



JacksonRoxborough Pty Ltd
Steel Detailing Consultants

BORNHORST + WARD

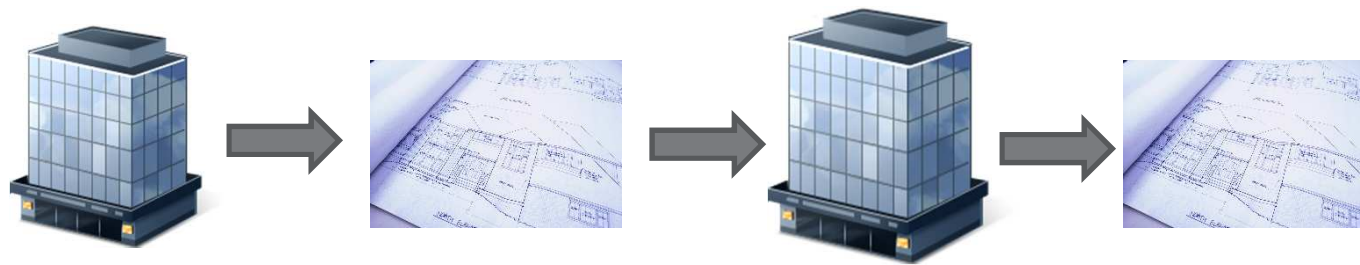
CONSULTING ENGINEERS
CIVIL AND STRUCTURAL

THE EVOLUTION OF THE FEDERATED MODEL
FROM DESIGN TO CONSTRUCTION

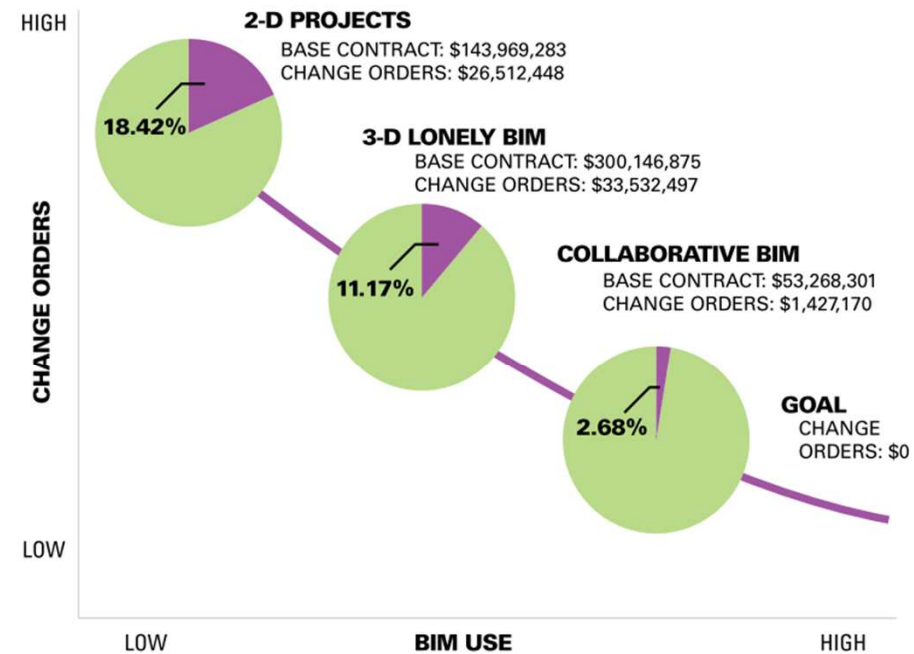


 **BrisBIM**
Technology Innovation in the Built Environment

THE CURRENT WORKFLOW



MCGRAW HILL REPORT



A study by J.C. Cannistraro of 408 projects Valued at \$559 million shows how, in the big picture, BIM saves money as the team gets more collaborative.

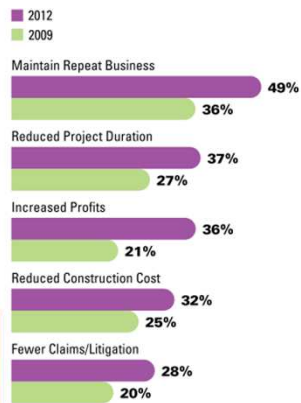
Percentage of BIM Users Who Consider Benefits of High/Very High Value (2009 to 2012)

Source: McGraw-Hill Construction, 2012

	2009 Rating by All BIM Users	2012 Rating by All BIM Users	2012 Rating by Very High E-Level BIM Users
Increased Profits	21%	36%	52%
Fewer Claims and Litigation	20%	28%	50%
Reducing Overall Project Duration	27%	37%	60%
Maintaining Repeat Business	36%	49%	58%

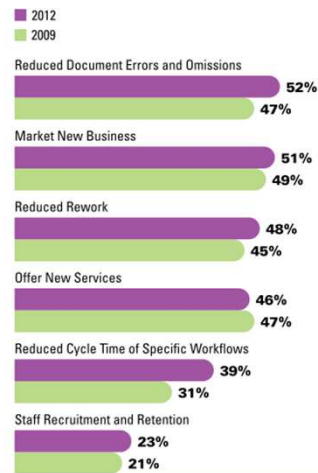
Long-Term BIM Benefits (2009 and 2012)

Source: McGraw-Hill Construction, 2012



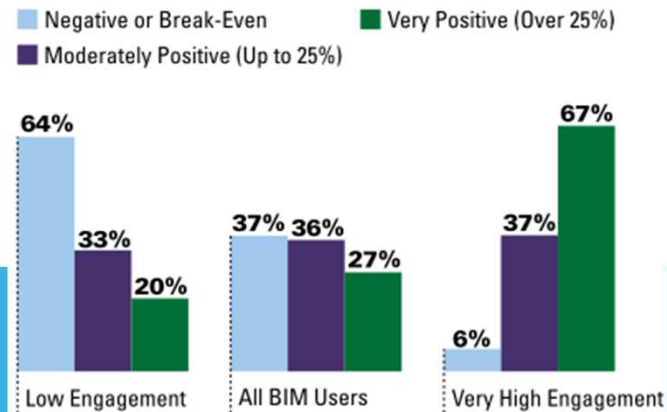
Short-Term BIM Benefits (2009 and 2012)

Source: McGraw-Hill Construction, 2012



BIM ROI for Users by Level of Engagement

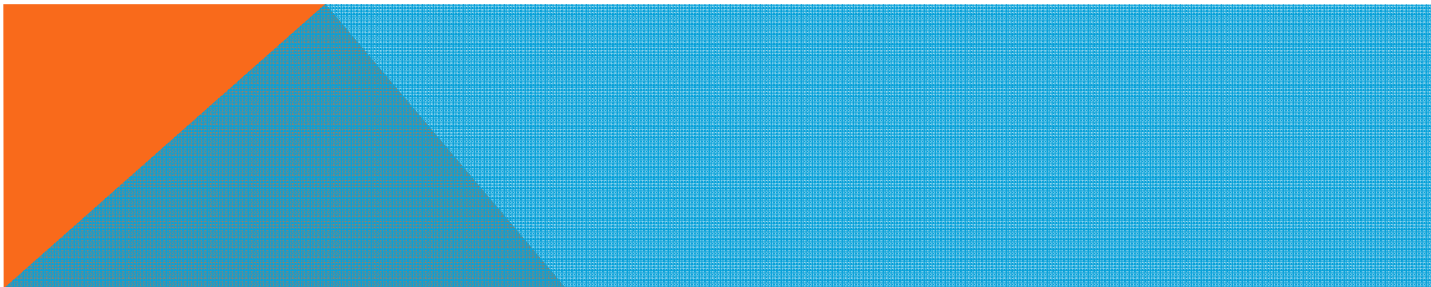
Source: McGraw-Hill Construction, 2012



TO ACHIEVE GOOD RESULTS – CONSIDER:

Use the right tools for the job

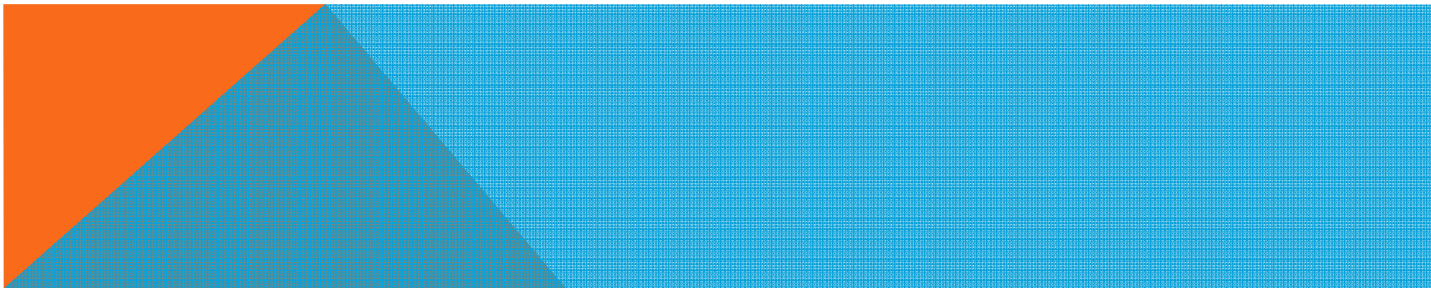
Use Industry Professionals that
are high end users



OVERVIEW OF REVIT/TEKLA INTEGRATION

Integration between Revit & Tekla using data rich IFC files

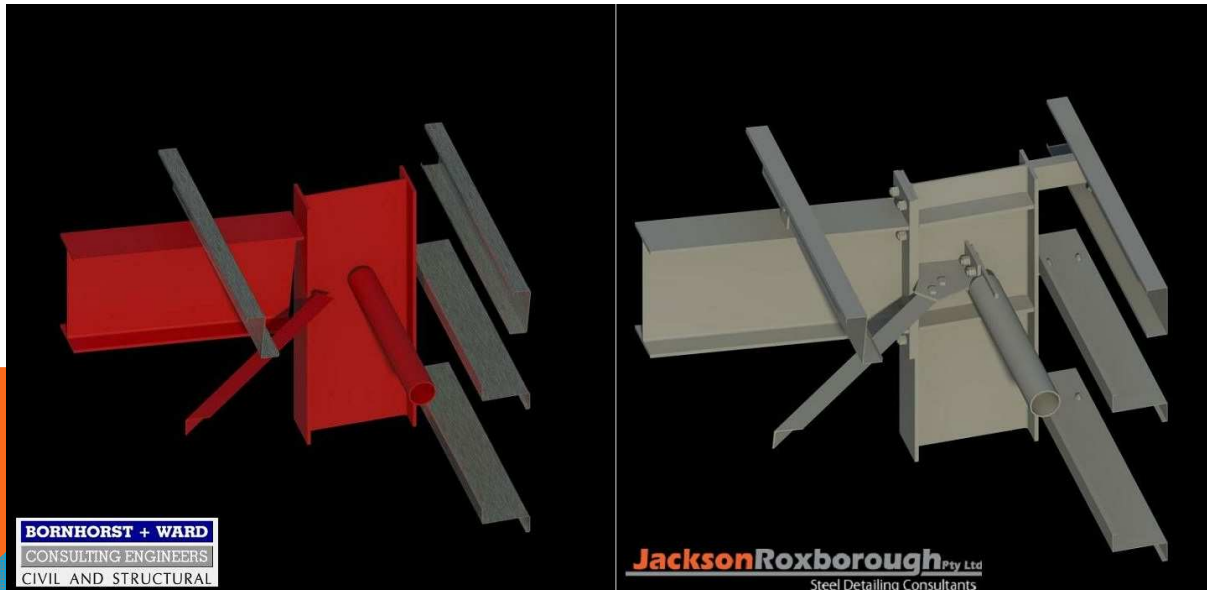
- Design communication method – back and fourth between software
- Ability to interrogate individual elements
- Ability to append data to elements
- Revision control
- Key benefit – Visual



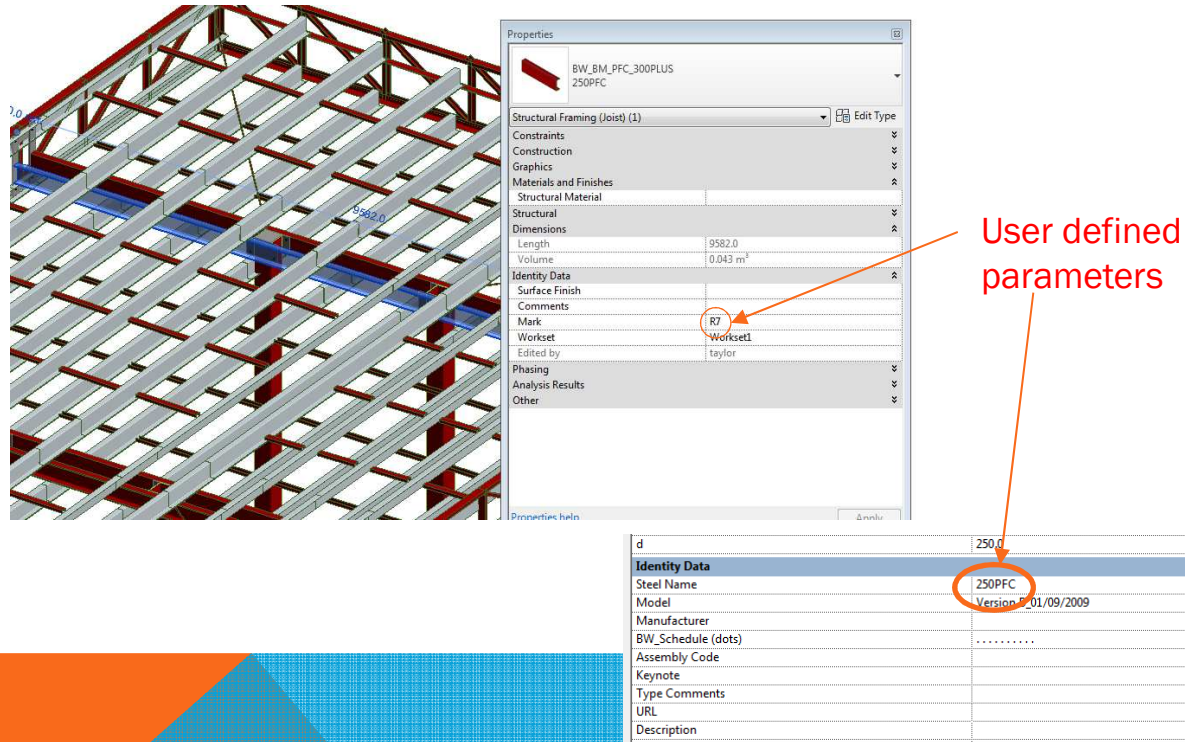
CREATE REVIT MODEL

Create Model within Revit.

Model to LOD 300. Member geometry, size, location but no connections.



CREATING THE REVIT MODEL - CHECKING



The image shows a 3D model of a steel joist structure on the left. On the right, the Properties window is open, showing the 'Workset' parameter circled in red. An arrow points from the text 'User defined parameters' to this circled parameter. Below the Properties window, the Identity Data window is open, showing the 'Steel Name' parameter circled in red, with the value '250PFC'.

Properties

BW_BM_PFC_300PLUS
250PFC

Structural Framing (Joist) (1) Edit Type

Constraints

Construction

Graphics

Materials and Finishes

Structural Material

Structural

Dimensions

Length 9582.0

Volume 0.043 m³

Identity Data

Surface Finish

Comments

Mark R7

Workset Workset1

Edited by taylor

Phasing

Analysis Results

Other

User defined parameters

Identity Data

Steel Name 250PFC

Model Version 01/09/2009

Manufacturer

BW_Schedule (dots)

Assembly Code

Keynote

Type Comments

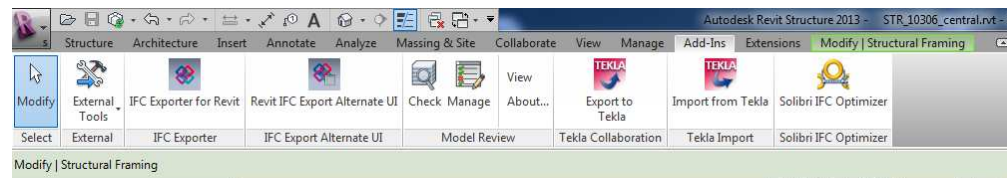
URL

Description

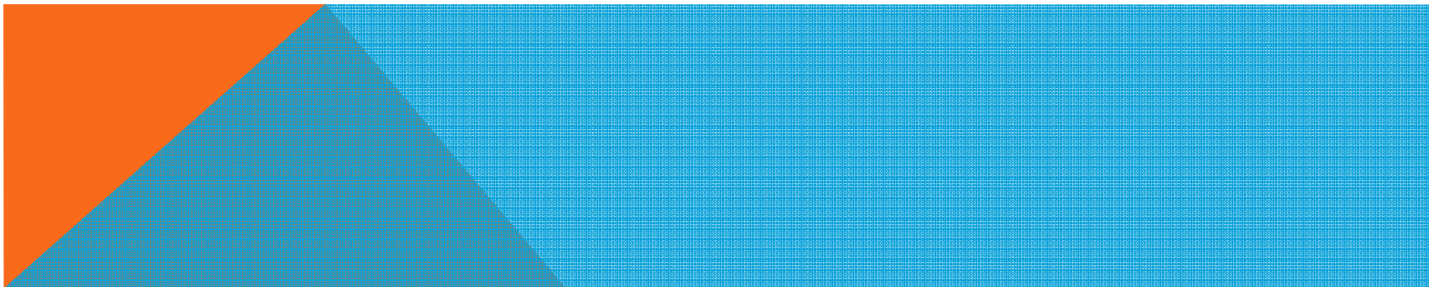
Assign element properties,
member mark, member name

EXPORTING THE REVIT MODEL TO TEKLA

Export using “Tekla Revit Export tool”

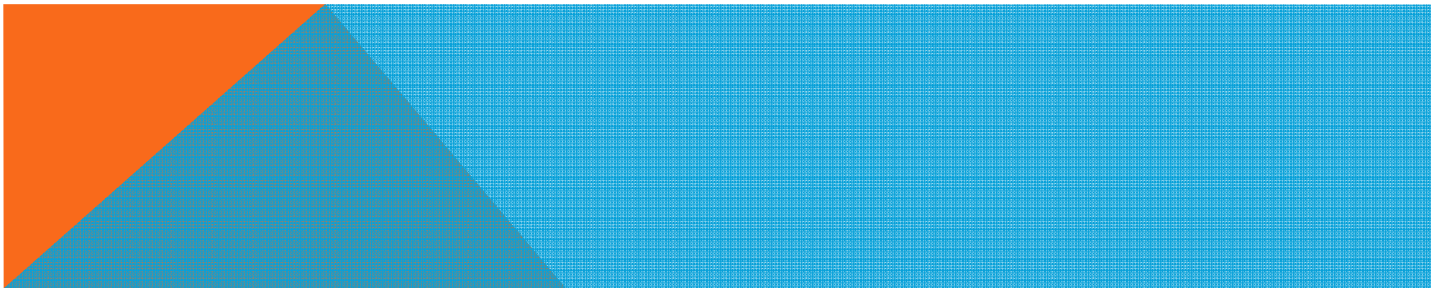


Export DWFX File + PDF drawings if required.

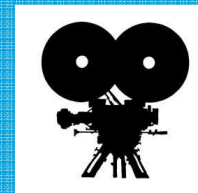
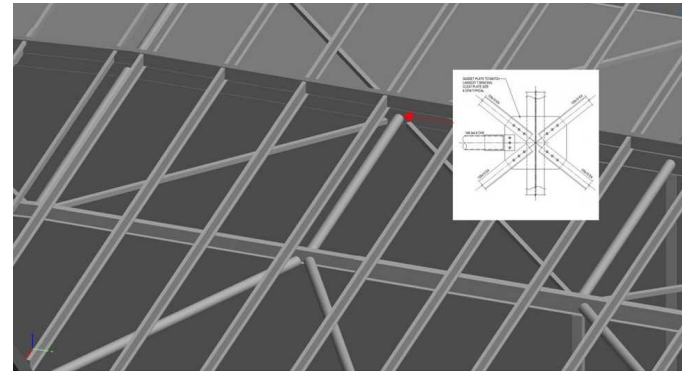
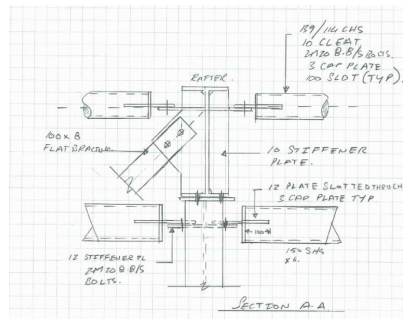


DIGITAL COMMUNICATION

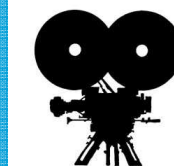
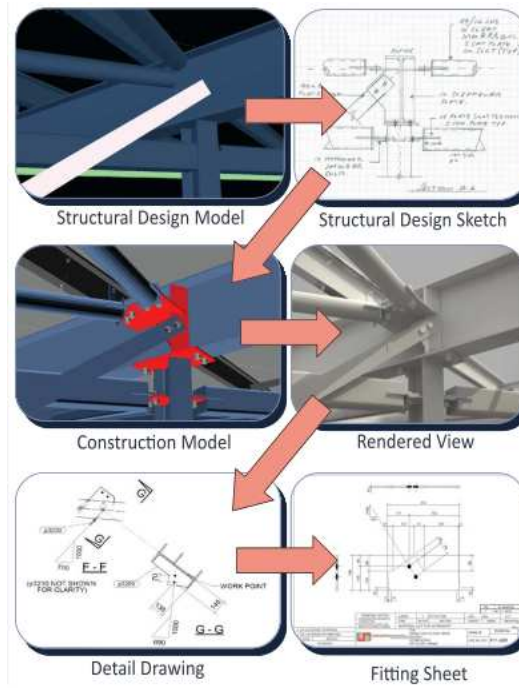
- What is IFC
- Is there a need for a paper deliverable from design to detailer?
- Can an IFC file be a contract document?
- Should an IFC be seen as a controlled document?
- Can data be added to IFC files as a means of additional communication?



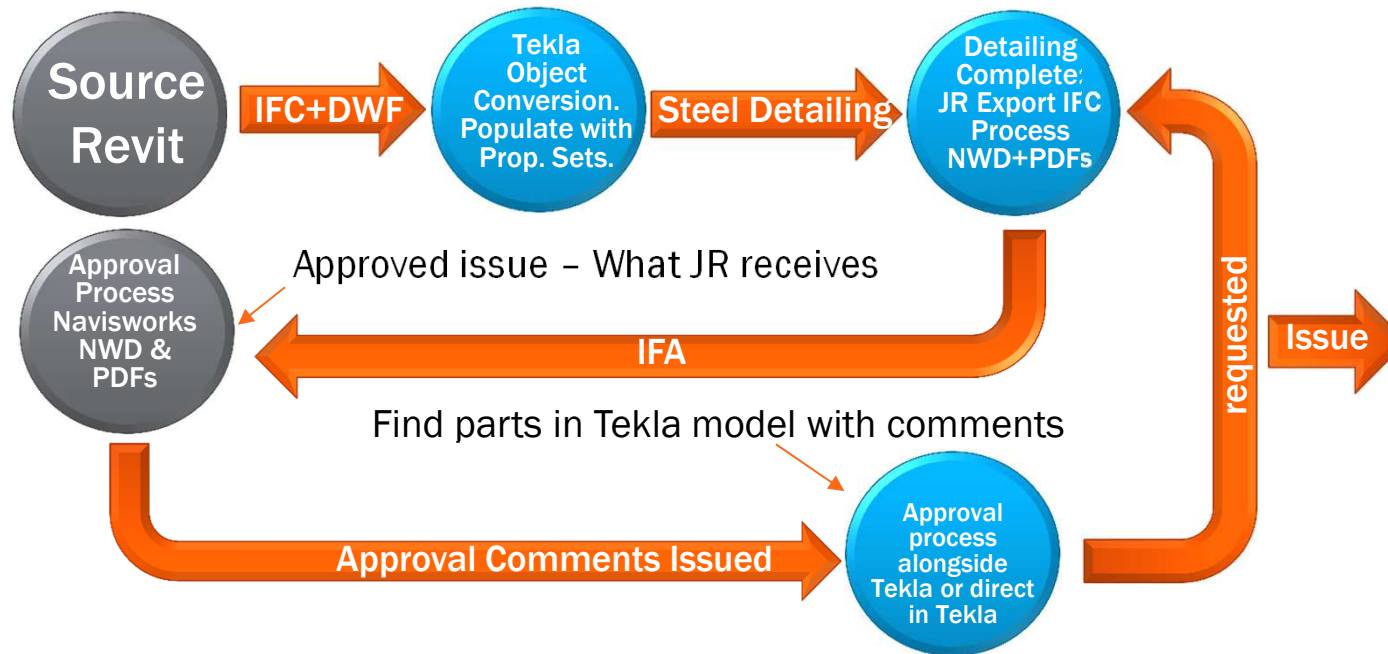
CONNECTION DESIGN DELIVERABLE



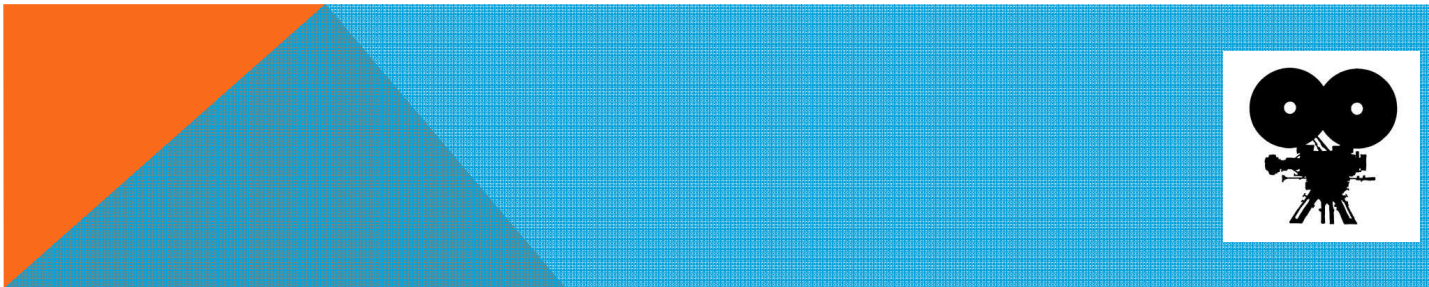
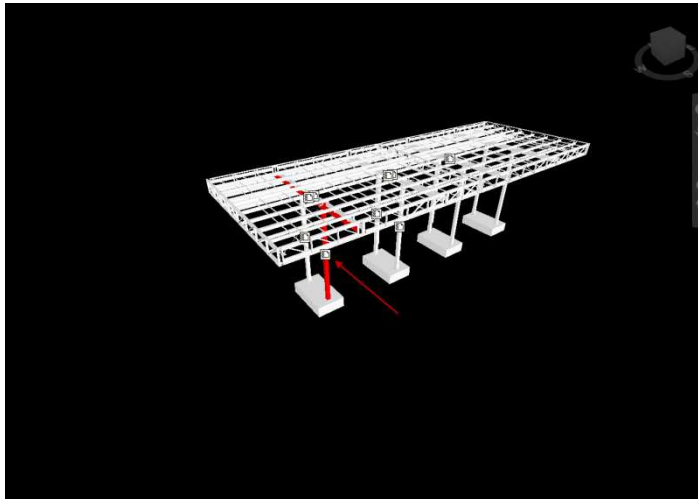
WORKFLOW



DESIGN REVIEW WORKFLOW



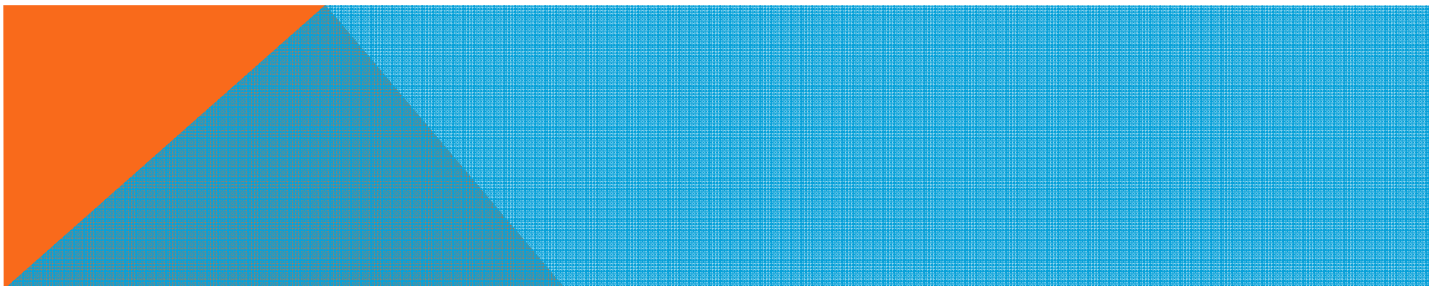
OVERLAY OF ICM AND DESIGN MODEL IN NAVISWORKS



PROVIDE APPROVAL COMMENTS WITHIN NAVISWORKS

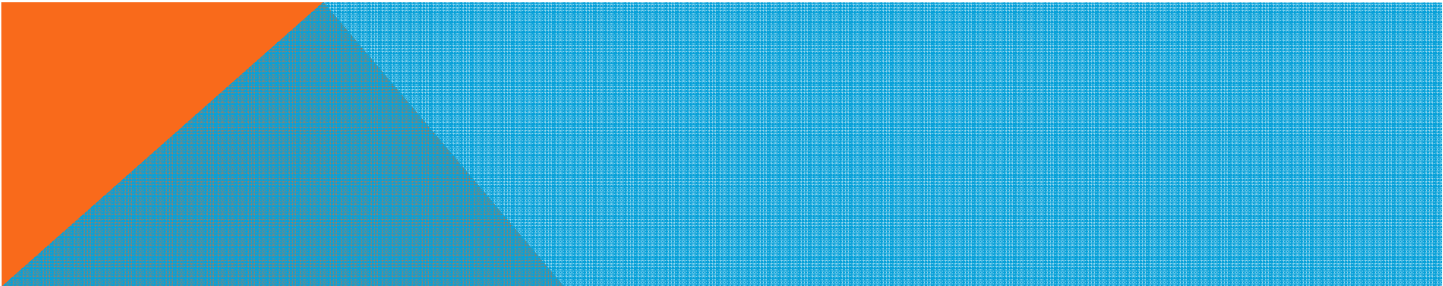
- Create User Tabs
- Create properties
- Create comments properties

Properties		
Item	IFCMATERIAL	IFCPROPERTYSET
Quantities	IFCBEAMTYPE	TimeLiner
Approval Comments	IFC	
Property	Value	
Reviewed	Yes	
Amend where noted and resubmit	No	
Review Comment	Review PDF markup	

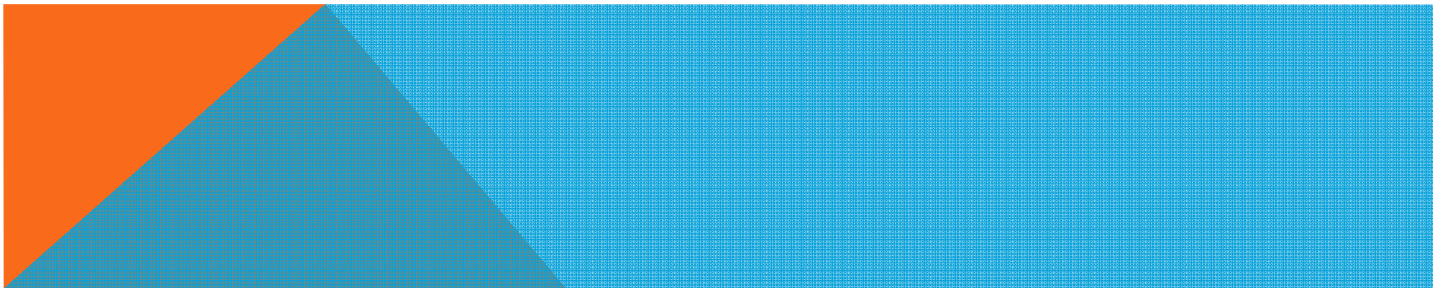
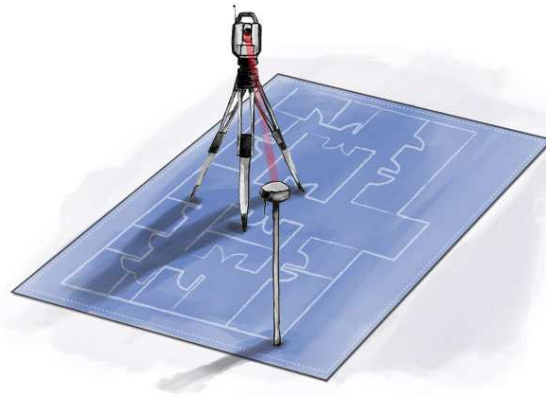


CHECK MEMBER SIZES IN SPREADSHEET

A											
GUID											
JR Assem											
JR Profile											
JR Gra											
BHW Ma											
BHW Profile											
BHW Materi											
Job_Numb											
Project_Desc											
Pr Title											
Drawing_Numb											
PDF File											
ID50A1AF0F-0000-9AEC-3133-353237373335	2007	PFC250*90	300PLUS	R1	250PFC	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 2007	\\Detail Drawings\XX - 2007-REV_0.PDF
ID50A1AF0F-0000-9AF2-3133-353237373335	2004	PFC250*90	300PLUS	R2	250PFC	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 2004	\\Detail Drawings\XX - 2004-REV_0.PDF
ID50A1AF0F-0000-9E15-3133-353237373335	2005	PFC250*90	300PLUS	R3	250PFC	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 2005	\\Detail Drawings\XX - 2005-REV_0.PDF
ID50A1AF0F-0000-9E1B-3133-353237373335	2006	PFC250*90	300PLUS	R4	250PFC	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 2006	\\Detail Drawings\XX - 2006-REV_0.PDF
ID50A1AF0F-0000-AFA4-3133-353237373335	1005	PFC250*90	300PLUS	R5	250PFC	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 1005	\\Detail Drawings\XX - 1005-REV_0.PDF
ID50A1AF0F-0000-AFA0-3133-353237373335	1007	PFC250*90	300PLUS	R6	250PFC	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 1007	\\Detail Drawings\XX - 1007-REV_0.PDF
ID50A1AF0F-0000-AFF1-3133-353237373335	1006	PFC250*90	300PLUS	R7	250PFC	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 1006	\\Detail Drawings\XX - 1006-REV_0.PDF
ID50A1AF0F-0000-AFED-3133-353237373335	1004	PFC250*90	300PLUS	R8	250PFC	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 1004	\\Detail Drawings\XX - 1004-REV_0.PDF
ID50A1AF0F-0000-9ADF-3133-353237373335	2002	SHS250*250*6.0	350	SC1	250x250x6.0 SHS	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 2002	\\Detail Drawings\XX - 2002-REV_0.PDF
ID50A1AF0F-0000-9AE7-3133-353237373335	2001	SHS250*250*6.0	350	SC2	250x250x6.0 SHS	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 2001	\\Detail Drawings\XX - 2001-REV_0.PDF
ID50A1AF0F-0000-9E0D-3133-353237373335	2003	SHS250*250*6.0	350	SC3	250x250x6.0 SHS	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 2003	\\Detail Drawings\XX - 2003-REV_0.PDF
ID50A1AF0F-0000-9E08-3133-353237373335	2001	SHS250*250*6.0	350	SC4	250x250x6.0 SHS	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 2001	\\Detail Drawings\XX - 2001-REV_0.PDF
ID50A1AF0F-0000-AFFD-3133-353237373335	1001	SHS250*250*6.0	350	SC5	250x250x6.0 SHS	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 1001	\\Detail Drawings\XX - 1001-REV_0.PDF
ID50A1AF0F-0000-B001-3133-353237373335	1003	SHS250*250*6.0	350	SC6	250x250x6.0 SHS	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 1003	\\Detail Drawings\XX - 1003-REV_0.PDF
ID50A1AF0F-0000-AFF9-3133-353237373335	1002	SHS250*250*6.0	350	SC7	250x250x6.0 SHS	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 1002	\\Detail Drawings\XX - 1002-REV_0.PDF
ID50A1AF0F-0000-AFF5-3133-353237373335	1003	SHS250*250*6.0	350	SC8	250x250x6.0 SHS	Steel - 300+	AA1003	WITH BORNHORST AND WARD	INTEGRATION TESTING	XX - 1003	\\Detail Drawings\XX - 1003-REV_0.PDF



DOWNSTREAM BENEFITS - SITE



DOWNSTREAM BENEFITS – 4D

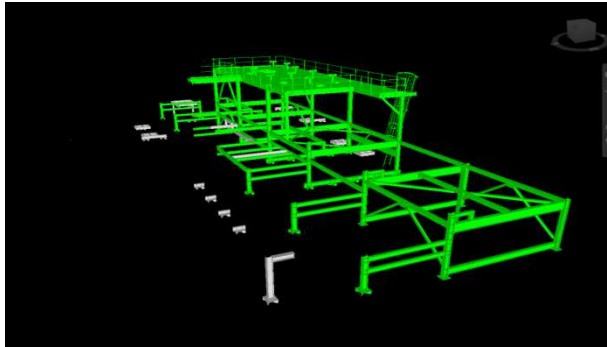


"Actually, that's 4D TV. The fourth D is for 'divorce.'"

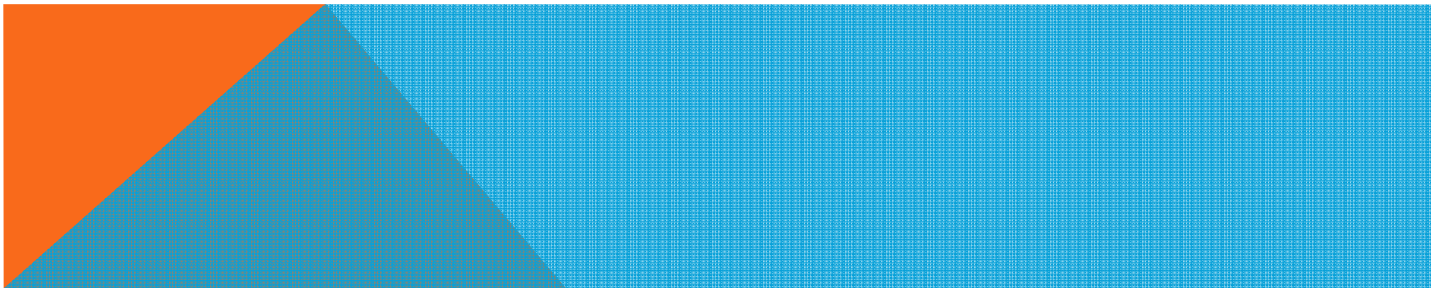
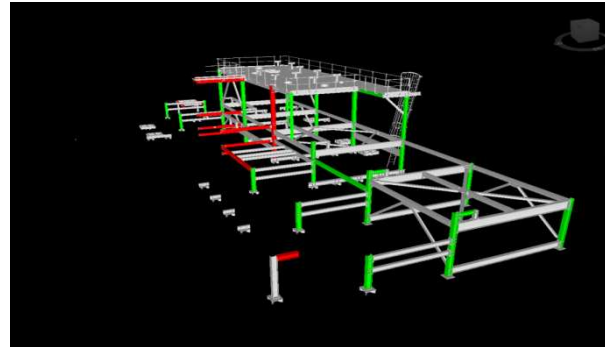


DOWNSTREAM BENEFITS – STEELWORK STATUS

Dwgs issued

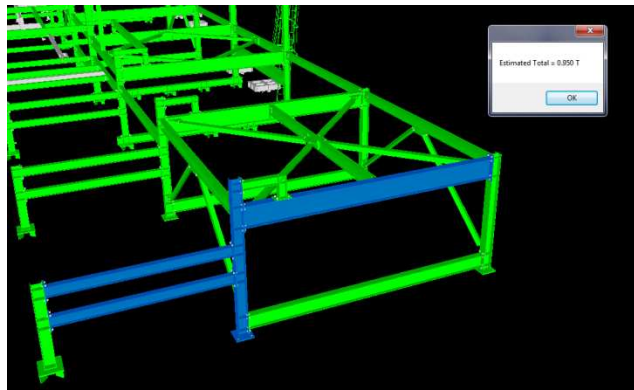


RFIs

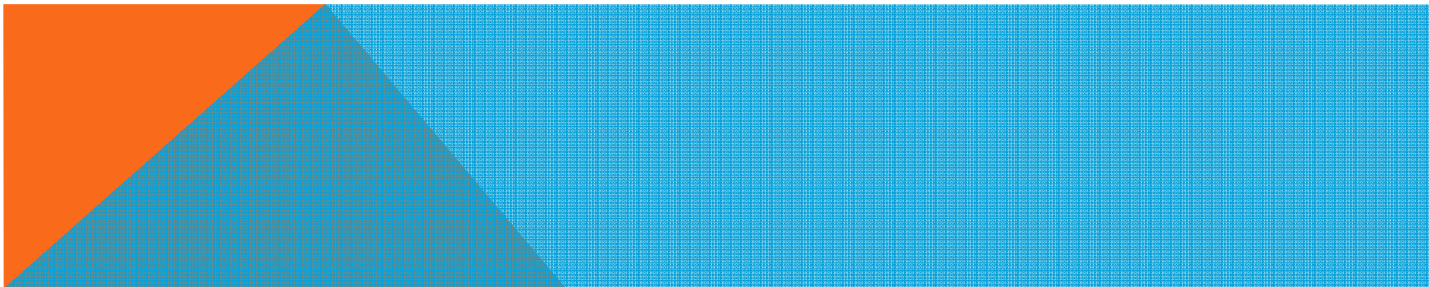
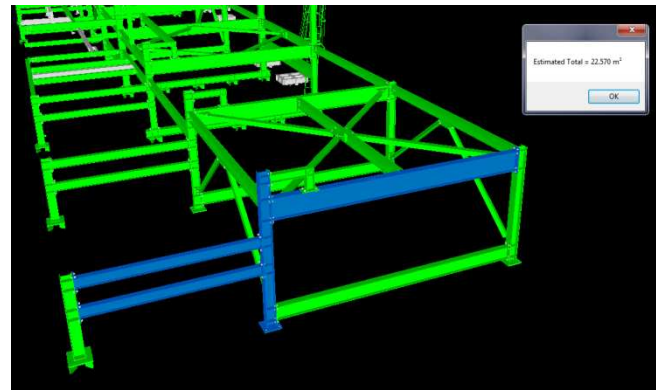


DOWNSTREAM BENEFITS - CALCULATIONS

Mass of selected

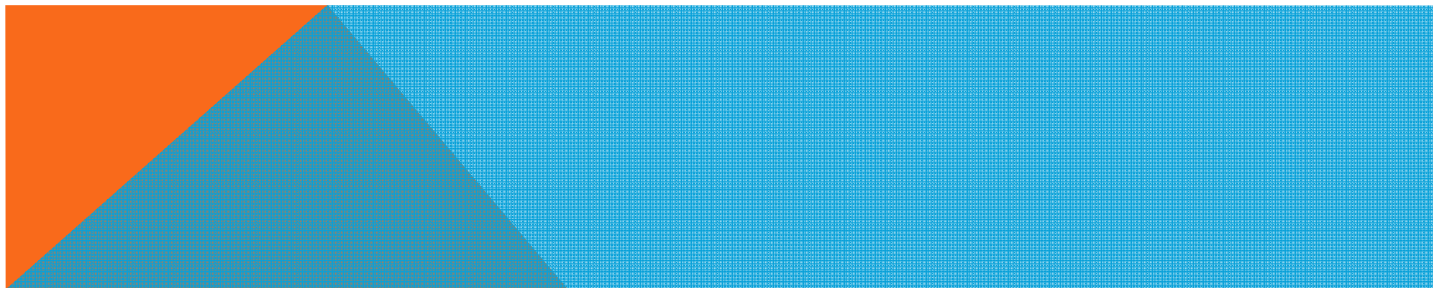
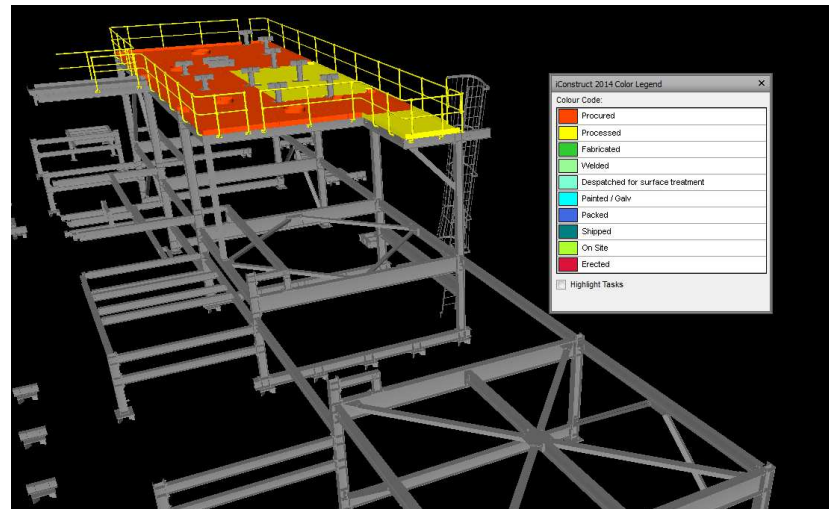


Area of selected

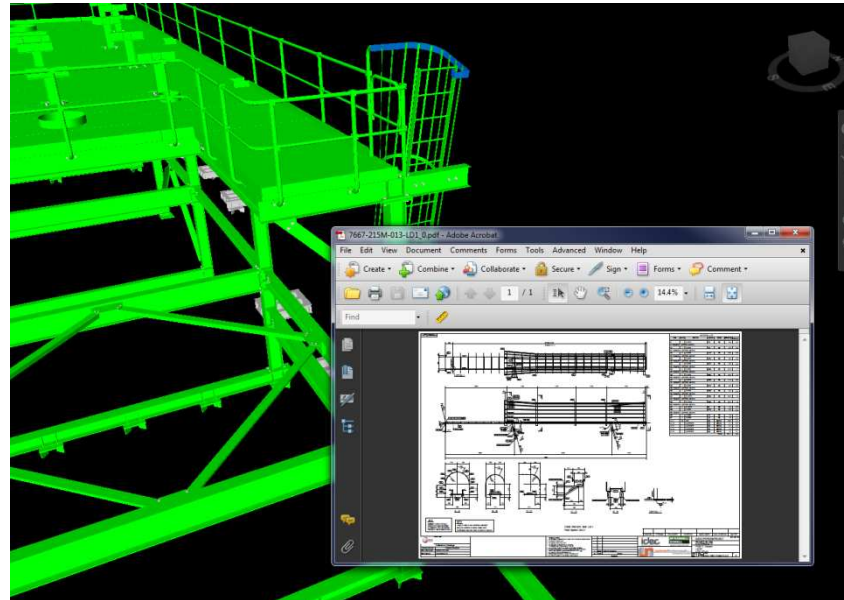


DOWNSTREAM BENEFITS - PROCUREMENT

Linked to control sheet

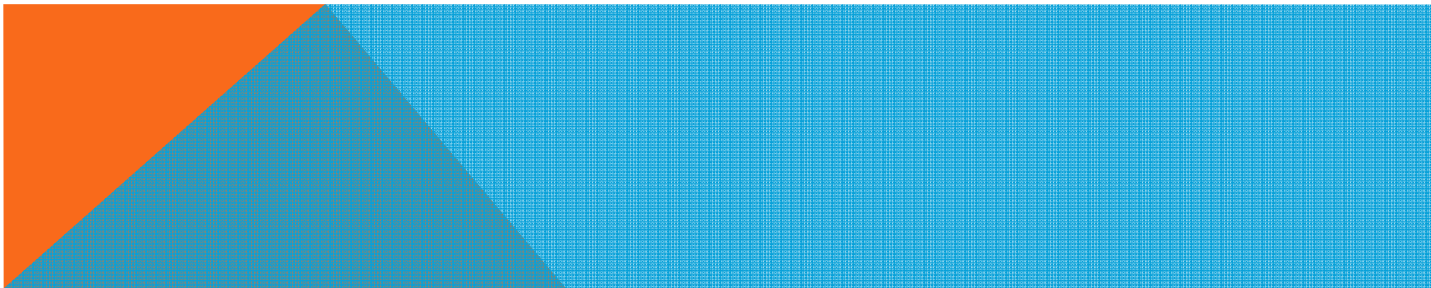
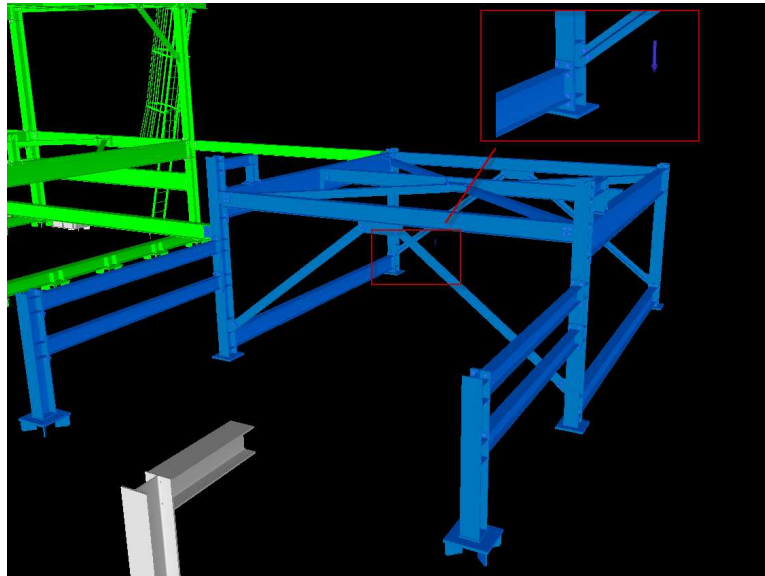


DOWNSTREAM BENEFITS – OPEN FILES OF SELECTED

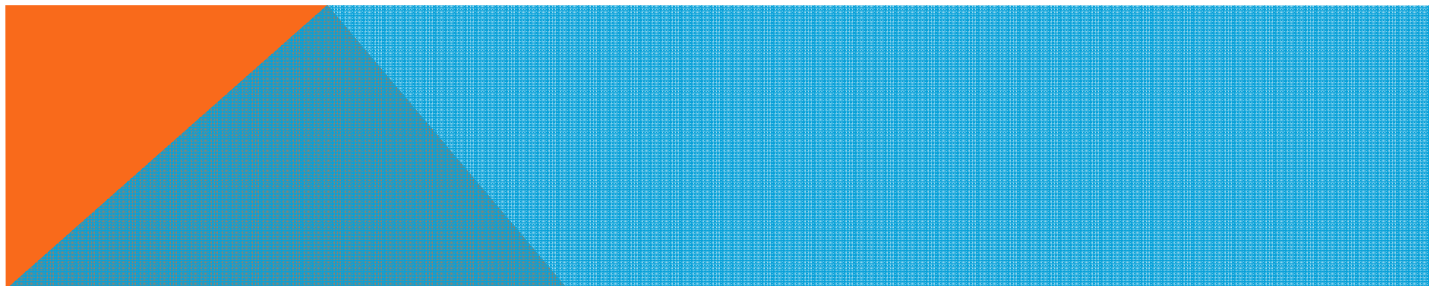
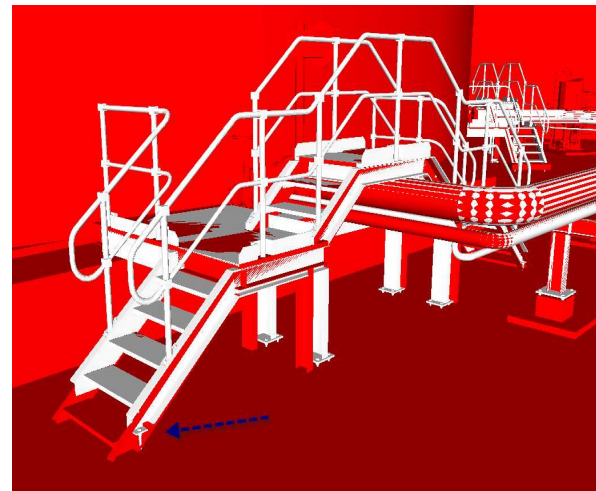
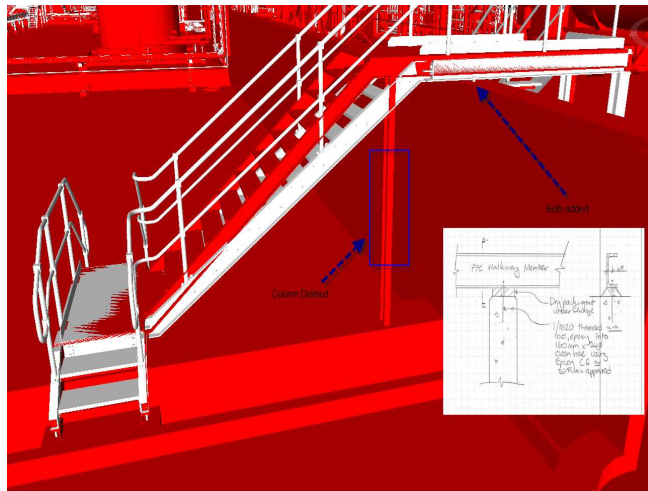


DOWNSTREAM BENEFITS

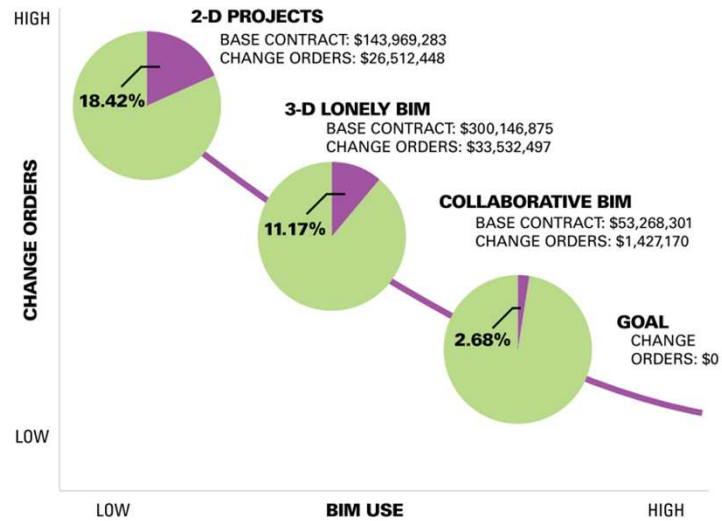
COG OF SELECTION FOR MODULAR CONSTRUCTION



WHY DO ALL OF THIS?



WHY DO ALL OF THIS?



A study by J.C. Cannistraro of 408 projects Valued at \$559 million shows how, in the big picture, BIM saves money as the team gets more collaborative.

