

The Undertaking of A Complex Project

Chad Van Kampen, P.E. M.ASCE LEED AP

Manager of Preconstruction | Kerkstra Precast – A Division of Fabcon

Jordan Watkins, P.E.

CEO | PTAC Engineering, LLC

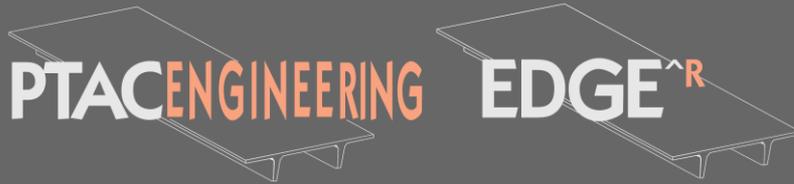
Shannon Cooper

BIM Manager | PTAC Engineering, LLC

About The Speaker

Shannon Cooper

Shannon is the BIM Manager and Revit/EDGE^R support at PTAC Engineering, LLC. He also has 15 years of experience in the precast/prestressed concrete detailing industry.



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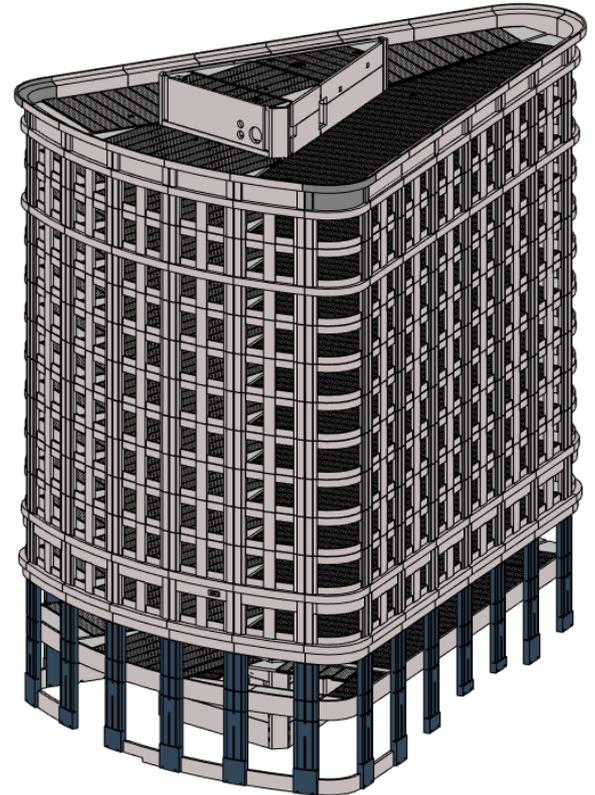
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We have a **be nice** policy
Please be positive and constructive



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AS590280

THE UNDERTAKING OF A COMPLEX PROJECT

JORDAN WATKINS, P.E.
CEO, PTAC ENGINEERING, LLC

CHAD VAN KAMPEN, P.E. MASCE LEED AP
MANAGER OF PRE-CONSTRUCTION, KERKSTRA PRECAST

CHAD VAN KAMPEN, P.E. MASCE LEED AP
BIM MANAGER, PTAC ENGINEERING, LLC

Learning Objectives

- Learn how we successfully used Autodesk BIM360 to coordinate and collaborate with all disciplines of the project.
- Learn how we used the model to fabricate steel forms.
- Learn how we used BIM 360 Glue to resolve clashes between trades.
- Learn how we used EDGE[®]R to produce an accurate model, erection drawings, and shop tickets.
- Learn how we used the model to validate and repair field conditions.
- Learn about vertical integration with casting in windows

Description

In this class we will discuss how we tackled a large complex structure using BIM. 10 Ionia was constructed on a 11,000 square foot triangular parking lot with a slight 7 foot slope in Grand Rapids, MI. This spatial problem was solved using precise layouts, precast concrete, and collaborative digital construction. The team used precast walls by Kerkstra Precast, a firm from Grandville, MI. Constructing a 13-story, 147-room hotel with precast elements with no true corners was very complex. It would have been a tall order without Autodesk products like Revit and BIM360. Plumbing and power had to be run through from the core as new precast pieces were placed. BIM360 Glue was a crucial part of this undertaking, clash detection was a must with this project. The success of combining precast and software technologies is truly remarkable. At the end of this class we will show you drone footage of the complex structure.

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Speaker(s)

JORDAN WATKINS

Jordan is the CEO of PTAC Consulting Engineers. He is a registered Professional Engineer with extensive experience in structural design, detailing, and project management of precast/prestressed concrete structures. He is an acting team leader for working projects. Currently responsible for stability and component design as well as three dimensional modeling of precast/prestressed concrete structures. He is also the manager of the software development branch of PTAC Consulting Engineers and the branch manager of the Daphne, AL office.

CHAD VAN KAMPEN

Chad is the Manager of Preconstruction at Kerkstra Precast – A Division of Fabcon. He has been immersed in the precast, prestressed and tilt-up industry from his graduation at Calvin University. This includes projects from small residential located locally, to large off site projects located in the Marshall Islands. Chad serves in PCI as the Chairman of the FRP Committee, Vice Chair of the Hollow-Core Committee and is active with several other organizations exploring and promoting the use of new materials and technology in precast and prestressed concrete. Chad has Design Build Management of precast structures from several thousand to \$25M+ including pre-construction support, design assist support, estimating, subcontractor scope reviews, sub trade management and coordination, internal shop drawings and ticketing coordination, contract review, and dispute resolution.

Specialties: Conversions of steel and cast in place to precast, precast high-rise structures utilizing hybrid composite steel framing, structures in high seismic areas, large design build / design assist total precast structures, site cast tilt-up, and design with FRP reinforcement.

SHANNON COOPER

Shannon is the BIM Manager and Revit/EDGE[®]R support at PTAC Engineering, LLC. He also has 15 years of experience in the precast/prestressed concrete detailing industry.

INTRODUCTION

A city street at night. On the left is a classic brick building with arched windows. In the center is a modern, curved building with many windows, some of which are illuminated from within. The building has a sign that says 'HILTON' at the top. To the right is another modern building with a glass facade. The street is lit with streetlights, and there are traffic lights visible. The sky is a deep blue. The word 'INTRODUCTION' is overlaid in large white letters across the center of the image.

LOUIS STREET NW

**DOWNTOWN GRAND RAPIDS
RESIDENCE INN**
10 IONIA AVE. N.W.

IONIA AVENUE NW

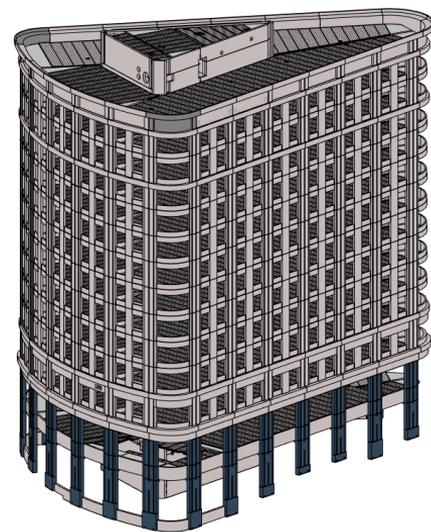
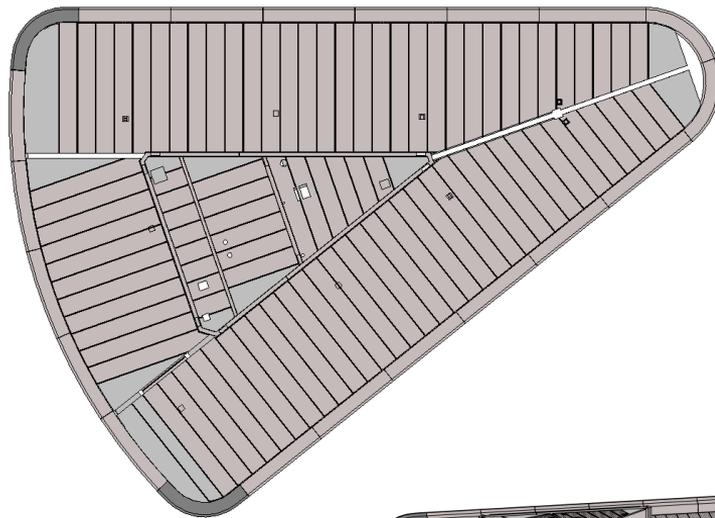
FULTON STREET W



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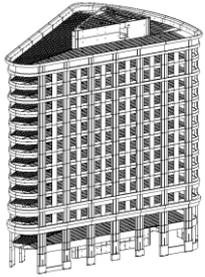
The geometry was tough, there are no corners in the project

*-Robert Szanter
President & Design Director of
Architecture firm Yamasaki*



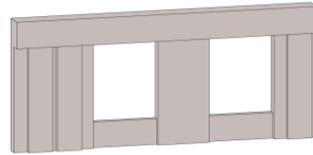
10 Ionia - Residence Inn by Marriott

Statistic



**Total Elements
Modeled**

100,000+



**Total Yards of
Concrete**

5,672



**Total Man
Hours**

12,900



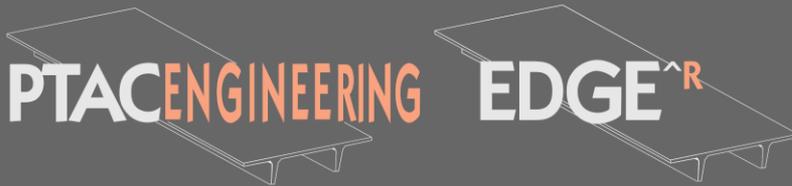
**Recast of
Pieces**

0

About The Speaker

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About The Speaker

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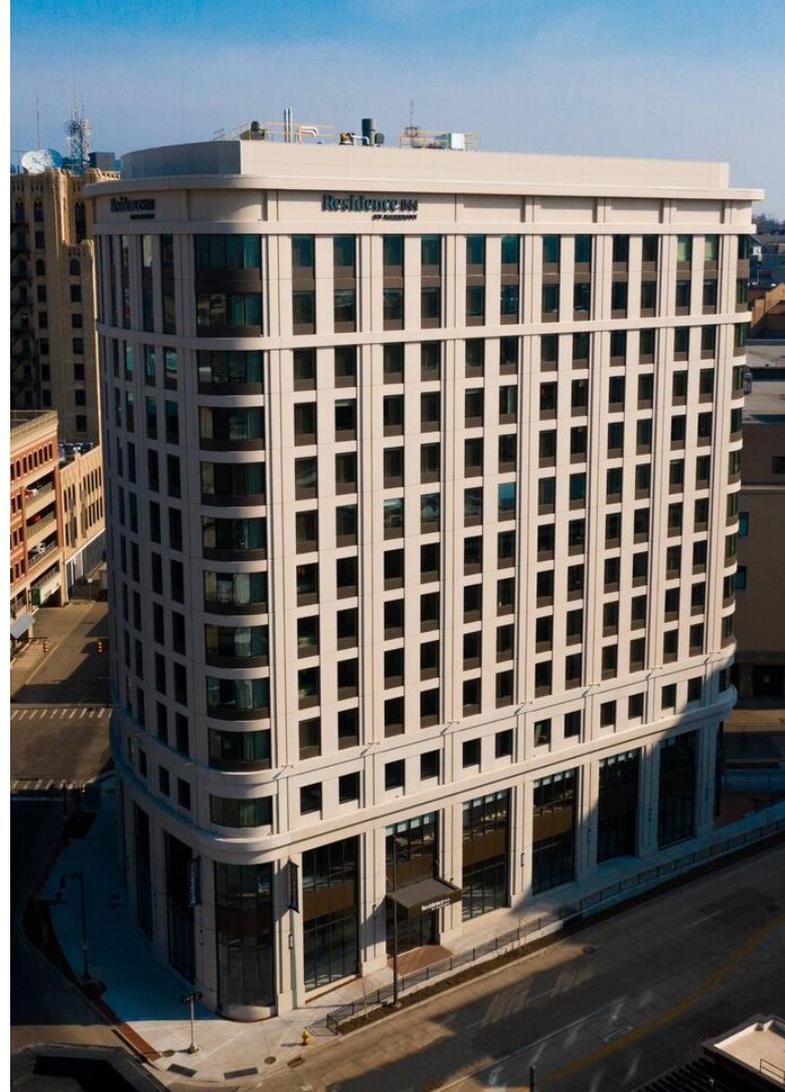
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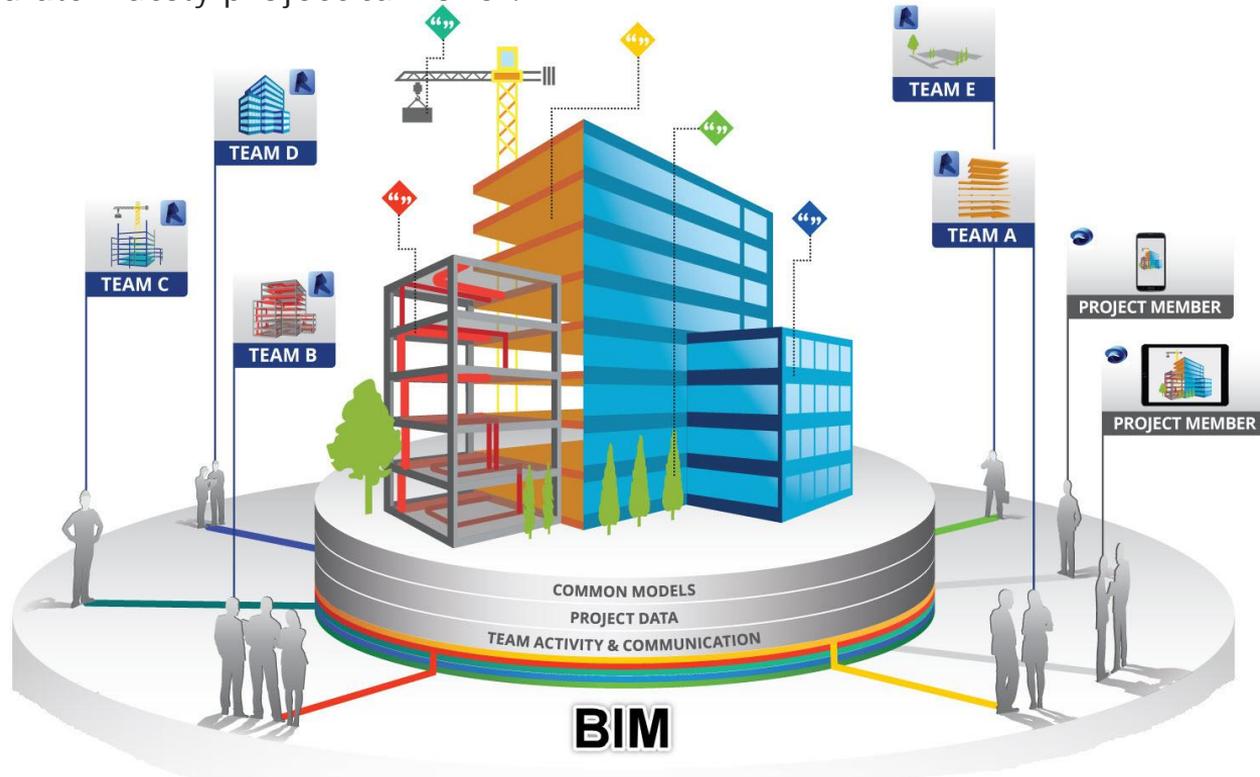
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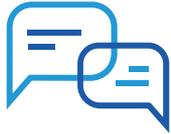
AUTODESK BIM 360

BIM 360 is a cloud-based solution that allows project teams to effectively work in a collaborative environment. It connects all project stakeholders to execute projects from conceptual design through construction and ultimately project turnover.



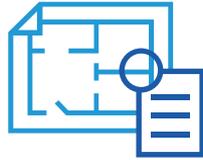
AUTODESK BIM 360 GLUE

Autodesk BIM 360 Glue is a cloud-based BIM management and collaboration product that connects the entire project team and streamlines BIM project workflows.



Integrates with Revit & Navisworks

Manage issues from Revit, Navisworks, or BIM Collaborate and track to resolution.



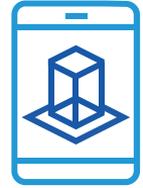
Automated Clash Detection

Catch errors early and spend more time on the biggest constructability issues.



Includes Design Collaboration

Track design progress in a shared timeline to get an overall picture of the project.

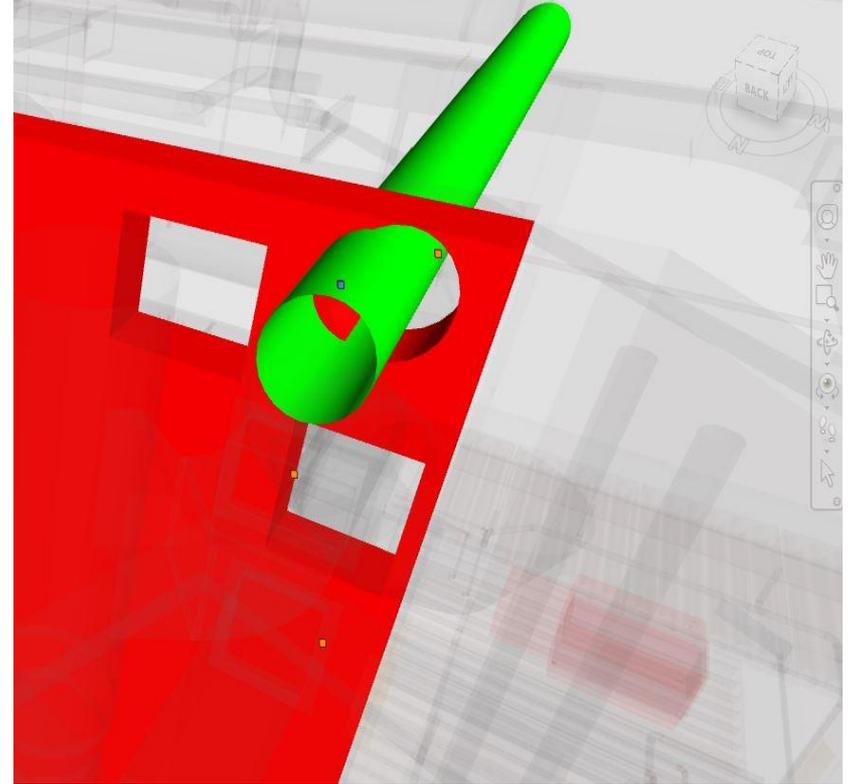
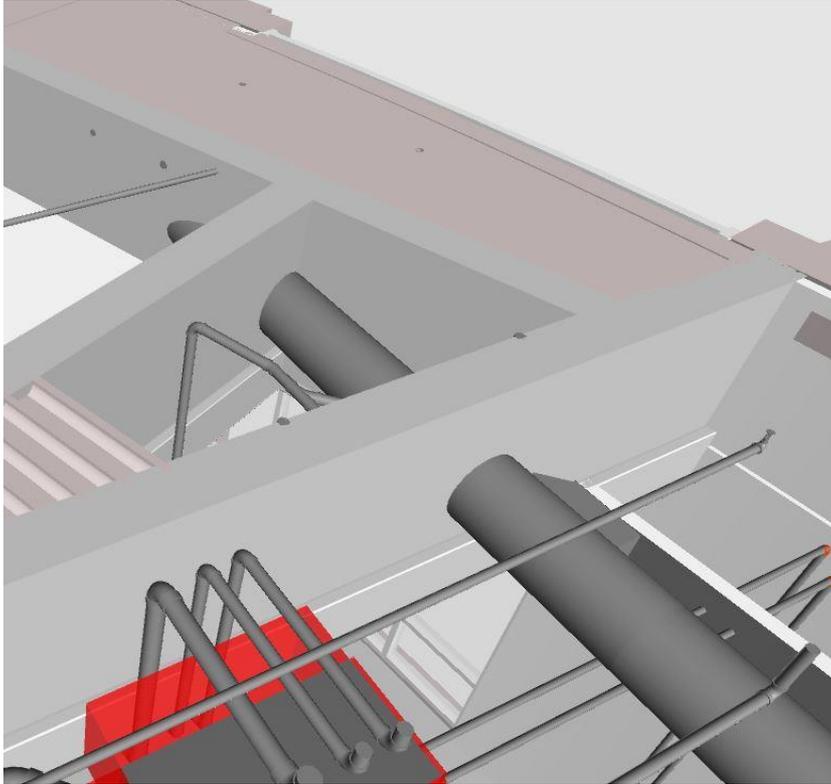


Enable Field Teams from Anywhere

View models on mobile – and give your field team the detailed data they need.

AUTODESK BIM 360 GLUE

Clash Detection



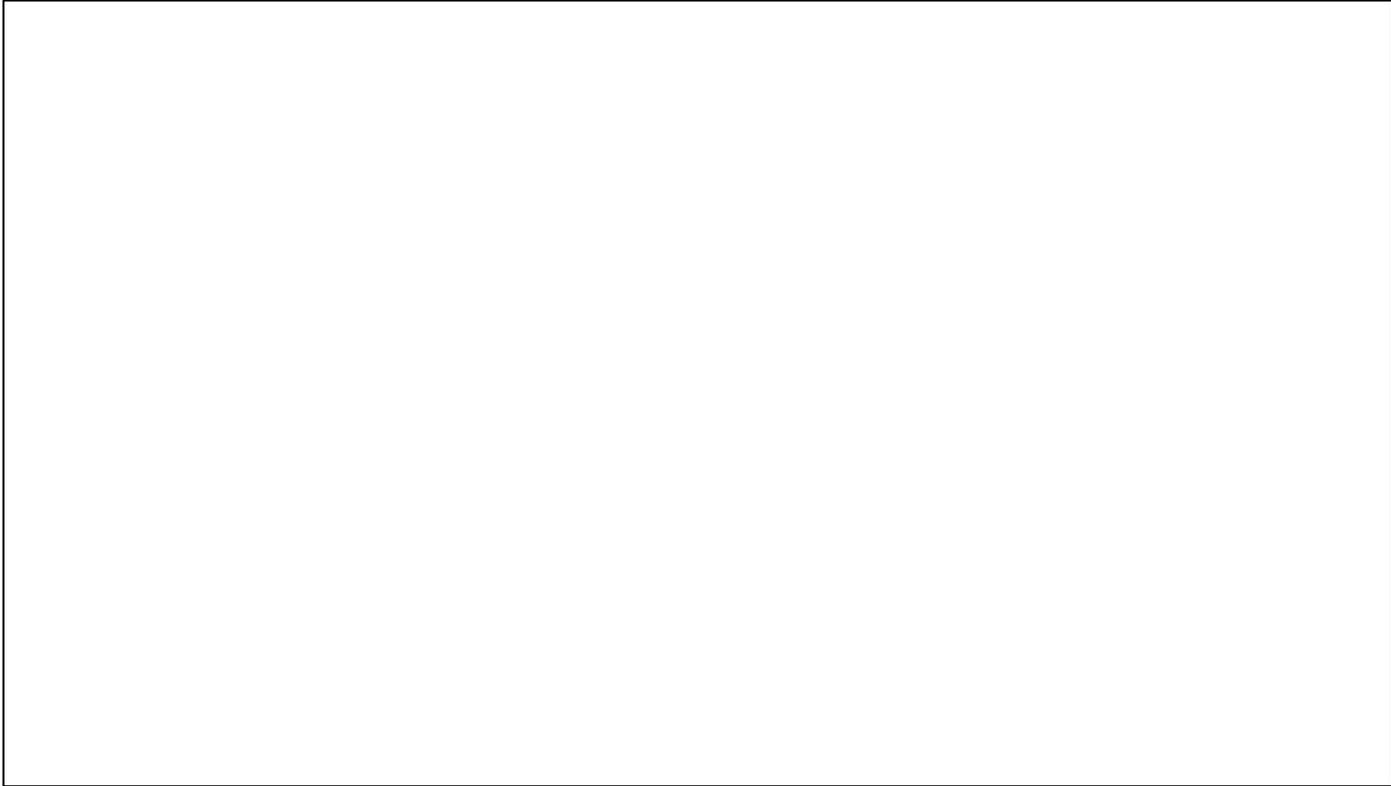
EDGE^R

- **EDGE^R is the software solution that the precast concrete industry has been in search of for quite some time. Utilizing the world's most preeminent graphics software, EDGE can be implemented for more seamless collaboration across multiple disciplines. More than just design, EDGE provides many benefits to the estimation, production, and erection phases of the precast life cycle.**
 - Intuitive Modeling Process
 - User-Friendly Drawing Creation
 - Accurate Material and Product Counts
 - Direct Implementation into Common Enterprise Resource Planning (ERP) Systems
 - Simplified Change Management
 - Utilizing the Full Intention of Building Information Modeling (BIM)
 - Seamless Creation of Shop Ticketing
 - Complete Tracking of Precast Elements



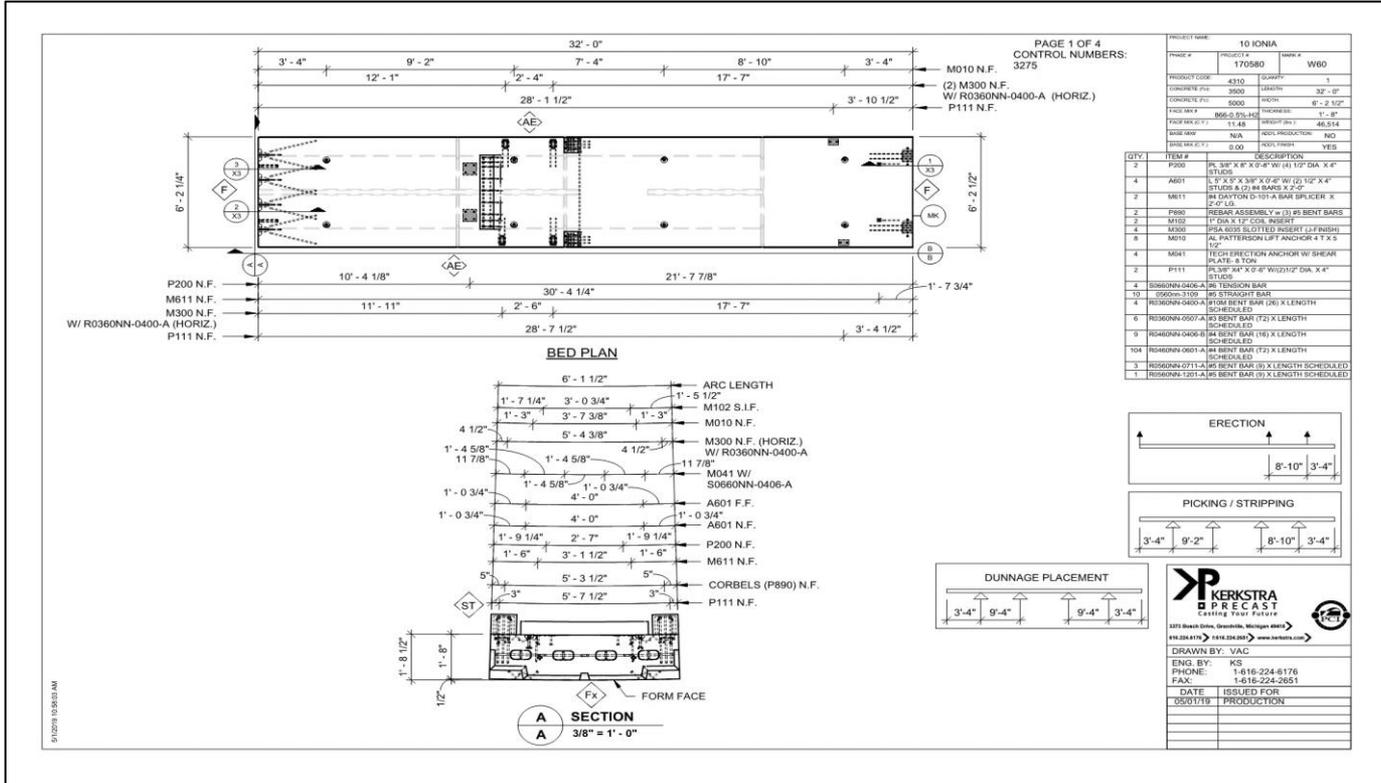
EDGE^R - MODELING

The precast model was built using Revit and EDGE^R



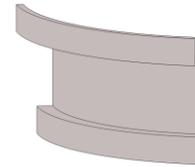
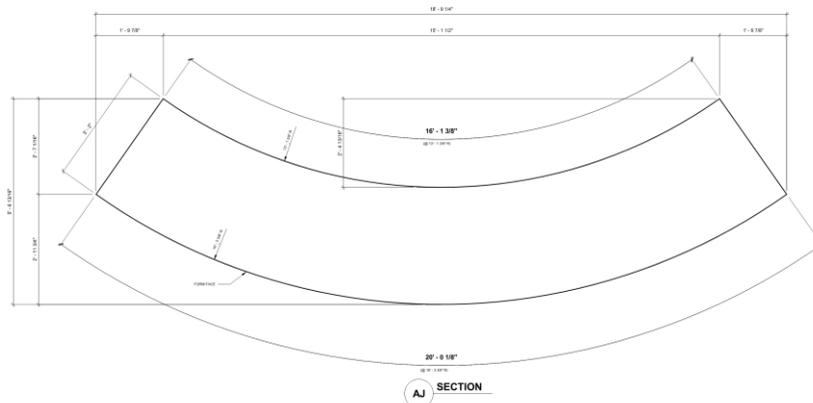
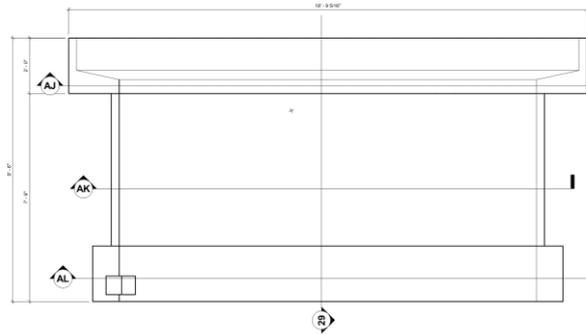
EDGE^R – SHOP TICKETS

Precast shop tickets created using Revit and EDGE^R



FORM GEOMETRY

PAGE 1 OF 2



PROJECT NAME:			10 IONA		
PHASE #	PROJECT #	MARK #			
1	17581	FORM 29			
PRODUCT CODE:	QUANTITY:				
CONCRETE (F6):	LENGTH:		18'-0 5/8"		
CONCRETE (F6):	WIDTH:		7'-0"		
FACE MIX #	THICKNESS:		3'-0"		
FACE MIX (C.Y.)	WEIGHT (SL.)				
BASE MIX#	ADDL PRODUCTION:				
BASE MIX (C.Y.)	ADDL FINISH:				

NOT FOR PRODUCTION

KERKSTRA
P R E C A S T
 CONCRETE FORM SYSTEMS

899 Beach Blvd., Brea, CA 92603
 949.433.8888

DRAWN BY: CAL
 ENG. BY: JAW
 PHONE: 1-800-432-8446
 FAX: 1-800-432-8875
 DATE ISSUED FOR:
 12/18/18 APPROVAL:

Complex Form Geometry

- Forms were made of steel to minimize waste typically seen with wood form building
- EDGE^R produced radiused form drawings for each of the three radiuses on the project.
- Each radius had a single base steel form for the curve.
- Each piece was then formed by adding or subtracting additional steel sections on top of that radius
- 3D modeling allowed the team to determine this possibility and build the forms.
- With out this method there would have been and additional 15 forms required to achieve the geometry of the exterior.



Production Benefits

Minimized Fit Up Conflict

- Pieces were not pre-fit prior to shipping
- Models of the pieces allowed easier quality control of piece shapes.
- Nose of the building was very high profile and made of two pieces.
- Fit up had to be perfect as the visibility of the nose was high based on traffic flow to local arena and concert venues.
- Bottom three floors were simulated limestone precast.



Fabricate Pieces

Rolled Vertical – BIM used to find CG



Pre-Glazed Units

Glazed Panels provided a dried in floor





Kurtis Fritz
Project Manager
Wolverine Building Group

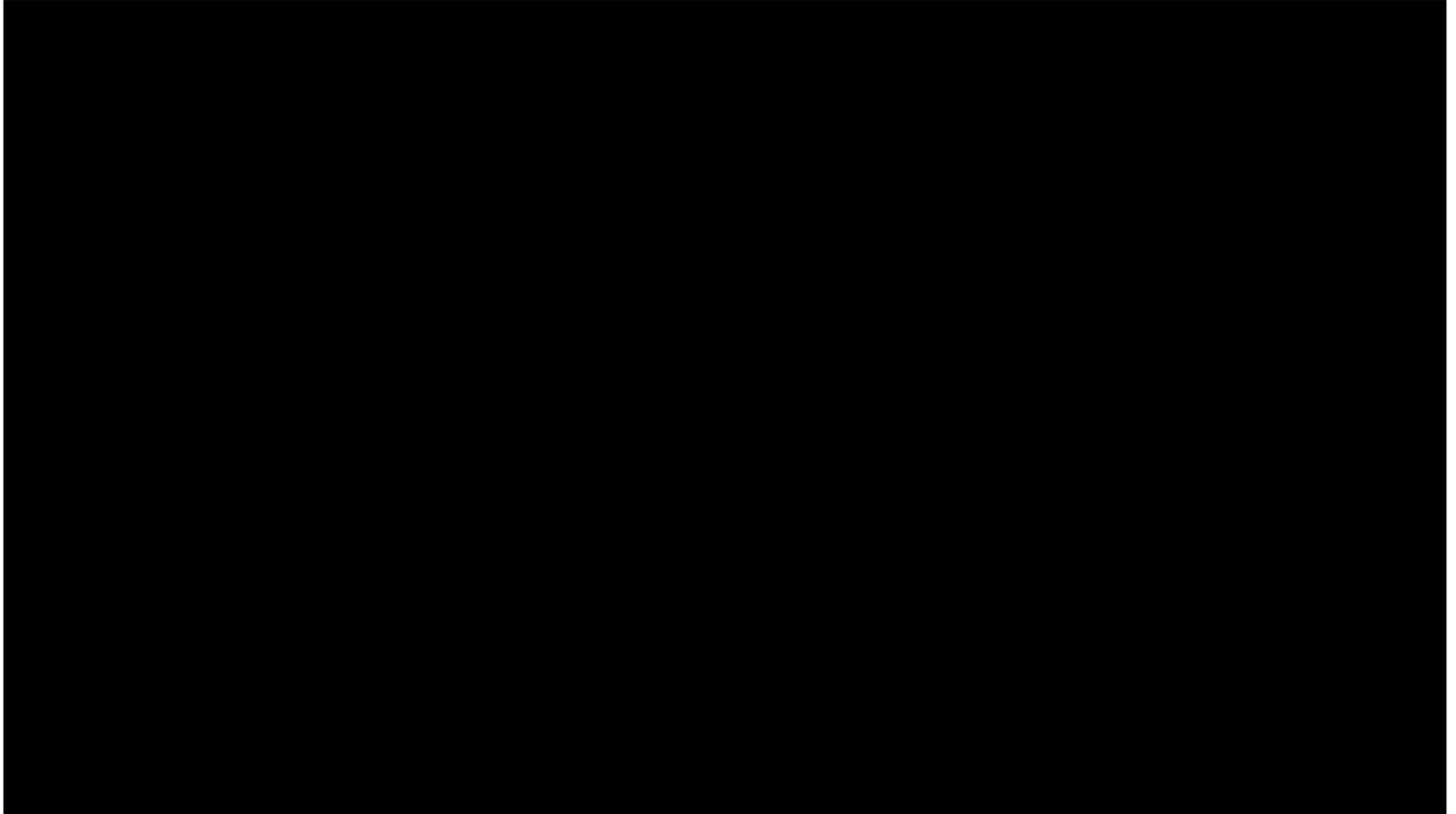
“The 10 Ionia project was a success, in large part, due to the collaborative use of BIM technology throughout the project life cycle. Due to the complex geometric shape of the building and the structure being predominantly precast concrete, it was critical to pre-plan every opening and penetration in the building.

With over 500 precast wall panels packed with reinforcing and over 1,000 precast concrete slabs, coordinating all of the penetrations in the field would have been a tremendous ongoing effort throughout the project. Kerkstra Precast was able to design for every planned penetration and adjust in-wall reinforcement prior to any panels being cast. This significantly reduced risk and unforeseen cost, as it allowed for a more efficient installation schedule and fewer field modifications for all trades involved. As the General Contractor on the project, Wolverine Building Group was able to navigate changes with all design disciplines quickly due to the use of the building model, which allowed for a lower potential of schedule impact and a quicker turnaround on pricing.”

OUTRO



10 Ionia Residence Inn by Marriott | Time-Lapse





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Q & A

 Comment (4)

Comments



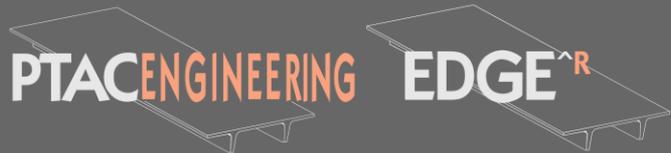
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Please be positive and constructive



Residence INN
BY HILTON

THANK YOU!



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Kerkstra

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The background features a dark, almost black, space filled with several large, metallic, 3D-rendered geometric shapes. These shapes, which resemble stylized letters or architectural components, are positioned in the corners and along the edges, creating a sense of depth and modernity. The lighting highlights the sharp edges and reflective surfaces of these objects.

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