The 24-Hour House: A house assembled in 24 Hours Using Revit, Navisworks, and BIM 360 Field

Fernanda Cruz, PMP
Architect and BIM Specialist
AGENDA

• About the speaker
• About the company
• About the Project
  o Context and motivations
  o Goals and Concepts
  o The Uses of BIM
  o Results & conclusions
• Questions from the audience
About the Speaker
Fernanda Cruz, PMP
Architect and BIM Specialist

2005 - 2010
UNICAMP
2009 BIM

2011 - 2012
QuattroD
L&M ENG
Data Centers
2012: BIM

2012 - 2013
QuattroD
QuattroD (implementação BIM na FDE)

2014 - 2016
QuattroD
QuattroD (implementação BIM na FDE)

2017
ISITEC
Teacher
PMP Certification
AU
Regular participation

2018
QUATTROD Partner

2019...
AU Speaker

Future...
About quattroD
The 24h House: Context and motivations
Housing Deficit in Brazil

Evolução do déficit habitacional en milhões de unidades

- 2007: 6.78
- 2008: 6.76
- 2009: 6.86
- 2010: 6.75
- 2011: 7.36
- 2012: 7.76
- 2013: 7.53
- 2014: 7.78

Deficit habitacional - em milhões

- 2007: 5.9
- 2008: 5.5
- 2009: 6
- 2010: 5.6
- 2011: 5.4
- 2012: 5.8
- 2013: 6.3
- 2014: 6.1

Componentes do déficit habitacional - em mil

- Habitação precária
- Cobertura familiar
- Ónus excessivo com aluguel
- Adaptação excessivo

Fontes: Pnad, IBGE e coelaboração de Ipc/Unas.

Desconsiderado 2010

Fonte: Abinac e EIV
Civil Construction - an inefficient “industry”
HOW TO DO MORE, BETTER, WITH LESS?
The 24h House: Project goals and concepts
A “popular” house

- Planned for an average Brazilian family
  - 45m²
  - 2 bedrooms
  - 1 living/dining room
  - 1 kitchen
  - 1 bathroom
Flexible and adaptable
Other goals

✓ In accordance with current regulations (NBR 15575)
✓ Sustainable and inclusive
✓ BUILD in 24h
The 24h House:
Main ingredients
A multi-discipline team

<table>
<thead>
<tr>
<th>Designers</th>
<th>Consulters</th>
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<tr>
<td>Idealização e realização</td>
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<td>Apoiadores</td>
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Industry Players
Construction System

Pre-cast concrete walls

Off-site construction concept
Three times assembled and disassembled

- To improve the planning
- To make in the right time

Laboratory tests

- Guarantee materials performance
- Assurance standards and regulations
Technology

- Construction systems

BIM
The 24h House: Uses of BIM
BIM Uses Throughout A Building Lifecycle
Design, Modeling and Documentation
ANÁLISE

NBR 15575: ÁREA MÍNIMA DE VENTILAÇÃO

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NBR 15575: DESNÍVEL DE PISO

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NBR 15575: ALTURA MÍNIMA DE PÉ DIREITO

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COSTS
4D Planning

1st Day

Outside view

Inside view
Construction Monitoring Workflow
Construction Monitoring - Workflow

Prepared BIM 360 Field → Preparing the model → Creating sets → Equipment → Collecting Data → Reports
Construction Monitoring - Workflow

Preparing BIM 360 Field → Preparing the model → Creating sets → Equipment → Collecting Data → Reports
Construction Monitoring - Workflow

Preparing BIM 360 Field ➔ Preparing the model ➔ Creating sets ➔ Equipment ➔ Collecting Data ➔ Reports
Construction Monitoring - Workflow

Preparing BIM 360 Field
Preparing the model
Creating sets
Equipment
Collecting Data
Reports
Construction Monitoring - Workflow

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Construction Monitoring - Workflow

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Preparing BIM 360 Field → Preparing the model → Creating sets → Equipment → Collecting Data → Reports
Results & conclusions
Results

Number of employees needed to build 100 houses

- Tradicional Masonry Houses: 200
- 24h House: 30

Construction Time

- Tradicional Masonry Houses
- Casa 24H
The 24h House Assembled Live on April’2019
Expectations X Reality

Do You Believe in BIM?
THANK YOU!