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MAX BÖGL

Progress is built on ideas.

FROM **BIM** TO REAL

Implementation of BIM collaboration methods in a construction company

Lejla Secerbegovic, Architect / BIM & Revit Expert

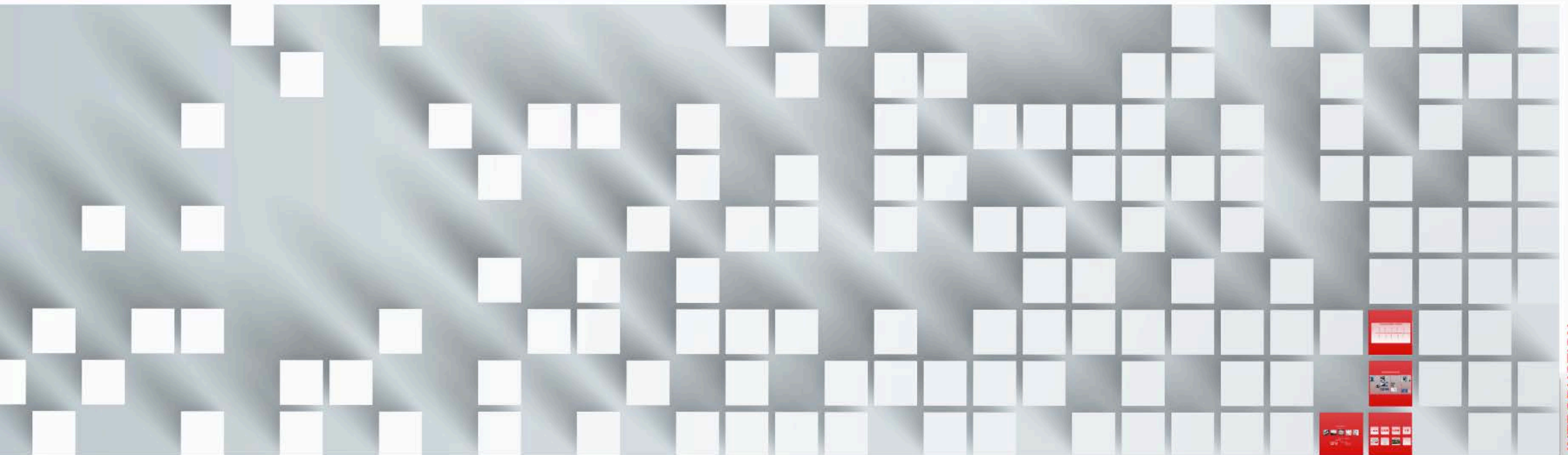
2.10.2014

BIMAARHUS



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INTRODUCTION

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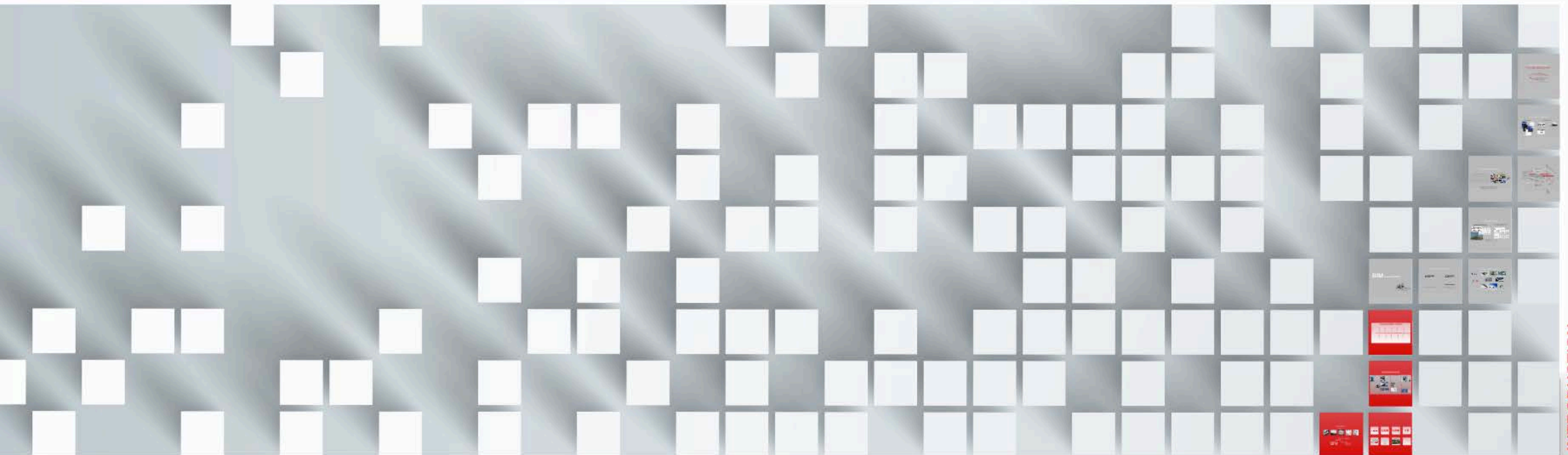
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BIM INSIGHT

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conclusion - what's next?

BIM INSIGHT

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2.10.2014

BIMAARHUS

Lejla Secerbegovic

Born in Banjaluka,
Bosnia & Herzegovina



Relocation to Austria



Diploma in Architecture
@TU VIENNA



Active in various
Architectural offices



Member of the BIM
Team @Max Bögl



DESIGN

TECHNOLOGY

WEBDESIGN

DIGITAL MEDIA

PHOTOSHOP

SCRIPTING

BIM

REVIT



1929
founded

6000
employees worldwide

1.5
Billion € Turnover

> 35 Facilities worldwide



19 Facilities in Germany



Main Headquarter in Sengenthal
near Neumarkt



3 Words about Max Bögl

INNOVATION
BIM

PREFABRICATION

OPERATING AREAS

BUILDING CONSTRUCTION



DC TOWER VIENNA



CENTRAL LIBRARY STUTTGART



FAIRTRADE FRANKFURT



AEROSPACE COMPOSITE PLANT
AL AIN, UAE



RHEINERGIE, COLOGNE



SHOPPING CENTER "NEUER MARKT"
NEUMARKT (MAX BÖGL HOME TOWN)

STEEL & PLANT CONSTRUCTION



AIRPORT STUTTGART



ALLIANZ ARENA, MUNICH



MESSE NÜRNBERG



SUNDSVALL STEEL BRIDGE



INFRASTRUCTURE



SPECIAL EQUIPMENT



TRAFFIC ROADS



SUBWAY STATIONS AMSTERDAM



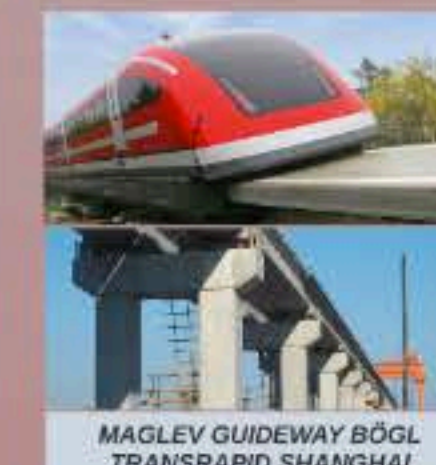
PRAGUE - BEROUNKY BRIDGE



NIJMEGEN - STADSBRUG



SLAB TRACK MAX BÖGL - HIGH-SPEED TRACKS IN CHINA



MAGLEV GUIDEWAY BÖGL
TRANSRAPID SHANGHAI

WIND POWER

HYBRID TOWER SYSTEM BY MAX BÖGL



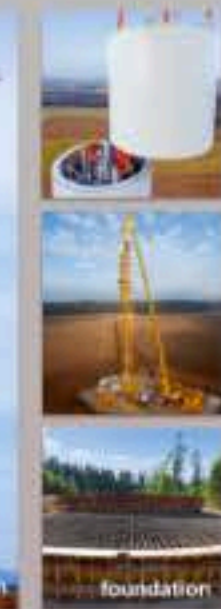
prefabrication



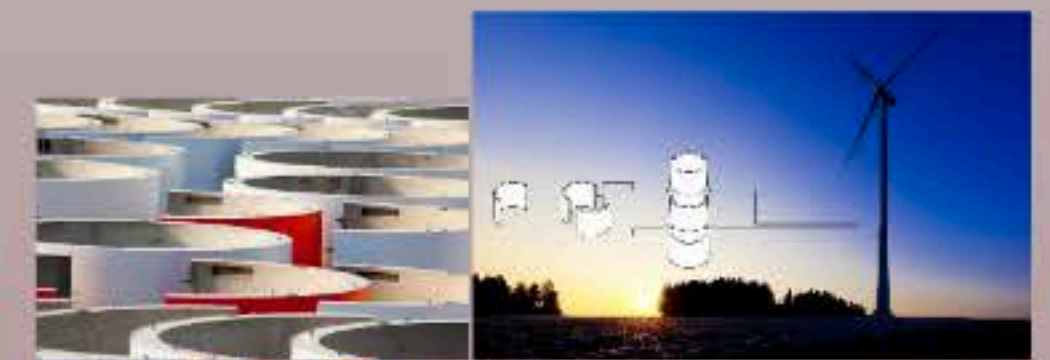
transportation



construction



foundation





DC TOWER VIENNA



CENTRAL LIBRARY STUTTGART



**AEROSPACE COMPOSITE PLANT
AL AIN, UAE**

FAIRTRADE FRANKFURT





RHEINERGIE, COLOGNE



***SHOPPING CENTER "NEUER MARKT"
NEUMARKT (MAX BÖGL HOME TOWN)***

OPERATING AREAS

BUILDING CONSTRUCTION



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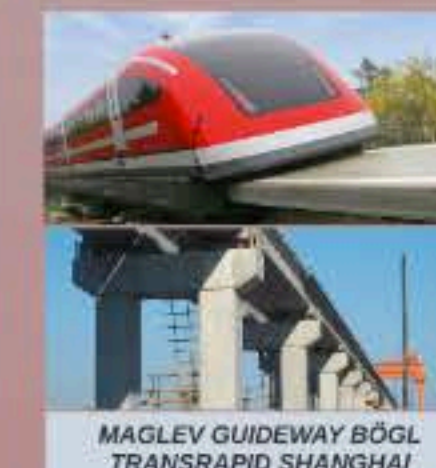
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SLAB TRACK MAX BÖGL - HIGH-SPEED TRACKS IN CHINA



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prefabrication



transportation



construction

foundation





AIRPORT STUTT GART



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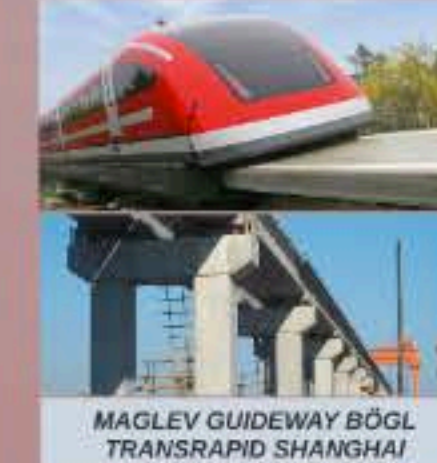
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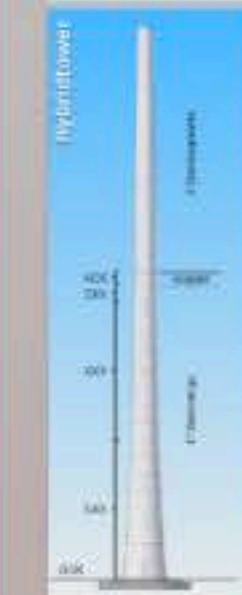
SLAB TRACK MAX BÖGL - HIGH-SPEED TRACKS IN CHINA



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HYBRID TOWER SYSTEM BY MAX BÖGL



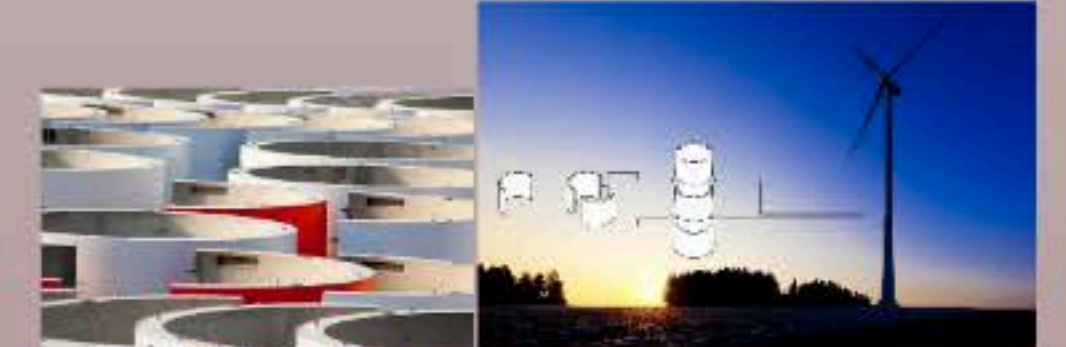
prefabrication



construction



foundation



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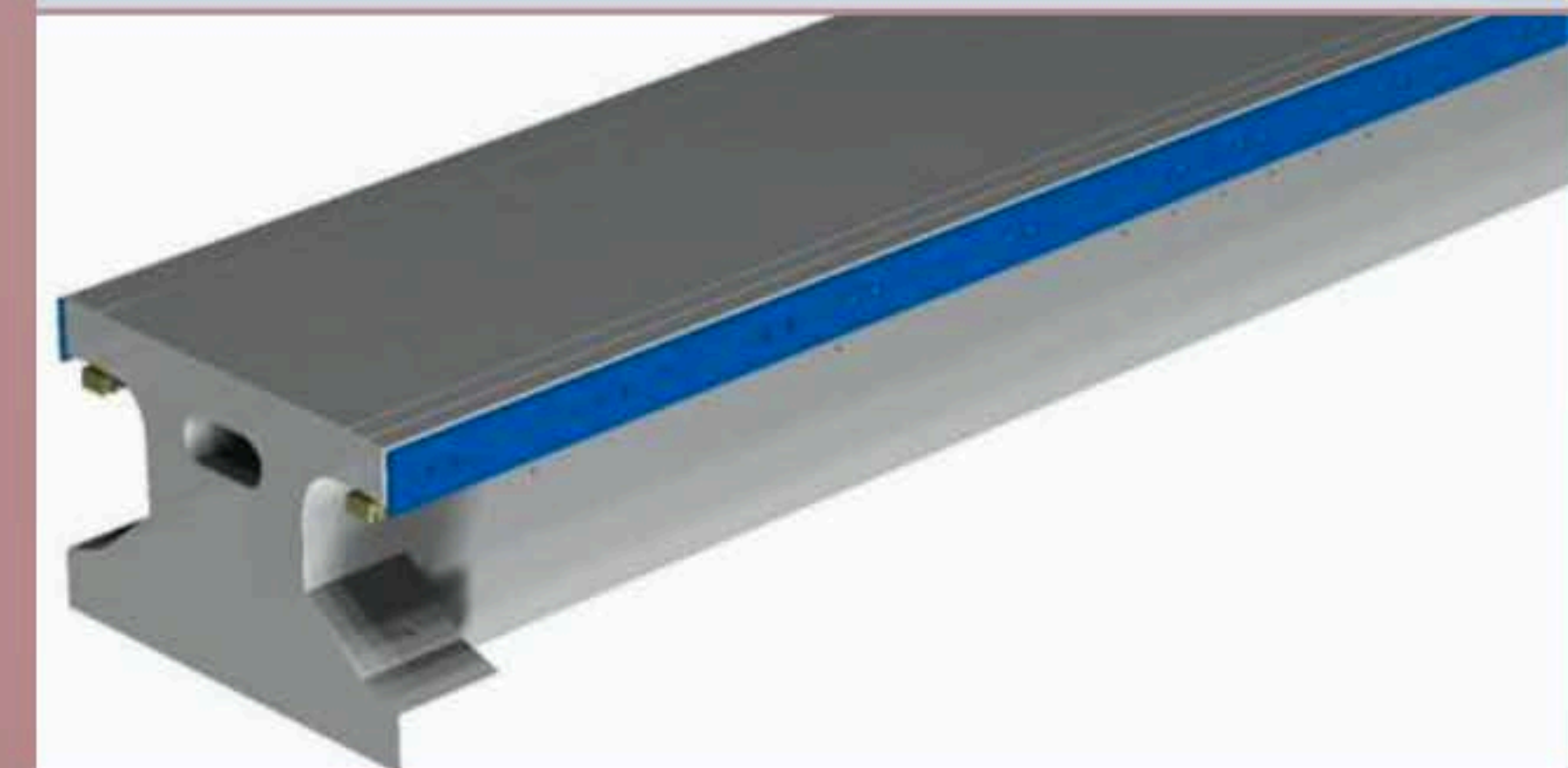
NIJMEGEN - STADSBRUG





**MAGLEV GUIDEWAY BÖGL
TRANSRAPID SHANGHAI**

SLAB TRACK MAX BÖGL - HIGHSPEED TRACKS IN CHINA



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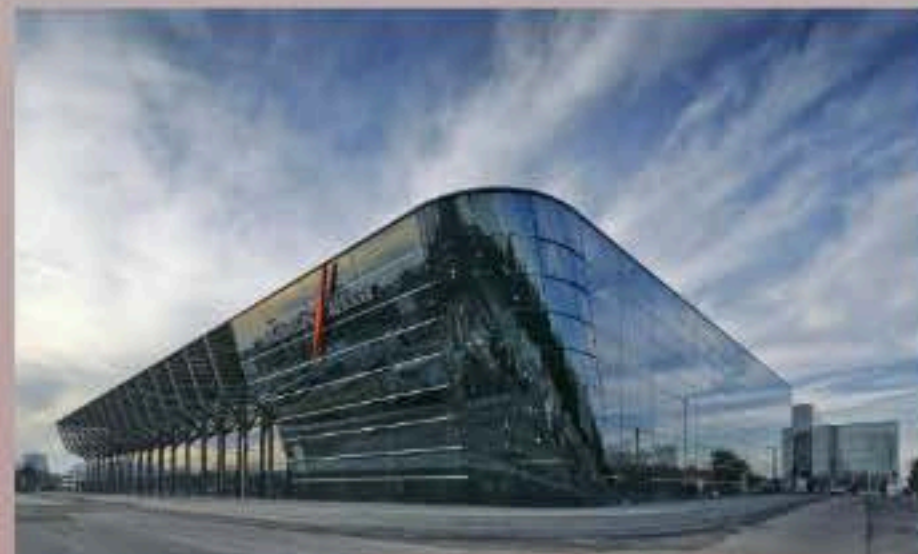
STEEL & PLANT CONSTRUCTION



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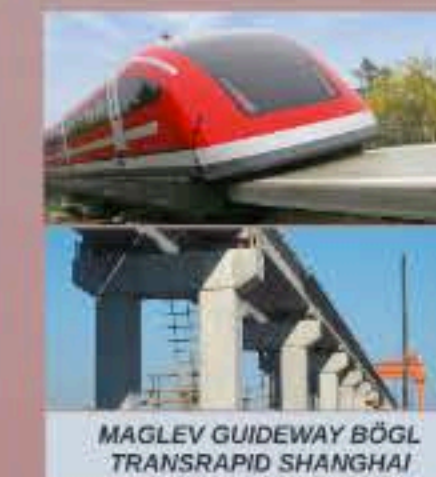


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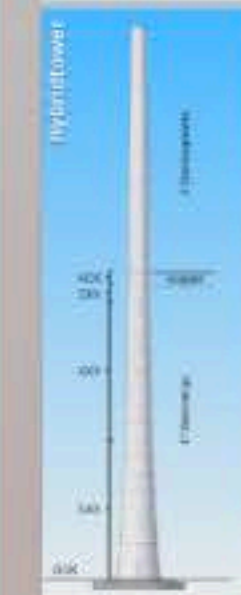
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HYBRID TOWER SYSTEM BY MAX BÖGL



prefabrication



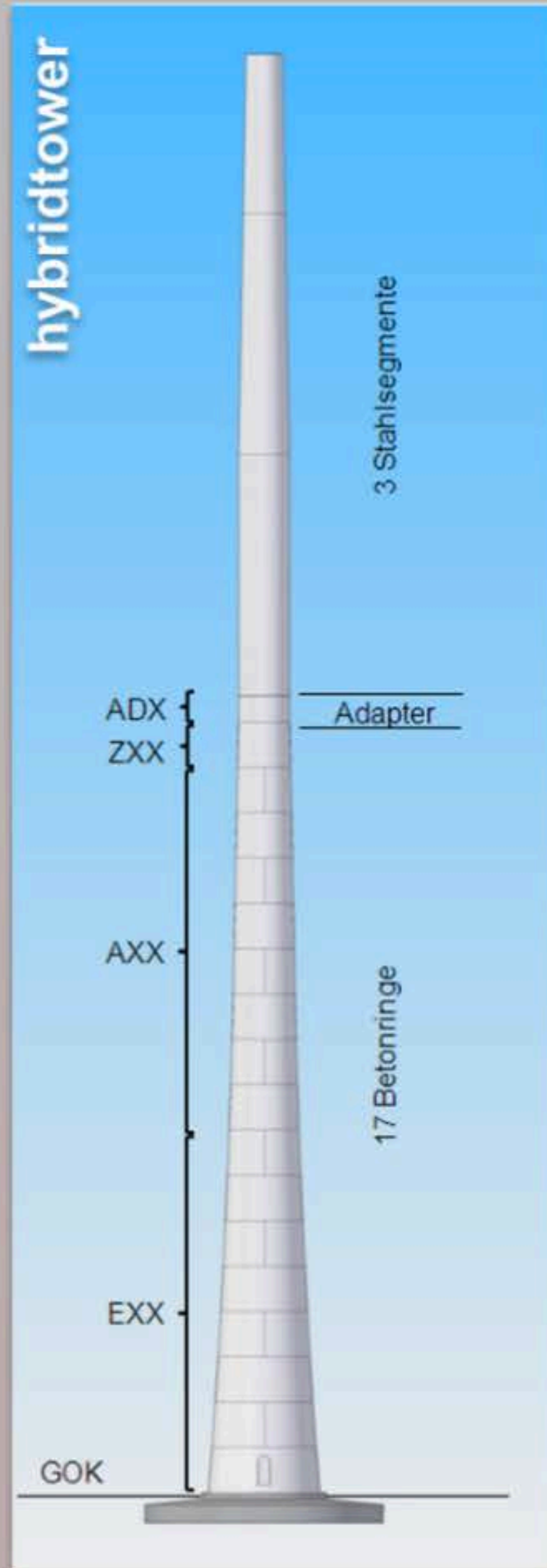
construction

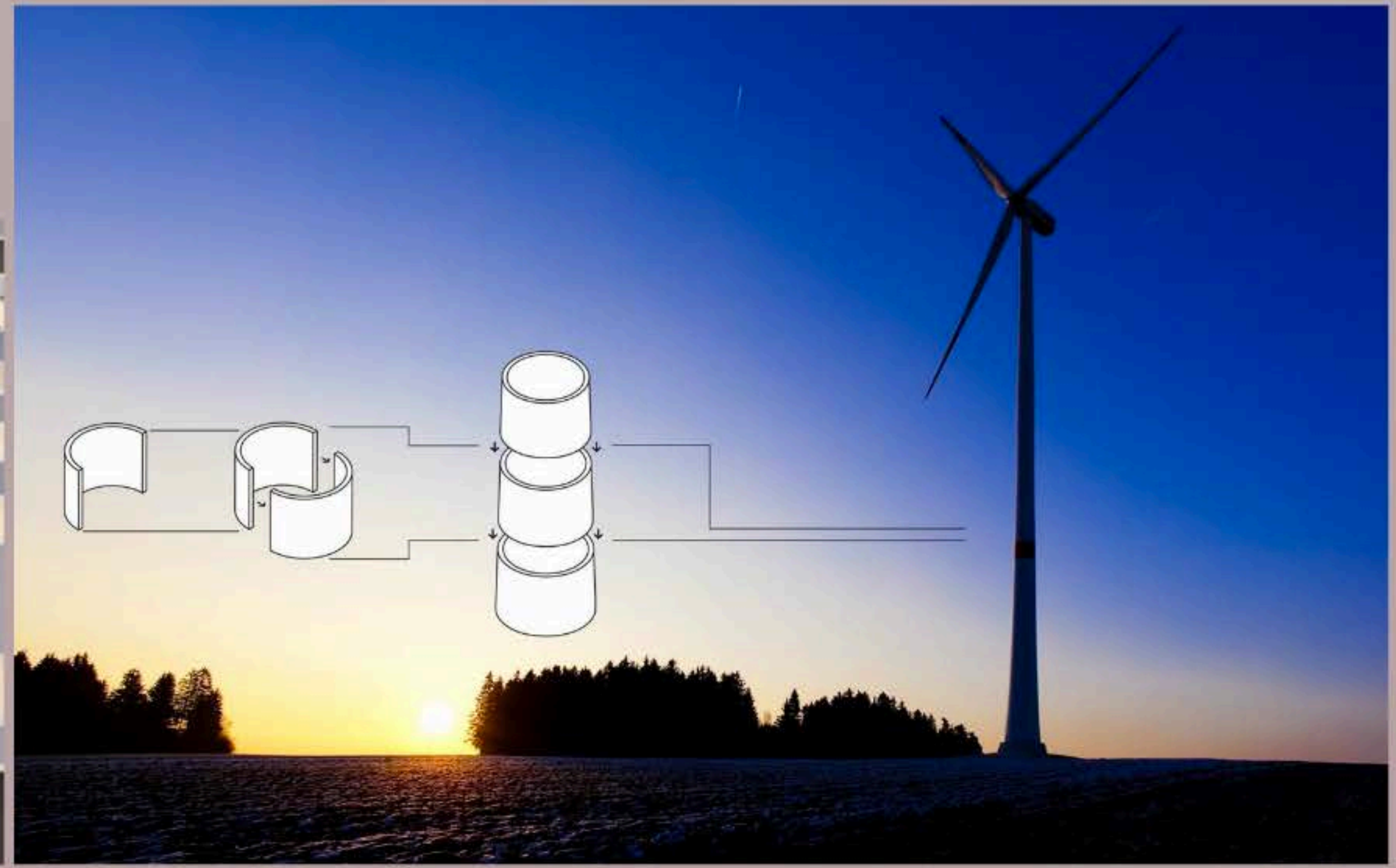


foundation



HYBRID TOWER SYSTEM BY MAX BÖGL







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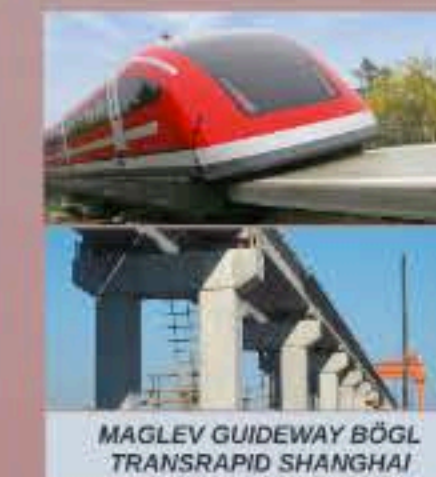


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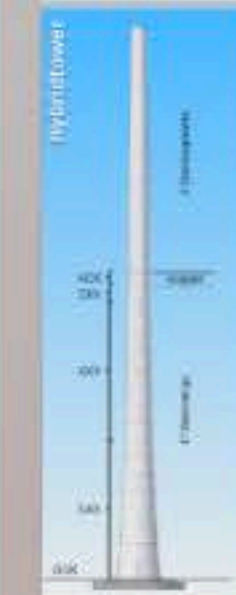
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MAGLEV GUIDEWAY BÖGL
TRANSRAPID SHANGHAI

WIND POWER

HYBRID TOWER SYSTEM BY MAX BÖGL



prefabrication



construction



foundation



BIM DEVELOPMENT OVERVIEW

Late '90s

Acquirement and modernisation of several prefabrication facilities



"The future of the building industry"
Visionary movie clip
by Max Bögl & Fraunhofer Institute



First 2k decade

Establishing of the
Max Bögl BIM TEAM



BIM Change
Management Concept
and implementation



Research and Awards

Research Projects about BIM topics
with renowned German institutions



BIM Awards



2014

1995

Century leap

First construction company
to implement SAP



Cooperations with
educational institutions



By the end of 2010...

Evaluation and beginning of the
implementation of BIM software



Innovation Centre in the Headquarter Söngen
serving as an in-house BIM training centre



Current IT projects

PLM @Wind Power
since 2012

Current state: operational system



BIM @Facility Management
since 2014

Current state: software evaluation



> 800 projects realized with BIM methods

Late '90s

Acquirement and modernisation of several prefabrication facilities



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STANFORD
UNIVERSITY



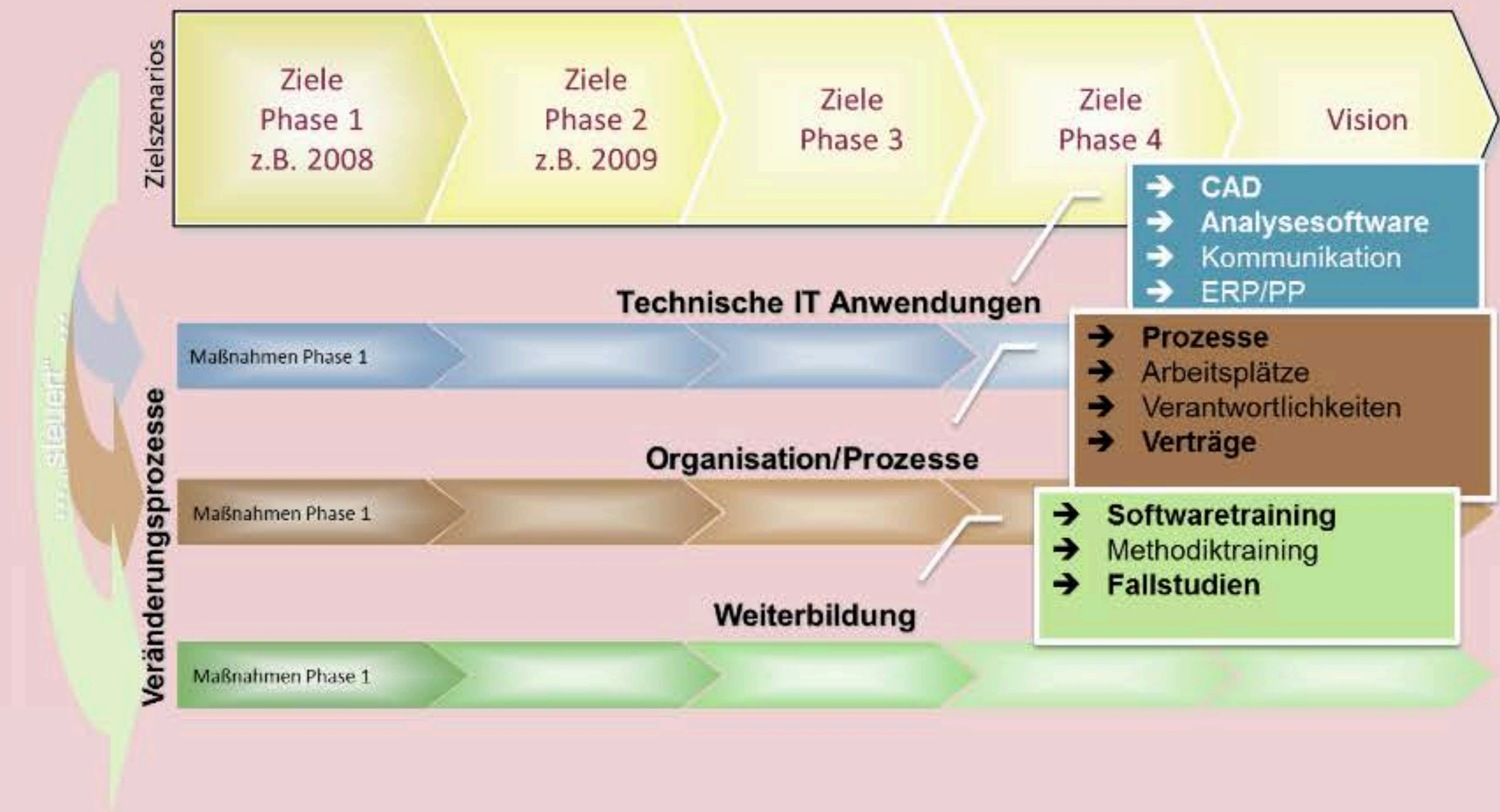
First 2k decade

Establishing of the
Max Bögl **BIM TEAM**



BIM Change Management Concept

Veränderungsschritte



By the end of 2010...

Evaluation and beginning of the Implementation of BIM software

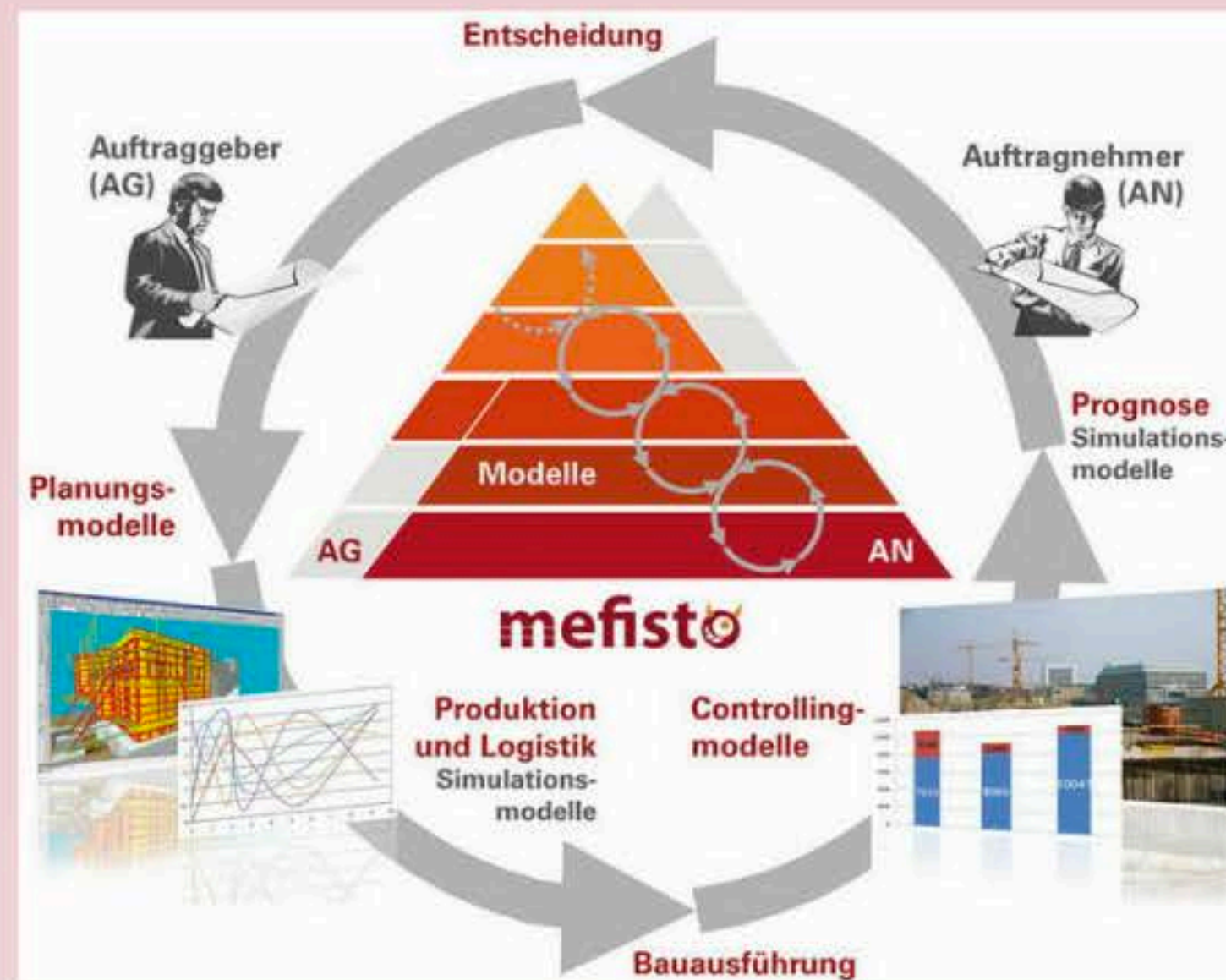


Innovation Centre in the Headquarter Sengenthal serving as an inhouse BIM training centre



Research and Awards

Research Projects about BIM topics
with renowned German institutions



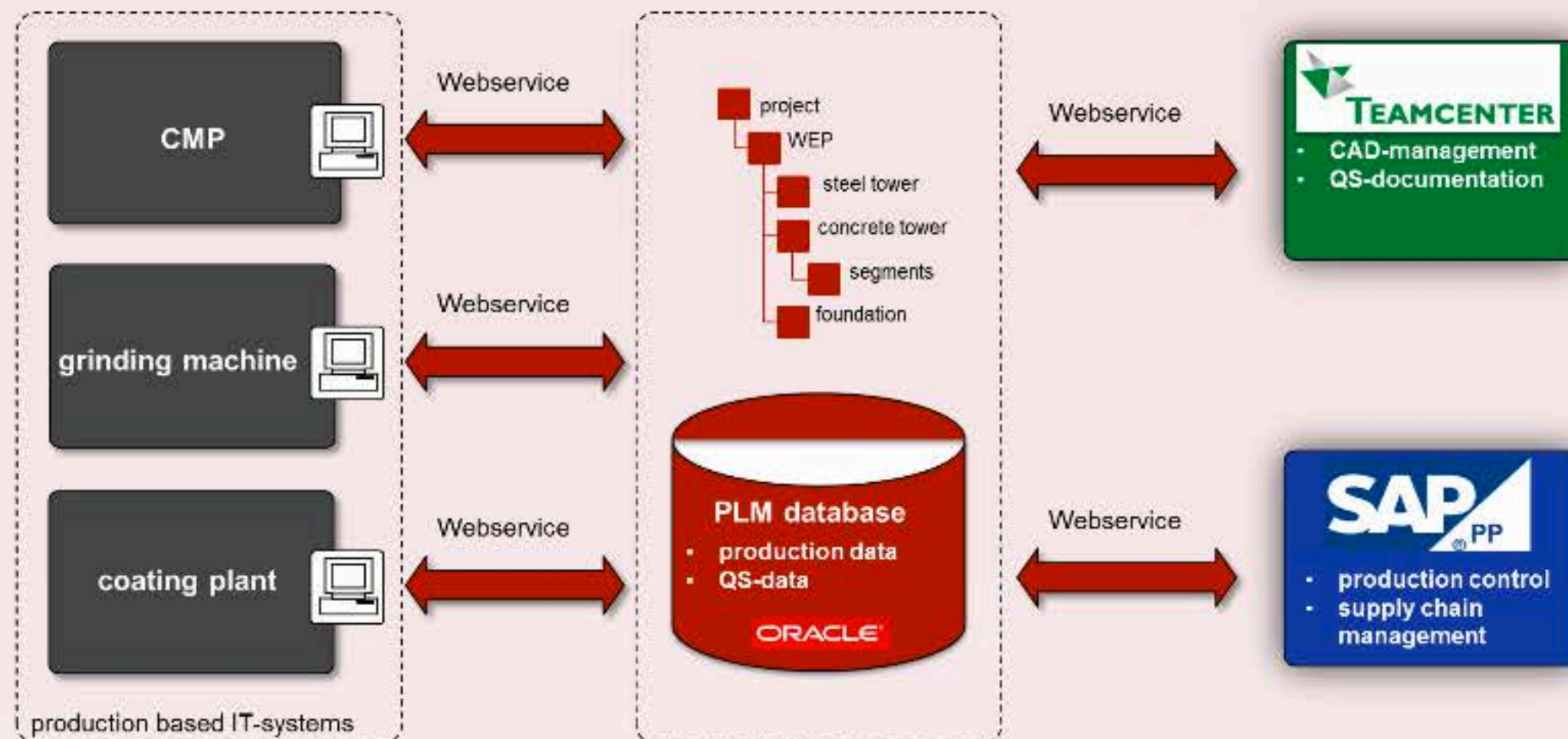
BIM Awards



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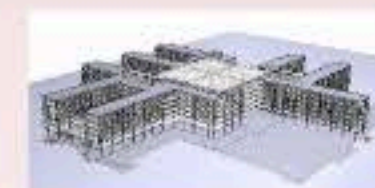
PLM @Wind Power
since 2012

Current state: operational system



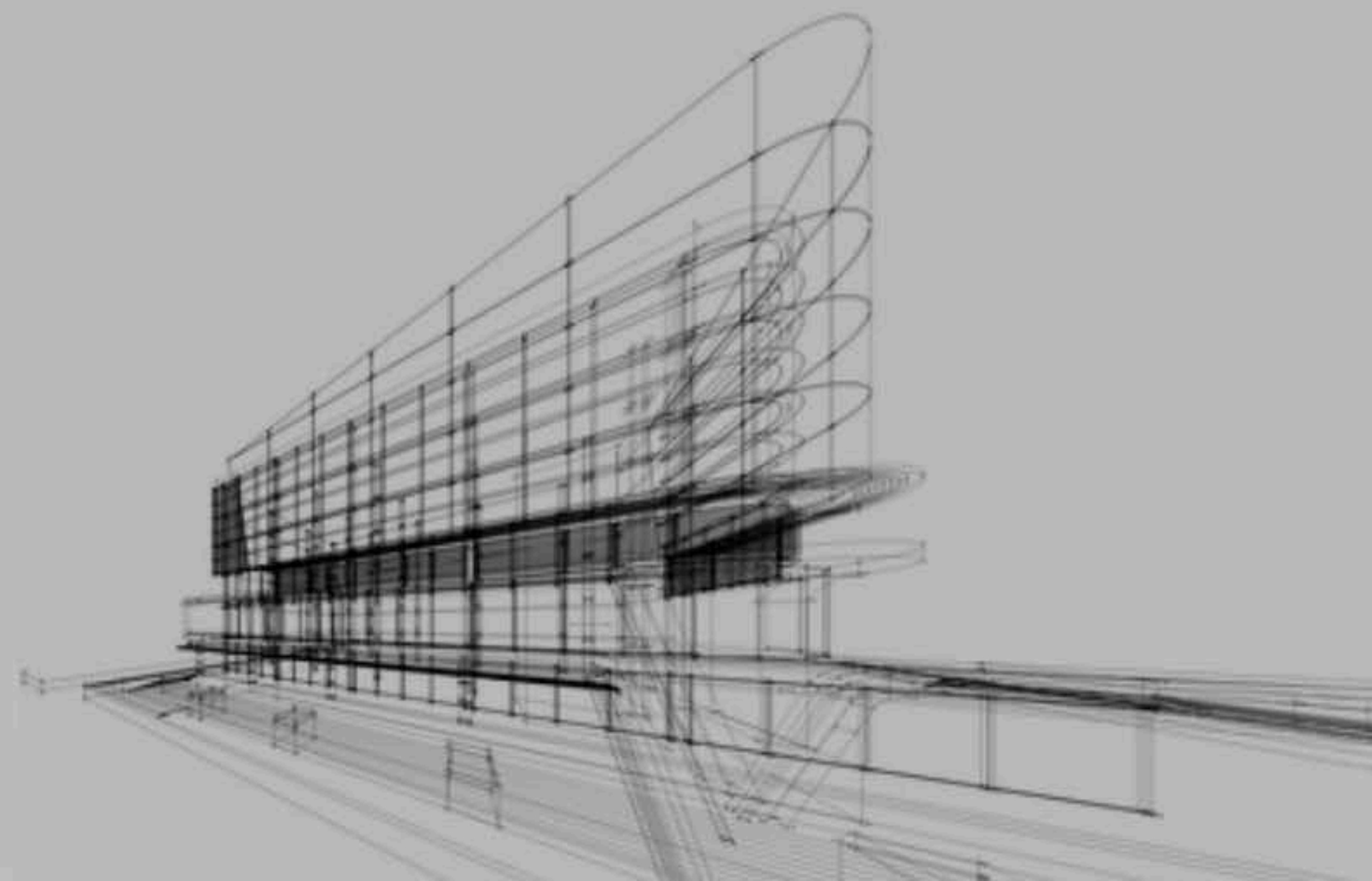
BIM @Facility Management
since 2014

Current state: software evaluation



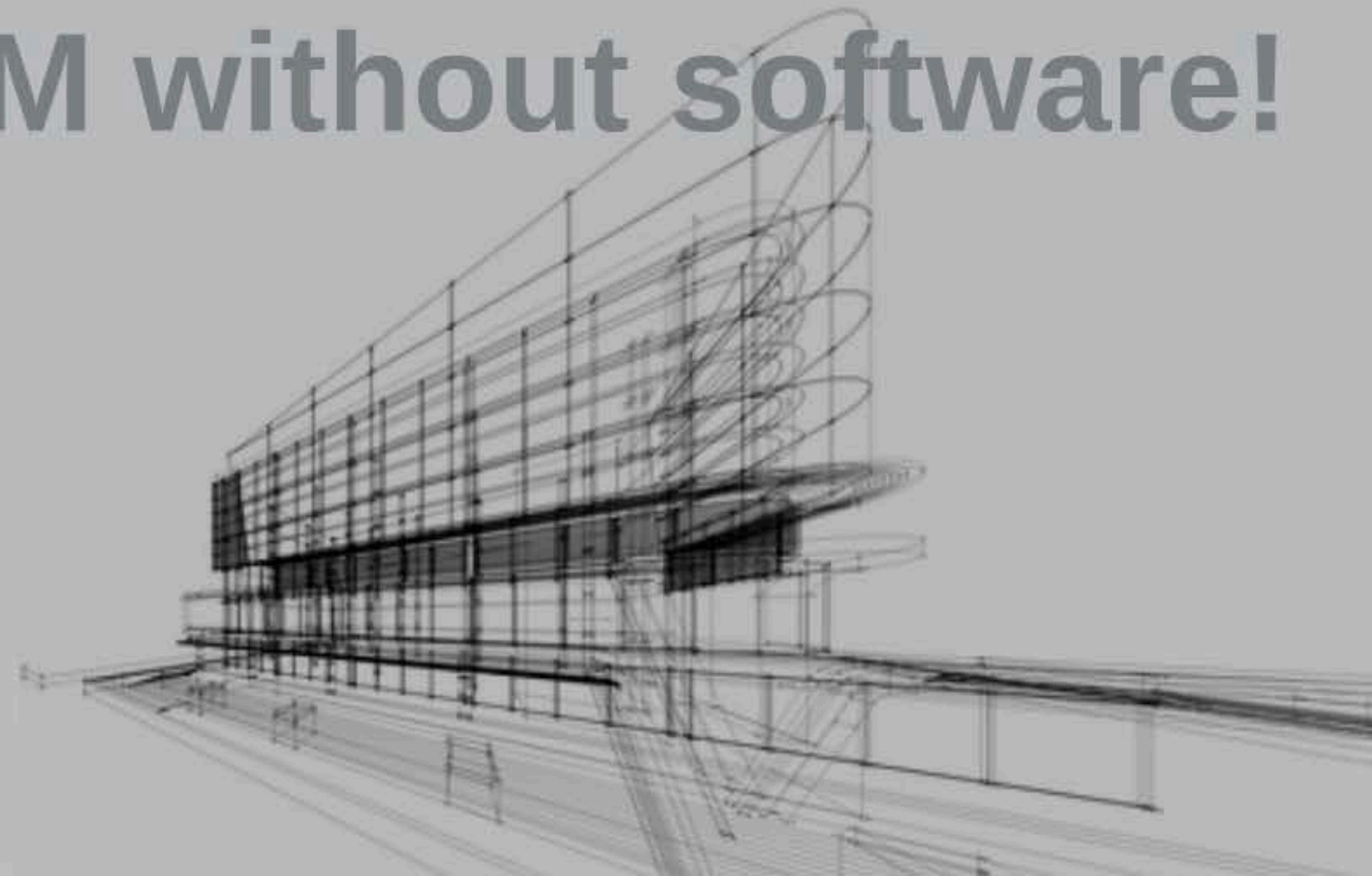
> 800 projects realized with BIM methods

BIM is not a software!



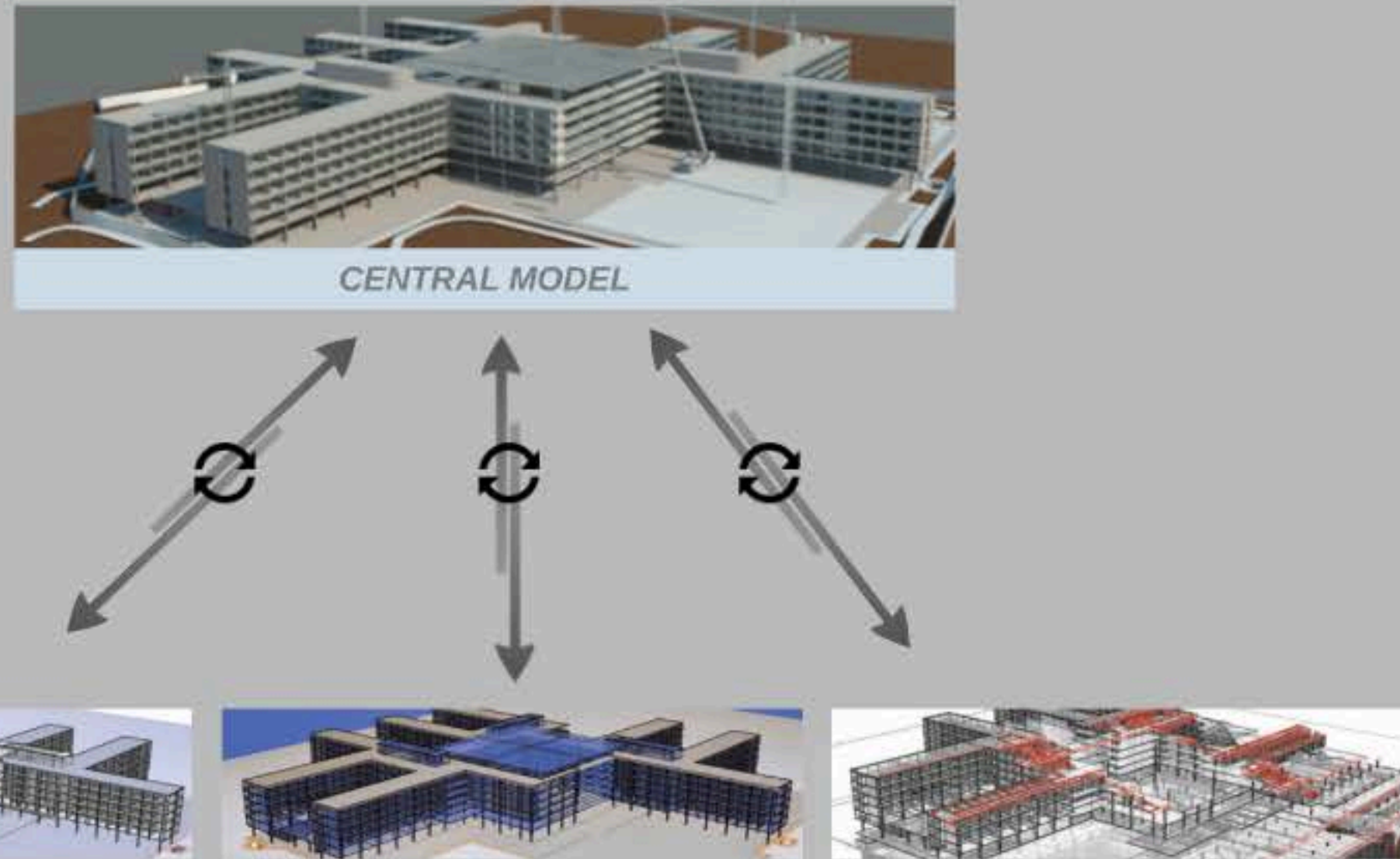
BIM is not a software!

....but there is no BIM without software!



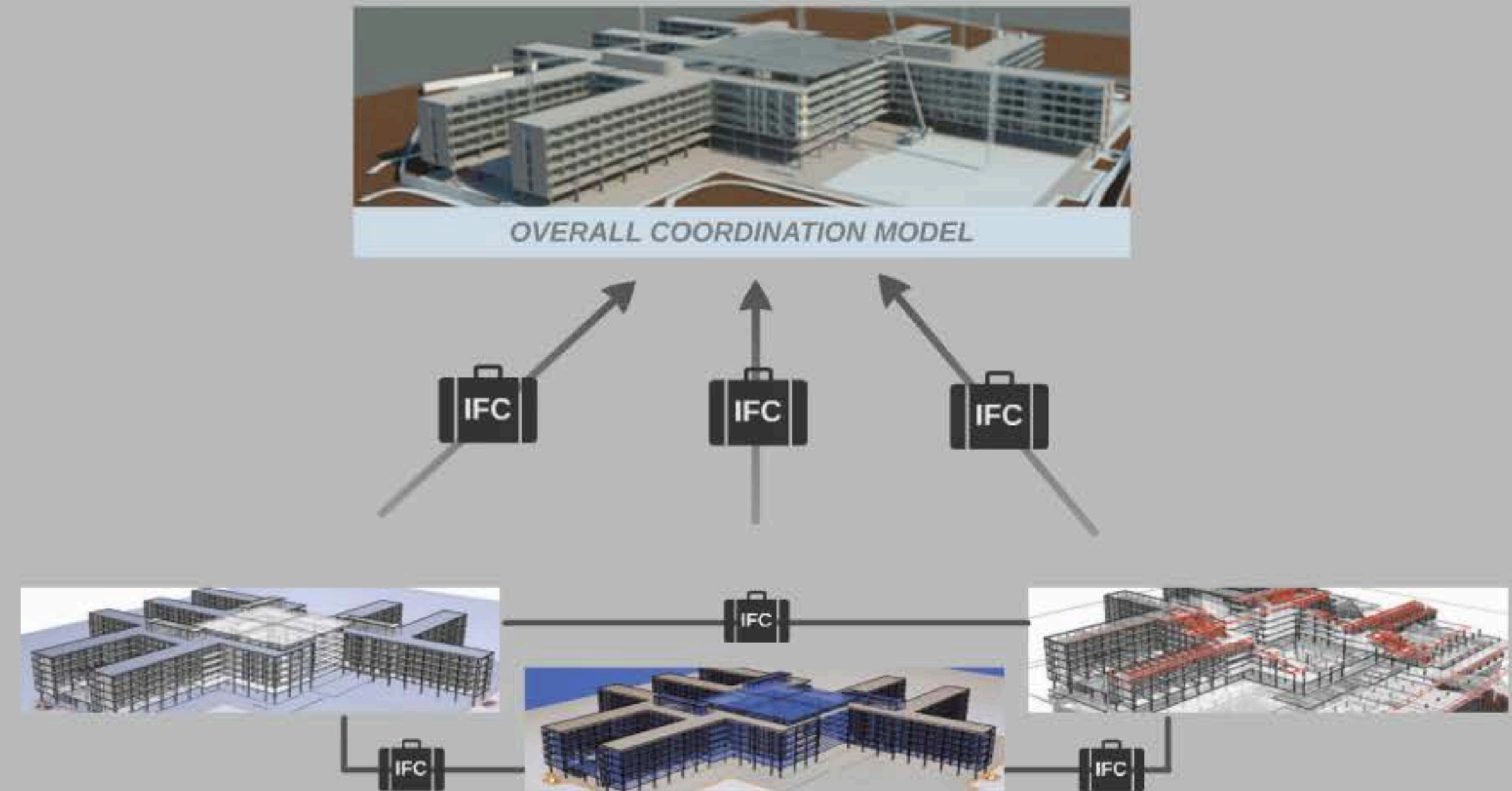
IT'S ALL ABOUT SOFTWARE (INTERFACES)

VISION



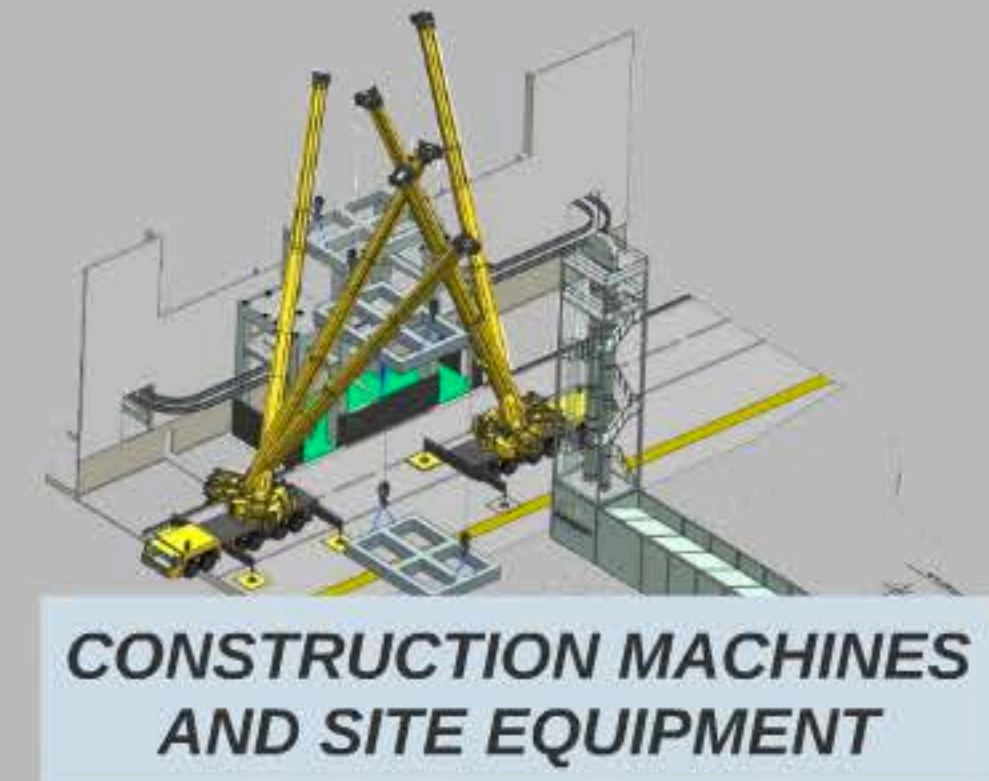
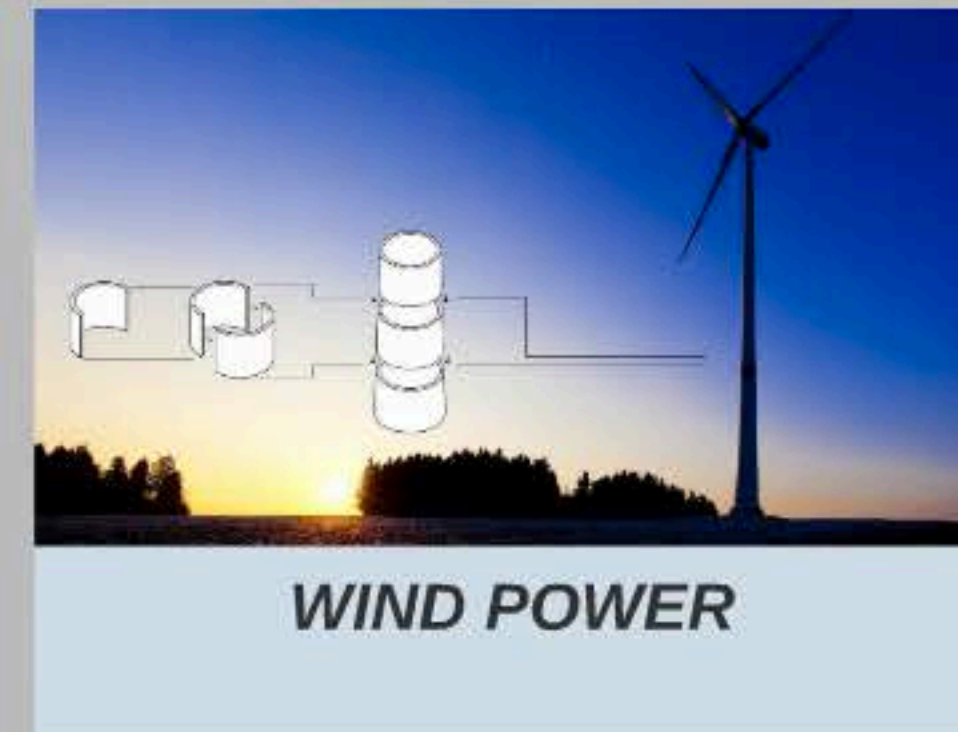
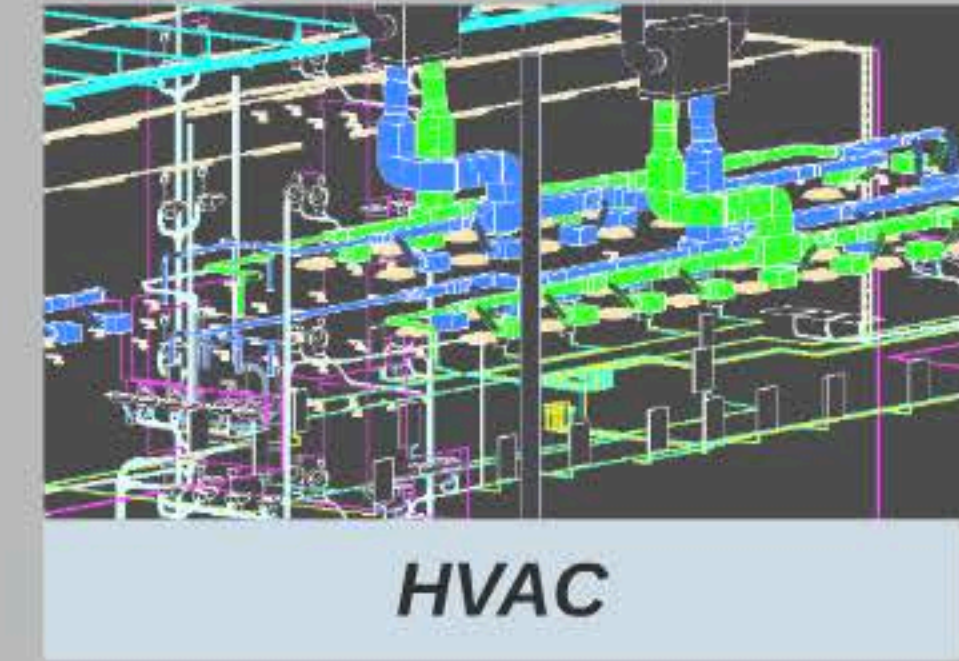
- ALL PARTNERS USE THE SAME SOFTWARE PLATFORM
- NO SOFTWARE INTERFACES NEEDED / AUTOMATIC SYNC
- CHANGES ARE INSTANTLY VISIBLE TO EVERYONE

REALITY



- MODELS FROM DIFFERENT SOFTWARE PLATFORMS
- IFC AS THE MOST COMMON MODEL EXCHANGE FORMAT
- SEPARATE MODEL FOR COORDINATION PURPOSES

MODELING SOFTWARE @MAX BÖGL



DIRECT MODEL OUTPUTS

DRAWINGS & VISUALISATIONS



DATA SHEETS & QUANTITIES

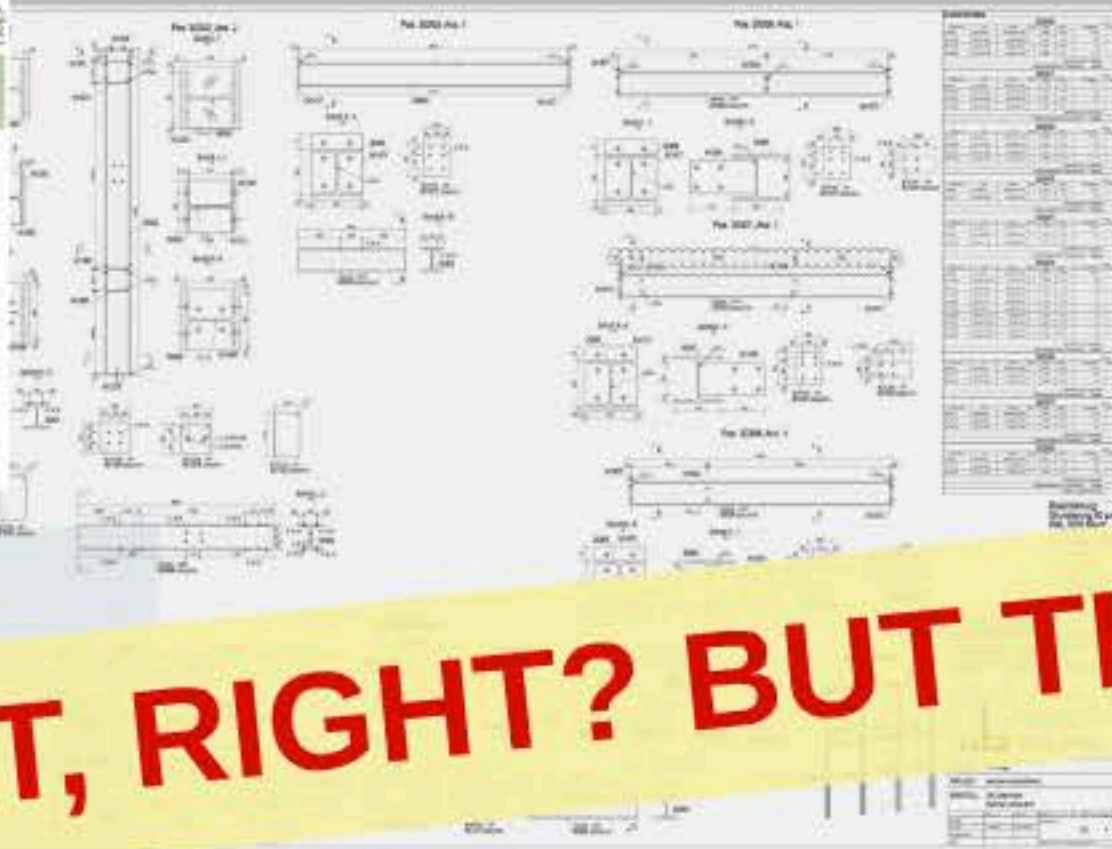
[illegible]

- ➔ DIRECT OUTPUTS IN THE NATIVE MODELING SOFTWARE
- ➔ QUICK AND SIMPLE

DIRECT MODEL OUTPUTS

DRAWINGS & VISUALISATIONS

DATA SHEETS & QUANTITIES



Raumliste									
Raumliste				Oberflächen					
Nummer	Fläche	Volumen	Belegung	Fußboden	Wandoberfläche	Deckenoberfläche			
5	115.37 SF	1673 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'			
27	1968.39 SF	38833 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'			
Fur. 2	2993.35 SF								
		17 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'			
		1 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'			
		5 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'			
		1 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'			
		1 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'			
		1 CF	Office	Ceramic Tile	Light Blue Painted	Acoustic Tile 2'x2'			
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26	252.69 SF	3009 CF	Office	Ceramic Tile	Light Green Painted	Acoustic Tile 2'x2'			
Buro: 10	2961.54 SF								
28	393.44 SF	3805 CF	Office	Ceramic Tile	N/A	Acoustic Tile 2'x2'			
Offener Arbeitsbereich	193.41 SF								
16	293.53 SF	4256 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'			
15	353.52 SF	2372 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'			
20	342.97 SF	2373 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'			
23	355.37 SF	2390 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'			
24	351.96 SF	2347 CF	Shipping/Receiving	Granite Tile	Wall Carpet	Acoustic Tile 2'x2'			
Rezeption: 5	907.95 SF								
6	59.30 SF	645 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'			
7	311.76 SF	3521 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'			
8	312.26 SF	4526 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'			
9	59.79 SF	760 CF	Shared	Ceramic Tile	White Painted	Acoustic Tile 2'x2'			
Services: 4	736.15 SF								
2	306.34 SF	1558 CF	Office Support	Laminate	White Painted	Acoustic Tile 2'x2'			
3	79.04 SF	1146 CF	Office Support	Laminate	White Painted	Acoustic Tile 2'x2'			
Lager: 2	197.38 SF								

GREAT, RIGHT? BUT THERE IS A LOT MORE!

- ➔ DIRECT OUTPUTS IN THE NATIVE MODELING SOFTWARE
- ➔ QUICK AND SIMPLE

GET THE MOST OUT OF YOUR MODEL!

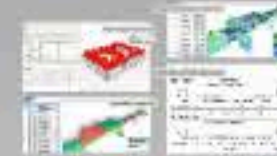
ANALYSIS, PM & COORDINATION SOFTWARE



Collision checking
Model coordination



Final quantity determination
Contract specifications
5D Project Management



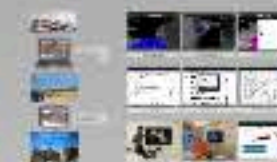
Project status tracking
Modelbased scheduling



Assembly planning
and simulation



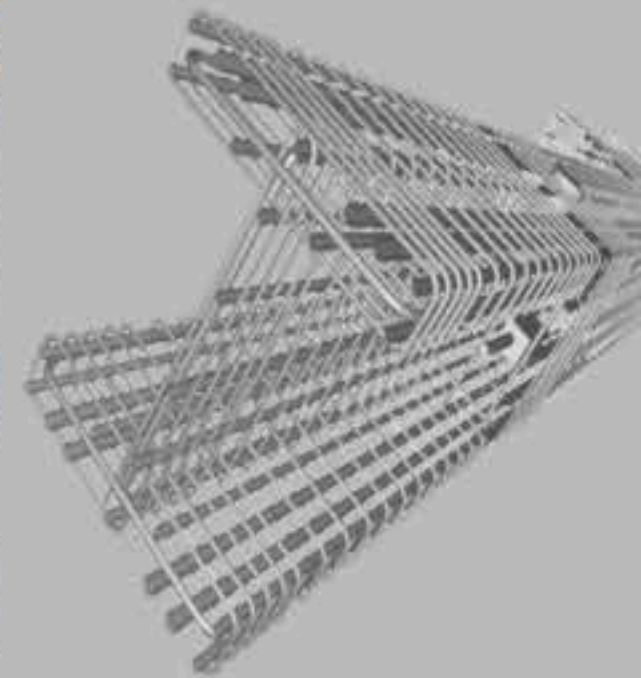
On-site models
Modelbased punchlists



PRODUCTION PROCESS



FORMWORK MILLING MACHINE

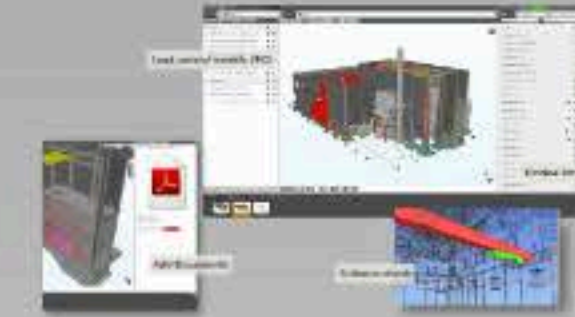


**THERE IS NO PLUG AND PLAY - OUR MODELS MUST
SPEAK THE LANGUAGE OF ALL THESE TOOLS**

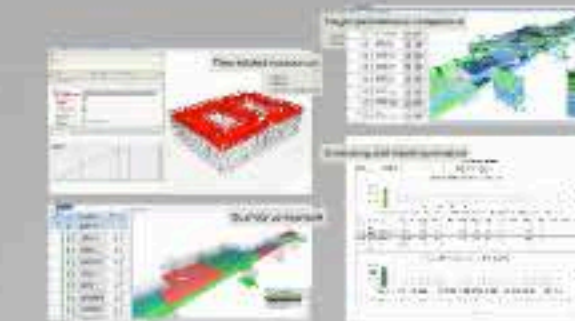
ANALYSIS, PM & COORDINATION SOFTWARE



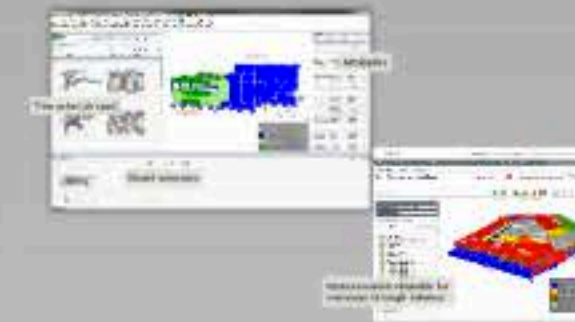
Collision checking
Model coordination



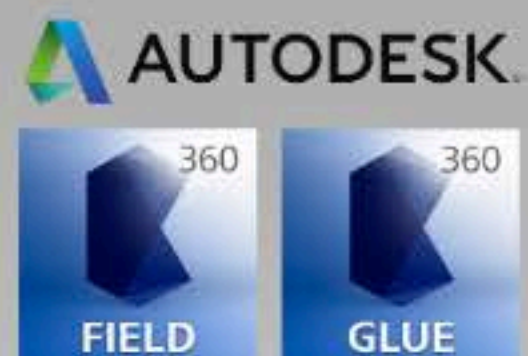
Final quantity determination
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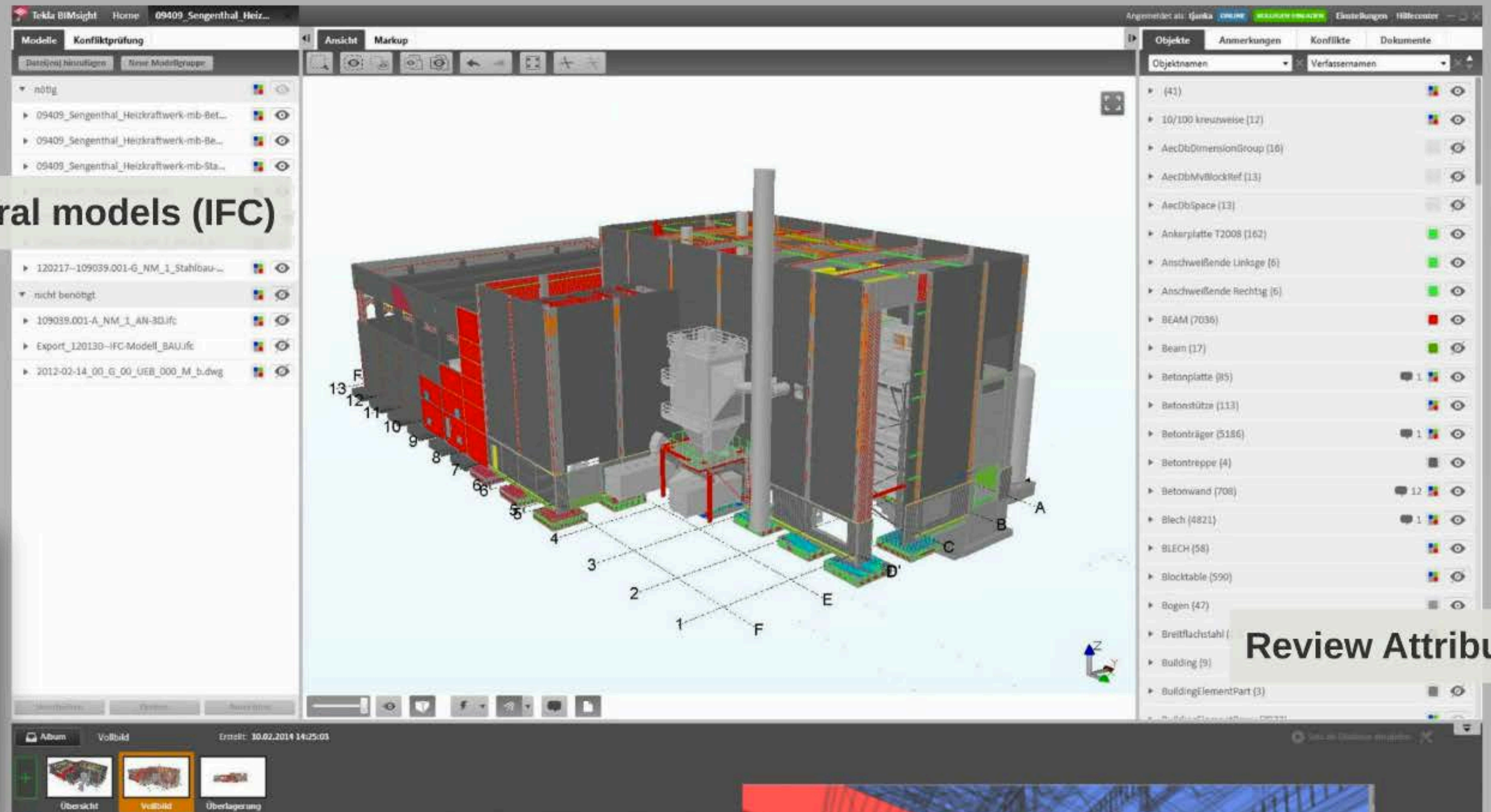
Assembly planning
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On-site models
Modelbased punchlists

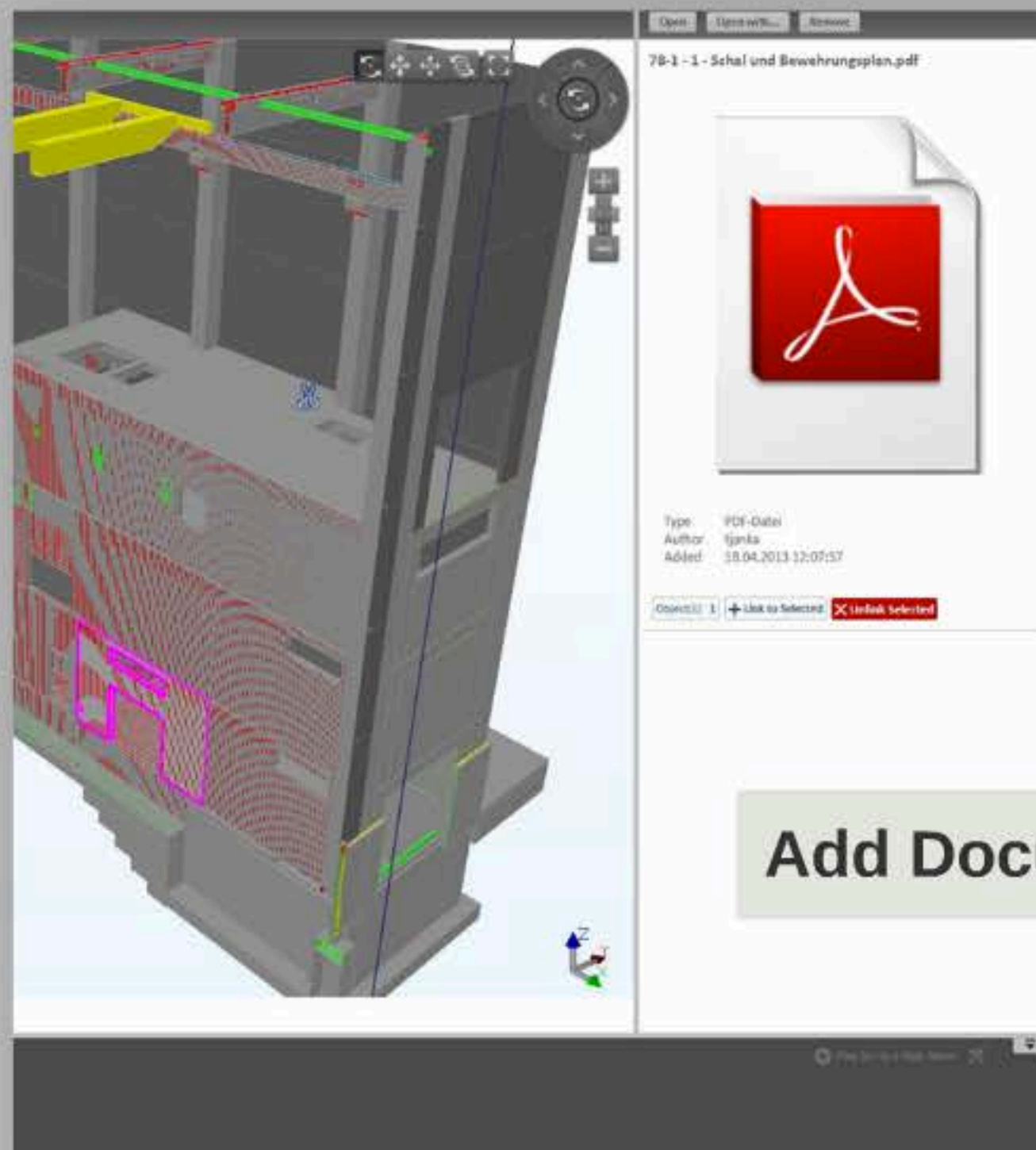


Load several models (IFC)

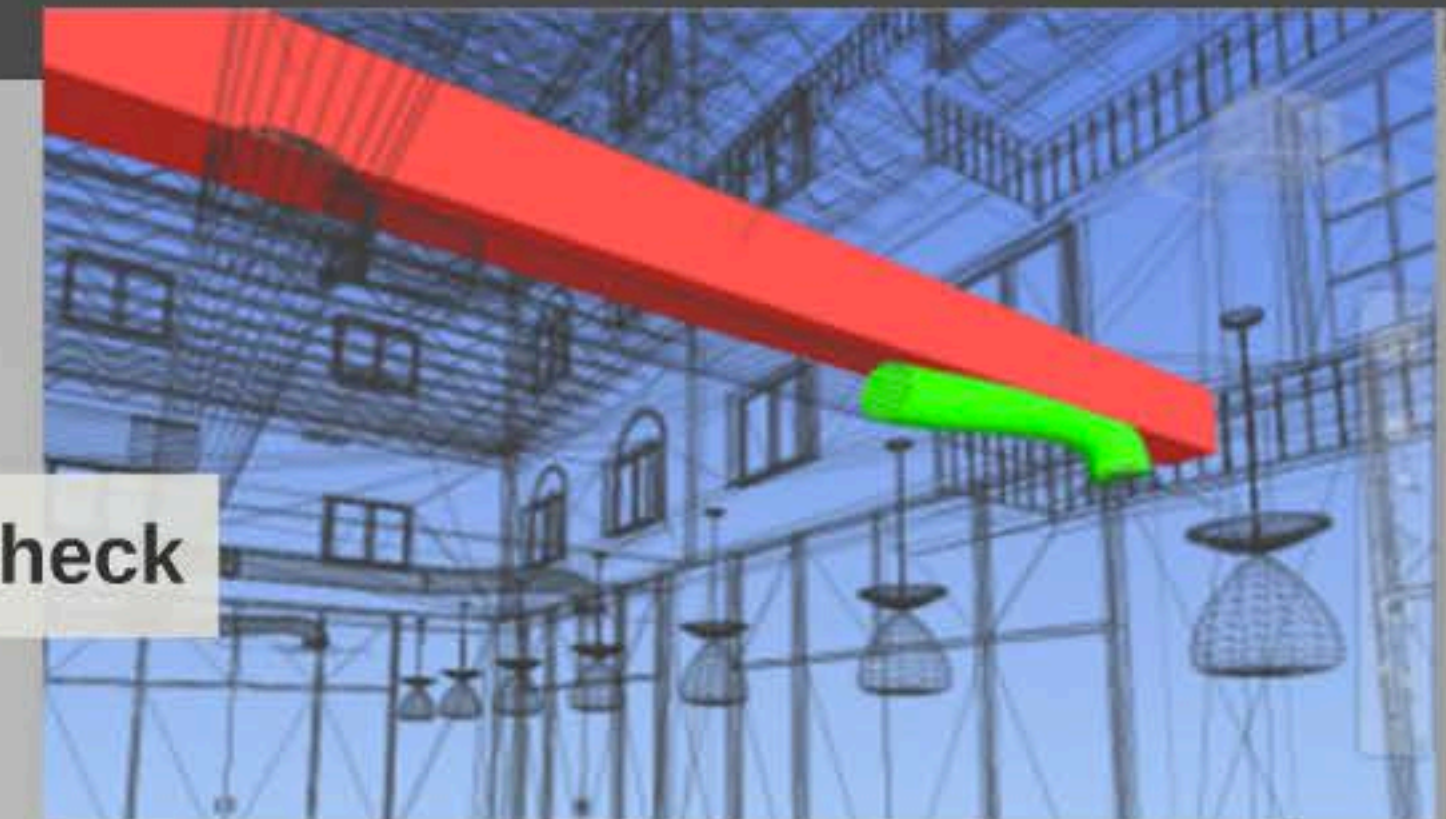


Review Attributes

Add Documents



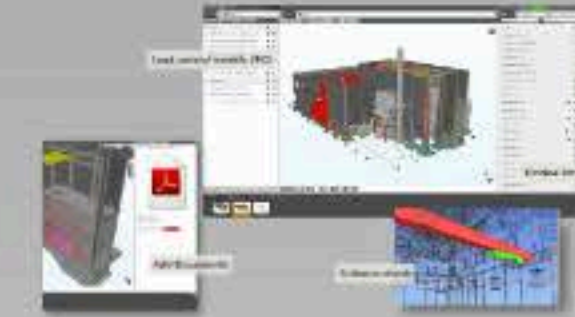
Collision check



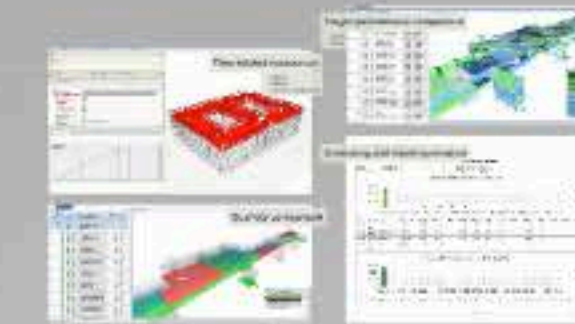
ANALYSIS, PM & COORDINATION SOFTWARE



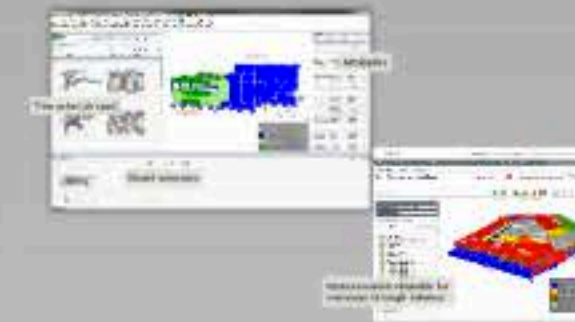
Collision checking
Model coordination



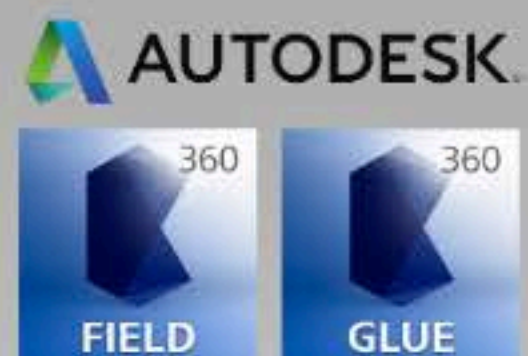
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Project status tracking
Modelbased scheduling

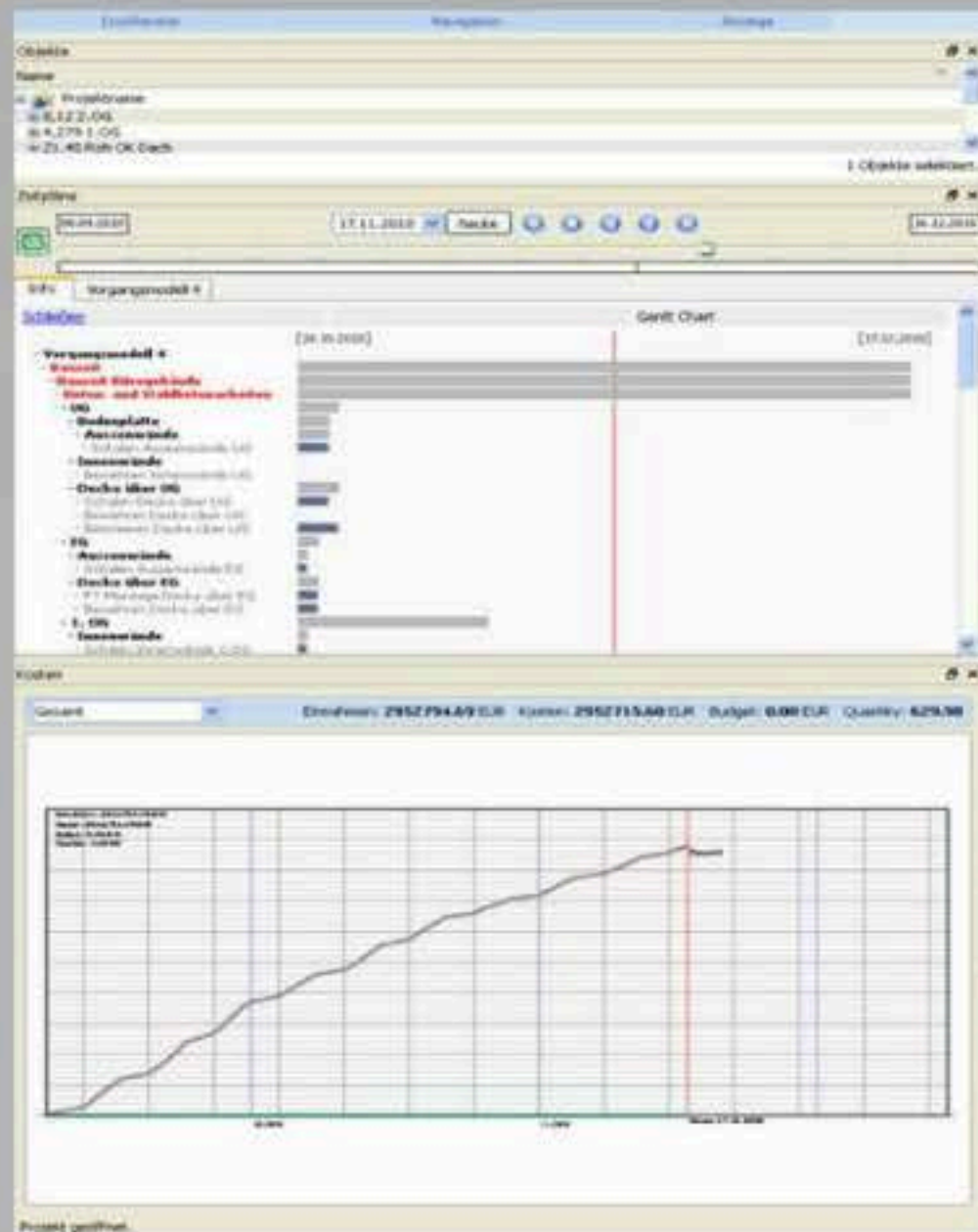


Assembly planning
and simulation



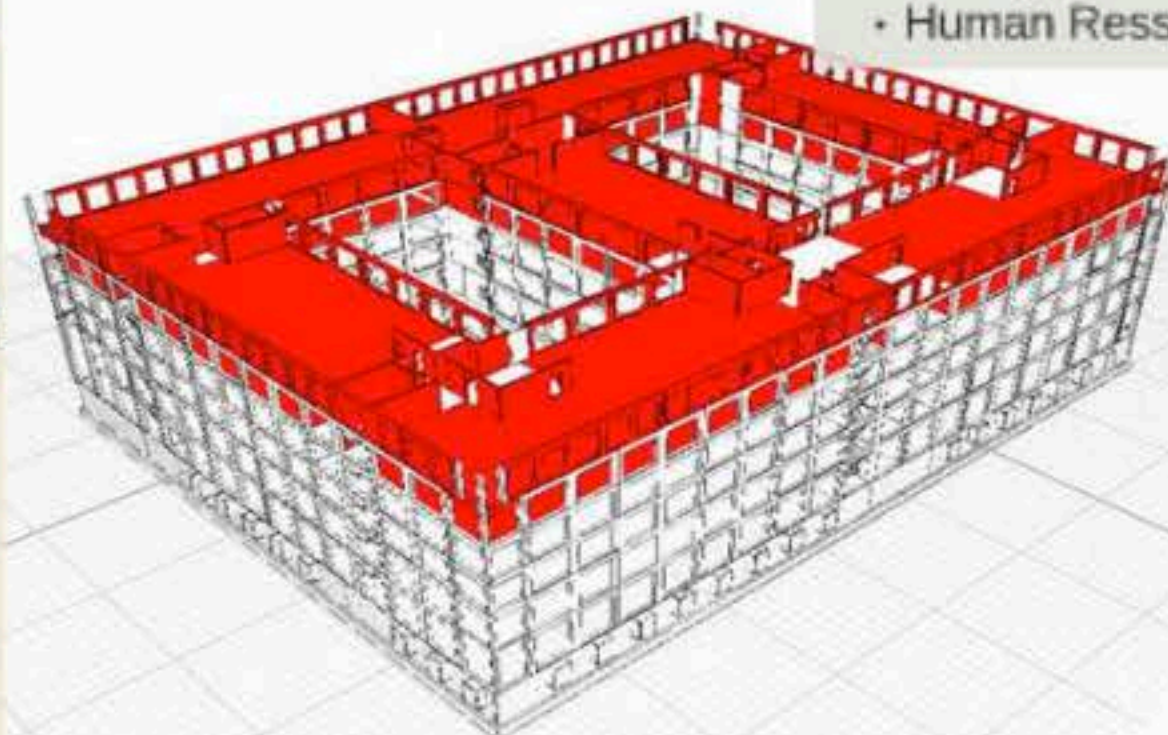
On-site models
Modelbased punchlists





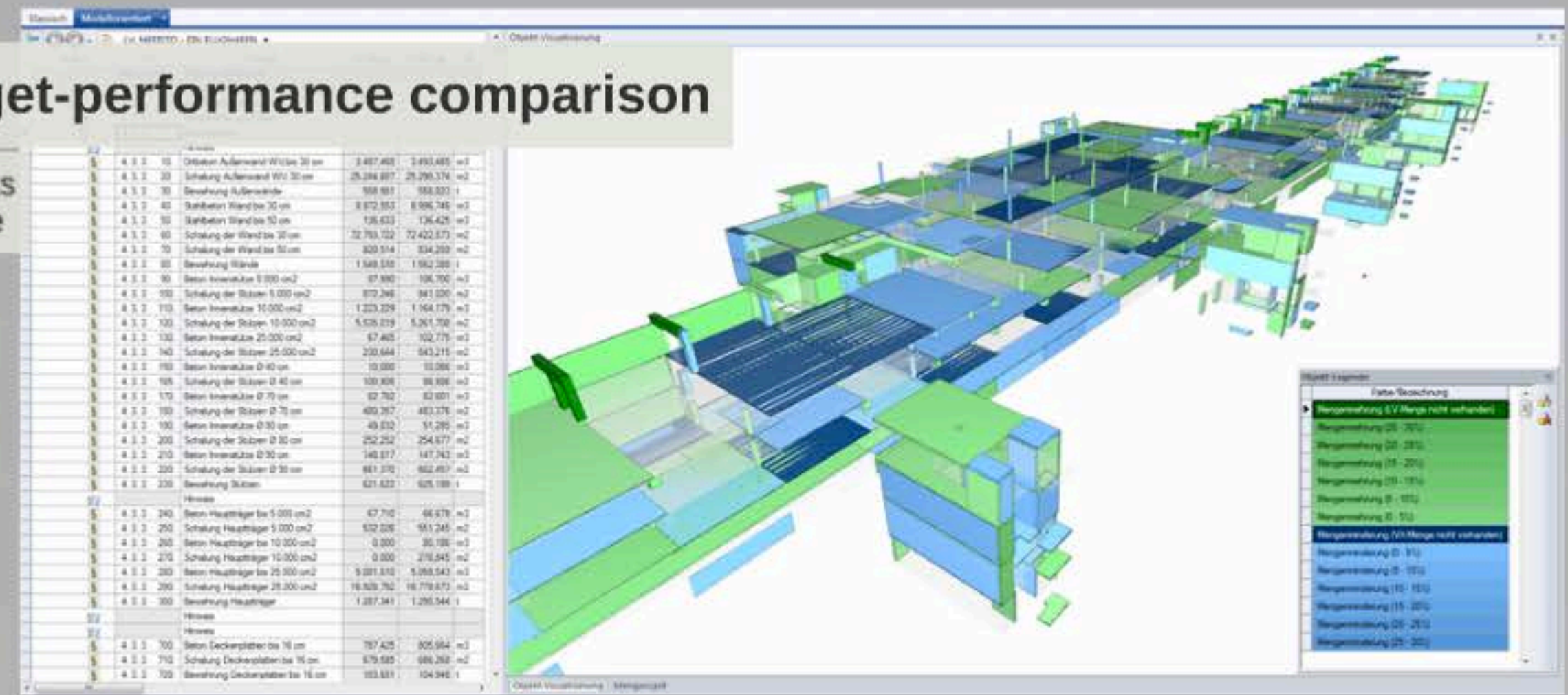
Time-related resources

- Costs
- Money
- Human Resources



Target-performance comparison

- Costs
- Time

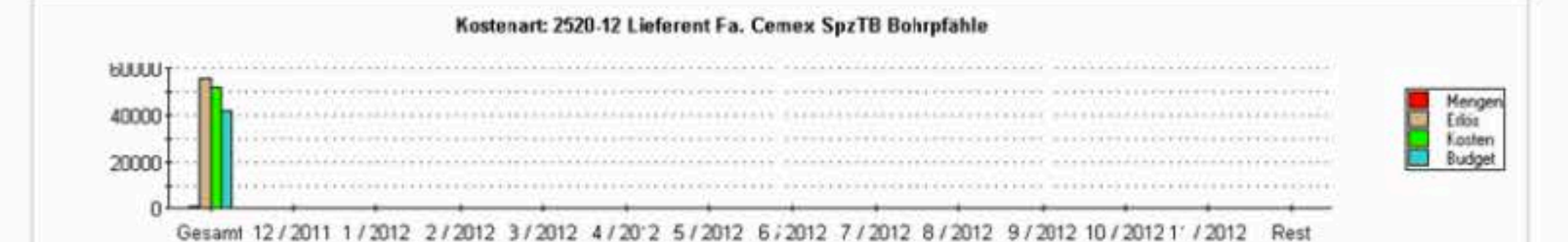


Controlling and report generation

Projekt: H18052b VORLAGE... Auswertung für VA-Mengen
Vorgangsmodell: Terminplan Ausgewählte Bauvorgänge: alle
Währung: EUR

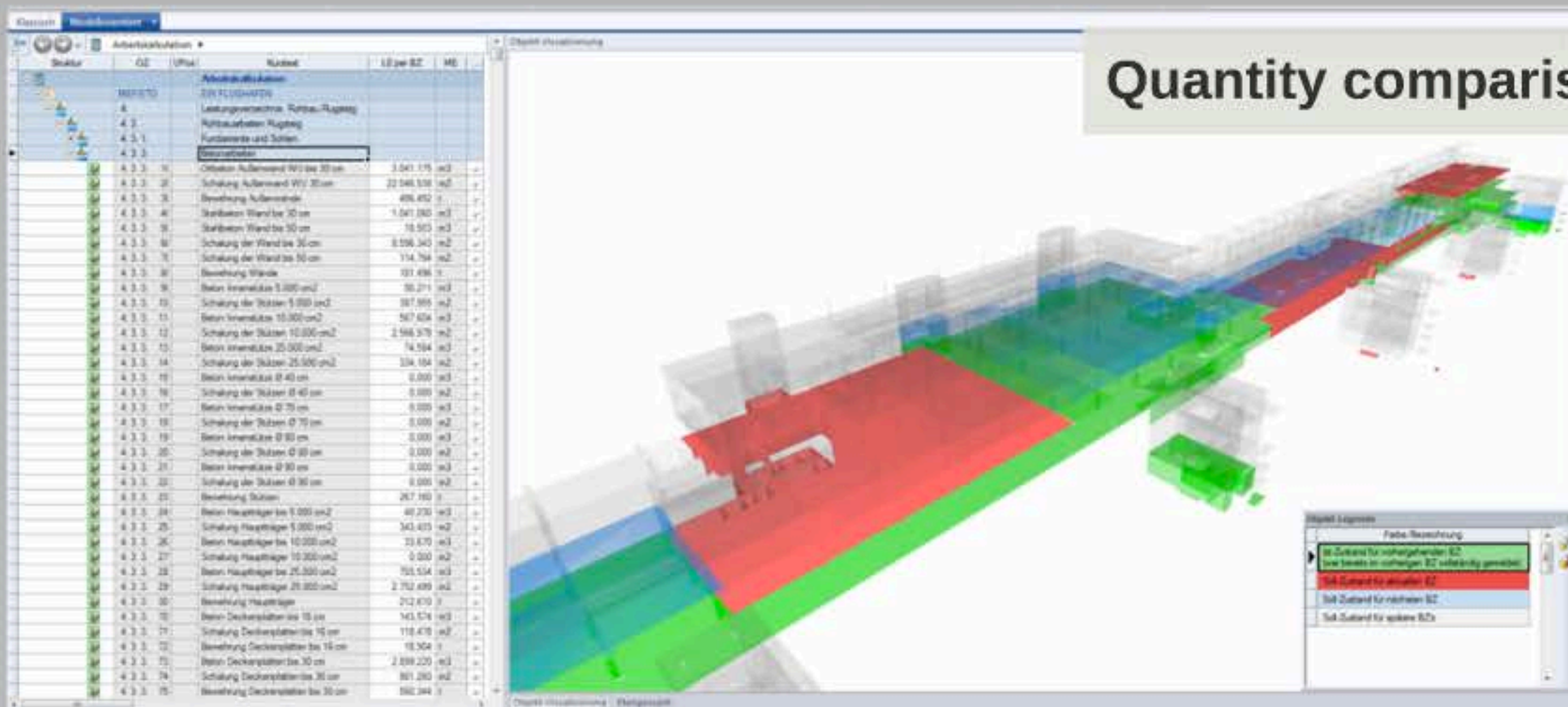


Schlüssel	Auswertungsgröße	Einh.	Art	Gesamt	12/2011	1/2012	2/2012	3/2012	4/2012	5/2012	6/2012	7/2012	8/2012	9/2012	10/2012	11/2012	Rest
2520-11	Lieferant Fa. Cemex Ing.-Bau	m³	Mengen	2.742	61		255	242	577	256				10	38		0
2520-11	Lieferant Fa. Cemex Ing.-Bau	EUR	Erlös	261.952	6.870		26.074	23.209	60.594	27.627				943	3.771		0
2520-11	Lieferant Fa. Cemex Ing.-Bau	EUR	Kosten	234.288	5.515		21.746	21.805	48.197	22.378				609	3.235		0
2520-11	Lieferant Fa. Cemex Ing.-Bau	EUR	Budget	0													0



Schlüssel	Auswertungsgröße	Einh.	Art	Gesamt	12/2011	1/2012	2/2012	3/2012	4/2012	5/2012	6/2012	7/2012	8/2012	9/2012	10/2012	11/2012	Rest
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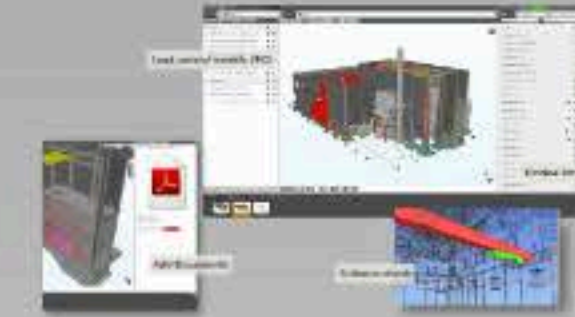
Quantity comparison



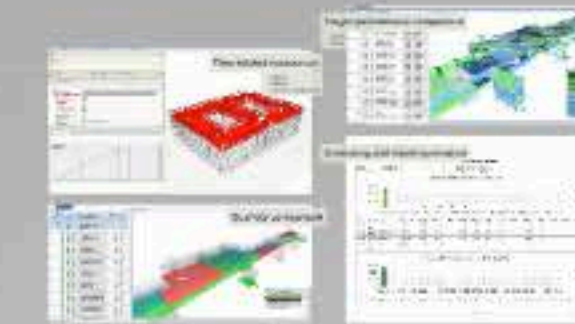
ANALYSIS, PM & COORDINATION SOFTWARE



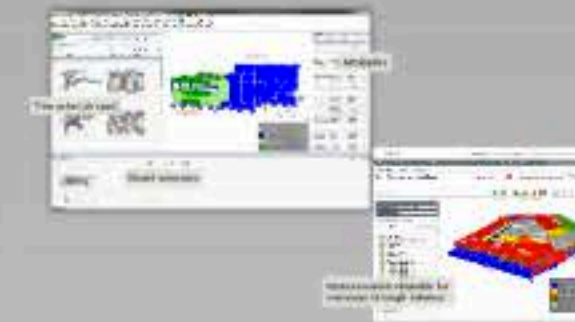
Collision checking
Model coordination



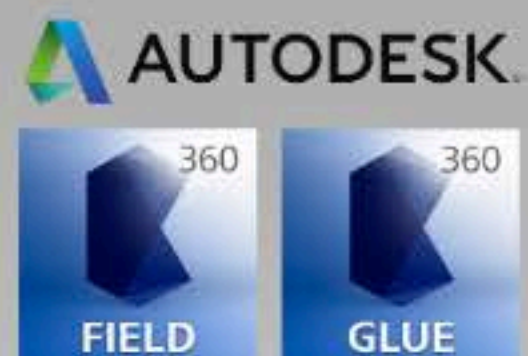
Final quantity determination
Contract specifications
5D Project Management



Project status tracking
Modelbased scheduling



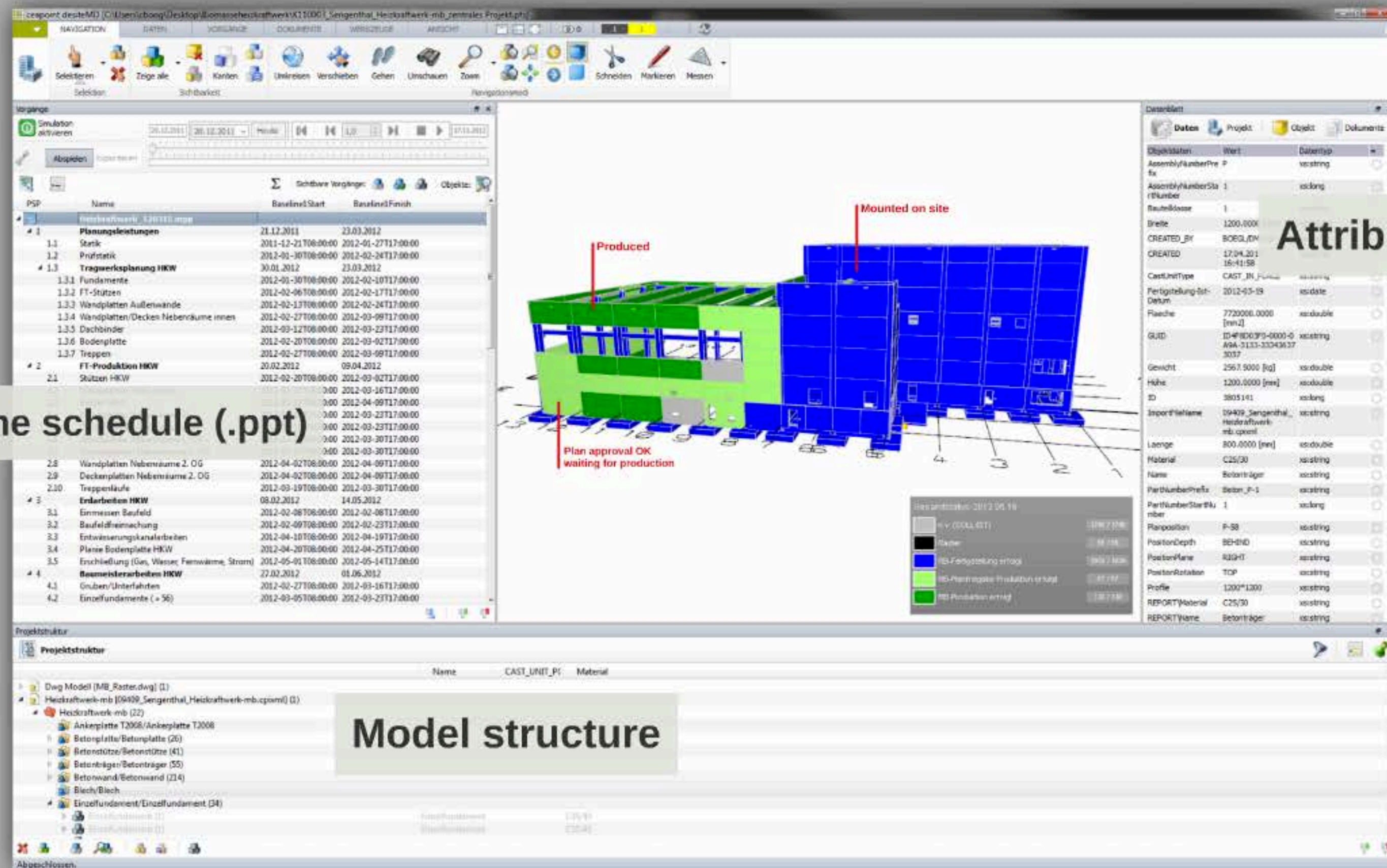
Assembly planning
and simulation



On-site models
Modelbased punchlists



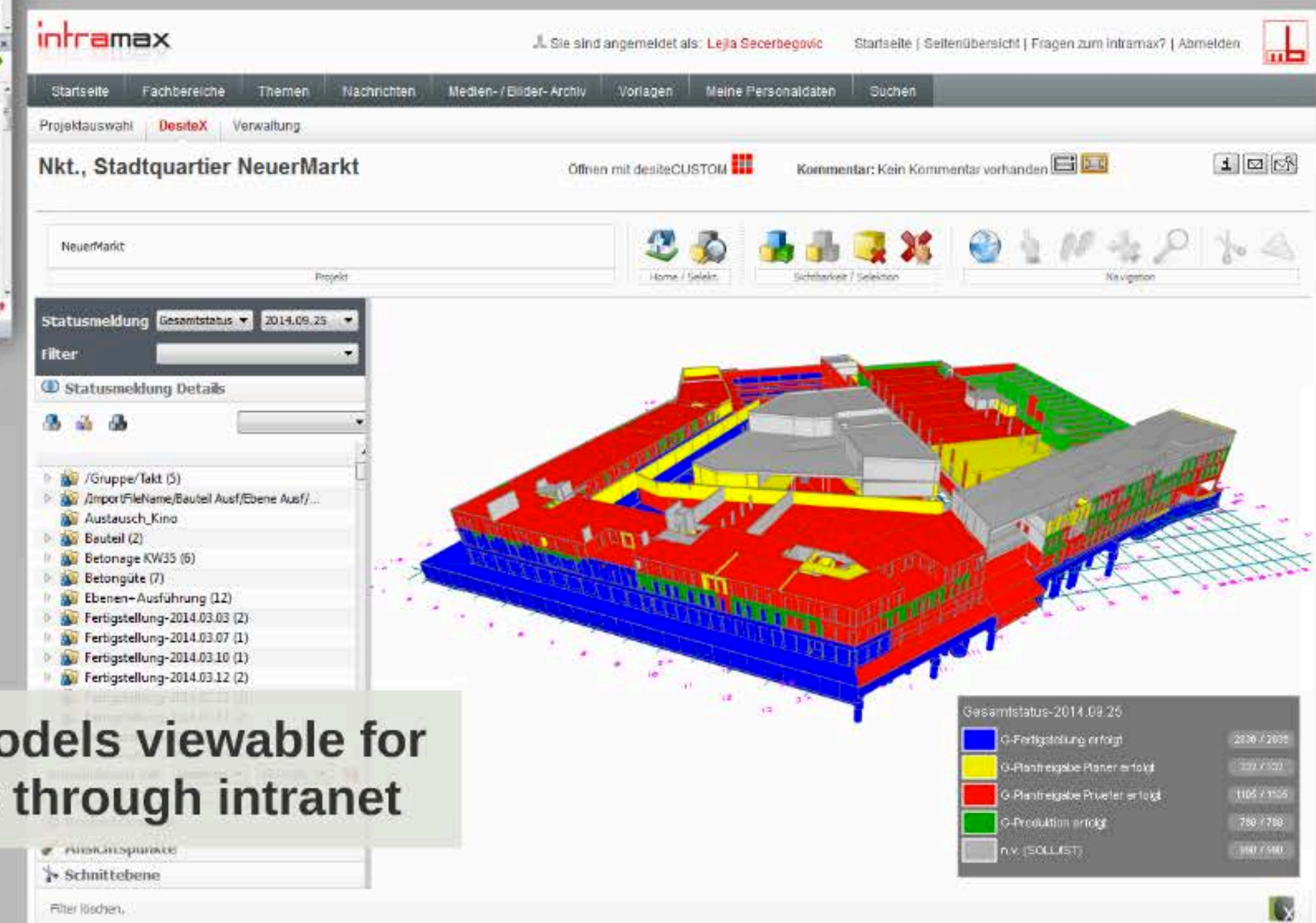
Time schedule (.ppt)



Model structure

Attributes

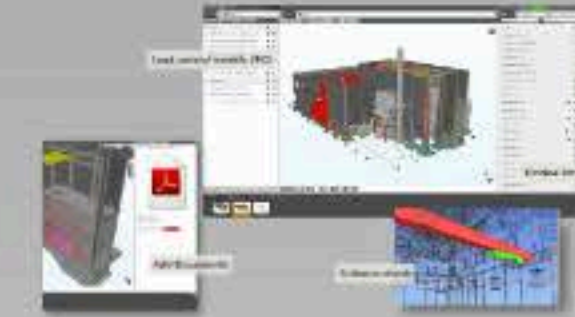
Status models viewable for everyone through intranet



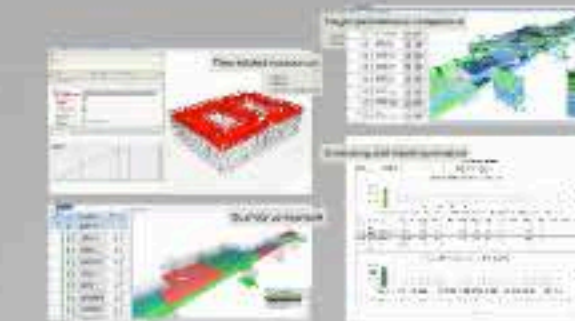
ANALYSIS, PM & COORDINATION SOFTWARE



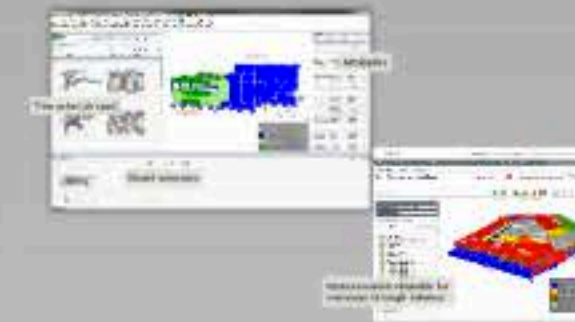
Collision checking
Model coordination



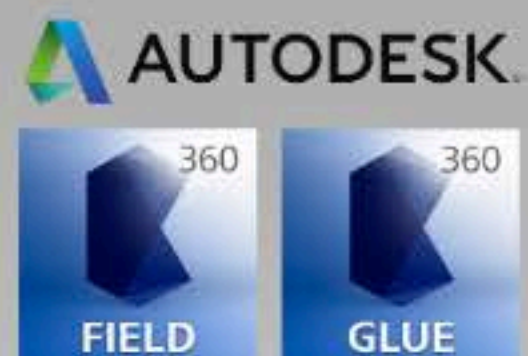
Final quantity determination
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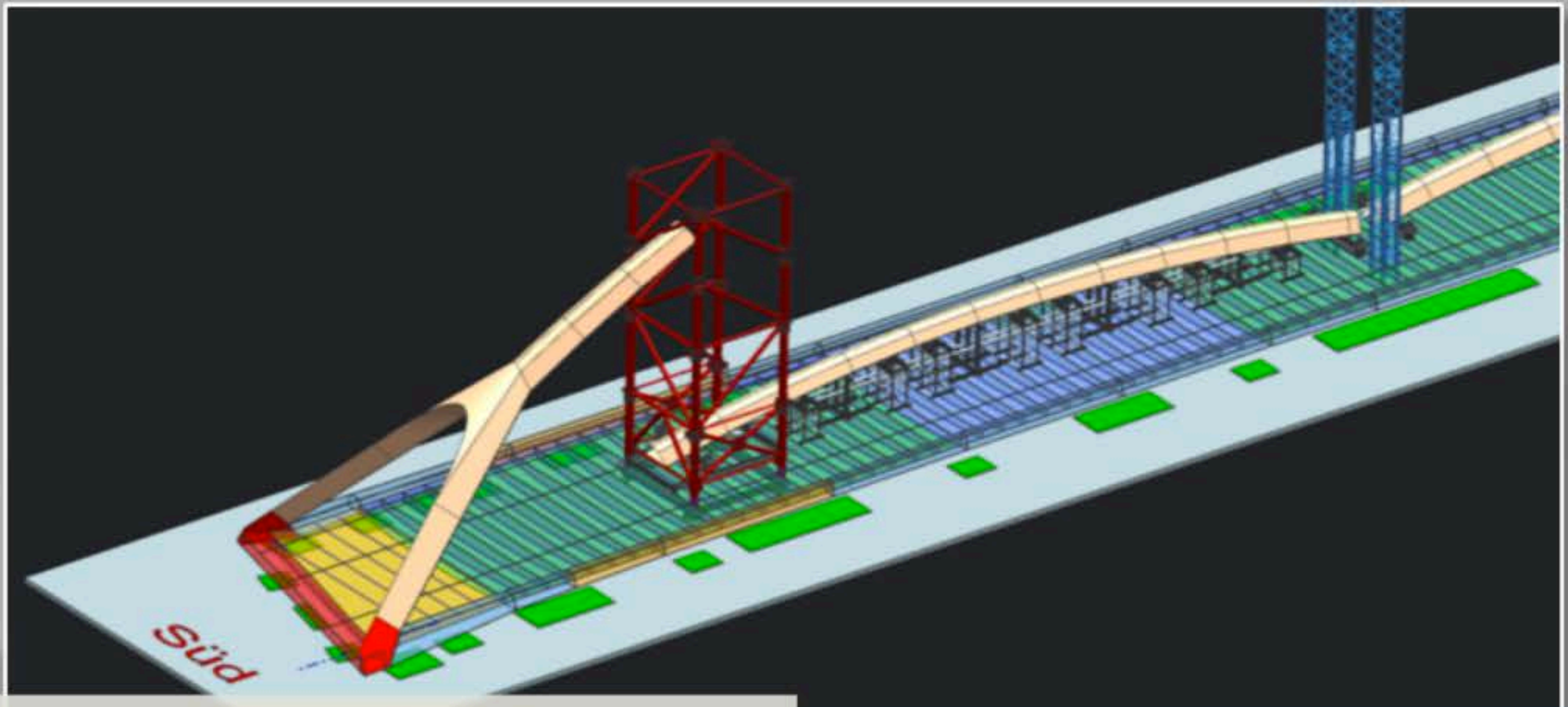


Assembly planning
and simulation

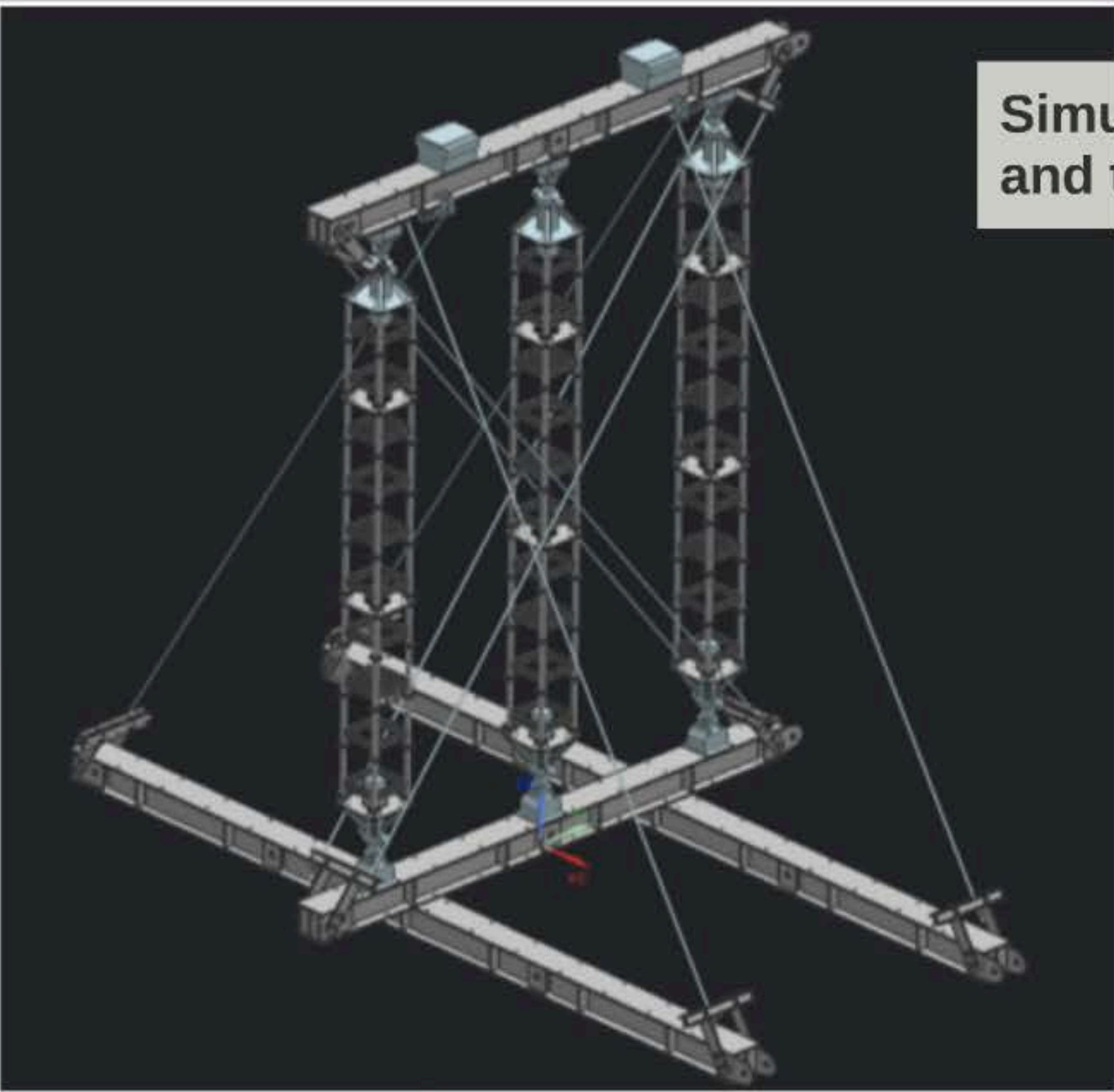


On-site models
Modelbased punchlists





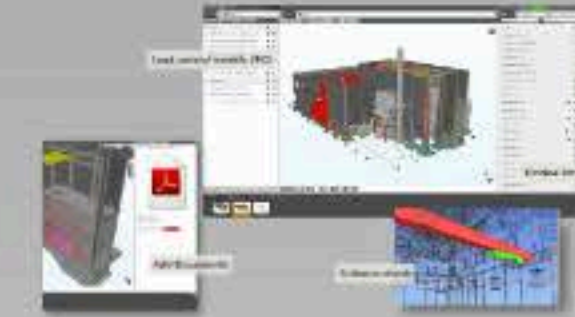
Simulation of the construction process and the auxiliary construction



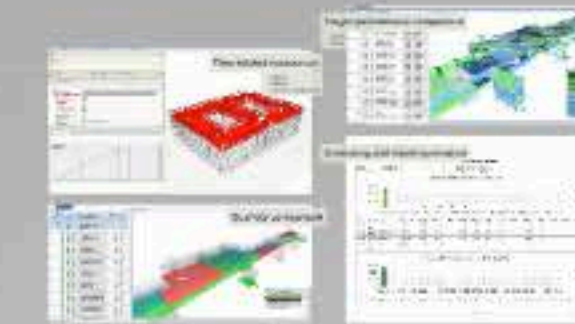
ANALYSIS, PM & COORDINATION SOFTWARE



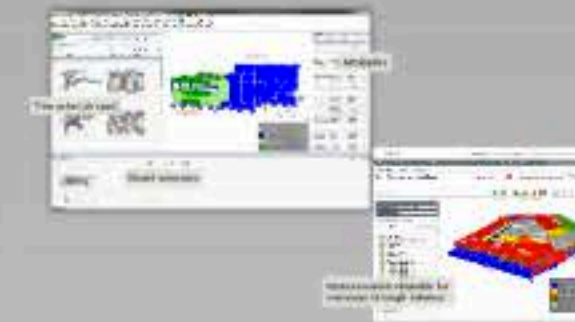
Collision checking
Model coordination



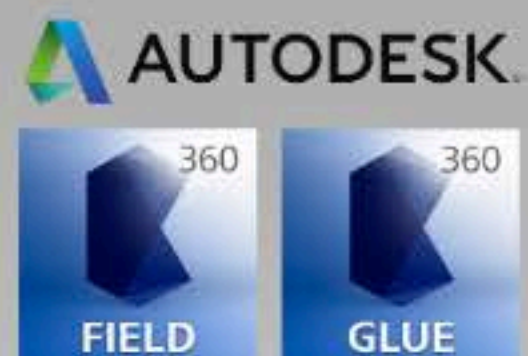
Final quantity determination
Contract specifications
5D Project Management



Project status tracking
Modelbased scheduling



Assembly planning
and simulation

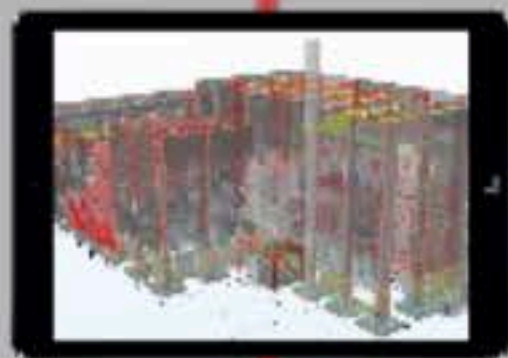


On-site models
Modelbased punchlists

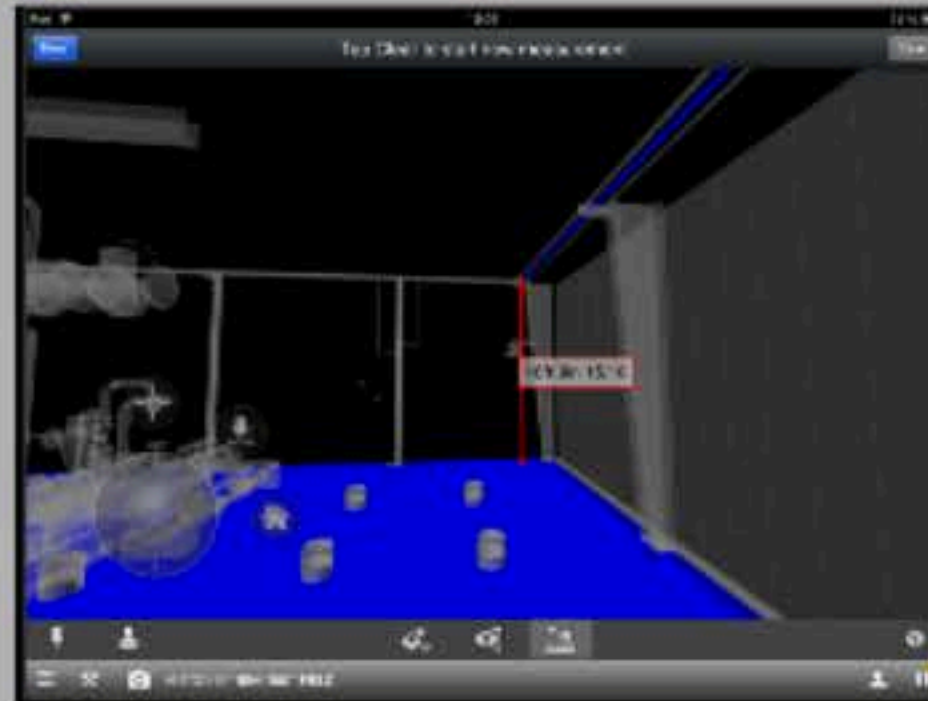




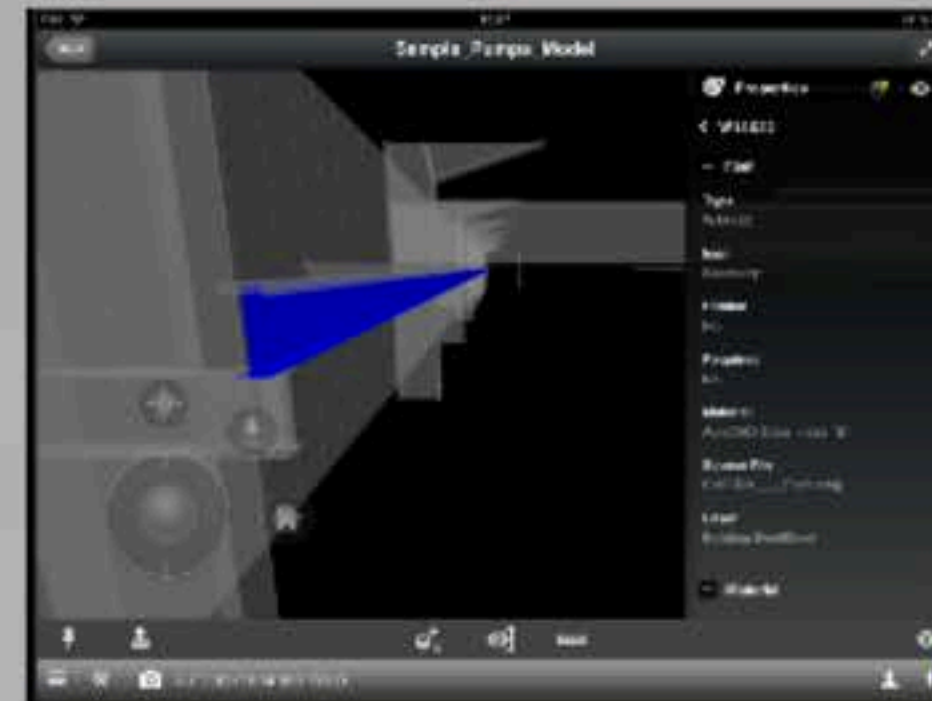
A computer is a great tool on your desk - but would you carry it around at the building site?



iPad adds the missing link between your desk and the construction site



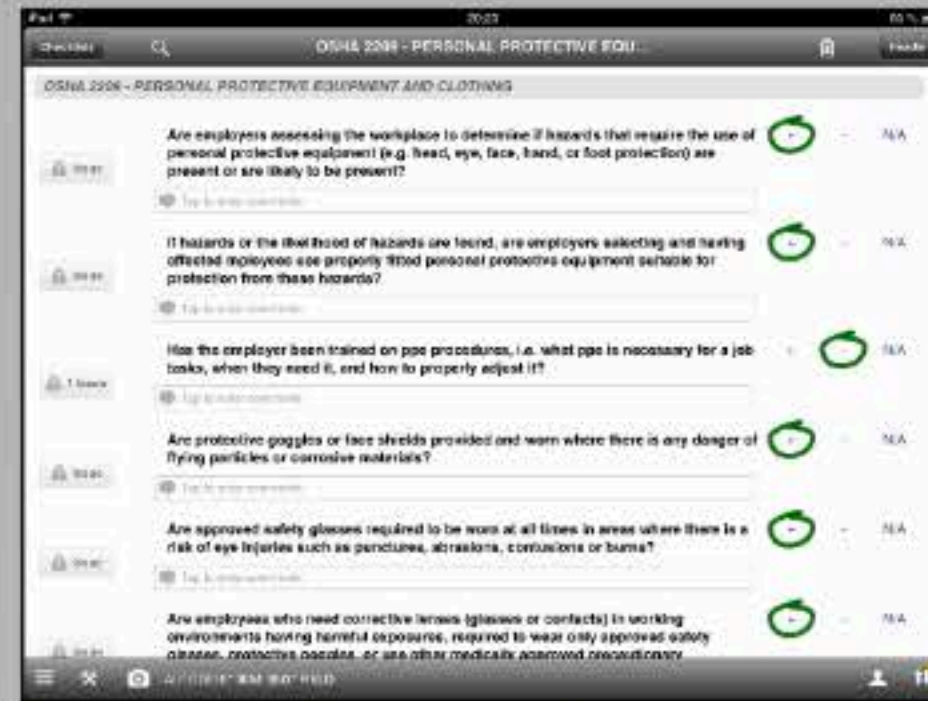
Live measurements



Review attributes



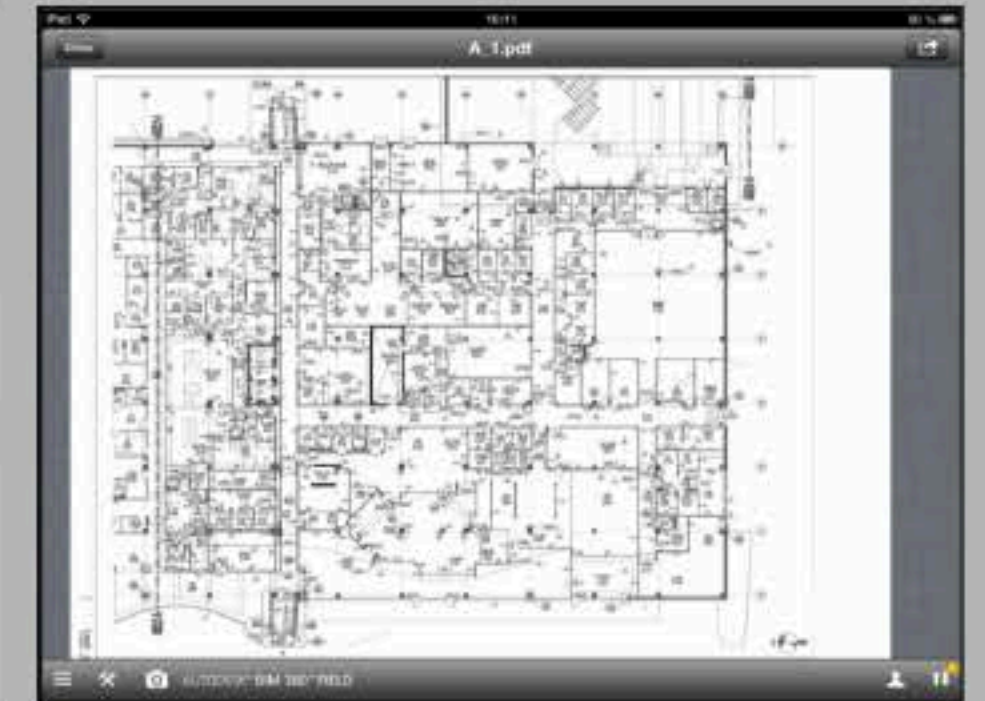
Link notes to the model



Make checklists



Assign tasks



Review drawings



Use the model for meetings



Bring the 3D Data to the site



Charts and reports

GET THE MOST OUT OF YOUR MODEL!

ANALYSIS, PM & COORDINATION SOFTWARE



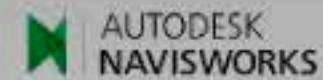
Collision checking
Model coordination



Final quantity determination
Contract specifications
5D Project Management



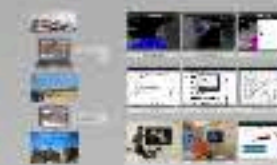
Project status tracking
Modelbased scheduling



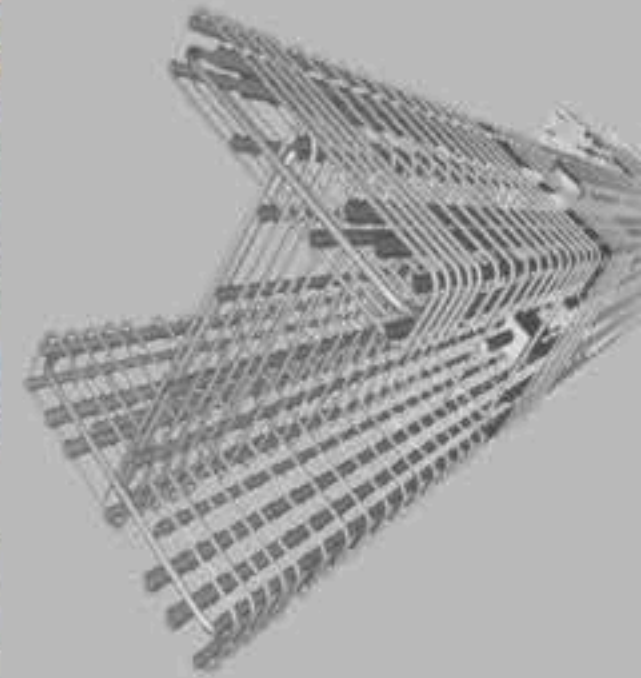
Assembly planning
and simulation



On-site models
Modelbased punchlists



PRODUCTION PROCESS



**THERE IS NO PLUG AND PLAY - OUR MODELS MUST
SPEAK THE LANGUAGE OF ALL THESE TOOLS**

PRODUCTION PROCESS



GRINDING MACHINE



CIRCULATION PLANT



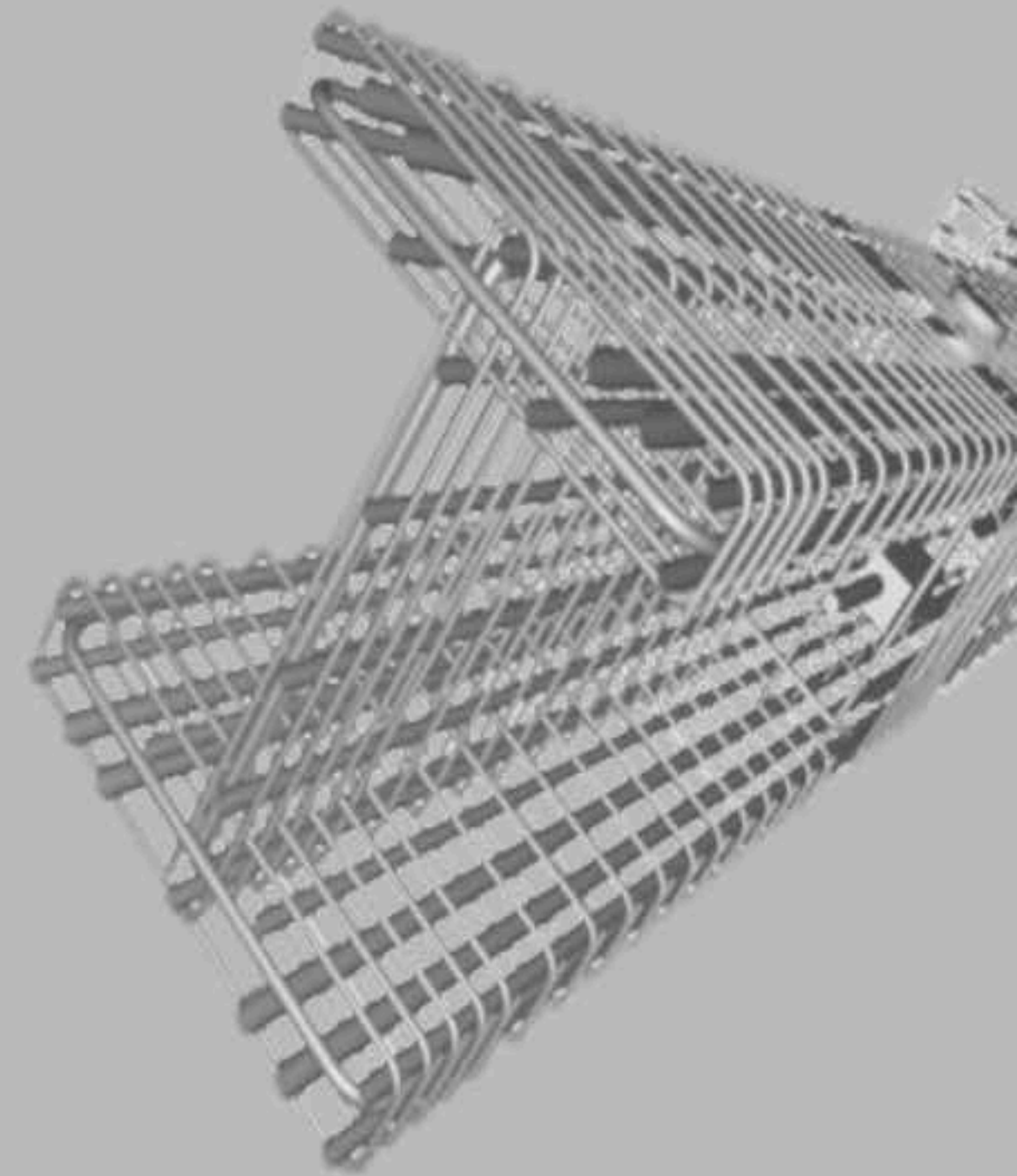
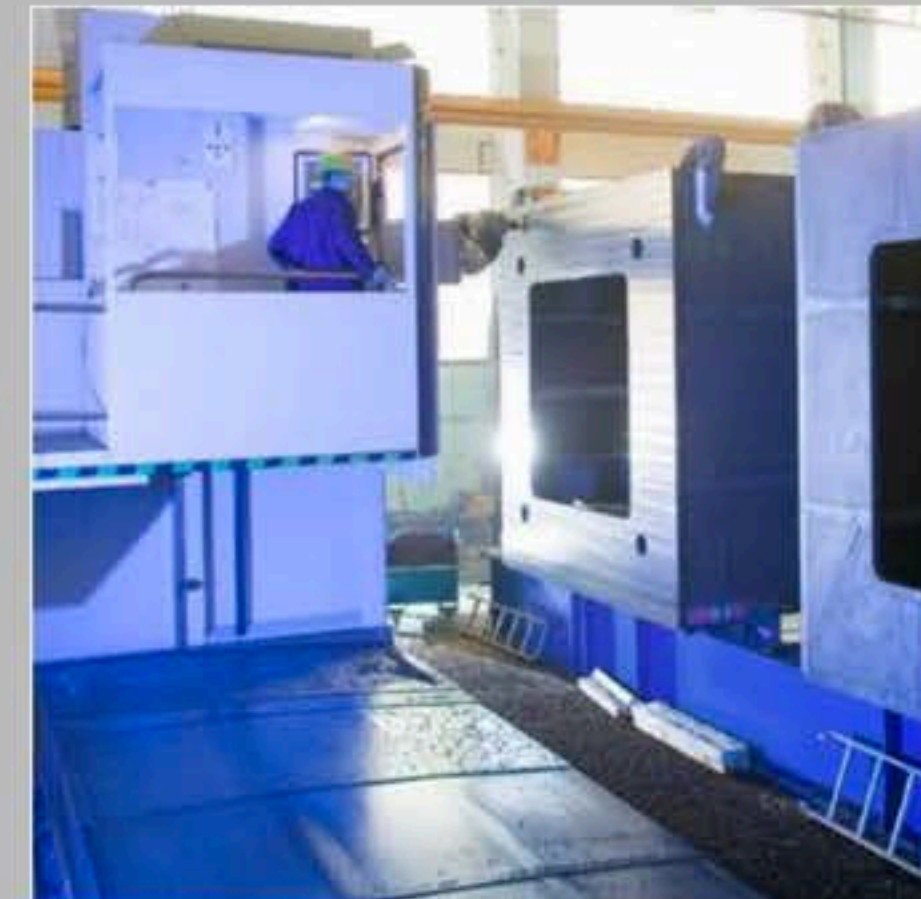
REBAR BENDING MACHINE



MESH WELDING ROBOT



FORMWORK MILLING MACHINE



GET THE MOST OUT OF YOUR MODEL!

ANALYSIS, PM & COORDINATION SOFTWARE



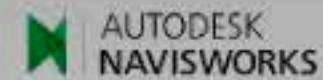
Collision checking
Model coordination



Final quantity determination
Contract specifications
5D Project Management



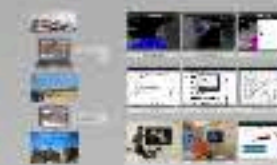
Project status tracking
Modelbased scheduling



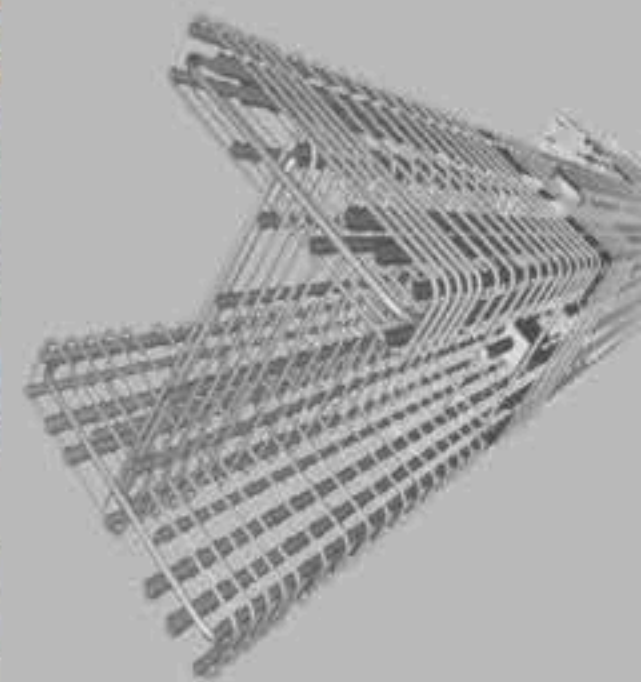
Assembly planning
and simulation



On-site models
Modelbased punchlists



PRODUCTION PROCESS



**THERE IS NO PLUG AND PLAY - OUR MODELS MUST
SPEAK THE LANGUAGE OF ALL THESE TOOLS**

MB PLANNING TEAM



MAX BÖGL



INHOUSE PLANNING TEAM



PARTNERING

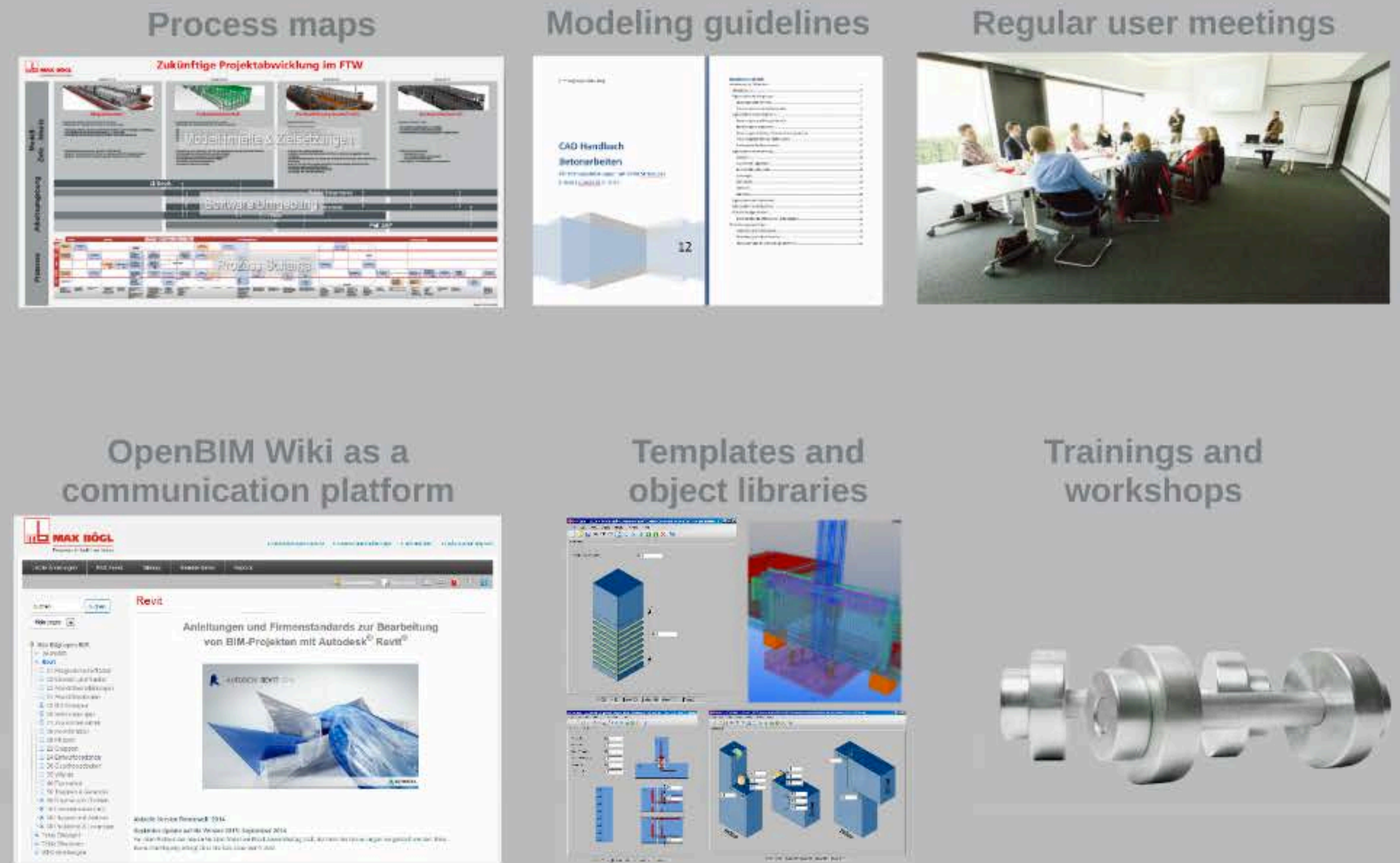
SAME OUTPUT!

SAME STANDARDS = SAME OUTPUT

NATIONAL STANDARDS

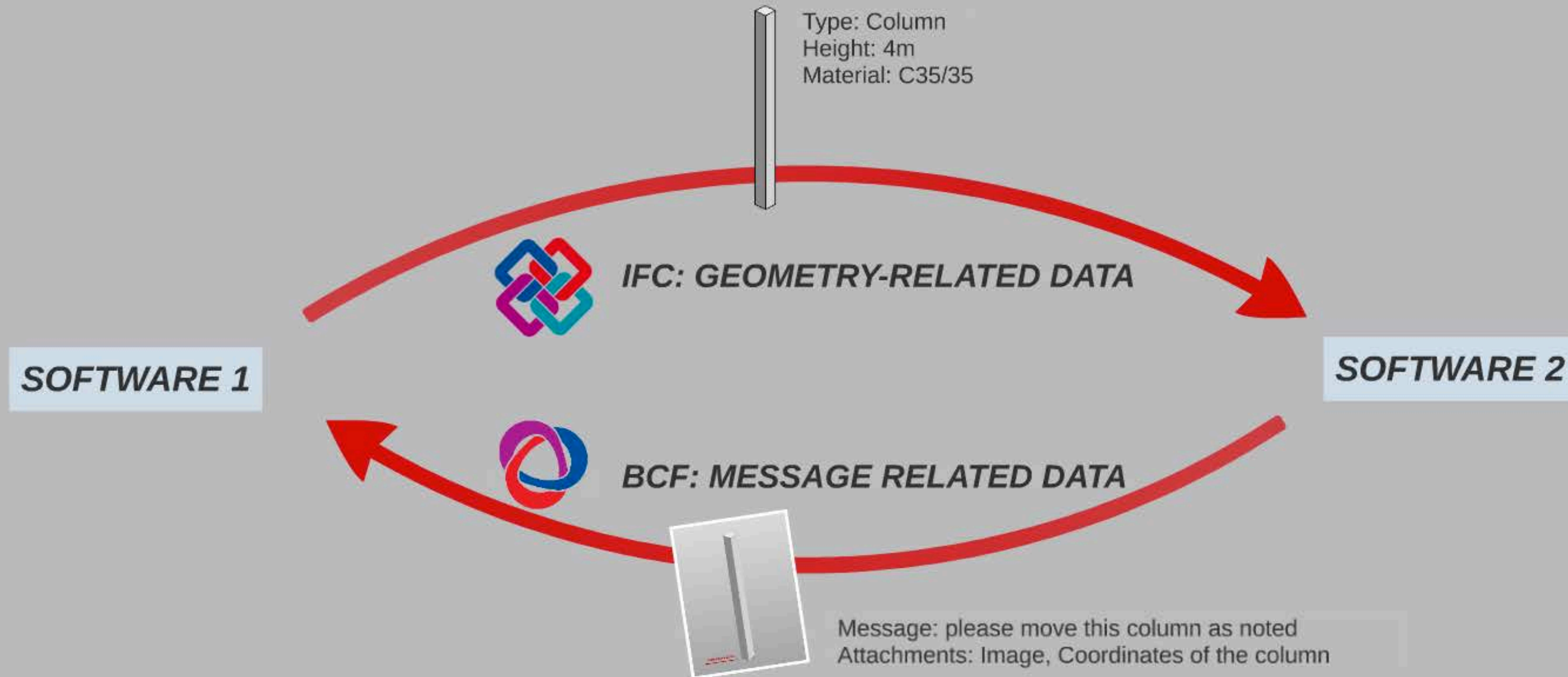


INHOUSE STANDARDS



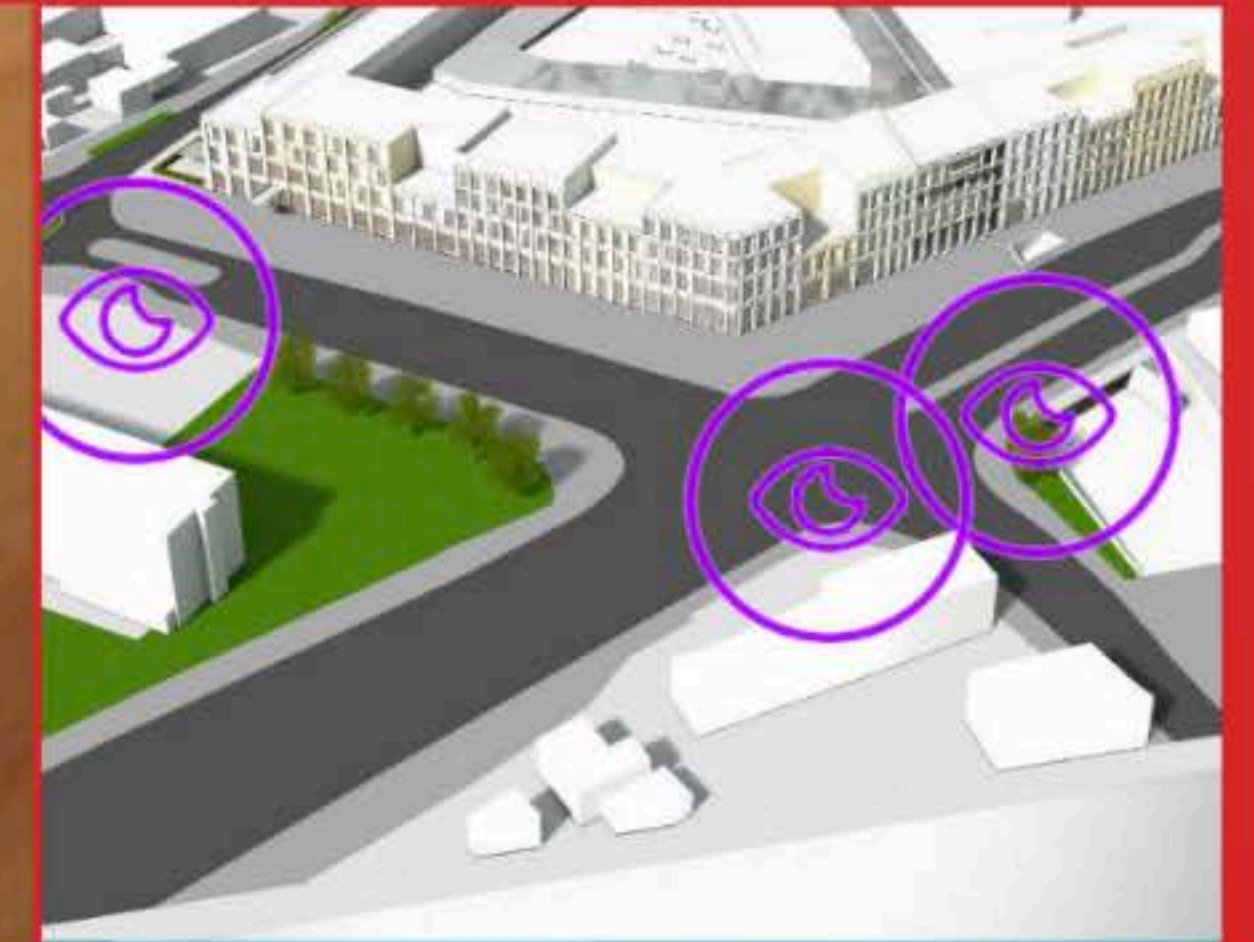
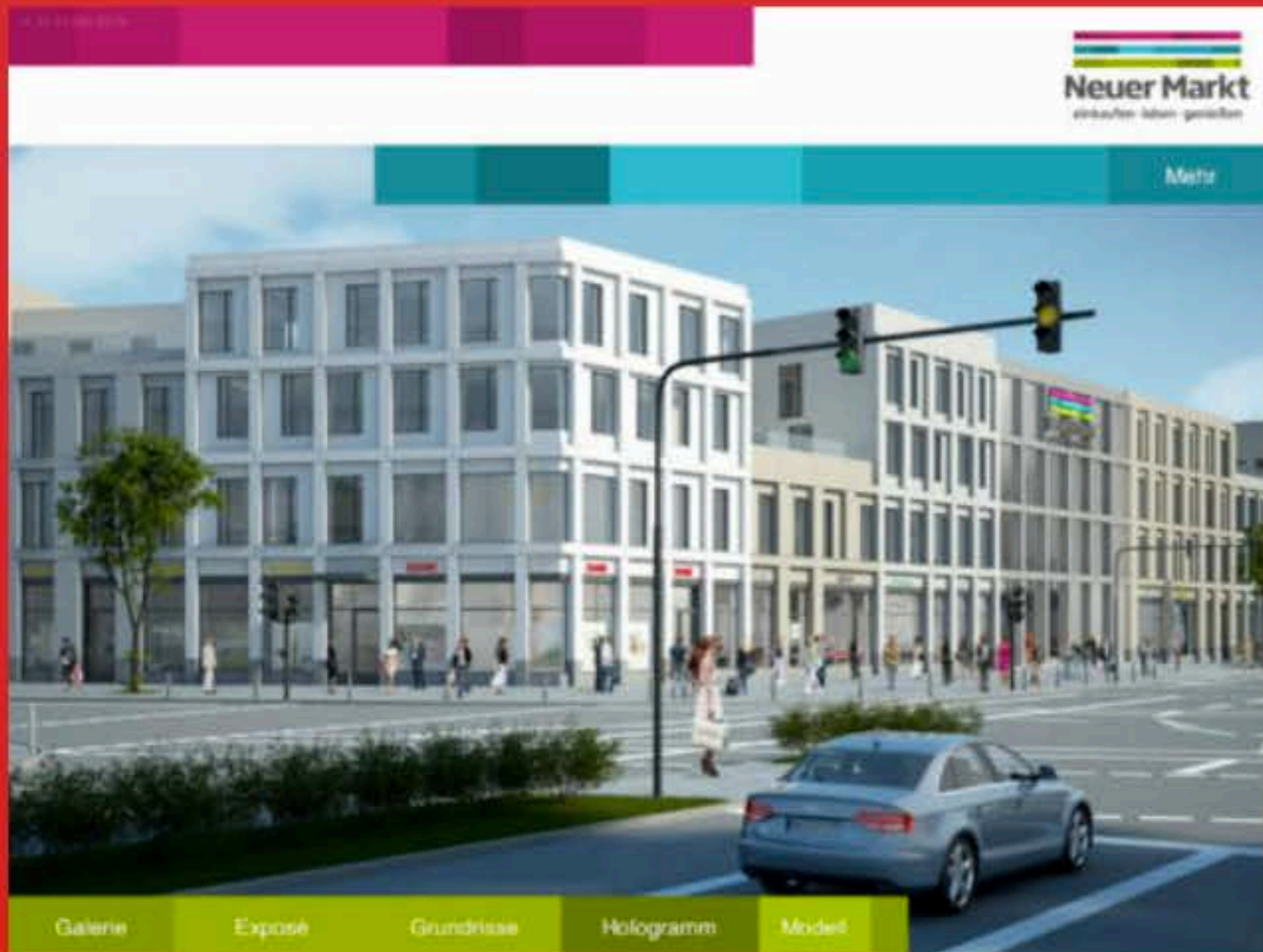
MODELBASED COMMUNICATION

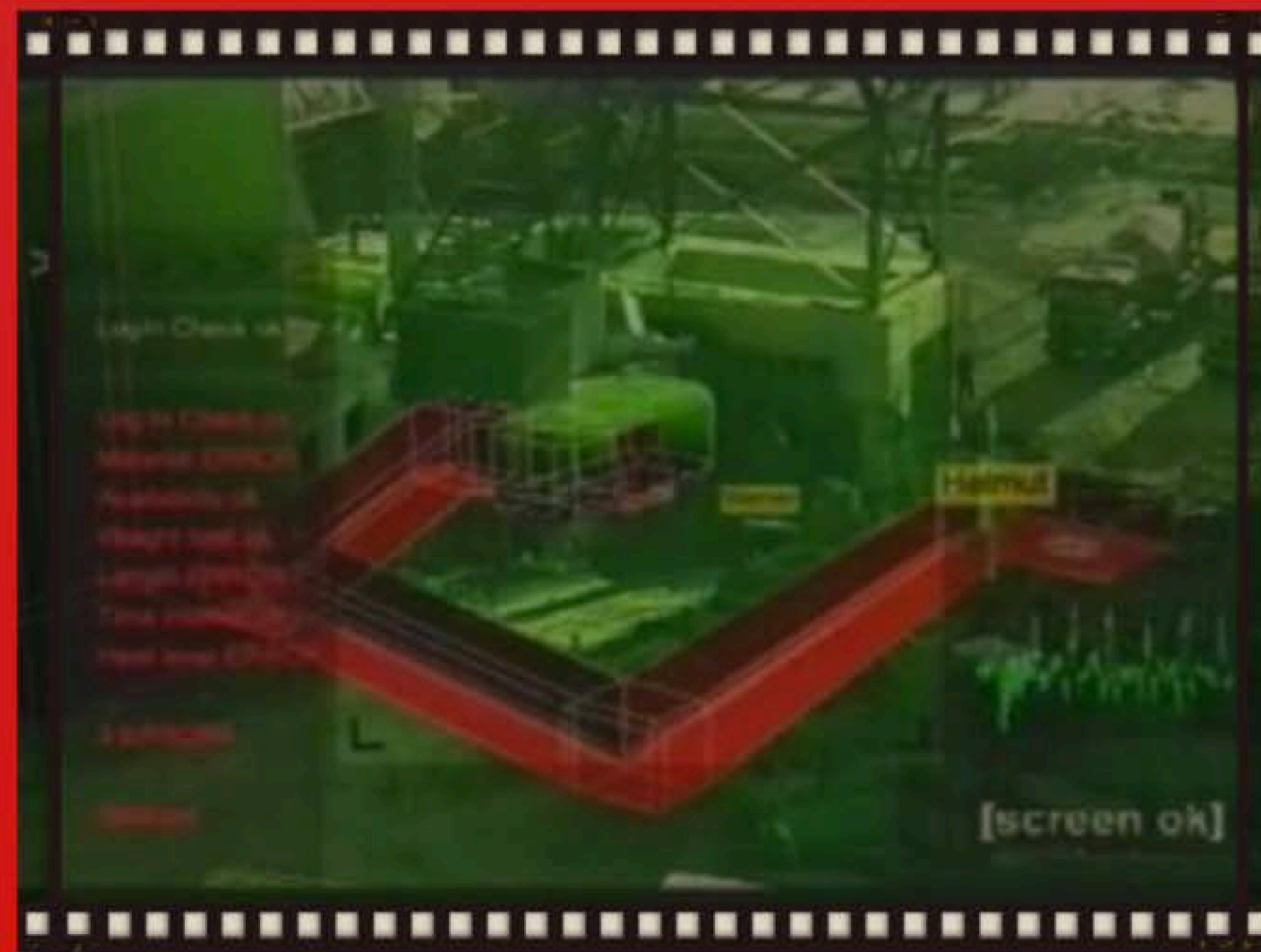
MORE AND MORE SOFTWARE SPEAKS BCF! BIM COLLABORATION FORMAT

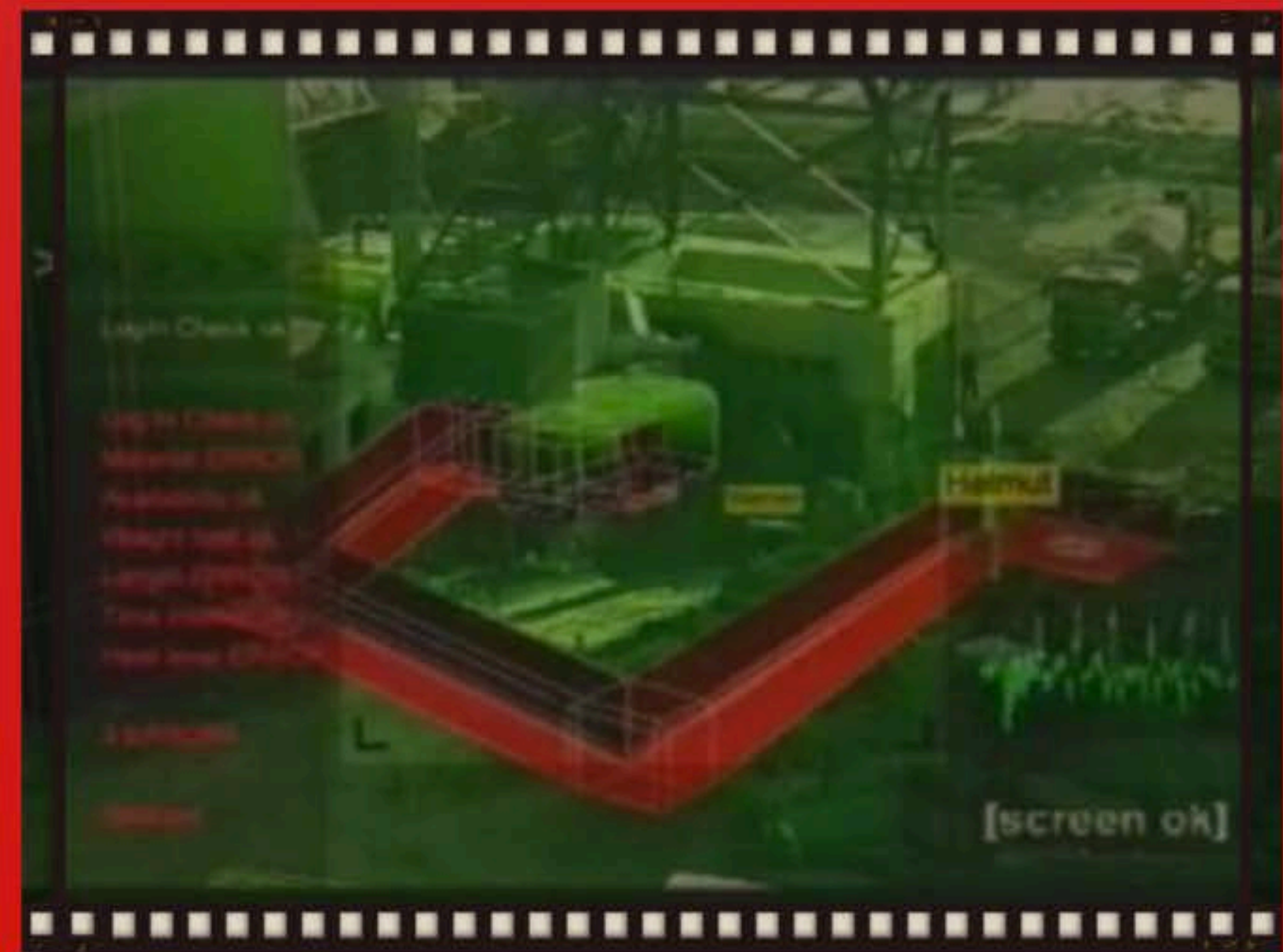


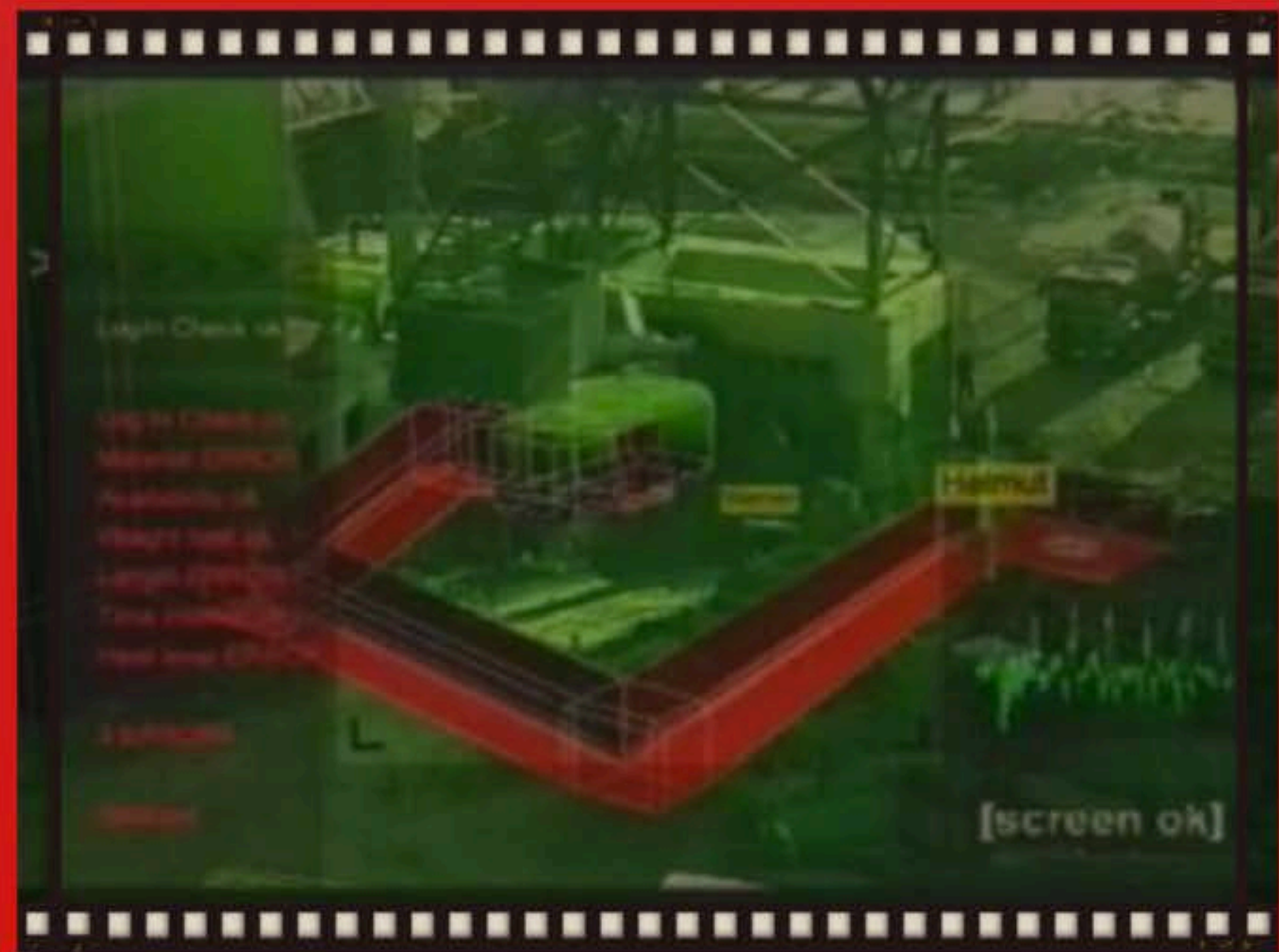
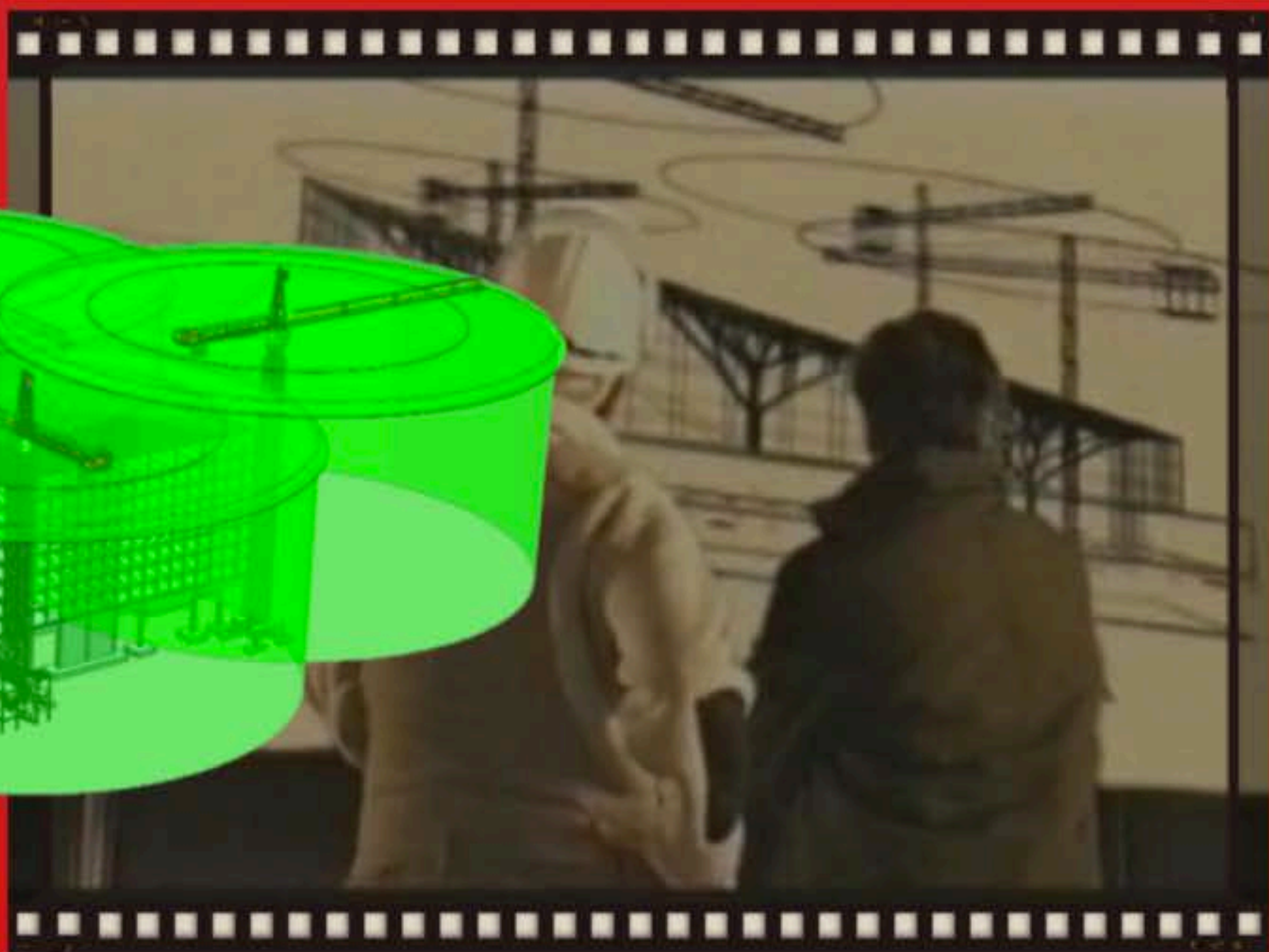
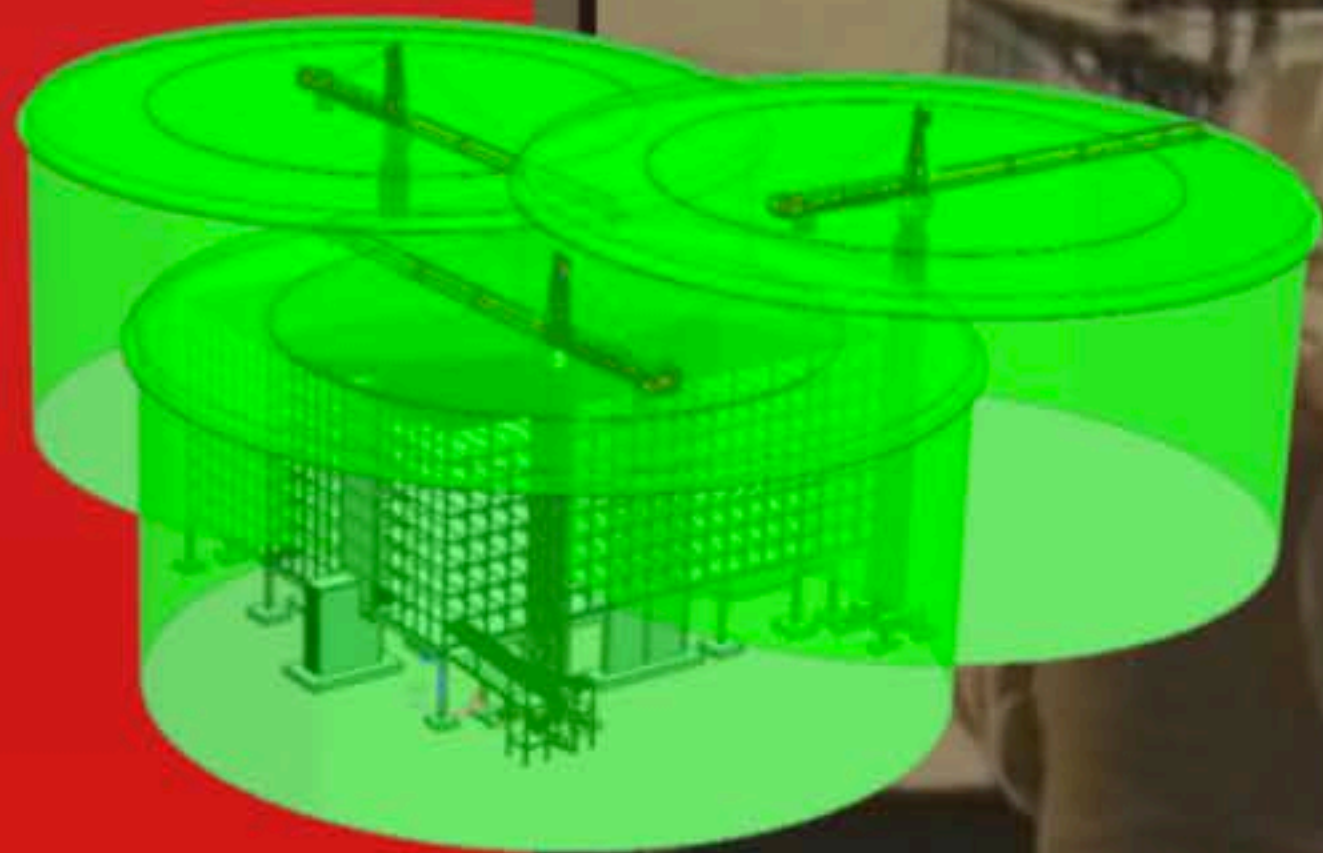
BEYOND BIM

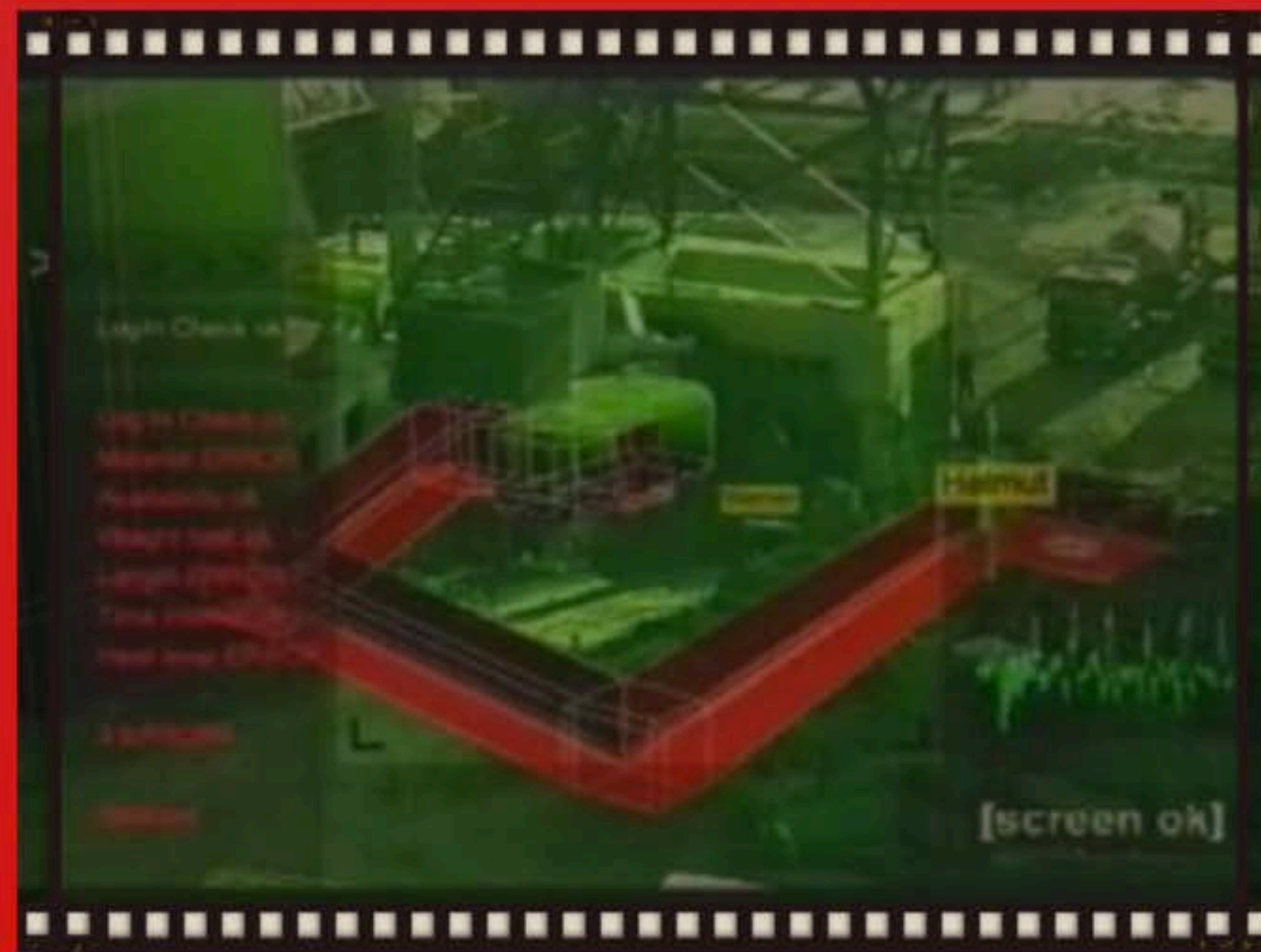
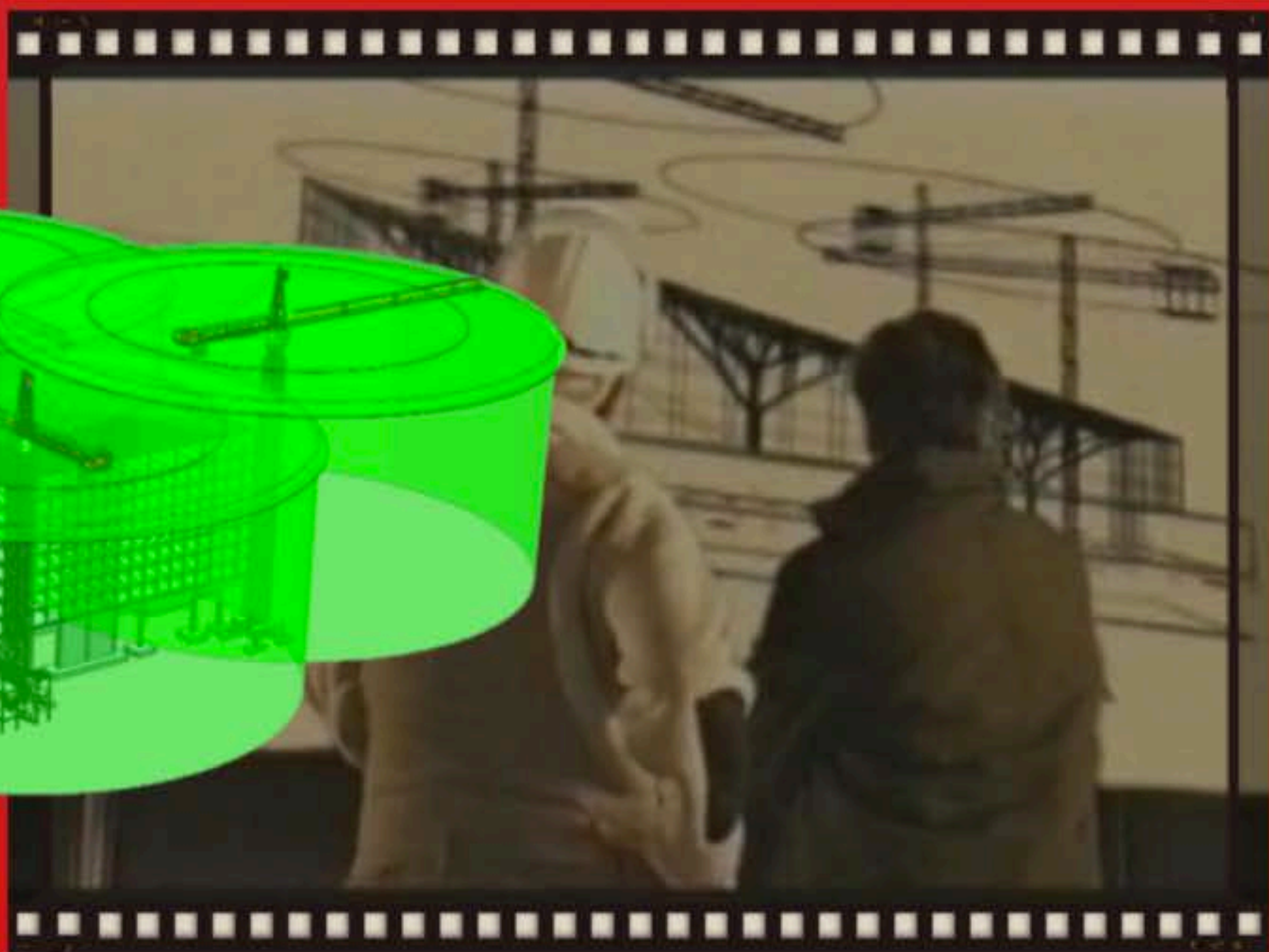
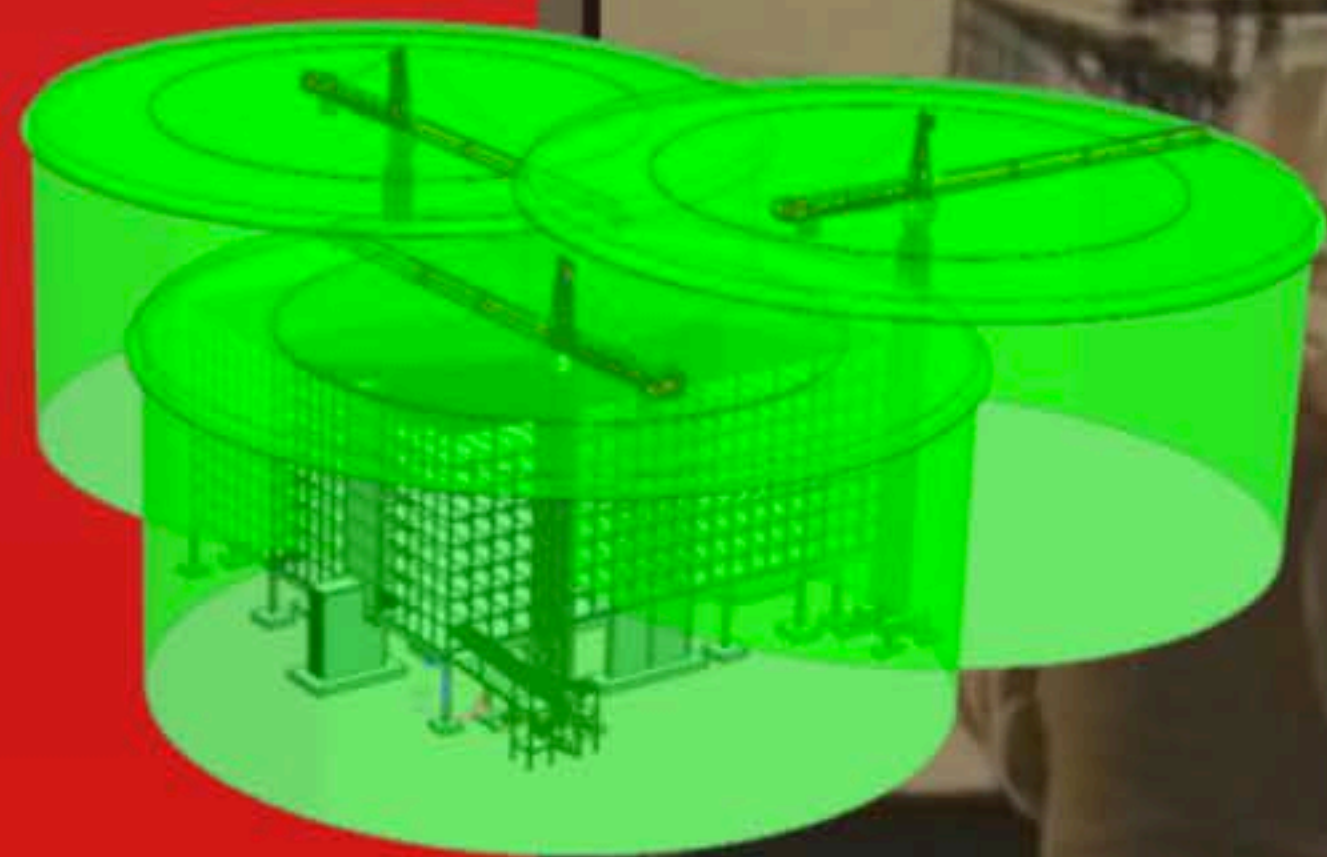
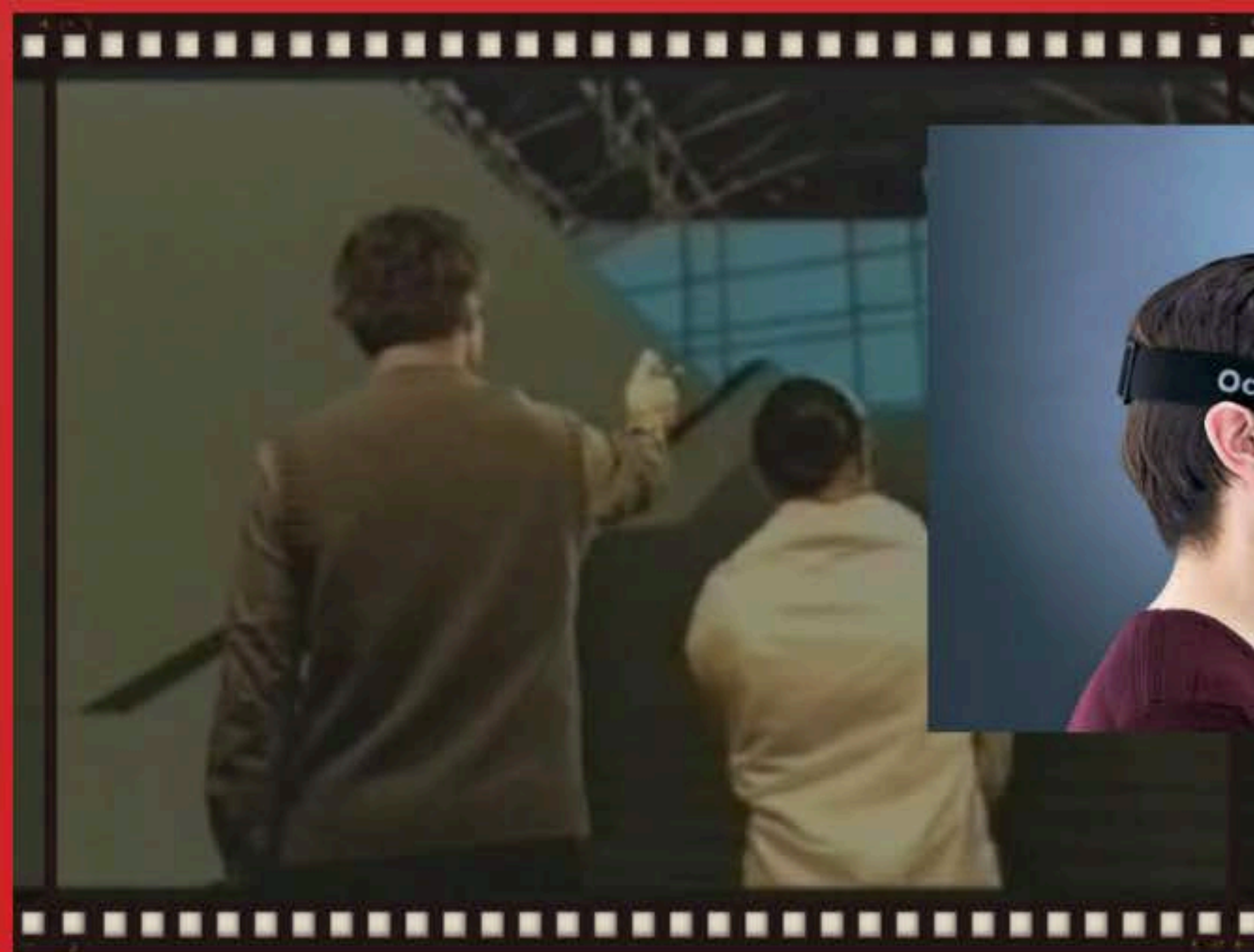
*Android and iOS App for our current Project Shopping Center Neuer Markt
including Virtual / Augmented Reality Features*

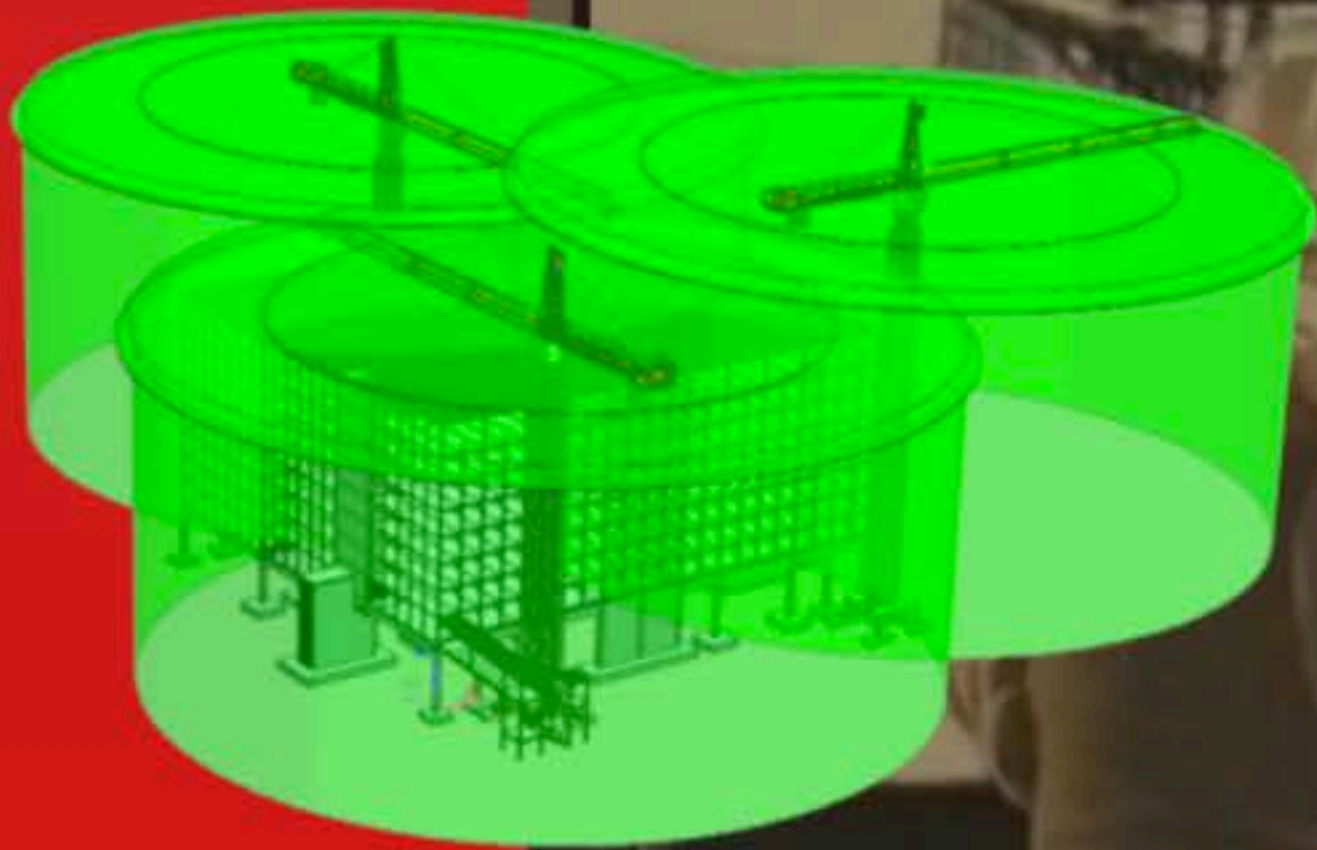
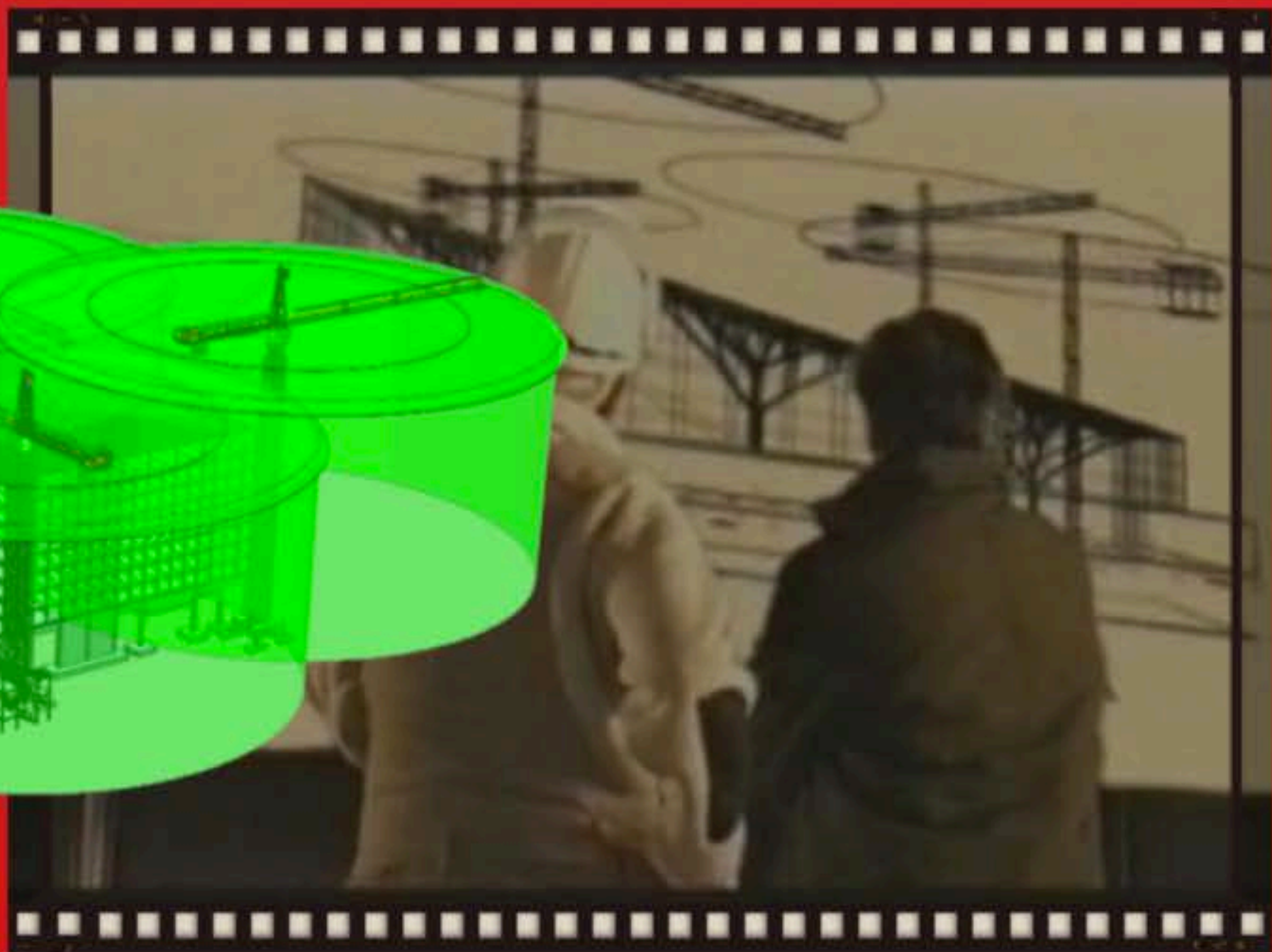
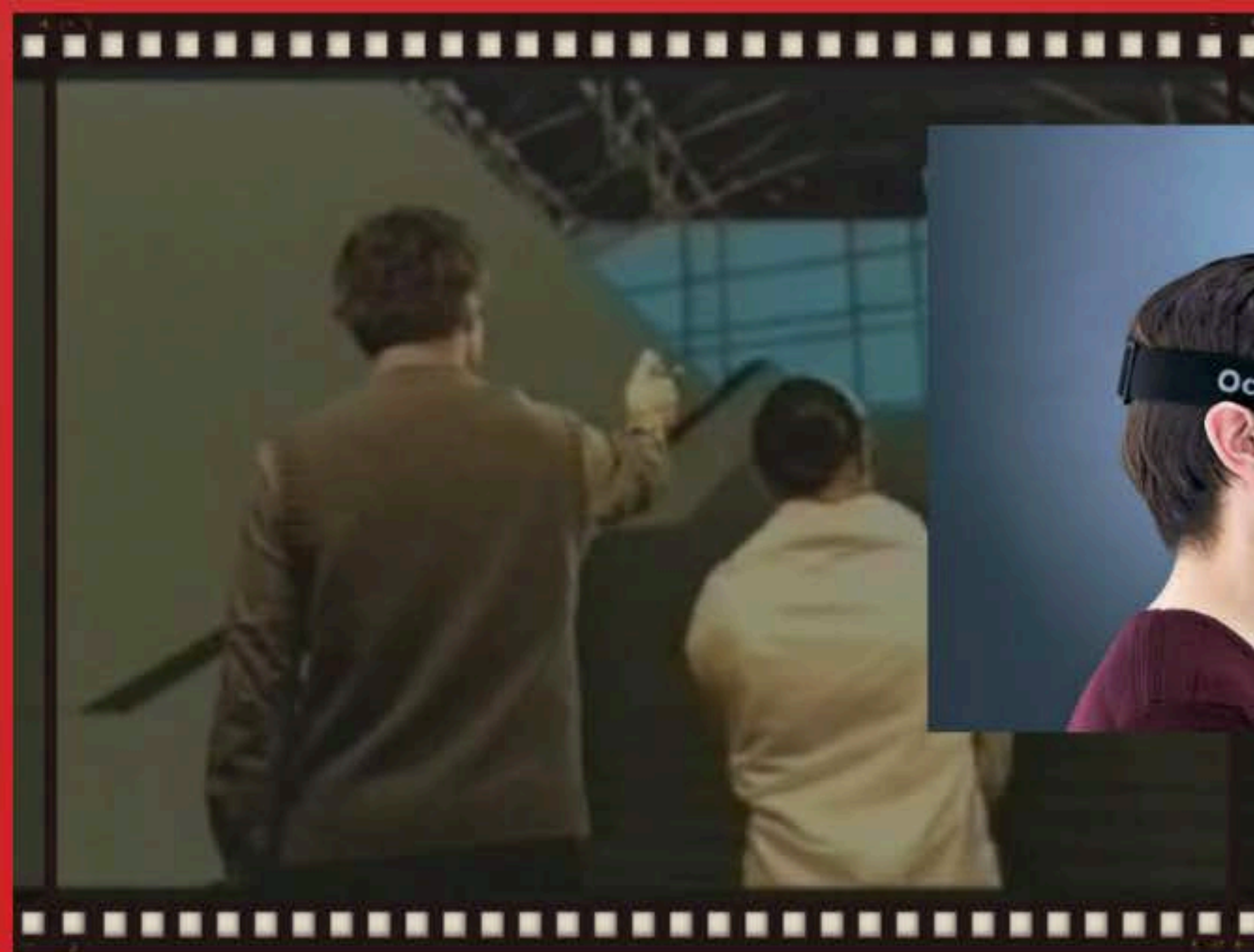


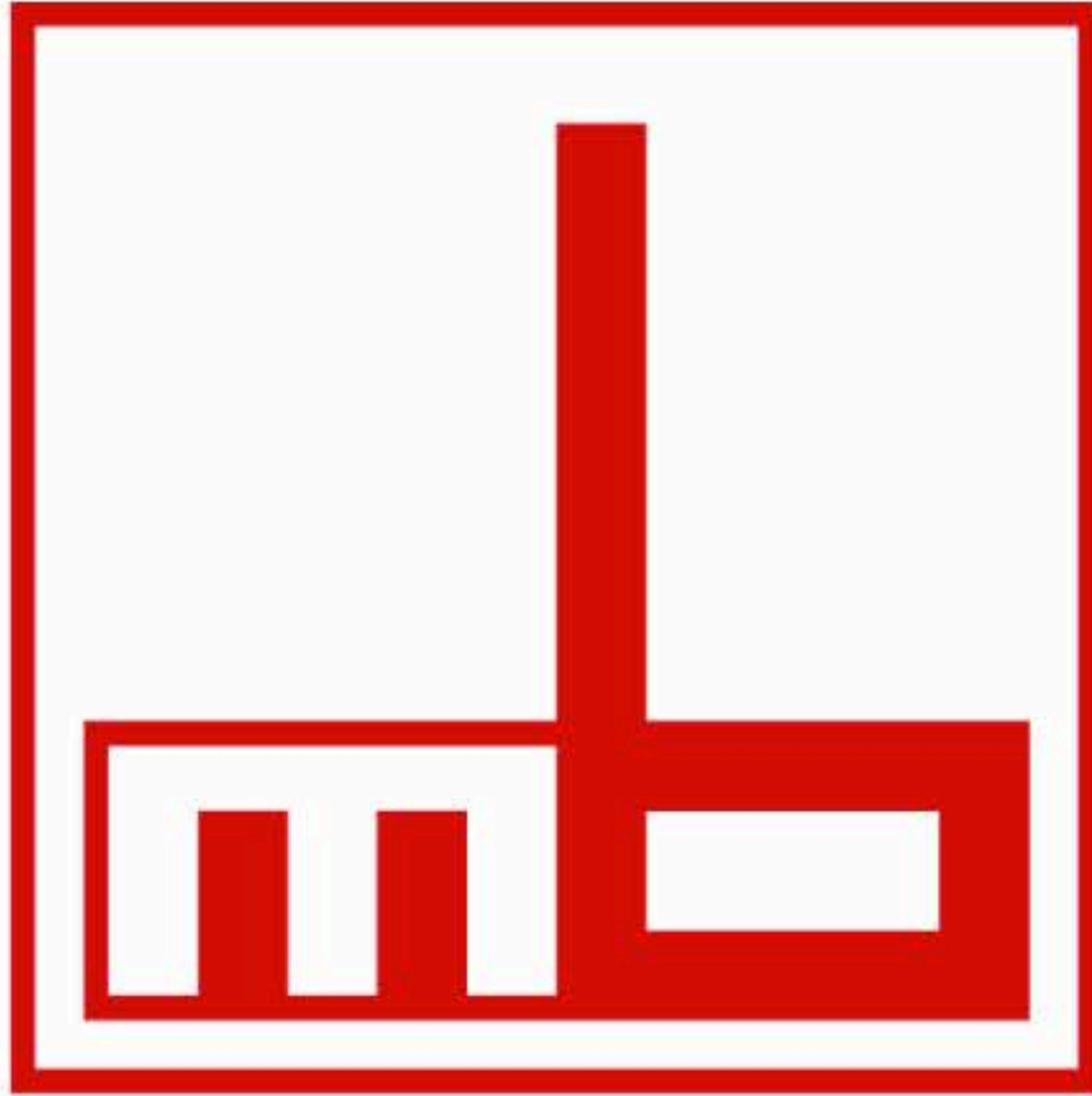












MAX BÖGL

Progress is built on ideas.



what's next?