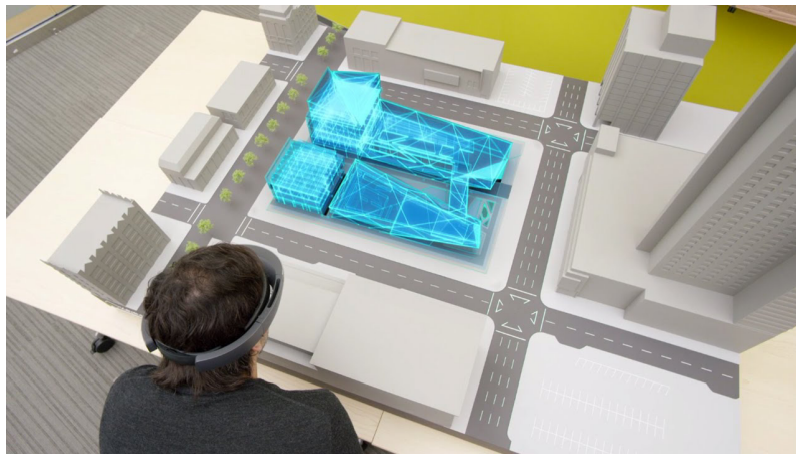


Fátima Gonçalves



— BIM uma tecnologia de gerenciamento de
— informação com tecnologia TRIMBLE

Trimble – Transforming the Way the World Works





BIM



TRANSFORMING THE WAY THE WORLD WORKS





FASES DO BIM

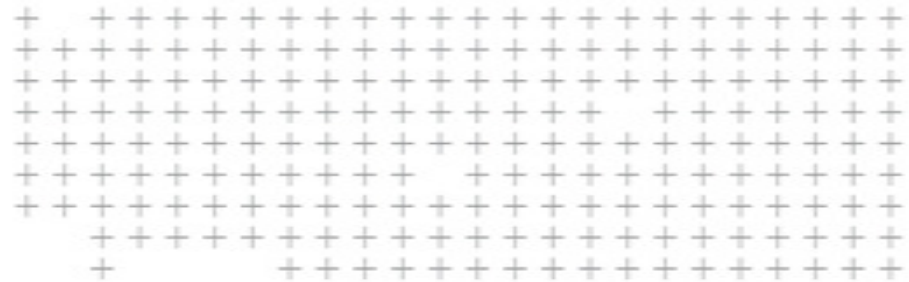
5D

4D

3D

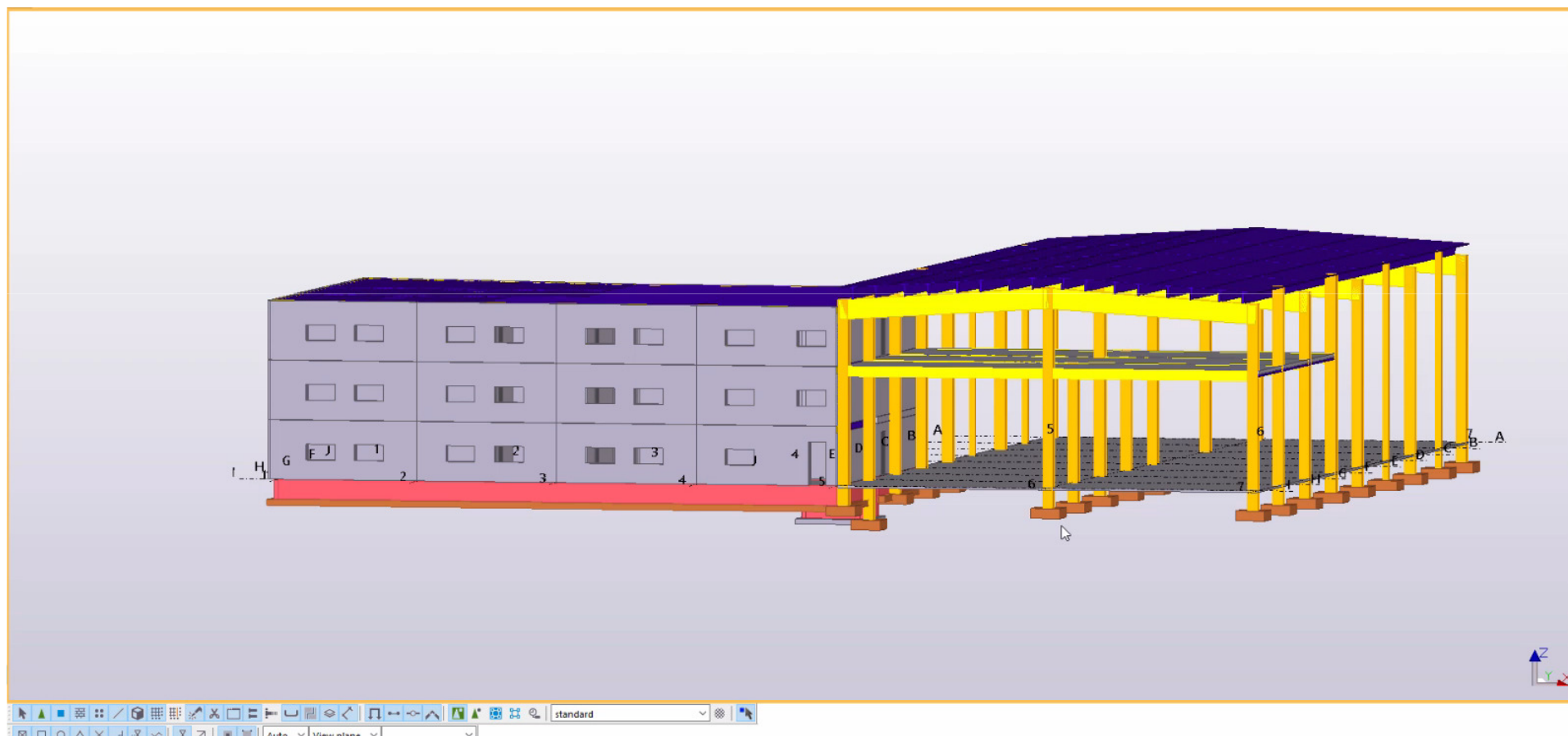
2D

Projeto
baseado em
modelos

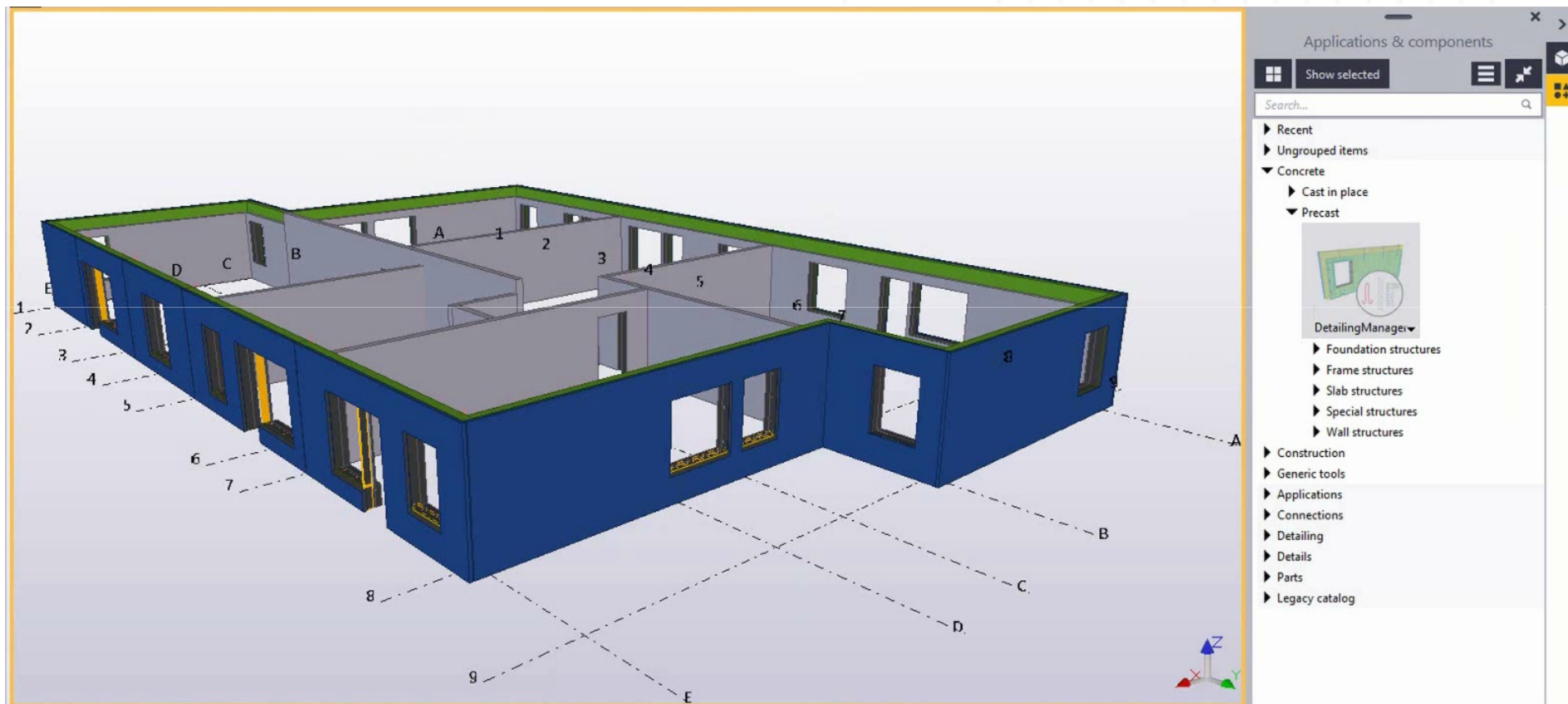


MODELO

MODELO

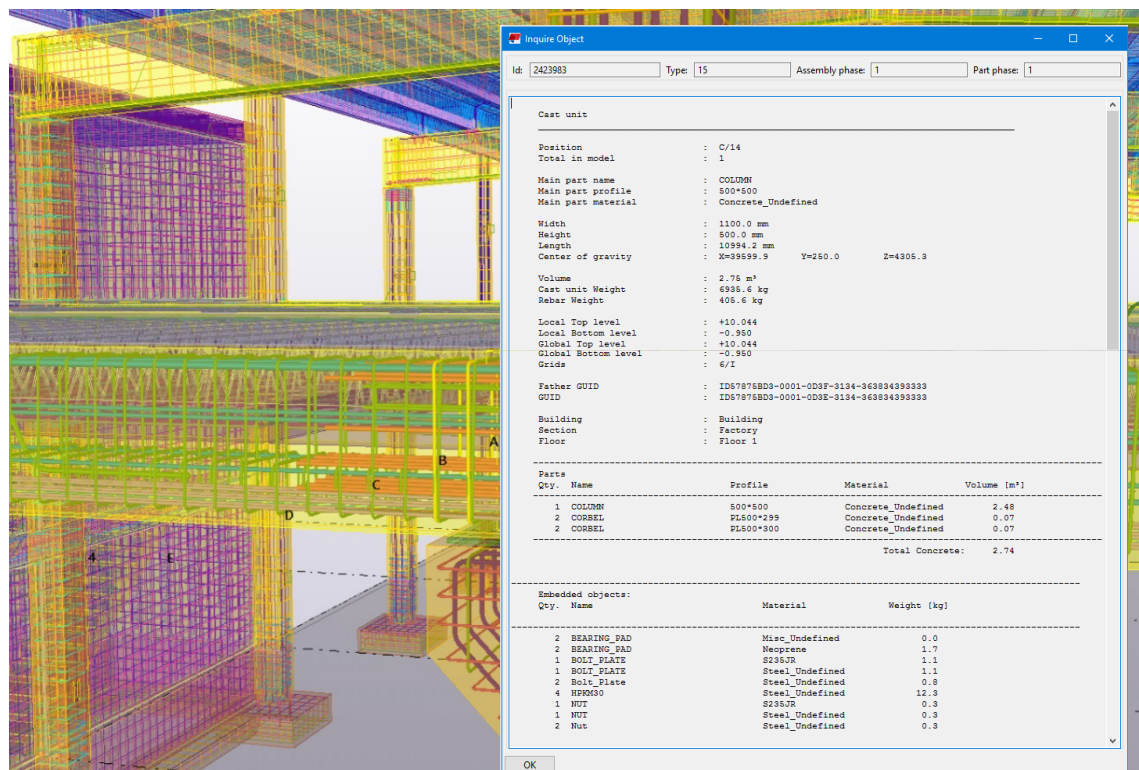


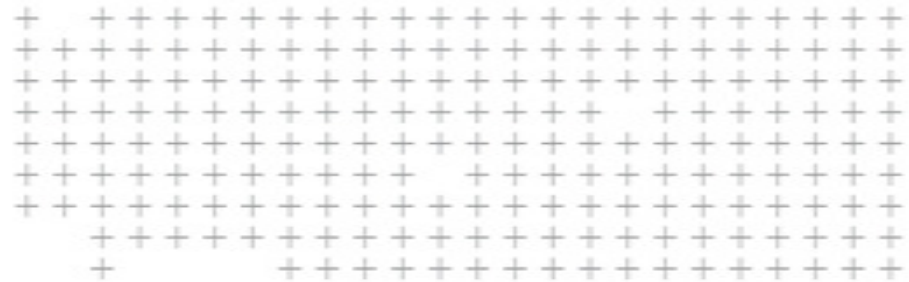
MODELO



MODELO

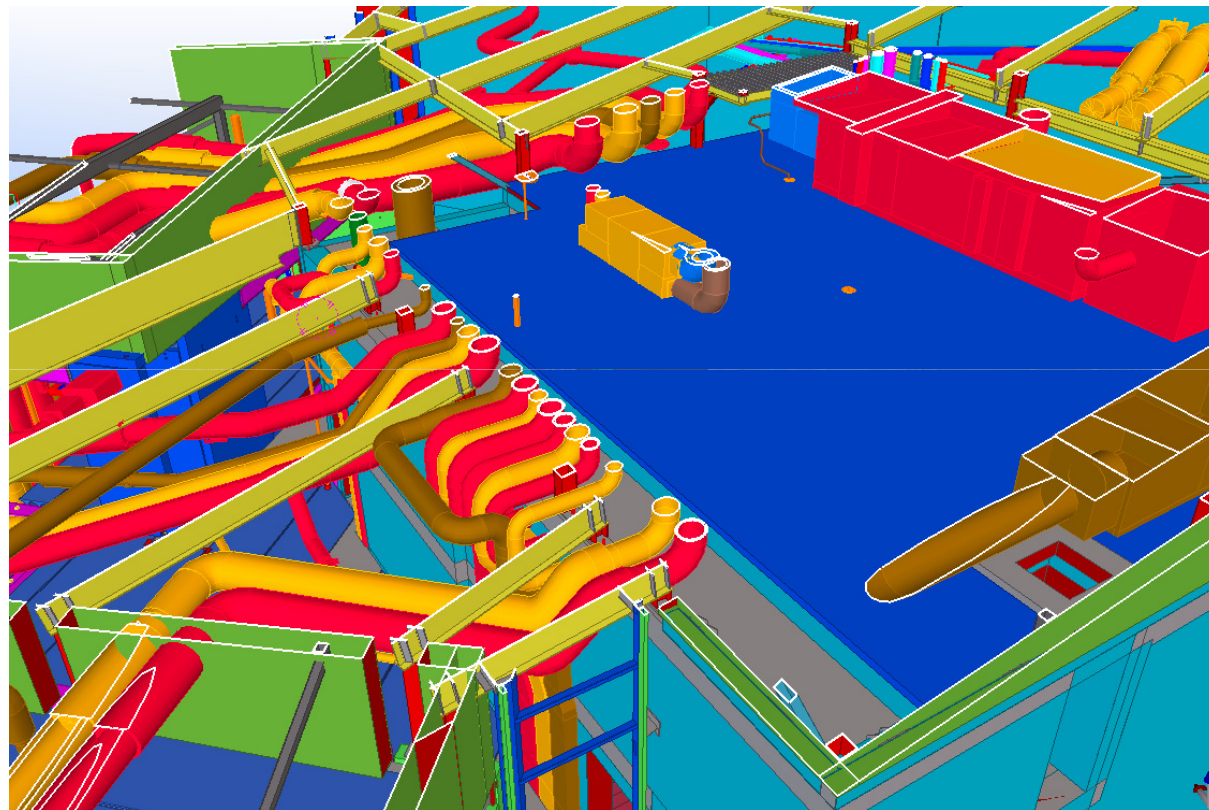
- 3D visual, as-built
- Modelo inteligente
- Automatizado
- Toda informação no modelo
- Todas as peças conectadas

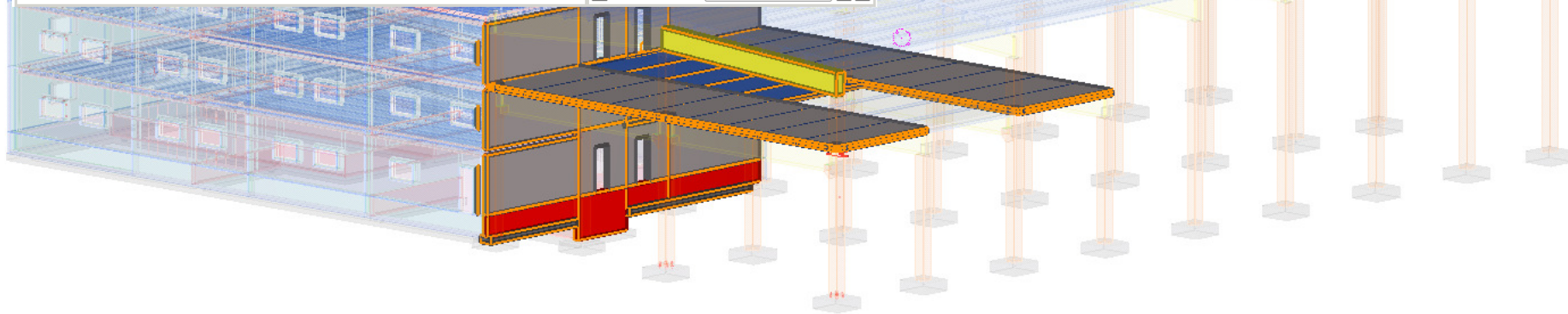




 **ERROS MINIMIZADOS**

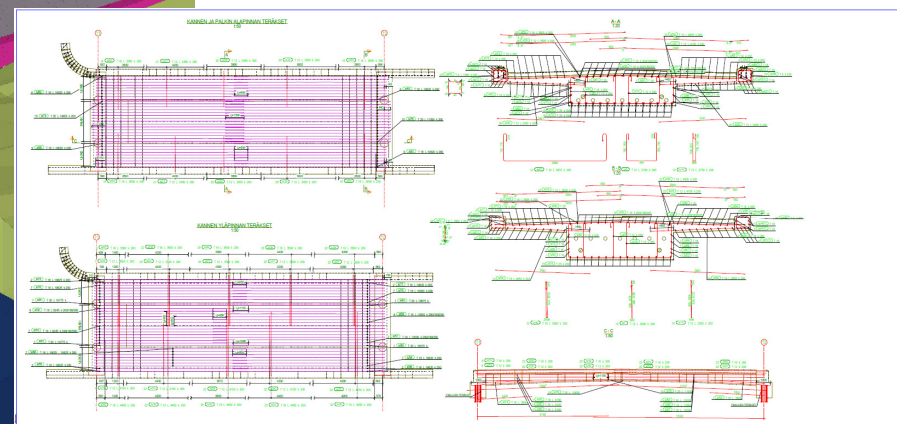
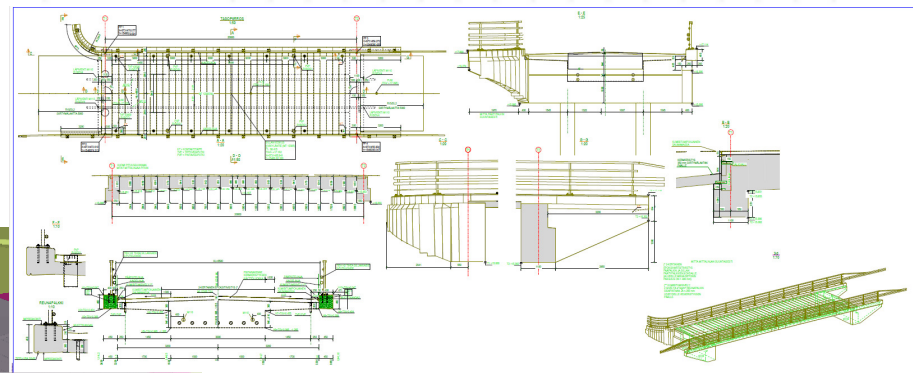
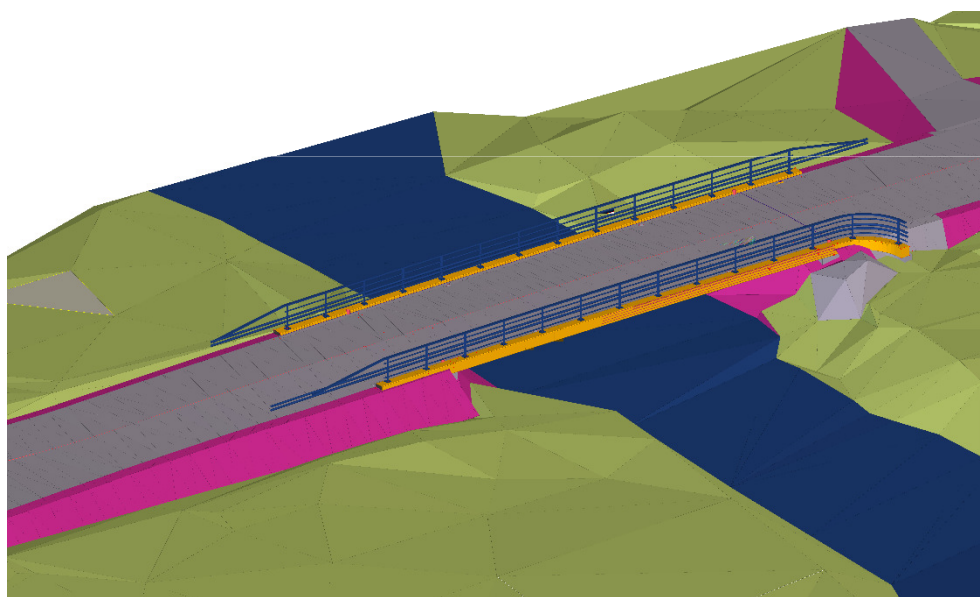
ERROS MINIMIZADOS





DESENHOS

- Gerados automaticamente
- Corretos & atualizados





ERROS MINIMIZADOS

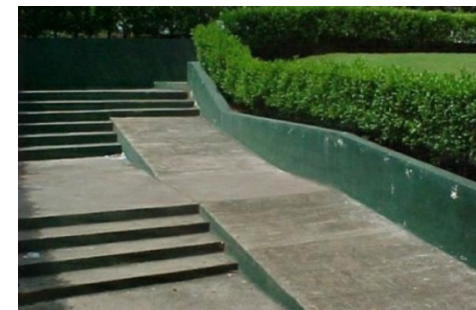
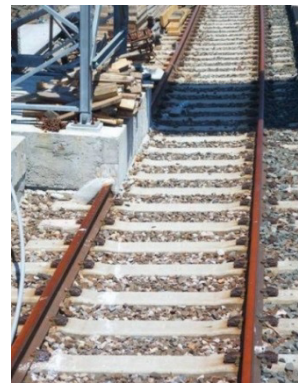


„By model-based working, we are able to solve most of the project issues already in the model and are able to deliver better quality buildings, on budget and on time“



Audrius Tulaba, Diretor geral da Markuciai, Lituânia

Pequenos erros...

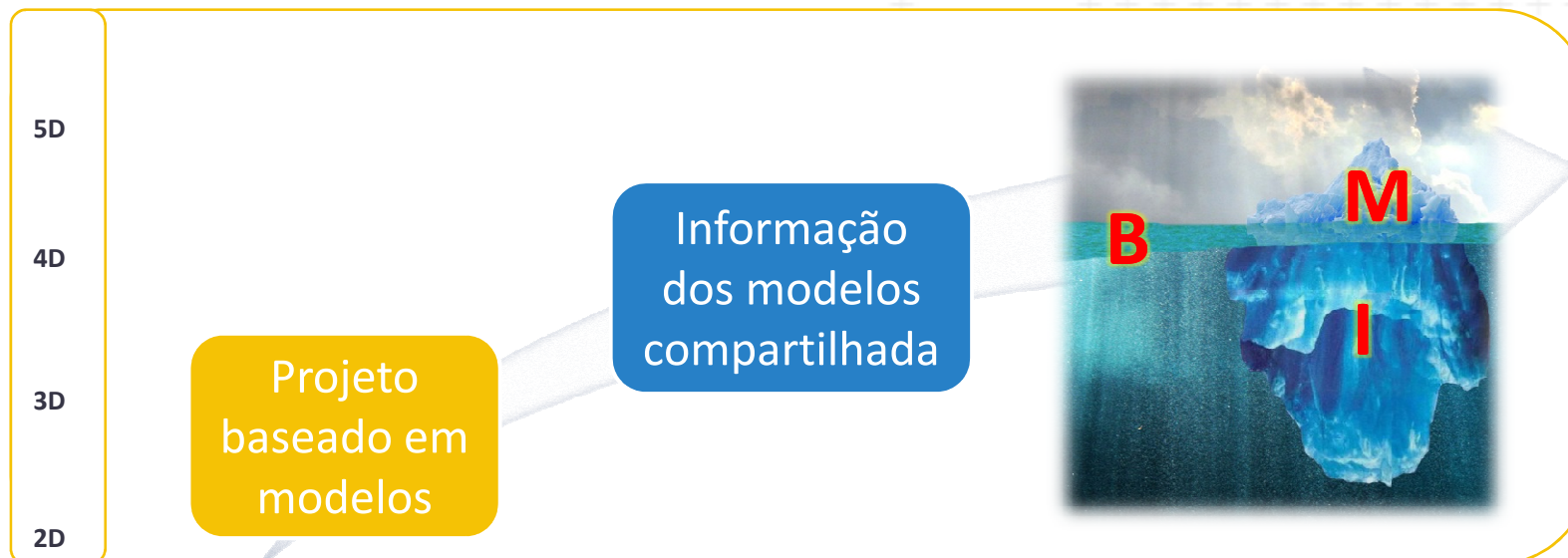


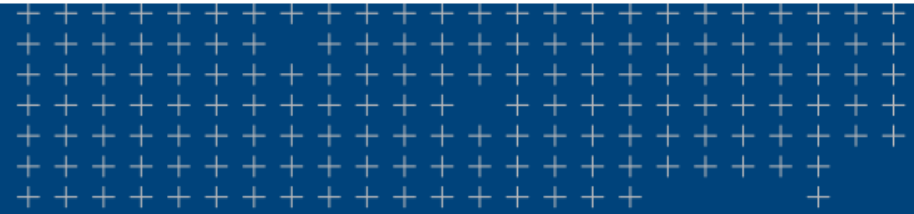
TRANSFORMING THE WAY THE WORLD WORKS





FASES DO BIM





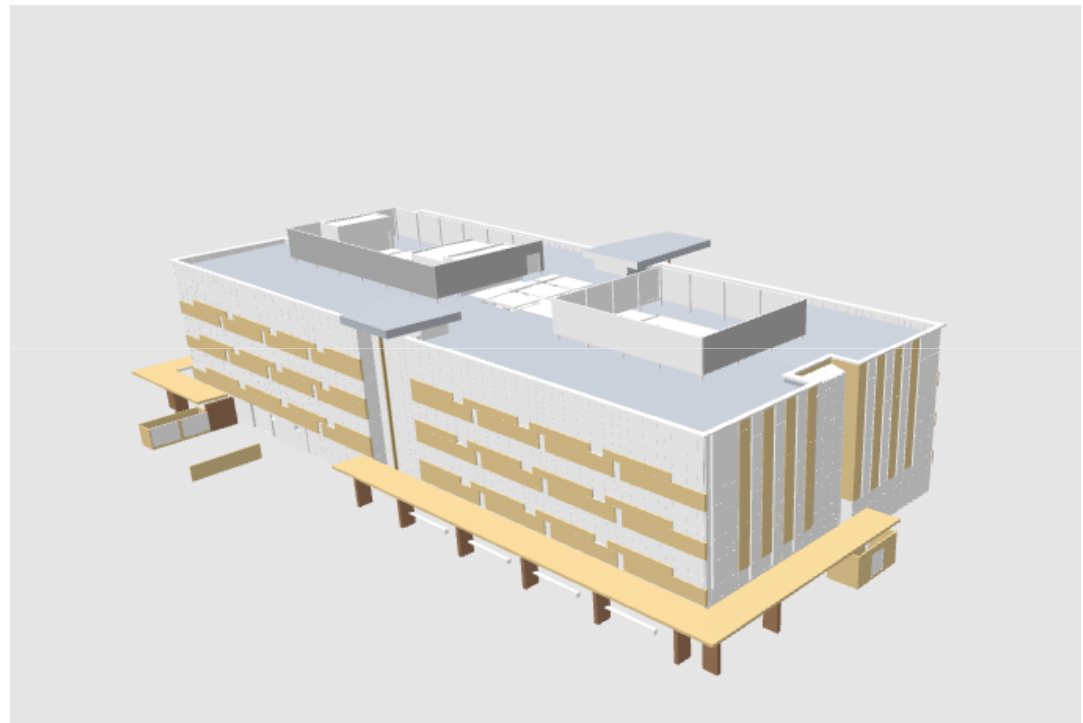
Transforming the way the world works



Trimble Rockies – Estudo de Caso para Construção Vertical

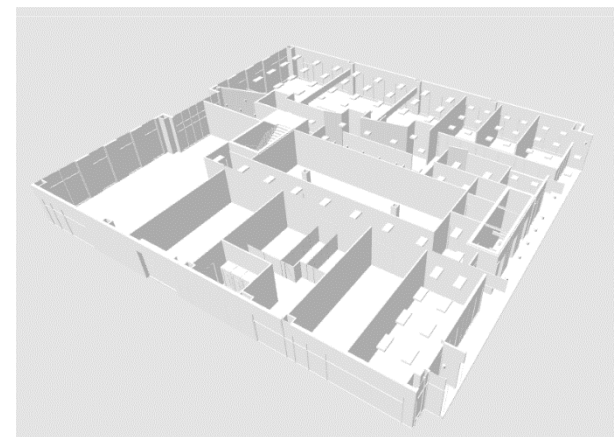
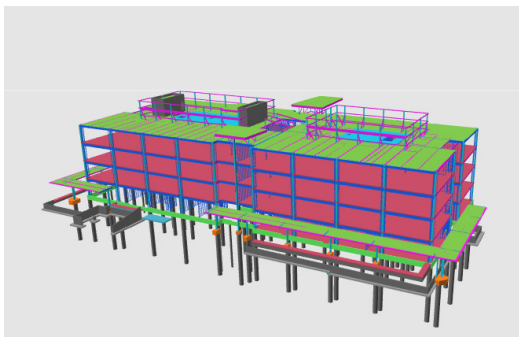
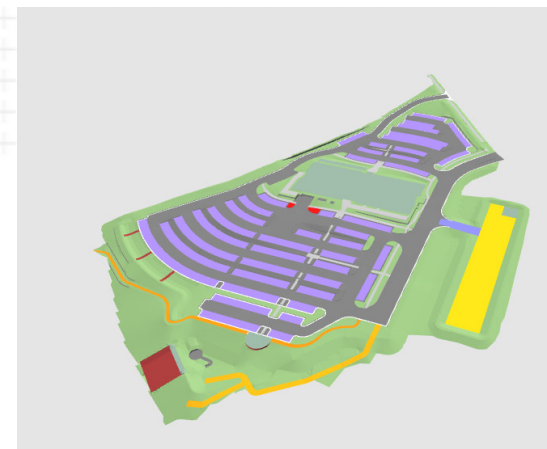
≡ Trimble Rockies

- Local – Westminster/CO
- 4 andares
- 11,613 m² de Área Total
- Capacidade para 570 pessoas

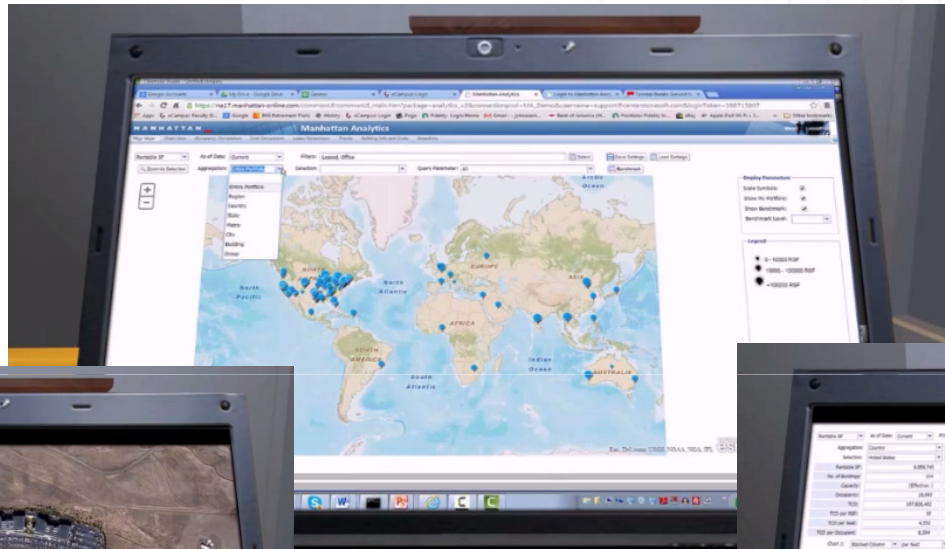


PROJETO TRIMBLE ROCKIES

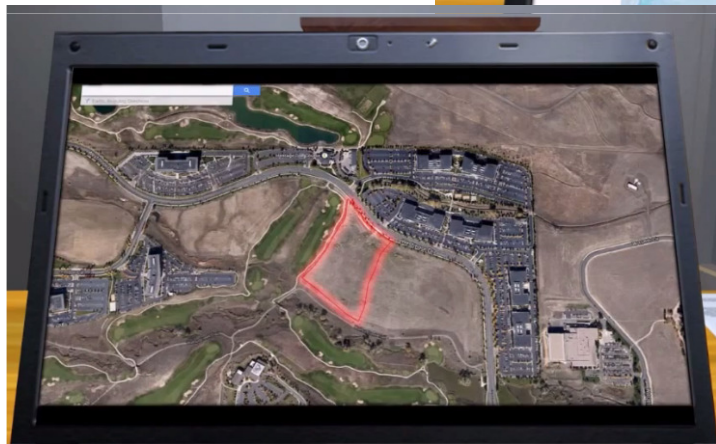
- Estudo de Viabilidade
- Reconhecimento de terreno
- Preparação do terreno
- Projetos : BIM
 - Arquitetura
 - Estrutura
 - Instalações
- Plataforma colaborativa
- Resultados Obtidos



Estudo de Viabilidade



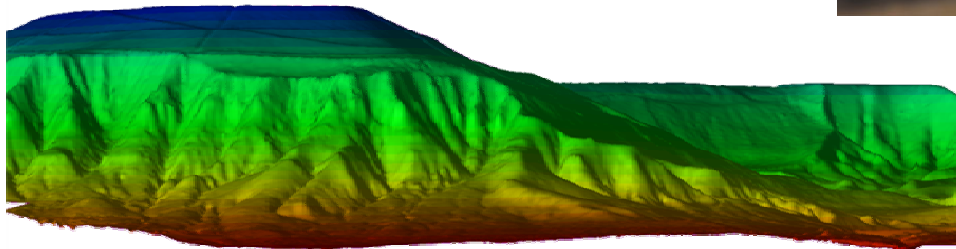
Software Manhattan



TRANSFORMING THE WAY THE WORLD WORKS



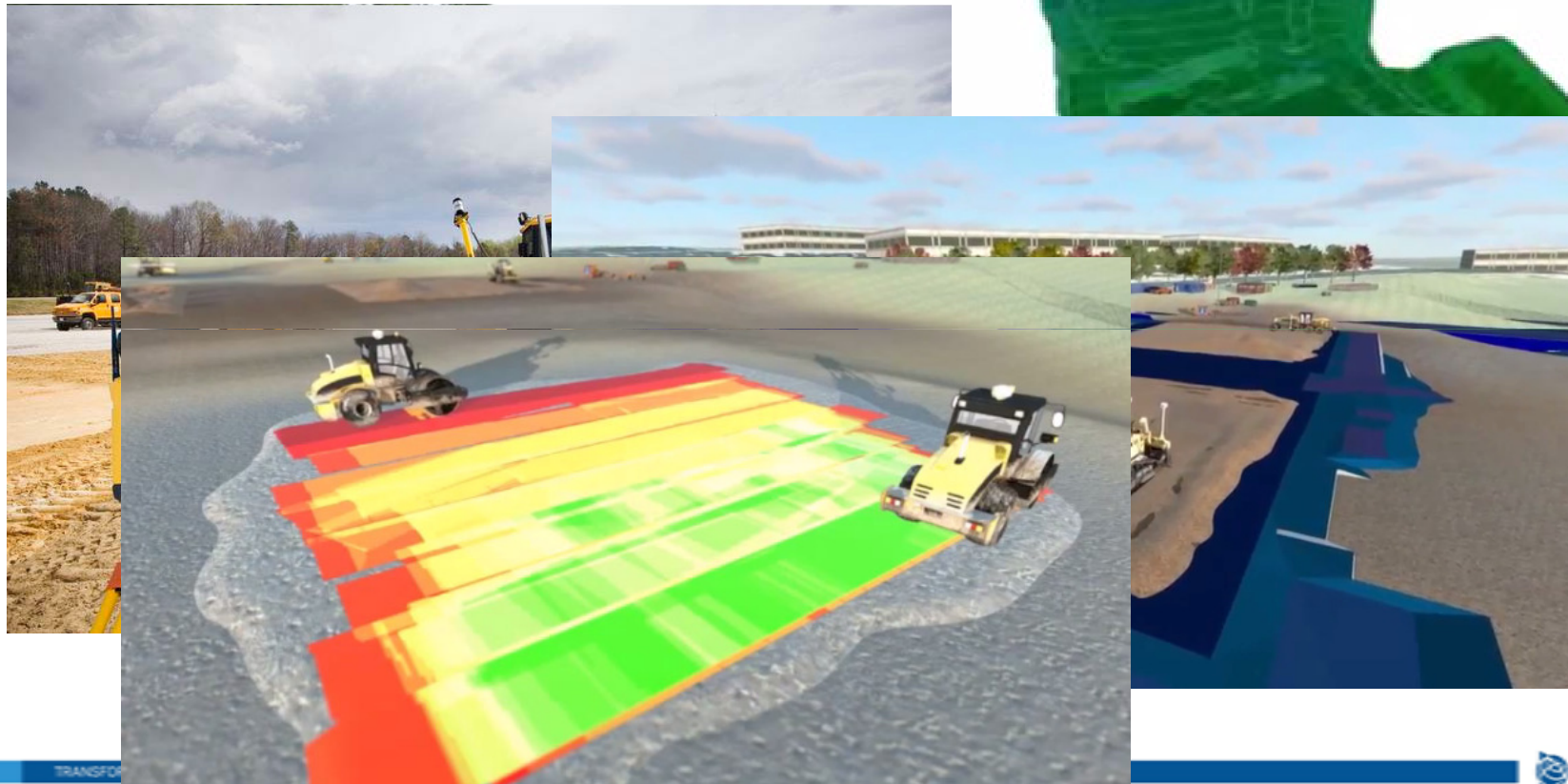
Reconhecimento do Terreno



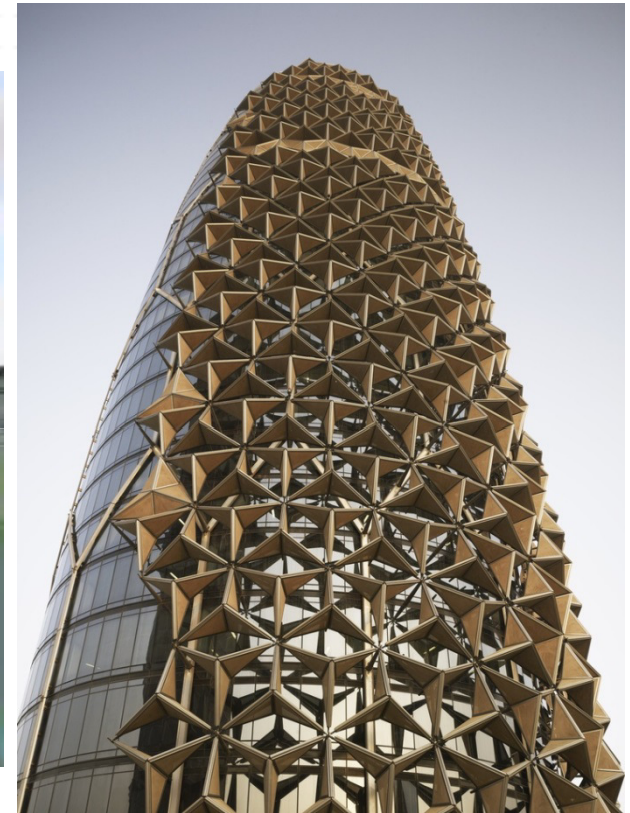
TRANSFORMING THE WAY THE WORLD WORKS



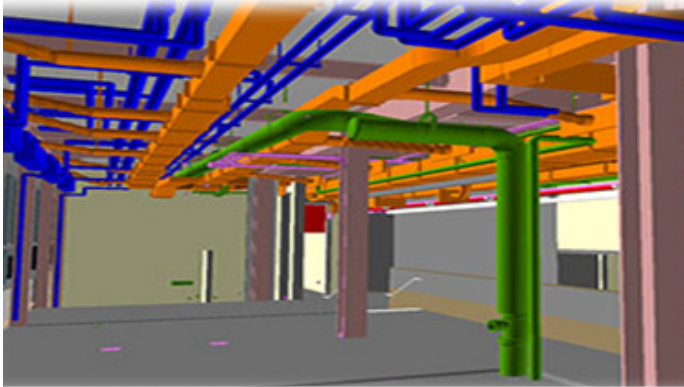
Preparação do Terreno



≡ Projetos – Arquitetura



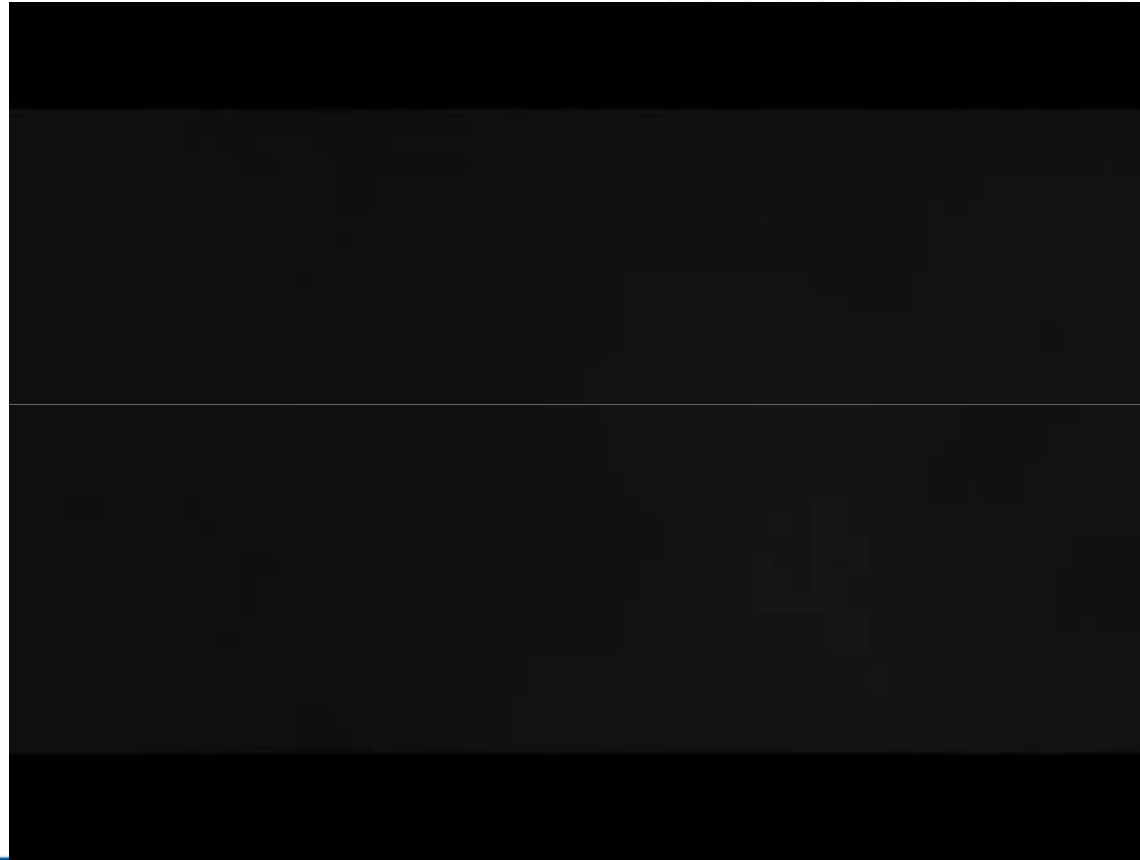
Projetos – Instalações



TRANSFORMING THE WAY THE WORLD WORKS

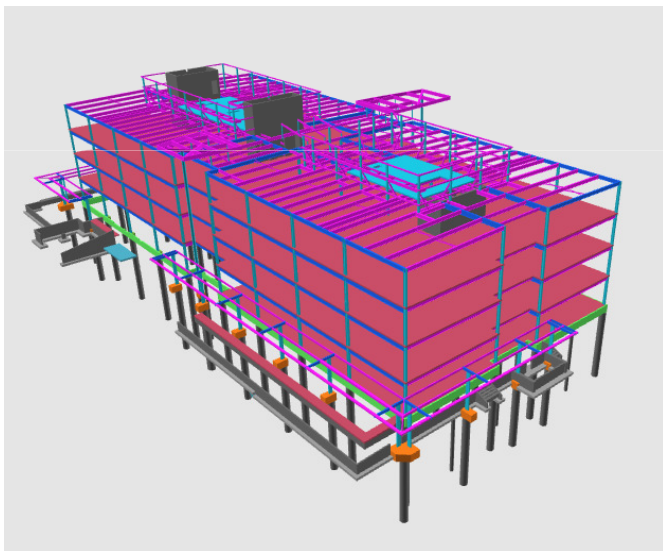


Trimble x Trena

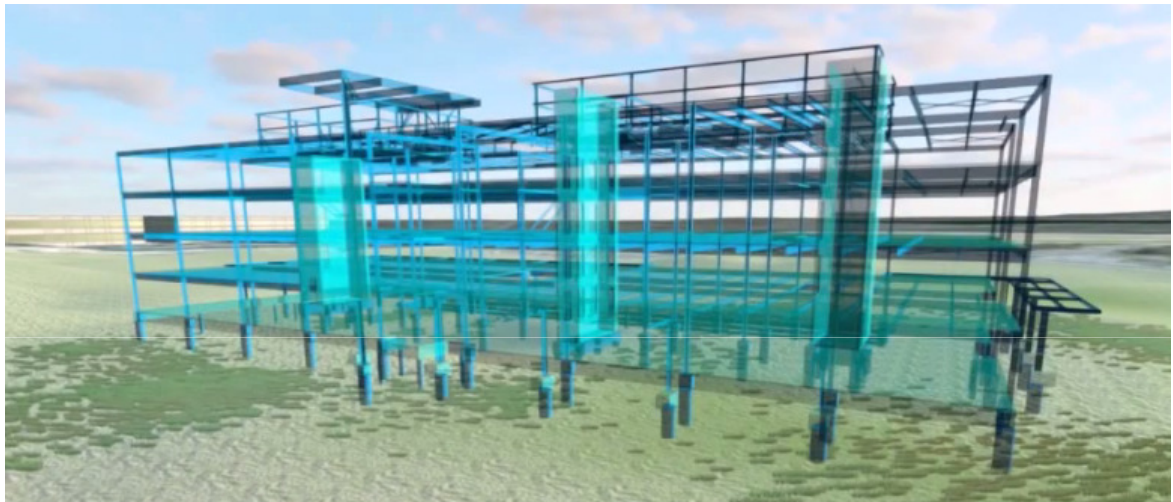


≡ Projetos - Estrutural

CONCRETO PRÉ-MOLDADO

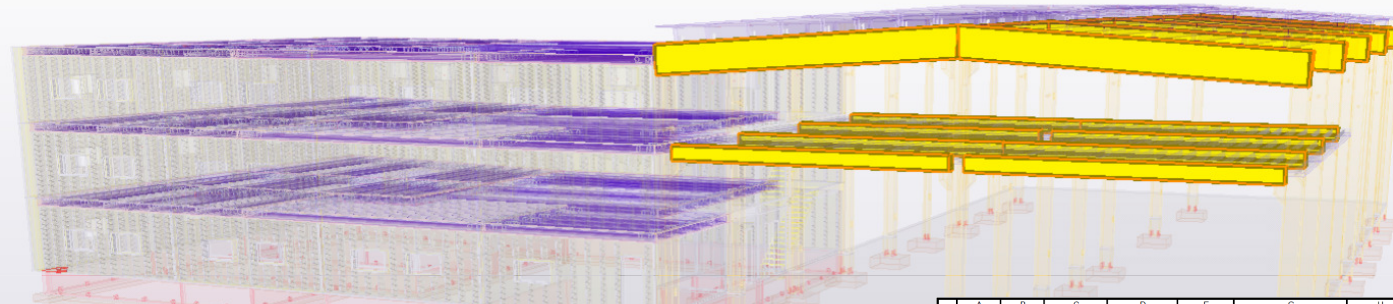


CONCRETO MOLDADO IN LOCO



METÁLICAS

4. INFORMAÇÃO RÁPIDA E PRECISA



Object Browser

Cost Unit List ☒ Show from model ☒ Show from Categories

Categories

Q Search...

Tip: Drag columns here to form groups

Count	Cost Unit	Position Number	Material Type	Material	Profile	Top Level / mm	Height / mm	Length / mm	Width / mm	Weight / t	Volume / m3	Phase	Quantity
▼ Name: BEAM (18)													
1	Precast	B/7	CONCRETE	Concrete, Undefined	RCL300*500-400*200	6 000	500	10 285	400	4.175	1.7	1	1
1	Precast	B/8	CONCRETE	Concrete, Undefined	RCL300*500-400*200	6 000	500	10 285	400	4.175	1.7	1	1
1	Precast	B/2	CONCRETE	Concrete, Undefined	RCL300*500-400*200	6 000	500	10 285	400	4.070	1.7	1	1
1	Precast	B/1	CONCRETE	Concrete, Undefined	RCL300*500-400*200	6 000	500	10 010	400	4.070	1.7	1	1
1	Precast	B/4	CONCRETE	Concrete, Undefined	RCL300*500-600*200	6 000	500	10 285	600	5.161	2.2	1	1
1	Precast	B/3	CONCRETE	Concrete, Undefined	RCL300*500-600*200	6 000	500	10 285	600	5.161	2.2	1	1
1	Precast	B/5	CONCRETE	Concrete, Undefined	RCL300*500-600*200	6 000	500	10 010	600	5.831	2.1	1	1
1	Precast	B/6	CONCRETE	Concrete, Undefined	RCL300*500-600*200	6 000	280	10 010	600	5.037	2.1	1	1
1	Precast	B/9	CONCRETE	Concrete, Undefined	1000*500	10 023	1 000	10 868	500	12.892	5.4	1	1
1	Precast	B/10	CONCRETE	Concrete, Undefined	1000*500	10 023	1 000	10 868	500	12.892	5.4	1	1
1	Precast	B/11	CONCRETE	Concrete, Undefined	1000*500	10 023	1 000	10 868	500	13.000	5.4	1	1
1	Precast	B/12	CONCRETE	Concrete, Undefined	1000*500	10 023	1 000	10 868	500	13.000	5.4	1	1
1	Precast	B/13	CONCRETE	Concrete, Undefined	1000*500	10 023	1 000	10 868	500	13.000	5.4	1	1
1	Precast	B/14	CONCRETE	Concrete, Undefined	1000*500	10 023	1 000	10 868	500	13.000	5.4	1	1
1	Precast	B/15	CONCRETE	Concrete, Undefined	1000*500	10 023	1 000	10 868	500	12.893	5.4	1	1
1	Precast	B/16	CONCRETE	Concrete, Undefined	1000*500	10 023	1 000	10 868	500	13.000	5.4	1	1
1	Precast	B/17	CONCRETE	Concrete, Undefined	1000*500	10 023	1 000	10 868	500	12.872	5.4	1	1
1	Precast	B/18	CONCRETE	Concrete, Undefined	1000*500	10 023	1 000	10 868	500	12.872	5.4	1	1
▼ Name: COLUMN (25)													
								259 978		133 503	55.4		25,000
▼ Name: DOUBLE TEU (32)													
								383 040		264 812	110.3		32,000
▼ Name: FLUGRAN (27)													
								64 290		104 510	43.4		27,000
▼ Name: HOLLOW CORE (172)													
								1 279 798		614 637	256.0		172,000

Number of objects in the table: 281

Result of: 'how' - Of these rows: 41

2 200 448 1 311 237 545.6 281,000

Project (73)

Reference models (344)

Design Status (73)

Undeclared - Product type (1014)

Concrete Class (500)

Structural Class (500)

Planned Use time (300)

Exposure Class 3A (500)

Exposure Class XF (500)

Exposure Class XS (500)

Exposure Class XD (500)

Exposure Class XC (500)

Exposure Class XC (500)

Fabrication Status (387)

Follow Design (903)

Follow Fabrication (903)

Follow Execution (903)

Object (281/281)

Cost Unit Index (281/281)

Cost Unit Weight (281/281)

Classes (281/281)

Delivery kits (-/-)

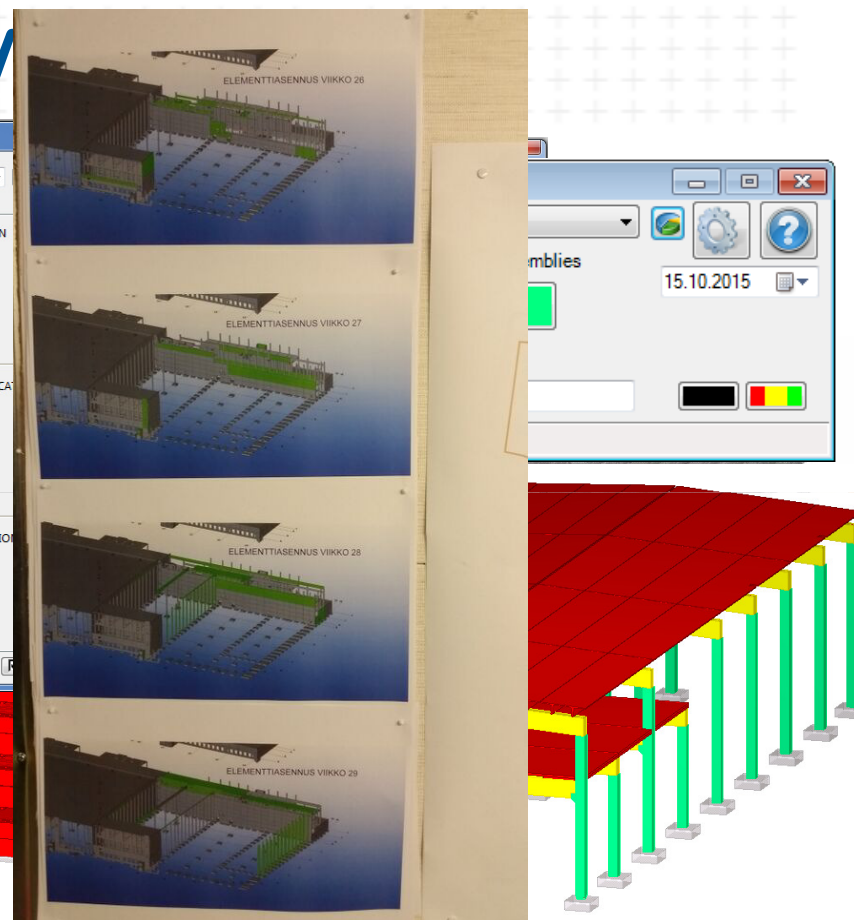
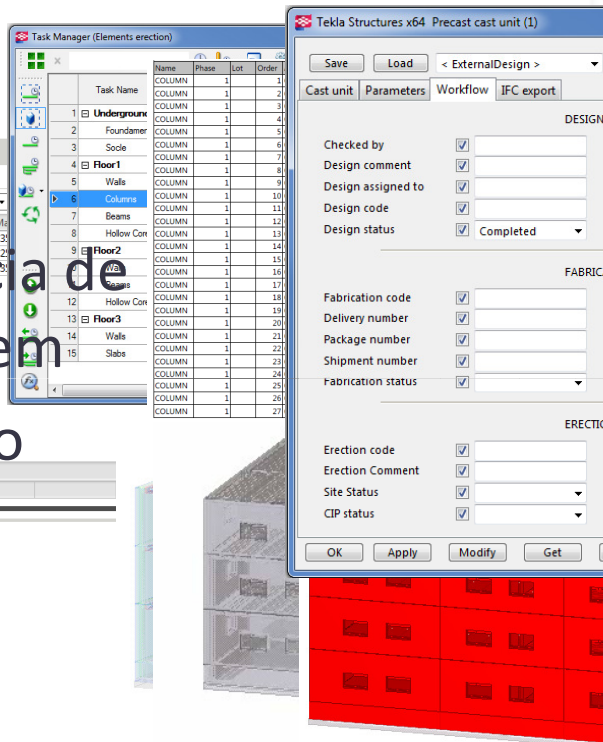
Embeds (1434/1434)

Reinforcement (12334/12334)

No highlight or selection in the model

FLUXO DE TRABALHO BIM

- Lotes
- Tarefas
- Sequência de montagem
- Status do projeto



Gerenciamento, Planejamento e Cronograma:

VICO OFFICE

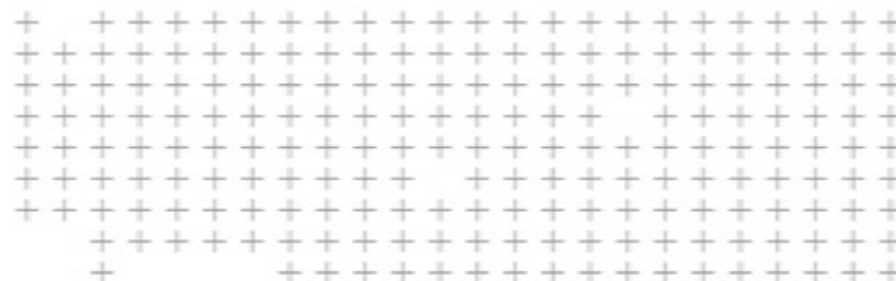
The screenshot displays the VICO Office software interface, which is used for project management, planning, and scheduling. The interface is divided into several sections:

- Top Bar:** Contains tabs for 'Cost Planner' and '3D View'. Below these are various toolbars for navigation, editing, and data management.
- Left Panel:** A sidebar with a tree view showing the project structure. The 'Project' section is expanded, showing options like 'View Dashboard', 'Define Settings', 'Select Module', 'Import from Excel', 'Compare & Update', and 'Define Targets'. Other sections include 'Content', 'Model Management', 'Takeoff', 'Cost Planning', and 'Reports'.
- Central Area:**
 - 3D View:** A 3D model of a building structure. A blue circle with the number '1' is placed over the model, with the text 'Elements provide geometry' next to it.
 - Quantity List:** A table showing the quantities of various elements. A blue circle with the number '2' is placed over the table, with the text 'Quantities calculated automatically' next to it. The table has columns for 'Info', 'Code', 'Description', 'Unit', and 'Value'. The 'Description' column is highlighted in yellow.
- Bottom Panel:** A table showing the cost plan. A blue circle with the number '3' is placed over the table, with the text 'Model based quantities drive cost plan' next to it. The table has columns for 'Code', 'Description', 'Source Qty', 'Consumption', 'Waste', 'Qty', 'UOM', 'Unit Cost', 'CostPar..', 'Net Total', and '%Parent..'. The 'Description' column is highlighted in blue.

At the bottom of the interface, there is a status bar with the text 'Cost Planner' and a 'Project N...' button.

FASES DO BIM





 **COMUNICAÇÃO**

TRABALHO EM EQUIPE EFICIENTE



TRANSFORMING THE WAY THE WORLD WORKS

 Trimble

Plataforma Colaborativa – Trimble Connect



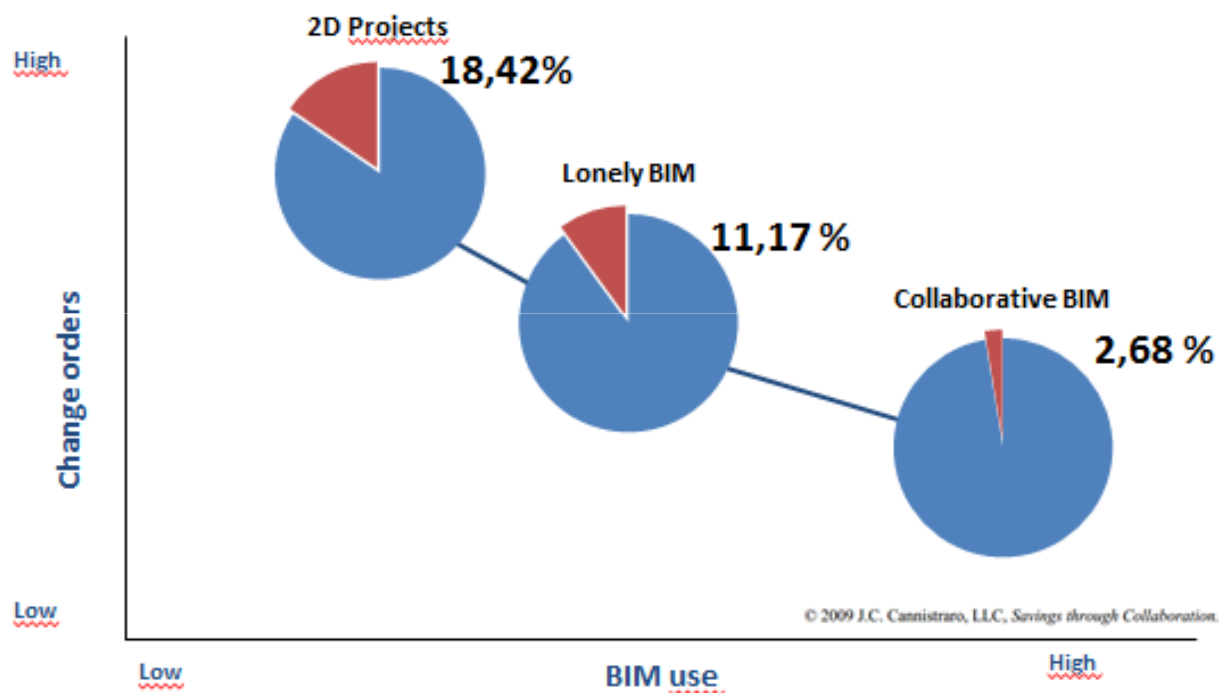
TRANSFORMING THE WAY THE WORLD WORKS



5. TRABALHO EM EQUIPE EFICIENTE



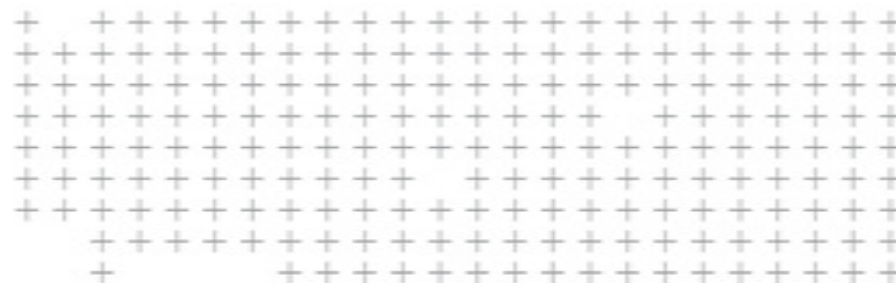
Resultados Obtidos



PRODUTIVIDADE DA MÁQUINA
30%+

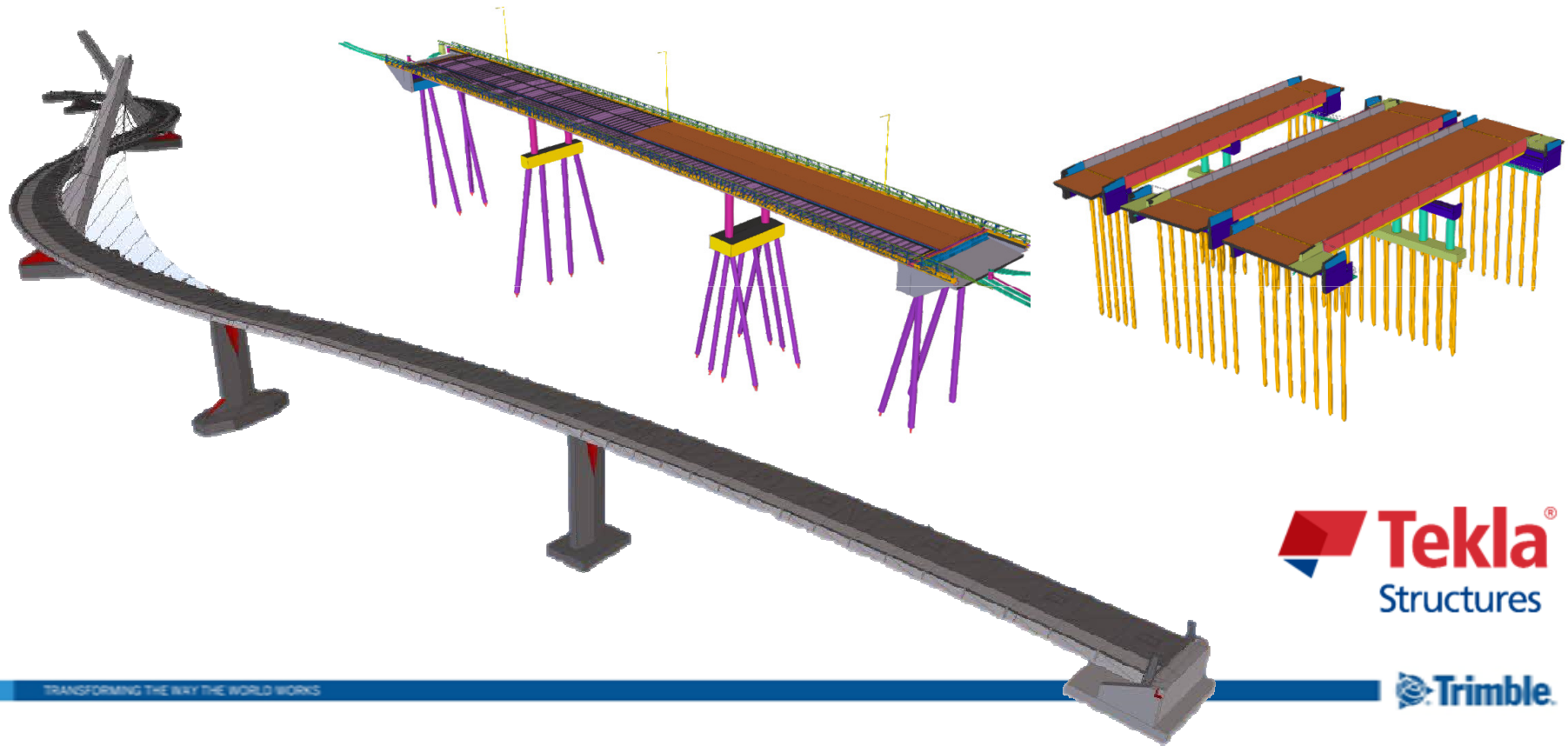
REDUÇÃO DO RETRABALHO
50%+

MELHORIAS GERAIS DE
30%



 Outros exemplos:

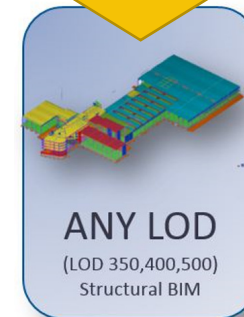
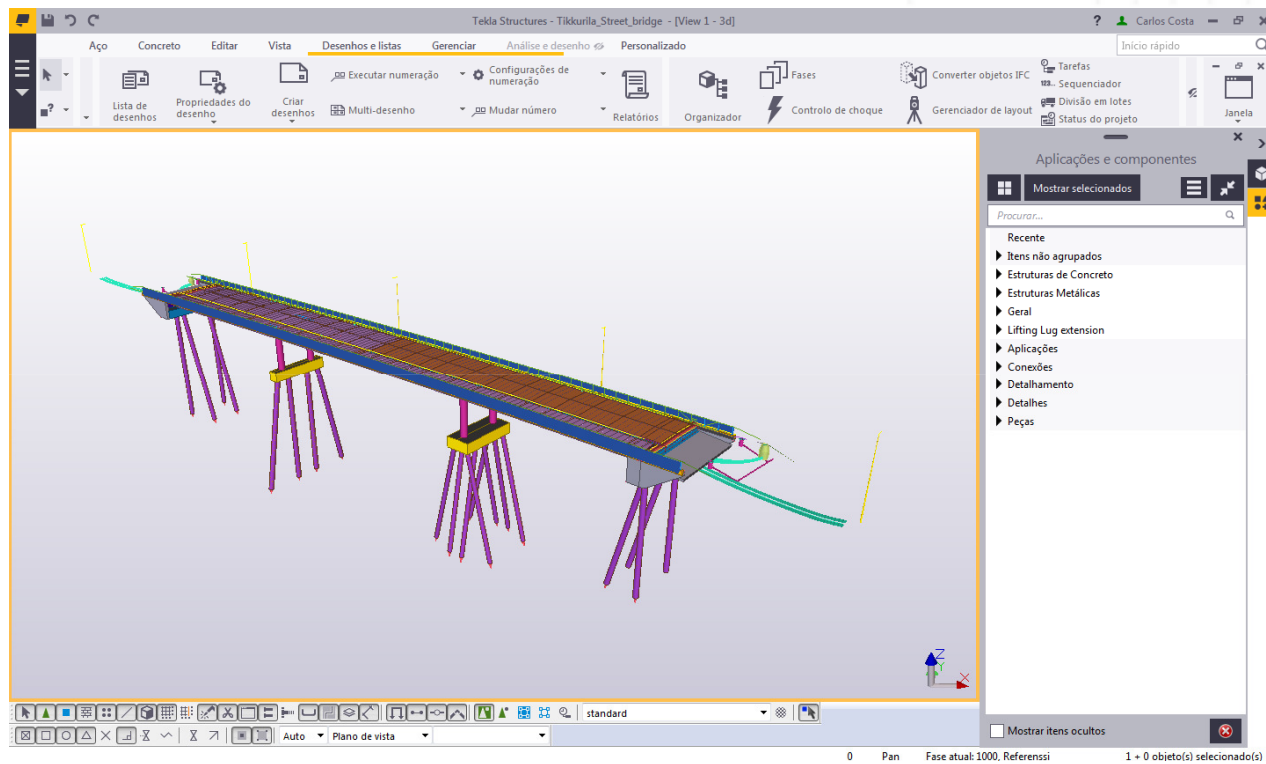
≡ Modelagem Realista de Pontes (ND=500)



Tekla[®]
Structures

 **Trimble**

Modelagem Realista de Pontes (ND=500)

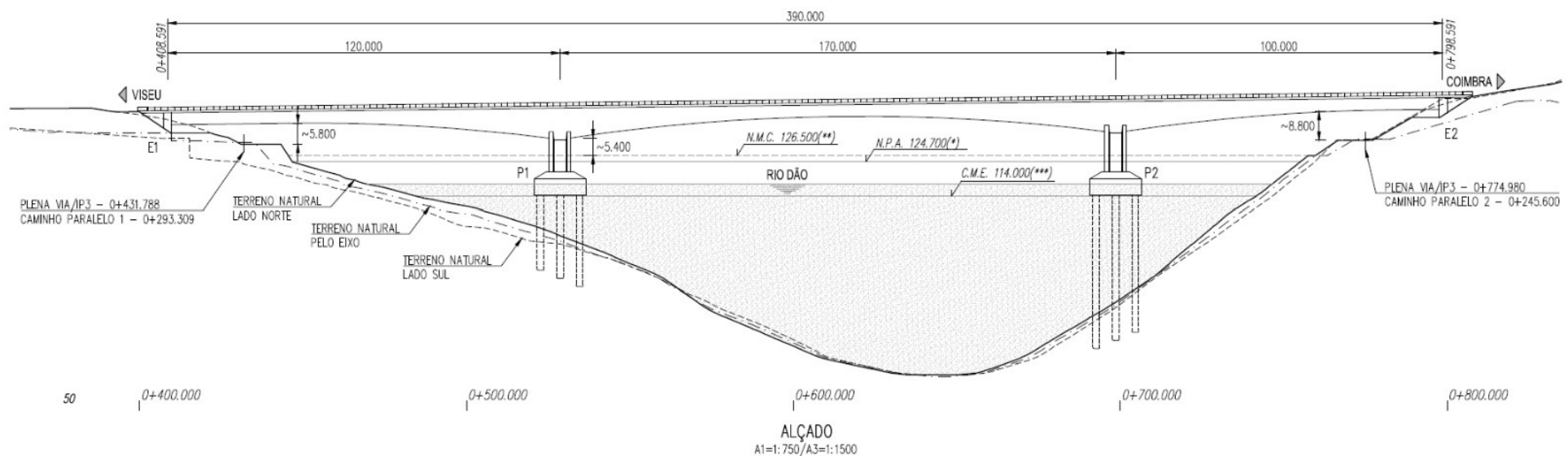


≡ Ponte sobre a foz do Rio Dão, Portugal



TRANSFORMING THE WAY THE WORLD WORKS

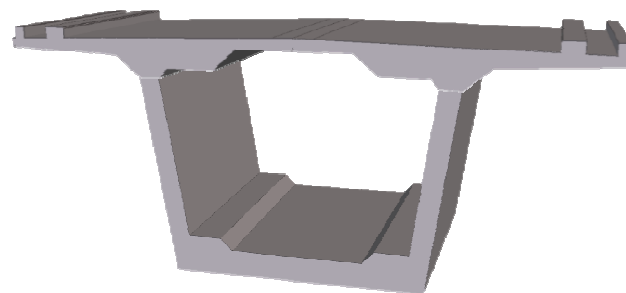
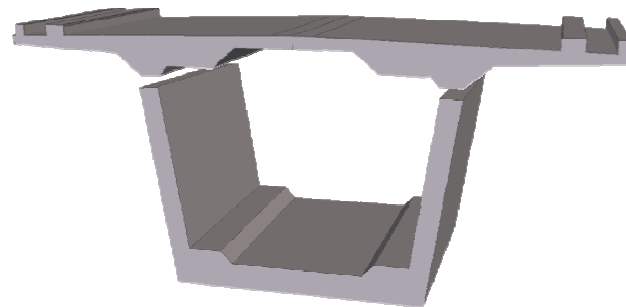
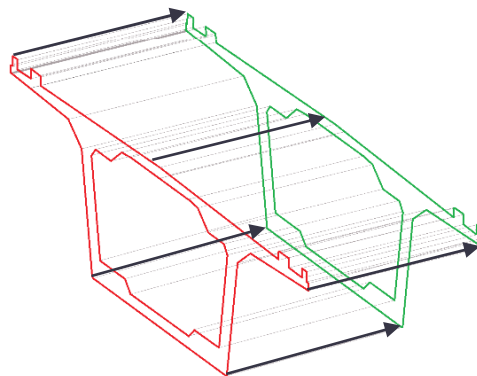
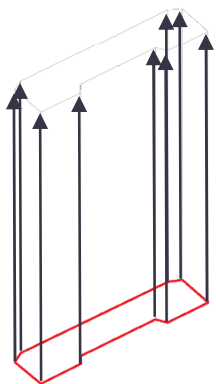
≡ Ponte sobre a foz do Rio Dão, Portugal



- Comprimento: 390m (120m + 170m + 100m)

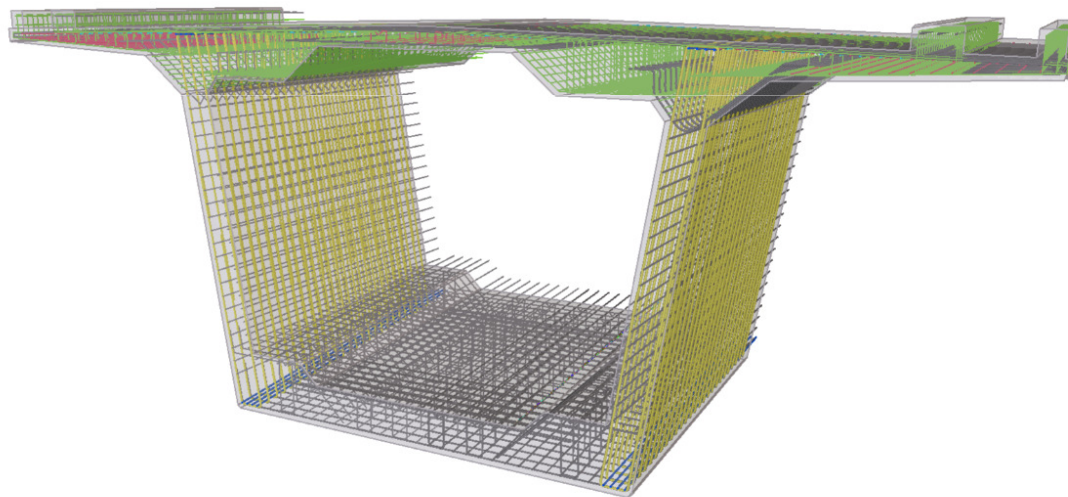
Ponte sobre a foz do Rio Dão, Portugal

- Modelagem das Aduelas
 - 5h/h por aduela após consolidação da tecnologia



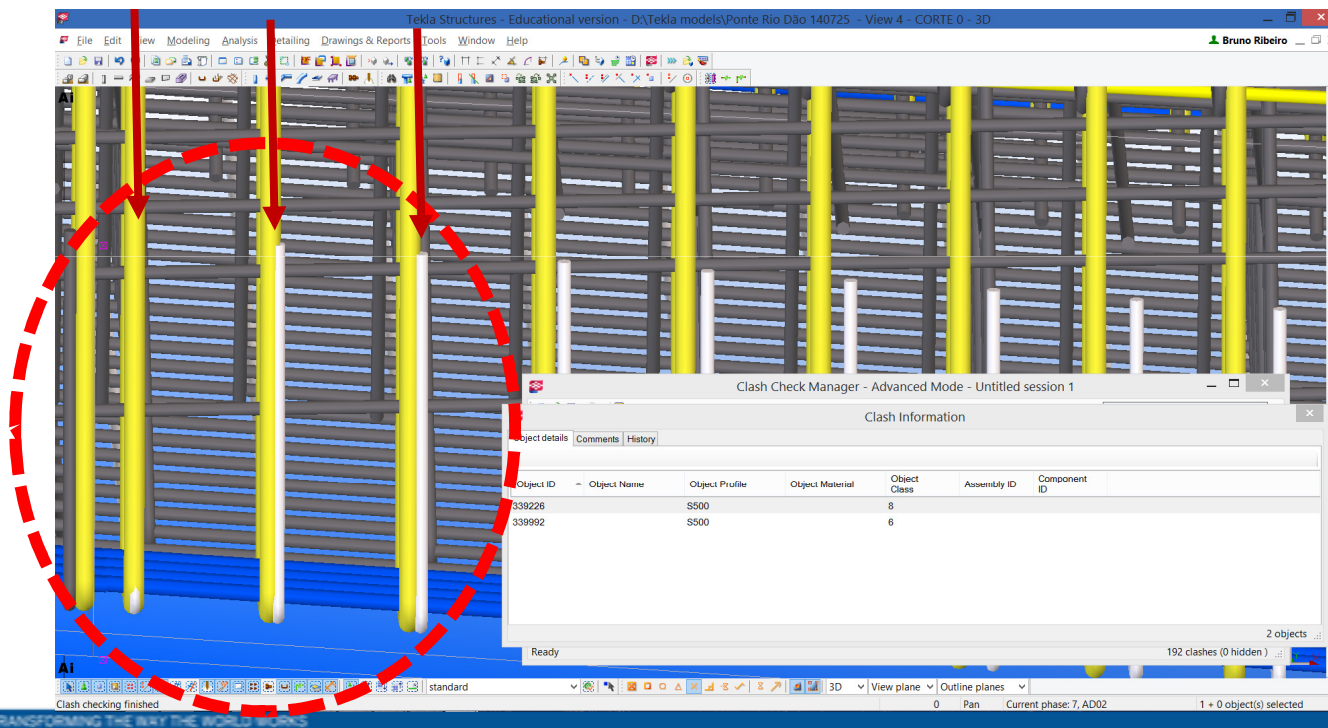
≡ Ponte sobre a foz do Rio Dão, Portugal

- Modelagem das Aduelas
 - 5h/h por aduela após consolidação da tecnologia



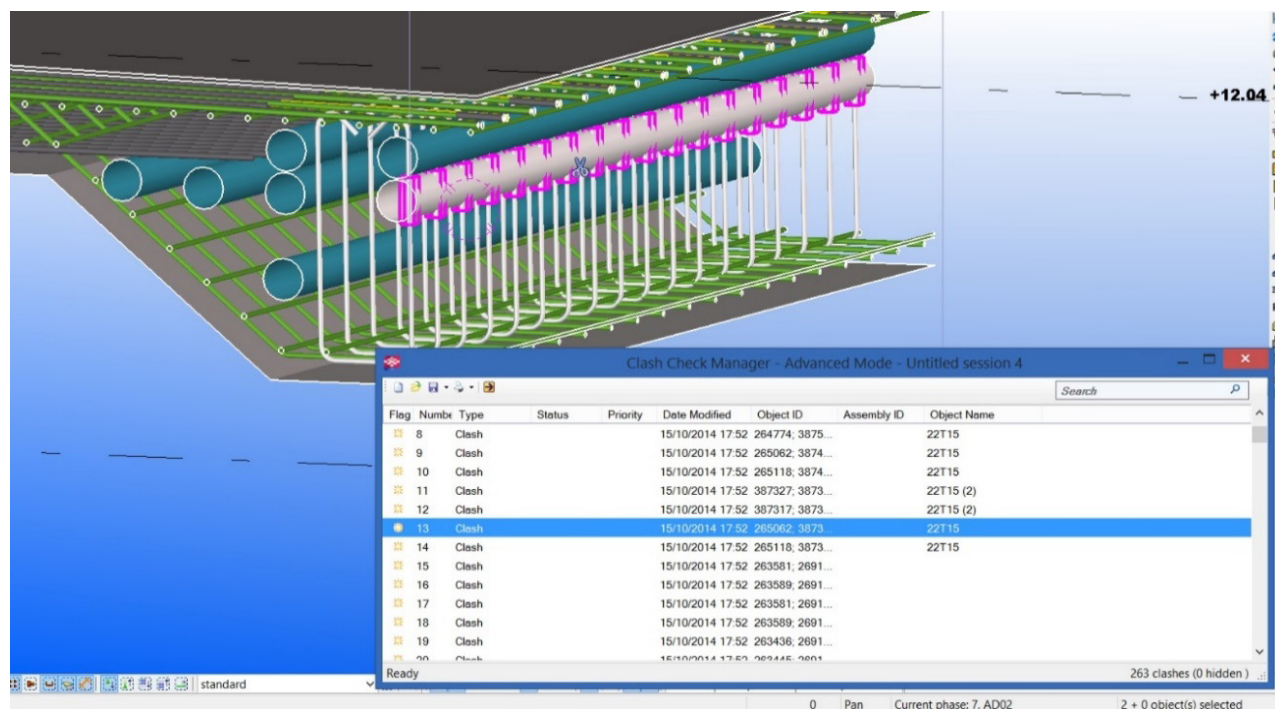
≡ Ponte sobre a foz do Rio Dão, Portugal

- Checagem de Interferências (toleráveis)



≡ Ponte sobre a foz do Rio Dão, Portugal

- Checagem de Interferências (críticas)





Ponte sobre a foz do Rio Dão, Portugal

- Comparações BIM x Tradicional
 - Volumes de concreto

Inquire Object

Id: 32907 Type: 15 Assembly phase: 18 Part phase: 18

Cast unit

Position : B41 (?)
Total in model : 1

Main part name : P2.13C
Main part profile : AD13
Main part material : C40/50

Width : 15000.0 mm
Height : 4688.9 mm
Length : 5123.2 mm
Center of gravity : X=23512.8 Y=-0.0 Z=9539.6

Volume : 66.88 m³
Cast unit Weight : 160510.9 kg
Reinforcing bar Weight : 0.0 kg

Local Top level : +11.460
Local Bottom level : +6.800
Global Top level : +11.460
Global Bottom level : +6.800
Grids : Co-Cn/D-A

Father GUID : ID63D18841-0000-081F-3134-303632343233
GUID : ID63D18841-0000-081E-3134-303632343233

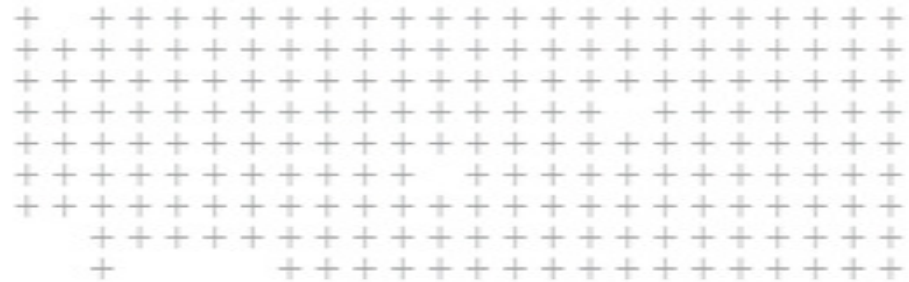
Qty.	Name	Profile	Material	Volume [m³]
1	P2.13C	AD13	C40/50	66.88

Total Concrete: 66.88

More:

OK

Aduela	Real (m3)	BIM (m3)	Variação
P1.06A e P1.06B	142	141,3	0,5 %
P2.05C e P2.05D	148	147,2	0,5 %



Outras Tecnologias para Construção Civil

≡ Laser Scanner



TRANSFORMING THE WAY THE WORLD WORKS

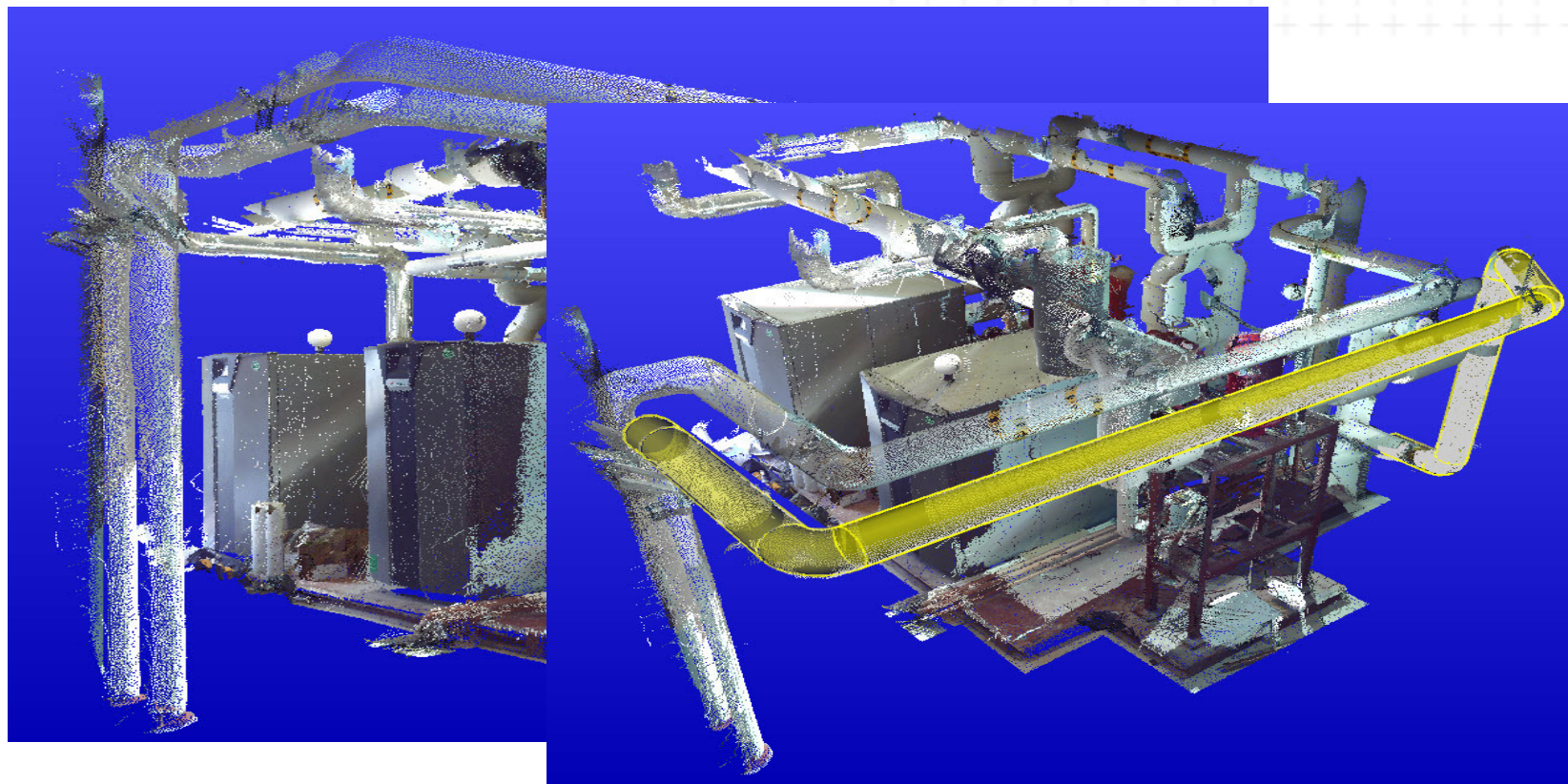


≡ Vantagens na utilização do laser scanner para As-Built

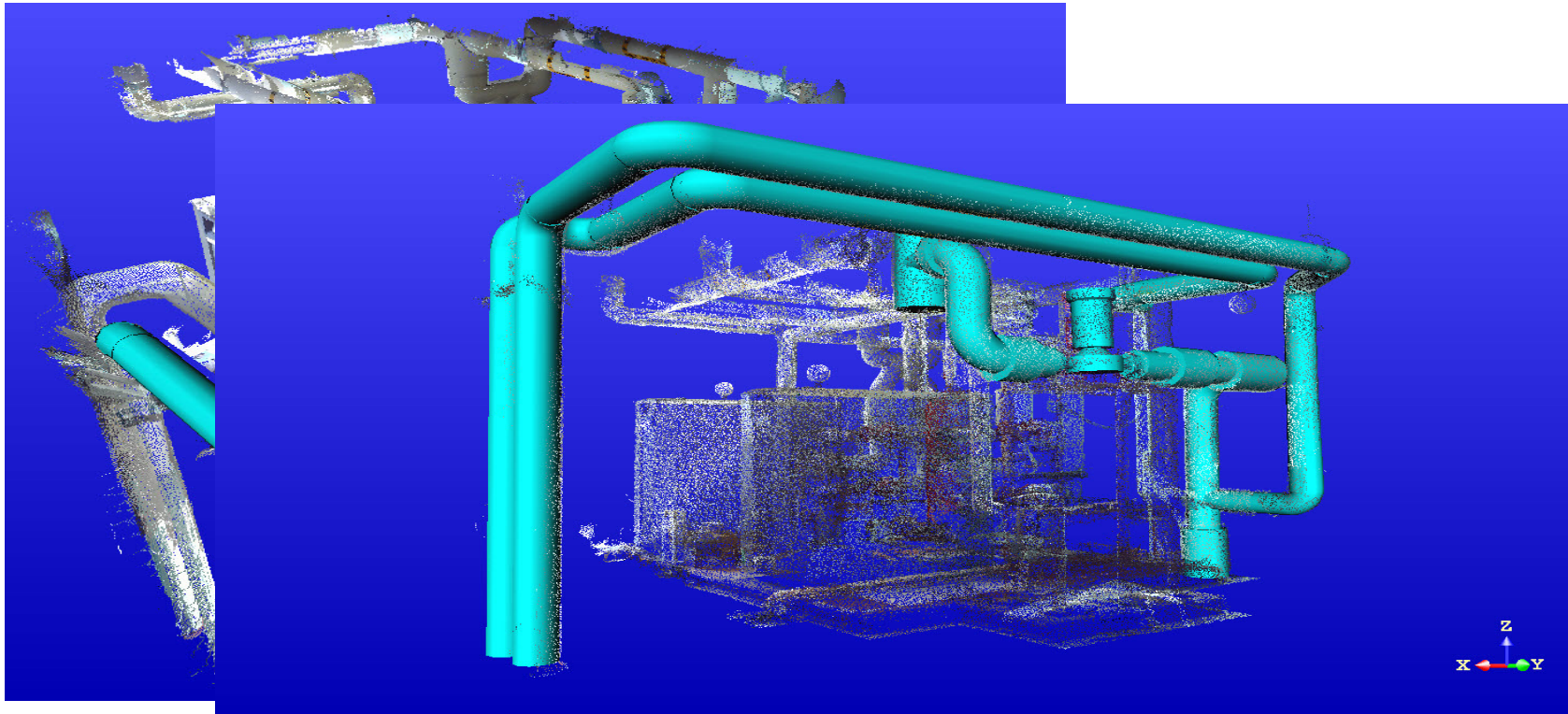
- Rápida coleta de pontos em campo
- Alta precisão
- Maior segurança em campo
- Diminuição do retrabalho



== Nuvem de pontos

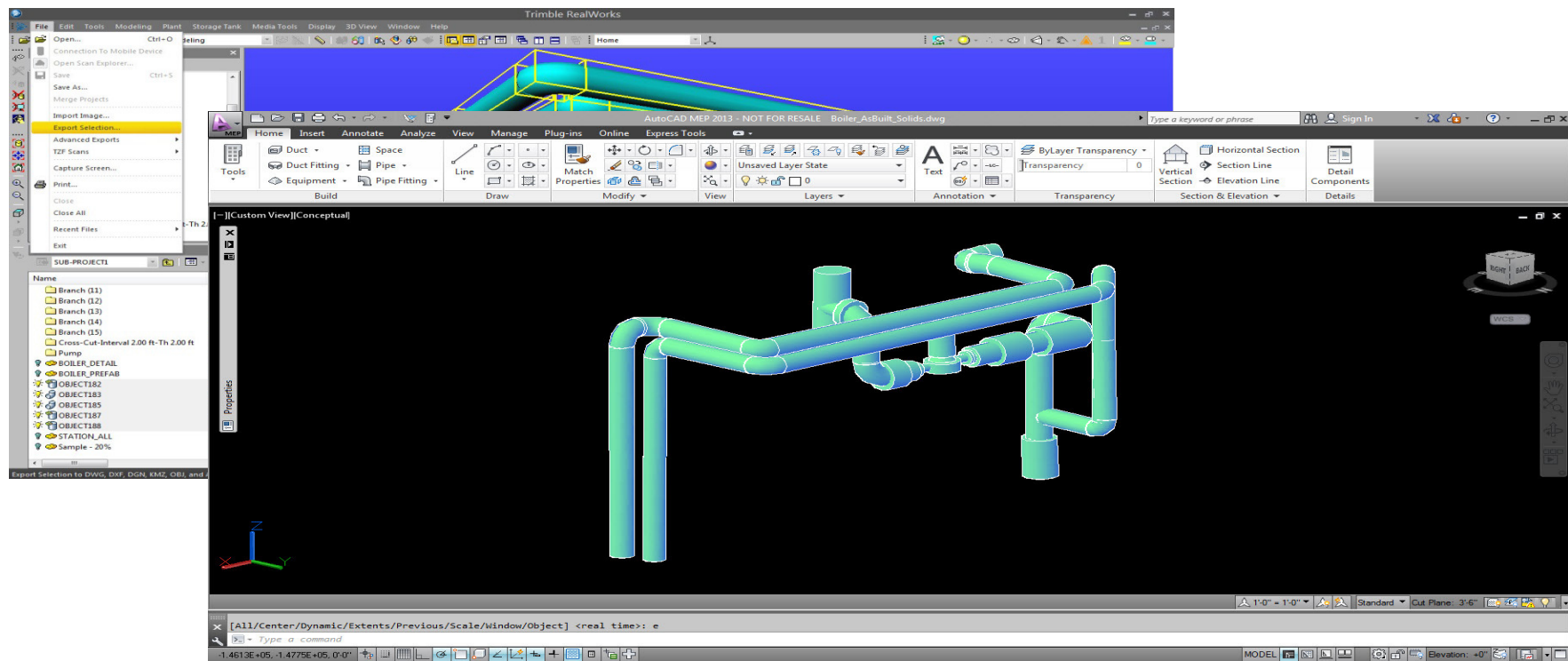


Modelagem da Nuvem de Pontos





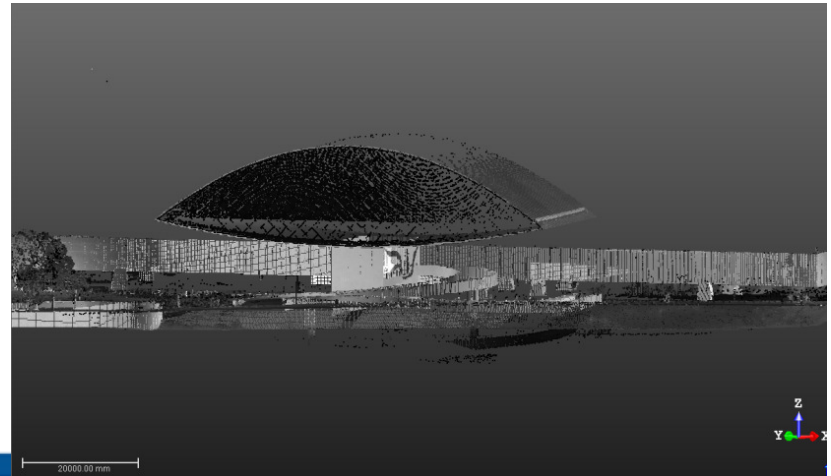
Exportação de Sólidos 3D



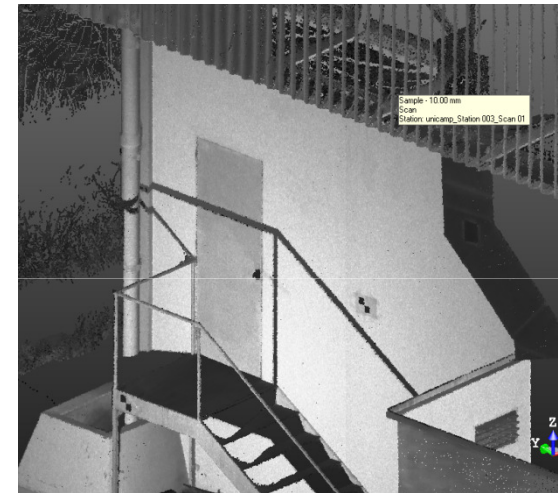


Laser Scanner

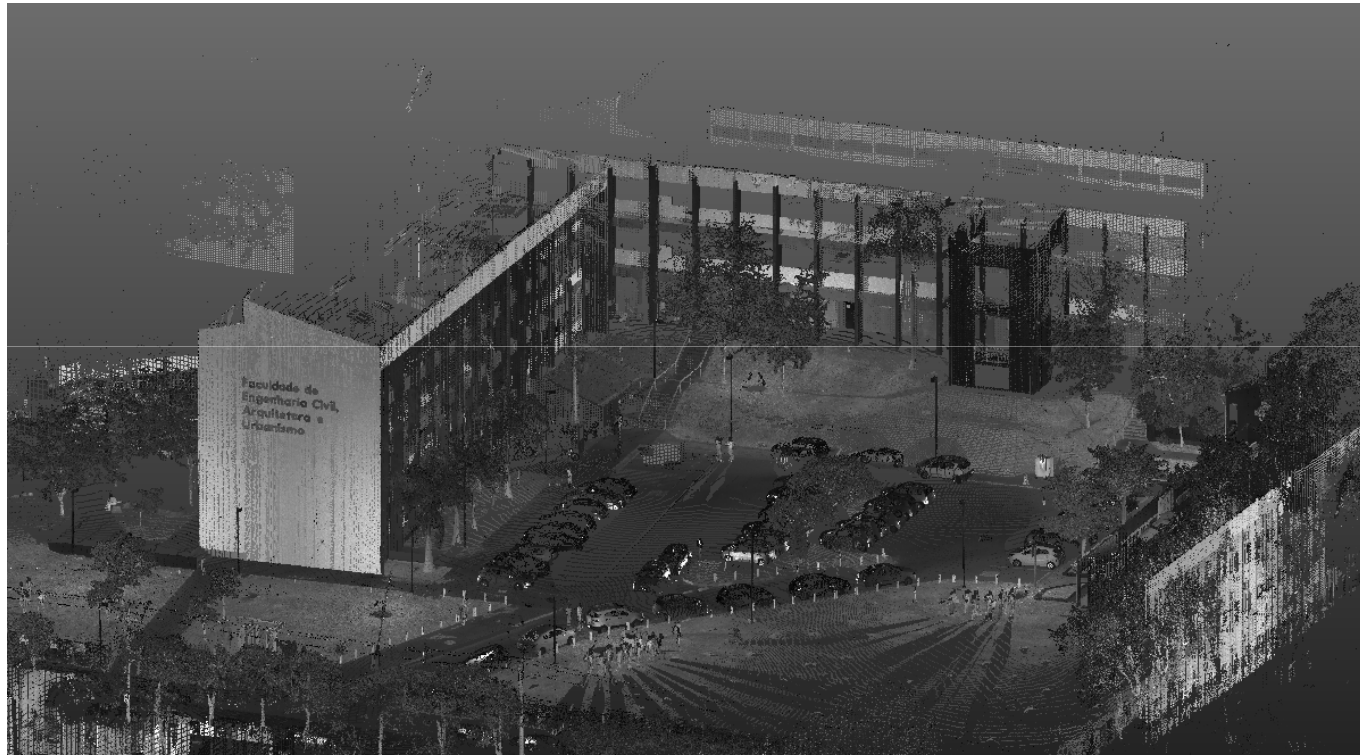
Museu Oscar Niemeyer - MON



≡ Laser Scanner – Unicamp Limeira



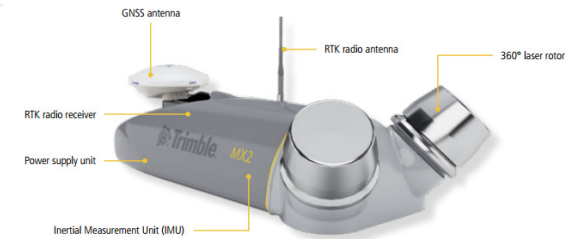
≡ Laser Scanner - FEC



Mobile Mapping



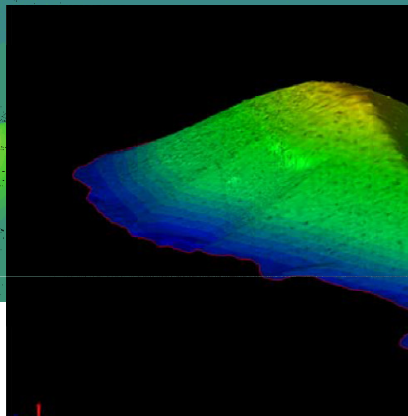
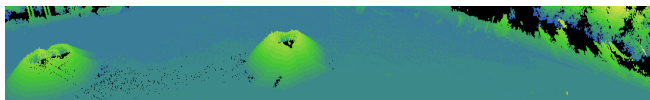
MX7



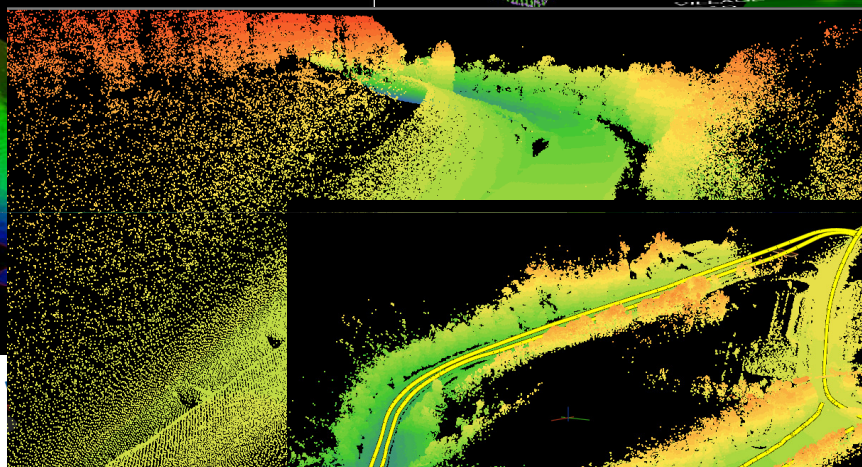
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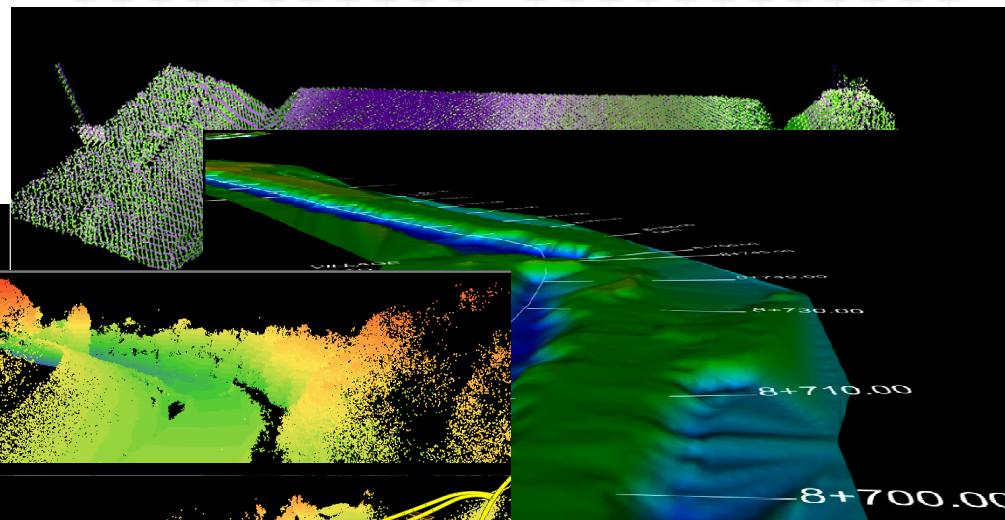
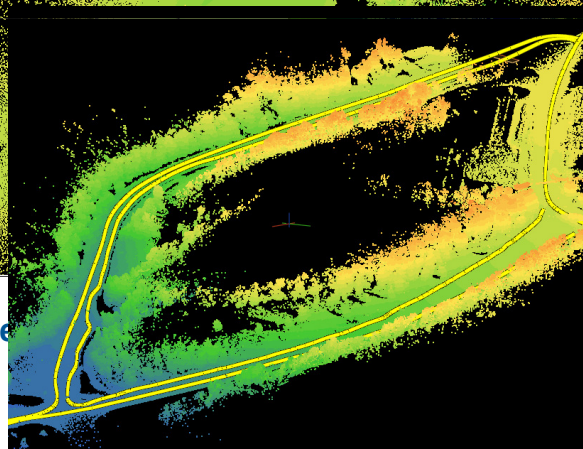
Exemplos



Cálculo de



Levantame

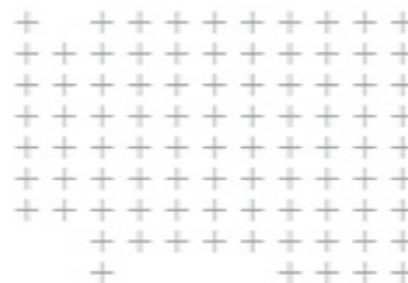


elo digital de terreno



Presenter's name

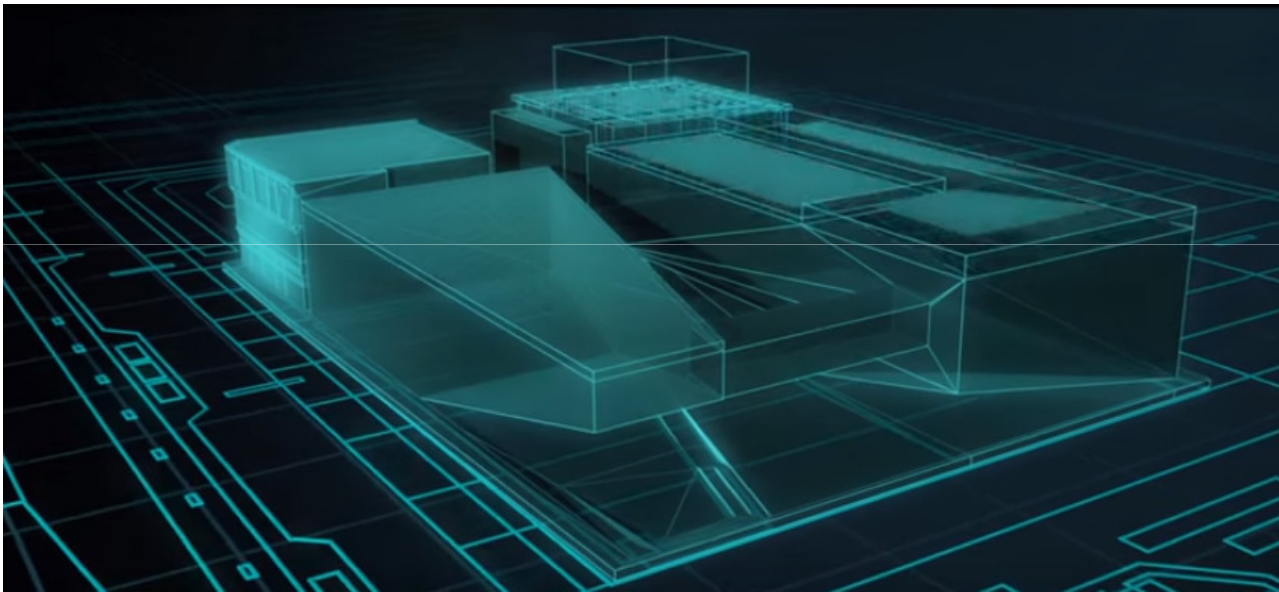




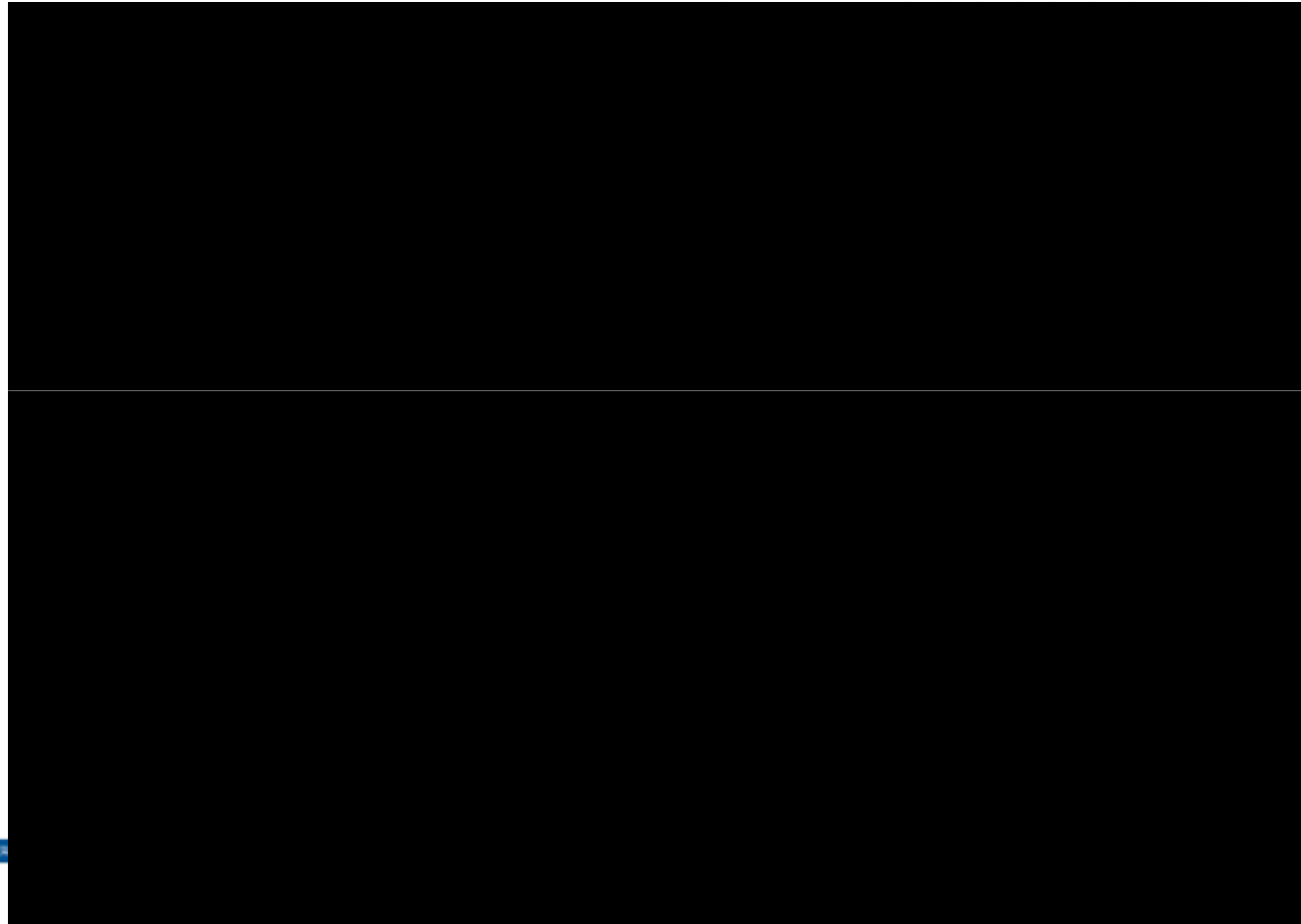
O Futuro da Construção



Microsoft HoloLens - Trimble



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