



CONSTRUSOFT

Tekla BIM workflow

optimizing the total process



PORTUGAL
STEEL

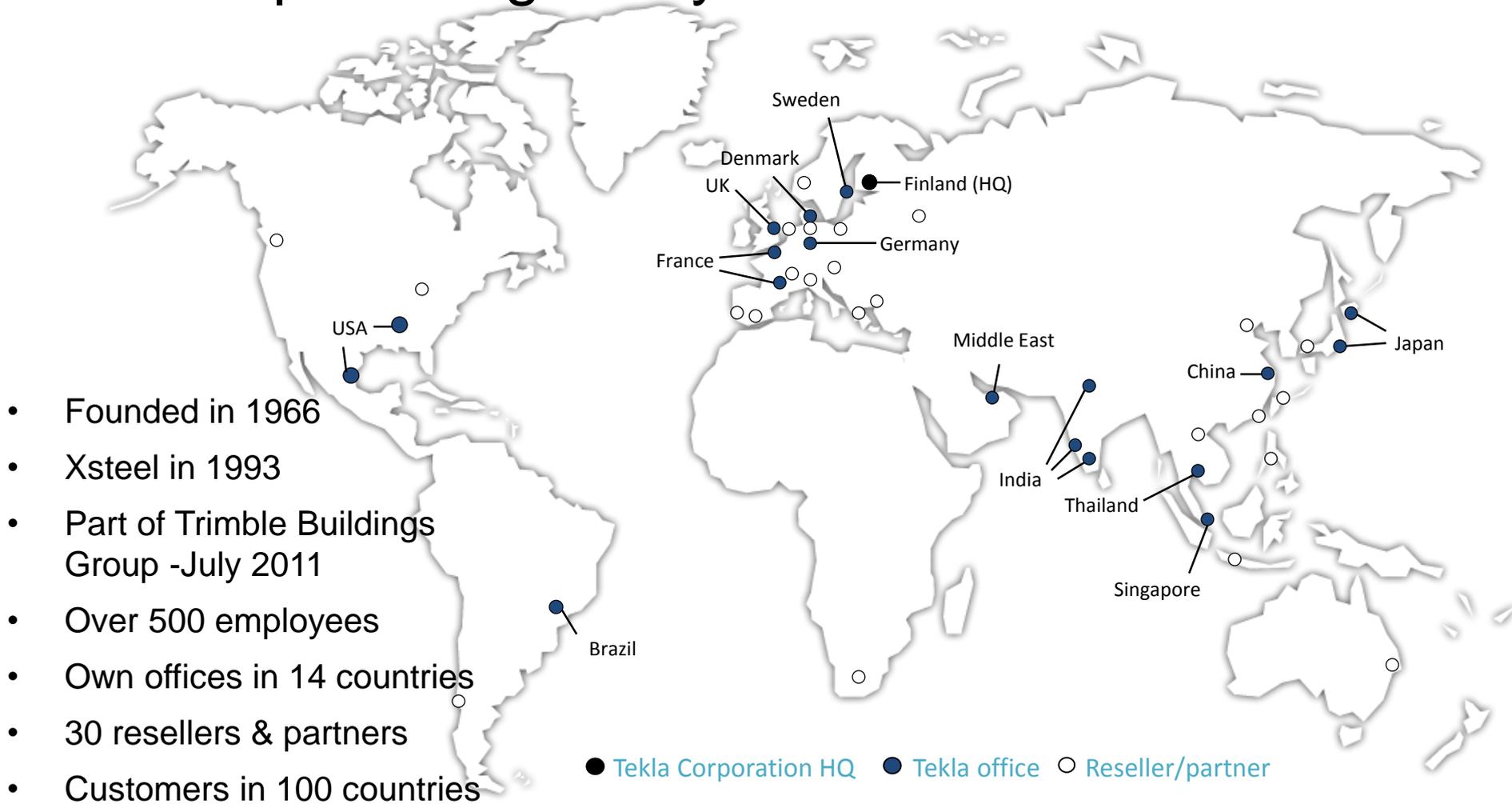
Vakis P. Kokorelis
Director Geral
Construsoft Portugal

Agenda

- Tekla - Global Software Company
- How to make working more efficient and productive?
- Tekla BIM Solution
 - Design and documentation
 - Structural analysis
 - Engineering the details
- Reference cases
- Conclusion

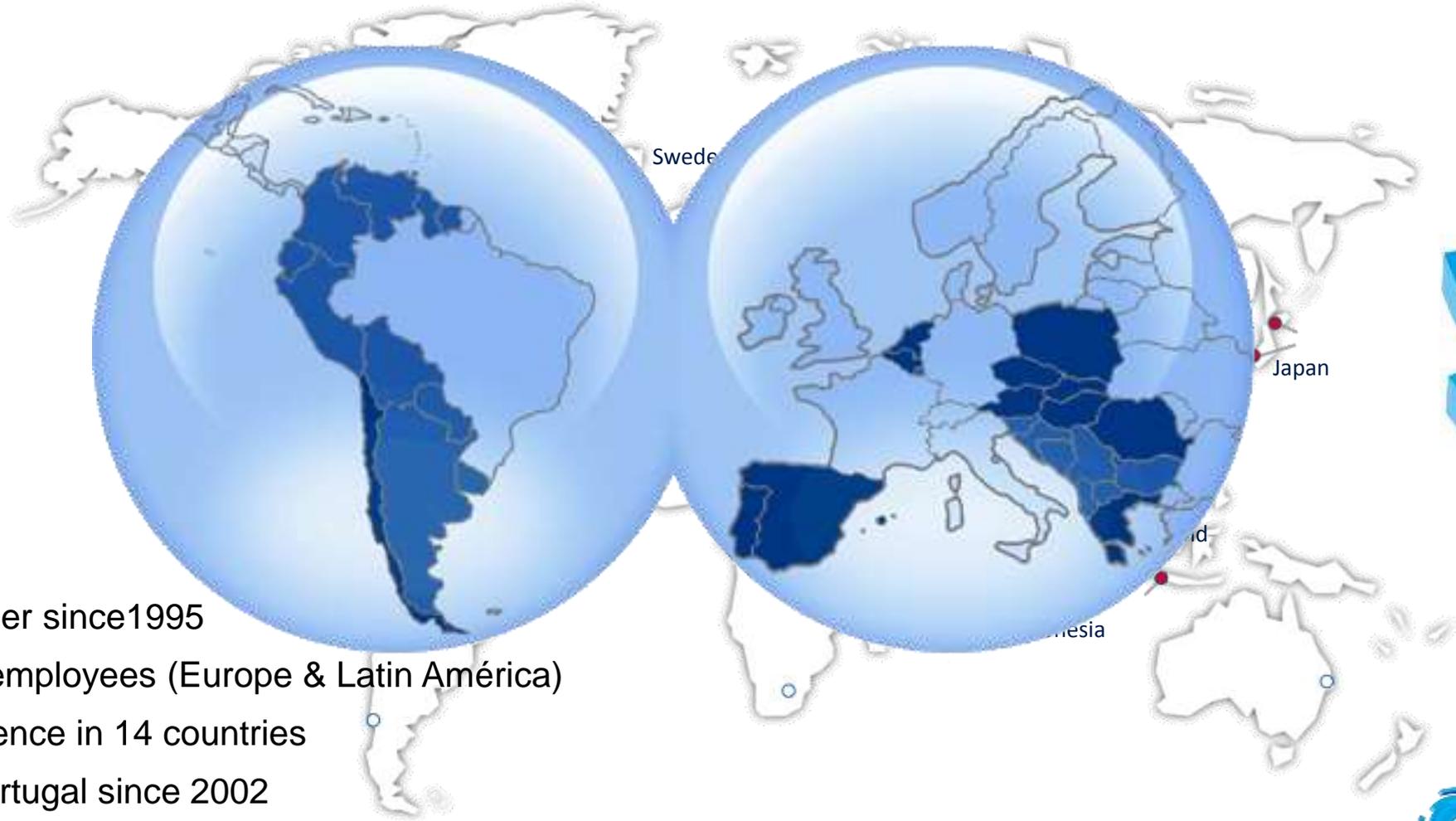
- 
- **Tekla - Global Software Company**
 - How to make working more efficient and productive?
 - Tekla BIM Solution
 - Design and documentation
 - Structural analysis
 - Engineering the details
 - Reference cases
 - Conclusion

Tekla operates globally



- Founded in 1966
- Xsteel in 1993
- Part of Trimble Buildings Group -July 2011
- Over 500 employees
- Own offices in 14 countries
- 30 resellers & partners
- Customers in 100 countries

Construsoft part of the Global Network



- Partner since 1995
- 100 employees (Europe & Latin América)
- Presence in 14 countries
- In Portugal since 2002

● Tekla Corporation HQ

● Tekla Office

○ Reseller/Partner

Tekla software solutions

- Tekla BIM solutions are developed for multiple stakeholders involved in building and construction projects



Concrete Contractors



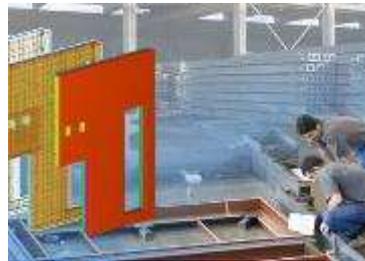
Structural Engineers



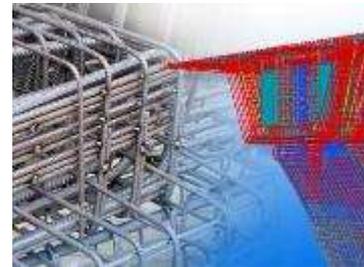
General Contractors



Steel Fabricators

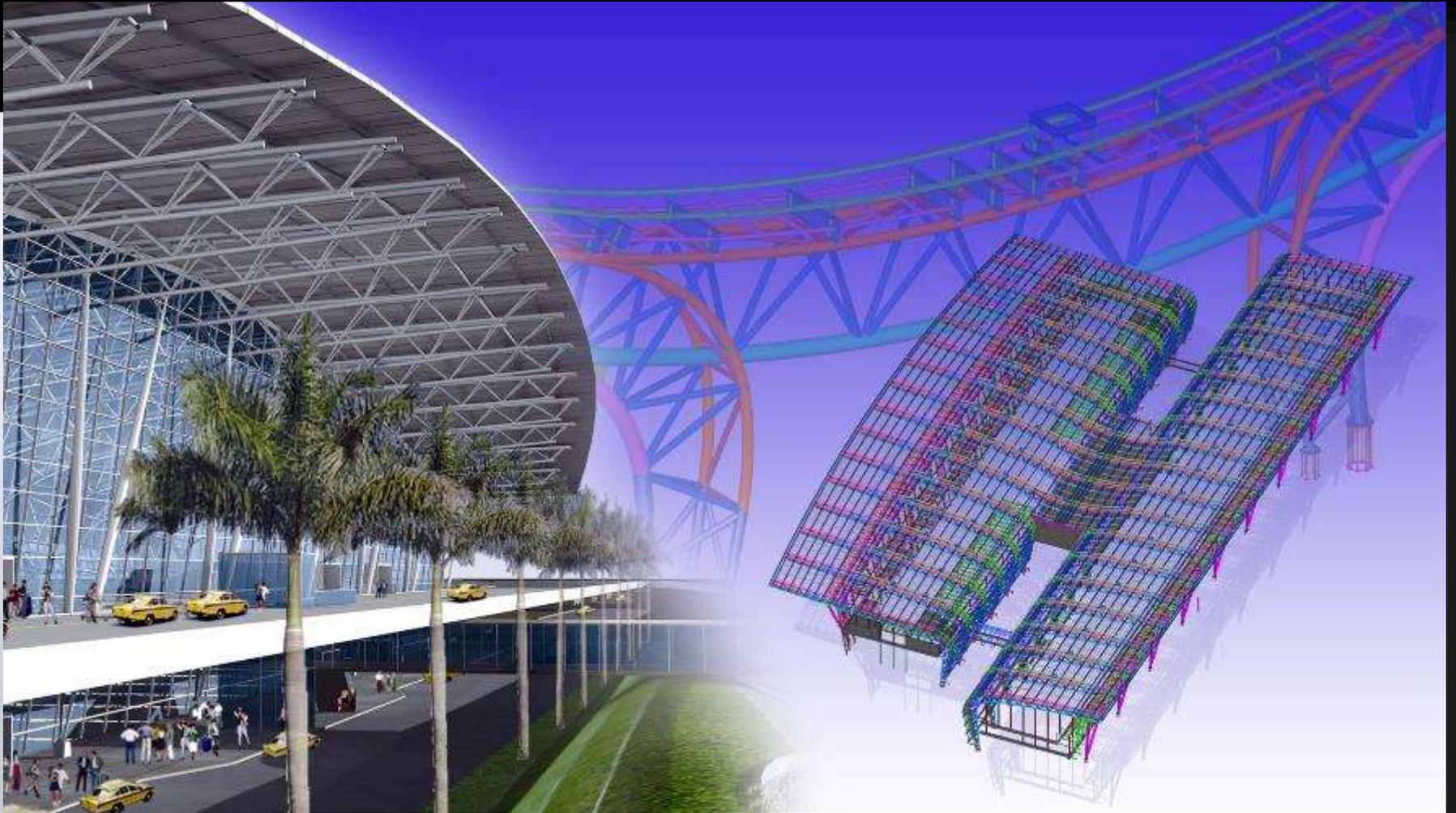


Precast Fabricators

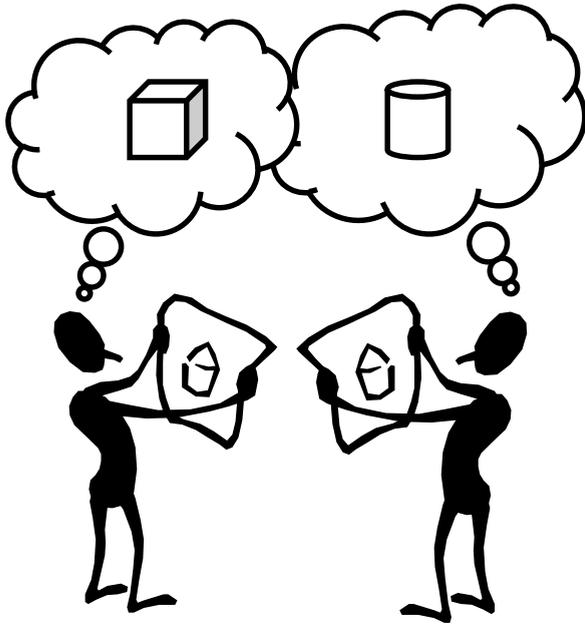


Rebar Fabricators

- 
- Tekla - Global Software Company
 - **How to make working more efficient and productive?**
 - Tekla BIM Solution
 - Design and documentation
 - Structural analysis
 - Engineering the details
 - Reference cases
 - Conclusion



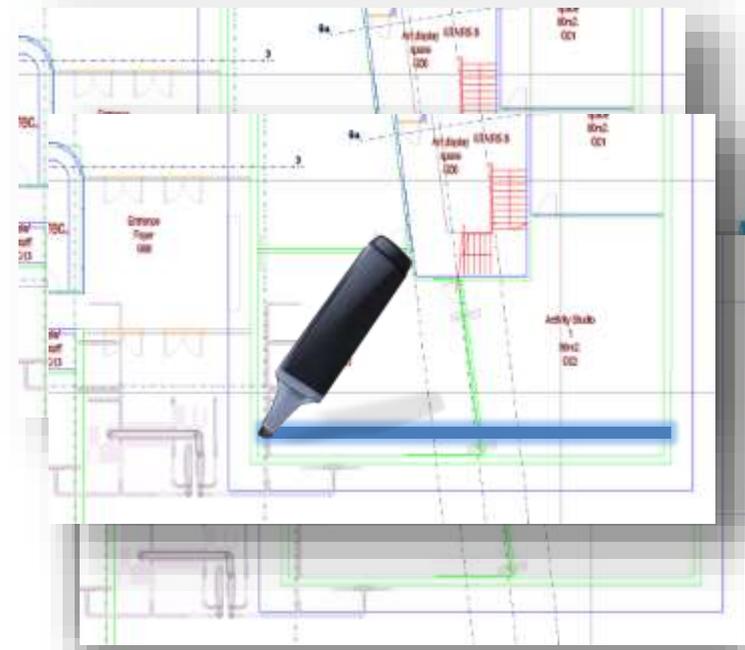
Challenges



- *Communication*

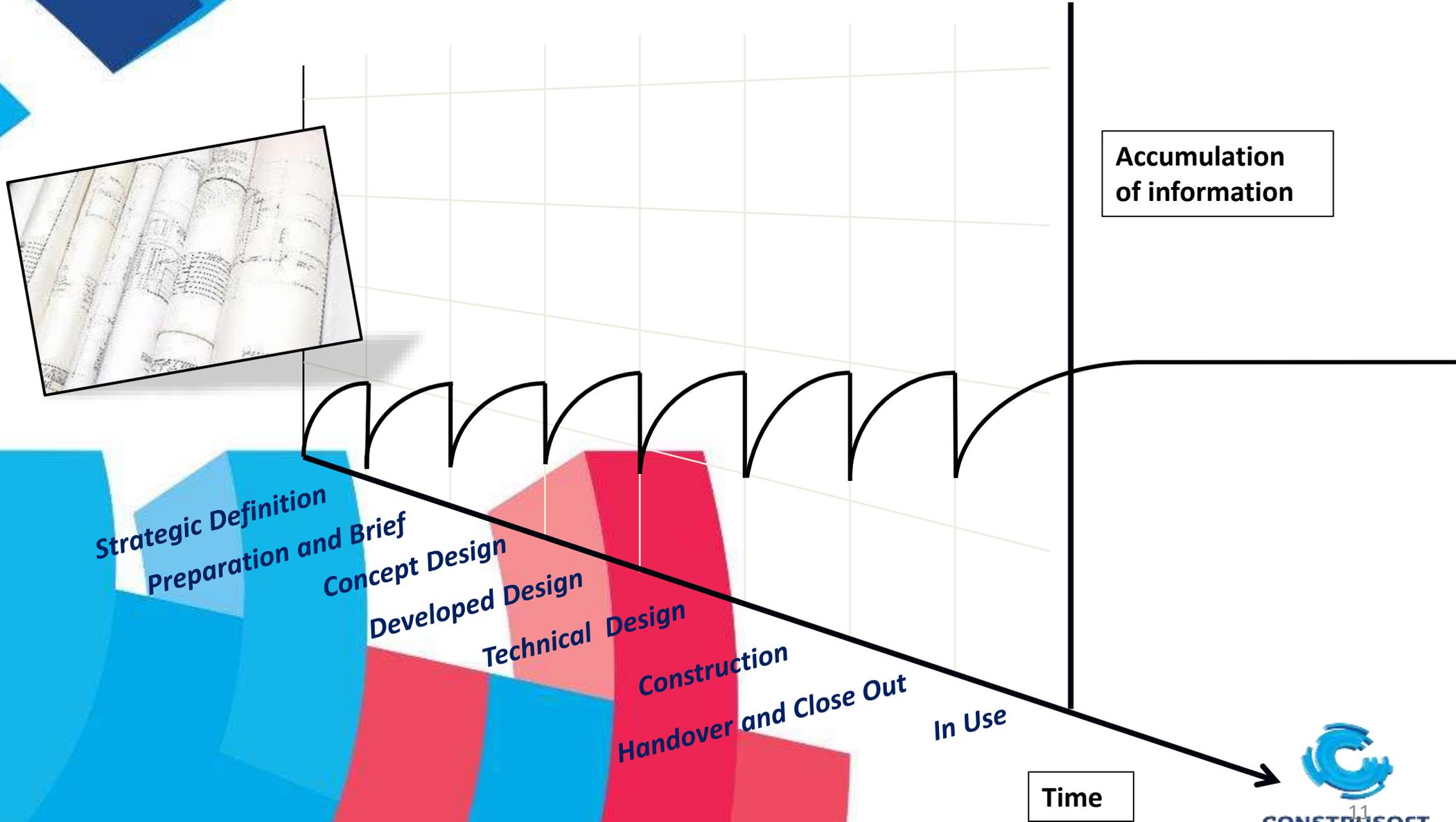


- *Information management*

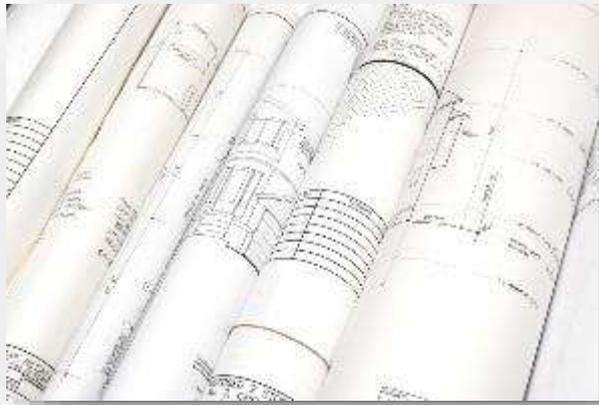


- *Change coordination*

Inefficient process spends project resources



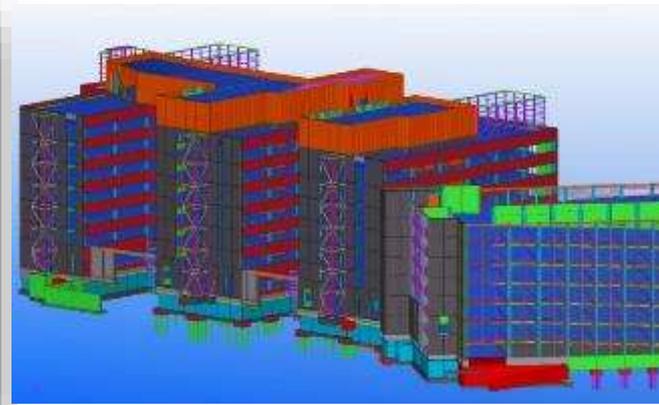
Solution: From 2D to 3D to BIM



- *Paper drawings*



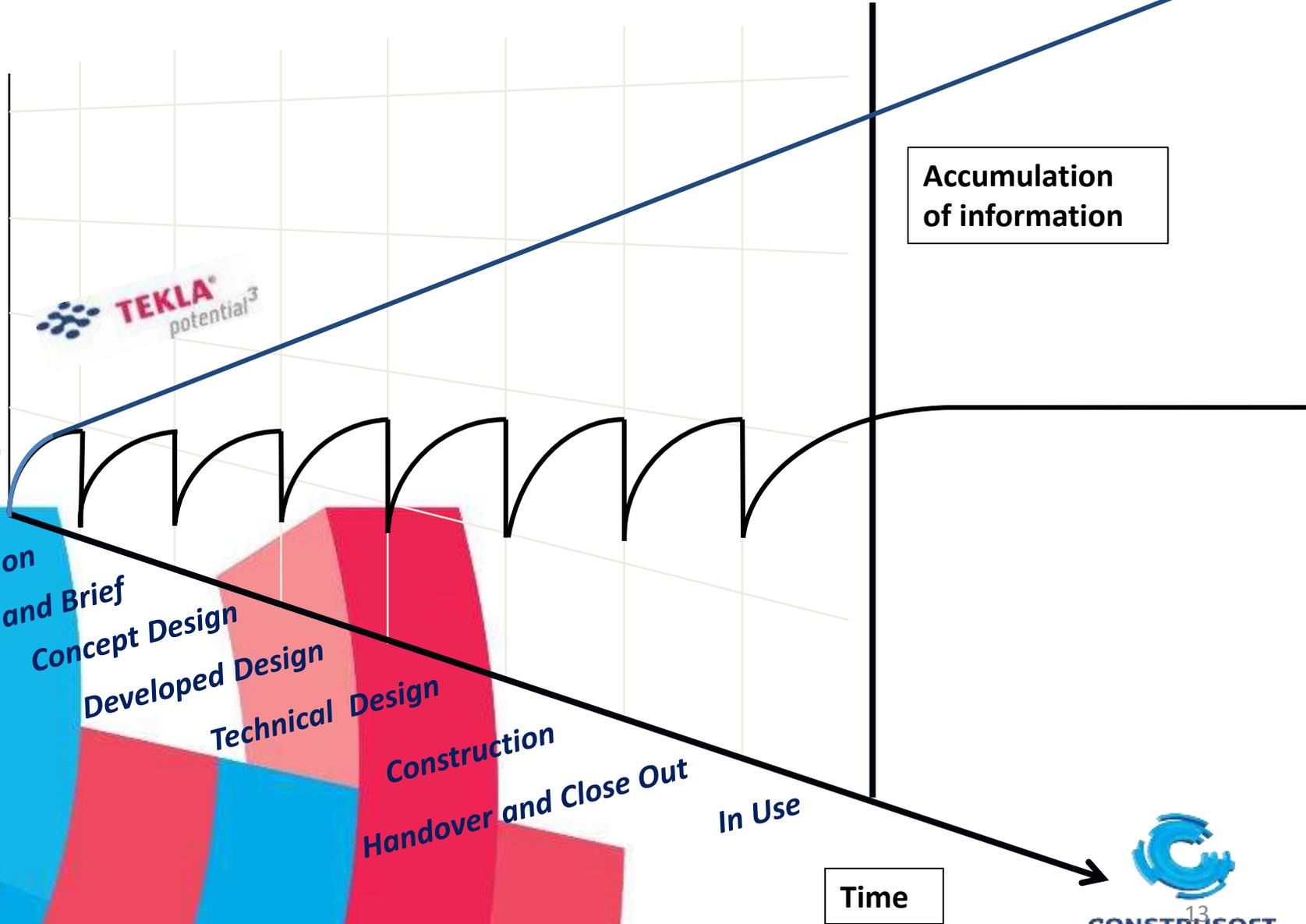
- *3D model*



- *BIM model*

- BIM (Building Information Modeling) process, intelligent and data rich 3D Modeling

BIM process increases productivity...



Return On Investment

*The highly detailed as built structural Tekla BIM models enable the highest level of constructability and production control **for the business.***

- What are the benefits for the company?
- How much will save and earn?
- Why should invest?



TEKLA[®]
*potential*³



CONSTRUSOFT

ROI calculation for the business

ROI=

Profits - Costs

Costs

▪ Investment Period

▪ Harvest Period

€

Time

> How to gain the profits?



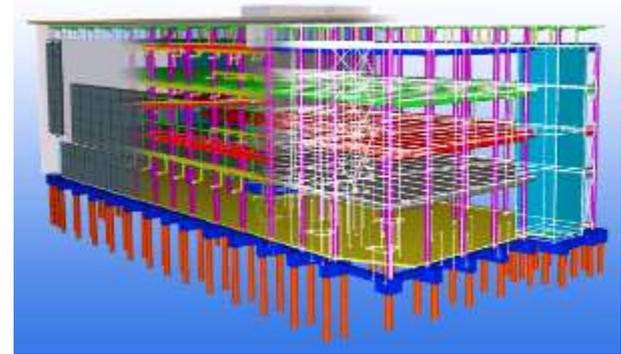
ROI calculation for the business

Multiple factors will influence the amount of the ROI such as:

- The existing processes and the level of productivity
- Quality of services offered

But also...

- Utilization of the information that is in the model
- The services offered today vs. potential services tomorrow
- How much we win more work



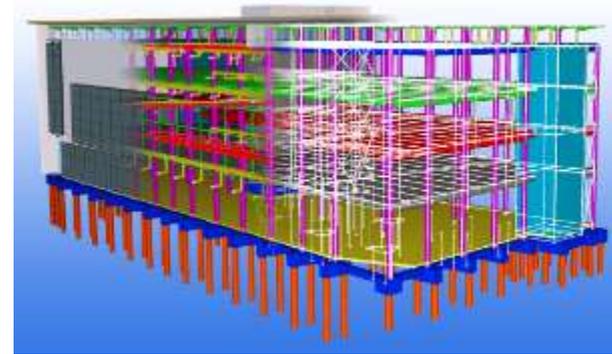
ROI calculation for the business

Multiple factors will influence the amount of the ROI such as:

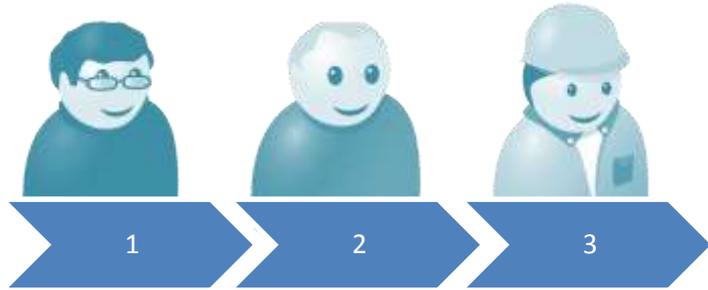
- **Your existing processes and the level of productivity**
- Quality of services offered

But also...

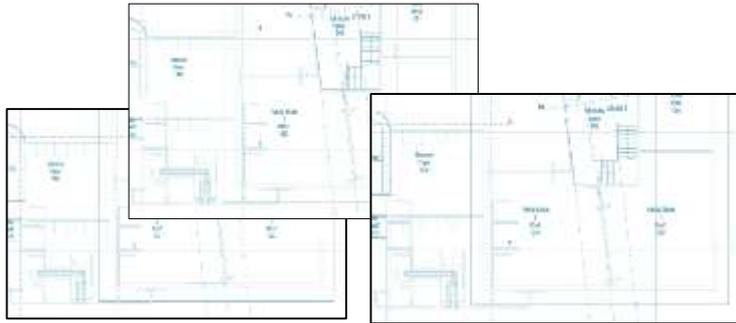
- Utilization of the **information** that is in the model
- The **services** offered today vs. potential services tomorrow
- How much we **win more work**



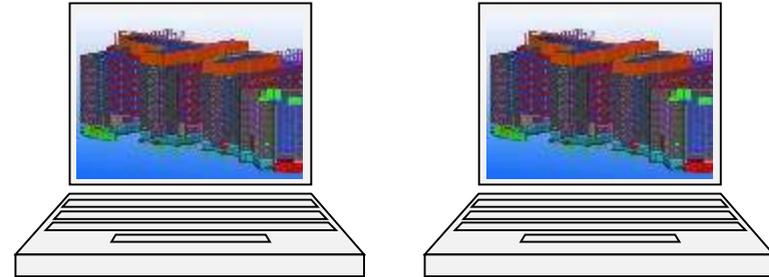
Existing processes and level of productivity



> *Workflow*



> *Production of drawings*



> *Collaboration*



> *Lead times*

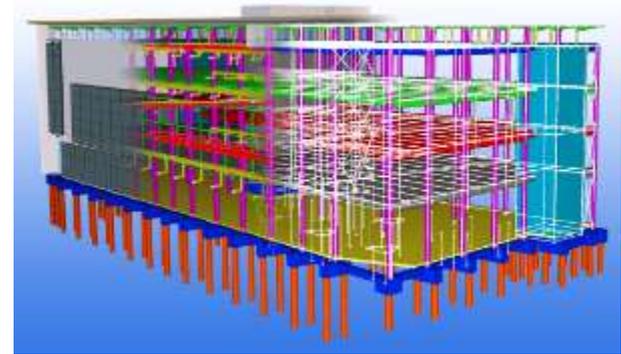
ROI calculation for the business

Multiple factors will influence the amount of the ROI such as:

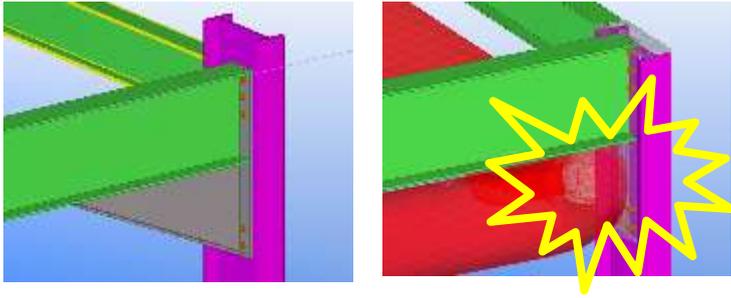
- Your existing processes and the level of productivity
- **Quality of services offered**

But also...

- Utilization of the information that is in the model
- The services offered today vs. potential services tomorrow
- How much we win more work



Quality of services offered



> *Clash detection*



> *Reduced errors on site*

RFI									
RFI ID	RFI Description	RFI Status	RFI Date	RFI Category	RFI Priority	RFI Assigned To	RFI Assigned Date	RFI Assigned By	RFI Assigned To
RFI-001	Request for information regarding material specifications for concrete columns.	Open	2023-10-26	Material	High	John Doe	2023-10-26	John Doe	John Doe
RFI-002	Request for information regarding structural requirements for steel beams.	Open	2023-10-26	Structural	Medium	Jane Smith	2023-10-26	Jane Smith	Jane Smith
RFI-003	Request for information regarding electrical requirements for lighting fixtures.	Open	2023-10-26	Electrical	Low	Mike Johnson	2023-10-26	Mike Johnson	Mike Johnson
RFI-004	Request for information regarding plumbing requirements for kitchen fixtures.	Open	2023-10-26	Plumbing	Low	Sarah Lee	2023-10-26	Sarah Lee	Sarah Lee
RFI-005	Request for information regarding HVAC requirements for office spaces.	Open	2023-10-26	HVAC	Medium	David Kim	2023-10-26	David Kim	David Kim
RFI-006	Request for information regarding fire safety requirements for exit doors.	Open	2023-10-26	Fire Safety	High	Emily White	2023-10-26	Emily White	Emily White
RFI-007	Request for information regarding accessibility requirements for ramps.	Open	2023-10-26	Accessibility	Medium	Chris Brown	2023-10-26	Chris Brown	Chris Brown
RFI-008	Request for information regarding exterior cladding requirements for facade panels.	Open	2023-10-26	Exterior	Low	Alex Green	2023-10-26	Alex Green	Alex Green
RFI-009	Request for information regarding interior finishes requirements for wall panels.	Open	2023-10-26	Interior	Low	Mia Black	2023-10-26	Mia Black	Mia Black
RFI-010	Request for information regarding landscaping requirements for site perimeter.	Open	2023-10-26	Landscaping	Low	Noah Gray	2023-10-26	Noah Gray	Noah Gray

• *Management of RFI's*



> *Model to site*



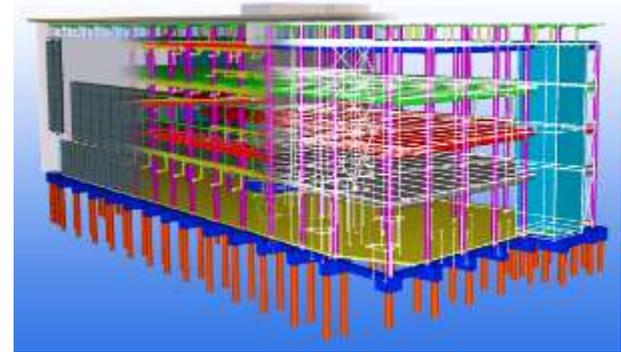
ROI calculation for your business

Multiple factors will influence the amount of your ROI such as:

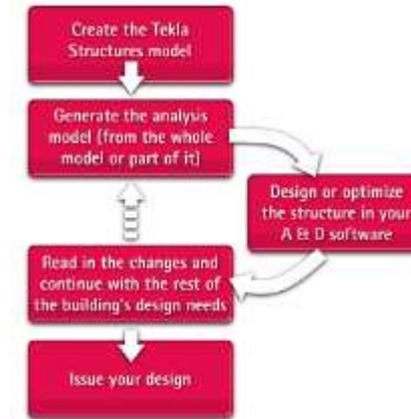
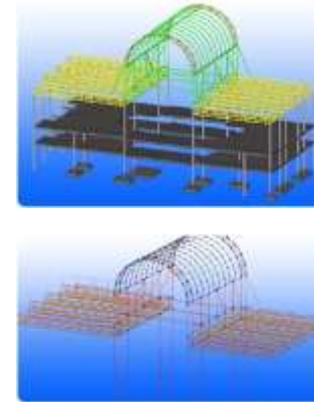
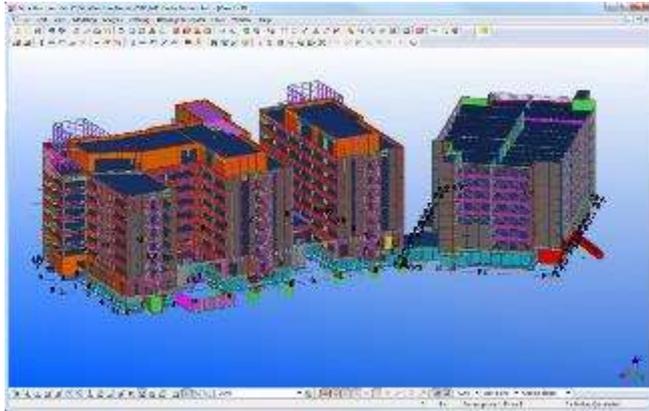
- Your existing processes and the level of productivity
- Quality of services offered

But also...

- **Utilization of the information that is in the model**
- The services you offer today vs. potential services tomorrow
- How much you win more work

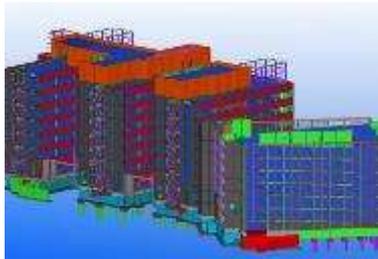


Information management



- **Constructability**

- *Precast, cast in place, steel etc.*



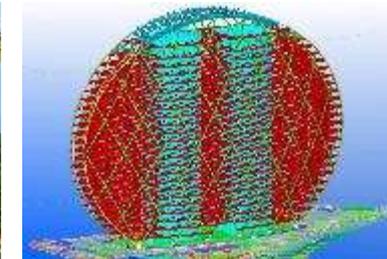
3107 Drawings
6700 reinforced concrete elements
630 ton rebar (267 000 rebar groups)
157 ton steel
4226 bolts groups
15658 Welds

In total, over 1 million objects
Model database 73 MB

- > **Large file size handling**

- > **Interoperability**

i.e. A&D packages SDNF, IFC and CIS/2, SAP2000, Staad.Pro, S-FRAME, GTStrudl, Dlubal RFEM and RSTAB, MidasIT Robot™ Structural Analysis Professional software



- > **Flexible design**

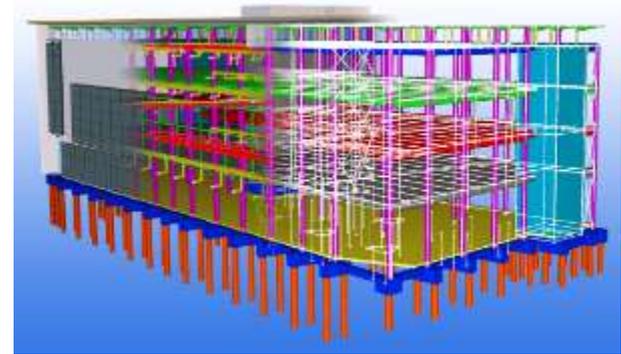
ROI calculation for the business

Multiple factors will influence the amount of the ROI such as:

- Your existing processes and the level of productivity
- Quality of services offered

But also...

- Utilization of the information that is in the model
- **The services offered today vs. potential services tomorrow**
- How much we win more work



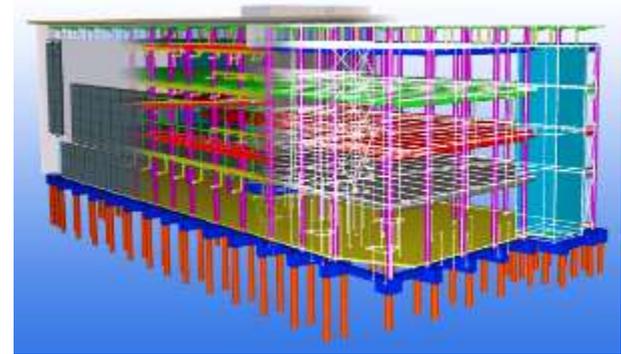
ROI calculation for the business

Multiple factors will influence the amount of the ROI such as:

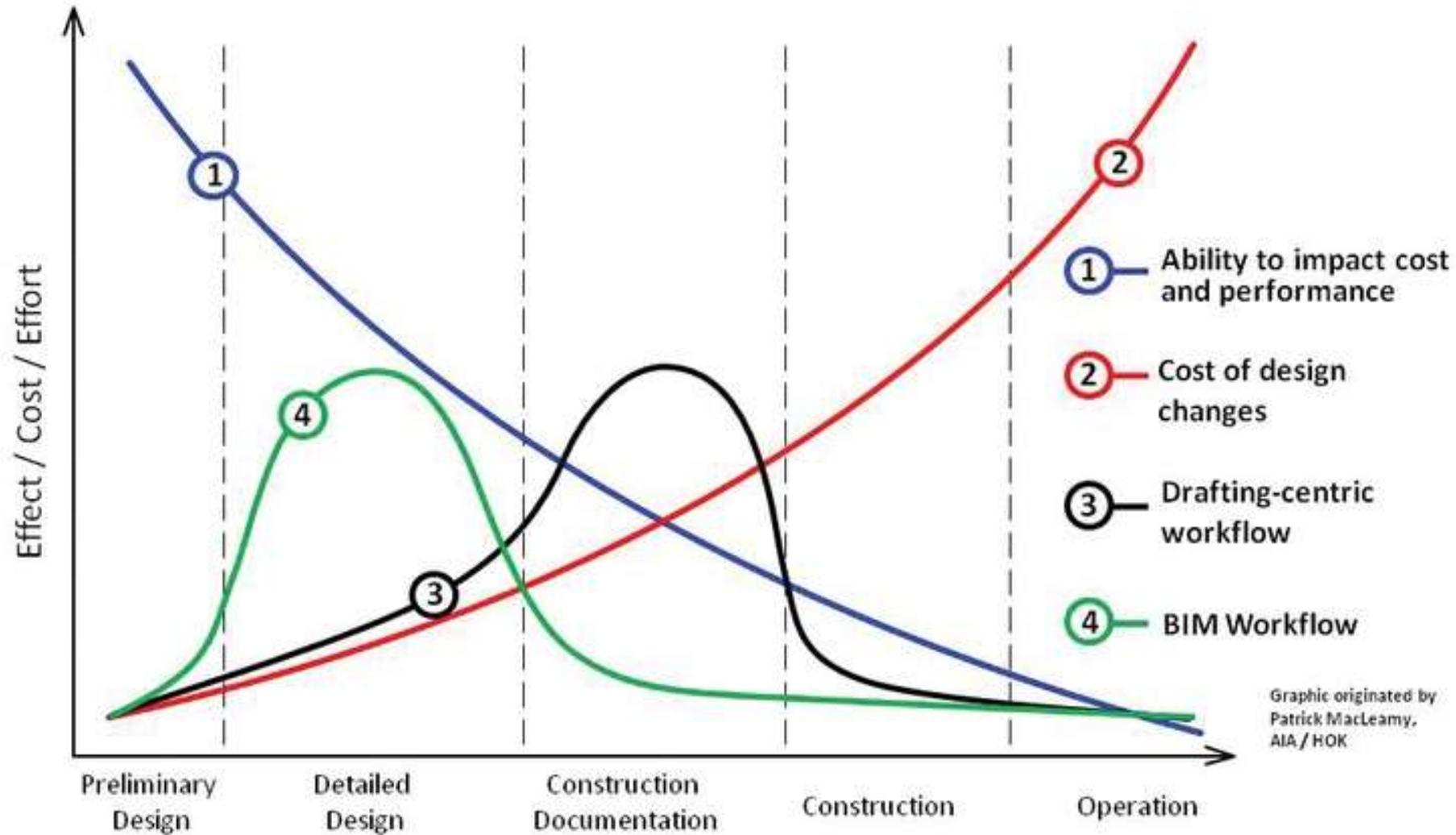
- Your existing processes and the level of productivity
- Quality of services offered

But also...

- Utilization of the information that is in the model
- The services offered today vs. potential services tomorrow
- **How much we win more work**



Project Progress

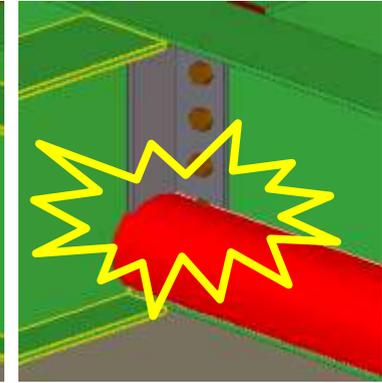
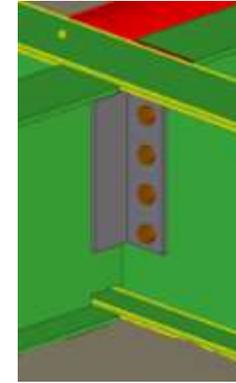
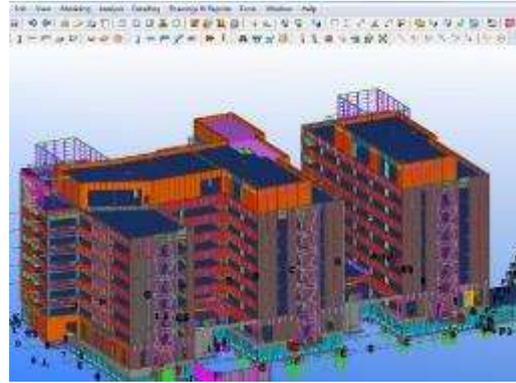
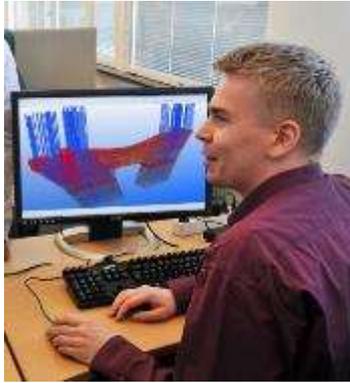


Graphic originated by
Patrick MacLeamy,
AIA / HOK



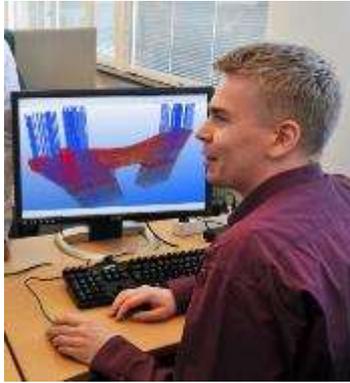
CONSTRUSOFT

BIM process makes working easier



- *Enhanced collaboration*
 - *Effective information management*
 - *Improved change coordination*
- BIM - technologies and processes integrating building information through attributed 3D geometry

BIM process makes working easier



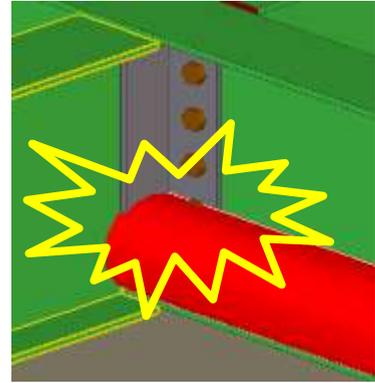
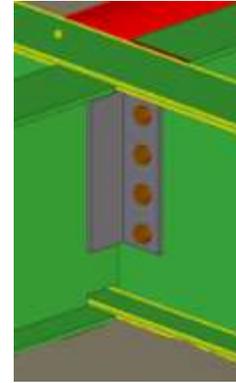
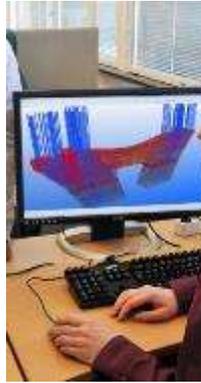
- *Enhanced collaboration*

- *Effective management*

change

- BIM - **technologies** and **processes** integrating building information through attributed 3D geometry

BIM process makes working easier



- *Enhanced collaboration*

- *Improved change coordination*

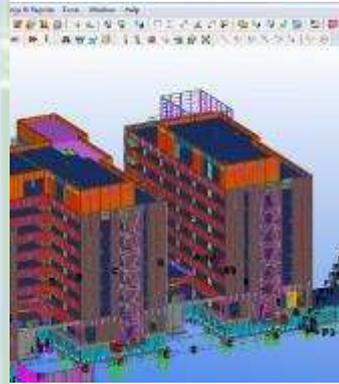
- BIM - technologies and processes integrating **building information** through attributed 3D geometry

BIM process makes working easier

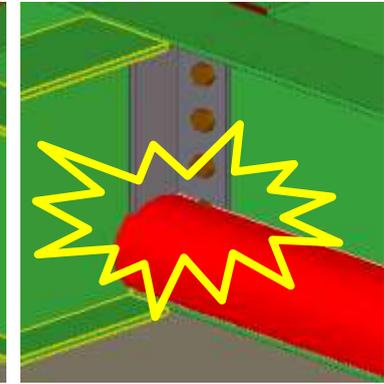
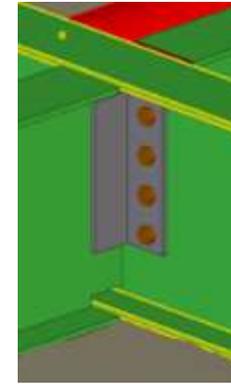


- Enhance data collection

- Solids
- Wireframe & surface
- 2D Drawings
- Specifications
- RFIs
- Site scanned data



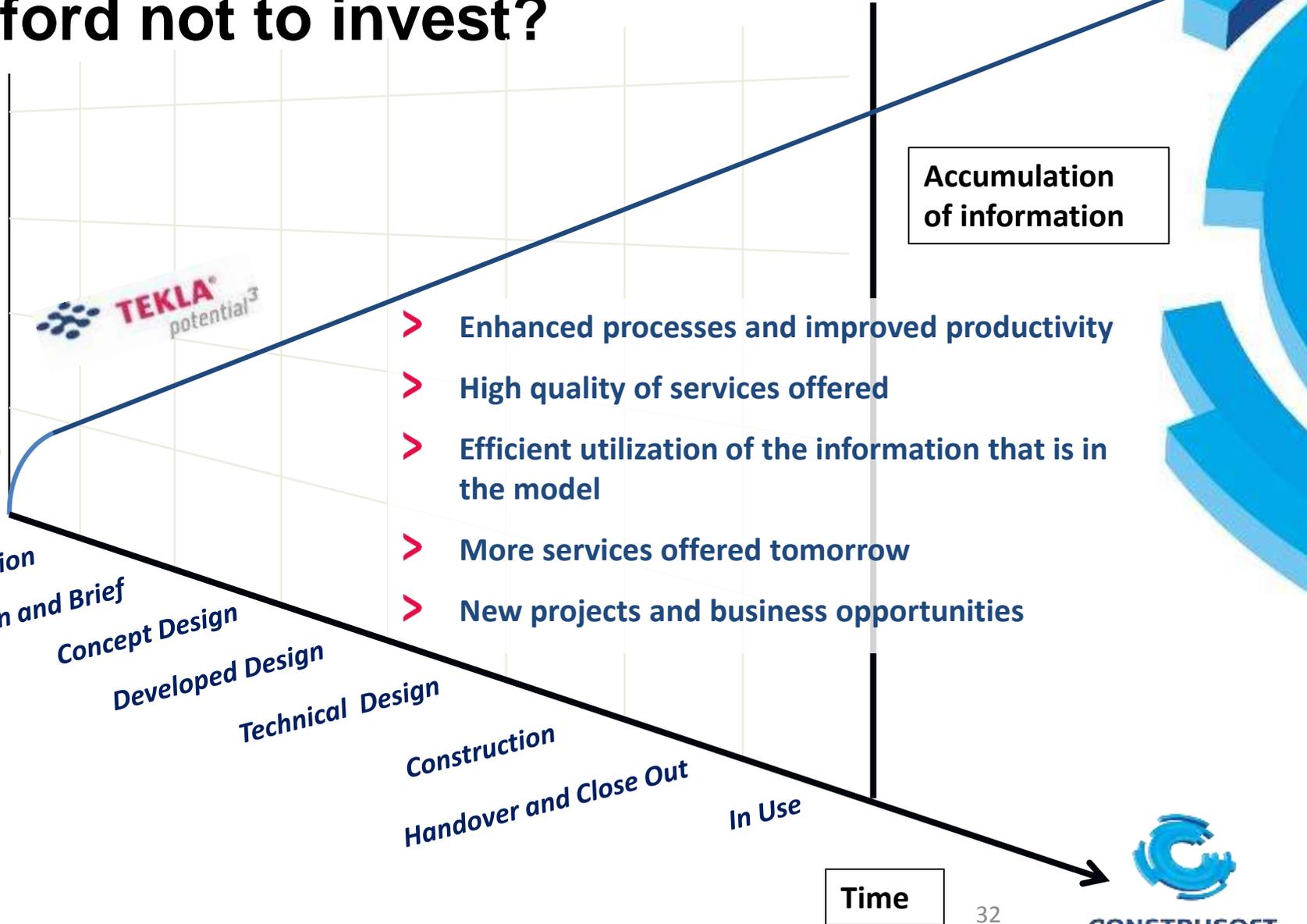
• Effective information management



• Improved change coordination

- BIM - technologies and processes integrating building information through **attributed 3D geometry**

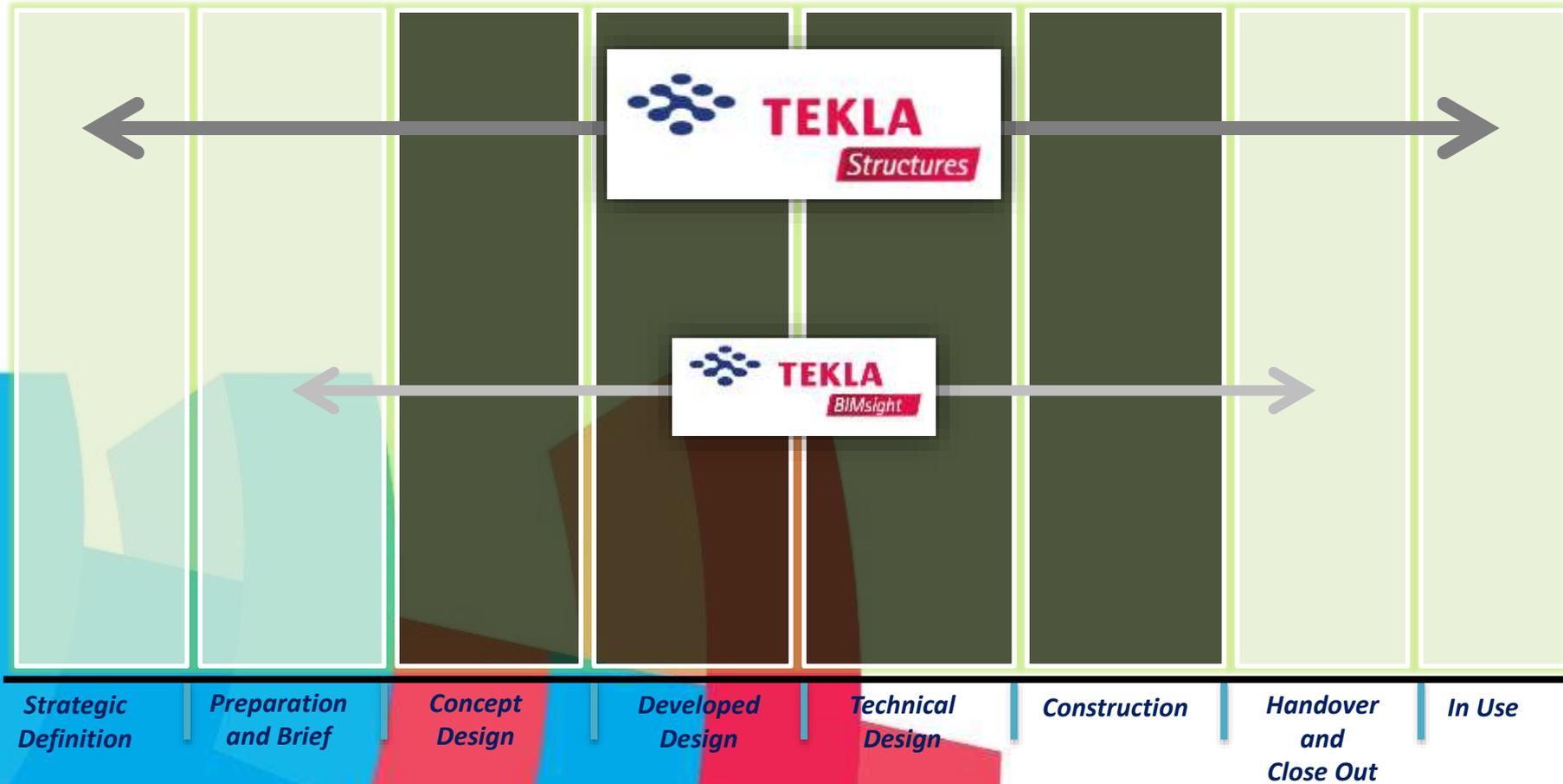
Can we afford not to invest?



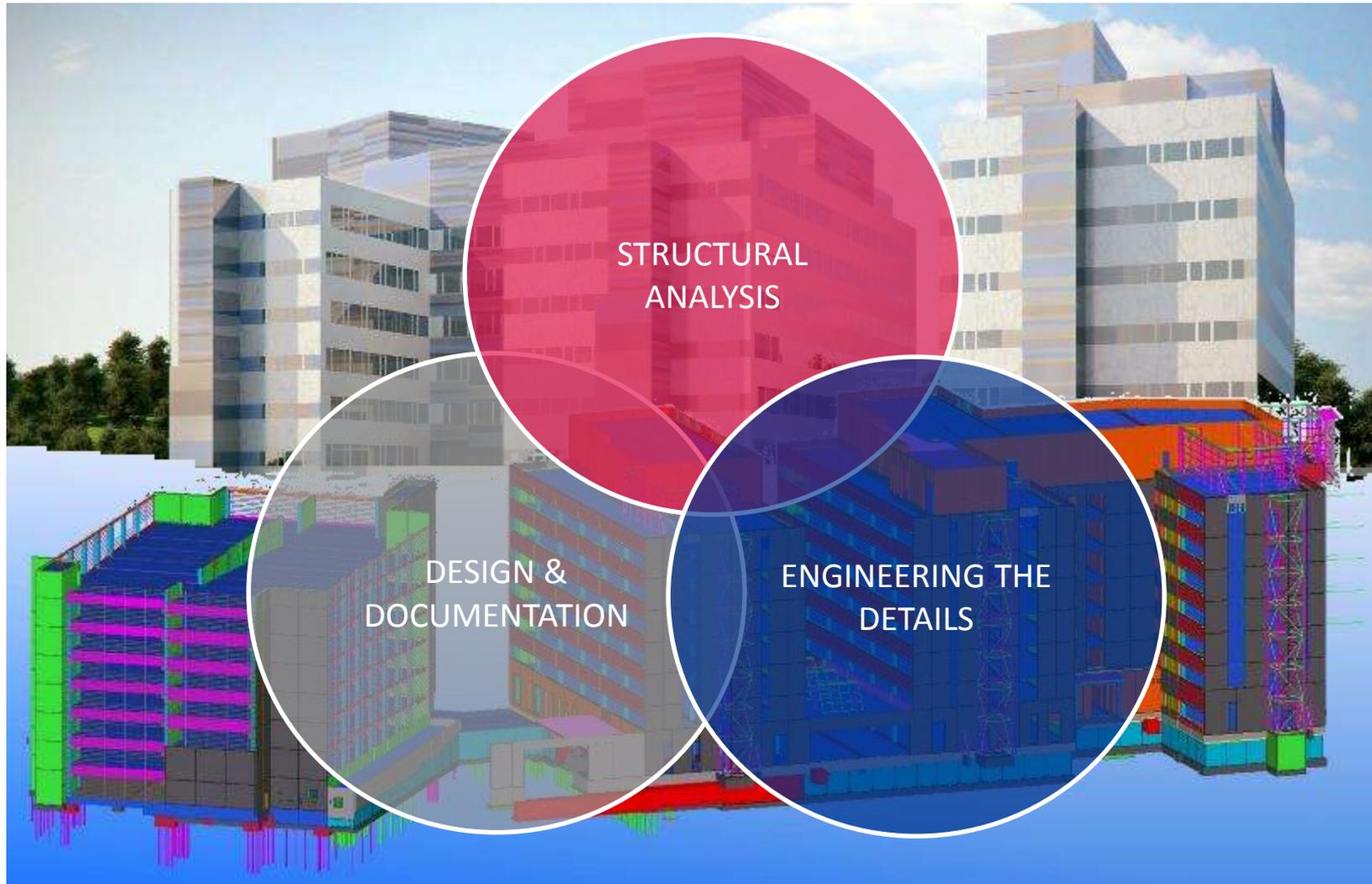
- 
- Tekla - Global Software Company
 - How to make working more efficient and productive?
 - **Tekla BIM Solution**
 - **Design and documentation**
 - **Structural analysis**
 - **Engineering the details**
 - Reference cases
 - Conclusion

Tekla BIM solution

From conceptual design stage to execution stage

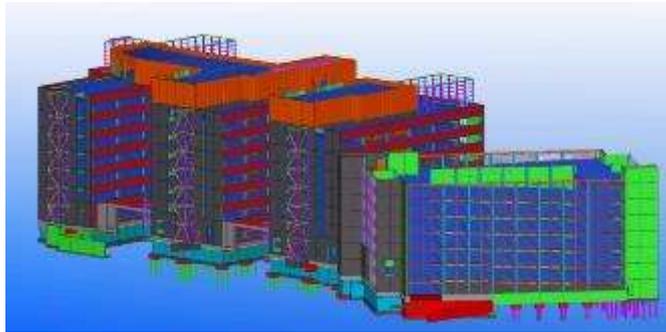


Tekla BIM Solution



Design and documentation

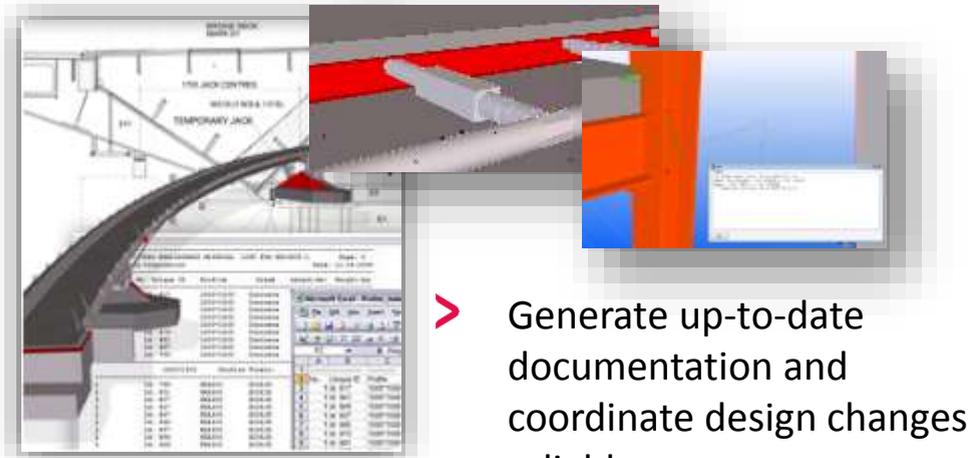
- Create an accurate, dynamic and intelligent 3D model



- > Benefit from interoperability between different software applications

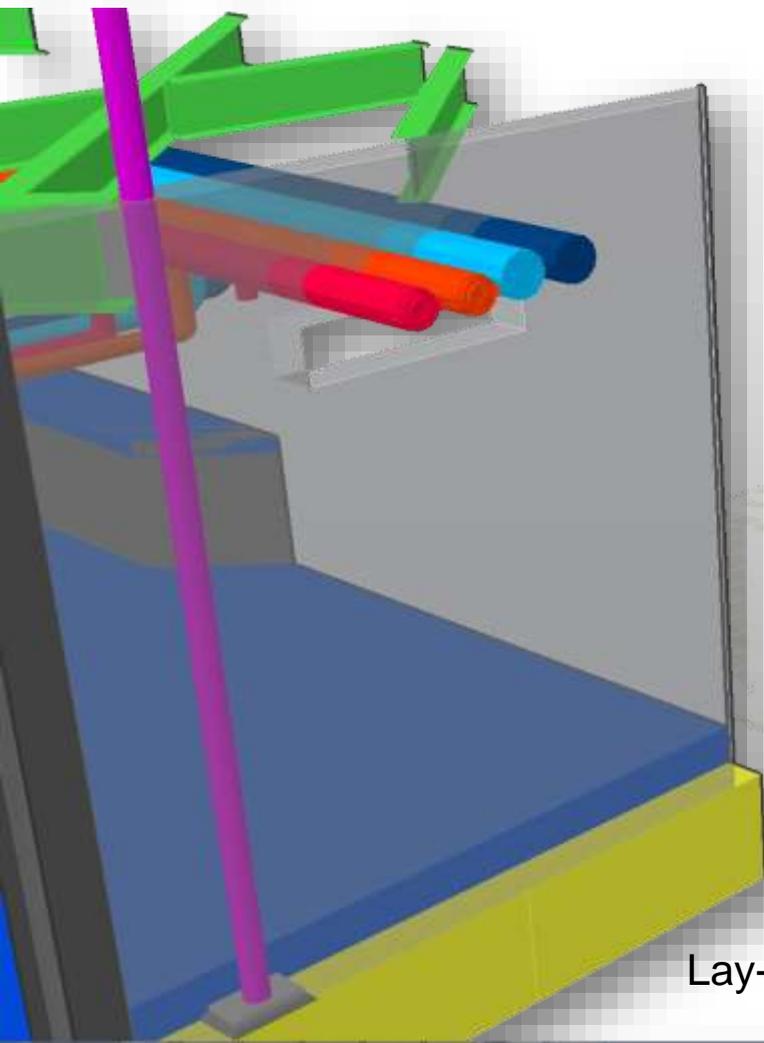


- > Deliver an as-built model to other project disciplines

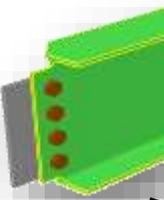


- > Generate up-to-date documentation and coordinate design changes reliably

Design model

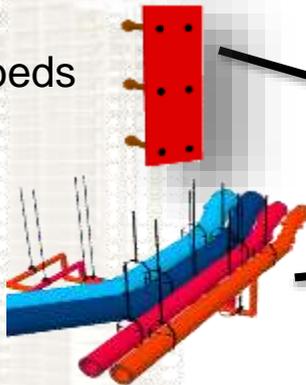


Plates, Bolts & Welds

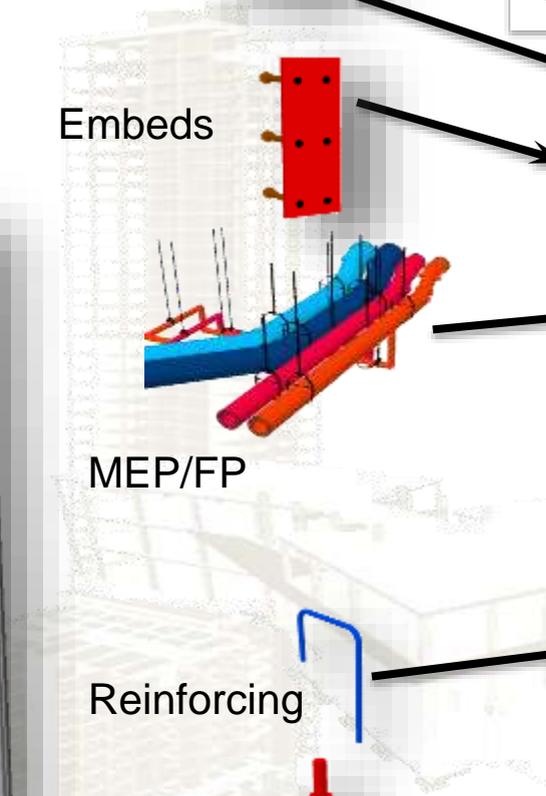


Tekla BIM Construction model

Embeds



MEP/FP



Reinforcing



Bolts

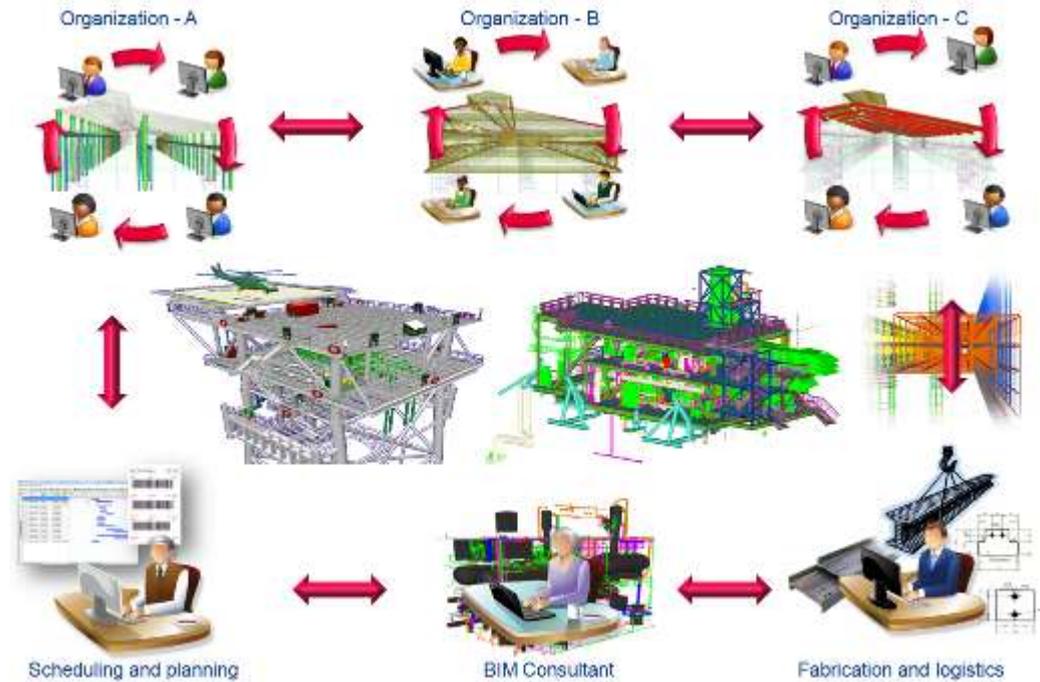


Lay-Out Points

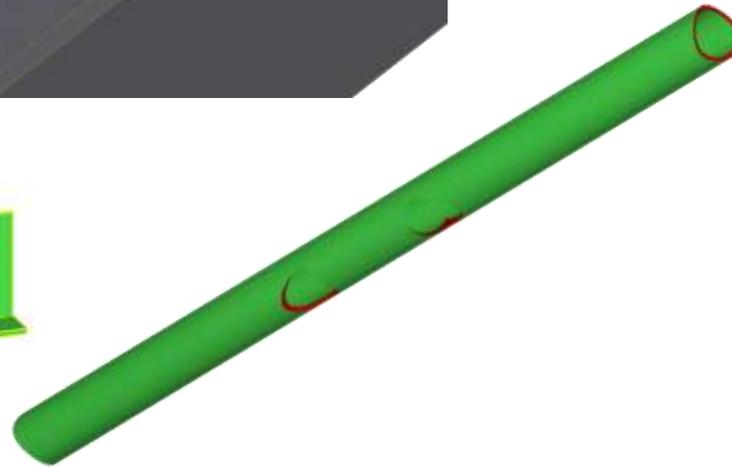
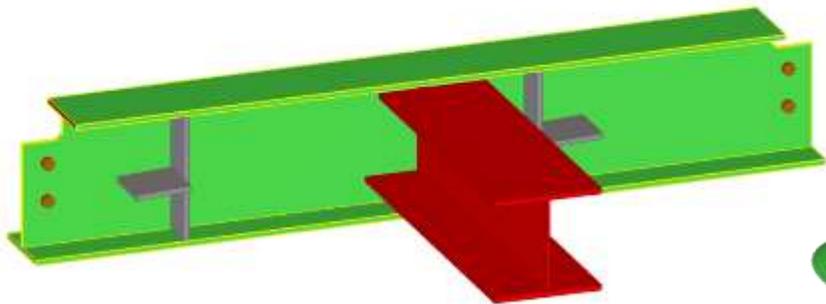
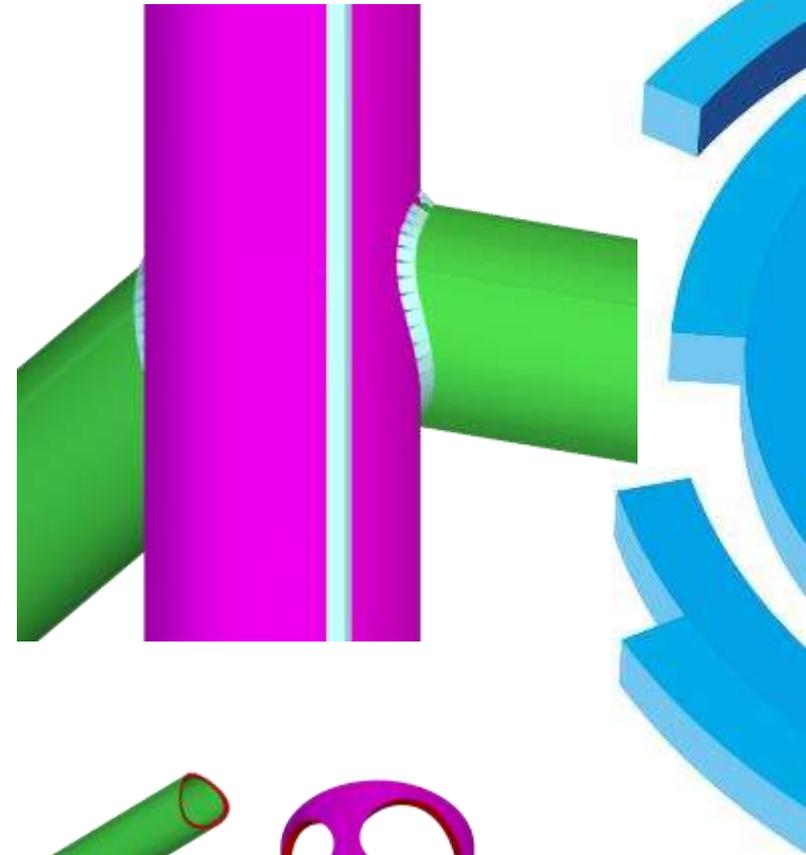
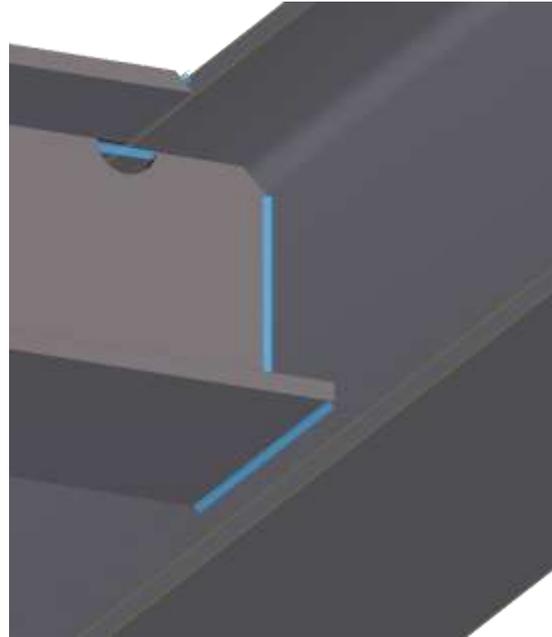
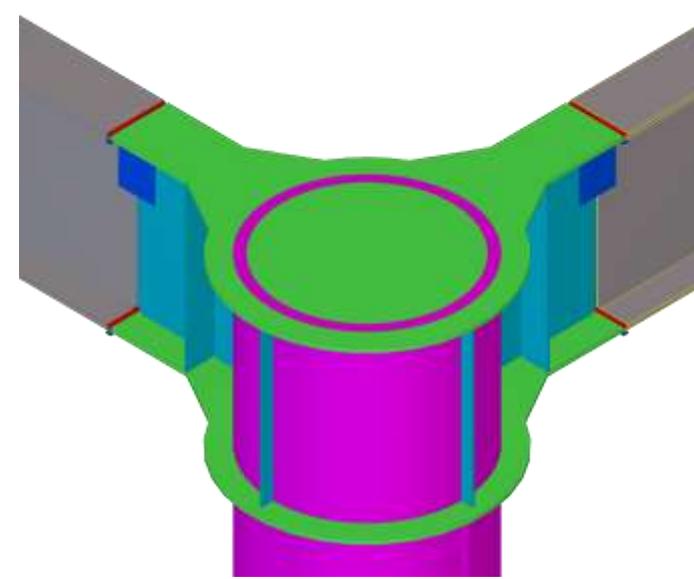


Tekla Structures modelling

- Work simultaneously
 - Engineers, project managers, detailers or any other party who wishes to view or control the model
 - Window to reliable project information during the fabrication process
- Quality control assured
 - Information such as engineering drawings easy to access and always up to-date
- Model the whole project
 - from initial concept studies including 4D visualisation to the design of structures, safety systems and sustainability
 - all the way from commissioning, modifications to eventual decommissioning



Tekla Structures modelling

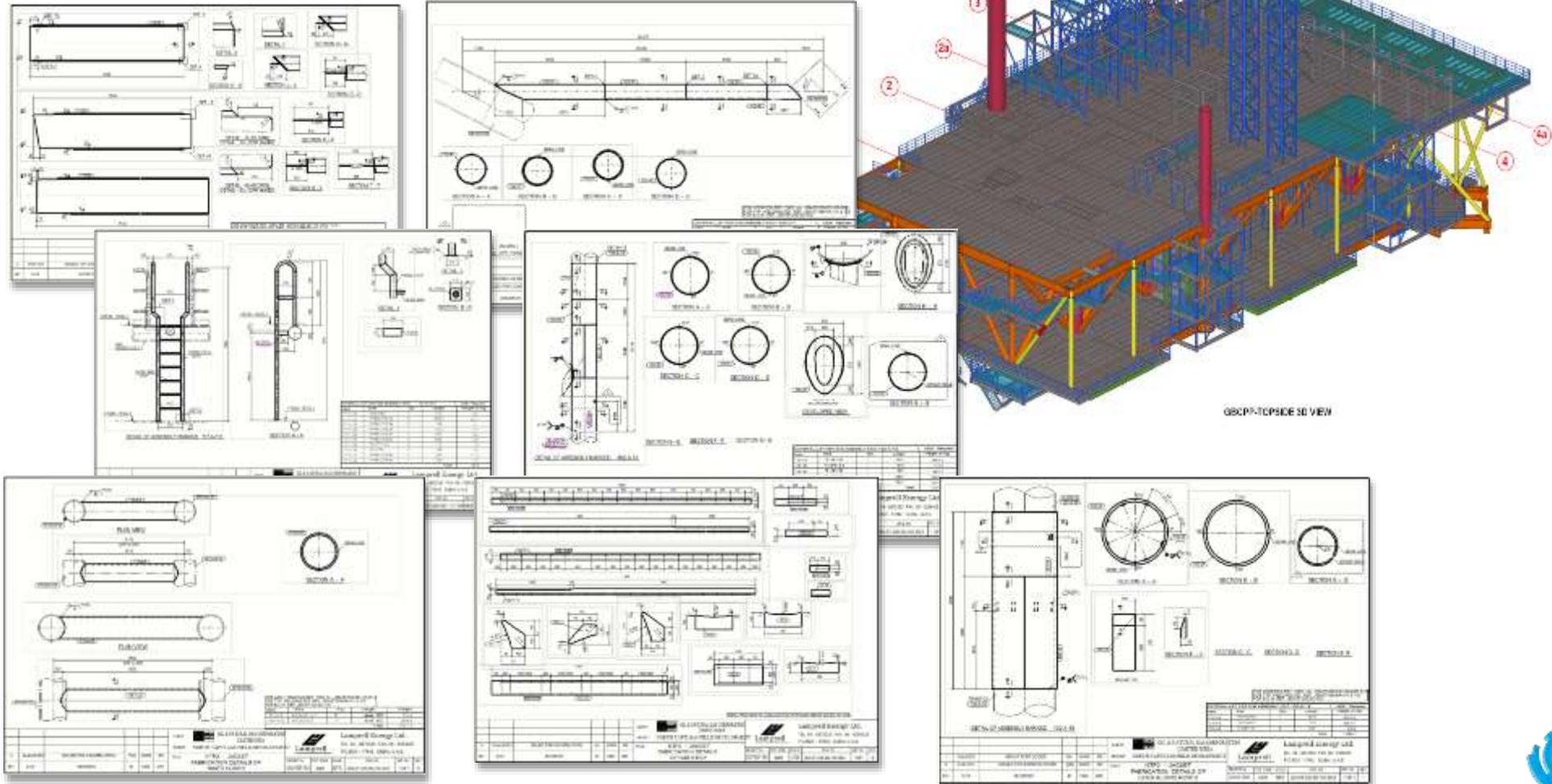


[Date]



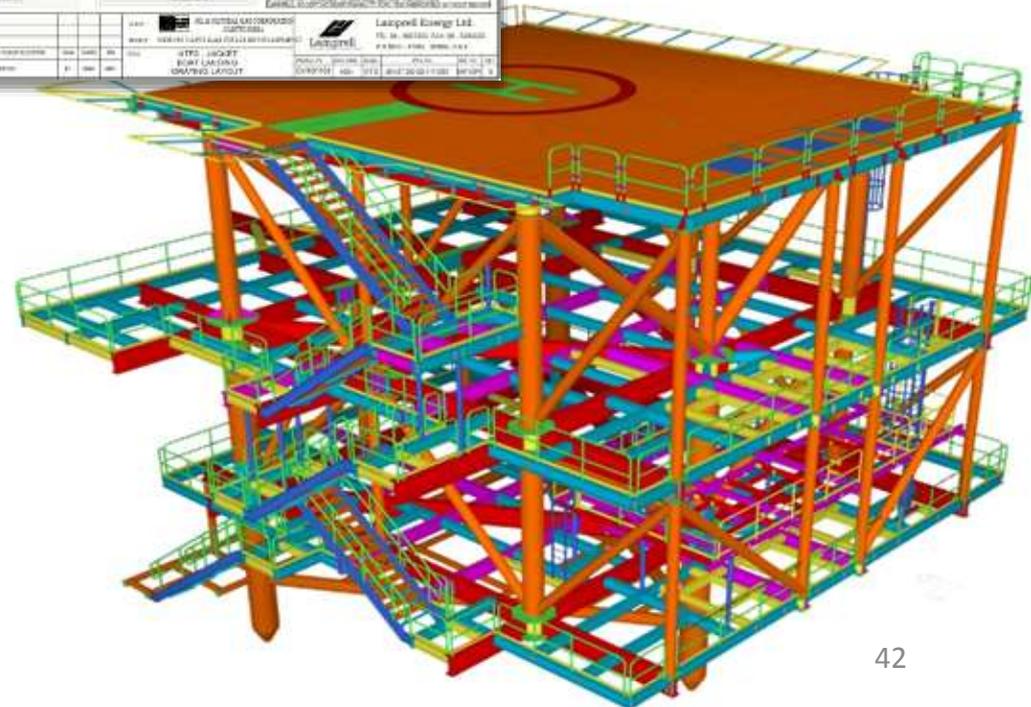
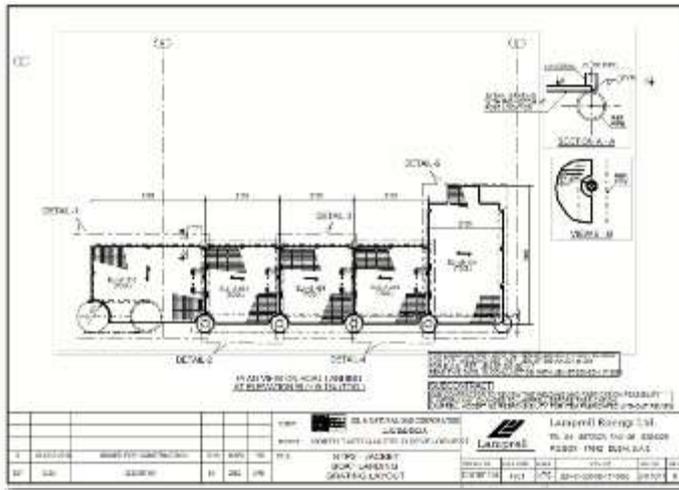
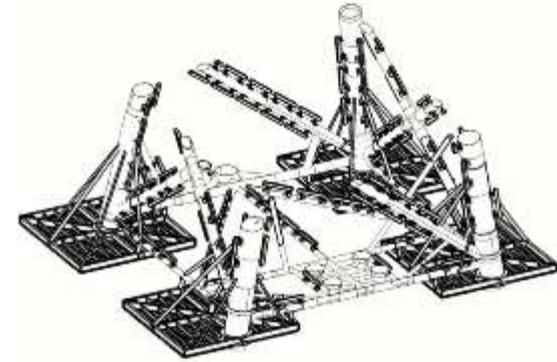
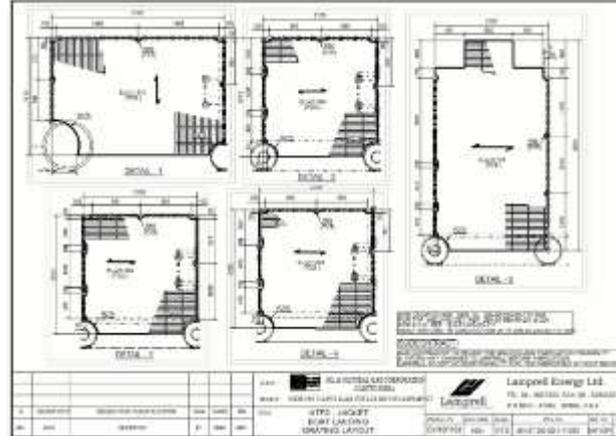
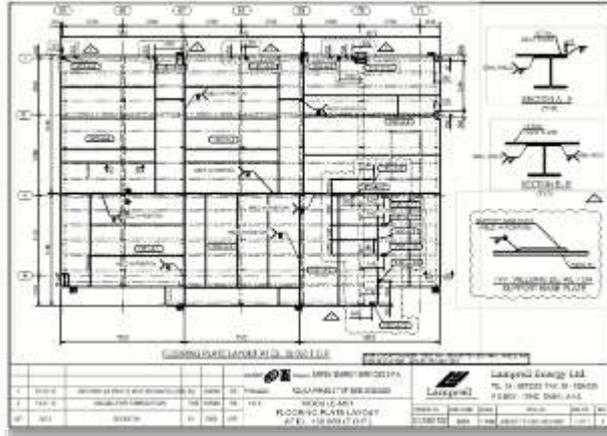
CONSTRUSOFT

Tekla Structures workshop drawings



[Date]

Tekla Structures engineering drawings



[Date]

Tekla Structures listings



Tekla Structures Bar Code Date: 21.04.2009
 Project: POLICE HEADQUARTE Time: 15:30:03

ProjNum	Assembly	Phase	Weight
1396	1067	1	10.16



ProjNum	Assembly	Phase	Weight
1396	1055	7	1057



ProjNum	Assembly	Phase	Weight
1396	1068	7	900



MATERIAL LIST

PROJECT NAME: Project
 JOB NO.: 12040
 REF: 0401
 REF: 20.04.2009
 MODEL

Size	No.	Material	Length (mm)	Net Area(m ²) for one	Net Area(m ²) for all	Net Weight(kg) for one	Net Weight(kg) for all
Ø100x100x8	2	Ø100	450	0.120	1.440	0.0	0.0
		Total Length: 900		Total Area: 1.440		Total Weight: 0.0	
Ø100	2	Ø100	1000	0.240	1.680	128.0	128.0
		Total Length: 2000		Total Area: 1.680		Total Weight: 128.0	
H120x75	2	H120	180	0.053	0.086	3.0	6.0
H120x75	8	H120	240	0.060	0.324	1.8	14.4
		Total Length: 1800		Total Area: 0.324		Total Weight: 20.4	
H120x100	4	H120	407	0.074	0.176	3.0	12.0
H120x100	9	H120	300	0.111	0.718	4.0	36.0
H120x100	5	H120	1385	0.089	0.445	3.0	15.0
H120x100	5	H120	1510	0.085	0.425	3.0	15.0
H120x100	3	H120	1840	0.067	1.221	3.0	9.0
H120x100	4	H120	1935	0.083	1.073	3.0	12.0
H120x100	1	H120	2512	0.067	0.067	3.0	3.0
H120x100	1	H120	1030	0.069	0.069	3.0	3.0
		Total Length: 10400		Total Area: 0.620		Total Weight: 208.0	
H120x120	28	H120	185	0.078	2.204	3.0	77.0
H120x120	36	H120	171	0.078	2.828	3.0	86.0
H120x120	5	H120	1190	0.089	0.445	3.0	15.0
H120x120	5	H120	138	0.060	0.300	3.0	15.0
		Total Length: 14214		Total Area: 3.288		Total Weight: 203.0	
H120x150	8	H120	137	0.077	0.313	3.0	24.0
		Total Length: 1096		Total Area: 0.313		Total Weight: 24.0	



ASSEMBLY PART LIST

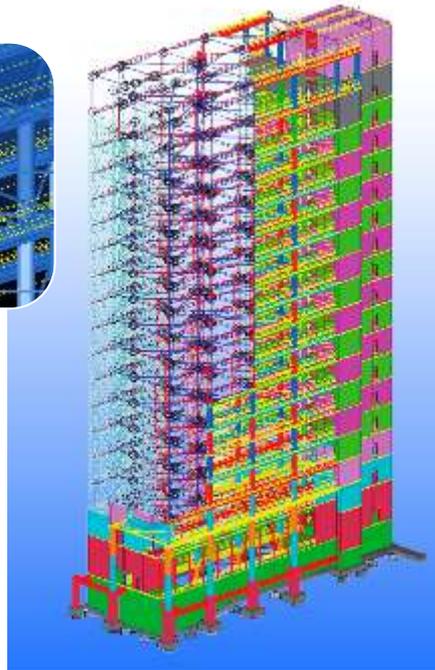
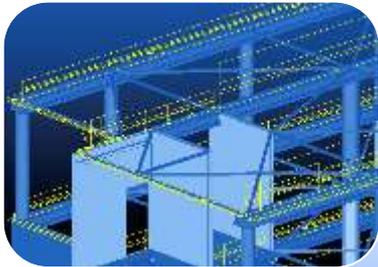
ITEM: 1000000
 PART NAME: Project
 JOB NO.: 12040
 REF: 0401
 REF: 20.04.2009
 MODEL

PartNo	PartNo	Qty	Material	Length (mm)	Net Area(m ²) for one	Net Area(m ²) for all	Net weight(kg) for one	Net Weight(kg) for all
1	Ø100x100x8	2	Ø100	450	0.120	1.440	0.0	0.0
2	Ø100	2	Ø100	1000	0.240	1.680	128.0	128.0
3	H120x75	2	H120	180	0.053	0.086	3.0	6.0
4	H120x75	8	H120	240	0.060	0.324	1.8	14.4
5	H120x100	4	H120	407	0.074	0.176	3.0	12.0
6	H120x100	9	H120	300	0.111	0.718	4.0	36.0
7	H120x100	5	H120	1385	0.089	0.445	3.0	15.0
8	H120x100	5	H120	1510	0.085	0.425	3.0	15.0
9	H120x100	3	H120	1840	0.067	1.221	3.0	9.0
10	H120x100	4	H120	1935	0.083	1.073	3.0	12.0
11	H120x100	1	H120	2512	0.067	0.067	3.0	3.0
12	H120x100	1	H120	1030	0.069	0.069	3.0	3.0
13	H120x120	28	H120	185	0.078	2.204	3.0	77.0
14	H120x120	36	H120	171	0.078	2.828	3.0	86.0
15	H120x120	5	H120	1190	0.089	0.445	3.0	15.0
16	H120x120	5	H120	138	0.060	0.300	3.0	15.0
17	H120x150	8	H120	137	0.077	0.313	3.0	24.0
18	H120x150	8	H120	137	0.077	0.313	3.0	24.0

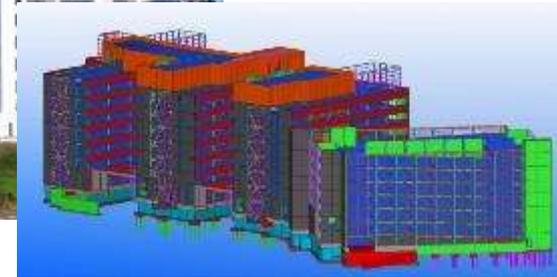
[Date]

Structural analysis

- > Integrate modeling and design with analysis



- > Manage big amounts of information in small formats



3107 Drawings
6700 reinforced concrete elements
630 ton rebar (267 000 rebar groups)
157 ton steel
4226 bolts groups
15658 Welds

In total, over 1 million objects
Model database 73 MB

SAP 2000

S-FRAME
SOFTWARE

GT STRUDL

STAAD.Pro 2007

Diubal

RFEM 5
RSTAB 8

MIDAS

22.10.2014

44



CONSTRUSOFT

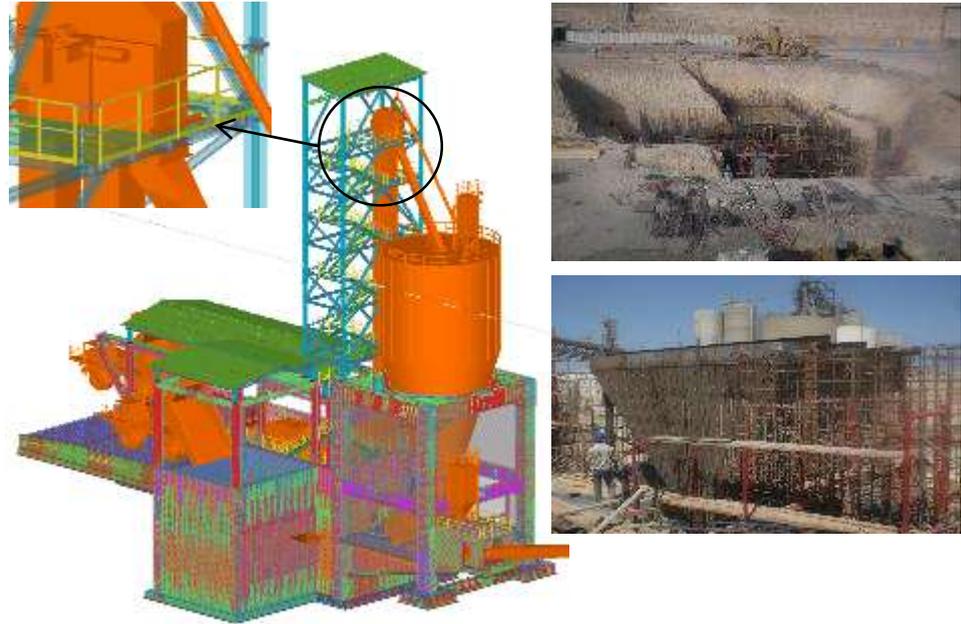
Engineering the details



- > Create better engineered buildable design solutions

Activity	Start	End	Resources
1.000000	01/01/2014	01/01/2014	1000000
1.000001	01/01/2014	01/01/2014	1000000
1.000002	01/01/2014	01/01/2014	1000000
1.000003	01/01/2014	01/01/2014	1000000
1.000004	01/01/2014	01/01/2014	1000000
1.000005	01/01/2014	01/01/2014	1000000
1.000006	01/01/2014	01/01/2014	1000000
1.000007	01/01/2014	01/01/2014	1000000
1.000008	01/01/2014	01/01/2014	1000000
1.000009	01/01/2014	01/01/2014	1000000
1.000010	01/01/2014	01/01/2014	1000000
1.000011	01/01/2014	01/01/2014	1000000
1.000012	01/01/2014	01/01/2014	1000000
1.000013	01/01/2014	01/01/2014	1000000
1.000014	01/01/2014	01/01/2014	1000000
1.000015	01/01/2014	01/01/2014	1000000
1.000016	01/01/2014	01/01/2014	1000000
1.000017	01/01/2014	01/01/2014	1000000
1.000018	01/01/2014	01/01/2014	1000000
1.000019	01/01/2014	01/01/2014	1000000
1.000020	01/01/2014	01/01/2014	1000000

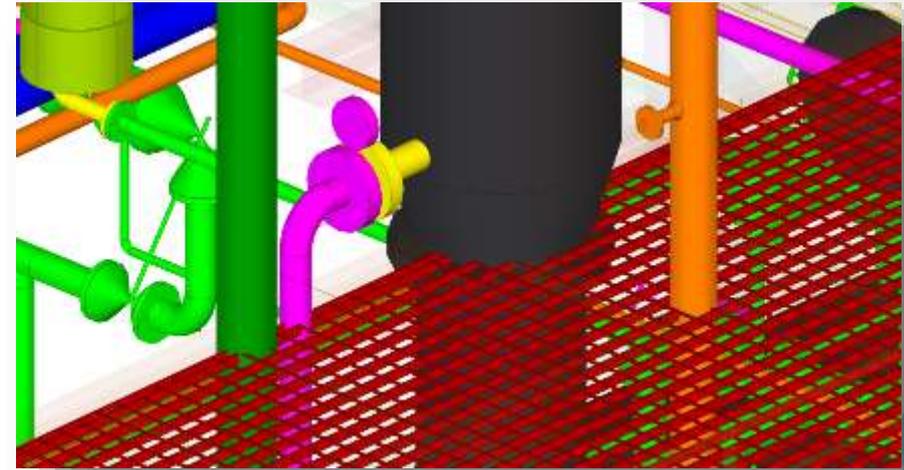
- > Make earlier construction based planning



- > Benefit from improved accuracy, reduced site errors and minimized rework

Clash Check Manager

- Identify conflicts within model
- Organize and assign clashes
- Manage collaborative BIM workflow



Clash Check Manager - Advanced Mode - PHASE2_CLASHES.xml

Flag	Number	Type	Status	Priority	Date Modified
	14	Clash			3/22/2011 8:25 AM
	15	Cut through			3/22/2011 8:25 AM
✓	16	Cut through			3/22/2011 8:25 AM
	17	Cut through			3/22/2011 8:25 AM
	18	Cut through			3/22/2011 8:25 AM
	19	Cut through			3/22/2011 8:25 AM
	20	Cut through			3/22/2011 8:25 AM
	21	Cut through			3/22/2011 8:25 AM
	22	Cut through			3/22/2011 8:25 AM
	23	Cut through			3/22/2011 8:25 AM

Ready

STATUS

Clash Check Manager - Advanced Mode - PHASE2_CLASHES.xml

Flag	Number	Type	Status	Priority	Date Modified
	14	Clash			3/22/2011 8:25 AM
	15	Cut through			3/22/2011 8:25 AM
✓	16	Cut through			3/22/2011 8:25 AM
	17	Cut through			3/22/2011 8:25 AM
	18	Cut through			3/22/2011 8:25 AM
	19	Cut through			3/22/2011 8:25 AM
	20	Cut through			3/22/2011 8:25 AM
	21	Cut through			3/22/2011 8:25 AM
	22	Cut through			3/22/2011 8:25 AM
	23	Cut through			3/22/2011 8:25 AM

Ready

PRIORITIZE

Clash Check Manager - Advanced Mode - PHASE2_CLASHES.xml

Flag	Number	Type	Status	Priority	Date Modified
	14	Clash			3/22/2011 8:25 AM
	15	Cut through			3/22/2011 8:25 AM
✓	16	Cut through			3/22/2011 8:25 AM
	17	Cut through			3/22/2011 8:25 AM
	18	Cut through			3/22/2011 8:25 AM
	19	Cut through			3/22/2011 8:25 AM
	20	Cut through			3/22/2011 8:25 AM
	21	Cut through			3/22/2011 8:25 AM
	22	Cut through			3/22/2011 8:25 AM
	23	Cut through			3/22/2011 8:25 AM

Ready

GROUP

Organizer

- Browse properties by model or categories
- Get instant insight into project quantities
- Quickly build estimates
- Manage deliveries and track quantities
- Export to Excel

Object Browser

Part List

Show from model Show from Categories

QTY	Assembly Mark	Part Mark	Profile	Name	Material	Length / ft-in	Weight / lb
1	C9	p11	FL3/8"x3 1/2"	PLATE	A36	6'3/4	2.3
1	C9	p10	FL3/8"x3 1/2"	PLATE	A36	6"	2.2
1	C9	p9	FL3/8"x3 1/2"	PLATE	A36	8'1/2	7.7
1	AB3	p6	FL3/8"x3 15/16	EXTRAPLATE	A36	3'15/16	1.7
1	AB3	p6	FL3/8"x3 15/16	EXTRAPLATE	A36	3'15/16	1.7
1	AB3	p6	FL3/8"x3 15/16	EXTRAPLATE	A36	3'15/16	1.7
1	AB3	p6	FL3/8"x3 15/16	EXTRAPLATE	A36	3'15/16	1.7
1	C9	p93	PL3/4"x15"	PLATE	A36	1'3"	47.9
1	C9	p11	FL3/8"x3 1/2"	PLATE	A36	6'3/4	2.3
1	C8	p10	FL3/8"x3 1/2"	PLATE	A36	6"	2.2
1	C8	p10	FL3/8"x3 1/2"	PLATE	A36	6"	2.2
1	C9	p9	FL3/8"x3 1/2"	PLATE	A36	8'1/2	7.7
1	AB3	p6	FL3/8"x3 15/16	EXTRAPLATE	A36	3'15/16	1.7
1	AB3	p6	FL3/8"x3 15/16	EXTRAPLATE	A36	3'15/16	1.7
1	AB3	p6	FL3/8"x3 15/16	EXTRAPLATE	A36	3'15/16	1.7
1	AB3	p6	FL3/8"x3 15/16	EXTRAPLATE	A36	3'15/16	1.7
1	C9	p93	PL3/4"x15"	PLATE	A36	1'3"	47.9
1	C4	p11	FL3/8"x3 1/2"	PLATE	A36	6'3/4	2.3
1	C4	p10	FL3/8"x3 1/2"	PLATE	A36	6"	2.2
1	C4	p9	FL3/8"x3 1/2"	PLATE	A36	8'1/2	7.7
1	AB3	p6	FL3/8"x3 15/16	EXTRAPLATE	A36	3'15/16	1.7
1	AB3	p6	FL3/8"x3 15/16	EXTRAPLATE	A36	3'15/16	1.7
1	AB3	p6	FL3/8"x3 15/16	EXTRAPLATE	A36	3'15/16	1.7

Categories

Search for...

Assemblies by Phase (1687/5061)

- 1 (40/80)
 - COLUMN (32)
 - VERT.BRACE (8)
- 2 (200/400)
 - HANDRAIL (167)
 - STAIR HANDRAIL (32)
 - TOEPLATE (1)
- 3 (112/224)
 - COLUMN (12)
 - GIRDER (52)
 - VERT.BRACE (48)
- 4 (334/668)
- 5 (28/56)

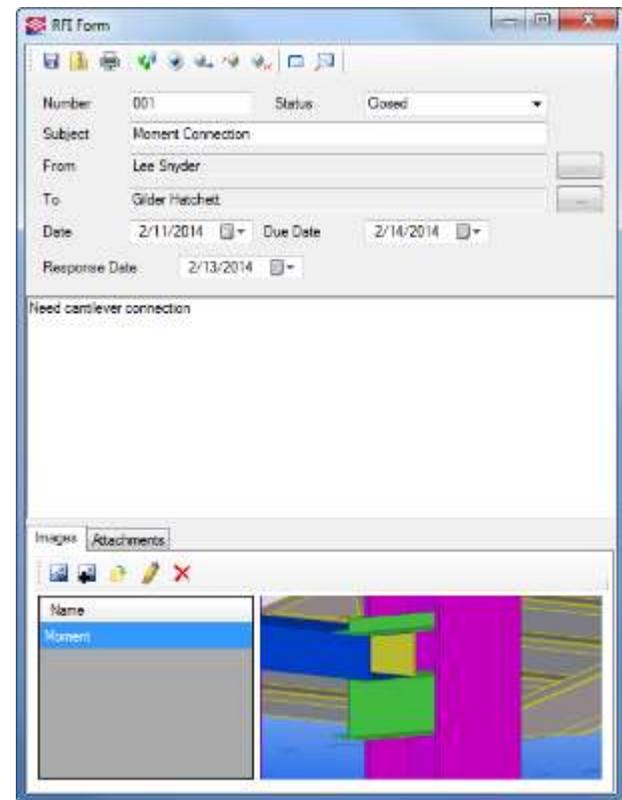
Categories

Search for...

- Project (233/233)
 - Site (131/131)
 - Building 1 (131/131)
 - Section 1 (70/70)
 - Floor 3 (28)
 - Floor 2 (2)
 - Floor 1 (40)
 - Section 2 (61/61)
 - Floor 3 (26)
 - Floor 2 (1)
 - Floor 1 (34)
 - Uncategorized (102)
 - Steel Assemblies (215/215)
 - Beams (81)
 - Columns (18)
 - Channels (-)
 - Anchor Rods (78)
 - Braces (-)
 - Joists (32)
 - Stairs (-)
 - Handrail (-)
 - Rafters (-)
 - Plates (6)
 - Steel Secondary Parts (350/350)
 - Secondary part Beam (-)
 - Secondary part Plate (40)
 - Secondary part Angle (310)
 - Secondary part Column (-)
 - Secondary part Channel (-)
 - Secondary part Tread (-)
 - Bolt Groups (313/313)
 - Site (313)
 - Welds (368/368)
 - Workshop (368)
 - Components (213)

RFI Manager

- Manage RFI's and link them with the model.
 - Link to IFC reference model objects as well as native objects
 - Colorize model based of RFI status
 - Automatically check for overdue status
 - Publish to HTML or FTP site or zip up and email



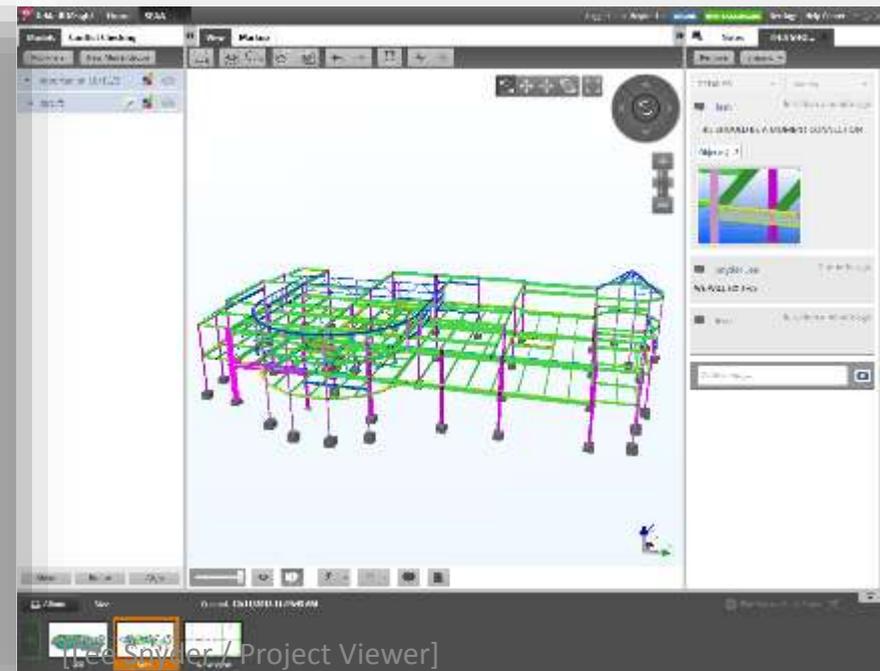
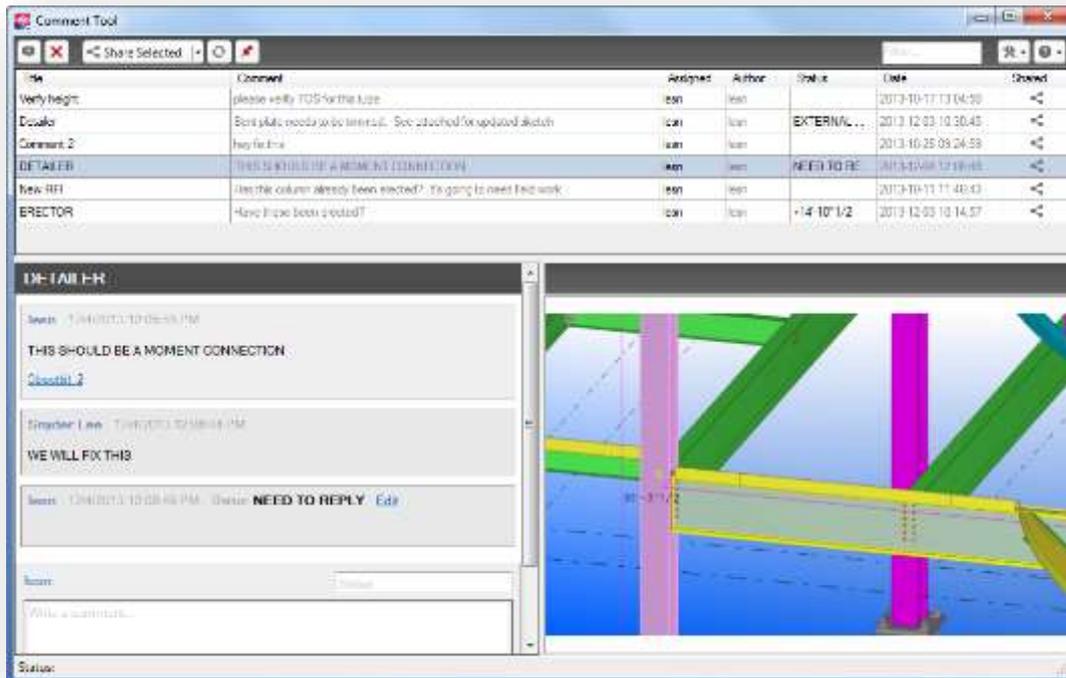
RFI Manager

Number	Subject	Status	Date	Due Date	To
001	Moment Connection	Closed	2/11/2014	2/14/2014	Gilder Hatchett
002	Verify Radius	Overdue	2/12/2014	2/17/2014	Gilder Hatchett
003	Missing Bent Plate detail	Open	2/20/2014	2/25/2014	Gilder Hatchett
004	Verify anchor bolt detail on Grid E/11	Open	2/20/2014	2/25/2014	Gilder Hatchett
005	DCN #38 missing section	Open	2/20/2014	2/25/2014	Gilder Hatchett
006	Pc Mk A1387 on hold?	Closed	2/20/2014	2/25/2014	Gilder Hatchett
007	Edge Slab verification	Open	2/20/2014	2/25/2014	Gilder Hatchett



Comment Tool

- > Communicate changes, questions, and work assignments directly into the model
- > Live link between Tekla Structures and Tekla BIMsight



Add User-Defined Attributes

> Example: Shop Status

Tekla Structures x64 Beam (1)

Notes	Assembly Status	Material Status	IFC export	
Parameters	End Conditions	Modeling Workflow	Field Studs	Change Orders
Design/Detailing Status	Shop/Site Status	RFI Management	Clash Management	

SHOP

Fabrication Code:

Delivery Number:

Package Number:

Shipment Number:

Planned Fab Start Date: 02/11/2014

Planned Fab End Date: 02/13/2014

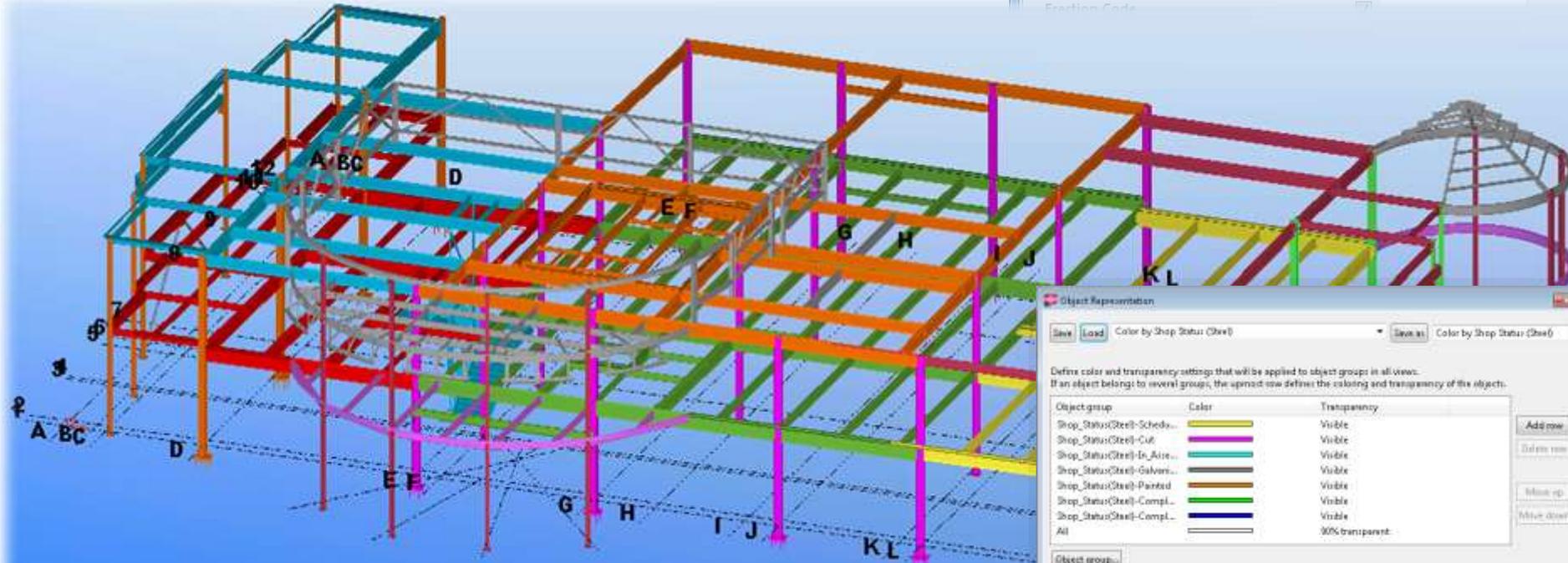
Actual Fab Start Date: 02/12/2014

Actual Fab End Date: 02/13/2014

Shop Status (Steel): Completed-In yarc

SITE

Fraction Code:



Object Representation

Save Load Color by Shop Status (Steel) Save as Color by Shop Status (Steel)

Define color and transparency settings that will be applied to object groups in all views.
If an object belongs to several groups, the upmost row defines the coloring and transparency of the object.

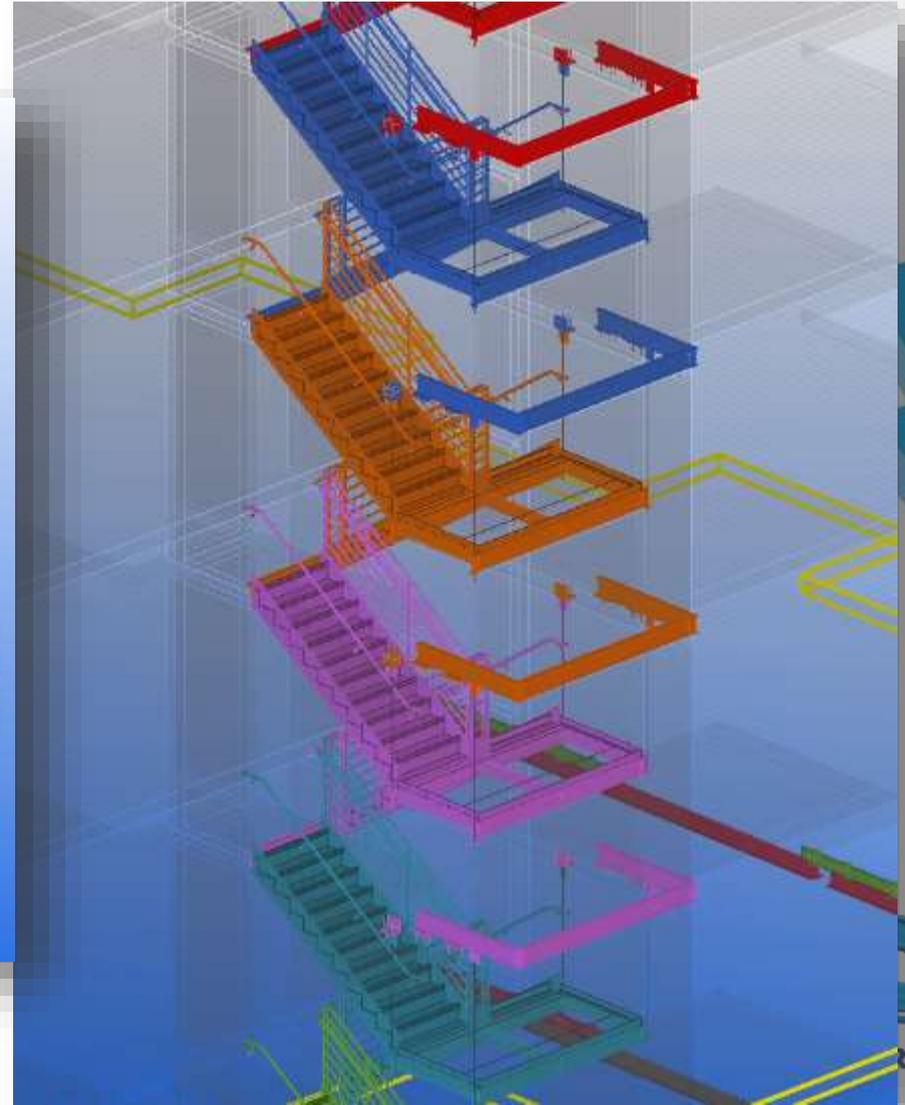
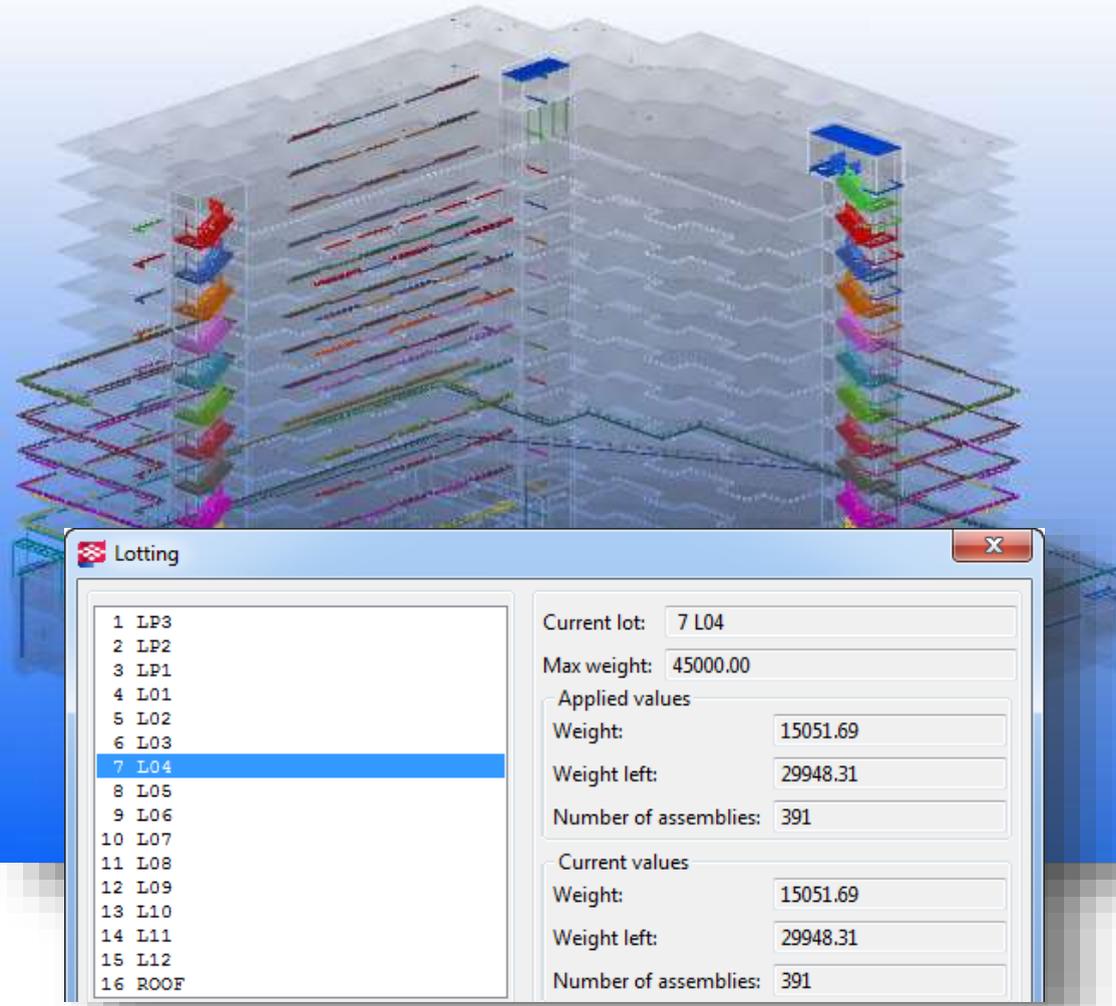
Object group	Color	Transparency
Shop_Status(Steel)-Schedu...		Visible
Shop_Status(Steel)-Cut		Visible
Shop_Status(Steel)-In_Airc...		Visible
Shop_Status(Steel)-Galvani...		Visible
Shop_Status(Steel)-Painted		Visible
Shop_Status(Steel)-Compl...		Visible
Shop_Status(Steel)-Compl...		Visible
All		90% transparent

Object group:

OK Apply Modify Cancel

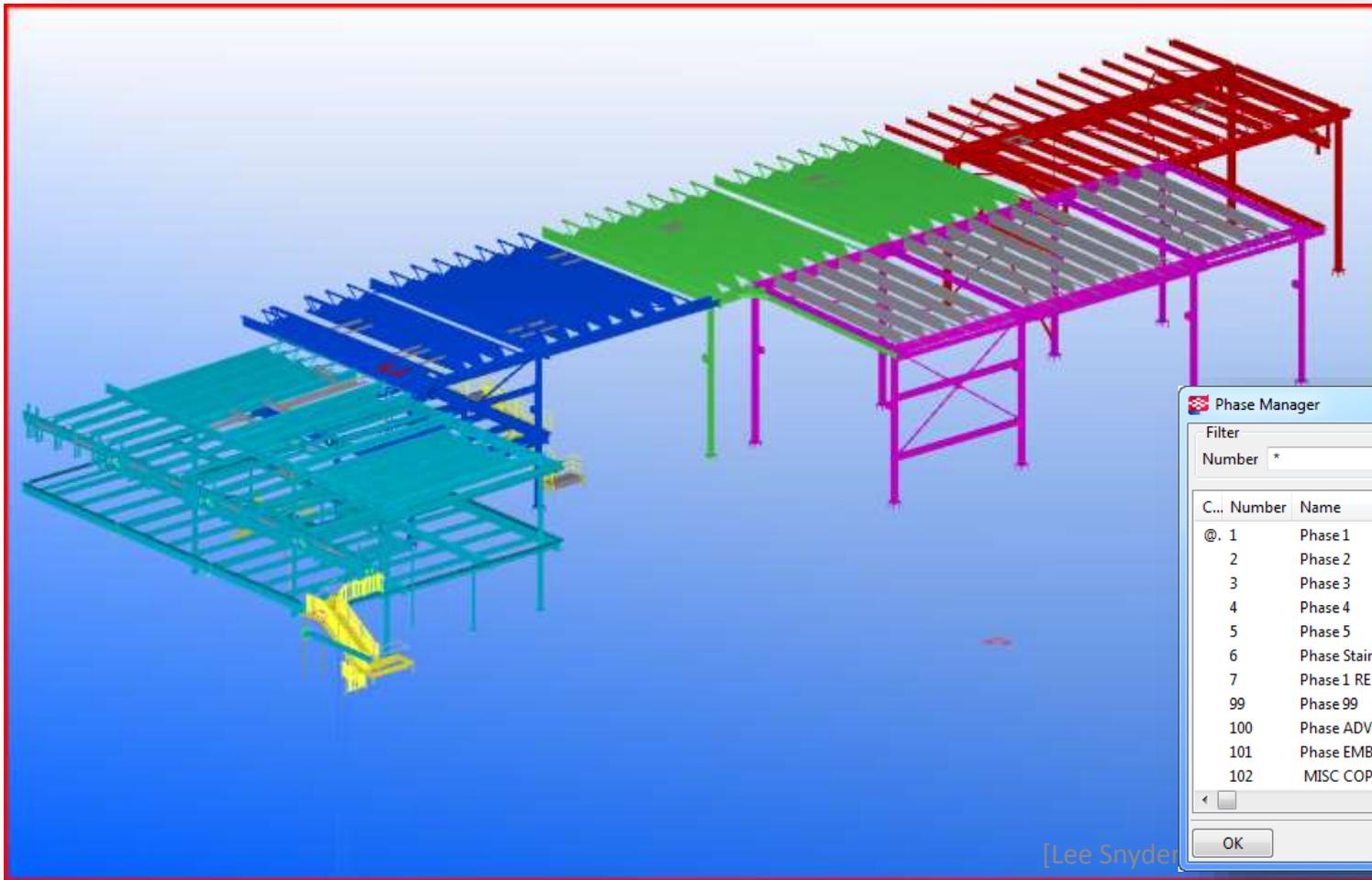
Add/View Truck Lotting

> Standard Iron & Wire Works



Add/View Phase or Sequence

> Seech Industries Inc



Phase Manager

Filter
Number * Name * Filter

C...	Number	Name	Comr
@.	1	Phase 1	
	2	Phase 2	
	3	Phase 3	
	4	Phase 4	
	5	Phase 5	
	6	Phase Stairs & Rail	
	7	Phase 1 RE DO	
	99	Phase 99	
	100	Phase ADVANCED	
	101	Phase EMBED	
	102	MISC COPY MATERAIL	

Phase
Set current
Add
Delete

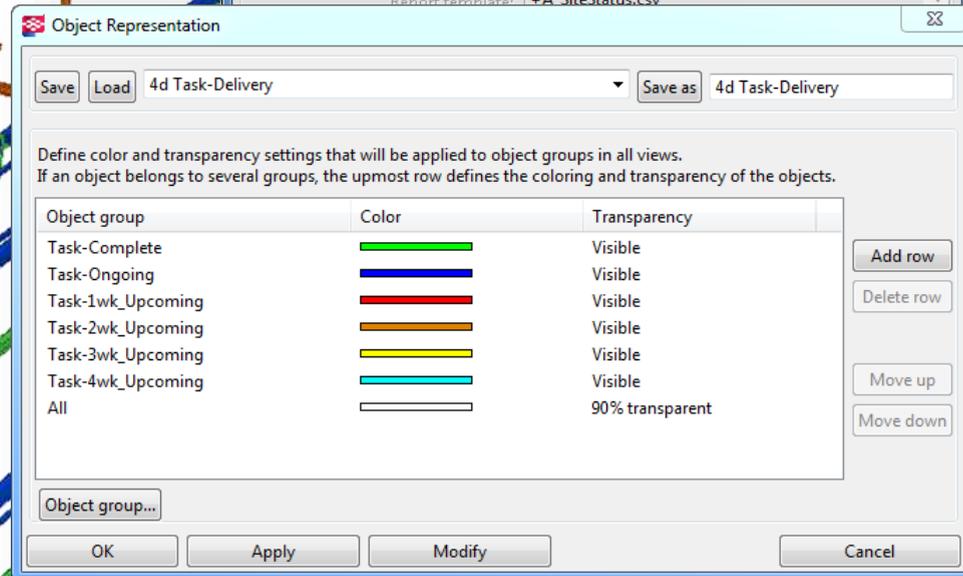
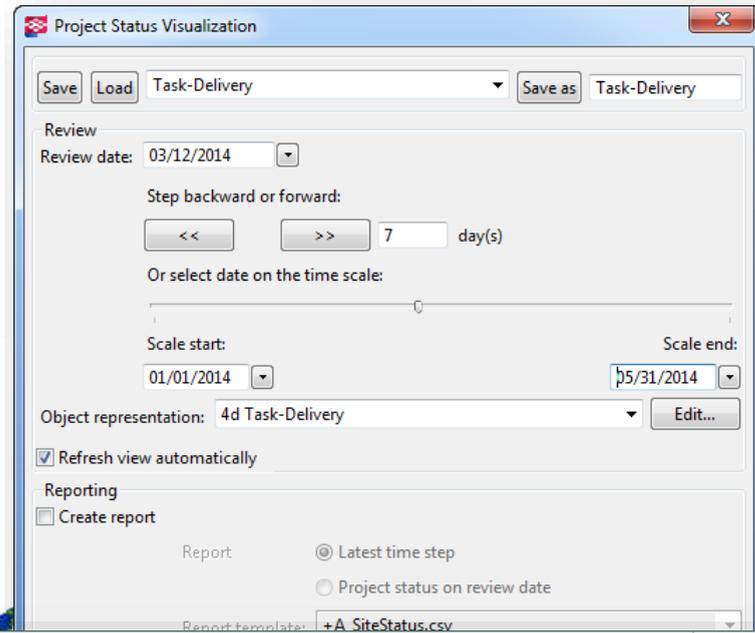
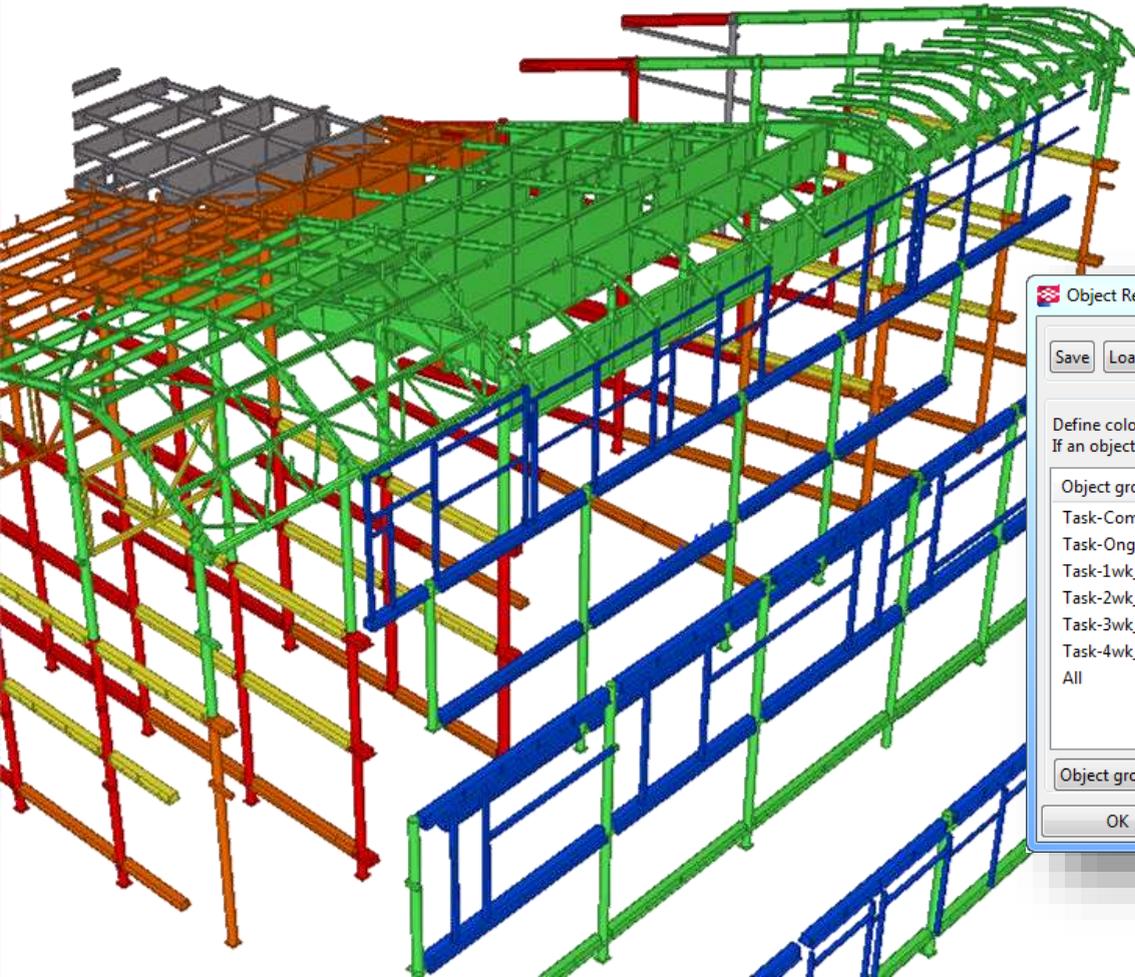
Select
Phases by objects
Objects by phases

Objects
Modify phase

OK

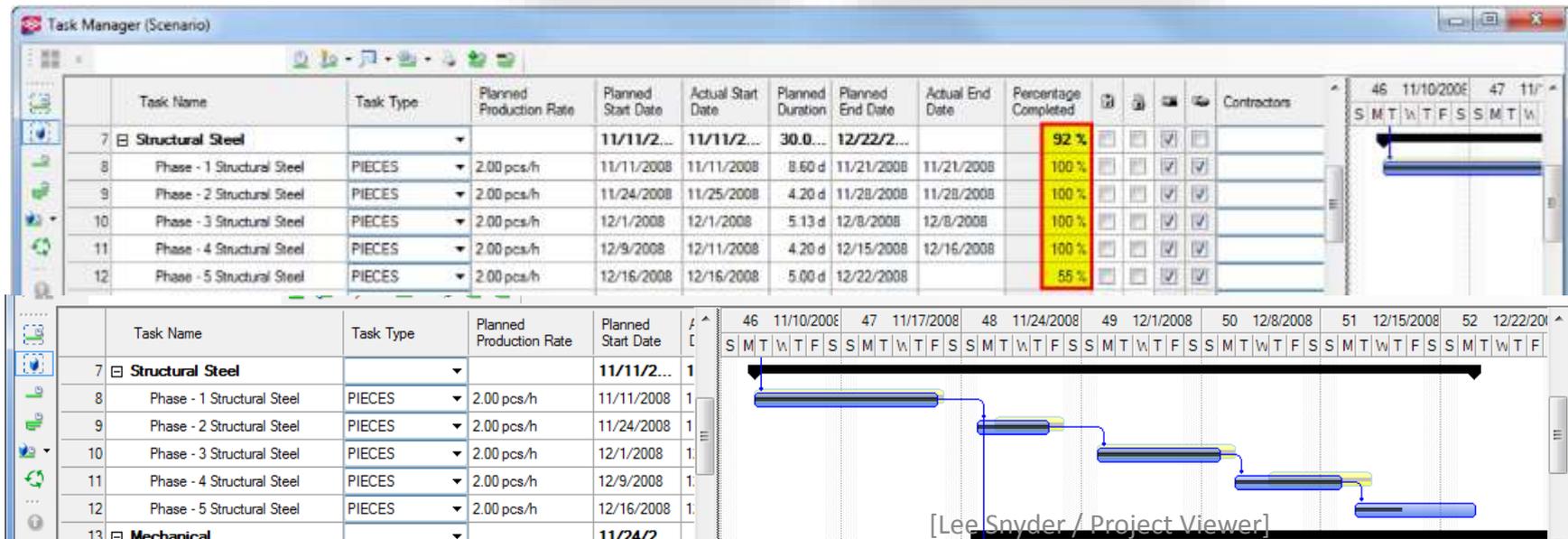
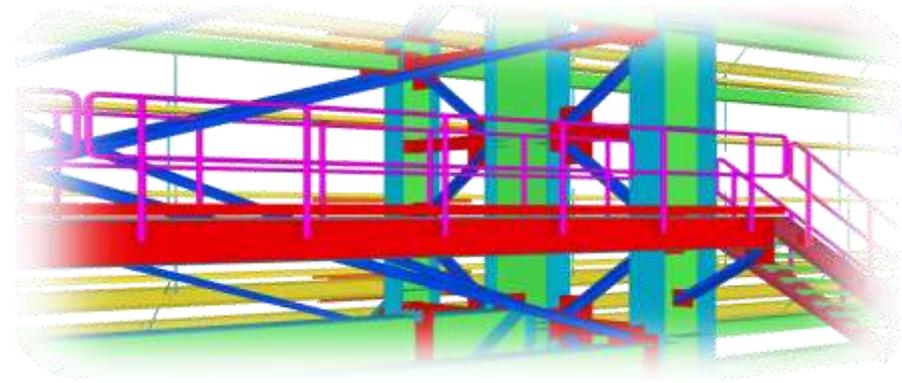
Project Status Visualization

> Time frame specific review



Task Manager

- > Quantity Based Scheduling
- > Establish Production Rates
- > Provide Accurate and Reliable Planning

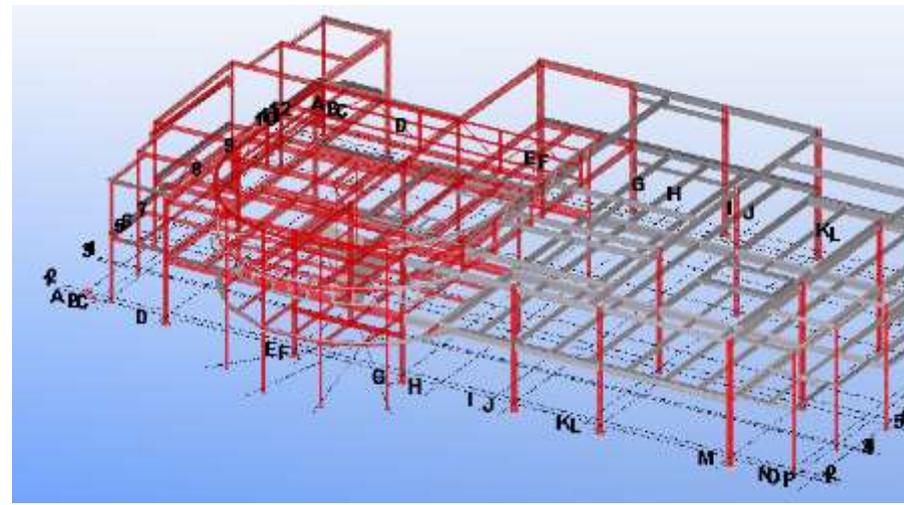


[Lee Snyder / Project Viewer]



Construction Sequencer

- Define erection order
- Create reports and animations



Excel Report.xlsx - Microsoft Excel

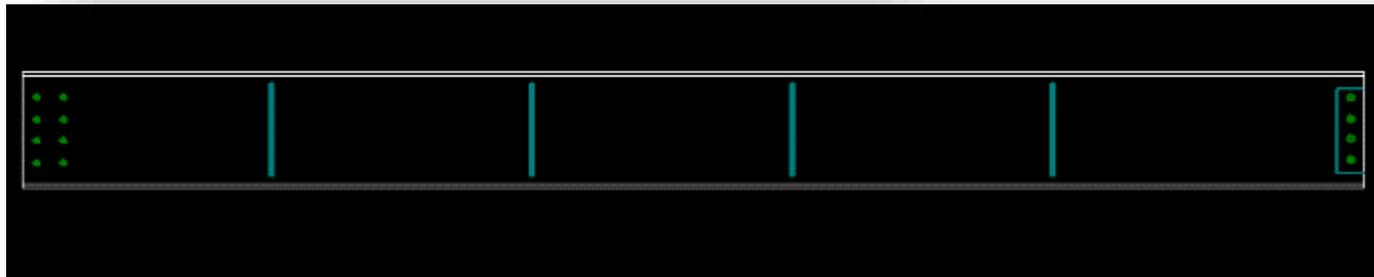
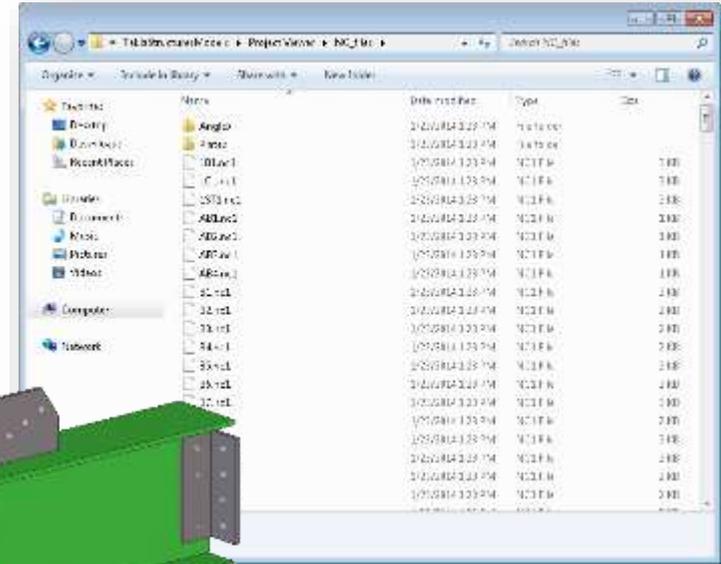
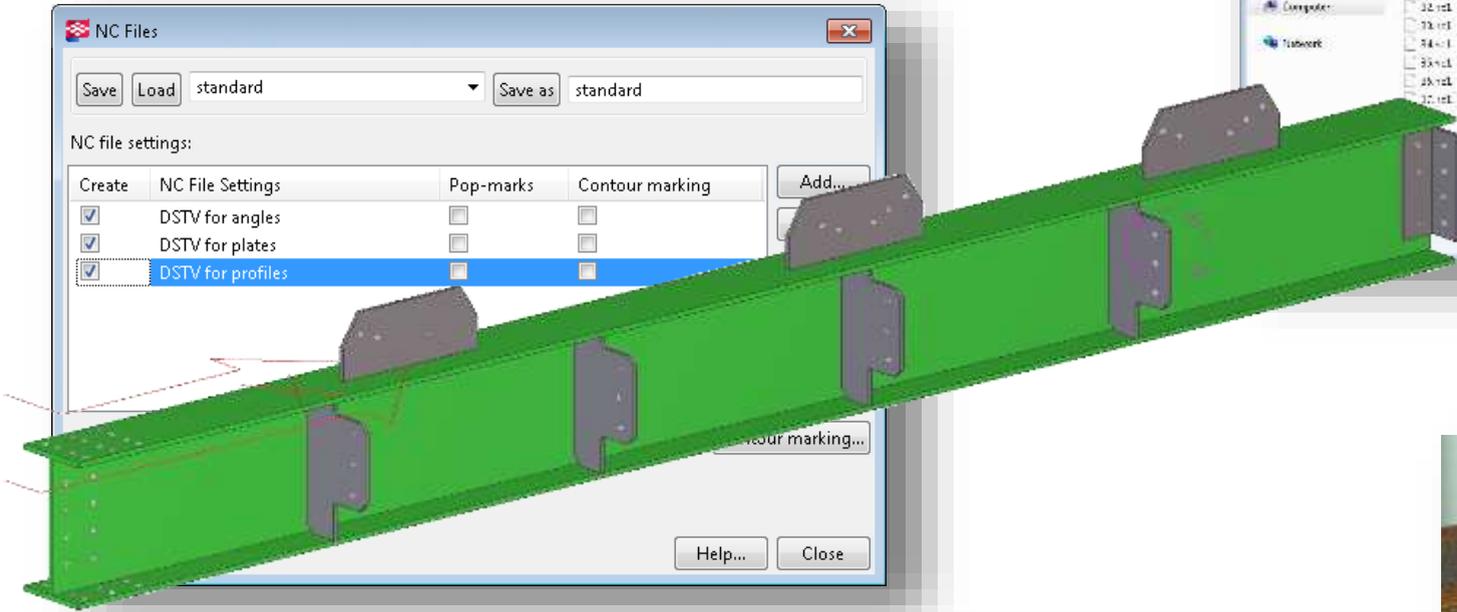
Home Insert Page Layout Formulas Data Review View PDF-XChange 4

Clipboard Font Alignment Number Styles Cells Editing

	A	B	C	D	E	F	G	H	I	J
1	Name	Phase	Order	AssemblyMark	Profile	TotalWeight	MaximumOverallL	GlobalCenterOfGravity	ElevationTop	NearestGridLocati
2	COLUMN	41	1	C1	W8X28	936.51	30'5"3/4	(-0"1/4, 30'8"1/16, 13'8"9/16)	29'3"3/4	A/5
3	COLUMN	41	2	C2	W8X28	955.16	31'2"	(-0"1/4, 63'4", 14'0"7/16)	30'0"	A/8
4	COLUMN	41	3	C3	W8X24	767.46	30'2"3/16	(4'0", 16'8", 13'1"1/2)	29'0"3/16	B/-3
5	COLUMN	41	4	C4	W8X24	783.81	30'10"3/8	(4'0", 77'4", 13'5"9/16)	29'8"3/8	B/9
6	COLUMN	41	5	C6	PIPE8STD	874.78	30'6"1/2	(6'0"1/16, 91'11"15/16, 13'7"9/16)	29'4"1/2	C/-
7	COLUMN	41	6	C5	PIPE8STD	856.94	29'10"1/2	(6'0"1/16, 2'0"1/16, 13'3"9/16)	28'8"1/2	C/2
8	COLUMN	41	7	C7	W12X79	2899.31	30'6"	(20'8"1/16, 0', 11'7"3/16)	28'8"	D/1
9	COLUMN	41	8	C8	W12X79	2887.62	30'5"3/4	(20'7"15/16, 30'8", 12'2"13/16)	29'3"3/4	D/5
10	COLUMN	41	9	C9	W12X79	3007.64	31'2"	(20'8", 63'4", 12'9"13/16)	30'0"	D/8
11	COLUMN	41	10	C10	W12X79	2852.67	31'2"	(20'8", 94'0", 11'7"1/2)	29'4"	D/11
12	COLUMN	57	11	C11	HSS8X8X1/4	291.07	9'9"3/8	(31'6"1/2, 10'6"1/4, 33'4"7/16)	38'8"	D-E/2-

Create Steel Fabrication Data

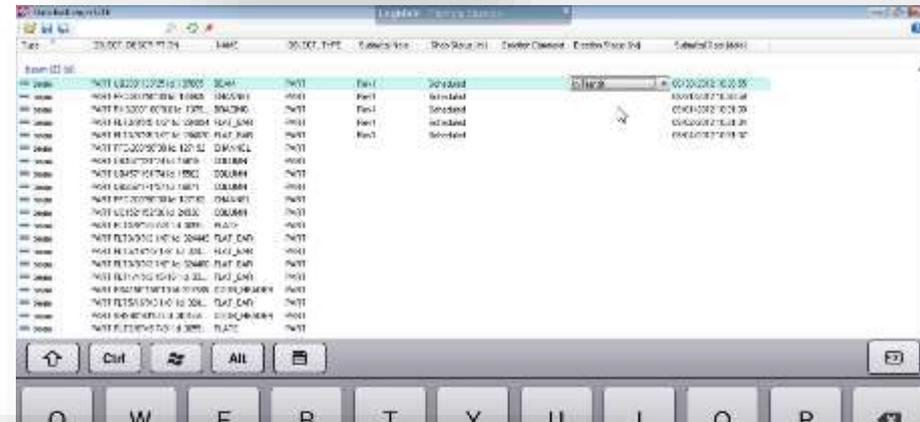
- DSTV, DXF, etc.



Attribute Import



- Cloud based information exchange
- Remote status reporting



Type	OBJECT_DESC...	NAME	OBJECT_TYPE	Submittal Note	Shop Status (int)	Erection Comment	Erection Status (int)	Submittal Date (date)
beam (23 (s))								
beam	PART UB203*13...	BEAM	PART					
beam	PART PFC-200*9...	CHANNEL	PART					
beam	PART RHS200*1...	BRACING	PART					
beam	PART FLT3/8*X...	FLAT_BAR	PART					
beam	PART FLT3/8*X...	FLAT_BAR	PART					
beam	PART PFC-200*9...	CHANNEL	PART					
beam	PART UB457*19...	COLUMN	PART					
beam	PART UB457*19...	COLUMN	PART					
beam	PART UB356*17...	COLUMN	PART					
beam	PART PFC-200*9...	CHANNEL	PART					
beam	PART UC152*15...	COLUMN	PART					

10:35:19 AM

August, 2012

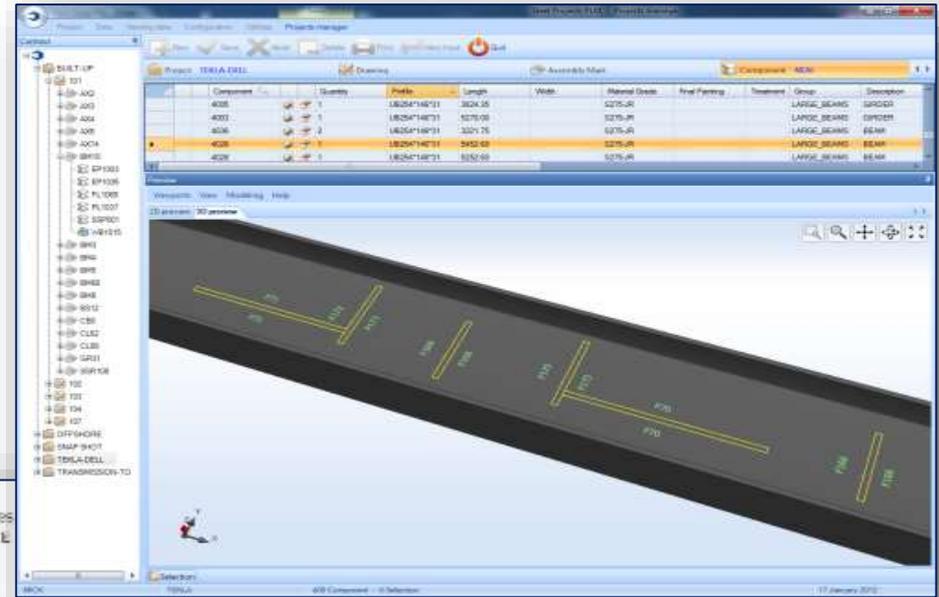
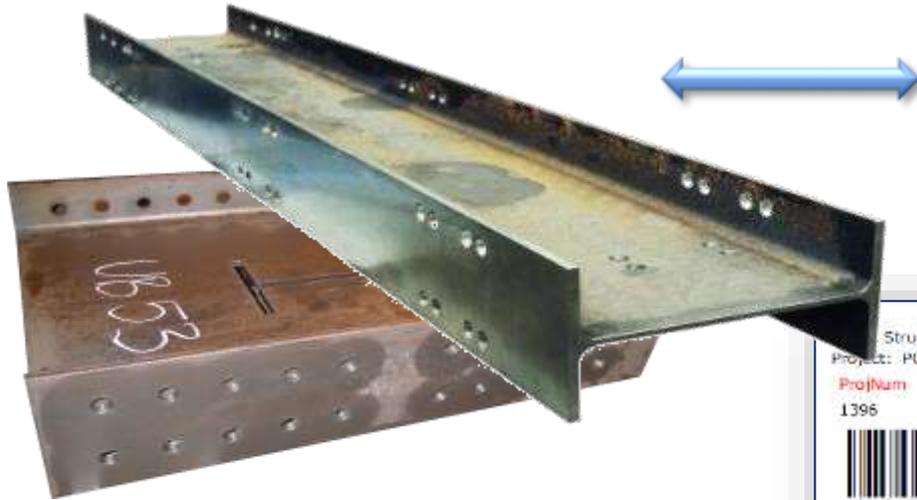
Sun	Mon	Tue	Wed	Thu	Fri	Sat
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

Today: 8/27/2012



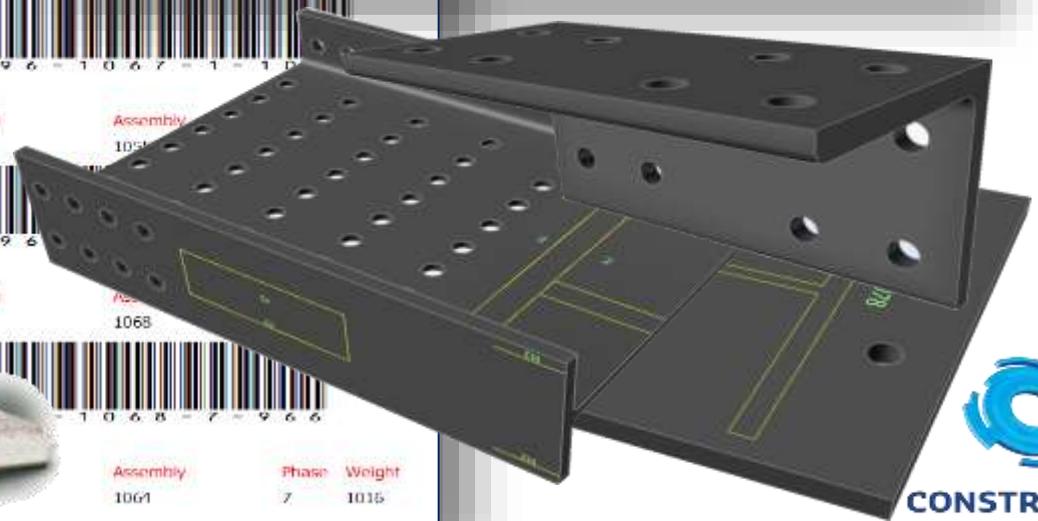
- 
- Tekla - a Global Software Company
 - BIM makes working more efficient & productive
 - Tekla BIM Solution
 - Design and documentation
 - Structural analysis
 - Engineering the details
 - **Reference cases**
 - Conclusion

Steel Projects PLM CNC Production / Planning

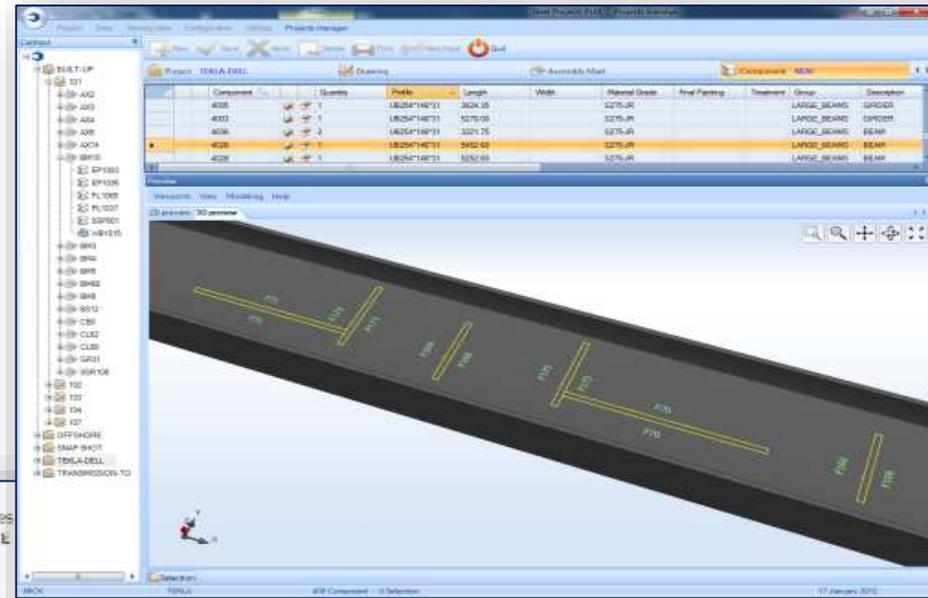
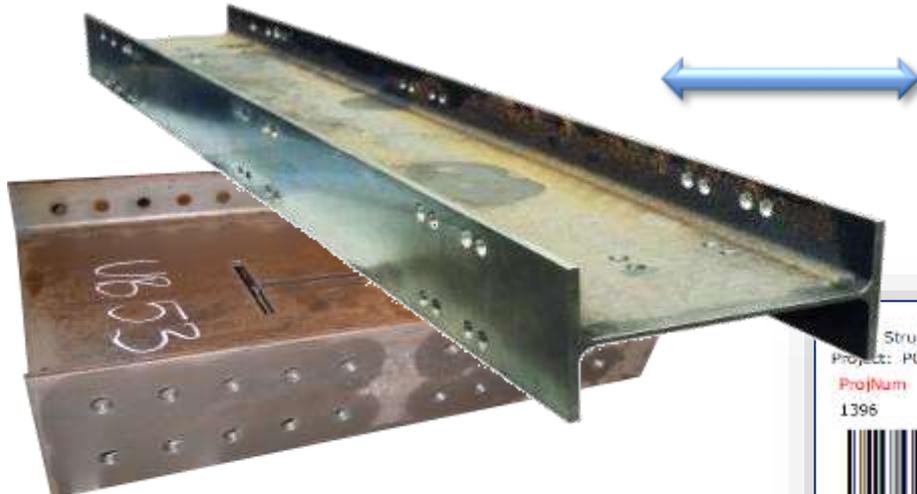


Structures
Project: POLICE

ProjNum	1396
ProjNum	1396
Assembly	1051
ProjNum	1396
Assembly	1068
Assembly	1061
Phase	7
Weight	1015

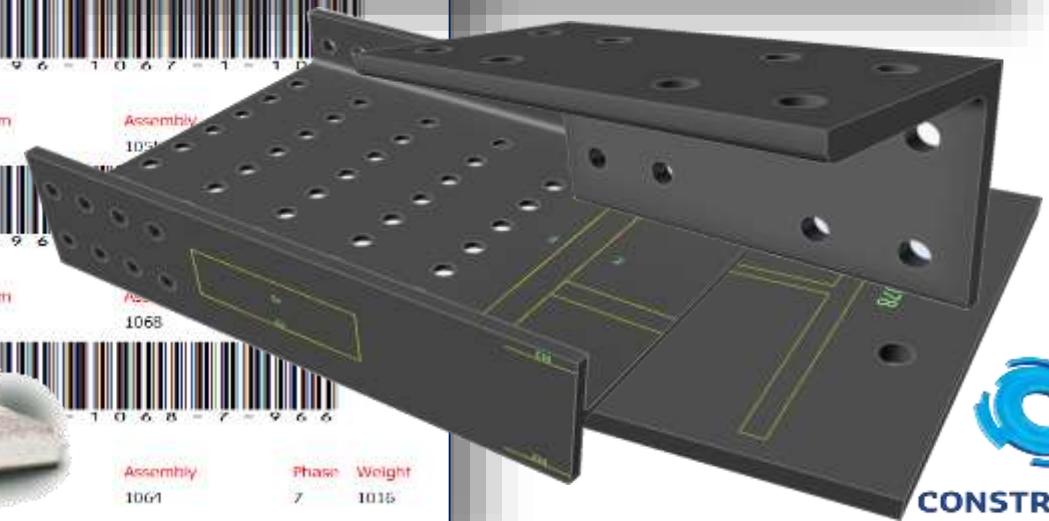


Steel Projects PLM CNC Production / Planning

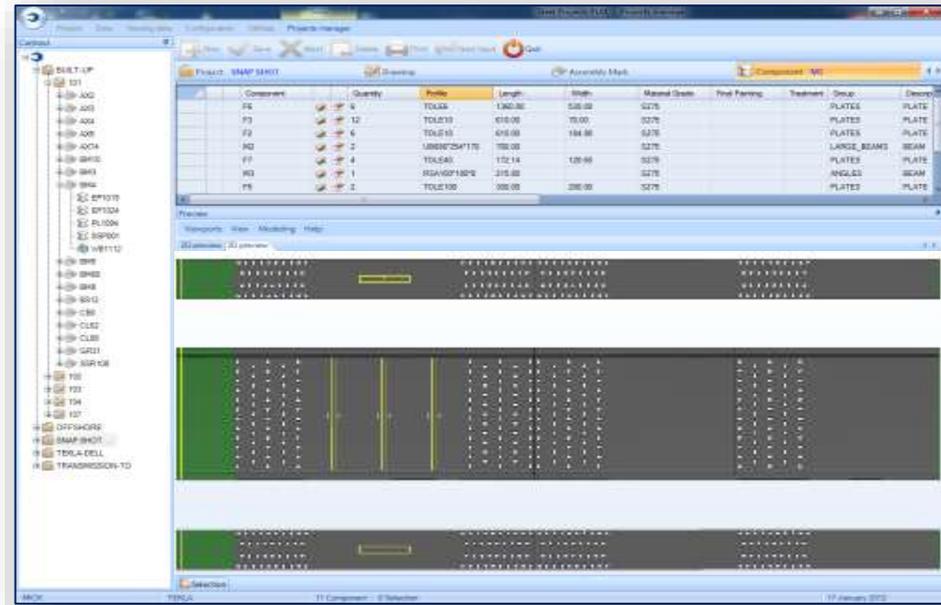


Structures
Project: POLICE

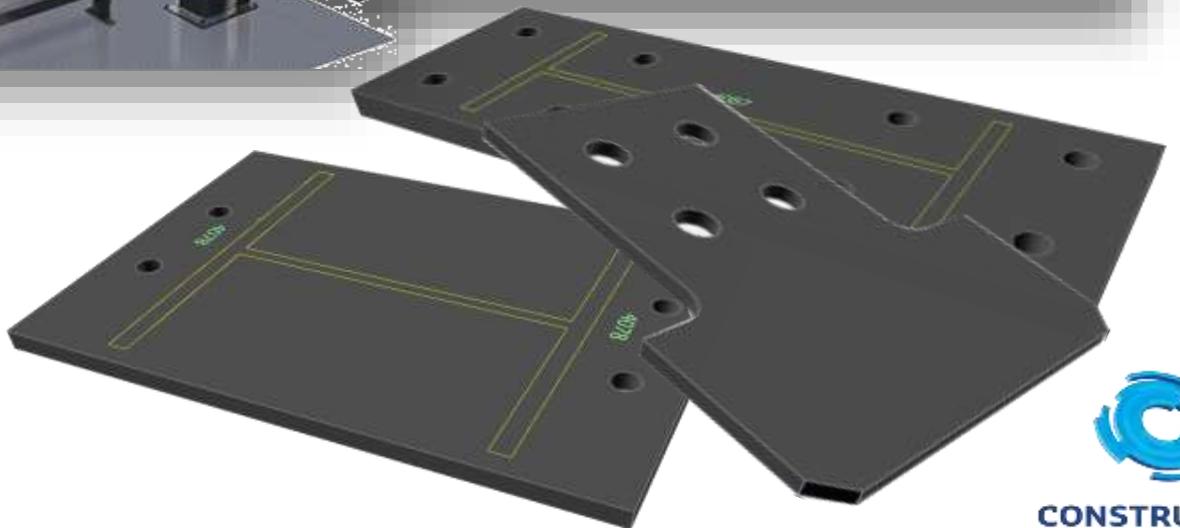
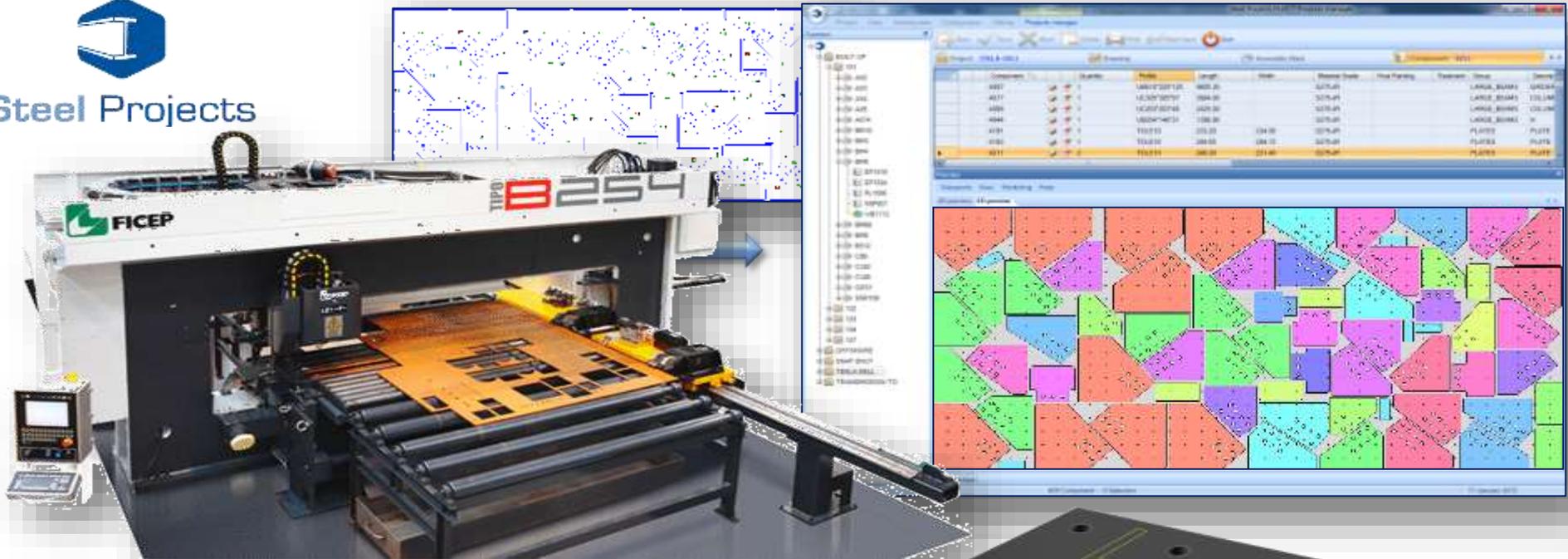
ProjNum	1396				
ProjNum	1396				
Assembly	1051				
ProjNum	1396				
Assembly	1068				
Assembly	1061	Phase	7	Weight	1015



Steel Projects PLM Section Nesting



Steel Projects PLM Plate Nesting

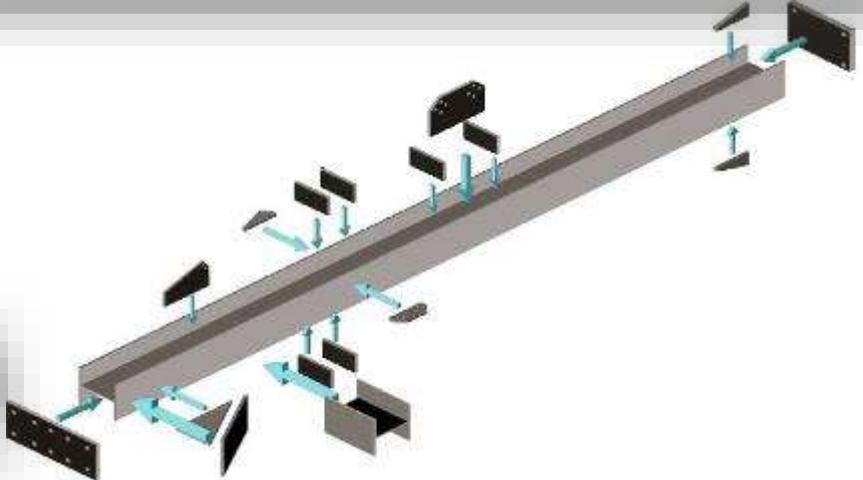


Steel Projects PLM CNC Planning and Time Calculation



Component	Quantity	Profile	Length	Width	Material Grade	Paint	Treatment	Group	Description
F6	6	TOL33	130.00	5.00	S275			PLATES	PLATE
F7	12	TOL33	610.00	10.00	S275			PLATES	PLATE
F8	6	TOL33	610.00	10.00	S275			PLATES	PLATE
F9	2	UNI300/170	180.00		S275			LARGE BEAMS	BEAM
F10	4	TOL33	112.14	120.00	S275			PLATES	PLATE
F11	1	UNI300/130	315.00		S275			ANGLES	BEAM
F12	2	TOL100	300.00	300.00	S275			PLATES	PLATE

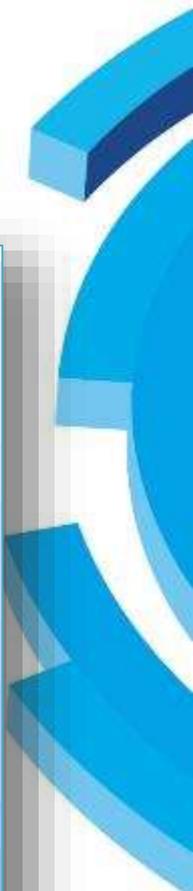
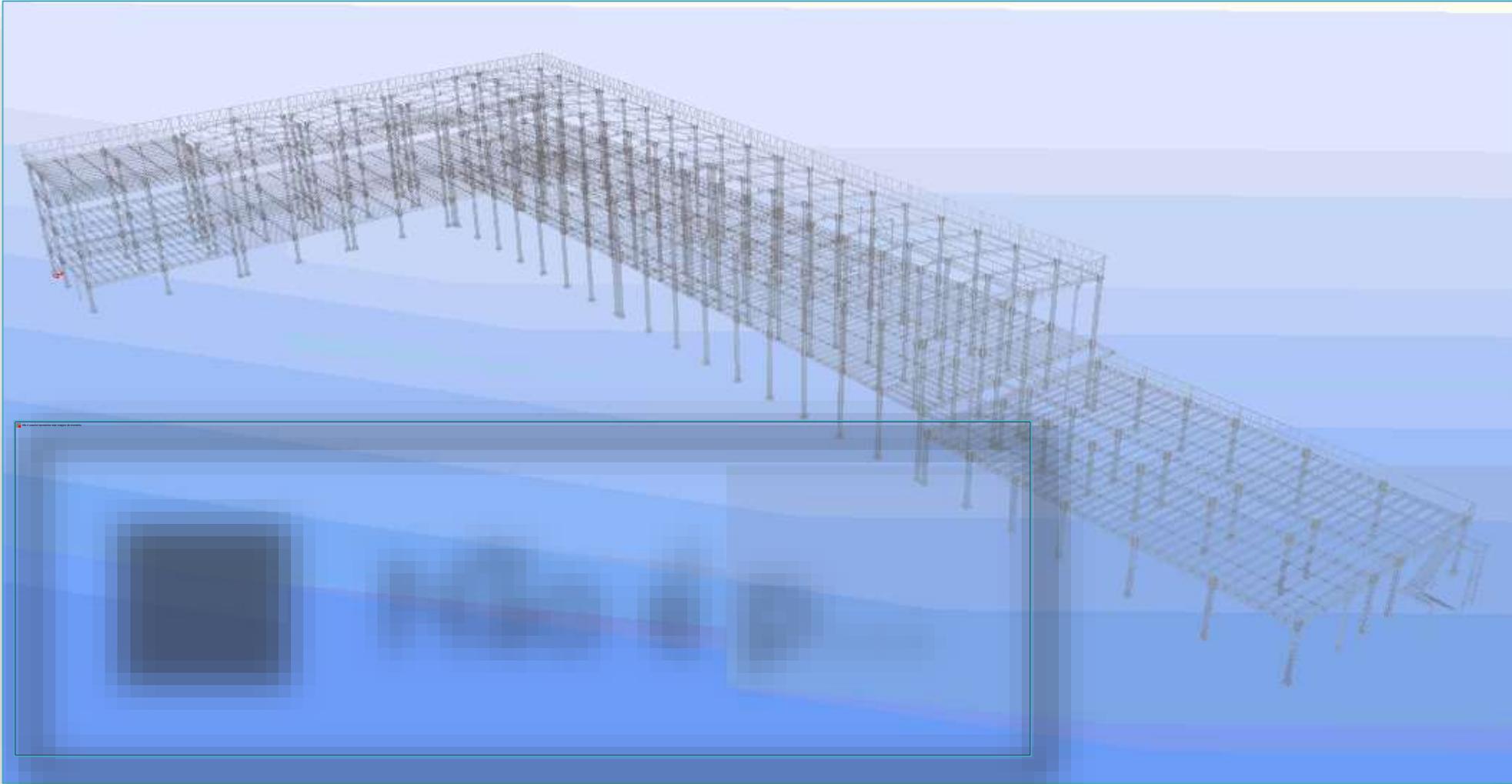
Material	Quantity	Production	Description	Creation Date	Creation User	Ready
PLATE	18	18	PLATE	2010/02/15 11:00	00	100%
PLATE	12	12	PLATE	2010/02/15 11:00	00	100%
PLATE	6	6	PLATE	2010/02/15 11:00	00	100%
PLATE	6	6	PLATE	2010/02/15 11:00	00	100%
PLATE	2	2	PLATE	2010/02/15 11:00	00	100%
PLATE	4	4	PLATE	2010/02/15 11:00	00	100%
PLATE	1	1	PLATE	2010/02/15 11:00	00	100%
PLATE	2	2	PLATE	2010/02/15 11:00	00	100%



Automated workshop

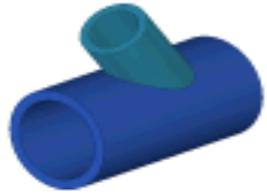


Production Feedback

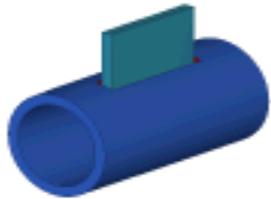




New range of specialised HGG tube to tube components in Tekla



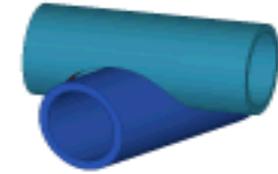
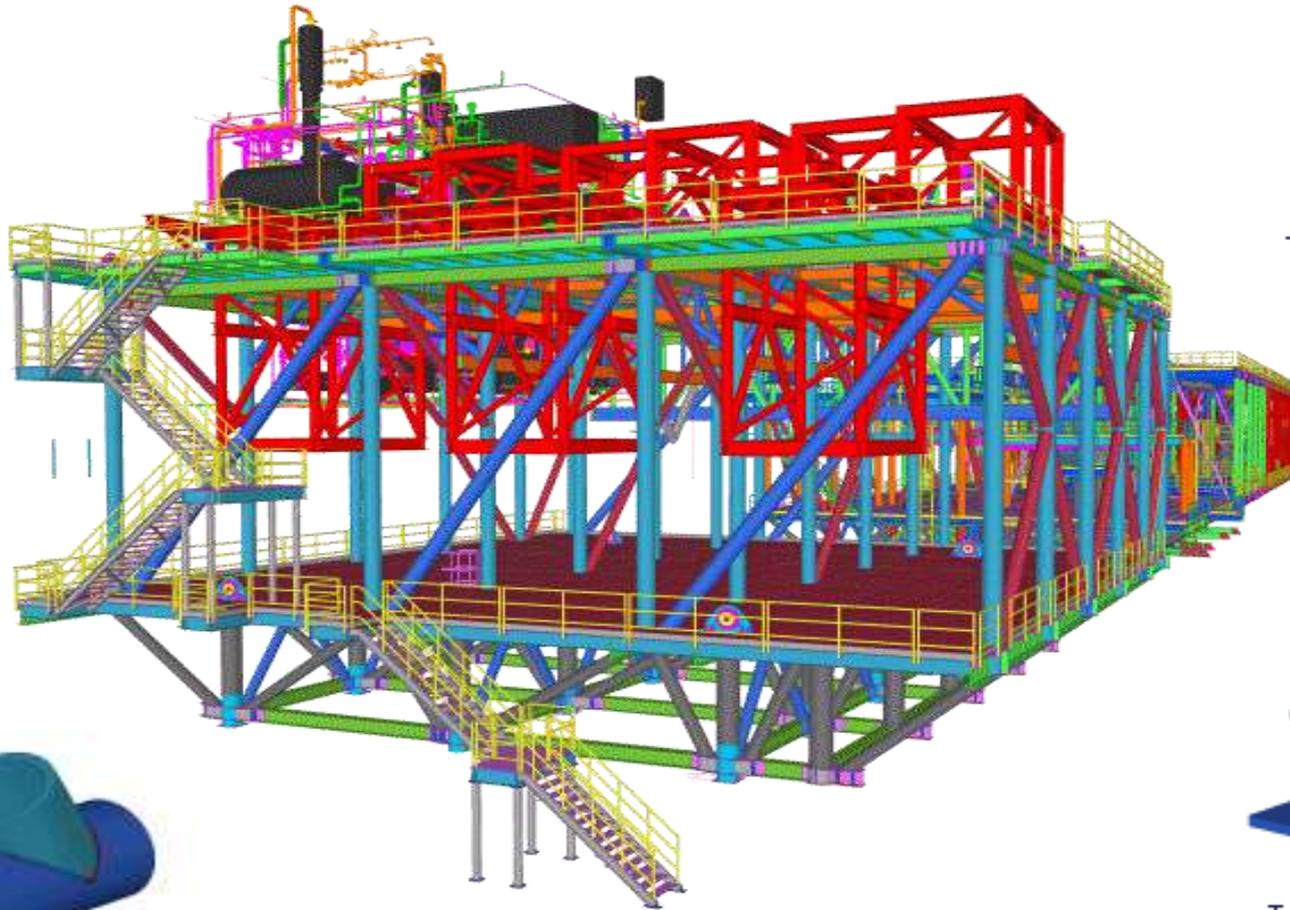
Tube-Saddle+Hole



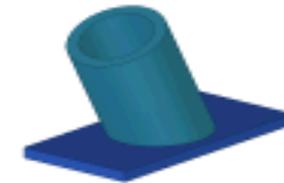
Tube-SlottedHole



Tube-MitreSaddl...



Tube-CrossingSa...

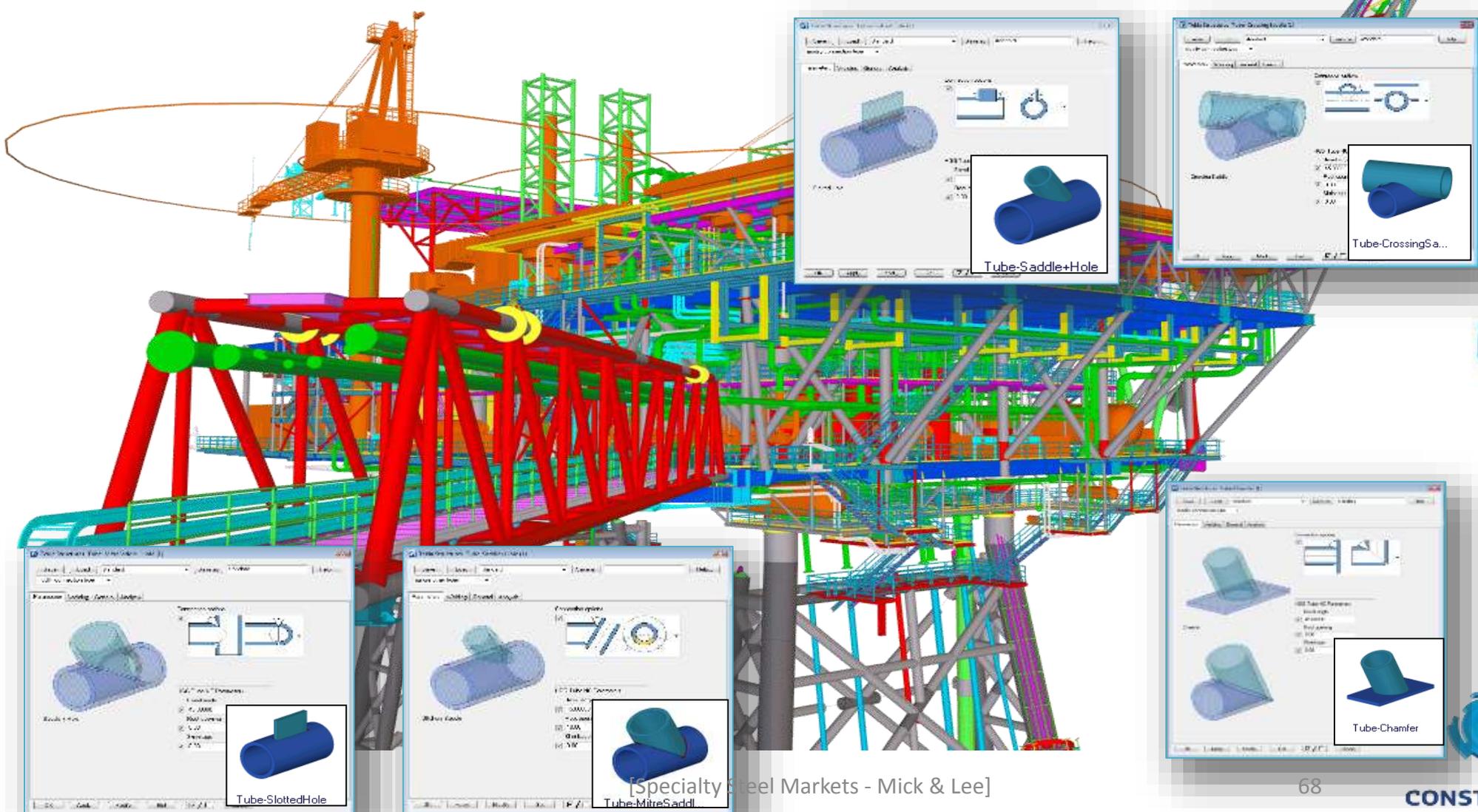


Tube-Chamfer



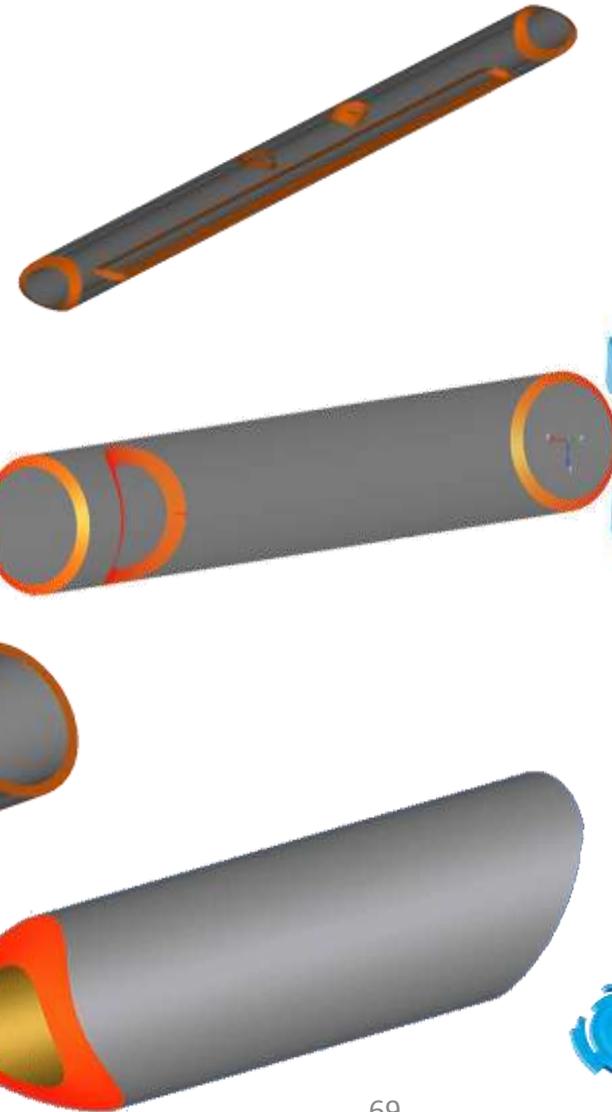
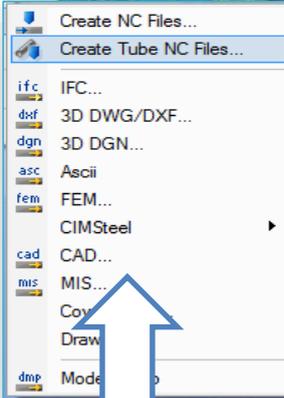
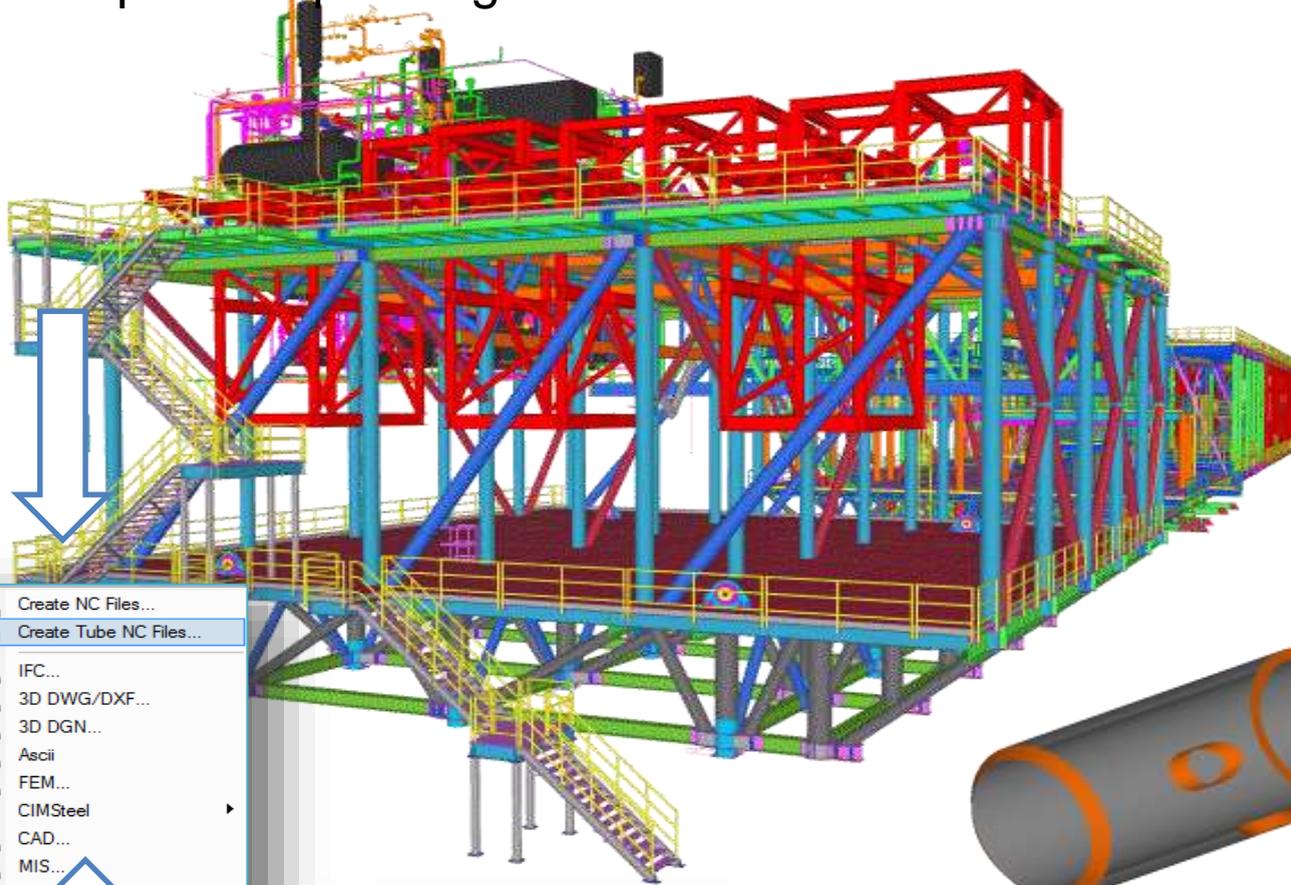


New range of specialised HGG tube to tube components in Tekla



[Specialty Steel Markets - Mick & Lee]

Export the profiling data from Tekla model direct to HGG interface



Links direct to all HGG profiling CNC machines

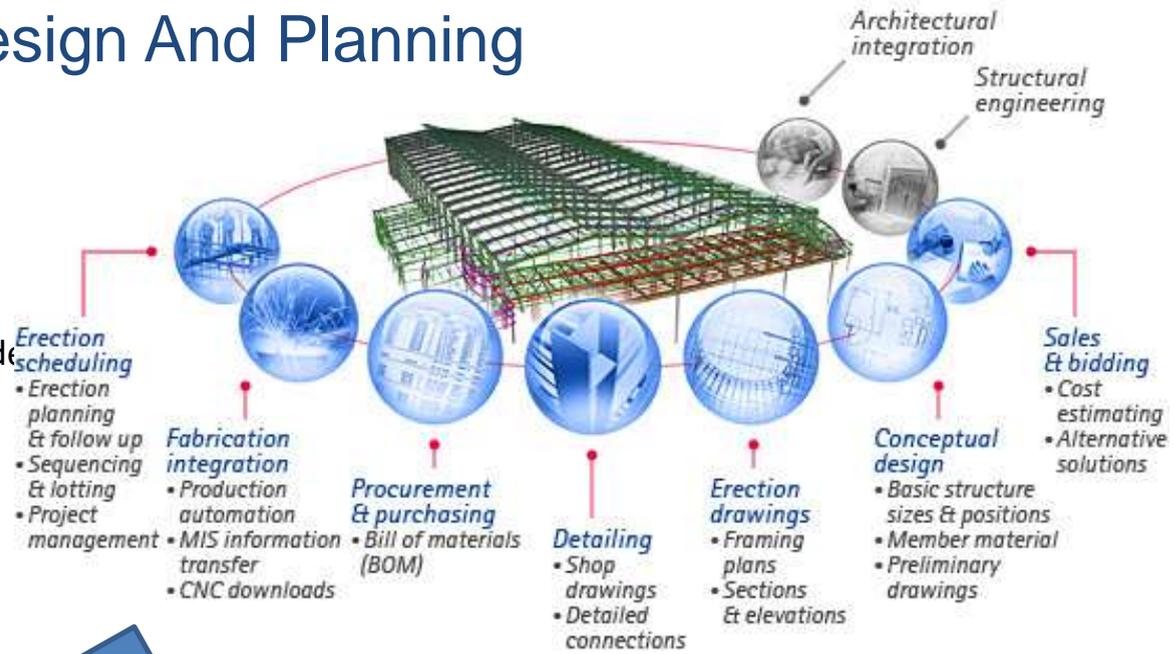


[Specialty Steel Markets - Ivick & Lee]

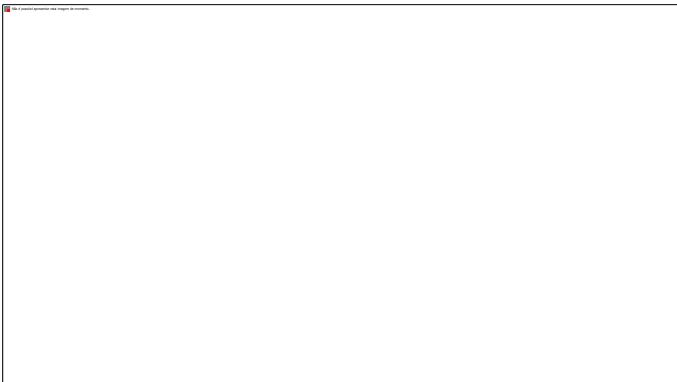


Tekla to Pemamek :- Design And Planning

- Using the Tekla Open API:
- Take the weld data from the Tekla model



From Model to production

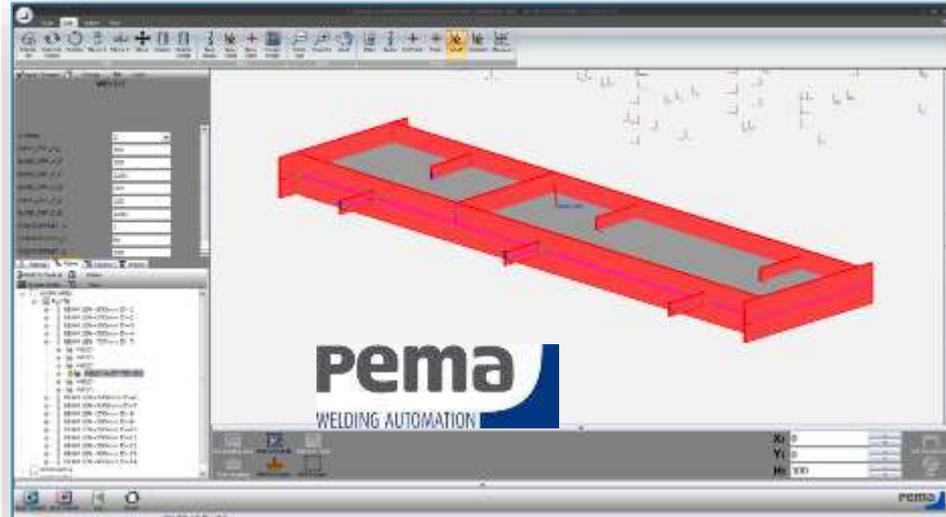
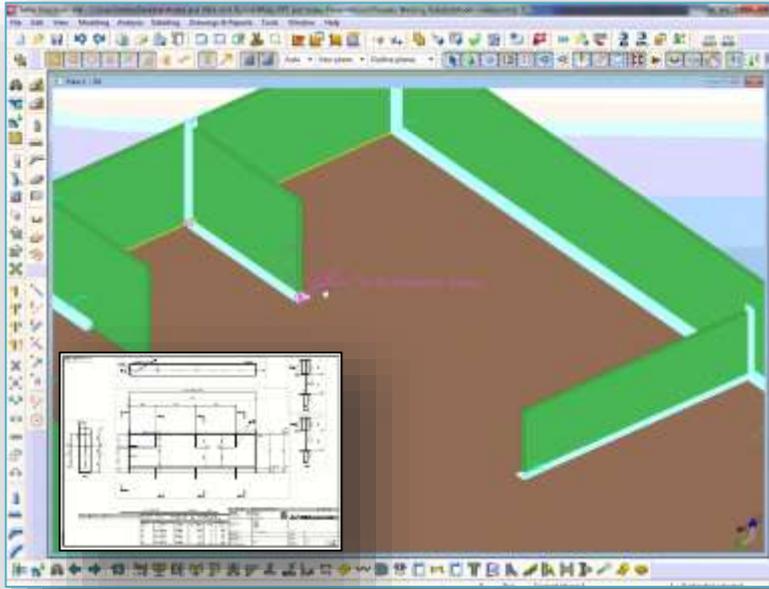


CONSTRUSOFT

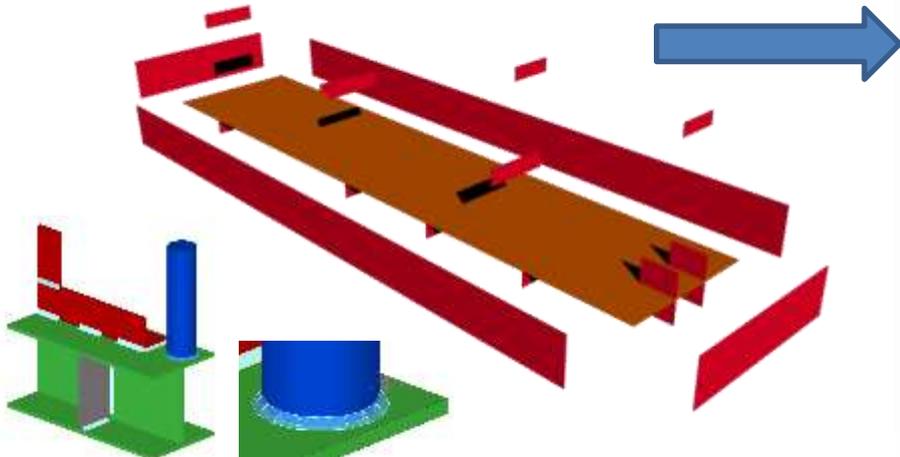
Creating welds in Tekla



Tekla Structures is active, select assembly to download

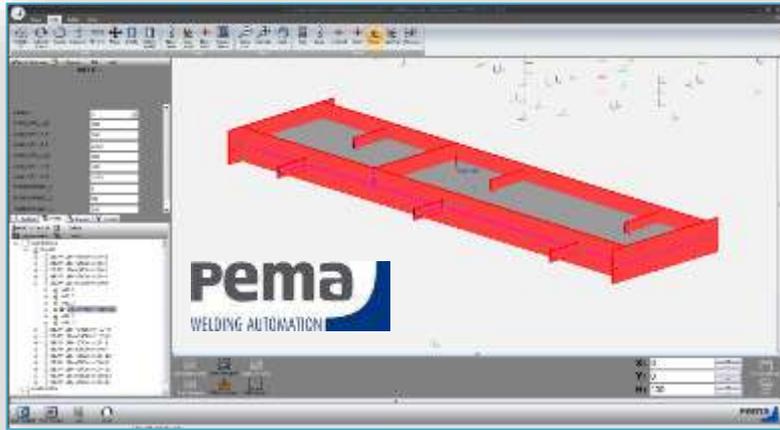


From Tekla Model To Weld Automation

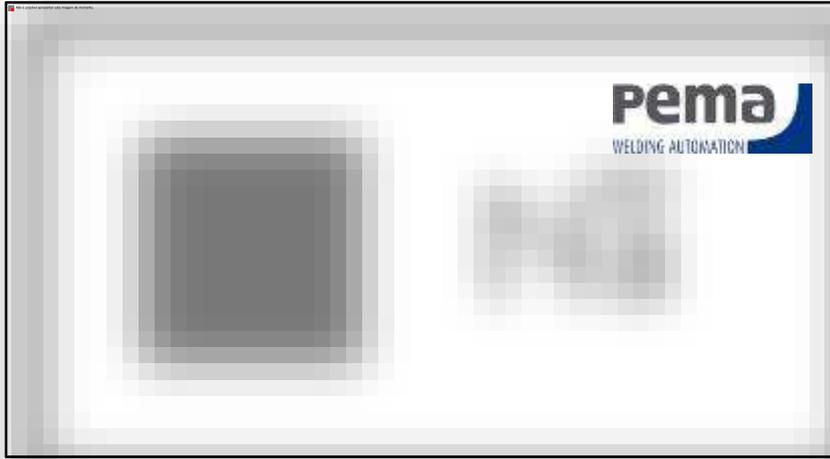


CONSTRUSOFT

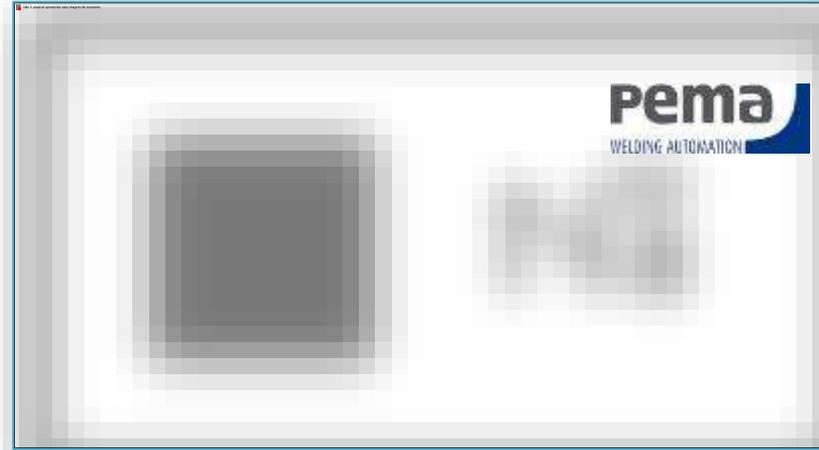
Robot programming: PEMA TEKLA Modeller Weld-Control programming system



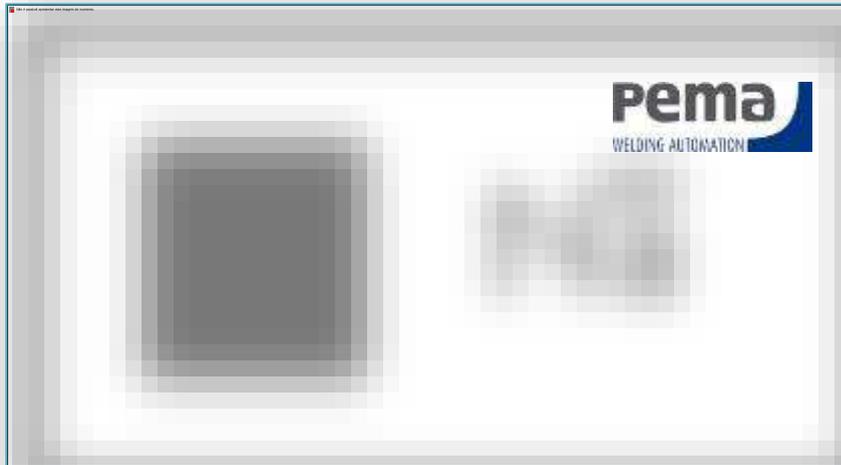
PEMA - Tekla Weld-Control programming system



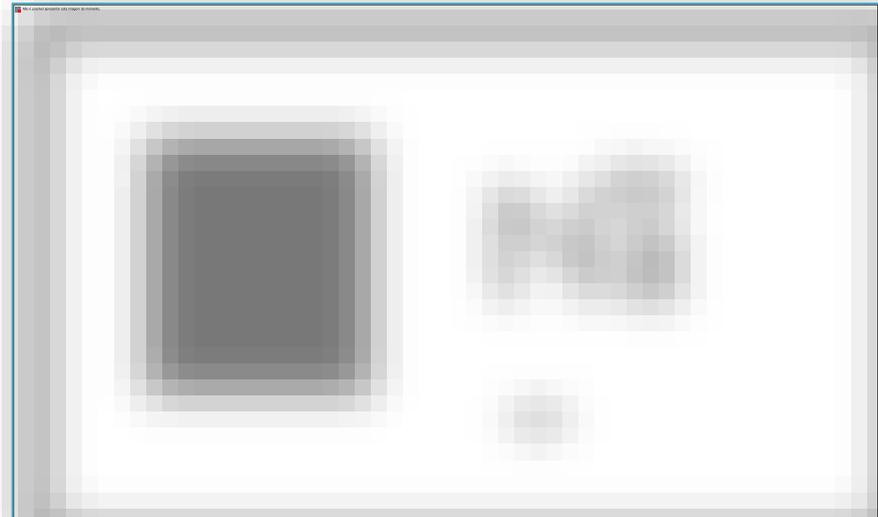
Load assembly from Tekla into PEMA weld-control software



Create 3D view of downloaded assembly



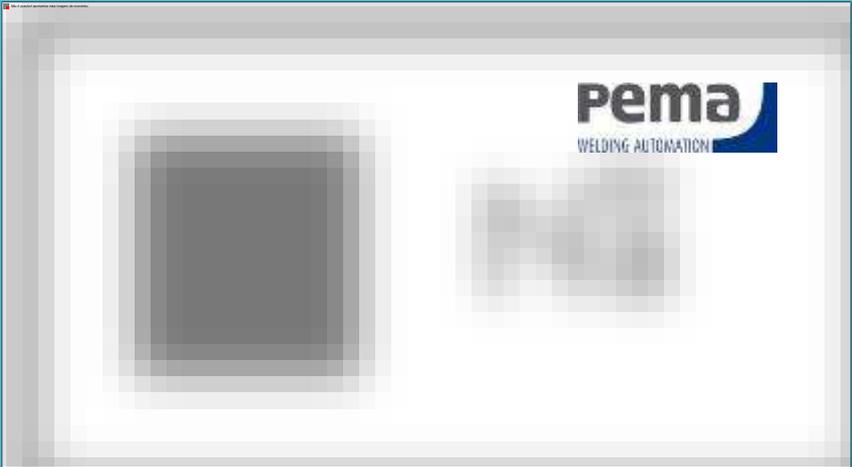
Assign downloaded subassembly to a welding station



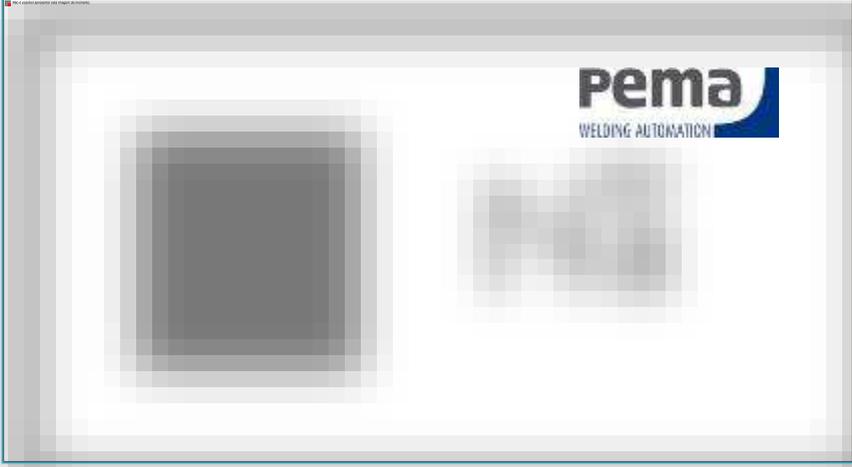
Create / edit weld paths



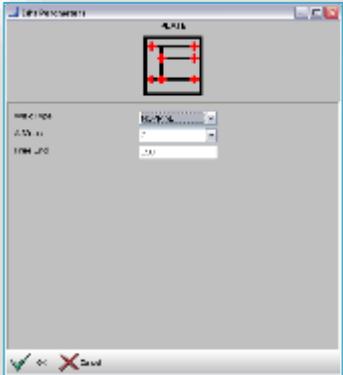
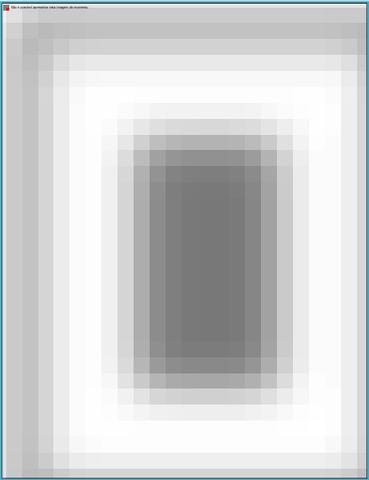
PEMA - Tekla Weld-Control programming system



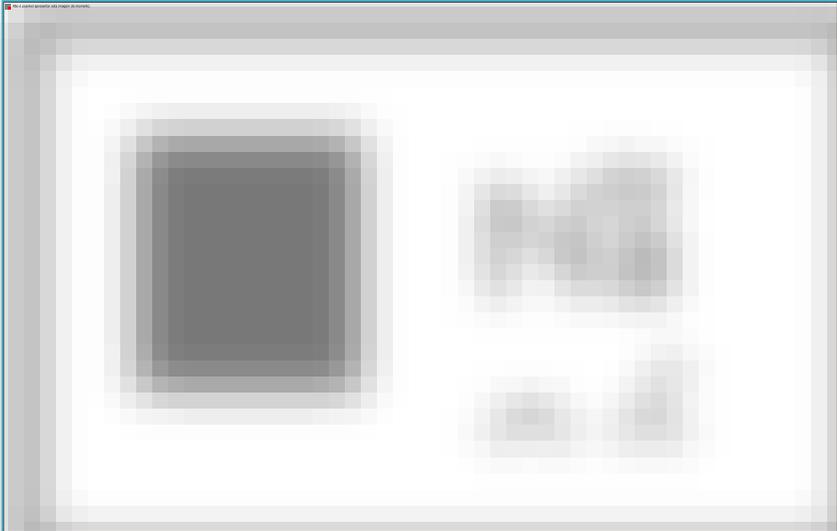
Create weld lines 3D visualization



Download welds to robot => Start welding



Modify welds if needed



H-beams welding example

Two Stargate type positioned stations
2 pcs of Motoman UP20MN welding robots
26m long robot floor track
Lincoln Power-Wave MAG welding power sources
Binzel torches and hoses





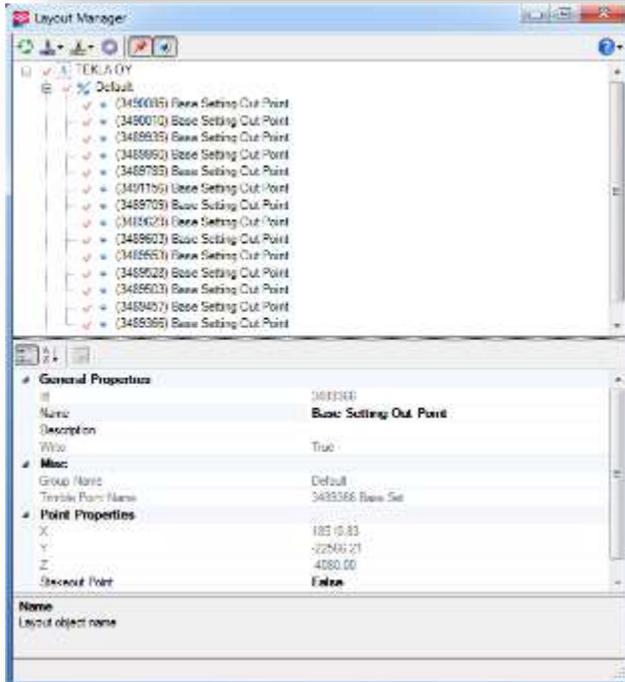
Tools in Tekla to integrate with Trimble



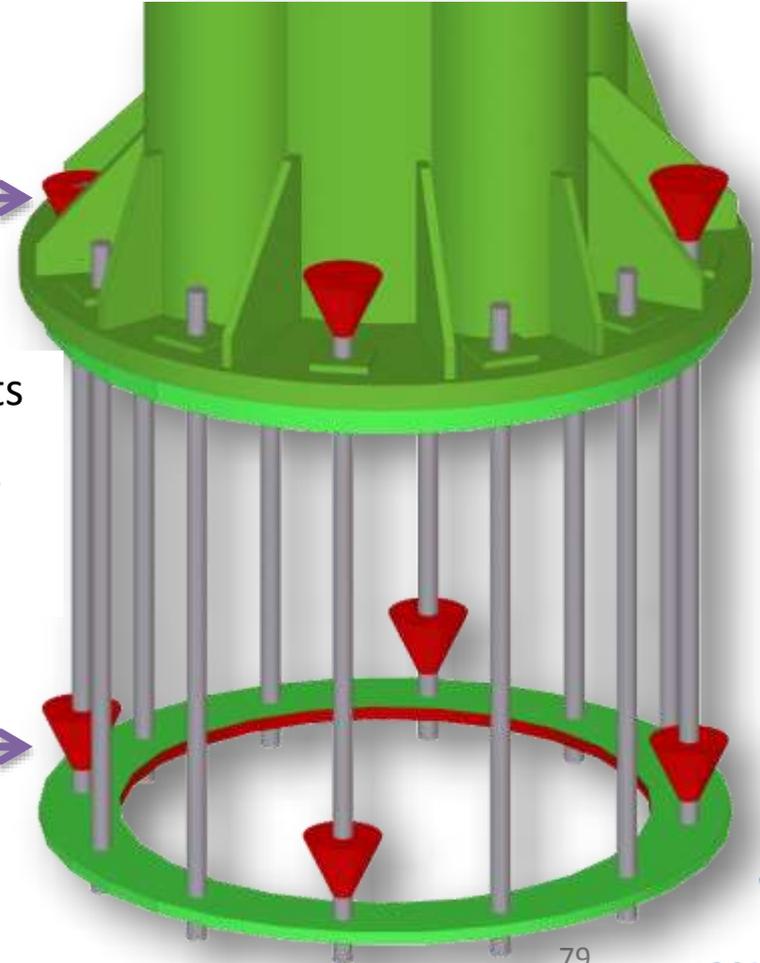
LayoutLine



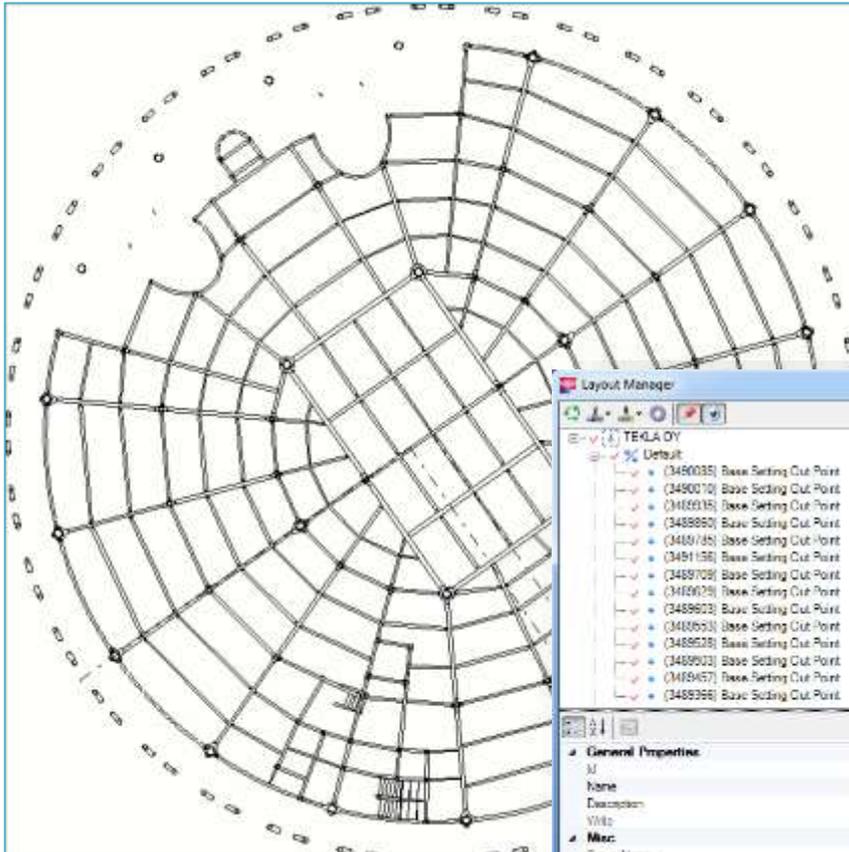
LayoutPoint



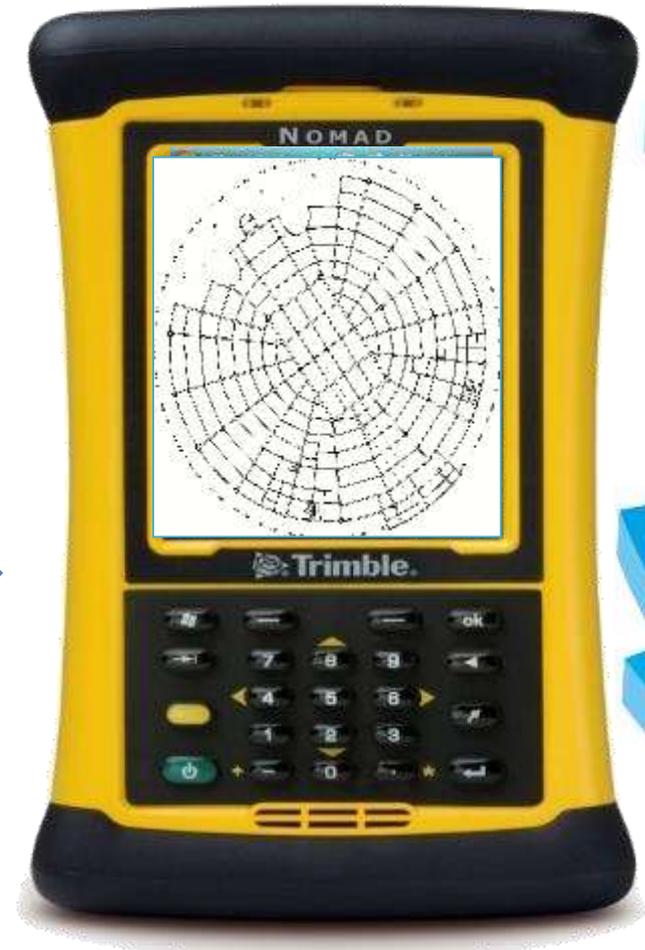
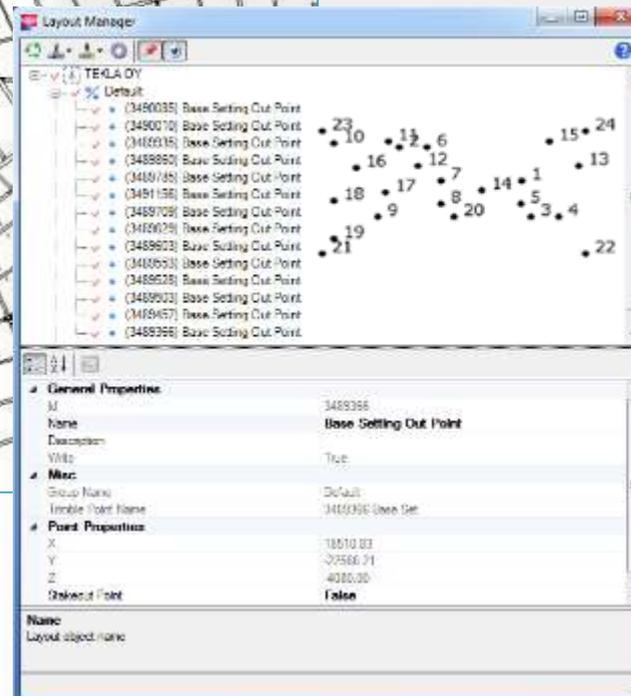
- > Create Layout Points
- > Create Layout Files
- > Create DWG / DXF



Pass files over to Nomad

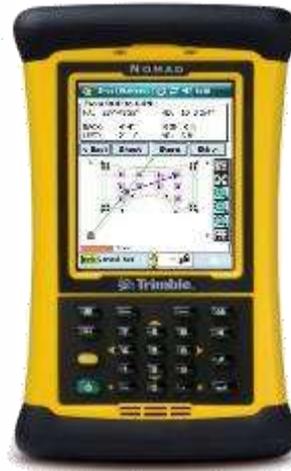
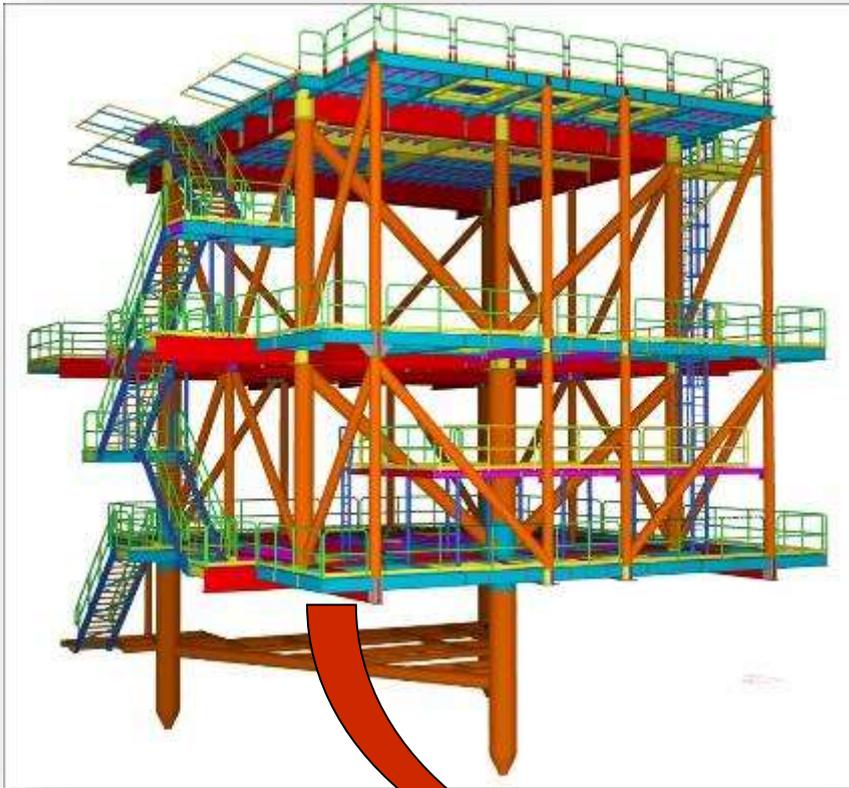


- > DXF DWG
- > Point data
- > Layout Files



Increasing productivity with model-based layout

Accurate model data



Used directly in the field



CONSTRUSOFT

Also used for fabrication set out applications



[Date]

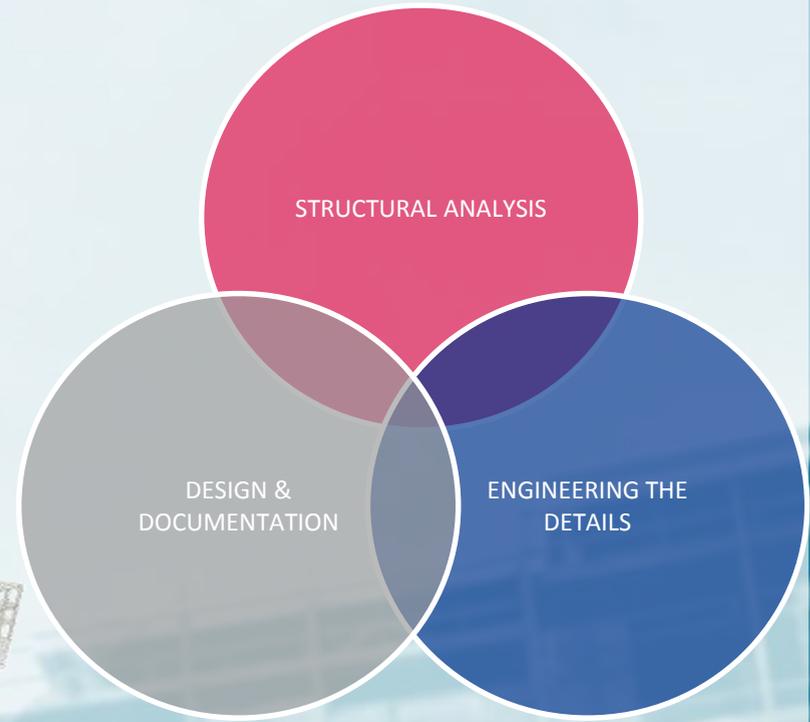
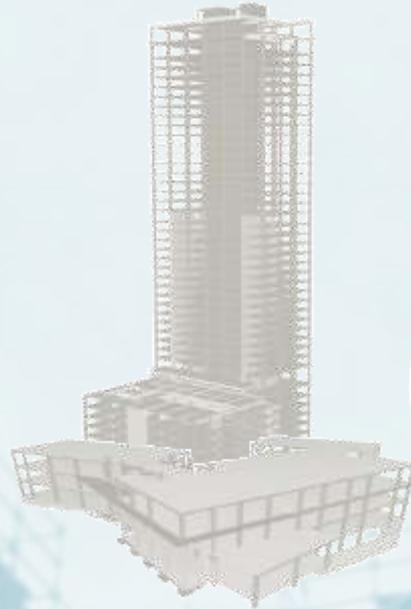


- 
- Tekla - a Global Software Company
 - BIM makes working more efficient & productive
 - Tekla BIM Solution
 - Design and documentation
 - Structural analysis
 - Engineering the details
 - Reference cases
 - **Conclusion**

Tekla BIM Solution

*Improved Project Performance
from Design to Construction*

- ✓ **Increased efficiency and productivity**
- ✓ **Management of risk and quality**
- ✓ **Competitive advantage and new business opportunities**



Obrigado!



Vakis P. Kokorelis

vkokorelis@construsoft.pt

+351 967 084 807



CONSTRUSOFT

- 
- Tekla - a Global Software Company
 - BIM makes working more efficient & productive
 - Tekla BIM Solution
 - Design and documentation
 - Structural analysis
 - Engineering the details
 - **Reference cases**
 - Conclusion

Existing processes and level of productivity

Yas Marina F1 Circuit

“Using Tekla Structures in the Yas Marina project increased our productivity by more than 30%.”

To make work faster, at peak times, more than 12 detailers worked on the same server, using the software in multi-user-mode. We

“We estimate a cost reduction of approximately 20% by using and implementing BIM in this project.”

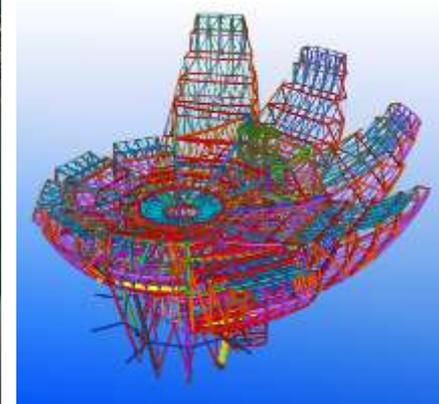
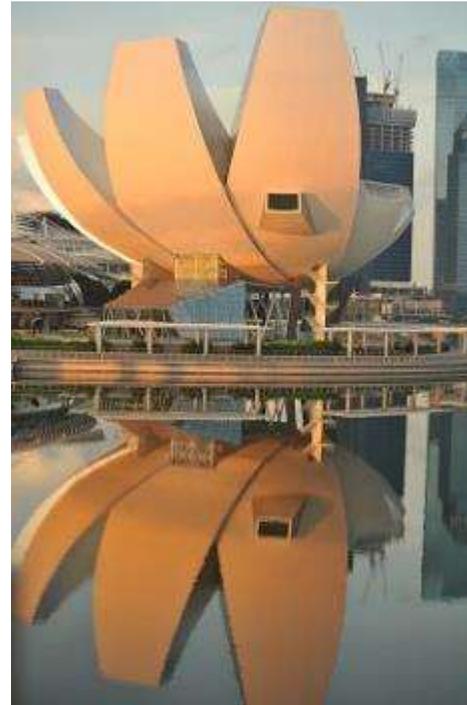
Regional Manager of ICW in the Middle East



ArtScience Museum

“If we didn’t have Tekla, the drawings would have taken five times longer.”

- Arnold C. Hipolito,
the Deputy Engineering Manager at Yognam



na
dle the
nes,
tures,
dels.

model
ture is
ve

Quality of services offered

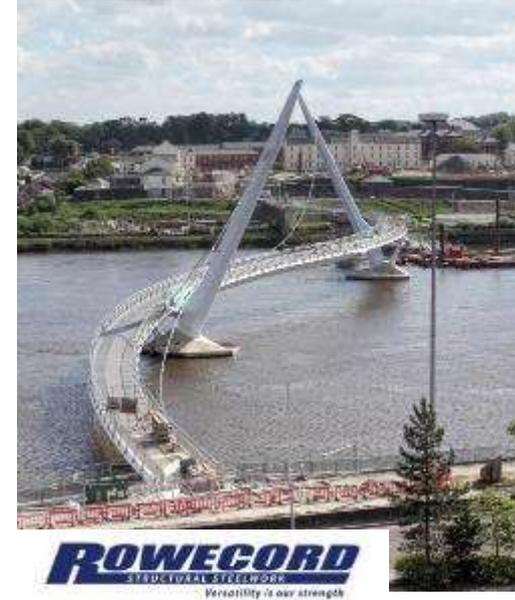
Peace Bridge

During the project the Tekla model worked as the source of general arrangement and fabrication drawings. As Rowecord was able to export information from Tekla to the fabricators onto box girder plates. Although the model was used primarily in the workshop, it was a significant benefit.

“Creating the model in Tekla environment reduced errors which was a significant benefit.”

“Although it is difficult to see that everything fits together is a real advantage.”

- Jeremy Masters, Drawing Office Manager of Rowecord



Manitoba Hydro Spillway



“Many issues were resolved very early in the design stage instead of construction site.”

- James Tapper, Tekla Administrator, KGS Group

Quality of services offered

Finnforest



"We'd already been using Tekla Structures to model all our steel structures for some years and we're also using the same system to an increasing extent for concrete structures. This was the first time we used Tekla Structures for wood."

Altogether, design
utilized to produce
production.

"We were able to significantly cut down on errors by using 3D modeling and certainly improved the quality of building."

was also successfully
reports to enhance

"I believe we were able to significantly improve the quality of building compared to the alternative of designing in a traditional 2D environment. Even though there were truly difficult structures and complex details, I never heard of a single problem on site."

-Ville Jaatinen, the design project's project engineer, WSP Finland

Skanska and Turner

Engineer can see impact of changes on sequencing.
Information in same Tekla model used for site co-ordination and RFID tagging
(Barcoding) used to track pieces. In addition, easy management of information
via

Est
\$1r

"Estimated saving: Gain of 10 days on project schedule @ \$100000/day benefit = \$1million saved"



SKANSKA

Turner



CONSTRUSOFT

Quality of services offered

Central Park Tower

Quantifying the impact of problems that are resolved is always a difficult task to do. How do you determine the cost of something that never happened?

In the case of Central Park Tower, [Weitz used a control project to benchmark coordination performance](#). When compared to a similar CIP core structure using tradition design and delivery the costs associated with Rfi and their ultimate impact to what the owner would be assessed in addition to the agreed GMP is made apparent.

Project Highlights

- Cast-in-place concrete fabricator used 21.6% less reinforcing material than originally budgeted, saving the owner \$112,000

- **No RFIs**

- **Construction schedule reduced by two weeks**

- **Zero change orders**

- Zero change orders

BENCHMARK COMPARISON OF CENTRAL PARK TOWER COORDINATION PROCESS



WEITZ SIMILAR COMPARISON PROJECT

April 2008
9 stories
CIP core
On schedule
44 RFIs for CIP core walls
14.7% of total RFI's on project
Range of costs for RFIs (includes direct and indirect project costs):
\$97,549 – \$161,549



CENTRAL PARK TOWER

April 2009
11 stories
CIP core
Two weeks ahead of schedule
0 RFIs for CIP core walls



CONSTRUSOFT

Information management

Aldar Headquarters

“In initial engineering, a 5% time saving was achieved by utilizing the architect/consultant’s model with similar levels of accuracy.”

architect/
in
which
formation
of the

- Andy Gleaves, Engineering Director at William Hare



Castle House Tower



“We
drafti
we w
the a
Addit
effect
Tekla.

“We believe that this project could not have been completed with traditional 2D drafting methods due to the geometry of the turbines, and therefore without Tekla we would not have taken the job.”

- Daniel Leech, Commercial director at TDS

Information Management

Panorama Tower

The structural engineering of the Panorama Tower business center was largely based on 3D modeling. Pöyry Civil Oy used the Tekla Structures software for structural engineering, and Ruukki, the supplier of the steel frame

part
util
per
oth

“Staad software, integrated into Tekla Structures, was used to perform design analyses related to the building’s stability and horizontal displacement accelerations to support other design calculations.”

“Th
env
ma

throughout the project. The greatest benefit was gained in data transfer between project parties, as Ruukki, for instance, designed the structural steel components by modeling. In addition, model-based design helped us to stay on the challenging schedule.”

- Kari Lassila, Project Manager at Pöyry Civil Oy



Bella Hotel



“Using the model on site has been a big advantage for us in this project. Communication with the contractor NCC, leaving little room for

“Bella Hotel was a very big model with a lot of information, and it is highly important to us to be able to work with the models in a quick and reliable way.”

-Bo Johansen
contractor NCC

to work with the models in a quick and reliable way.”

tant to us to be able

- Kaare K. B. Dahl
Project Manager, Ramboll Finland 93



CONSTRUSOFT

Service offering

Mall of Scandinavia

From Ruukki’s point of view, Building Information Modeling is necessary for projects like the Mall of Scandinavia. It is a large project with numerous project parties, and Ruukki has had to coordinate their actions with the other contractors. Overcoming logistic and information sharing challenges is a part of project management’s daily work, and to Ruukki’s experience it is vital for any successful project.

Tekla software for constant change when a change

“Tekla is an excellent tool that is significant for successful projects leading to successful business.”

“I have led a number of design software has been used in my projects. Tekla is an excellent tool that is significant for successful projects leading to successful business.”

and for managing the component belongs to and

has been available, no other

- Minna Kuusela-Opas,
Project Director, Ruukki



RUUKKI

Crusell Bridge



WSP SKANSKA

Extensive use was made of the building information model for the fabrication of steel girders and concrete reinforcement, for monitoring and management of the supply chain of fabricated components, for formwork scanning, and for construction practices during the project System™.

“Modeling supported lean construction practices during the project, such as production management on-site.”



CONSTRUSOFT

Service offering

Manskun rasti

The structural components of the model were grouped using Tekla model organizer, and the grouping has been maintained throughout the project. With the help of the grouping, 4D

simulation schedules. ***“The weekly 4D-schedules were of great assistance for the foremen in planning the work and monitoring the schedules.”***

construction site office. weekly 4D-schedules.

-Pentti Holm, General Foreman, Skanska



Ramboll

“The benefits provided by the software mean that we can provide a better product and much more data.”

“The benefits provided by the software mean that we can provide a better product and much more data.”

much more contractors, customers as a result of a

- Bent Feddersen, Chief of Expertise Development at Ramboll Denmark

