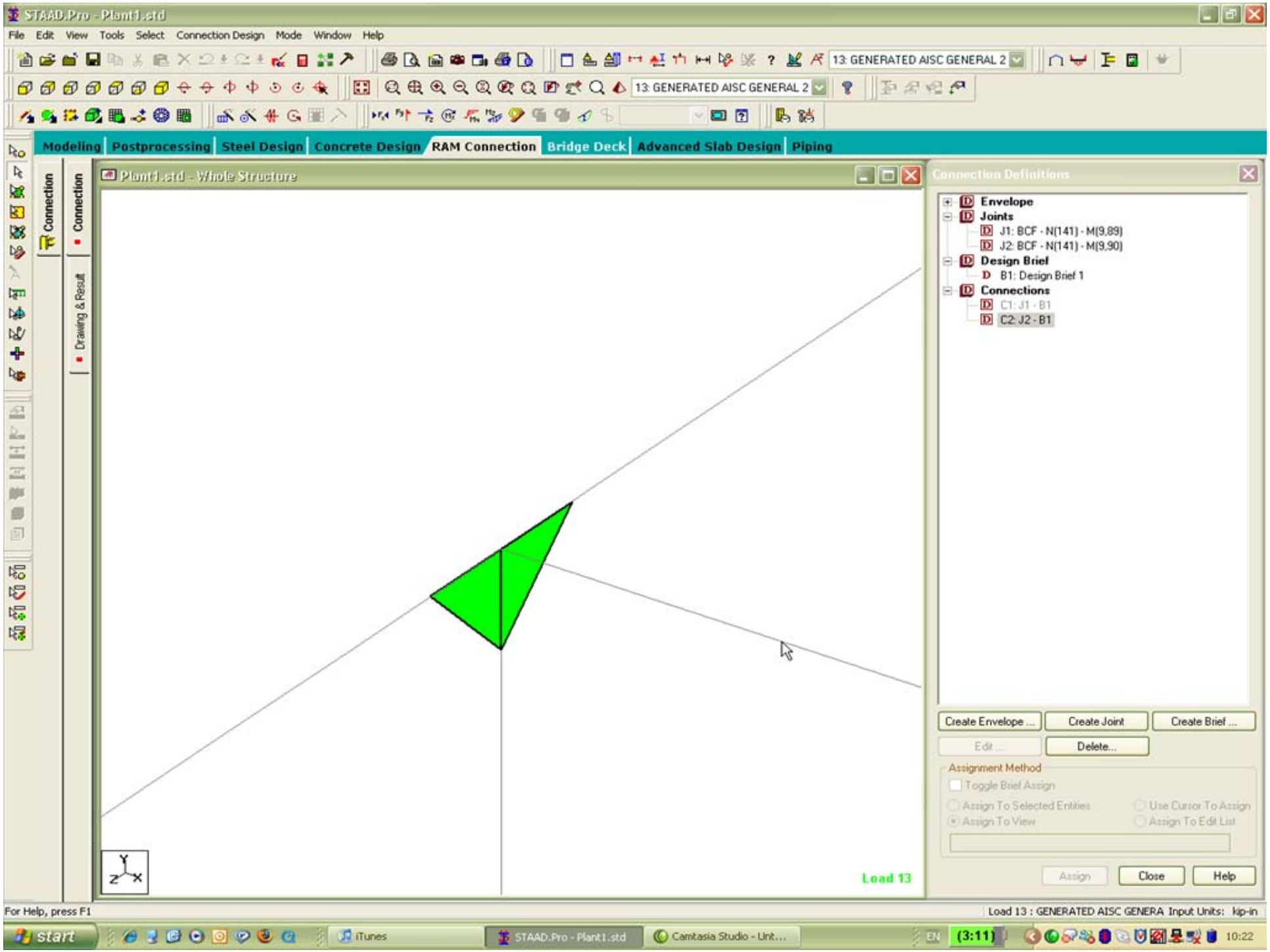
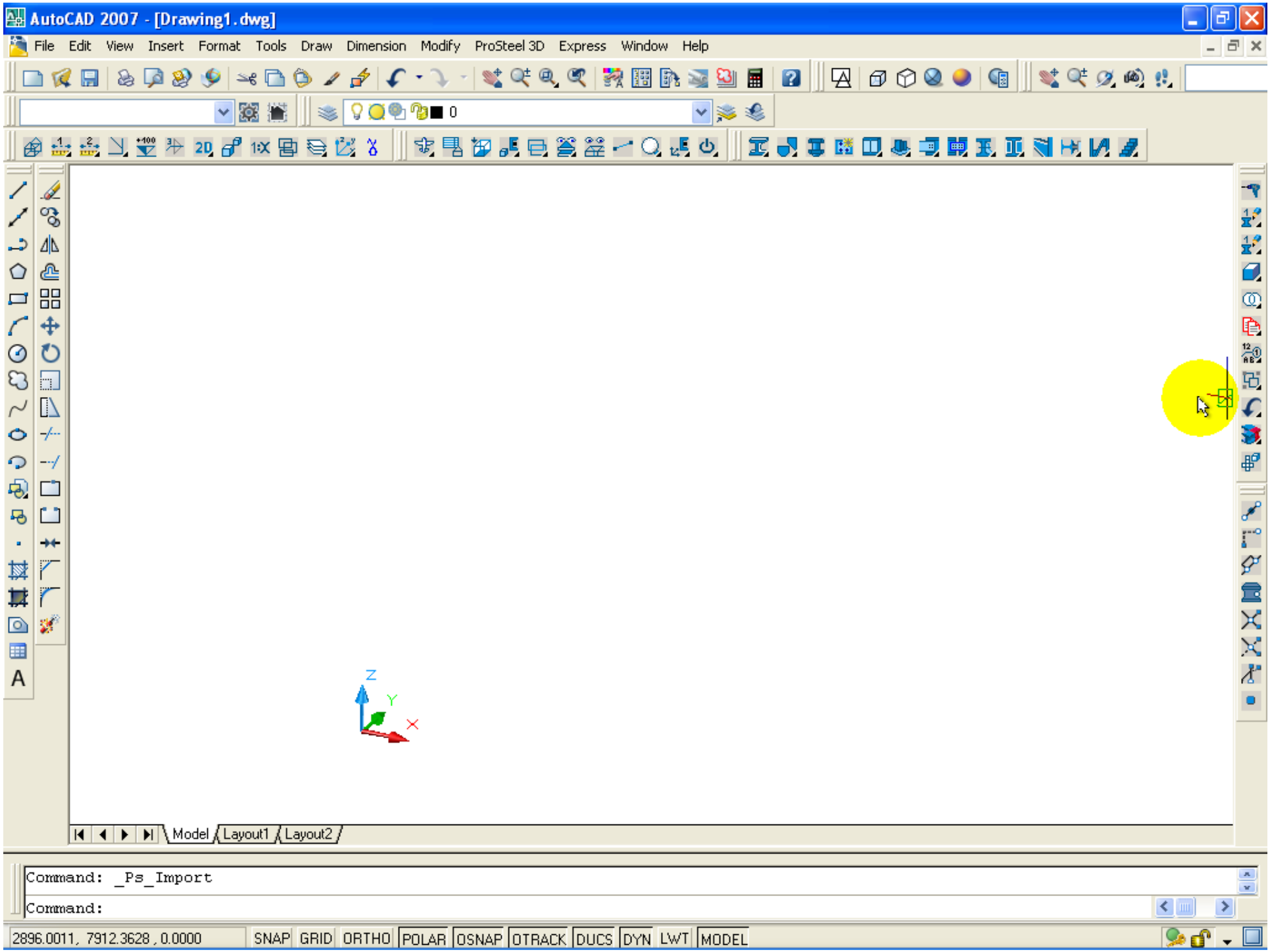
File Edit View Insert Format Tools Draw Dimension Modify ProSteel 3D Express Window Help
Model Layout1 Layout2
Command: _Ps_Import
Command:
43788.0250, 84385.2256 , 0.0000
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL

RAM Connection


STAAD.Pro - Plant1.std
File Edit View Tools Select Connection Design Mode Window Help
13: GENERATED AISC GENERAL 2
Modeling Postprocessing Steel Design Concrete Design RAM Connection Bridge Deck Advanced Slab Design Piping
Connection
Connection
Drawing & Result
Plant1.std - Whole Structure
Load 13
Connection Definitions
Envelope
Joints
J1: BCF - N(141) - M(9,89)
J2: BCF - N(141) - M(9,90)
Design Brief
B1: Design Brief 1
Connections
C1: J1 - B1
C2: J2 - B1
Create Envelope ...
Create Joint
Create Brief ...
Edit ...
Delete...
Assignment Method
Toggle Brief Assign
Assign To Selected Entities
Use Cursor To Assign
Assign To View
Assign To Edit List
Assign
Close
Help
For Help, press F1
Load 13 : GENERATED AISC GENERA Input Units: kip-in
start
iTunes
STAAD.Pro - Plant1.std
Camtasia Studio - Unt...
EN
(3:11)
10:22

Interoperability with RAM Connection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Model Layout1 Layout2
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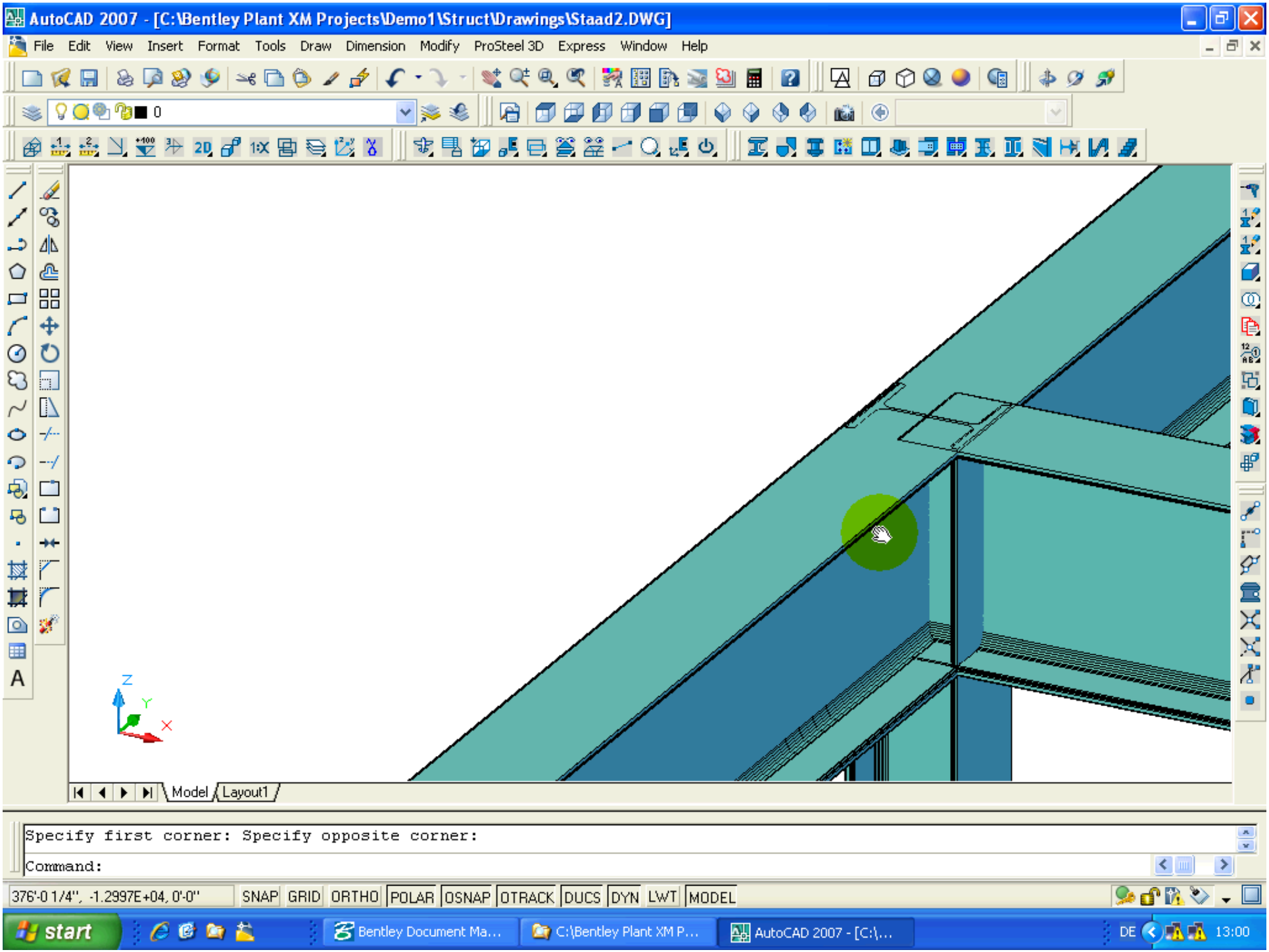
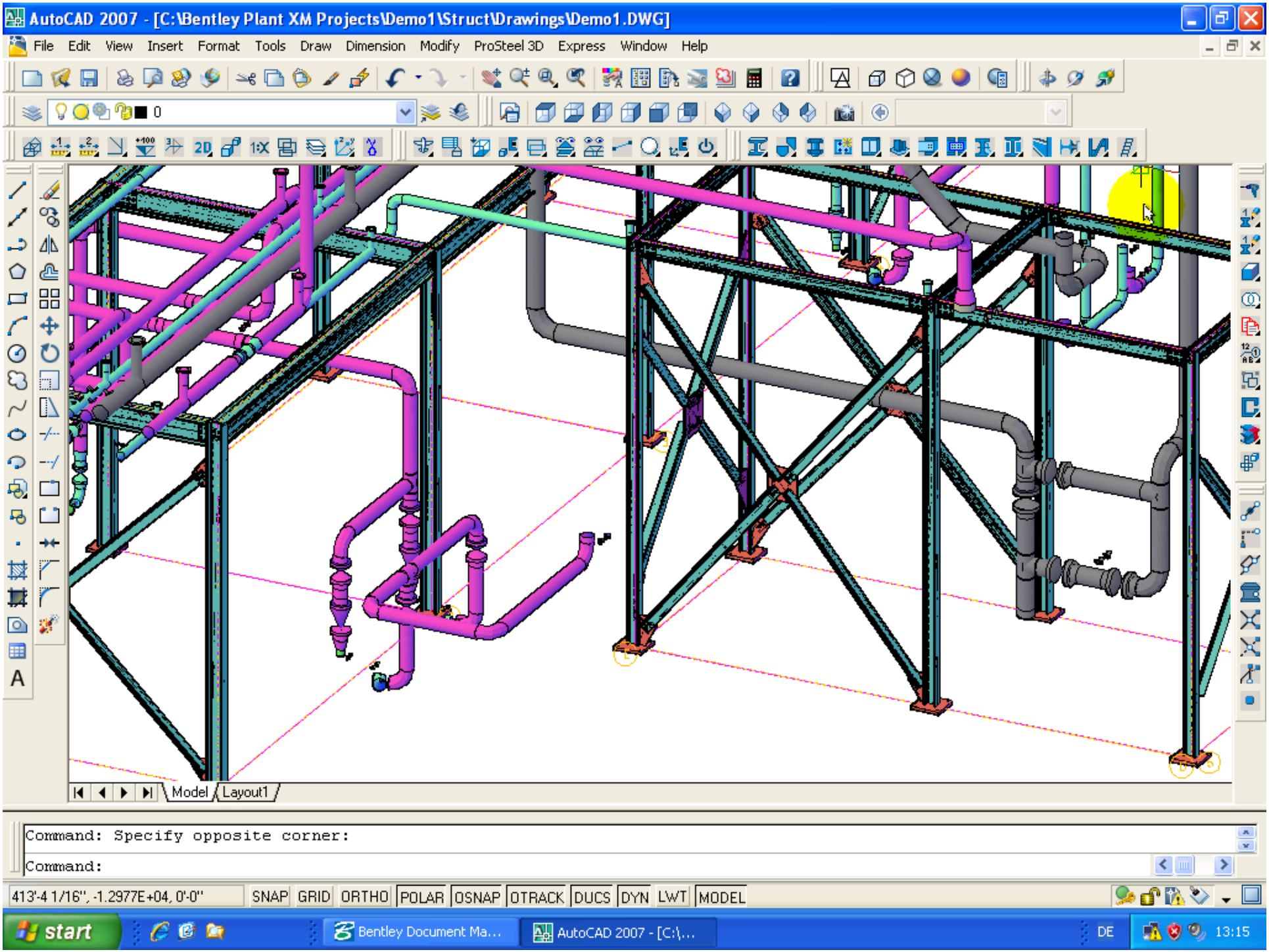
2896.0011, 7912.3628 , 0.0000
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL

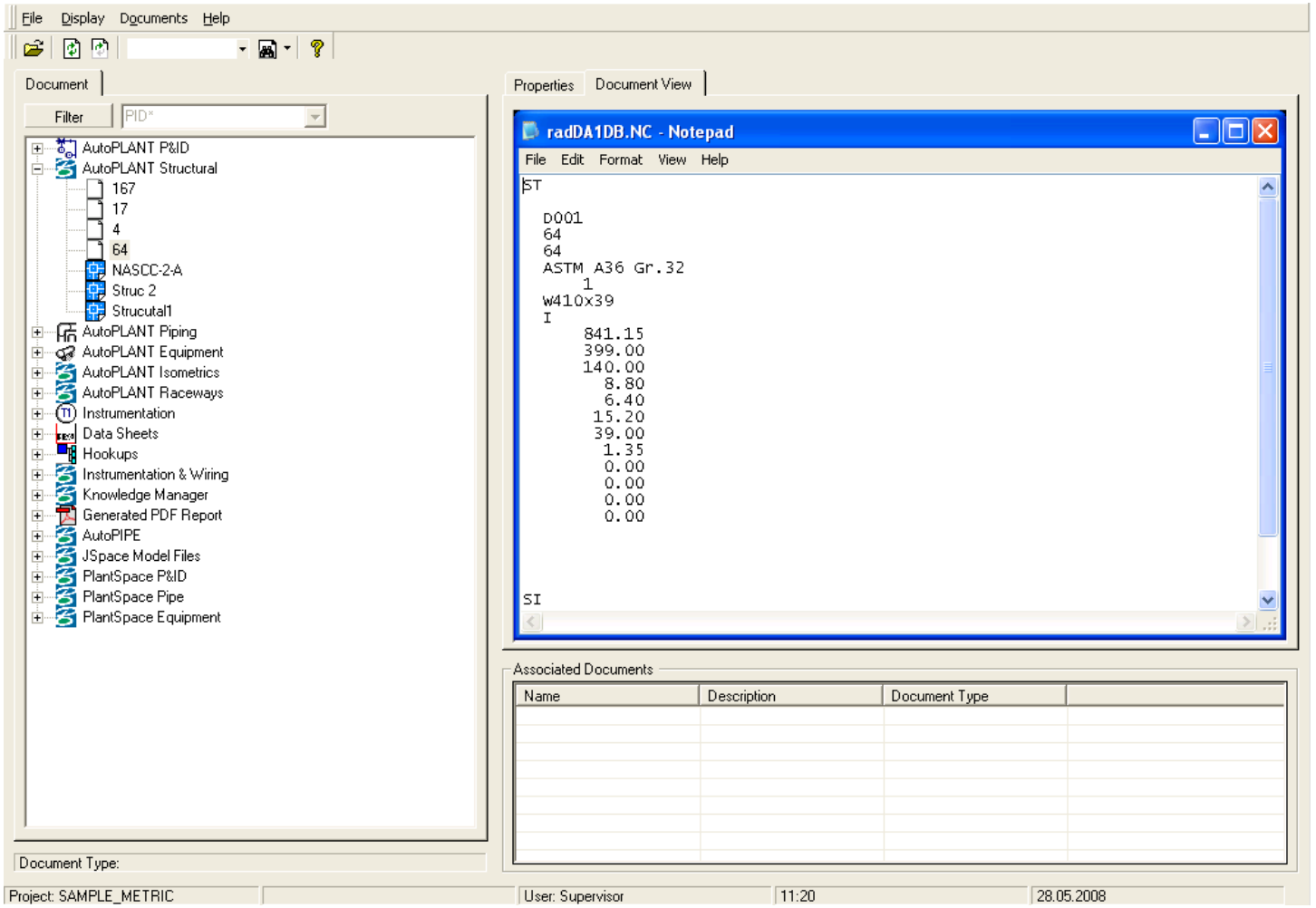
Creating Connections

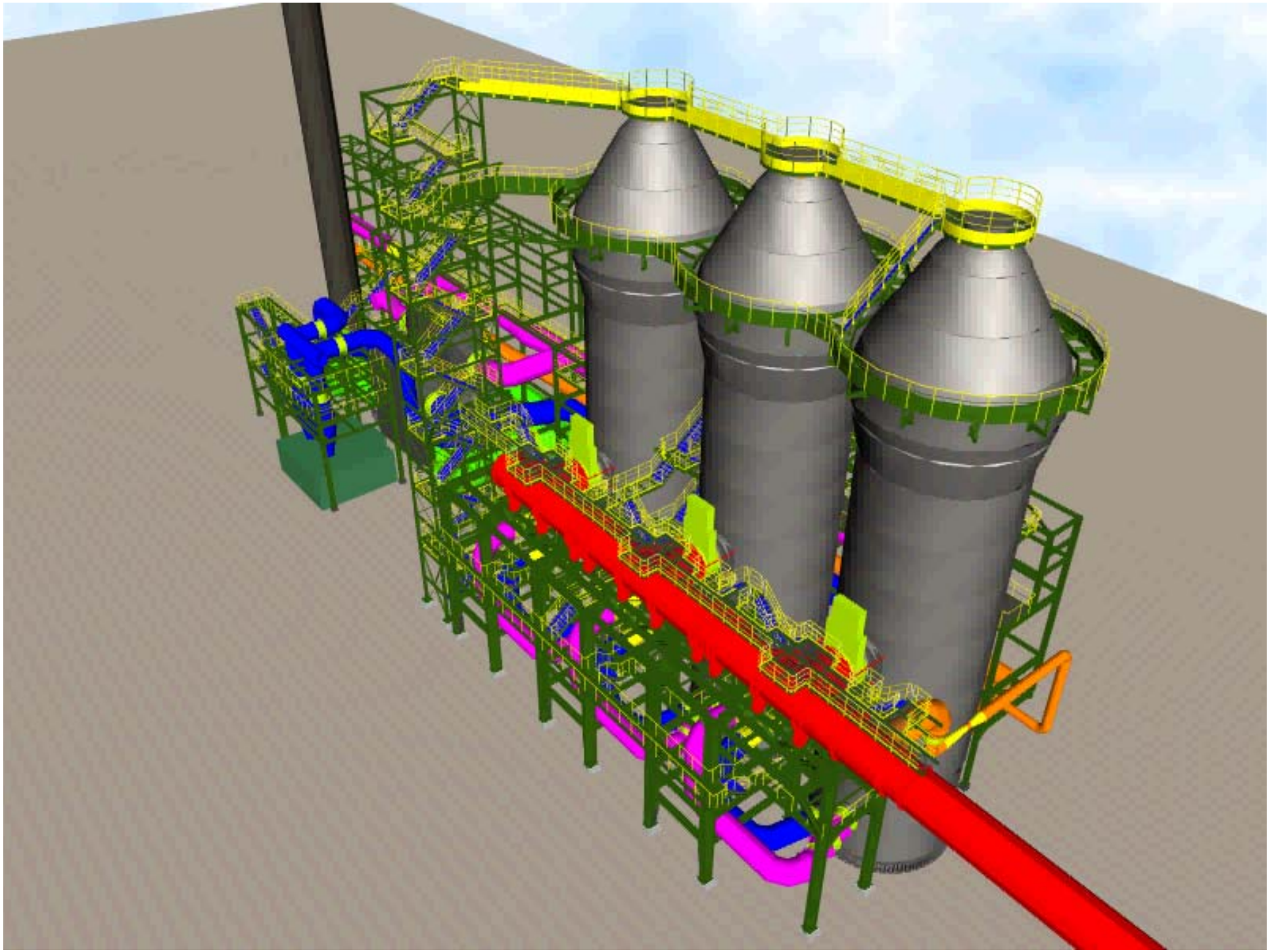

AutoCAD 2007 - [C:\Bentley Plant XM Projects\Demo1\Struct\Drawings\Staad2.DWG]
File Edit View Insert Format Tools Draw Dimension Modify ProSteel 3D Express Window Help
Model Layout1
Specify first corner: Specify opposite corner:
Command:
376'-0 1/4", -1.2997E+04, 0'-0"
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL
start
Bentley Document Ma...
C:\Bentley Plant XM P...
AutoCAD 2007 - [C:\...
DE
13:00

Working in a different environment


AutoCAD 2007 - [C:\Bentley Plant XM Projects\Demo1\Struct\Drawings\Demo1.DWG]
File Edit View Insert Format Tools Draw Dimension Modify ProSteel 3D Express Window Help
Model Layout1
Command: Specify opposite corner:
Command:
413'-4 1/16", -1.2977E+04, 0'-0"
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL
start
Bentley Document Ma...
AutoCAD 2007 - [C:\...
DE
13:15

Integration in Plant Environment



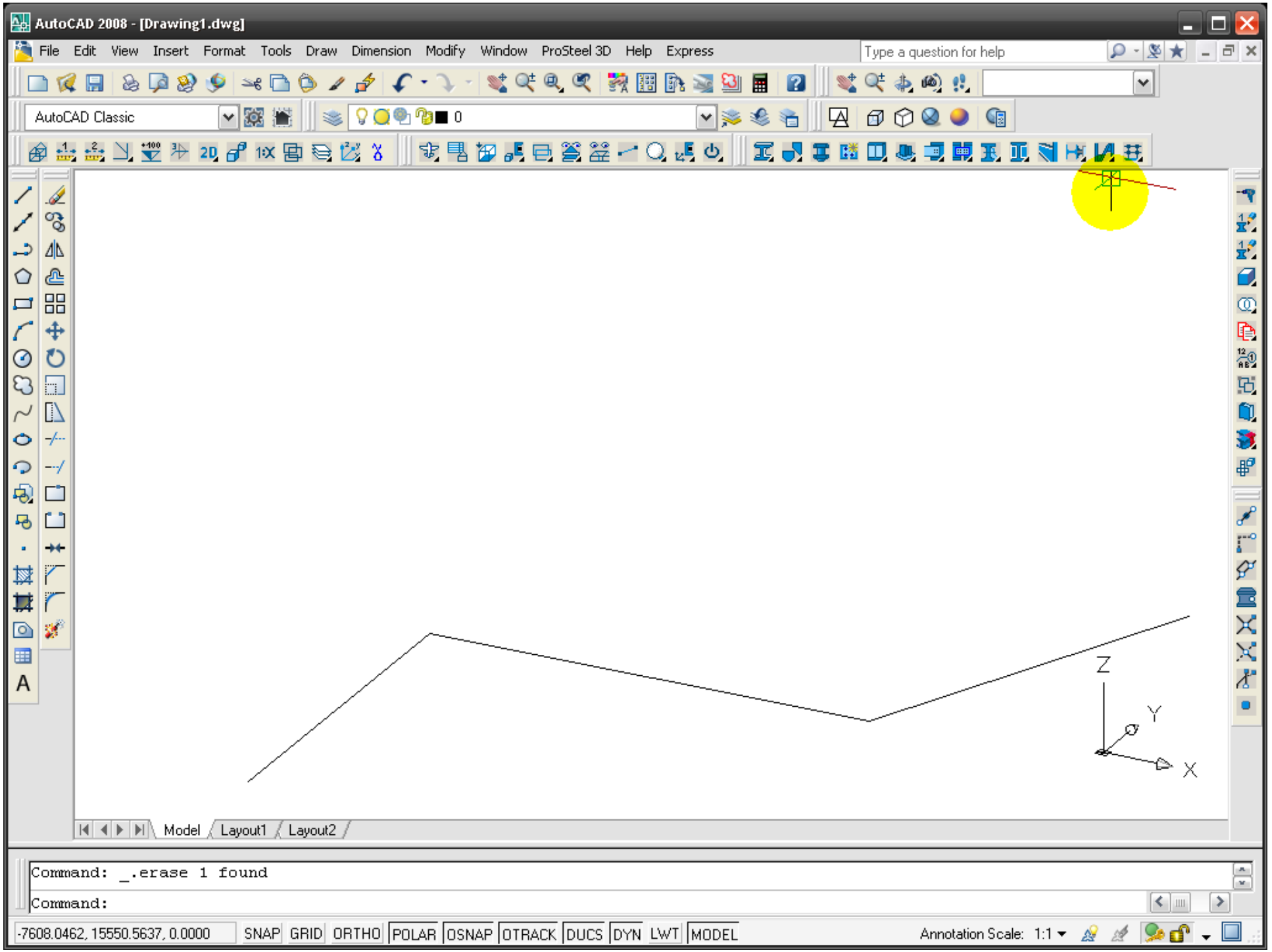


AutoCAD and Microstation

ProSteel V8i on MicroStation V8i

Finishing the model

Handrail


AutoCAD 2008 - [Drawing1.dwg]
File Edit View Insert Format Tools Draw Dimension Modify Window ProSteel 3D Help Express
Type a question for help
AutoCAD Classic
0
Z
Y
X
Model Layout1 Layout2
Command: _.erase 1 found
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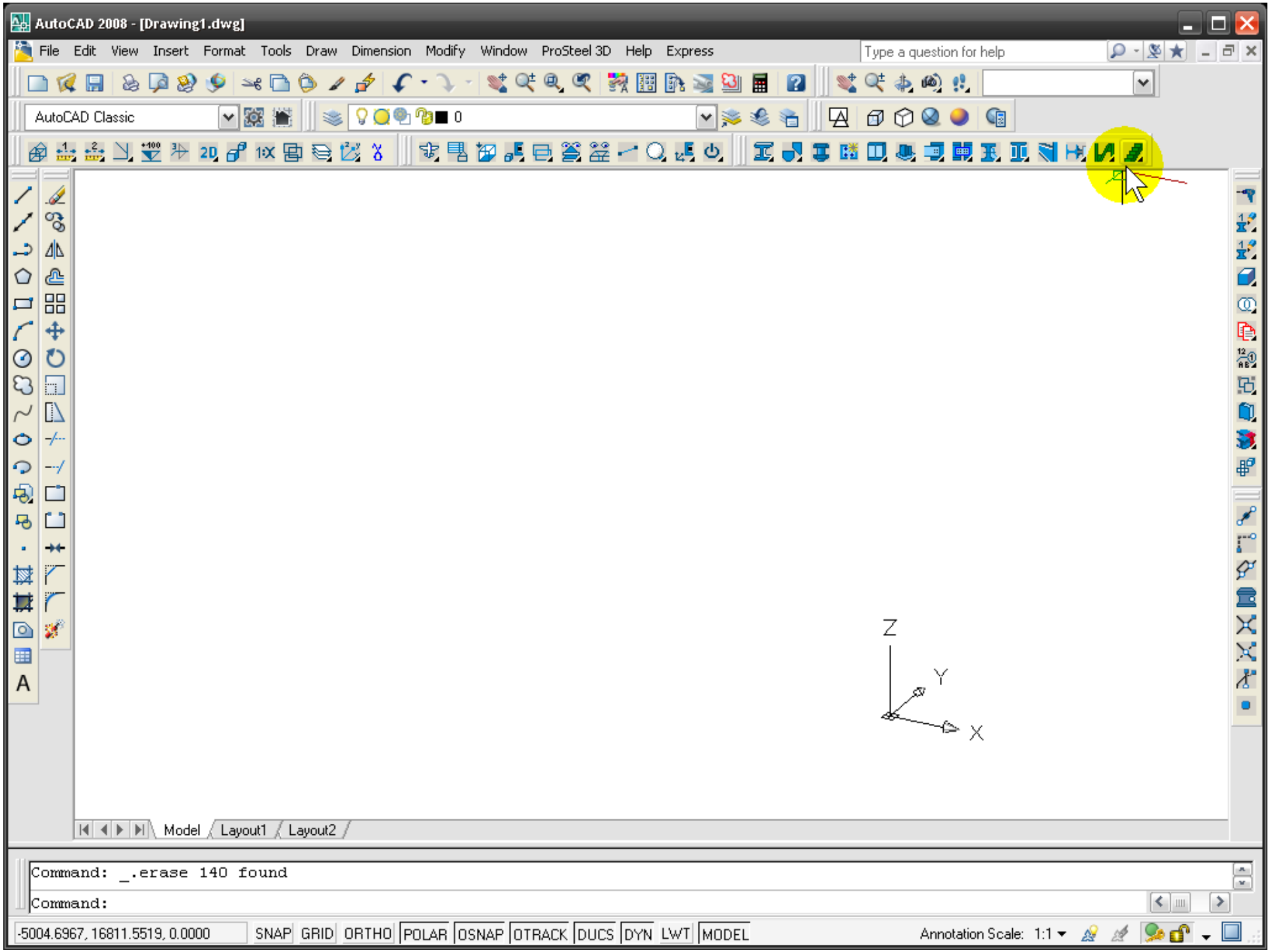
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL
Annotation Scale: 1:1

Stair


AutoCAD 2008 - [Drawing1.dwg]
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AutoCAD Classic
0
Z
Y
X
Model Layout1 Layout2
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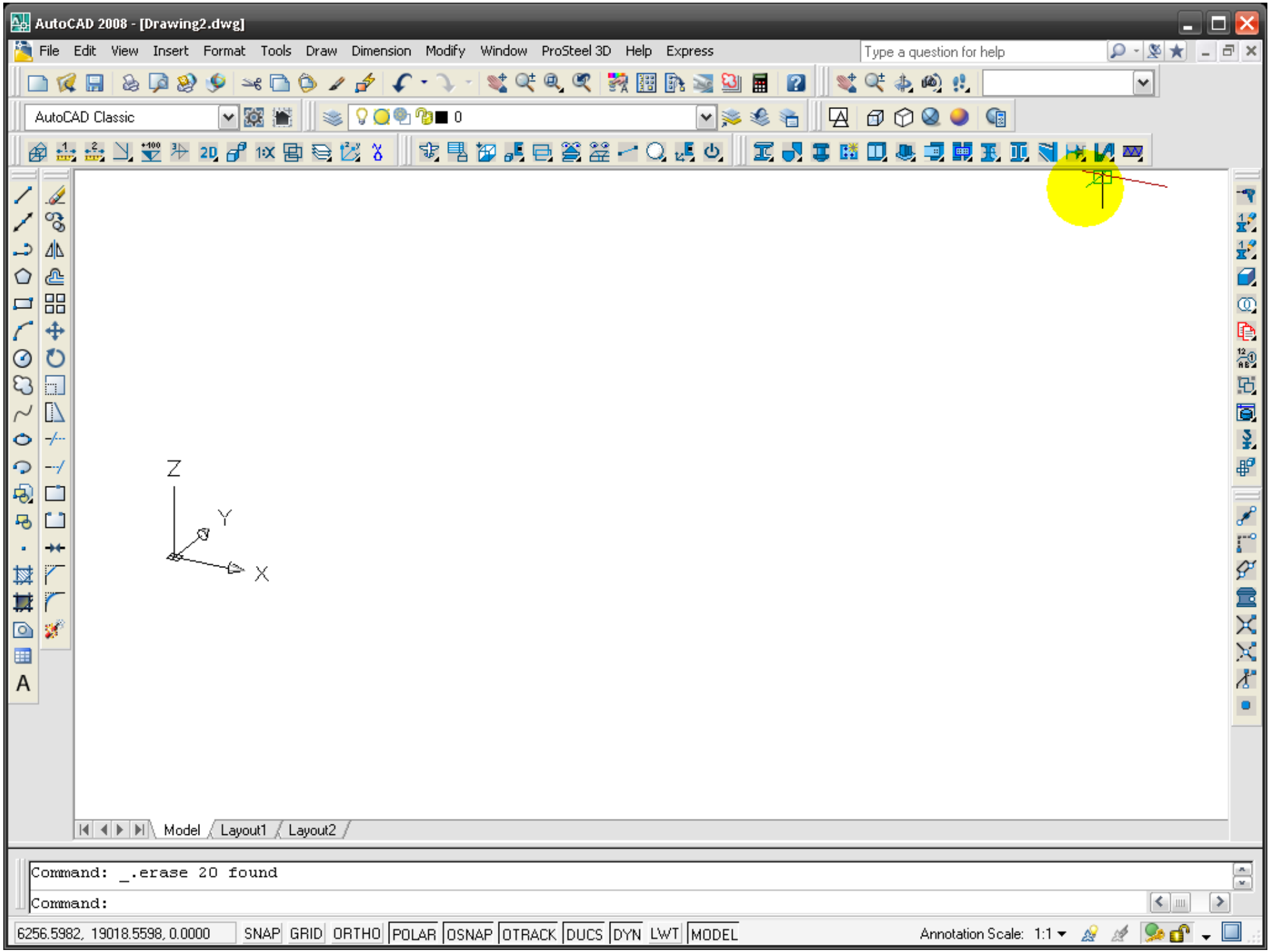
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL
Annotation Scale: 1:1

Joist


AutoCAD 2008 - [Drawing2.dwg]
File Edit View Insert Format Tools Draw Dimension Modify Window ProSteel 3D Help Express
Type a question for help
AutoCAD Classic
0
Z
Y
X
Model Layout1 Layout2
Command: _.erase 20 found
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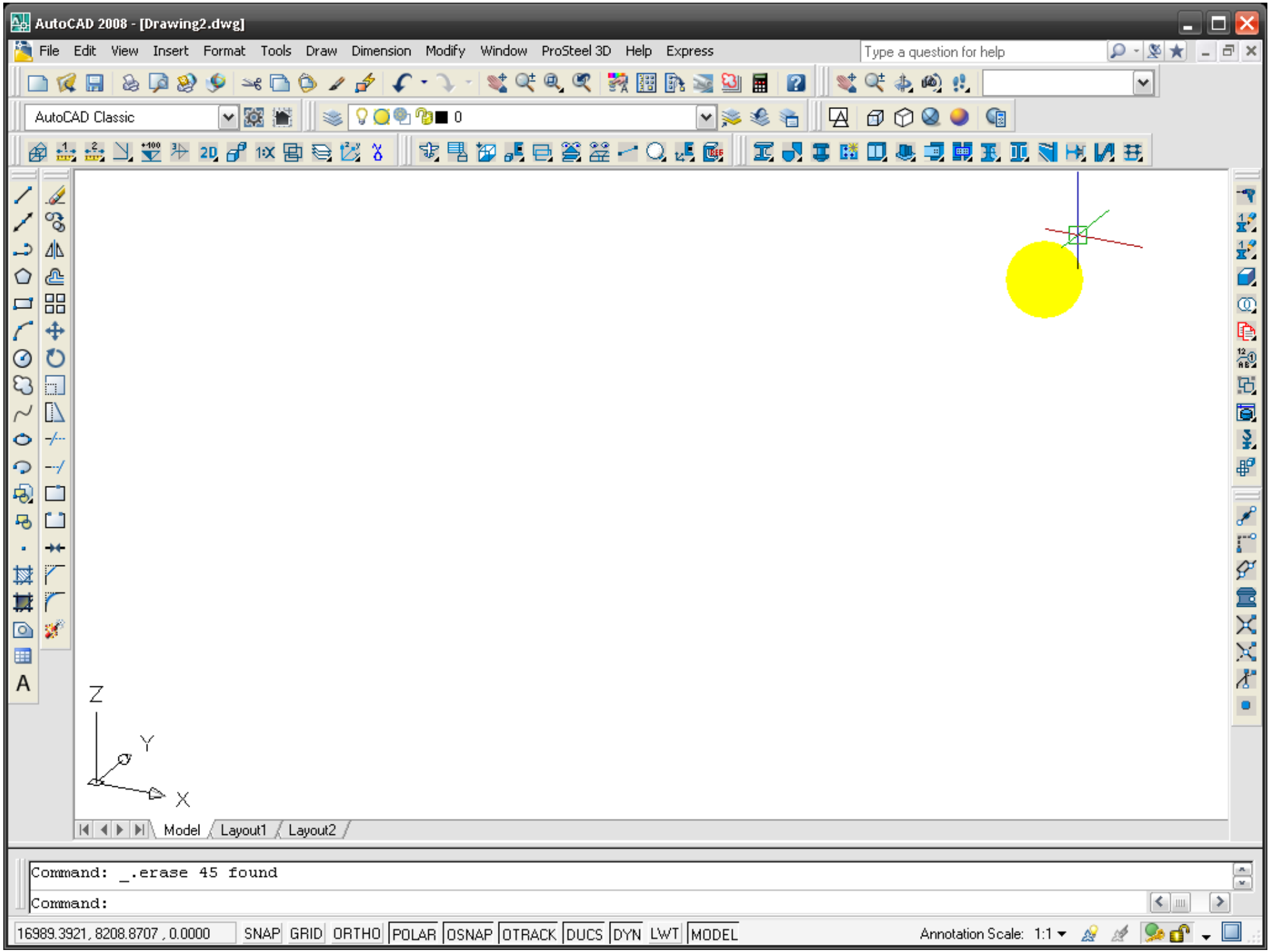
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL
Annotation Scale: 1:1

Circular Platform


AutoCAD 2008 - [Drawing2.dwg]
File Edit View Insert Format Tools Draw Dimension Modify Window ProSteel 3D Help Express
Type a question for help
AutoCAD Classic
0
Z
Y
X
Model Layout1 Layout2
Command: _.erase 45 found
Command:
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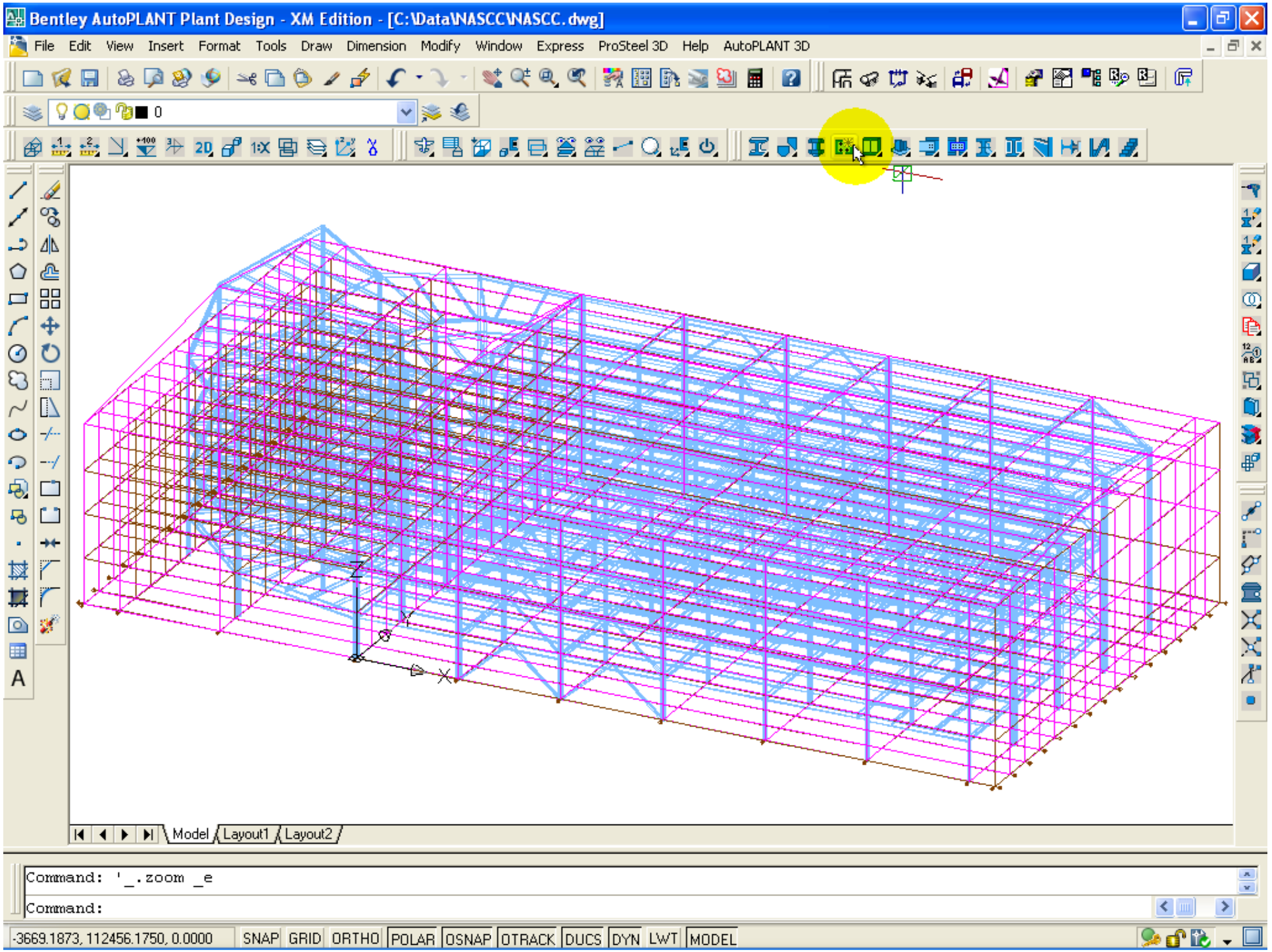
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL
Annotation Scale: 1:1

AutoConnect


Bentley AutoPLANT Plant Design - XM Edition - [C:\Data\NASCC\NASCC.dwg]
File Edit View Insert Format Tools Draw Dimension Modify Window Express ProSteel 3D Help AutoPLANT 3D
Model Layout1 Layout2
Command: '_.zoom _e
Command:
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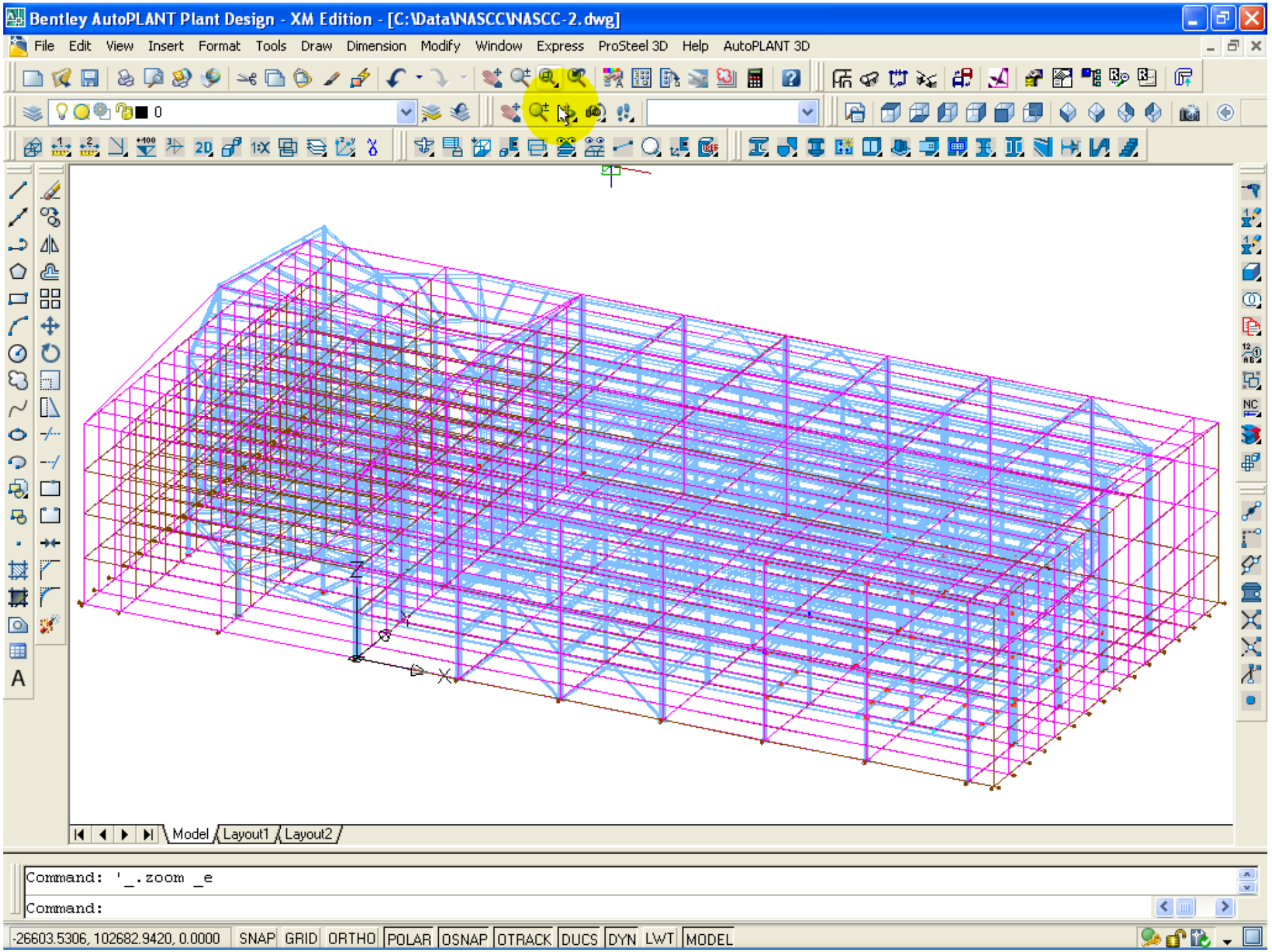
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL

Create fabrication information

NC Data


Bentley AutoPLANT Plant Design - XM Edition - [C:\Data\NASCC\NASCC-2.dwg]
File Edit View Insert Format Tools Draw Dimension Modify Window Express ProSteel 3D Help AutoPLANT 3D
Model Layout1 Layout2
Command: '_.zoom _e
Command:
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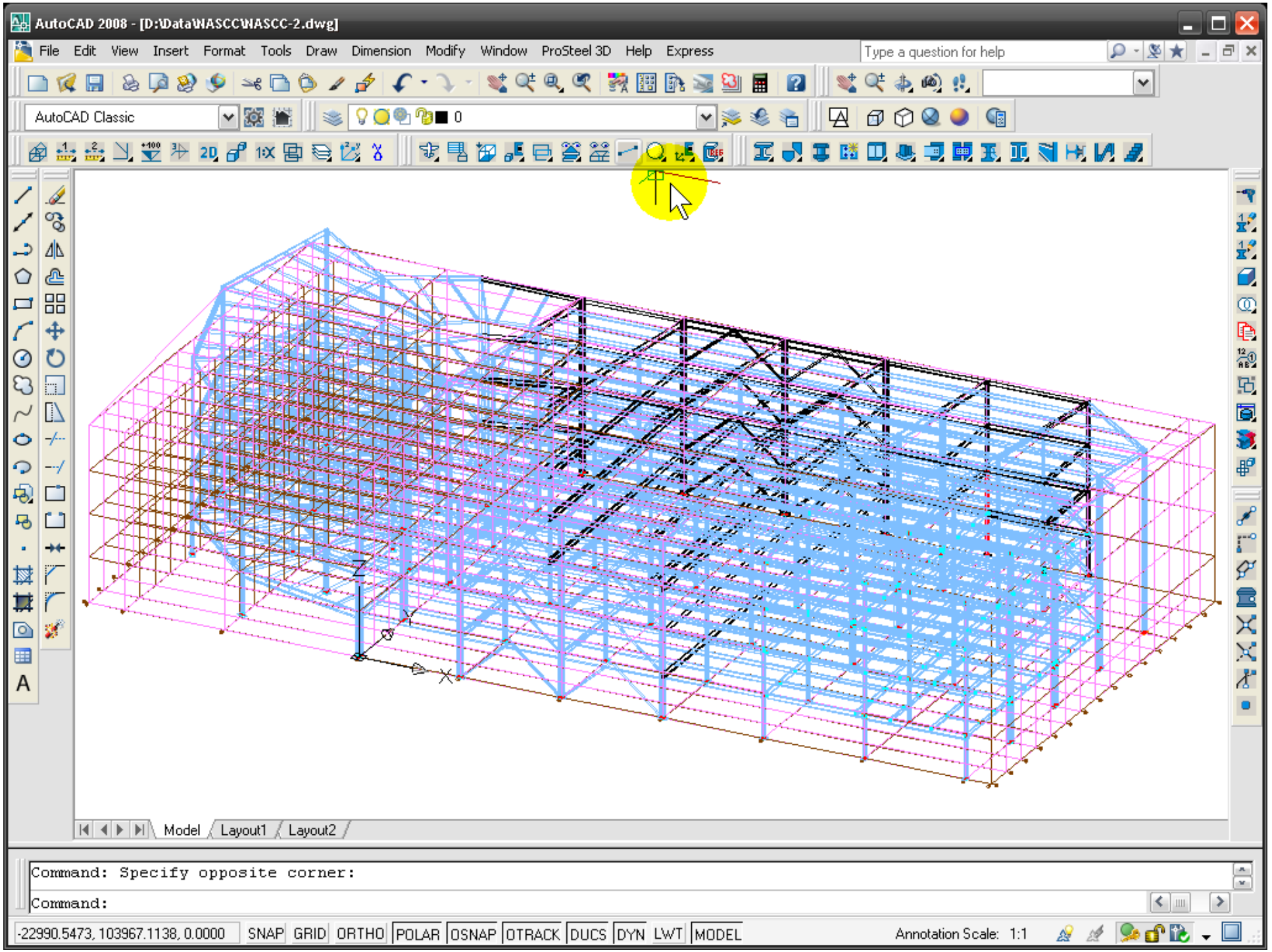
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL

Bill of Material (BOM)


AutoCAD 2008 - [D:\Data\WASCC\WASCC-2.dwg]
File Edit View Insert Format Tools Draw Dimension Modify Window ProSteel 3D Help Express
Type a question for help
AutoCAD Classic
Model Layout1 Layout2
Command: Specify opposite corner:
Command:
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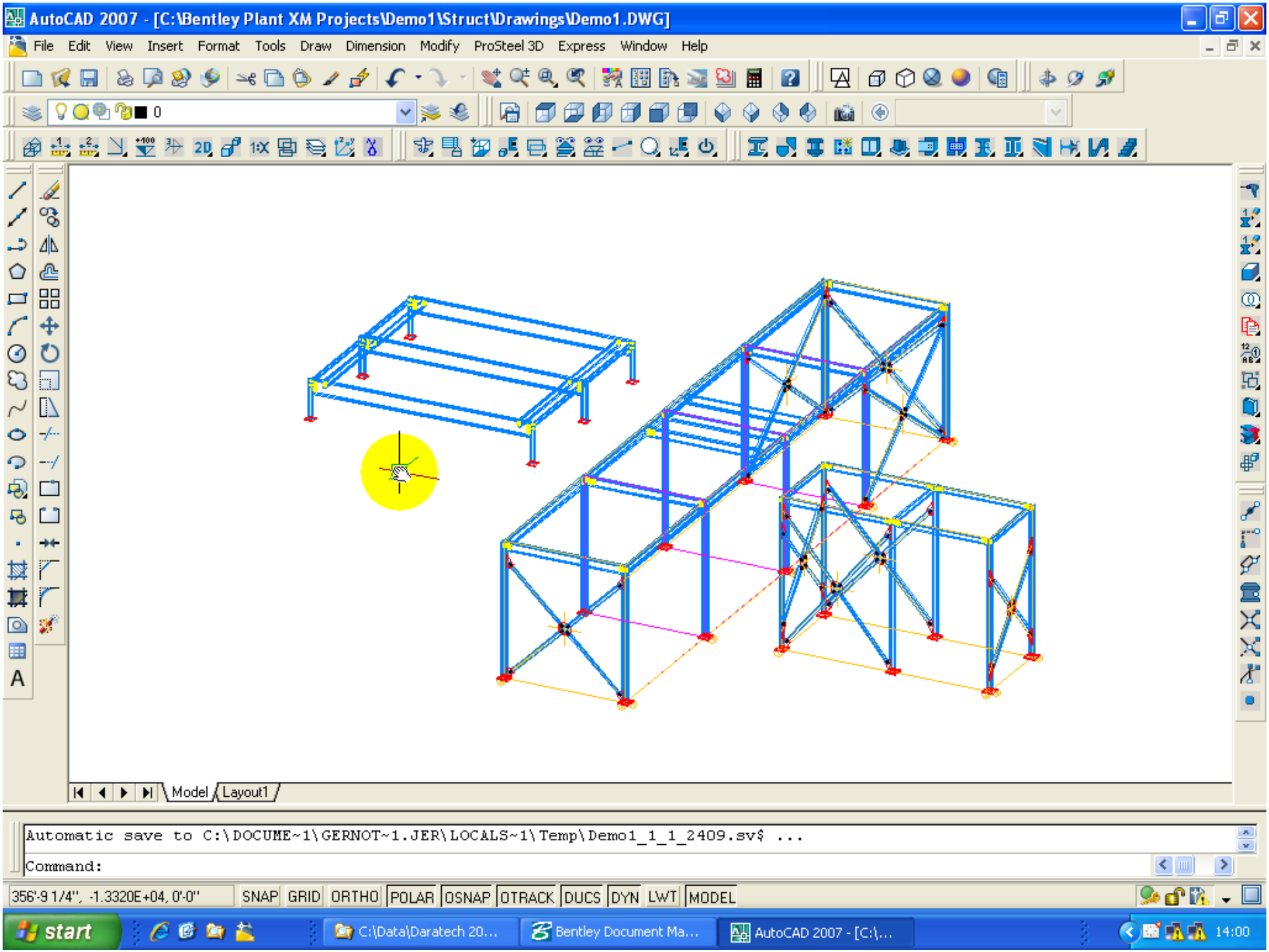
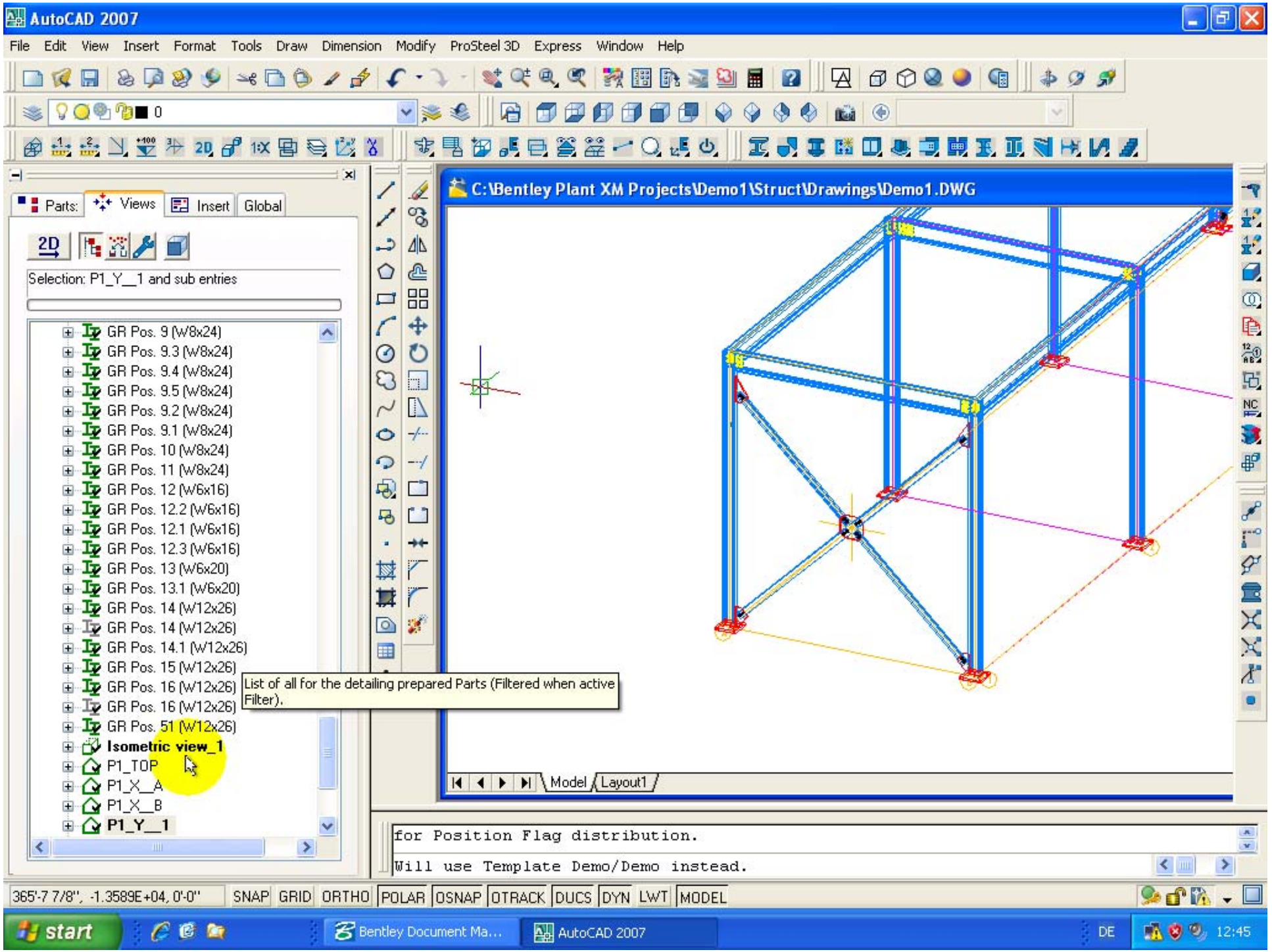
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL
Annotation Scale: 1:1

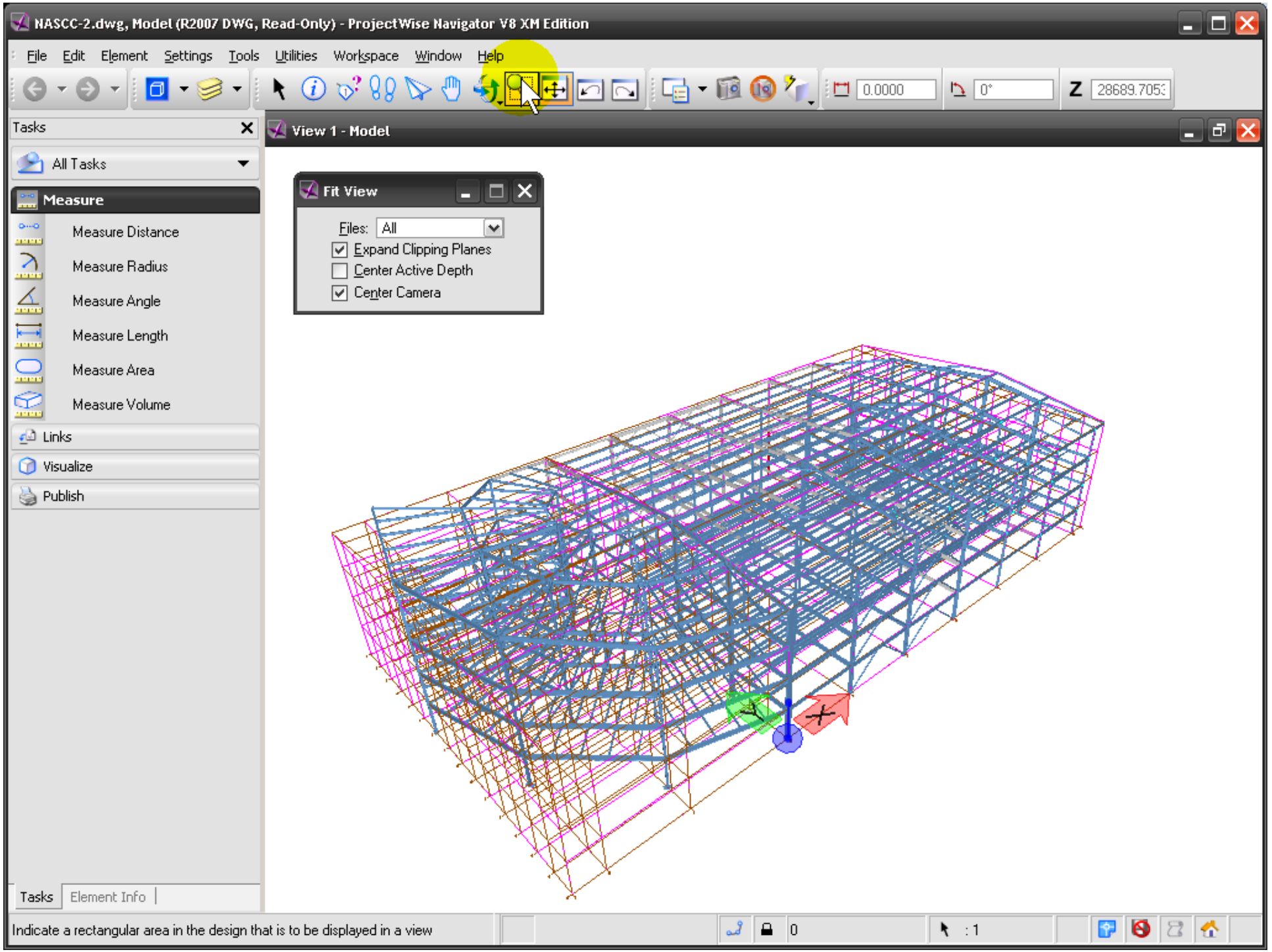
2D Drawings


AutoCAD 2007 - [C:\Bentley Plant XM Projects\Demo1\Struct\Drawings\Demo1.DWG]
File Edit View Insert Format Tools Draw Dimension Modify ProSteel 3D Express Window Help
Model Layout1
Automatic save to C:\DOCUME~1\GERNOT~1.JER\LOCALS~1\Temp\Demo1_1_1_2409.sv$ ...
Command:
356'-9 1/4", -1.3320E+04, 0'-0"
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL
start
C:\Data\Daratech 20...
Bentley Document Ma...
AutoCAD 2007 - [C:\...
14:00

Customizing 2D Output


AutoCAD 2007
File Edit View Insert Format Tools Draw Dimension Modify ProSteel 3D Express Window Help
Parts: Views Insert Global
Selection: P1_Y__1 and sub entries
GR Pos. 9 (W8x24)
GR Pos. 9.3 (W8x24)
GR Pos. 9.4 (W8x24)
GR Pos. 9.5 (W8x24)
GR Pos. 9.2 (W8x24)
GR Pos. 9.1 (W8x24)
GR Pos. 10 (W8x24)
GR Pos. 11 (W8x24)
GR Pos. 12 (W6x16)
GR Pos. 12.2 (W6x16)
GR Pos. 12.1 (W6x16)
GR Pos. 12.3 (W6x16)
GR Pos. 13 (W6x20)
GR Pos. 13.1 (W6x20)
GR Pos. 14 (W12x26)
GR Pos. 14 (W12x26)
GR Pos. 14.1 (W12x26)
GR Pos. 15 (W12x26)
GR Pos. 16 (W12x26)
GR Pos. 16 (W12x26)
GR Pos. 51 (W12x26)
Isometric view_1
P1_TOP
P1_X__A
P1_X__B
P1_Y__1
List of all for the detailing prepared Parts (Filtered when active Filter).
C:\Bentley Plant XM Projects\Demo1\Struct\Drawings\Demo1.DWG
Model Layout1
for Position Flag distribution.
Will use Template Demo/Demo instead.
365'-7 7/8", -1.3589E+04, 0'-0"
SNAP GRID ORTHO POLAR OSNAP OTRACK DUCS DYN LWT MODEL
start
Bentley Document Ma...
AutoCAD 2007
DE
12:45

Review

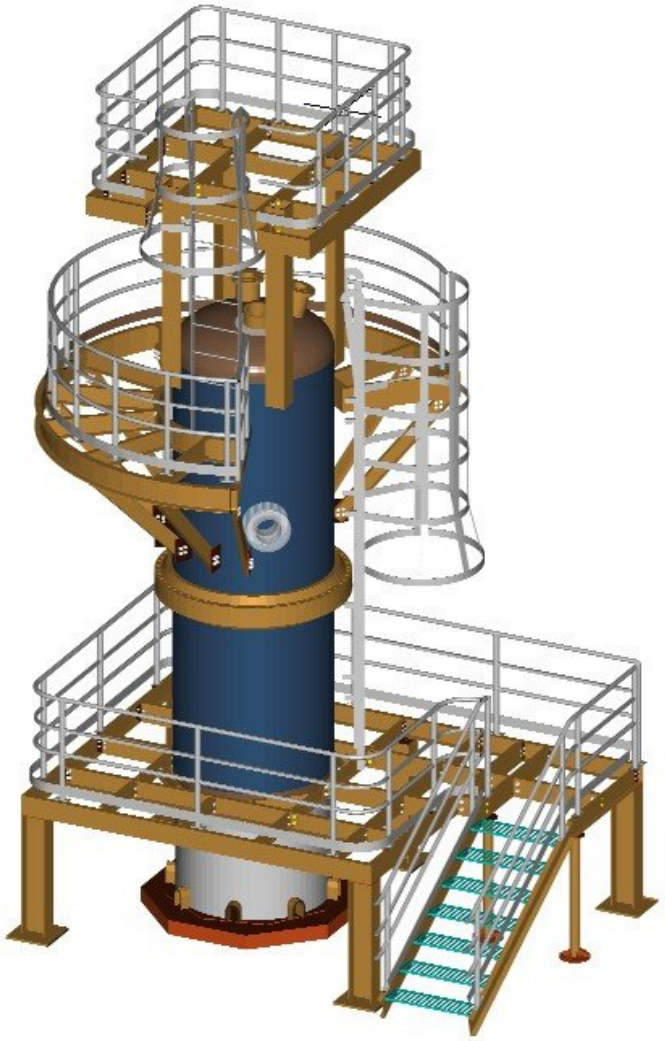

NASCC-2.dwg, Model (R2007 DWG, Read-Only) - ProjectWise Navigator V8 XM Edition
File Edit Element Settings Tools Utilities Workspace Window Help
0.0000
0°
Z 28689.705
Tasks
All Tasks
Measure
Measure Distance
Measure Radius
Measure Angle
Measure Length
Measure Area
Measure Volume
Links
Visualize
Publish
Tasks Element Info
View 1 - Model
Fit View
Files: All
Expand Clipping Planes
Center Active Depth
Center Camera
Indicate a rectangular area in the design that is to be displayed in a view
0
: 1

New Addition: StrucSoft Solutions

- PVGen Pro 3D
- JACKET Pro 3D
- Tower Pro 3D
- Struc Link
- STUD Pro 3D

PVGen Pro 3D

PVGen Pro 3D is an integrated software solution aimed at the engineering and manufacturing of Pressure Vessels. This is a unique application that generates 2D drawings, nozzle schedules, BOM and CNC data from a 3D model of a pressure vessel designed with Compress. Ideal for engineering consultants and fabrication shops.



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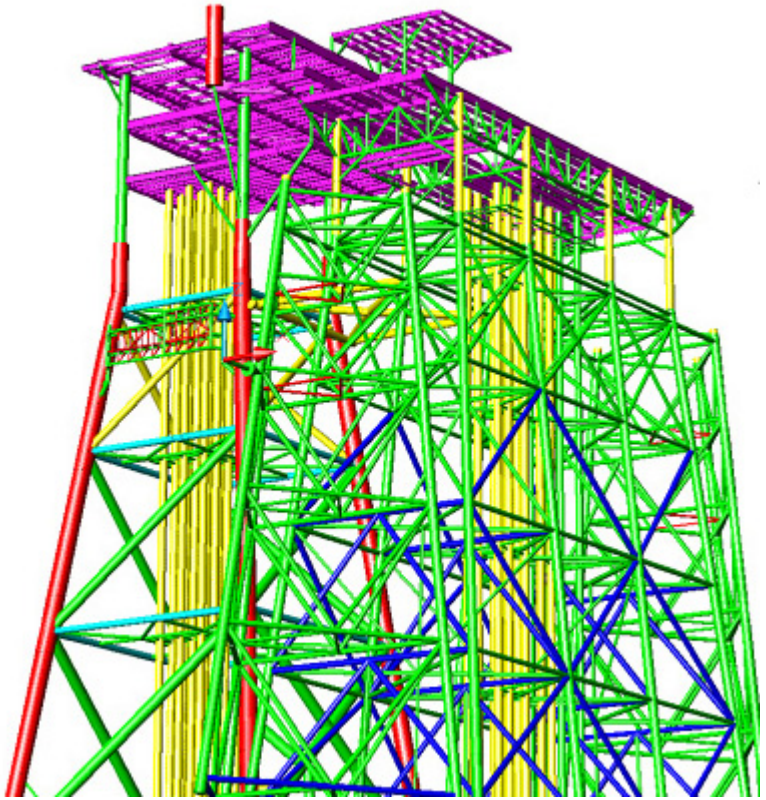
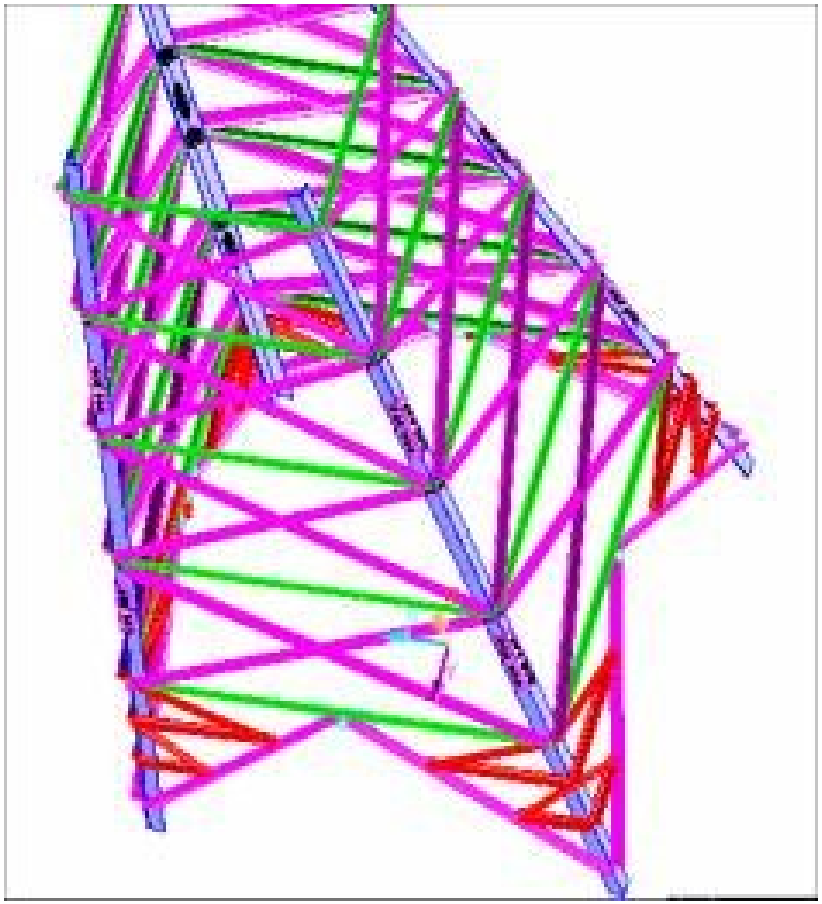
JACKET Pro 3D

JACKET Pro 3D is a collection of applications that convert ProSteel 3D into a dedicated software tool for companies involved in the design, construction and fabrication of off-shore structures.



Tower Pro 3D

Tower Pro 3D is a multi-legged lattice tower configurator and powerful model generator that allows you to build a tower structire, including all the connections – in minutes!!



Struc Link

Struc Link is bi-directional seamless interface between ProSteel 3D and several structural analysis programs. Allows for iterative back and forth exchange without loss of data.

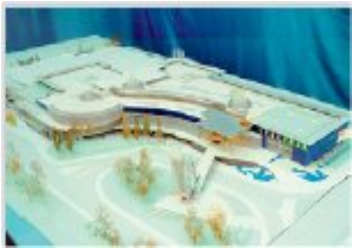
- ETABS
- SAP2000
- Multiframe
- Risa 3D
- Robot Millenium
- SFrame

STUD Pro 3D

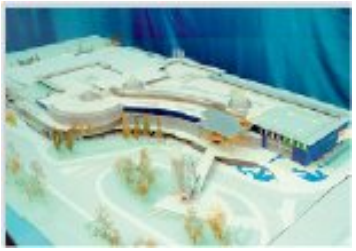
STUD Pro 3D is a 3D design and fabrication solution for light gauge and hybrid construction. Panellized walls, floors and trusses.

ProSteel Users (partial)

- DSD – Dillinger Stahlbau
- Thyssen KRUPP
- Siemens
- HOCHTIEF
- Degussa
- Maurer + Söhne
- Sinclair, Knight, Merz
- Connel Wagner
- KBR Kellog, Brown & Root
- Roche Mining Pty Ltd
- Walt Disney Imagineering
- PermaSteelisa Europe / Josef Gartner GmbH
- Larsen & Toubro Limited
- Hatch
- Alcan
- Petro Canada



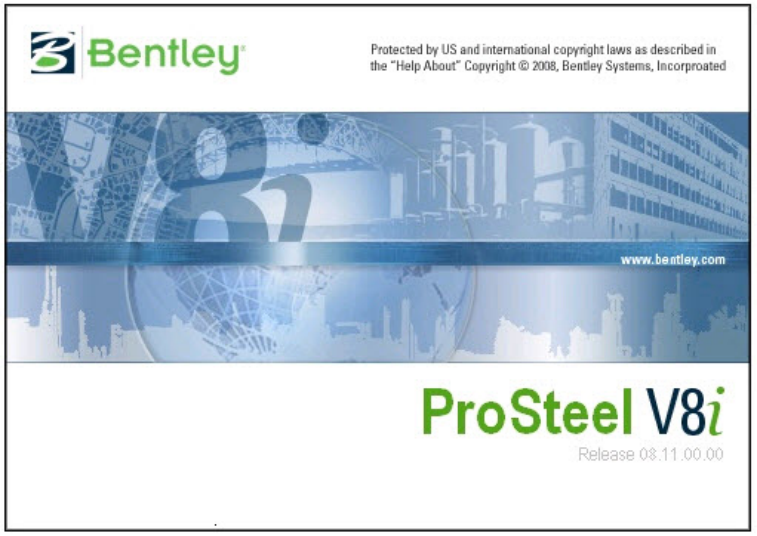
- SKM
- IKW GmbH
- Trimo
- Krupp
- Larsen Tourbro
- Novum Strucvtures
- PDC
- Amoka
- Bierkaemper
- Bloder
- DeAmerseSmid
- Artec
- i2M
- HAP
- ISN
- Larus Holding Ltd.
- System Steel
- Vastech
- Agrober
- Vabeko2000
- Legrand
- Falcone
- AIC GmbH
- Compusteel
- Artec
- Hoppe
- TrevazKft
- Heringbau
- Stevenson Structural
- Hoffmann
- TZH
- Buchkremer
- Carpenterie
- Phileas
- Jaernfornsen
- Elea
- Phol



What is new in V8i

V8i

- With more than 140 products, V8*i* stands as the most ambitious software portfolio release ever created for infrastructure professionals.



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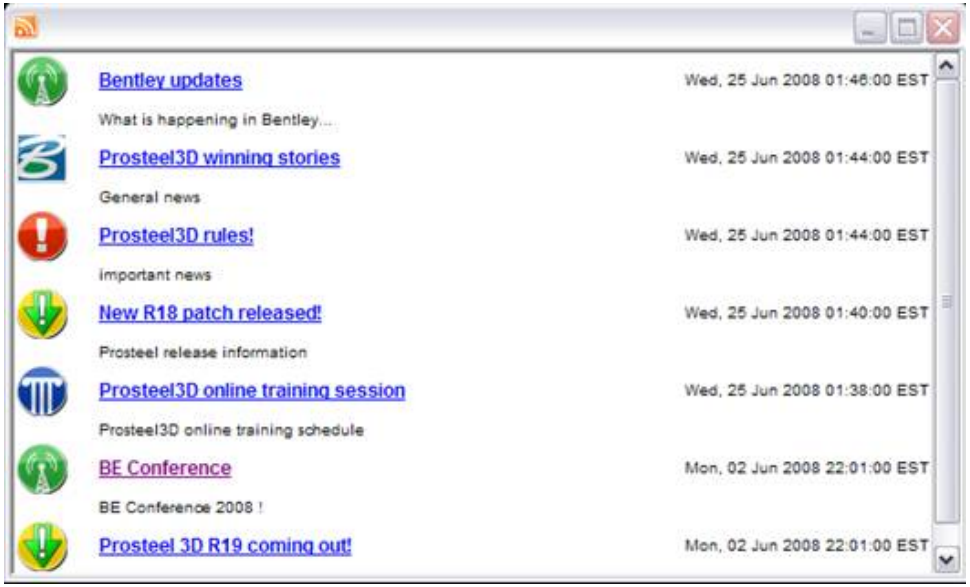
ProSteel V8i – 64 bit

- Support of Windows 64 bit
- Support of AutoCAD 2008 64 bit

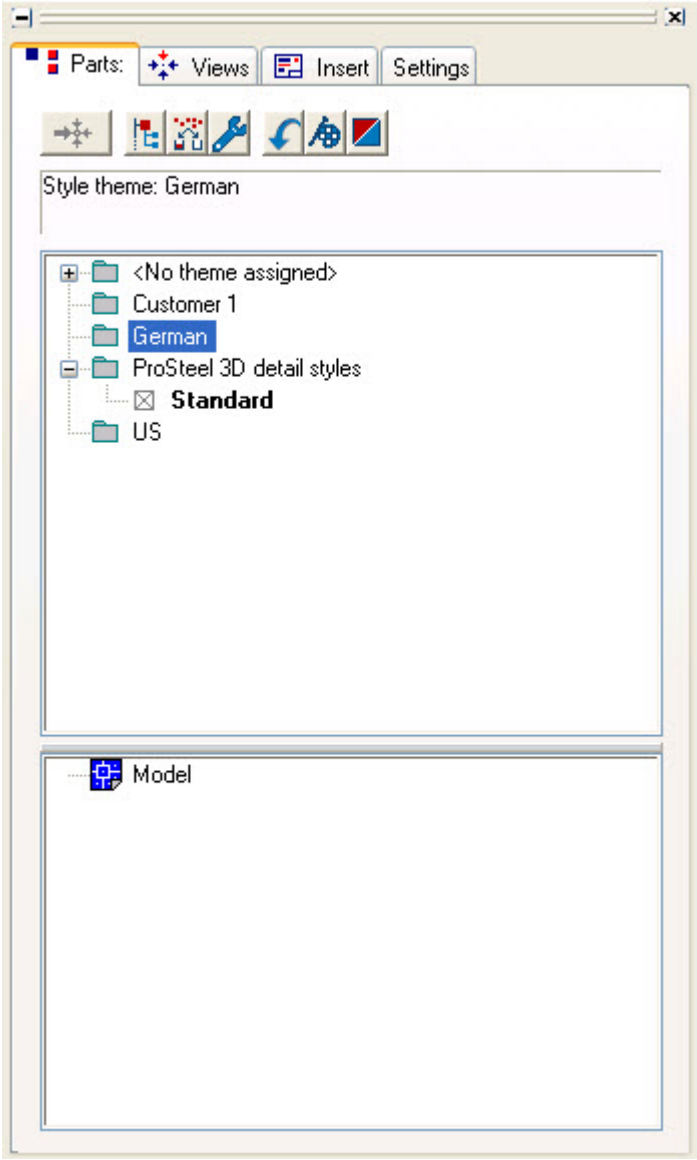
RSS Feed

- RSS in the acronym for"Really Simple Syndication".
- Bentley Systems will keep you informed about enhancements and modifications in ProSteel, the availability of new releases, interesting events …



Detail Style Themes

- The ProSteel Detail Styles can be organized in Themes.
  It is possible though to organize in example the Detail Styles for customers or region.



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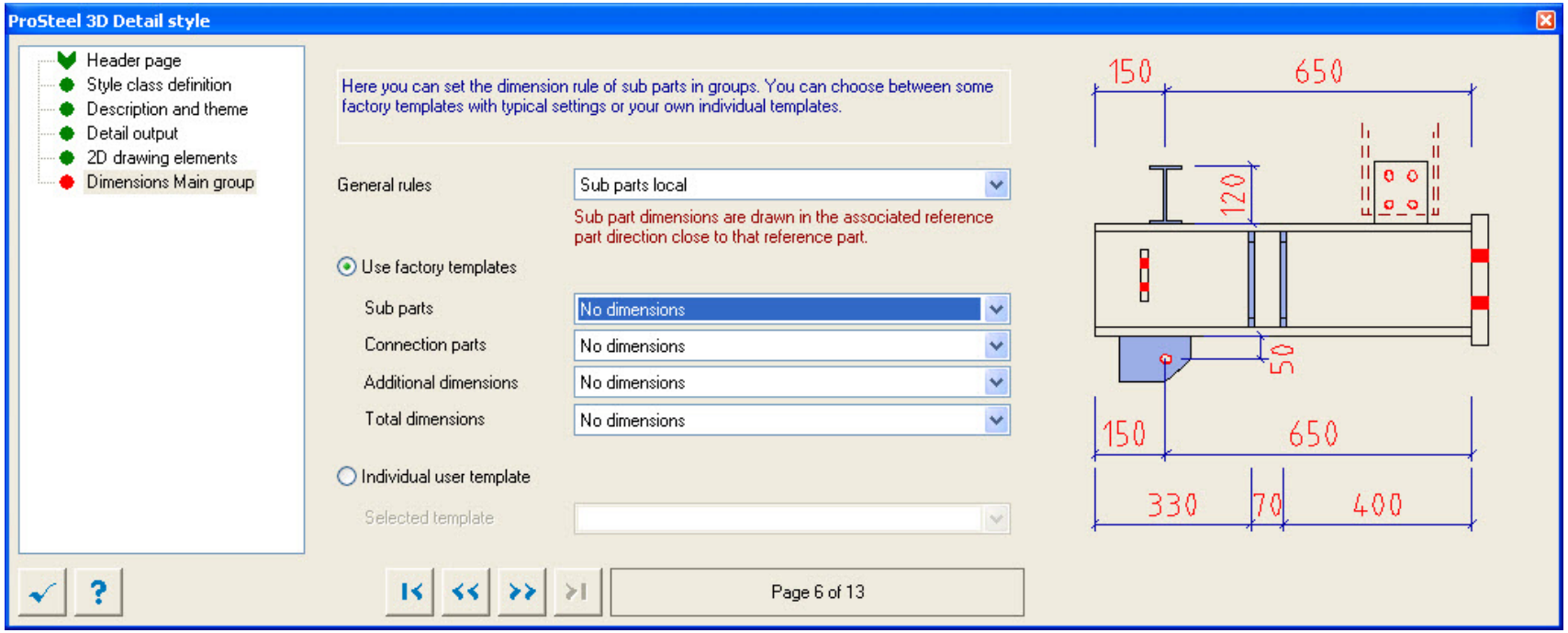
Detail Style Express



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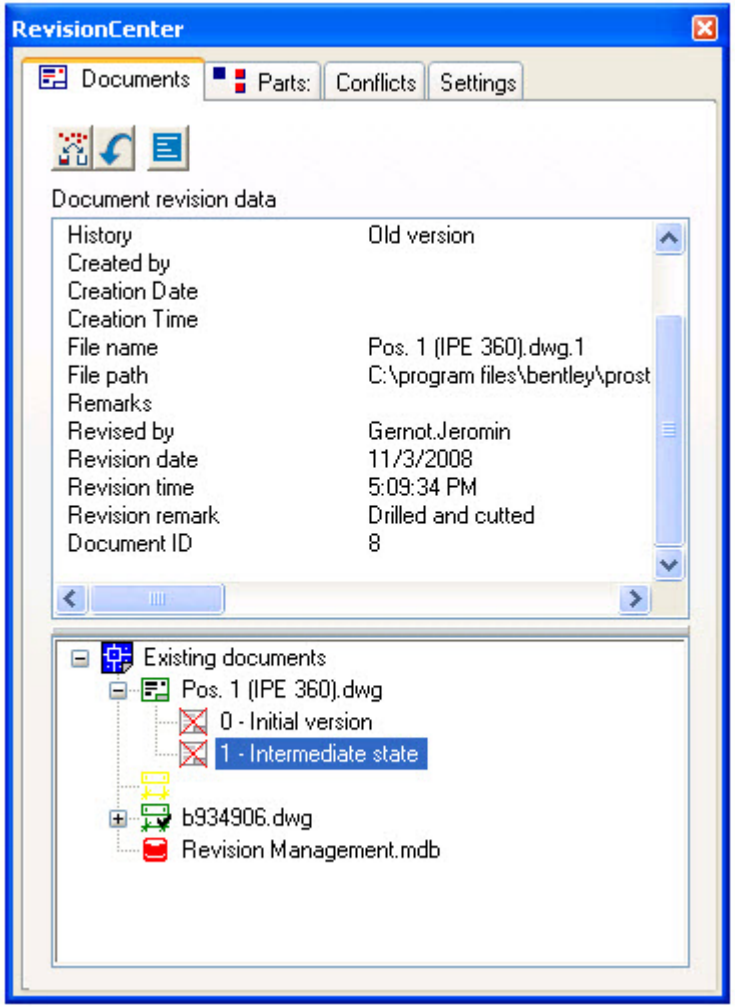
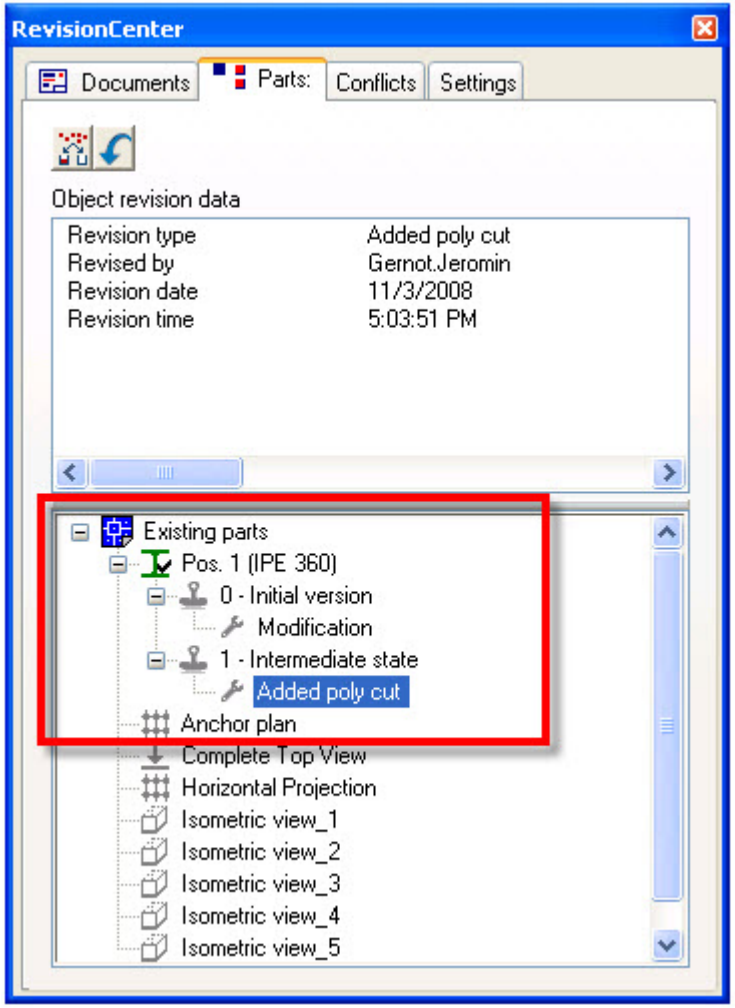
Revision Management





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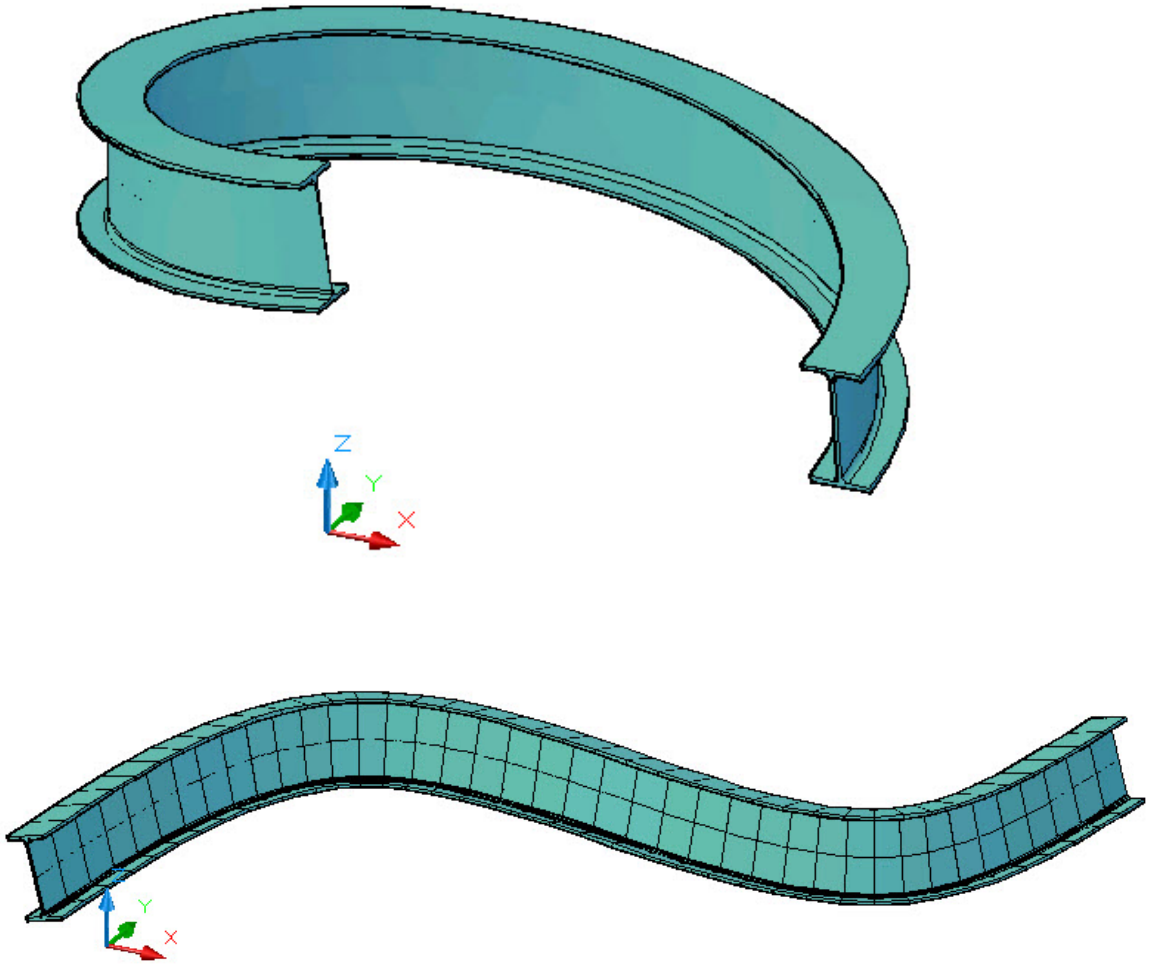
Shapes based on 2D Spline and Helix



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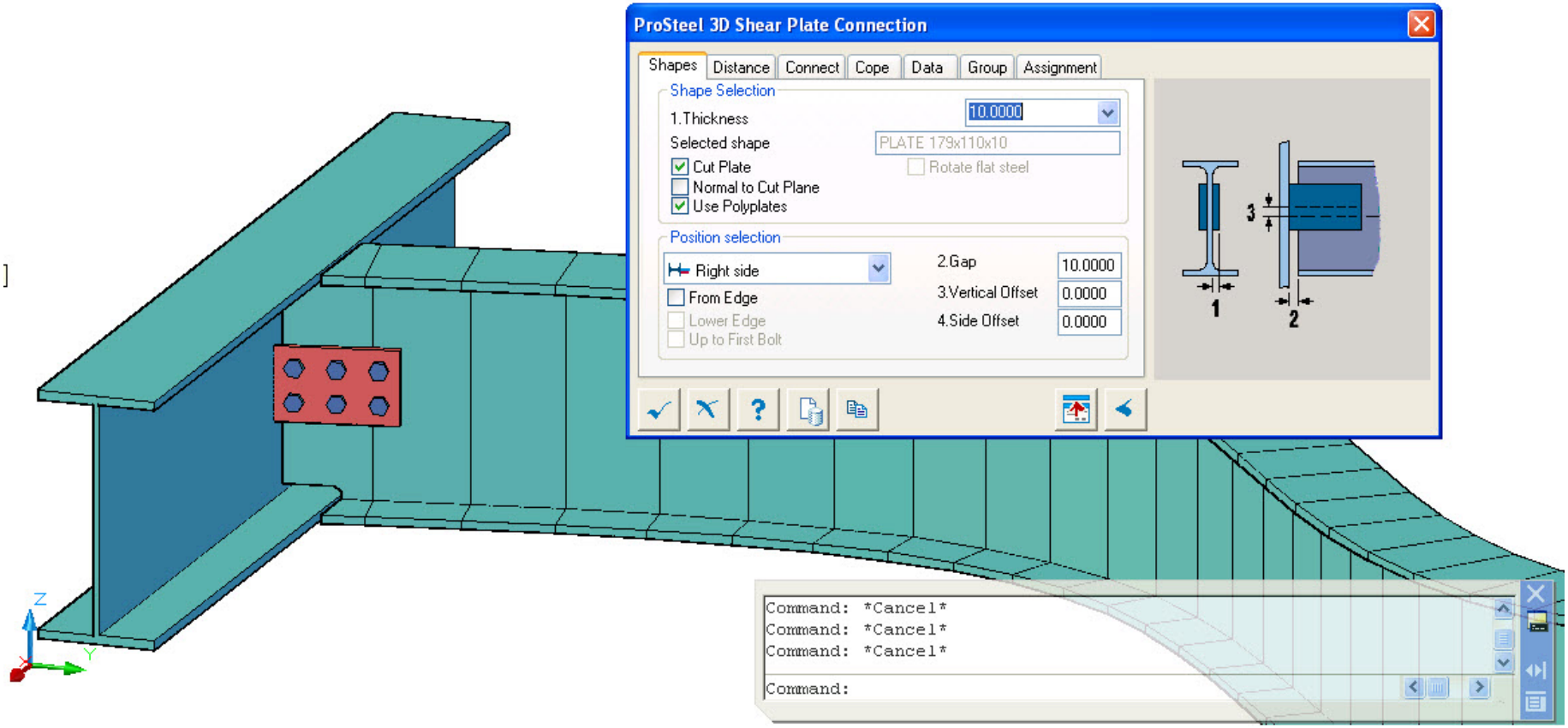
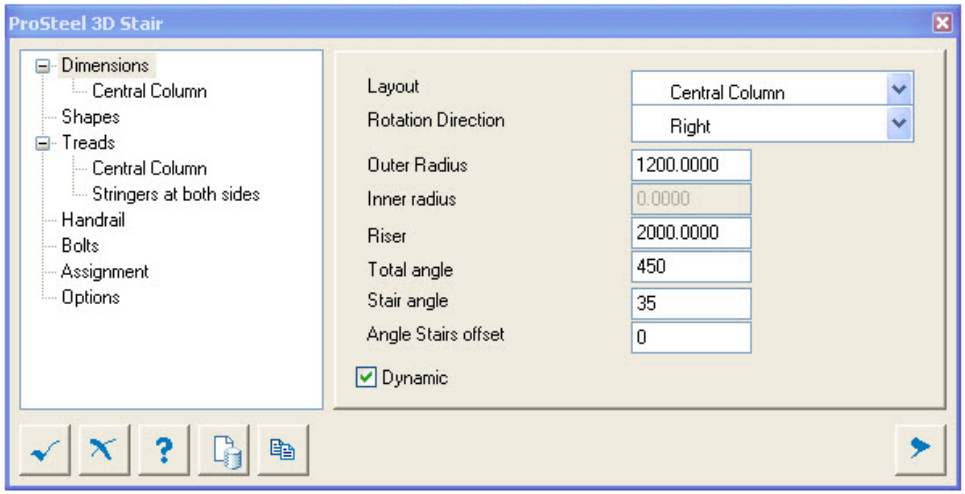
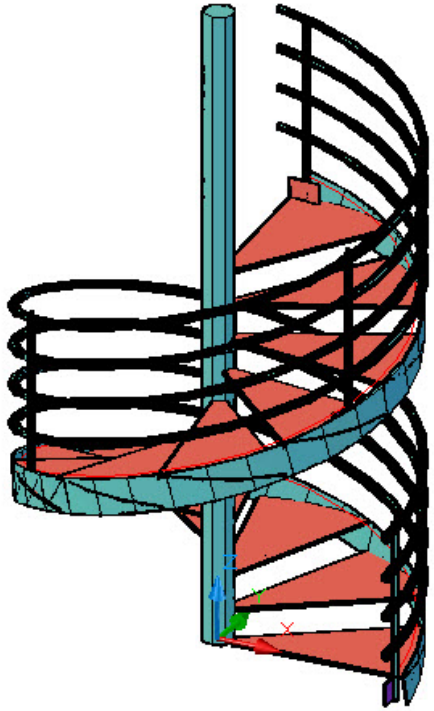
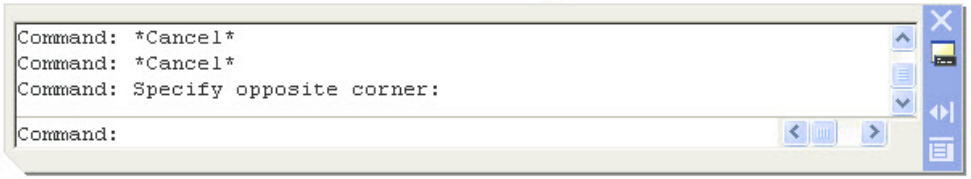

ProSteel 3D Shear Plate Connection
Shapes
Distance
Connect
Cope
Data
Group
Assignment
Shape Selection
1.Thickness
10.0000
Selected shape
PLATE 179x110x10
Cut Plate
Rotate flat steel
Normal to Cut Plane
Use Polyplates
Position selection
Right side
From Edge
Lower Edge
Up to First Bolt
2.Gap
10.0000
3.Vertical Offset
0.0000
4.Side Offset
0.0000
3
1
2
Z
Y
Command: *Cancel*
Command: *Cancel*
Command: *Cancel*
Command:

Bentley

Circular Staircase







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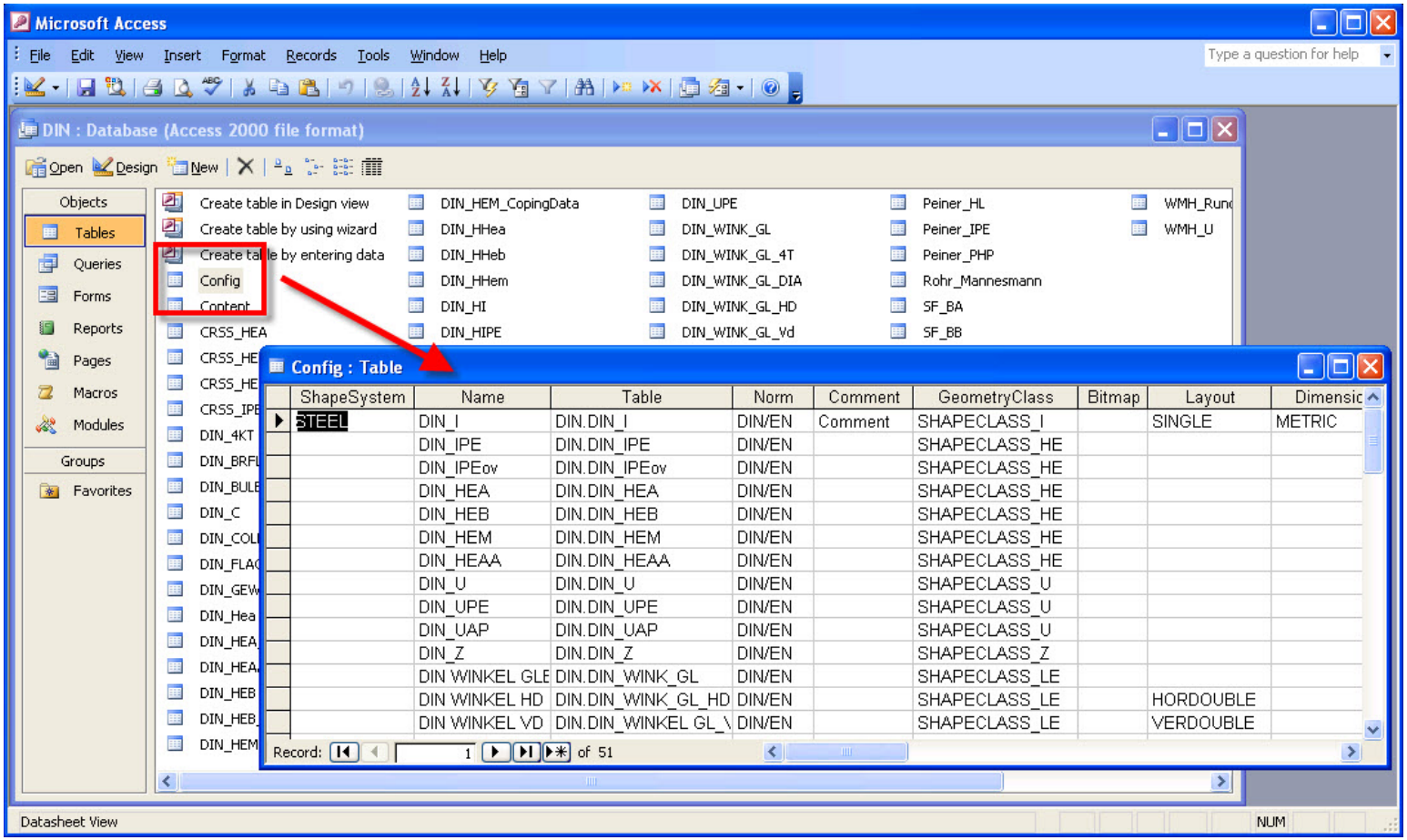
Databases in MDB format



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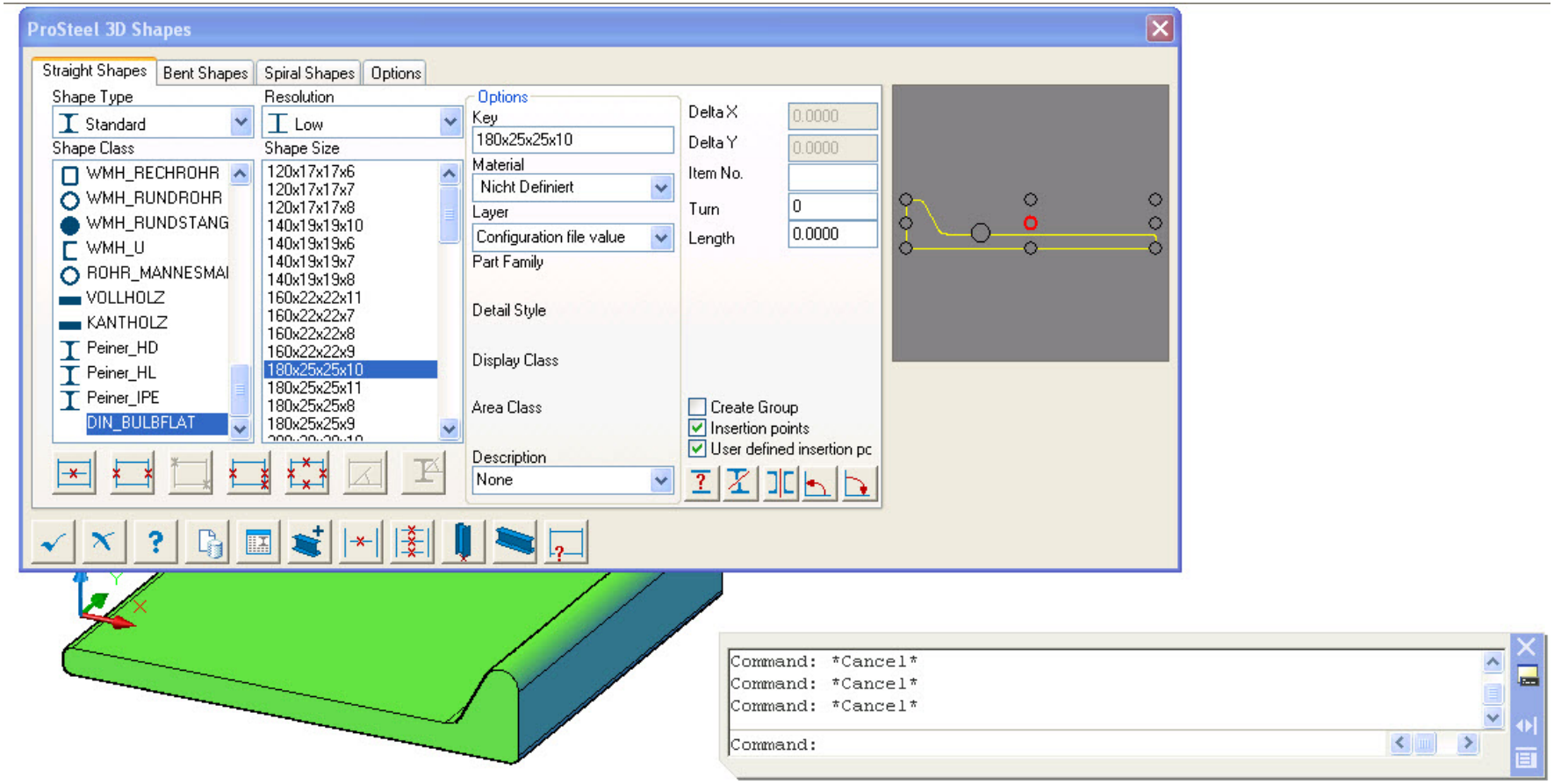
New Shape: Bulb Flat



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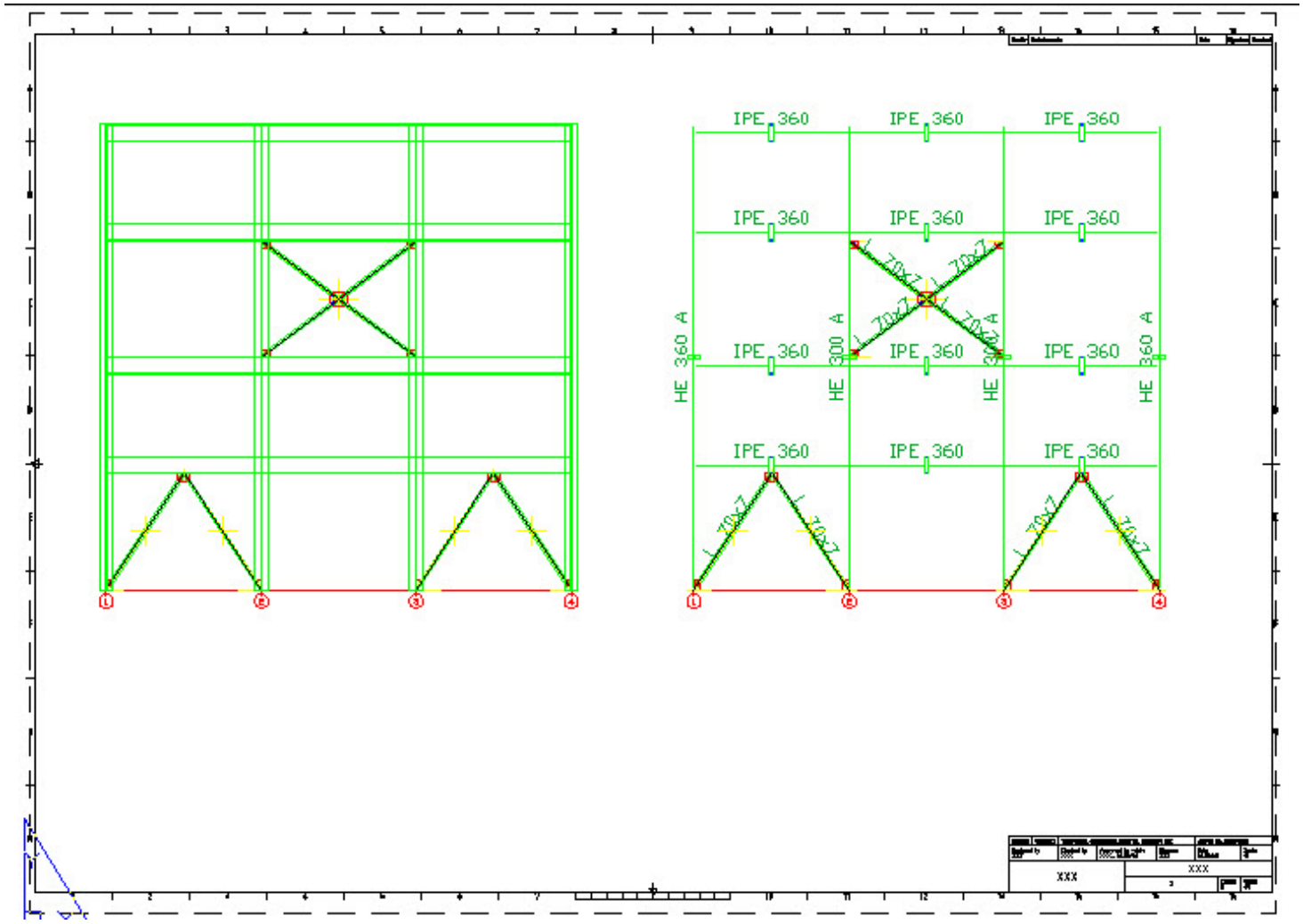
Viewport Display



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Examples

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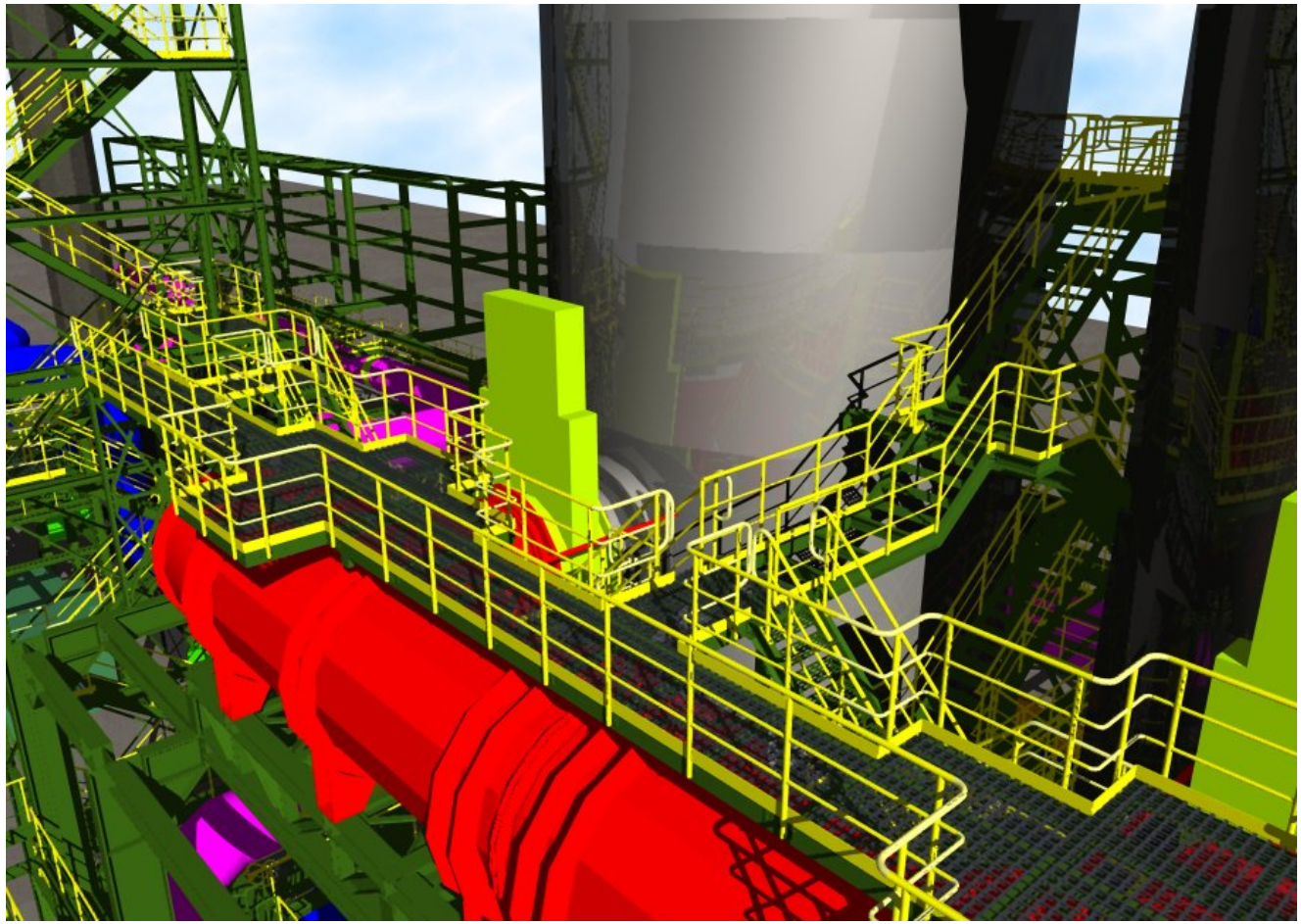
Thyssen Krupp Stahl AG / Hoffmann Konstruktionen - Blast furnace



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M/s. Larsen & Toubro Limited

HRSG for 445MW Konaseema Combined Cycle Power Plant, Andhra Pradesh, India

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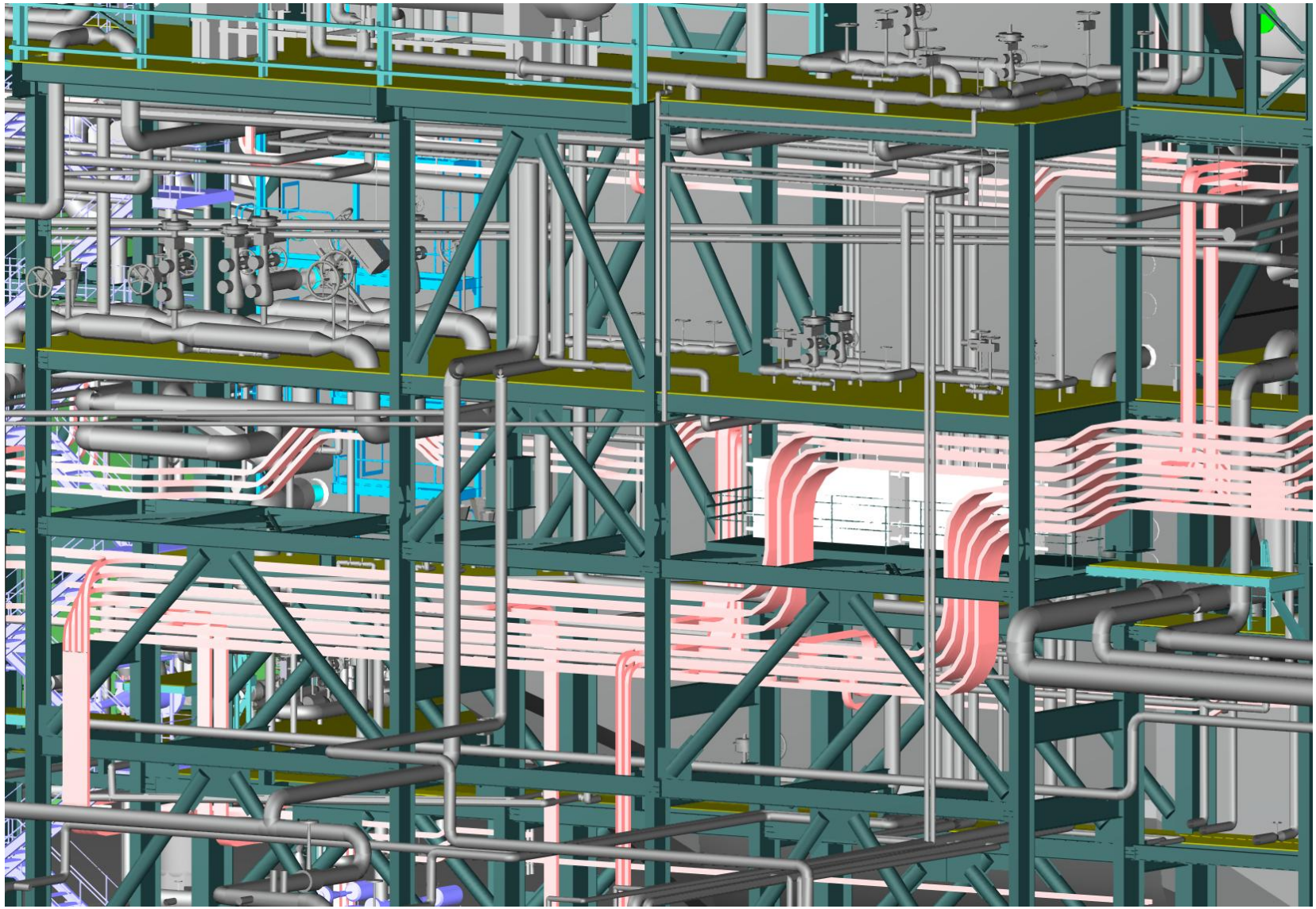

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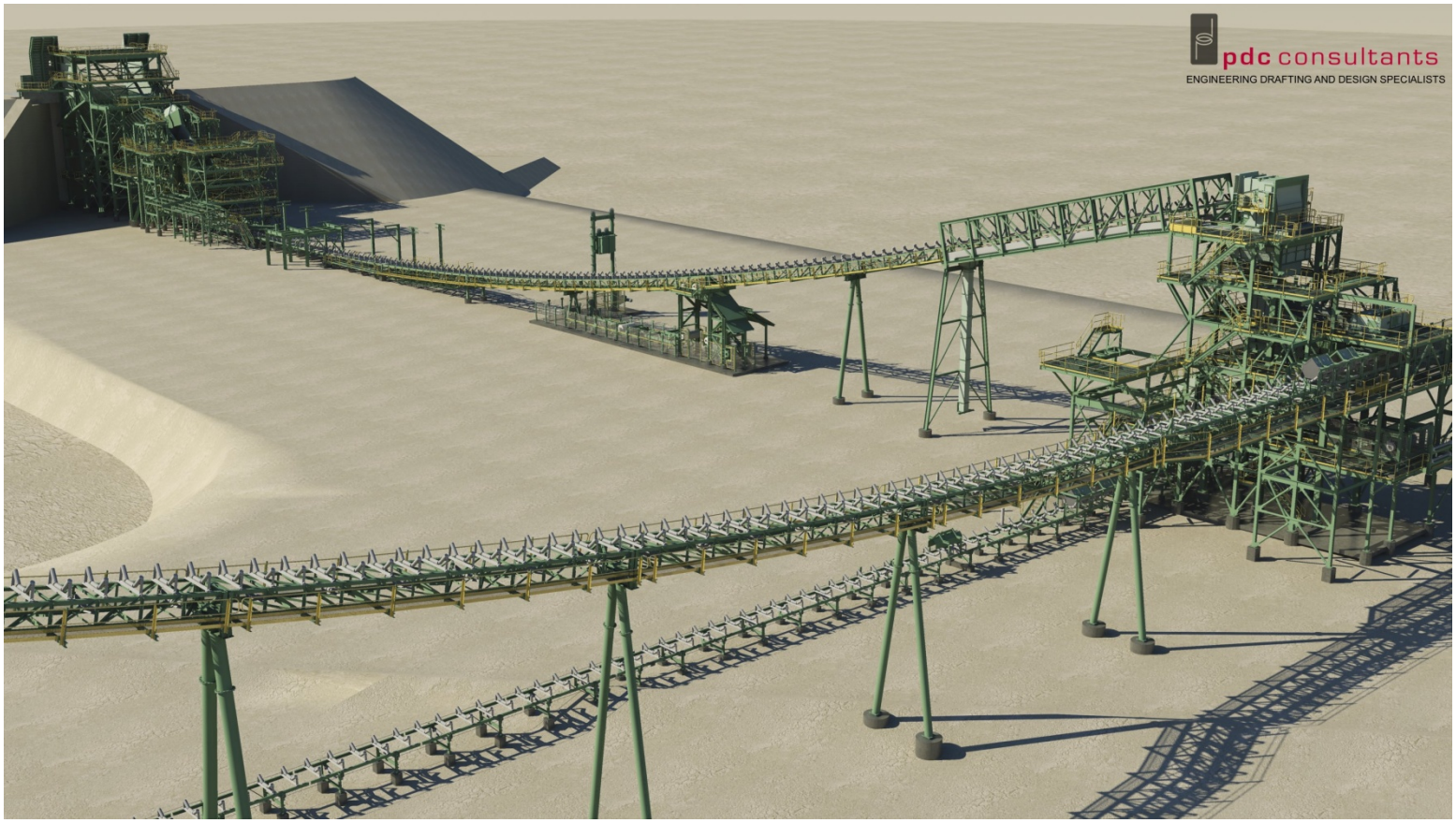
PDC Consultants
BHP Billiton Rapid Growth 3 Area C Iron Ore Project in Western Australia



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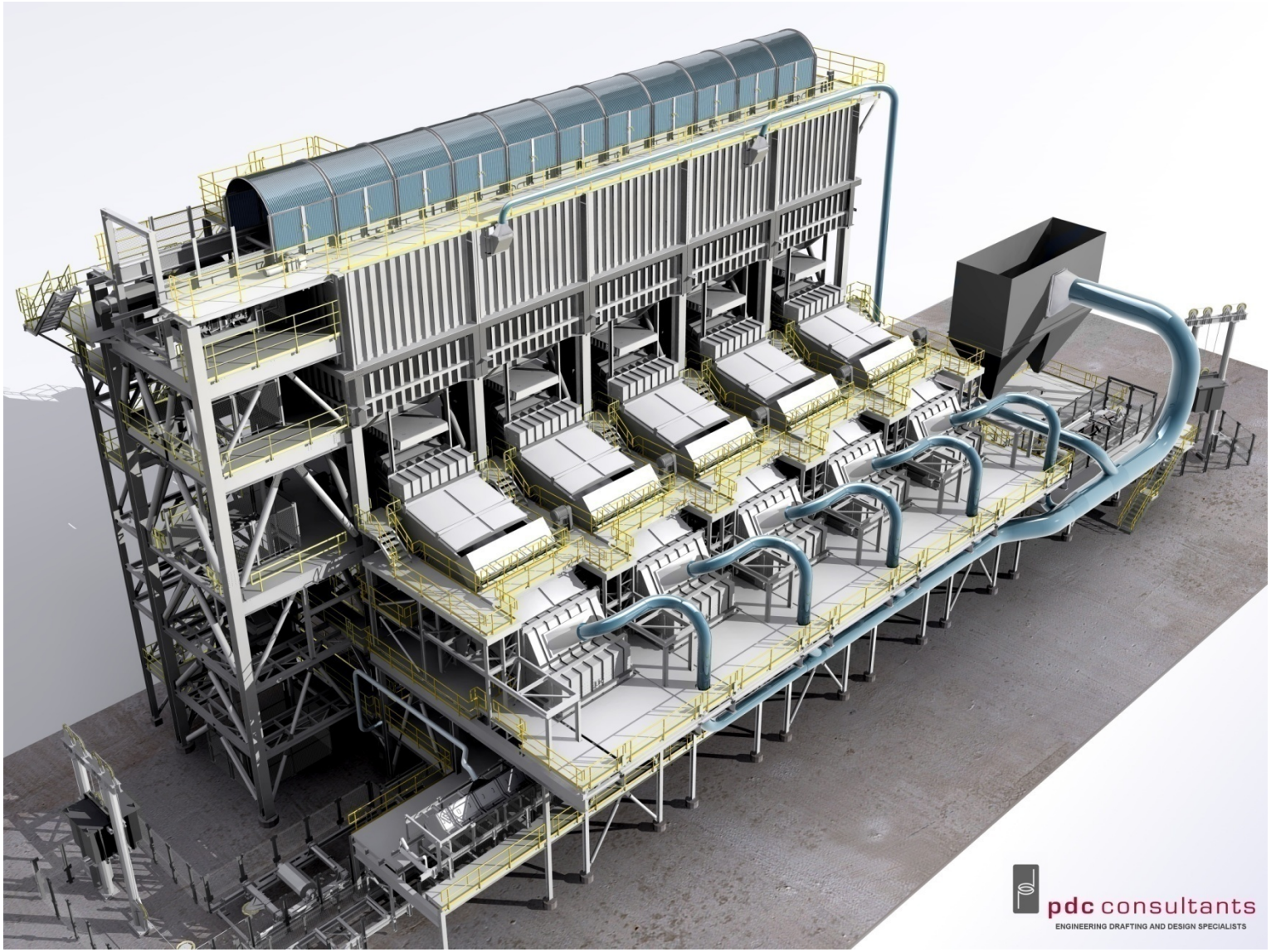

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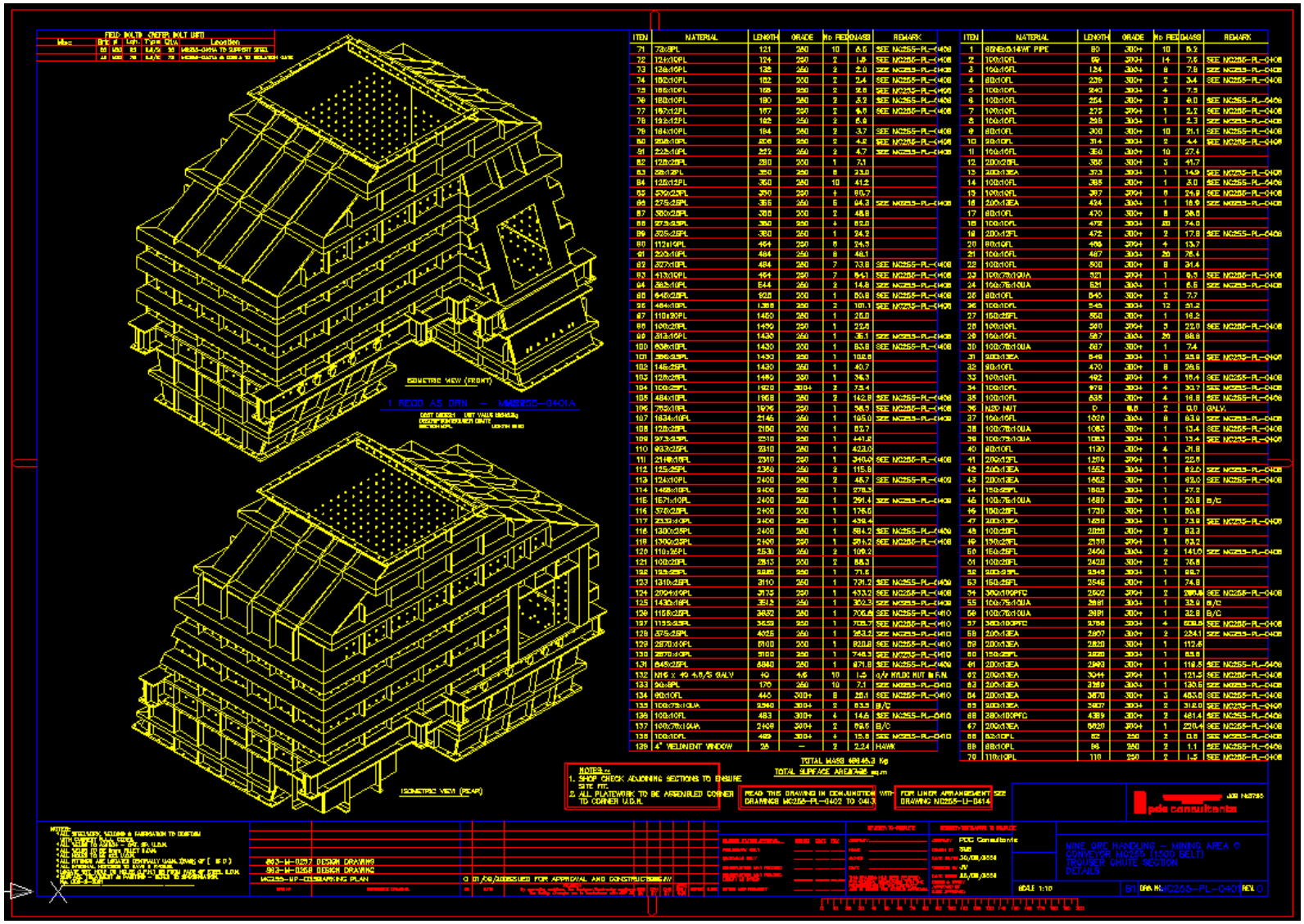

Trimo – Airport Yerevan

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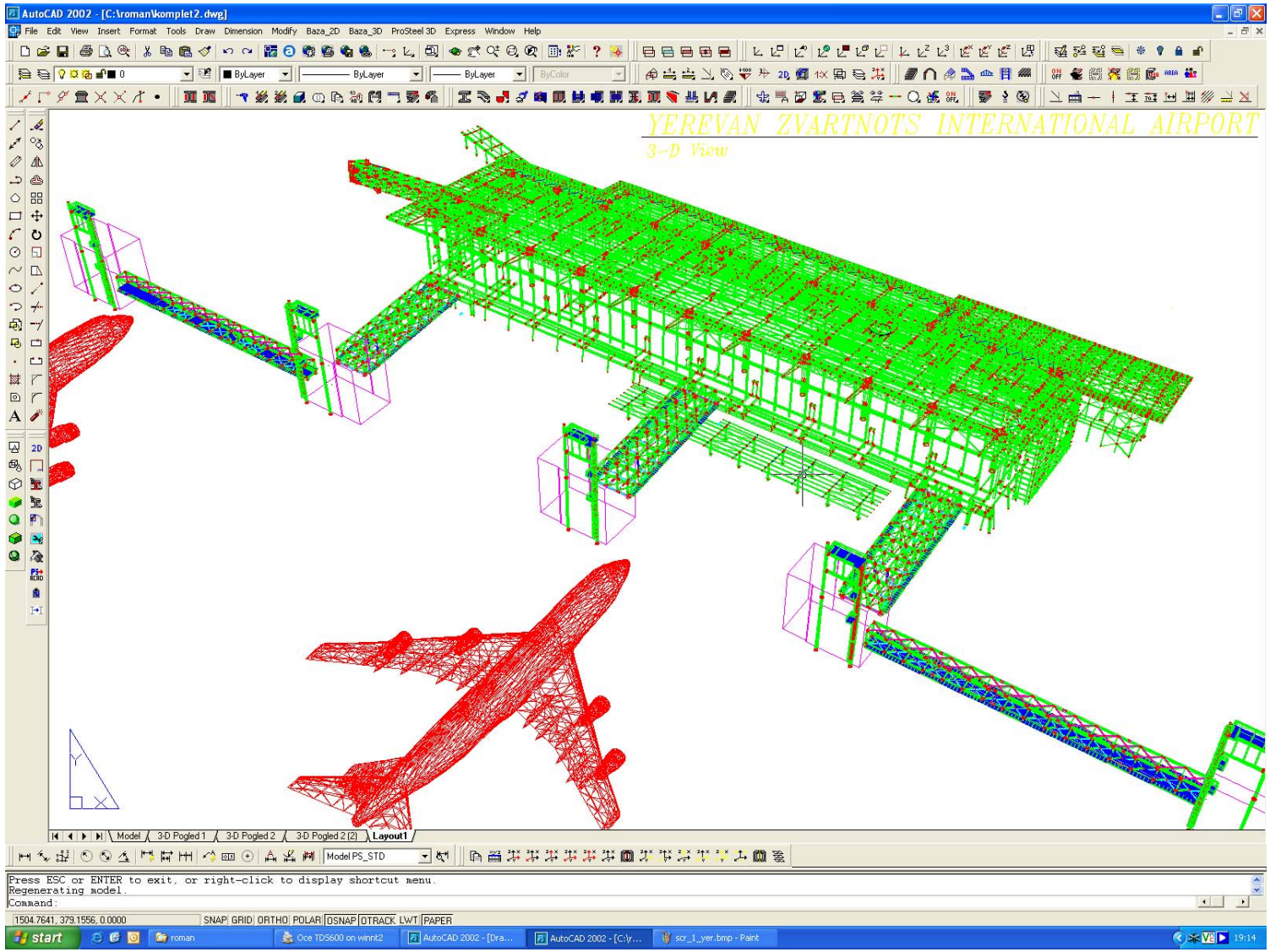
AutoCAD 2002 - [C:\roman\komplet2.dwg]
File Edit View Insert Format Tools Draw Dimension Modify Baza_2D Baza_3D ProSteel 3D Express Window Help
YEREVAN ZVARTNOTS INTERNATIONAL AIRPORT
3-D View
Model 3-D Pogled 1 3-D Pogled 2 3-D Pogled 2 (2) Layout1
Press ESC or ENTER to exit, or right-click to display shortcut menu.
Regenerating model.
Command:
1504.7641, 379.1556, 0.0000
SNAP GRID ORTHO POLAR OSNAP OTRACK LWT PAPER
start
roman
Oce TDS600 on winnt2
AutoCAD 2002 - [Dra...
AutoCAD 2002 - [C:\r...
scr_1_yer.bmp - Paint
19:14

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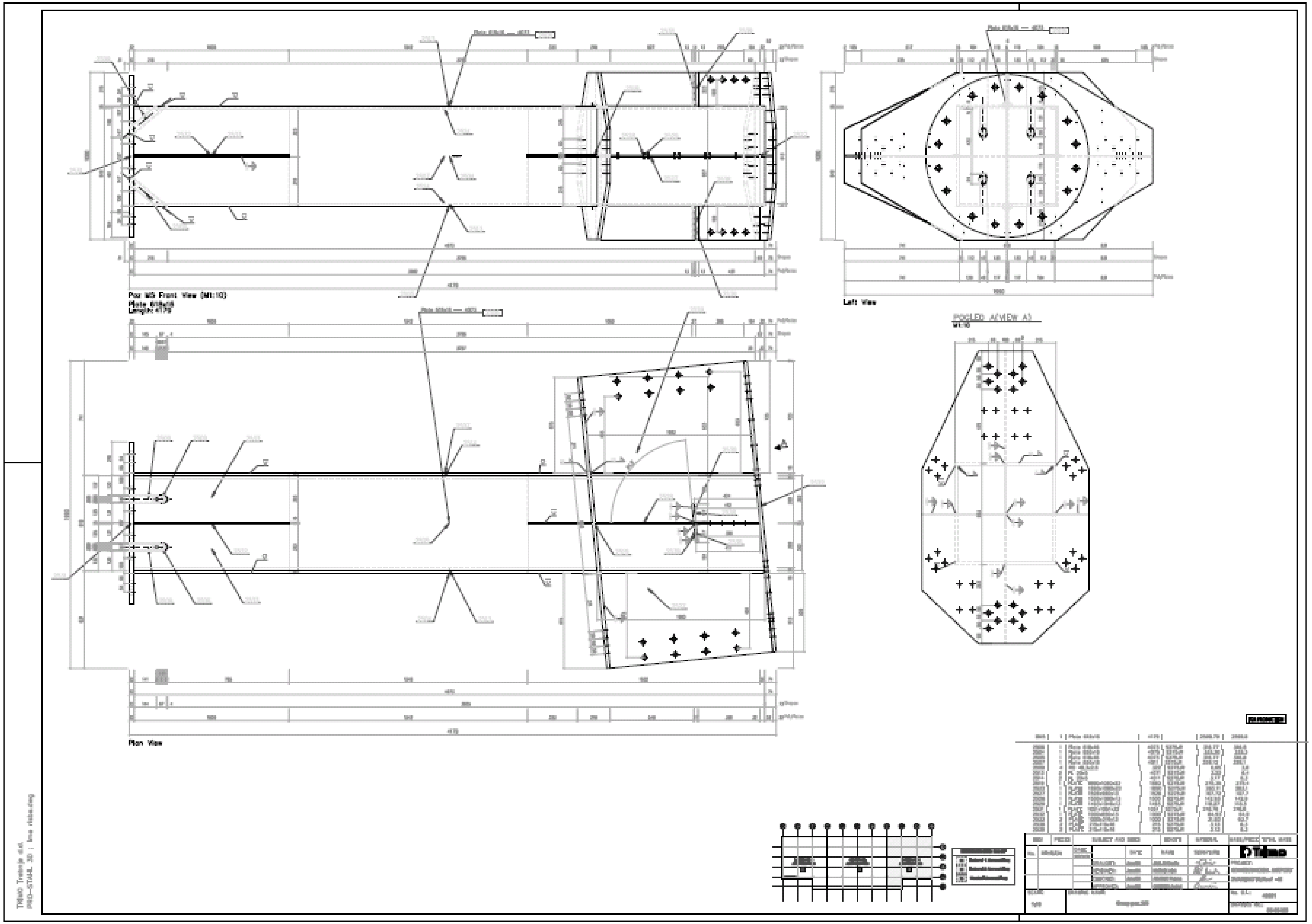

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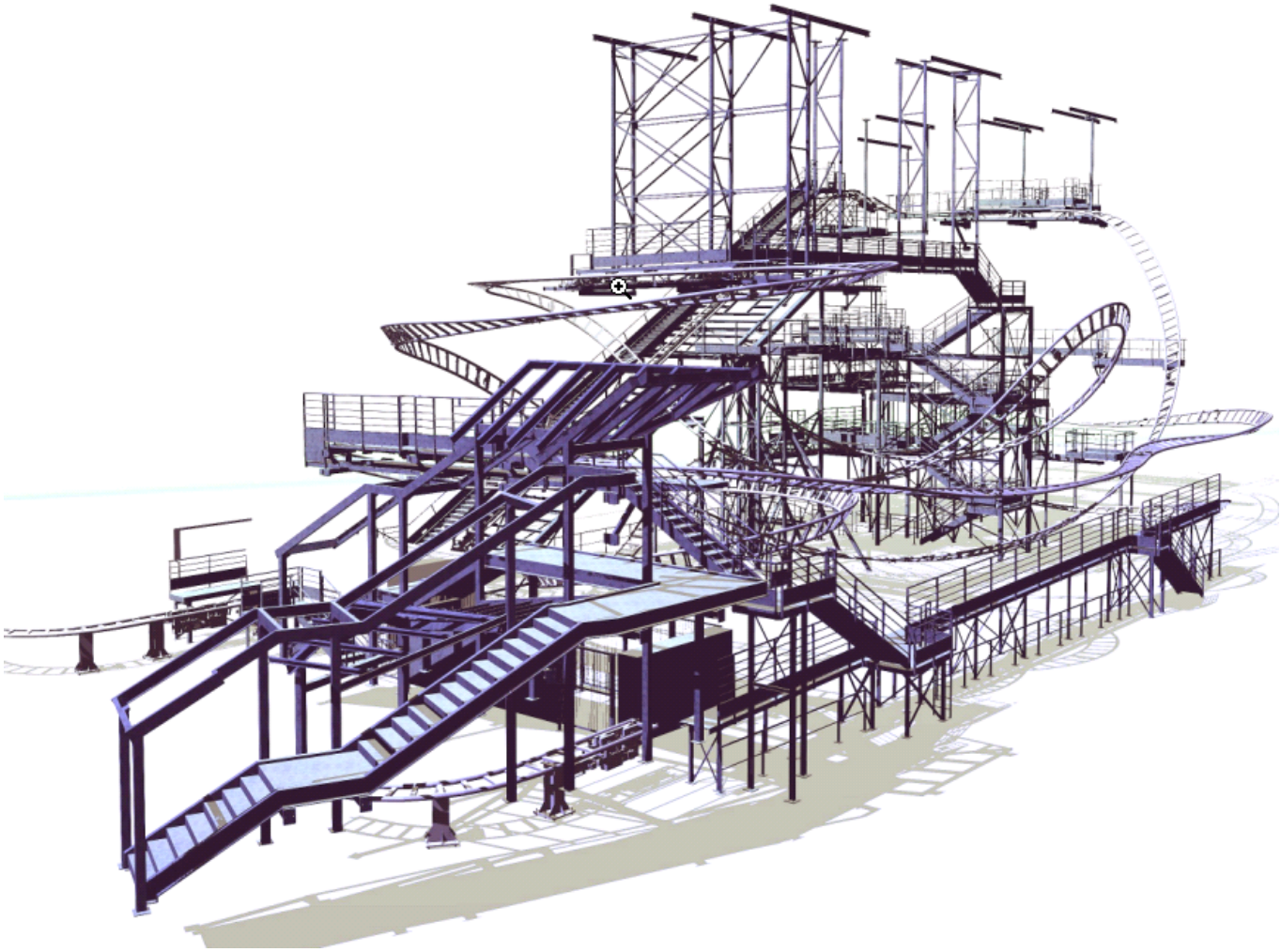
ARTEC - Eurodisney



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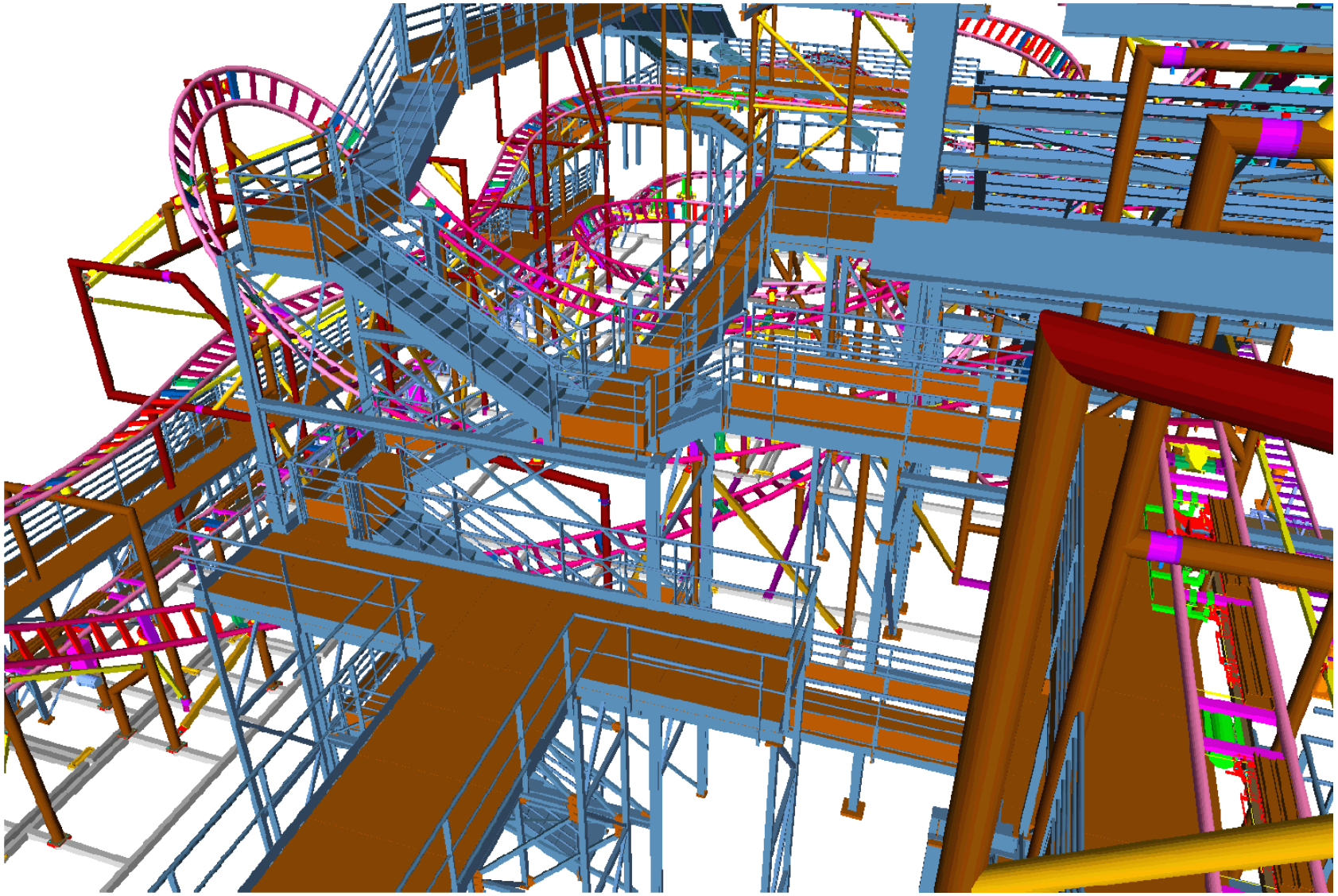

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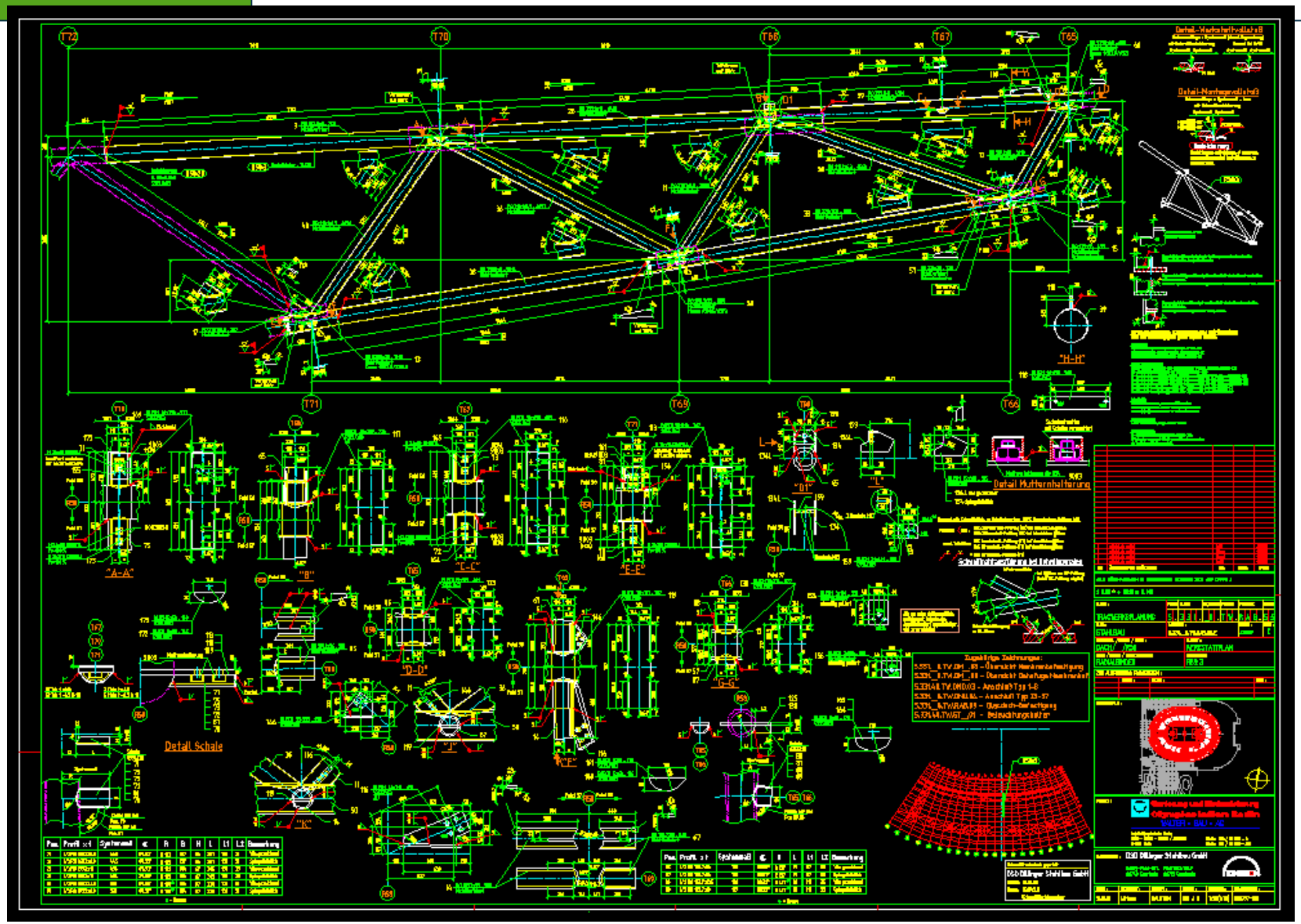
DSD Dillinger Stahlbau GmbH
Olympic Stadium, Berlin



How does ProSteel save your time?

- Integration with analysis and design software such as STAAD, RAM and Bentley Structural
- Integrated in other Bentley Solutions such as AutoPLANT, PlantSpace and Speedikon
- Based on standard platform (Microstation / AutoCAD)
- Customizable via programming and templates
- Exhaustive library of databases, handrails, stairs, trusses, connections and other details
- Robust and comprehensive generation of shop drawings and Lists automatically from 3D model

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- More effective design environment.
- Increased coordination between design, documentation and construction.
- Reduced errors and omissions project delivery time project and construction costs.
- Higher quality projects.
- Increased profitability

Thank you…

www.Bentley.com/ProSteel

Gernot Jeromin
Gernot.Jeromin@Bentley.com





Thank you

Bentley
Sustaining Infrastructure