



# Future of Making Things for Construction with BIM 360

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AEC Technical Marketing Mgr, AEC Education



## Agenda

- Why construction
- Construction industry challenges
- Technology trends
- Technology solutions
- Learning resources
- Business opportunities
- Q&A





# Why Construction

## Why Construction





## Digitization opportunity



21

Construction

22

Agriculture & Hunting





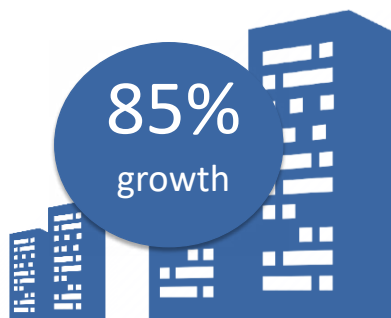
# Construction industry challenges

## Challenges facing the construction industry

Construction demand is growing rapidly

2014

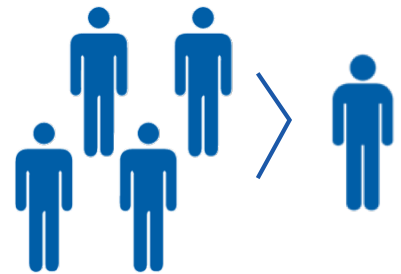
2030



On-time completion rates are dismal

25% projects  
10% deadlines

Construction labor pool is shrinking







# Technology trends



## Technologies as enablers

Cloud computing



Prefabrication



Internet of Things



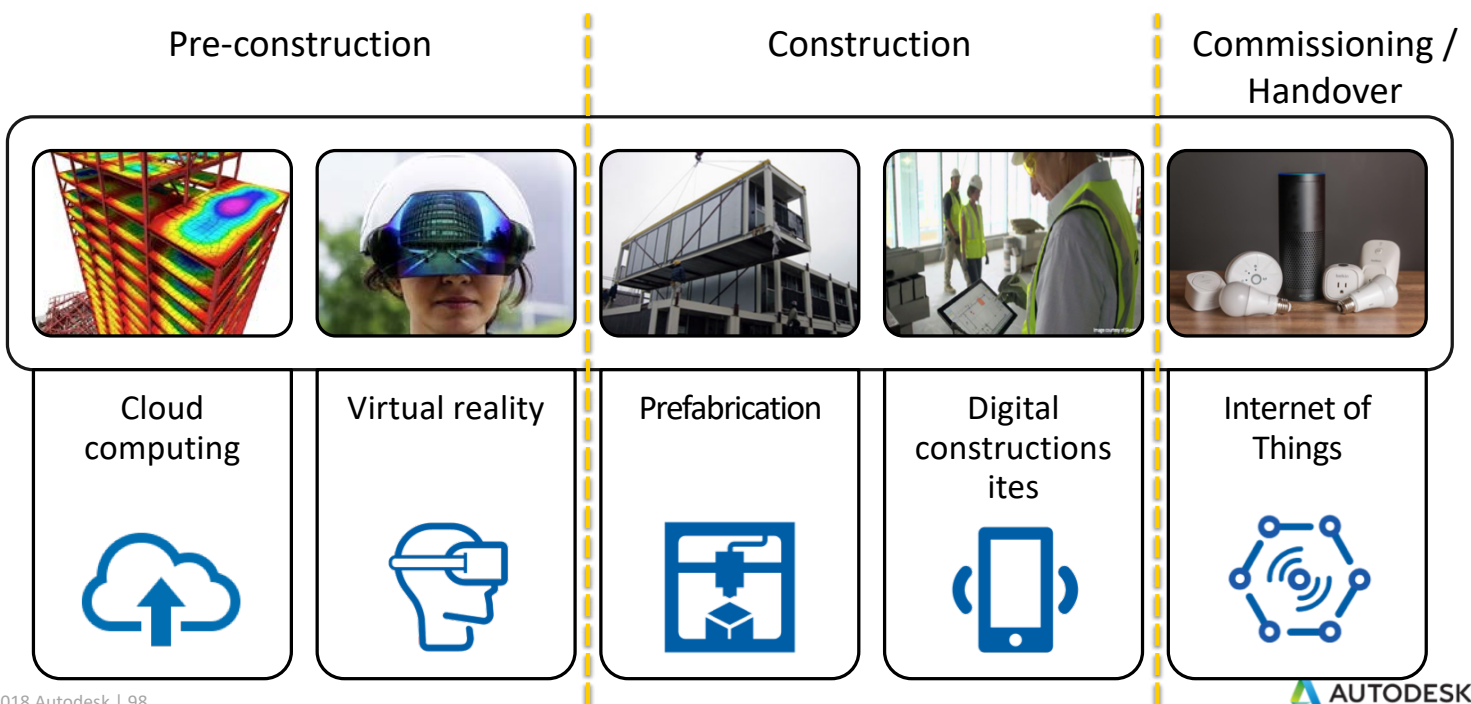
Virtual reality



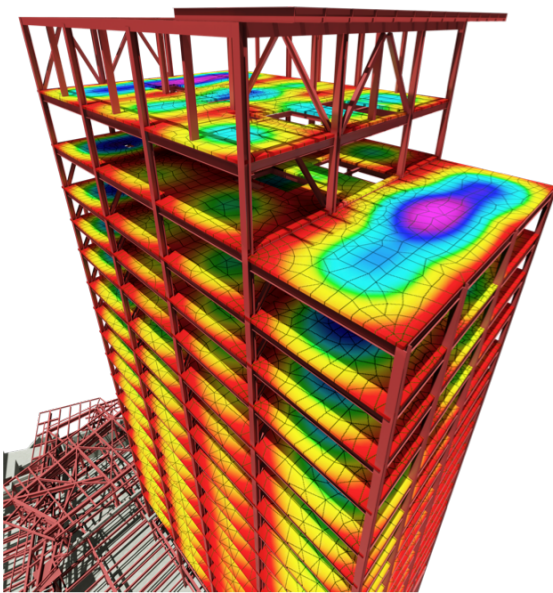
Digital construction sites



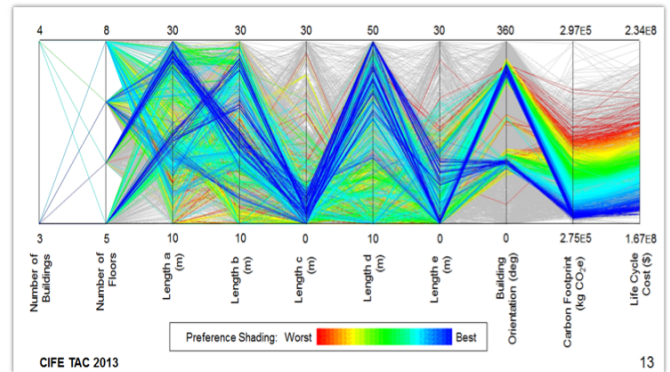
## Five technology trends in construction



# Cloud computing



- Evaluate multiple “what-if” scenarios
- Analyze big data
- Create construction intelligence



## Virtual & Augmented reality



- Experience immersive environments
- View project delivery in context
- Shrink boundaries between physical and virtual worlds





# Prefabrication

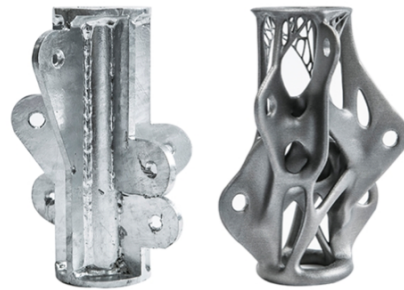


## Prefabrication



Example of prefabricated modular construction

- Manufacture in controlled environments
- Produce higher quality products
- BIM to manufacturing is more accessible



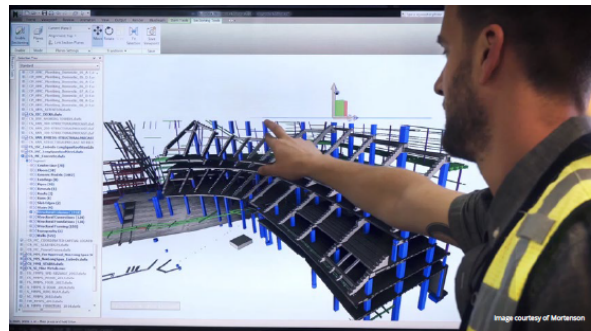
Example of traditional versus additive manufacturing

## Digital construction sites



Mobile applications

- Access centralized project information
- Access data anywhere
- Manage projects at the point of construction

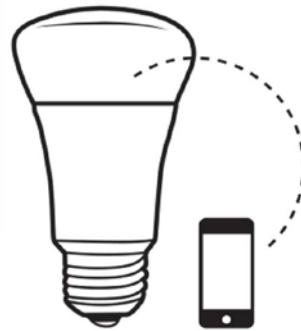


Virtual construction access on-site

# Internet of Things



- Connecting physical things to systems
- Increase the number of smart buildings
- Reduce operational waste for owners





# The Era of Connection

Image courtesy of Odeh Engineers, Inc.

Source: FARG

ALARM

REPETITIVE  
MOTION SENSING

# BIM plus the power of the cloud



Collaboration



Continuity



Insight



# Technology solutions

## Connected BIM

Pre-  
construction



Construction



Commissioning  
/ Handover



AUTODESK® BIM 360™



## Autodesk BIM 360

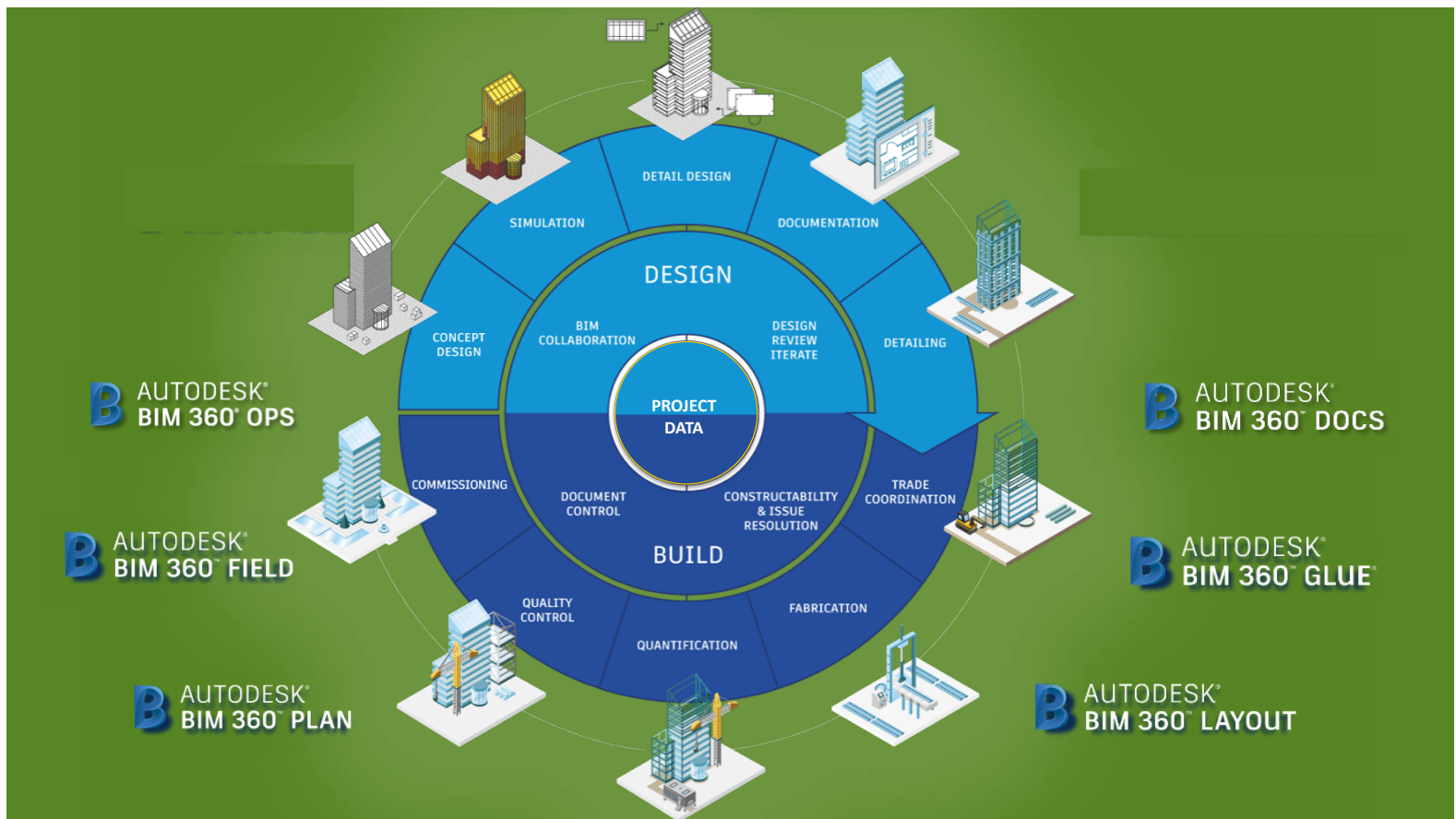


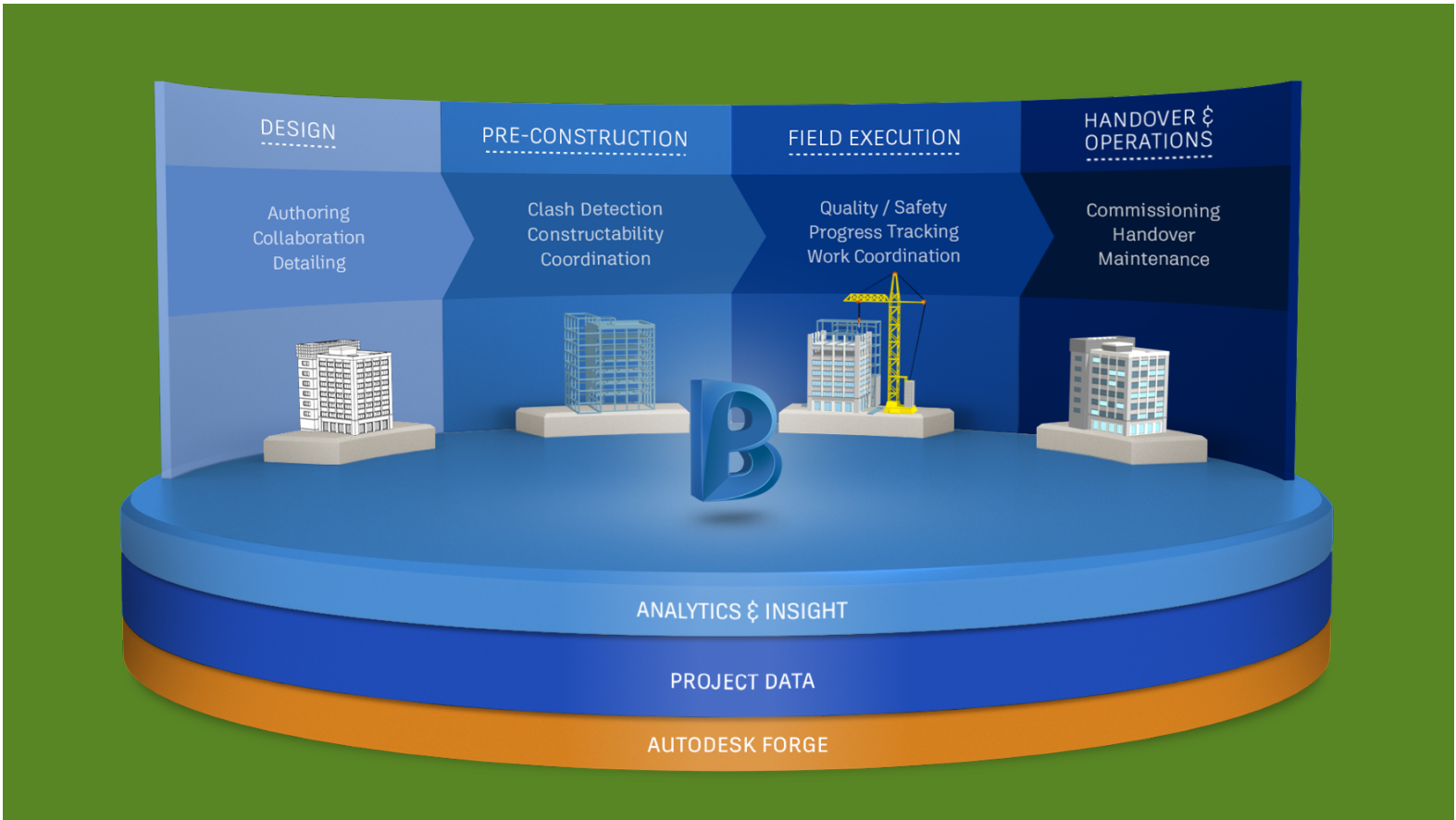
BIM 360 works for

- Owners
- Design teams
- Construction teams

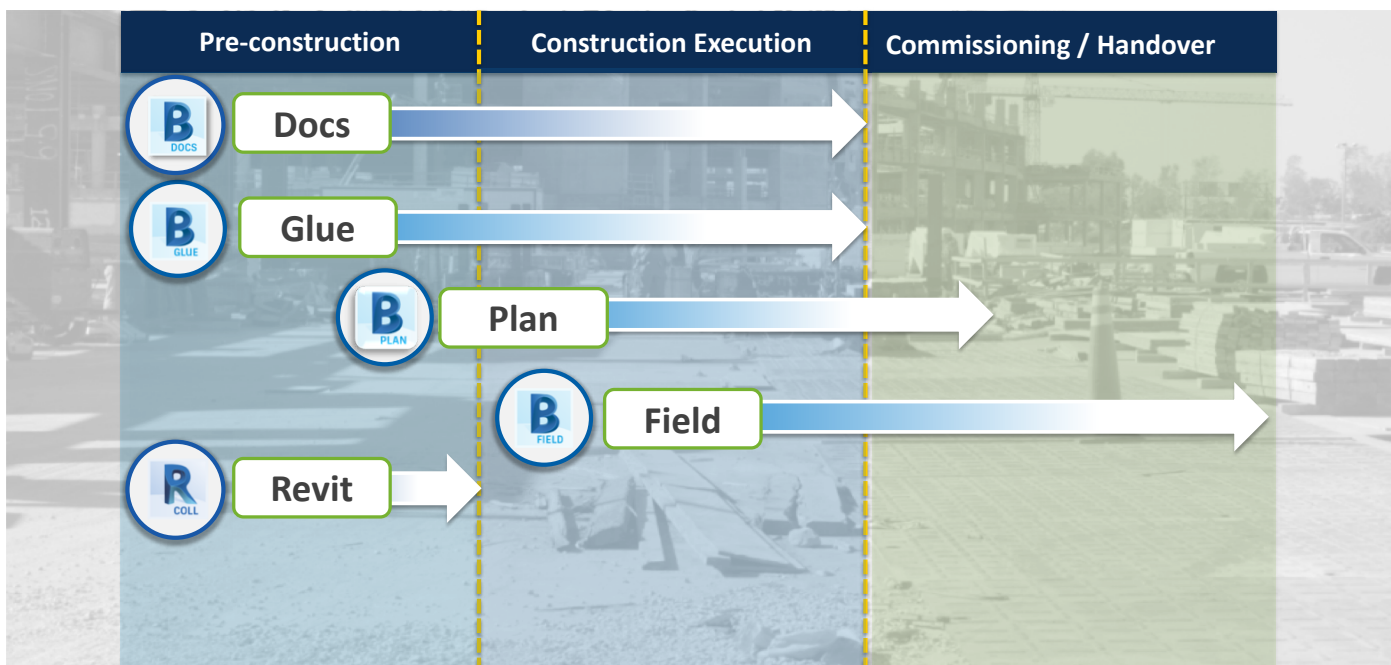
- Access centralized project information
- Access data anywhere
- Manage projects at the point of construction







# Autodesk BIM 360





## Academic case studies



# Milwaukee School of Engineering

## CM-4321 Project Management II



### About the project

- CM students develop a preconstruction proposal based on the given Revit model of the Trios Care Center at Kennewick, WA provided by general contractor

### Student outcomes

- Leverage cloud-based collaboration workflows
- Access information from BIM models

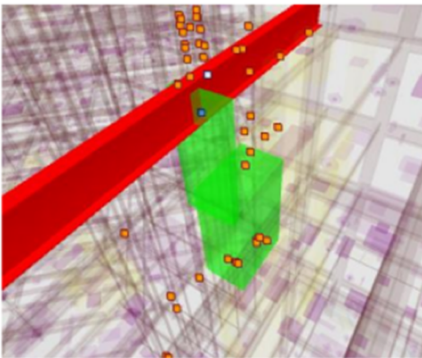
### Autodesk tools used

- Revit – model quality control and quantity takeoff
- BIM 360 Glue – Clash Detection in the cloud
- Navisworks – 4D Simulation

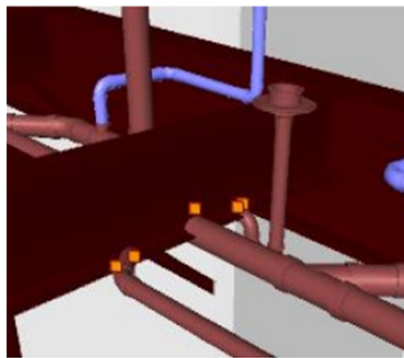


# Milwaukee School of Engineering

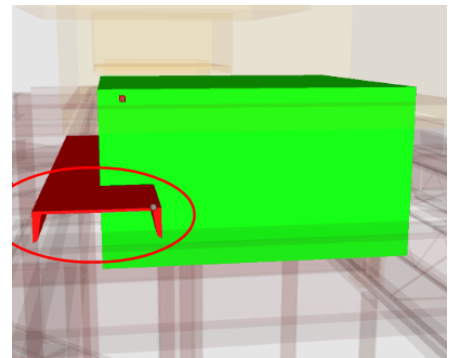
Structural & Electrical  
clashes



Structural & Plumbing  
clashes



Structural & HVAC  
clashes



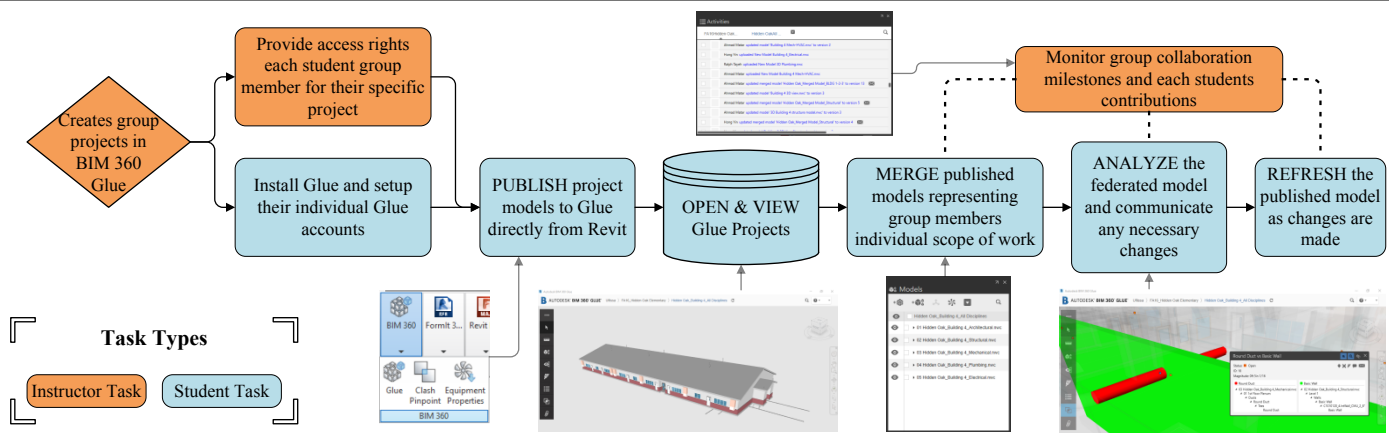
# University of Florida –Graduate BIM Course

## Autodesk BIM 360 Glue

### About the course

- Teams create BIM models of existing public schools in the State of Florida based on as-built drawing sets
- Teams coordinate and manage as-built models using BIM 360 Glue cloud service
- Teams are graded primarily on: Model quality, accuracy, collaboration, and presentation

### Team Project Process

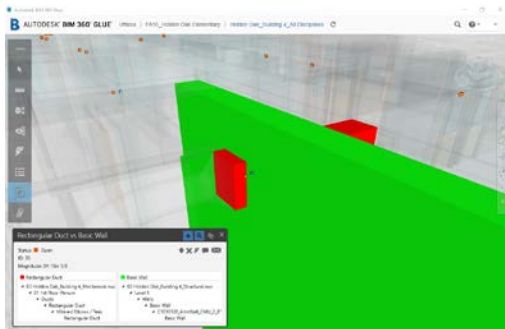


# University of Florida –Graduate BIM Course

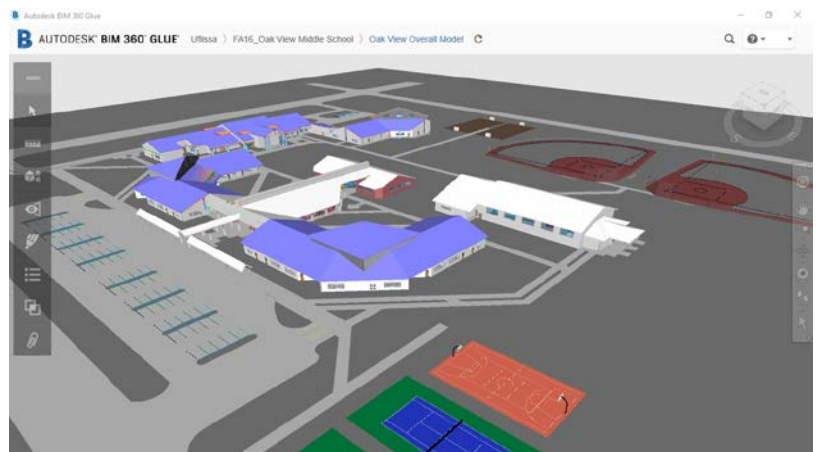
## Autodesk BIM 360 Glue (Continued)

### Student outcomes

- Acquire virtual collaboration experience using BIM 360 Glue
- Perform 3D model coordination and clash detection to comprehend changes
- Gain an appreciation for coordination workflow processes prevalent in AEC projects



Clash Example from team project



Elementary School As-Built Model Development



# Learning Resources



# Engaging with Autodesk

## Autodesk Education Community

Free\* access to software for students and educators

[autodesk.com/education](https://autodesk.com/education)

Educational licenses for

- individual use at home or school
- institutional use inside classrooms or computer labs

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## Autodesk Design Academy

Free access to content and learning tools  
[academy.autodesk.com](https://academy.autodesk.com)

Unlock student creativity with free projects and courses to introduce students to new technologies and practices in 3D design

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## Autodesk ConTech Academy

Construction technology learning for construction professionals  
[contechacademy.bim360.autodesk.com/](https://contechacademy.bim360.autodesk.com/)

Bolster your existing construction project programs with the latest technology trends.

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## Featured BIM 360 curriculum for construction

Project Coordination. Project Execution.

### Construction Document Management with BIM 360



BIM 360 Docs, BIM 360 Glue

### Construction Execution with BIM 360



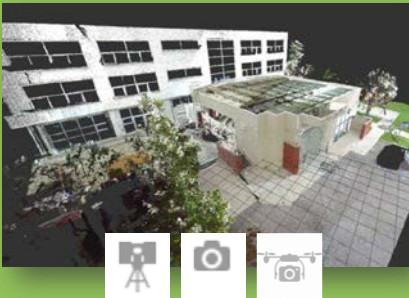
BIM 360 Glue, BIM 360 Field, Navisworks



## Featured curriculum for construction

Capture. Design. Collaborate.

Reality Computing for  
Design and Construction



ReCAP 360 Pro, Revit

Introduction to BIM



Revit

BIM for Construction Mgt  
and Planning



Revit, NavisWorks, BIM 360 Glue




## BIM use in curriculum example



BIM Curriculum

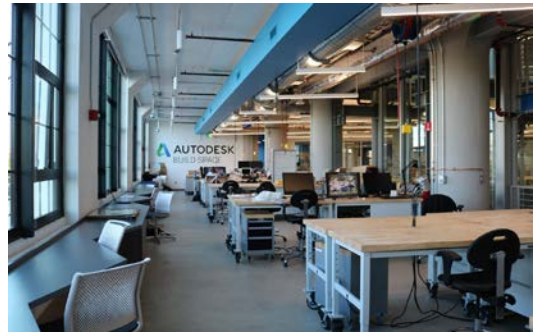


BIM 360 Curriculum

Year 1 Freshman		Year 2 Sophomore	Year 3 Junior		Year 4 Senior	
Intro to Construction Mgt	Construction Graphics 	Construction Drawings and Specs	Electrical and Mechanical Systems	Construction Method Analysis	Temporary Structures	Construction Cost Mgt
	Construction Materials and Systems		Soil Mechanics and Foundation	Construction Equipment	Construction Estimating	Project Control and Scheduling 
	Speech Communication		Mechanics of Materials	Mechanics of Materials	Legal Aspects of Construction	Heavy Construction Estimating
			Construction Project Mgt 			

# Autodesk labs for construction

Building, Innovation, Learning and Design (BUILD) Boston  
[autodesk.com/build-space](https://autodesk.com/build-space)



The Autodesk BUILD Space offers a residency based opportunity for institutions for access to:

- a high-tech workshop for the construction industry
- 3D printers, computer numerical controlled (CNC) machines, and robotic arms
- exploring the potential for factory-based construction



# Career prep opportunities for students



# Opportunities for students to stand out

## Autodesk Student Experts

- Active fans of Autodesk technology
- Deepen software skills
- Network with industry professionals
- Improve career opportunities



"The Student Experts Community in Graz gave me the chance to develop many skills. Besides teaching and lecturing, I gained a lot of social skills and made amazing friends. The knowledge in Autodesk Revit gave me the opportunity to work very early during my studies."

[Angelika Hinterbrandner](#)  
Graz University of Technology, Austria



"With Autodesk Expert Program I have better chances to show myself and my works to the world as well as gain more knowledge from other experts. Autodesk software and programs always enrich my design skills and broaden my perspective."

[Chi-Hung Lin](#)  
National Taipei University of Technology, Taiwan

[www.autodesk.com/studentexpert](http://www.autodesk.com/studentexpert)

# Certification

## Industry-recognized credentials

Help your students stand out with Autodesk Certification

- Accelerate their professional development
- Validate their industry-recognized credentials
- Get them noticed



Product certification exams:

- Revit
- AutoCAD
- Civil 3D



Certified Professional

In recognition of a commitment to professional excellence, this certifies that

(your name here)

has successfully completed the program requirements of

Autodesk Certified Professional:  
Revit® Architecture

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Date

  
Andrew August  
President, Chief Executive Officer

  
veritypartners.com

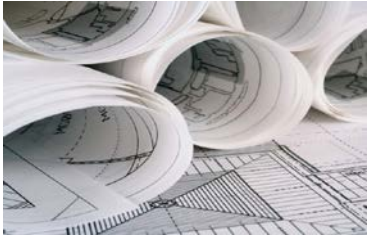
  
Autodesk  
Learning Partner

# Career readiness ladder

## Career role

- CAD Technician \$42k/yr
- Drafter

## Era of documentation

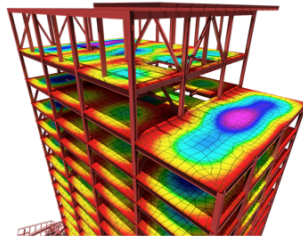


Good

## Career role

- BIM Specialist \$60k/yr
- BIM Project Coordinator

## Era of optimization



Better

## Career role

- BIM Manager \$76k/yr
- BIM Integrator

## Era of connection



Best





# Business opportunities

## Business opportunities

### Institutions

- BIM 360 Up and ready service
- BIM 360 Customization for education
- BIM 360 Training – Virtual & Face to Face

### Value Add Opportunities

- BIM 360 informational presentations
- Connect institution to industry for best practices and workflows

### Educators & students

- Autodesk Certified Professional exams

### Value Add Opportunities

- Connect students to industry internships and jobs



## Call to action

- 1) Engage with commercial and academic customers to assess BIM training opportunities
- 2) Identify instructor(s) who qualify for BIM training
- 3) Invite qualified instructors to the BIM TTT in April (Plano, TX, Date TBD)
- 4) Invite instructors to attend BIM Webinars presented by Autodesk / ThinkEDU (Dates TBD)
- 5) Partner with ThinkEDU to identify Focus accounts and opportunities in your area



Contact: [john.herridge@autodesk.com](mailto:john.herridge@autodesk.com)



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