


Hvor langt er vi nået med 3D PDF

Frank Møller Christensen
Bentleyuser.dk årsmøde 11.11.2008



Hvor langt er vi nået med 3D PDF



Historik

2008-11-11 2



Hvor langt er vi nået med 3D PDF



U3D formatet

2008-11-11 3



Universal 3D formatet



U3D formatet tillader udveksling, visualisering og animation af 3D modeller.

International standard i december 2004.


Implementeret i Adobe Acrobat version 7 i december 2004.

Print til 3D PDF og eksport til U3D blev i 2005 implementeret i MicroStation V8 og InterPlot produktet.

2008-11-11 4



3D PDF




3D PDF er implementeret i produkterne:


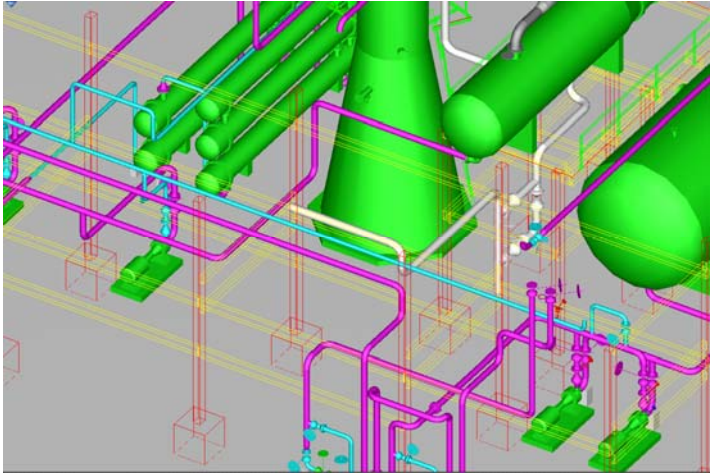
- MicroStation V8 – MicroStation V8i.
- Bentley Redline V8 – Bentley Redline V8i.
- Bentley View V8 – Bentley View V8i.
- ProjectWise Navigator.

Dvs., at alle har mulighed for at lave 3D PDF uden større omkostning (Bentley View).

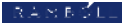
Der er mulighed for at lave 3D PDF for større multidisciplinære projekter (ProjectWise Navigator).

2008-11-11 5 

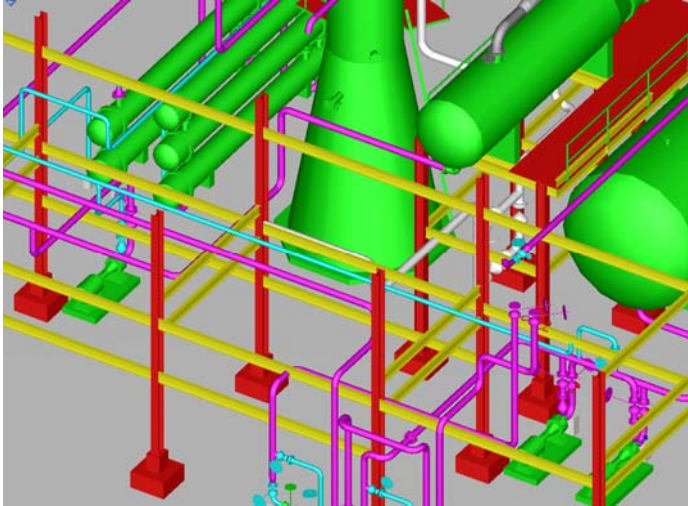
MicroStation V8 XM

MicroStation V8 XM indeholder ikke object enablers. I tilfældet her for AutoPLANT Structural.

2008-11-11 6 

ProjectWise Navigator



ProjectWise Navigator indeholder object enablers. I tilfældet her for AutoPLANT Structural.

2008-11-11 7

Hvor langt er vi nået med 3D PDF



Ændringer i MicroStation V8 XM og V8i

2008-11-11 8

Ændringer i MicroStation V8 XM og V8i



Generelt kan det siges, at har man adgang til MicroStation V8i, bør denne benyttes til at lave 3D PDF frem for MicroStation V8 XM.

En del af de viste eksempler giver problemer eller kan ikke printes til 3D PDF ved brug af MicroStation V8 XM.

Endvidere er en del af problemerne omkring for lidt hukommelse til store modeller løst i MicroStation V8i.

2008-11-11 9



Ændringer i MicroStation V8 XM og V8i




Brugervenlig Print dialog

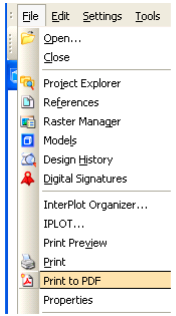
2008-11-11 10



Brugervenlig Print Dialog



File Edit Element
New...
Open...
Close
Save
Save As...
Compress
Save Settings
Project Explorer
Reference
Raster Manager
Models
Import
Export
Digital InterPlot
IPLLOT...
Print Preview
Print
Batch Print
Associate...
Properties
Protection
Send...

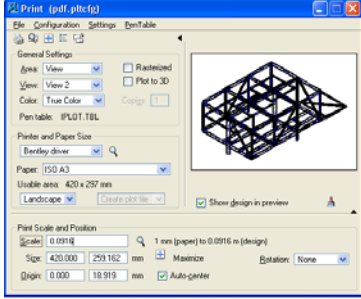


File Edit Settings Tools
Open...
Close
Project Explorer
References
Raster Manager
Models
Design History
Digital Signatures
InterPlot Organizer...
IPLLOT...
Print Preview
Print to PDF
Properties

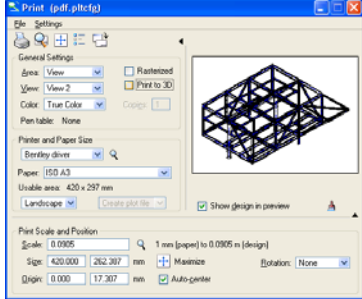
MicroStation V8 XM Bentley View V8i

2008-11-11 11

Brugervenlig Print Dialog



Print (pdf.pltcf) File Configuration Settings OpenTable
General Settings
Area: View
View: View 2
Color: True Color
Rasterized
Plot to 3D
Pen table: IPLLOT.TBL
Printer and Paper Size
Printer: Bentley driver
Paper: ISO A3
Usable area: 420 x 297 mm
Landscape
Print Scale and Position
Scale: 0.0916
Size: 420.000 x 297.162 mm
Origin: 0.000 x 18.919 mm
Auto-center

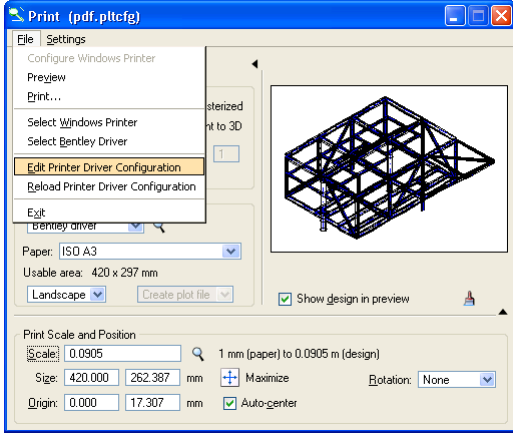


Print (pdf.pltcf) File Settings
General Settings
Area: View
View: View 2
Color: True Color
Rasterized
Plot to 3D
Pen table: None
Printer and Paper Size
Printer: Bentley driver
Paper: ISO A3
Usable area: 420 x 297 mm
Landscape
Print Scale and Position
Scale: 0.0905
Size: 420.000 x 292.207 mm
Origin: 0.000 x 17.307 mm
Auto-center

MicroStation V8 XM Bentley View V8i

2008-11-11 12

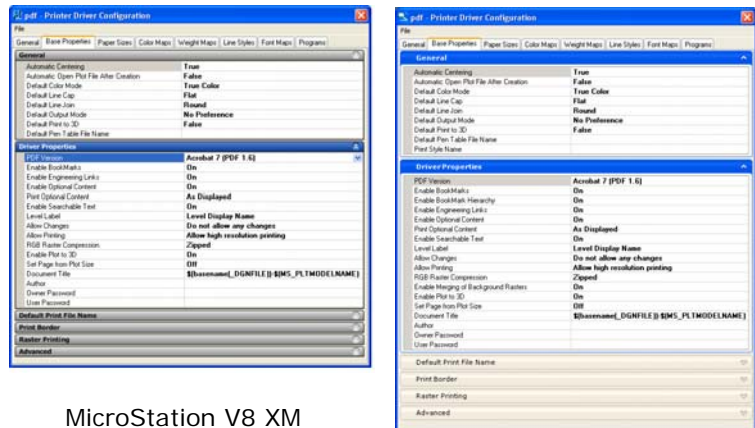
Brugervenlig Print Dialog



Ved at ændre i "Printer Driver Configuration" kan man styre indholdet i 3D PDF-filen.

2008-11-11 13

Brugervenlig Print Dialog





MicroStation V8 XM

Bentley View V8i

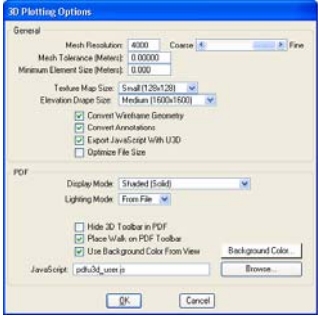
2008-11-11 14

Brugervenlig Print Dialog





MicroStation V8 XM




Bentley View V8i

I "3D Plotting Options" sætter man parametrene, som styrer overførelsen af data til 3D PDF-filen.

2008-11-11 15

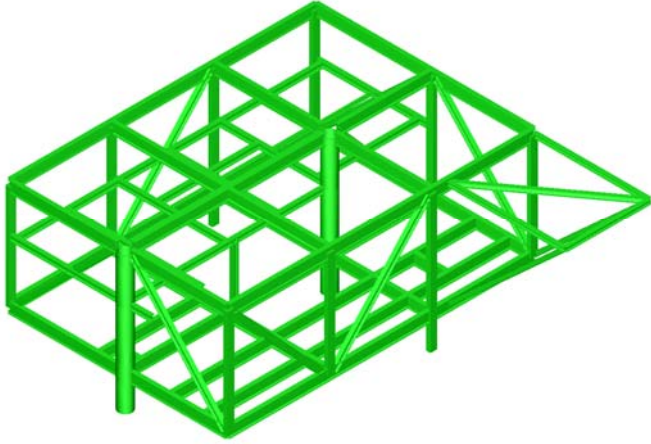
Hvor langt er vi nået med 3D PDF



Clip Volumes, Clip Masks og Reference Clip Boundaries

2008-11-11 16

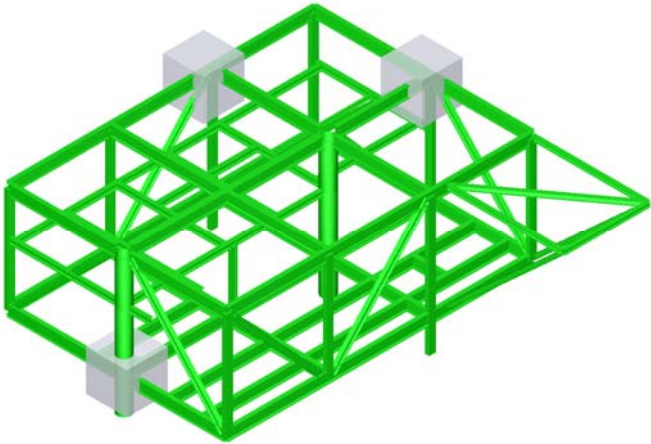
Clip volumes, clip masks og reference clip boundaries



Clip volumes, clip masks og reference clip boundaries fungerer ganske godt i begge versioner.

2008-11-11 17

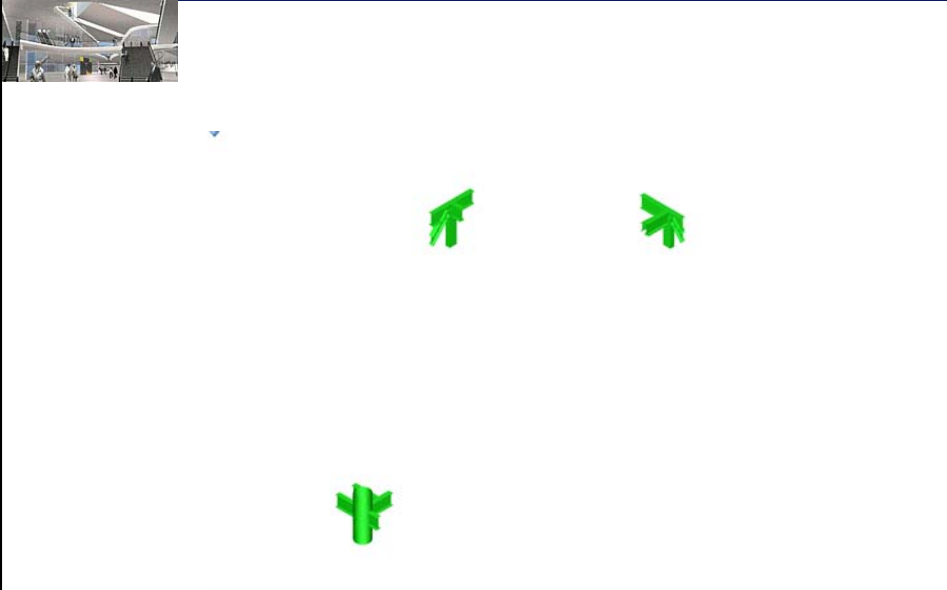
Clip volumes, clip masks og reference clip boundaries



Eksemplet viser 3 clip volumes, og som det ses understøttes transparente flader også.

2008-11-11 18

Clip volumes, clip masks og reference clip boundaries



Eksemplet viser, at Clip volumes gør det muligt, på en simpel måde, at fremhæve mindre detaljer.

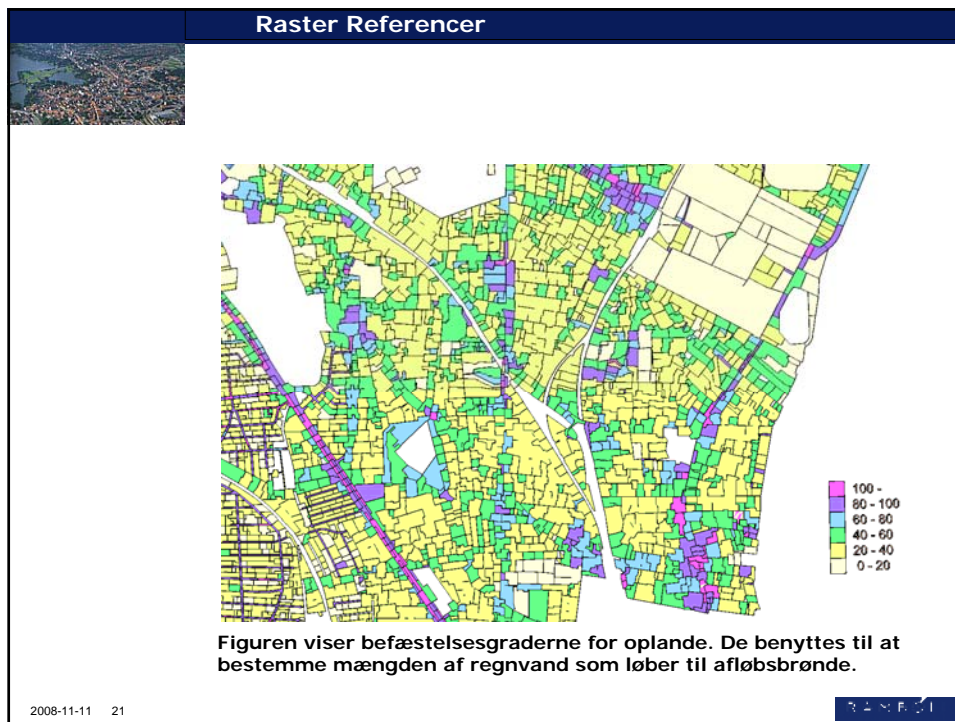
2008-11-11 19

Hvor langt er vi nået med 3D PDF





Raster Referencer

2008-11-11 20




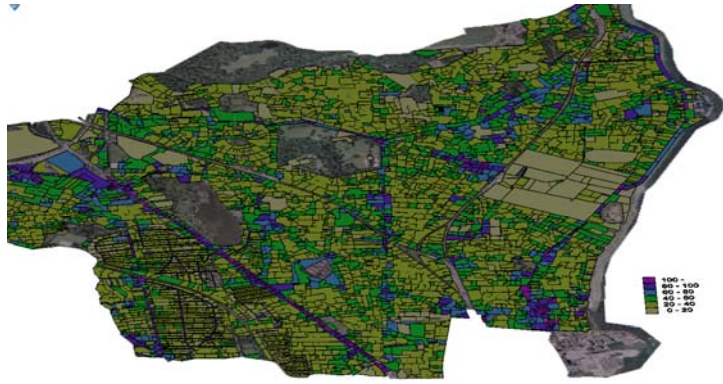
Raster Referencer

Rasterreferencerne overføres som alt anden information til 3D PDF.

2008-11-11 23

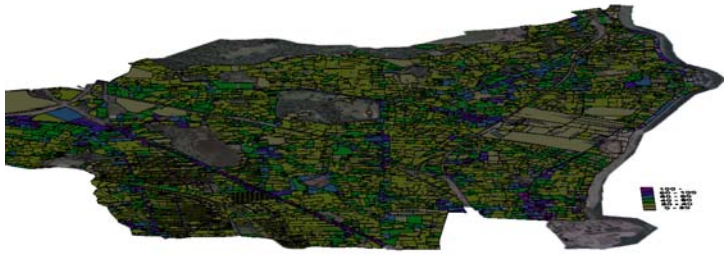
Raster Referencer

Da der arbejdes i 3D, kan man rumligt vandre rundt i sine beregningsdata i 3D PDF-filen.

2008-11-11 24

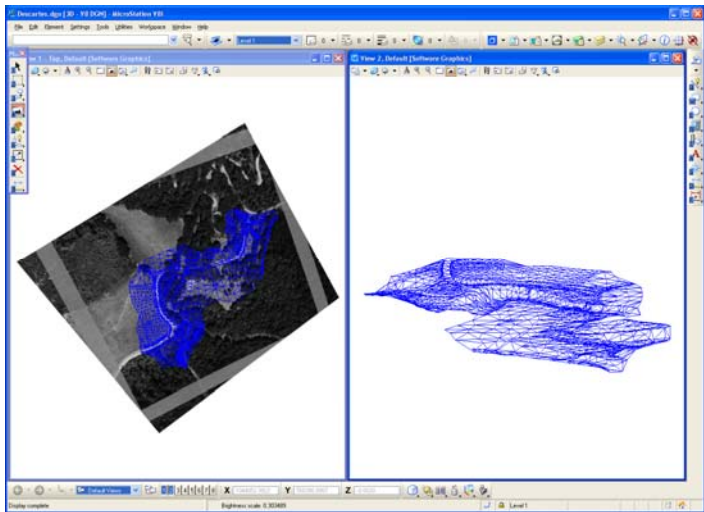
Raster Referencer



I eksemplet her, er både beregningsdata som rasterfilerne 2D repræsentationer.

2008-11-11 25

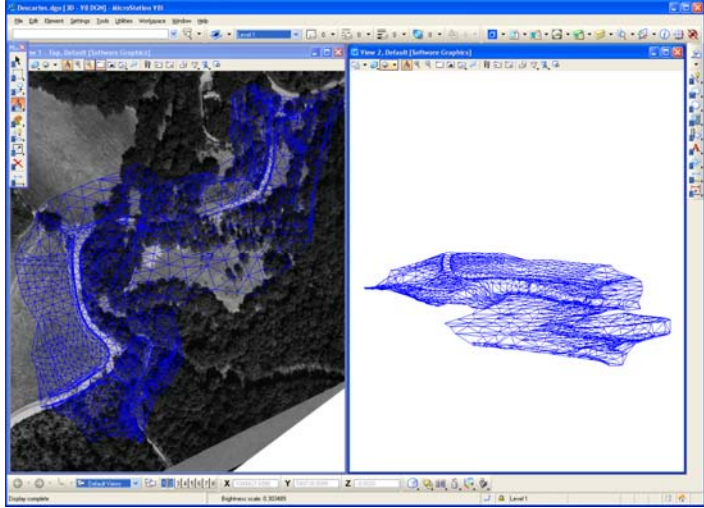
Raster Referencer



Et 2-dimensionalt luftfoto kan gøres 3-dimensionalt ved draping.

2008-11-11 26

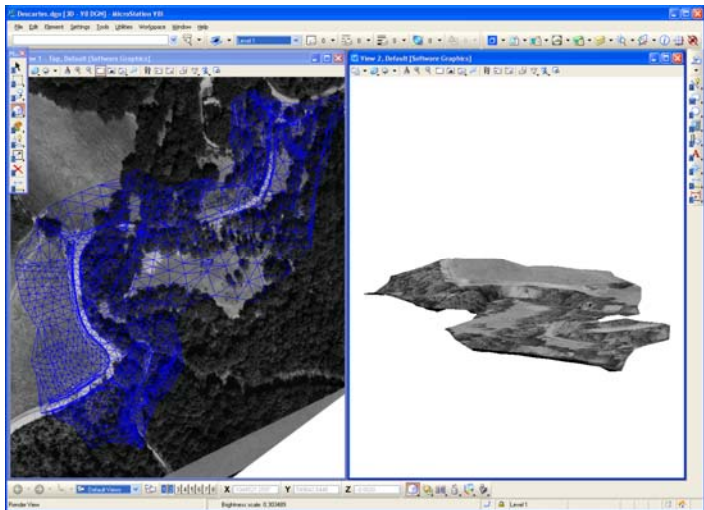
Raster Referencer



For at kunne drape skal rasterreferencefilen have tilknyttet et koordinatsystem, og man skal også have en DTM-model.

2008-11-11 27

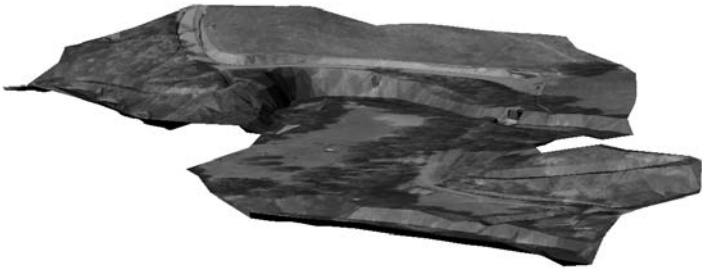

Raster Referencer



Draping'en, som er vist til højre, er foretaget med Bentley Descartes, men MicroStation kan også bruges.


2008-11-11 28

Raster Referencer



For at kunne printe en draped model til 3D PDF skal MicroStation V8i benyttes.

2008-11-11 29



Hvor langt er vi nået med 3D PDF




Mesh Tolerance

2008-11-11 30




Mesh Tolerance



Med mesh tolerancen styrer man, hvor godt krumme og dobbeltkrumme elementer overføres til 3D PDF. Man styrer pilhøjden fra det tilnærmede rette element til det krumme element.

2008-11-11 31

Mesh Tolerance



Eksemplet viser turbine og vinger på en vindmølle. Mesh tolerancen er sat til 0 og mesh resolution er lig 4000.

2008-11-11 32

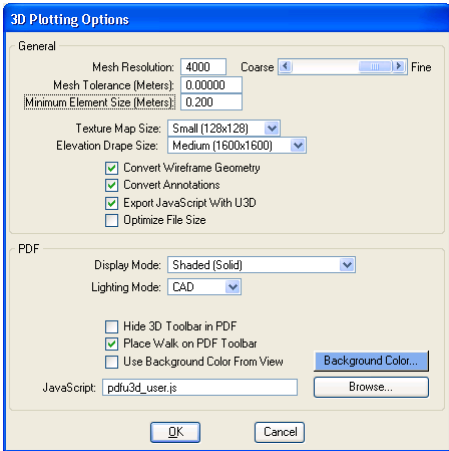
Mesh Tolerance



På figuren er der zoomet ind omkring en detalje i 3D PDF-filen. Som det ses på bolten, er præcisionen ganske høj.

2008-11-11 33

Mesh Tolerance



Man kan benytte "Minimum Element Size" til at fjerne små elementer i 3D PDF-filen. Sættes værdien til 0.20, fremkommer næste figur.

2008-11-11 34

Mesh Tolerance




Som det fremgår, er boltene nu udeladt fra 3D PDF-filen. Filens størrelse er reduceret med ca. 30%.

2008-11-11 35




Hvor langt er vi nået med 3D PDF



Engineering Links Support

2008-11-11 36



Engineering Link Support



Engineering Links kan overføres til 3D PDF-filer. Personligt mener jeg, at Engineering Links ikke er særlig interessante. Man har større glæde af at kunne overføre beskrivende komponentdata til 3D PDF-filer.

Dokumentationen for ProjectWise InterPlot V8i beskriver, hvordan man kan føre komponentdata over i 2D PDF-filer. Metoden virker formodentligt også med 3D PDF.

2008-11-11 37



Hvor langt er vi nået med 3D PDF

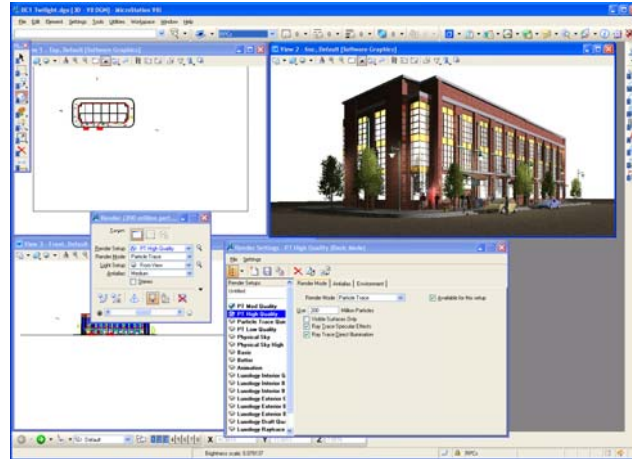


Publish Global Lighting Solutions

2008-11-11 38



Publish Global Lighting Solutions



Fotorealistiske renderinger kan overføres til 3D PDF, såfremt der benyttes particle tracing. Det benyttede eksempel er taget fra Bentleys bog "Rendering with MicroStation". Bogen indeholder mange gode eksempler, som man kan øve sig på.

2008-11-11 39



Publish Global Lighting Solutions




Billedet her er fra 3D PDF-filen. Der kan opnås en bedre kvalitet end vist, men her kommer vore talenter i spil. Man skal benytte MicroStation V8i, for at kunne printe en particle traced model til 3D PDF.

2008-11-11 40



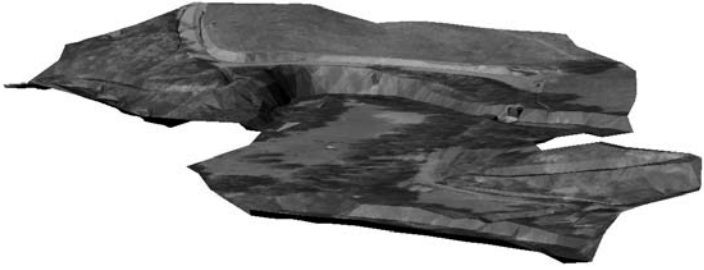
Publish Global Lighting Solutions



Som det fremgår af billedet, overføres RPC celler til 3D PDF-filen.
Dog kun som plane elementer.

2008-11-11 41

Publish Global Lighting Solutions



Vender vi tilbage til drapede rasterfiler, så har disse ingen materialer tilknyttet, og particle tracing forbedrer derfor ikke renderingen af disse.

2008-11-11 42

Hvor langt er vi nået med 3D PDF




Opsætning af parametre

2008-11-11 43



Opsætning af parametre



Print - Raster Options

General

Print raster images

Raster Color

Print raster in grayscale

Print monochrome raster as-is

Brightness: 0 -100

Contrast: 0 -100

Raster Quality


Quality factor: 100 1

Printer resolution (dpi): 600

Raster resolution (dpi): 600

OK Cancel

2008-11-11 44



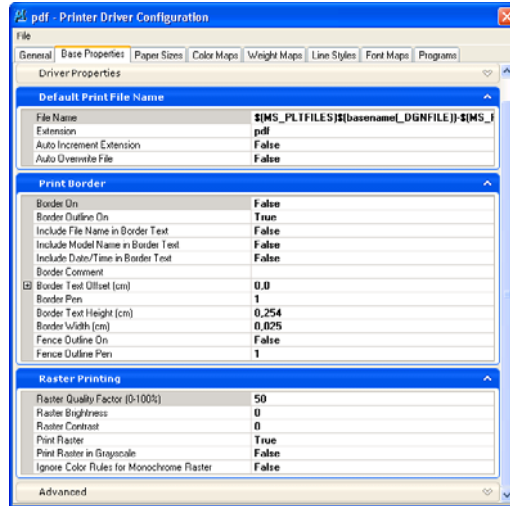
Opsætning af parametre

2008-11-11 45

Opsætning af parametre

2008-11-11 46

Opsætning af parametre



2008-11-11 47



Hvor langt er vi nået med 3D PDF

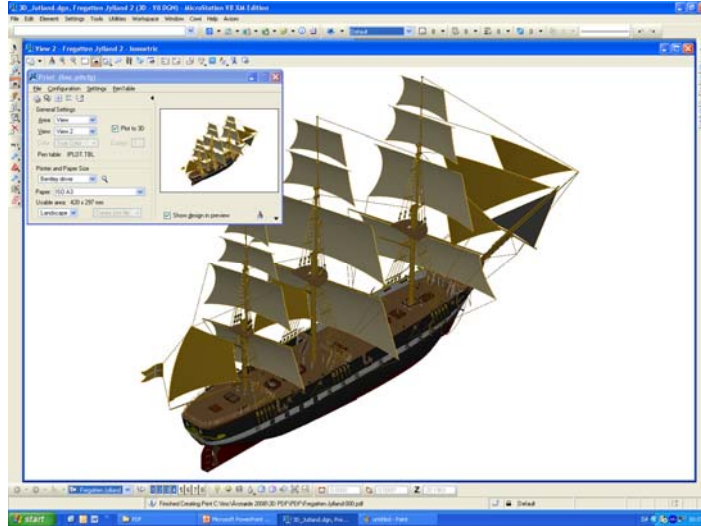


Hvordan printes til 3D PDF

2008-11-11 48



Hvordan printes til 3D PDF



2008-11-11 49



Hvordan printes til 3D PDF



2008-11-11 50



Hvordan printes til 3D PDF



- **Fordele**
Overfører Saved Views.
- **Ulemper**
Kan ikke indsættes vilkårligt men skal altid indsættes som en hel side.

2008-11-11 51



Hvordan printes til 3D PDF



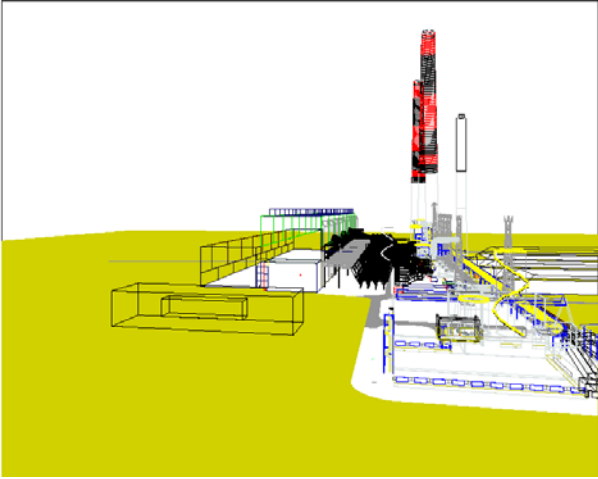
Print til 3D PDF

- MicroStation tilføjer automatisk et JavaScript.
- MicroStation indsætter Saved Views.
- Placeringen på plottet bør være korrekt.
- Acrobat Professional skal benyttes for at kunne lave links og bookmarks.
- Acrobat Professional skal benyttes for at kunne lave posters.

2008-11-11 52




Hvordan printes til 3D PDF

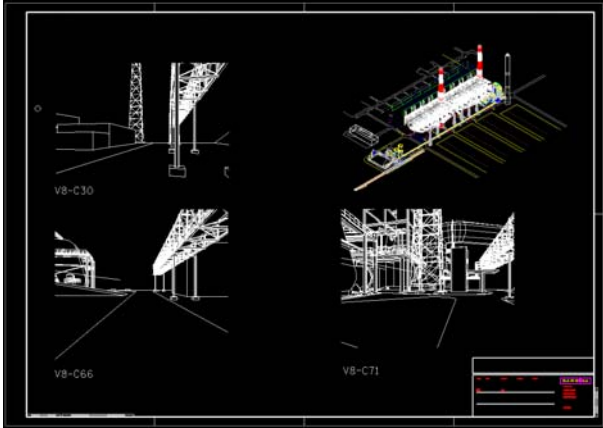


A 3D architectural rendering of an industrial facility. The scene features a prominent tall, cylindrical tower with red and black segments. In the foreground, there are various structures including a long, low building with a green roof, a fenced-in area, and a complex network of pipes and walkways. The ground is a flat, bright yellow color. A small inset image in the top left corner shows a photograph of a real-world building.

2008-11-11 53




Hvordan printes til 3D PDF

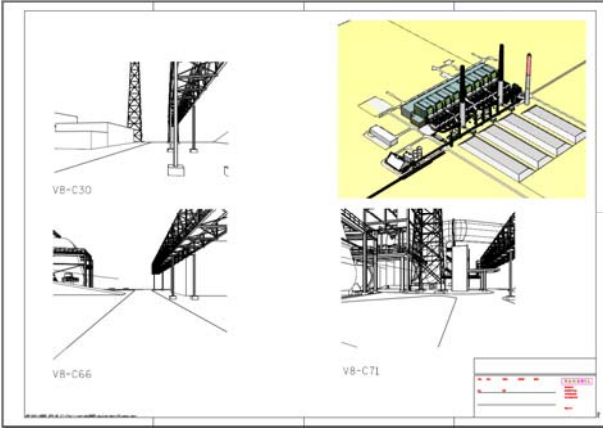



A collection of 3D wireframe views of industrial structures. The views are arranged in a grid. The top-left view is labeled 'V8-C30' and shows a tall, lattice-structured tower. The bottom-left view is labeled 'V8-C66' and shows a complex structure with multiple levels and a curved roof. The bottom-right view is labeled 'V8-C71' and shows a large, multi-story industrial building with a complex internal structure. A top-right view shows a perspective view of a building with a red roof. A small inset image in the top left corner shows a photograph of a real-world building.


2008-11-11 54



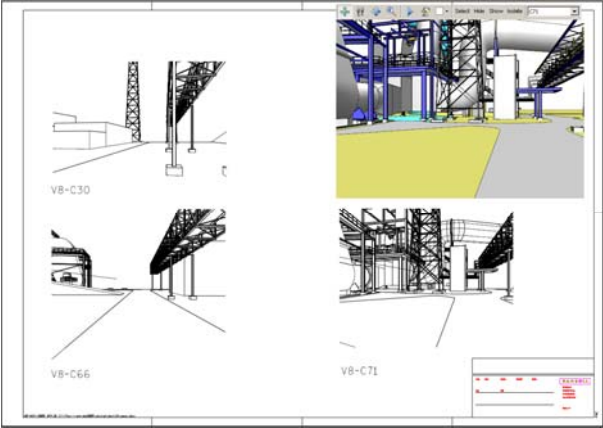

Hvordan printes til 3D PDF




2008-11-11 55




Hvordan printes til 3D PDF



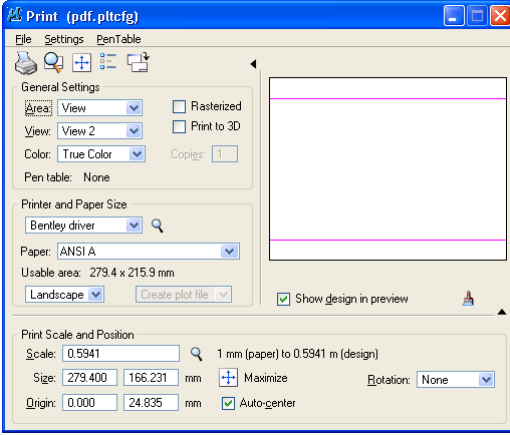
2008-11-11 56




Hvordan printes til 3D PDF




MicroStation 3D



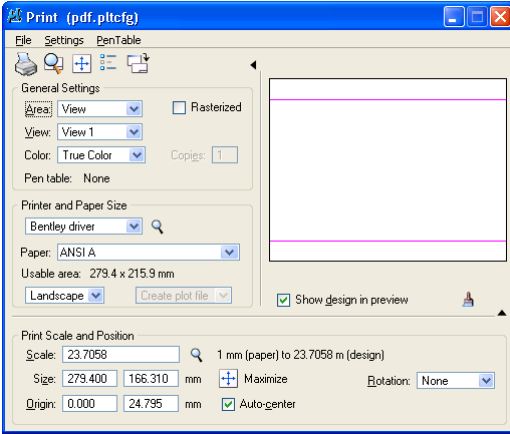
2008-11-11 57




Hvordan printes til 3D PDF




MicroStation 2D



2008-11-11 58



Hvordan printes til 3D PDF



References (48 of 48 unique, 46 displayed)

Slot	File Name	Model	Logical	Presentation						
5	V8-C71.hln	Default	c71	Wireframe	0	0	✓	✓	✓	
4	V8-C66.hln	Default	c66	Wireframe	0	0	✓	✓	✓	
3	V8-C30.hln	Default	c30	Wireframe	0	0	✓	✓	✓	
2	0000-1175.dgn	Default	VIEW1	Wireframe	0	0	✓	✓	✓	✓
1	nshl_v8.dgn	Default	P	Wireframe	0	0	✓	✓	✓	

Scale: 1.000000 : 2000.000000 Rotation: _____


Offset X: 0.1087 Y: 0.1624

Live Nesting: Allow Overrides: Depth: 1

New Level Display: Config Variable

2008-11-11 59

Hvordan printes til 3D PDF



Attachment Settings: 0000-1175.dgn

File Name: 0000-1175.dgn Browse...

Full Path: ..\3d.pdf\dolina\dgn\0000-1175.dgn

Model: Default

Logical Name: VIEW1

Description: _____

Scale (Master:Ref): 1.000000 : 2000.000000

Level: _____

Named Group: _____

Revision: _____

Nested Attachments: Live Nesting Depth: 1

Display Overrides: Allow

New Level Display: Use MS_REF_NEWLEVEL

Global LineStyle Scale: Master

Display Clip Back
 Snap Clip Front
 Locate Display Easter References
 Manipulate as Element Ignore Attachment When Live Nesting
 True Scale Use Lights
 Scale Line Styles Plot As 3D (PDF)

OK Cancel

2008-11-11 60

Hvor langt er vi nået med 3D PDF

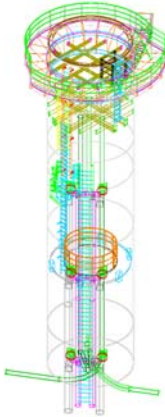



Export til U3D


2008-11-11 61



Export til U3D



2008-11-11 62



Export til U3D



- **Ulemper**
Viser ikke Saved Views.
- **Fordele**
Kan placeres vilkårligt i et PDF dokument.

2008-11-11 63

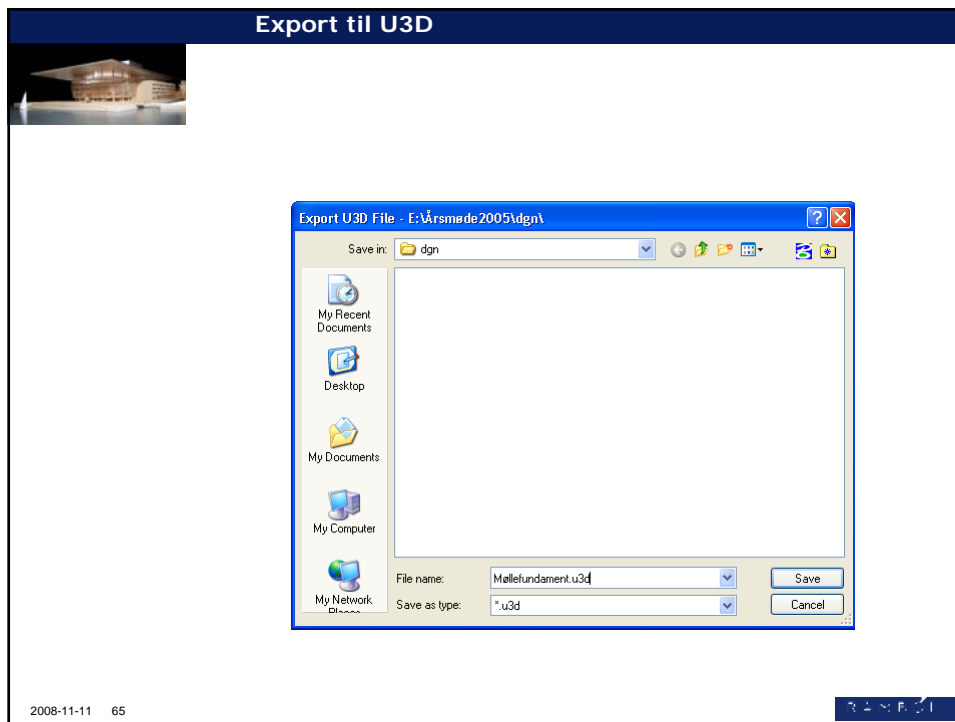
Export til U3D

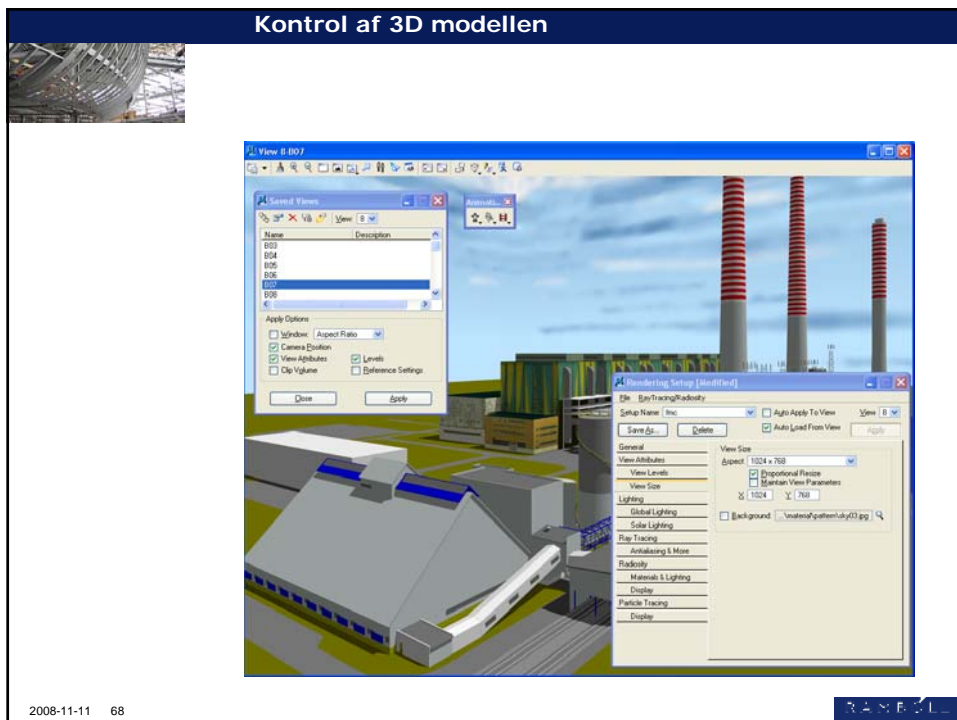


Eksport til U3D

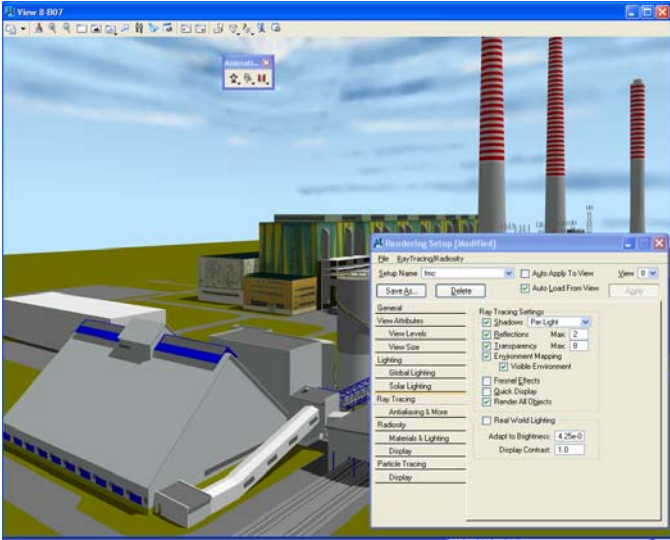
- Acrobat Professional 3D tools er nødvendige for at kunne indsætte U3D filen.
- Acrobat Professional skal benyttes for at kunne tilføje et JavaScript.
- Acrobat Professional skal benyttes for at kunne lave links og bookmarks.
- Acrobat Professional skal benyttes for at kunne lave posters.

2008-11-11 64





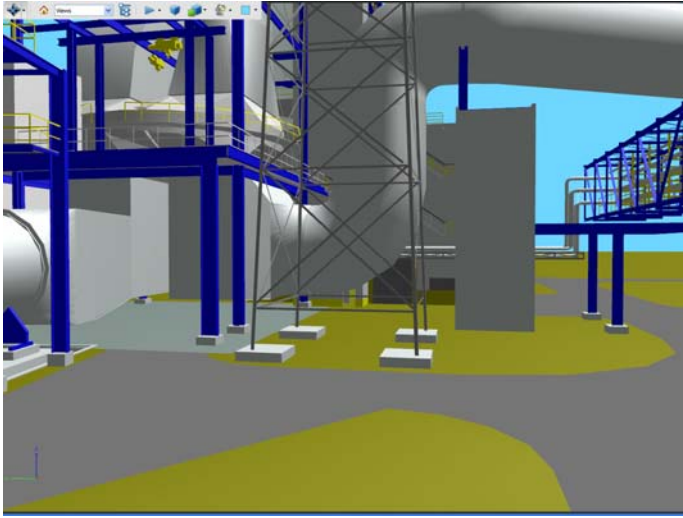
Kontrol af 3D modelleren



The screenshot shows a 3D rendering software window titled 'View 8 B97'. The main view displays a 3D model of an industrial facility with several tall, red-and-white striped chimneys against a blue sky. A 'Rendering Setup' dialog box is open on the right side of the window. The dialog box has a title bar 'Rendering Setup [Modifileret]' and a menu 'Dir: Raytracing/Radiosity'. It contains several sections: 'General' with 'View Attributes', 'View Levels', 'View Size', 'Lighting', 'Global Lighting', 'Solar Lighting', 'Ray Tracing', 'Interlocking & Move', 'Radiosity', 'Materials & Lighting', 'Display', 'Particle Tracing', and 'Display'; 'Ray Tracing Settings' with 'Shadows' (set to 'Per Light'), 'Reflections' (set to 'Max 2'), 'Transparency' (set to 'Max 8'), 'Environment Mapping', and 'Visible Environment'; 'Render Effects' with 'Quick Display' and 'Render All Objects'; and 'Real World Lighting' with 'Adapt to Brightness' (set to '4.25e-0') and 'Display Contrast' (set to '1.0').

2008-11-11 69


Kontrol af 3D modelleren

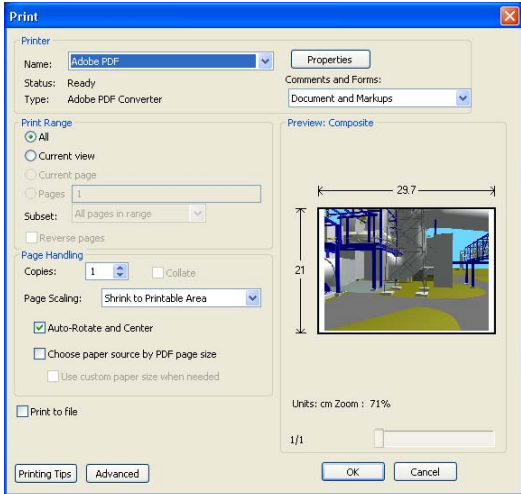


The screenshot shows a 3D rendering software window displaying a detailed 3D model of an industrial facility. The model features a complex network of blue structural beams, grey cylindrical tanks, and various pipes and walkways. The scene is rendered with realistic lighting and shadows, set against a blue sky. The software interface includes a standard Windows taskbar at the top and a toolbar with various rendering and navigation tools.

2008-11-11 70


Kontrol af 3D modelleren

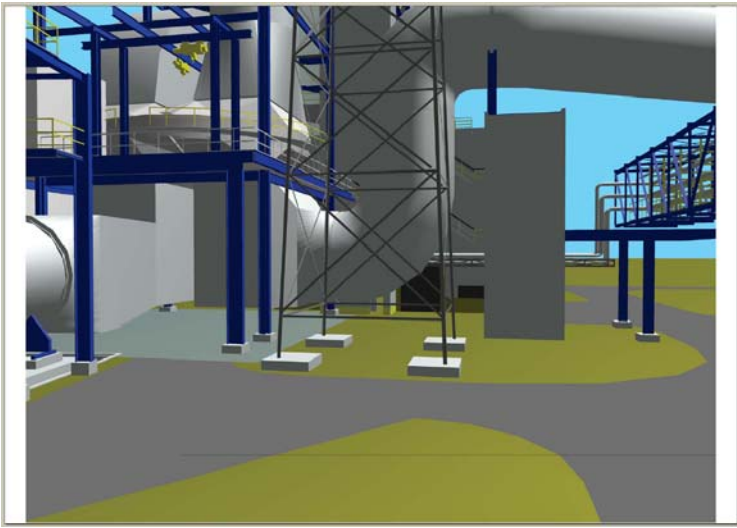




2008-11-11 71


Kontrol af 3D modelleren





2008-11-11 72


Kontrol af 3D modellen



Model
FMC
2008-11-08 13:29:11
Options: O

Fabrikat er ikke som specificeret

2008-11-11 73



Hvor langt er vi nået med 3D PDF

Spørgsmål.

