

323184

Additive Manufacturing for Production

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Learning Objectives

- Demonstrate the ability to use Revit models for basis of design
- Show how standards setup early helped drive the design
- How the R&D process worked before generative design & after
- Show users how the final product changed the New York skyline

Description

This class covers the use of Revit to create 3D mold drawings that are used to produce large format 3D printed molds. Walking thru the process of going from conceptual design to production mold tickets then to program specific mold files with Revit and Inventor. We will demonstrate a real life project that went from a dream to reality on less than a year. Attendees will be able to see real world R&D project, the use of (and before) generative design and the affects in production on a project that now highlights the NY skyline.

Speaker

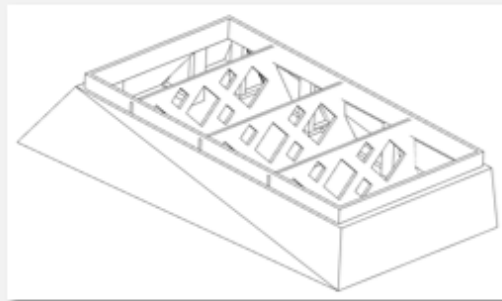
As the BIM Managing Director at Gate Precast Company Nate Brooks brings almost 18 years of precast and detailing experience to the table. Daily working with a group of about 90 Engineers and Detailers to manage Gate's Standards, look for new technology and work on several R&D projects throughout the many departs and locations at Gate. Nate's experience with precast ranges from structural products to hollowcore and lastly at one of Gate's architectural plants. While working with all the different products I have had the pleasure of working in Production, the Field, Trucking, Finishing and Engineering.

How we ended up with 3D printing as an option for precast production.

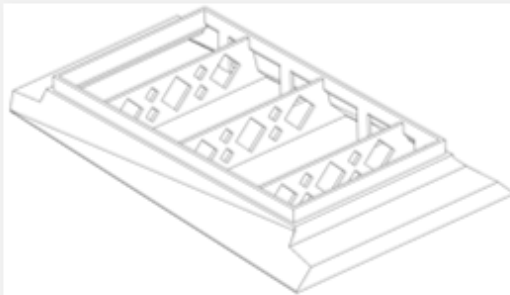
- A partnership with Oak Ridge National Laboratories (ORNL)
- Necessity
- The perfect project
- An R& D team that worked together with 1 goal in mind.

3D Printed Window Inserts

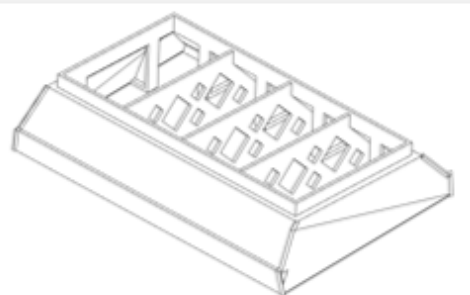
East/West



North



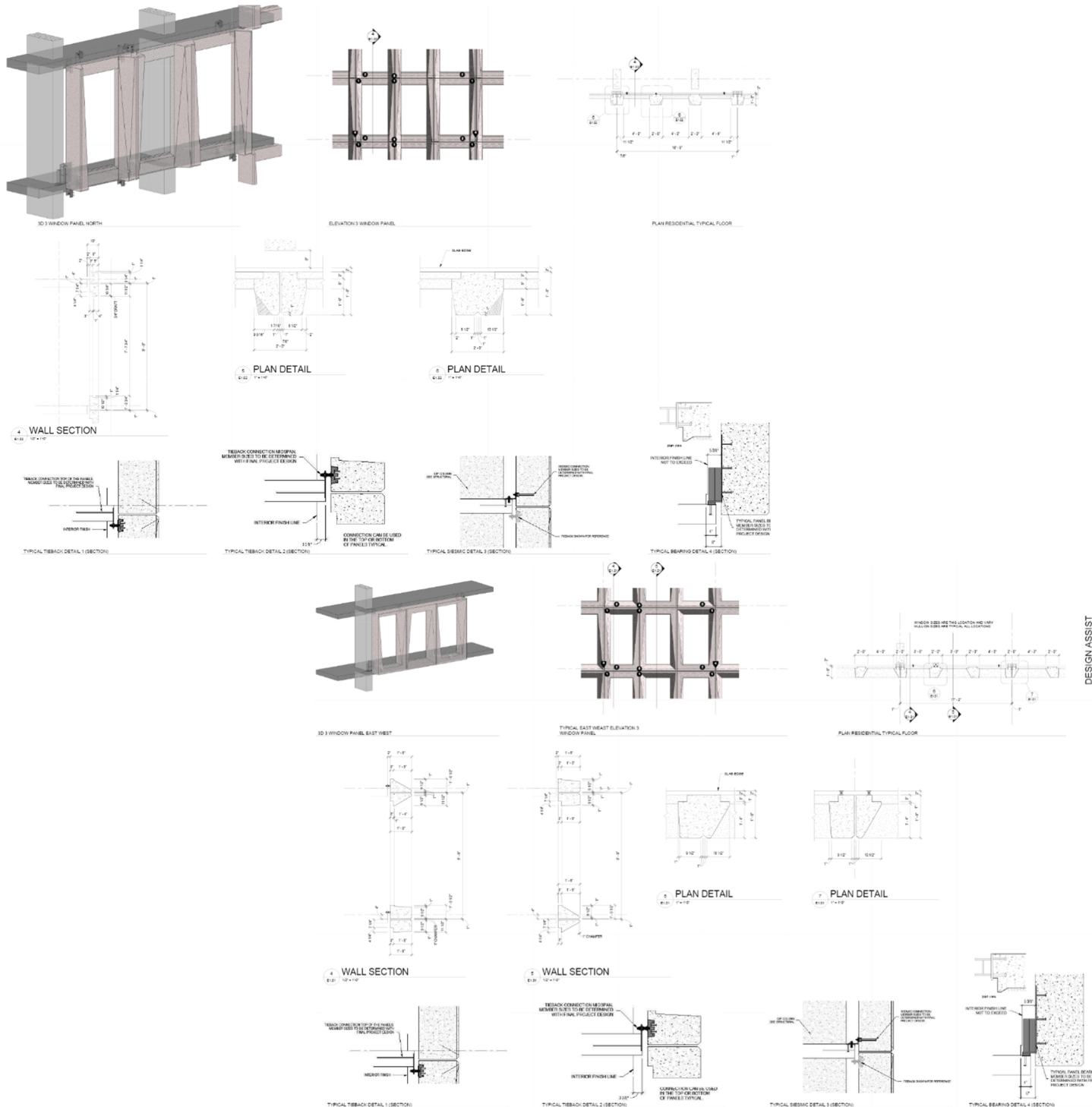
South



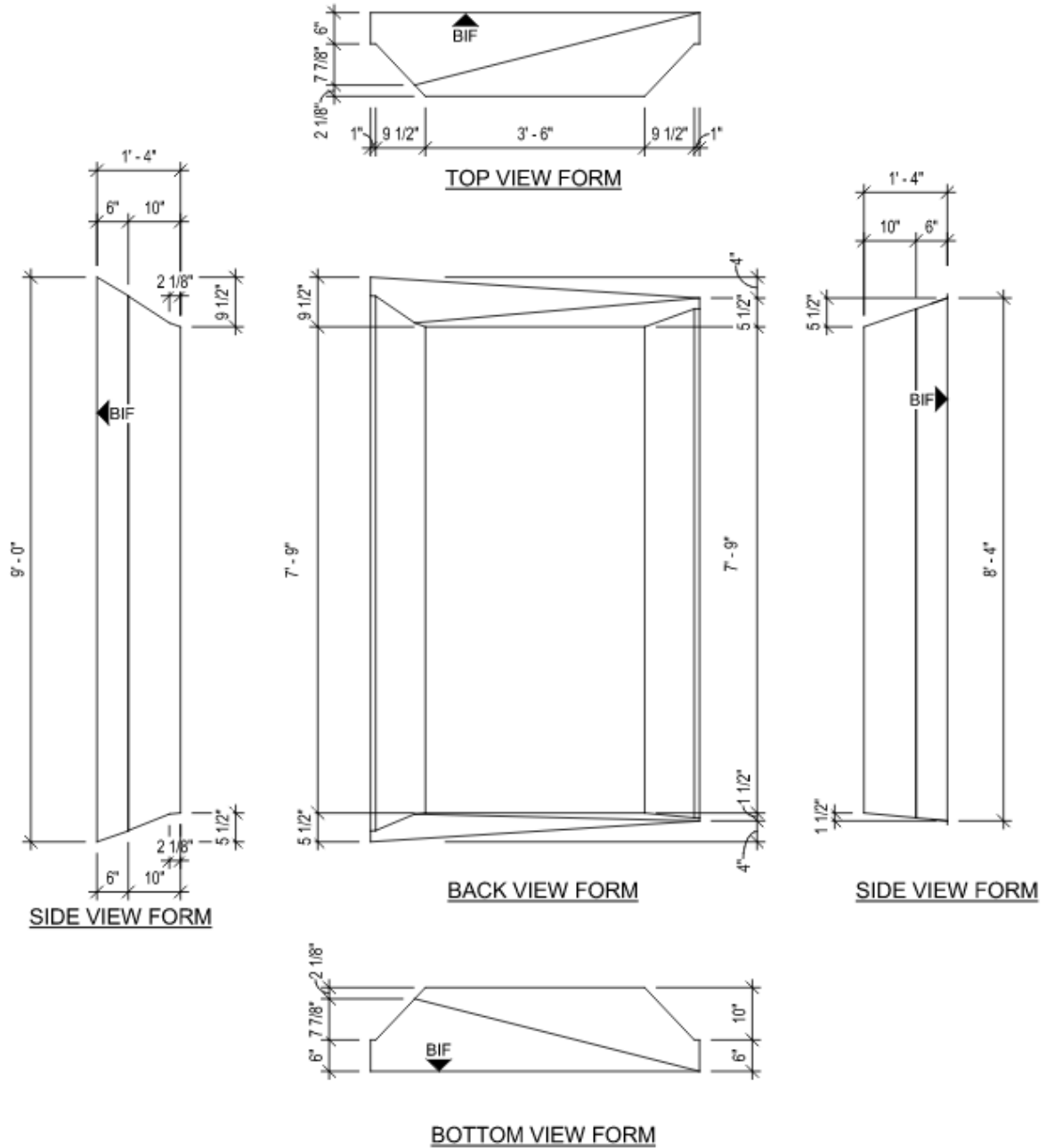
The use of Revit (BIM) was the only solution anyone ever considered for this project due to the complex nature, the need to cooperate between multiple organizations and the need for alternate mold types. Revit allowed us the Design team and the Production team to share files openly.

Standards setup

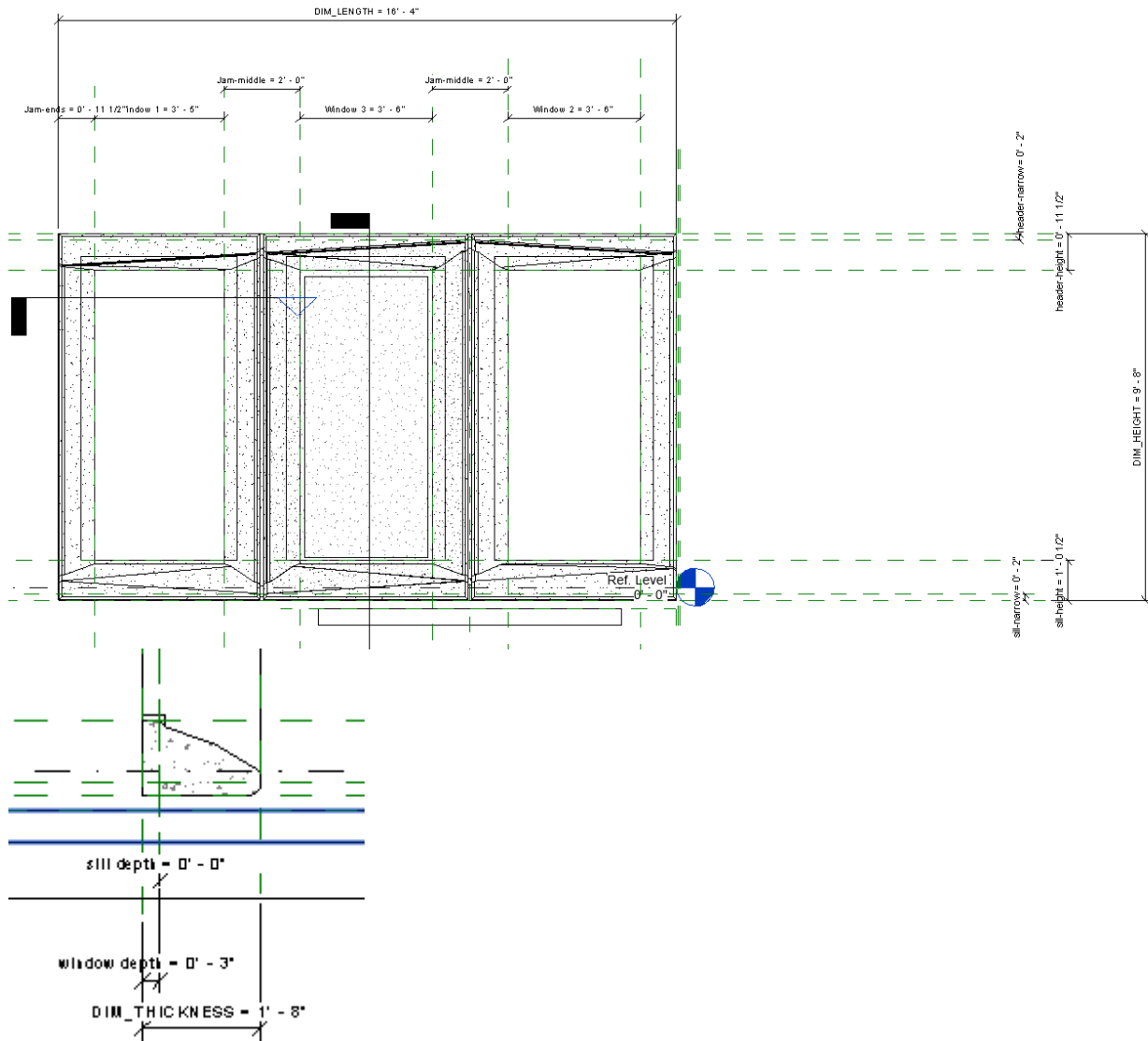
Very early, we realized this project was going to be very parameter heavy. We worked with the architect to build families that worked both with their model and with ours. We built models as we designed locking certain area and allowing others change as the overall size and design of the panels materialized. Working together thru Revit on the same platform and year was critical.



An example of the dimensions are shown below

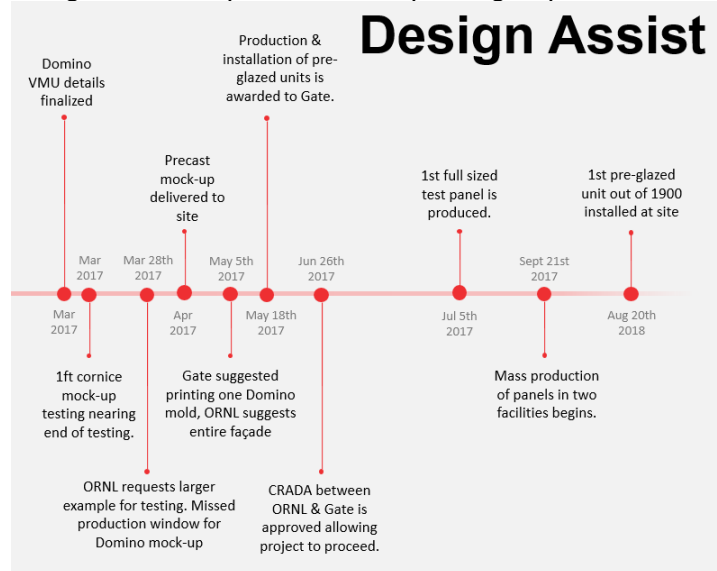


A sample of the panel families used for this project

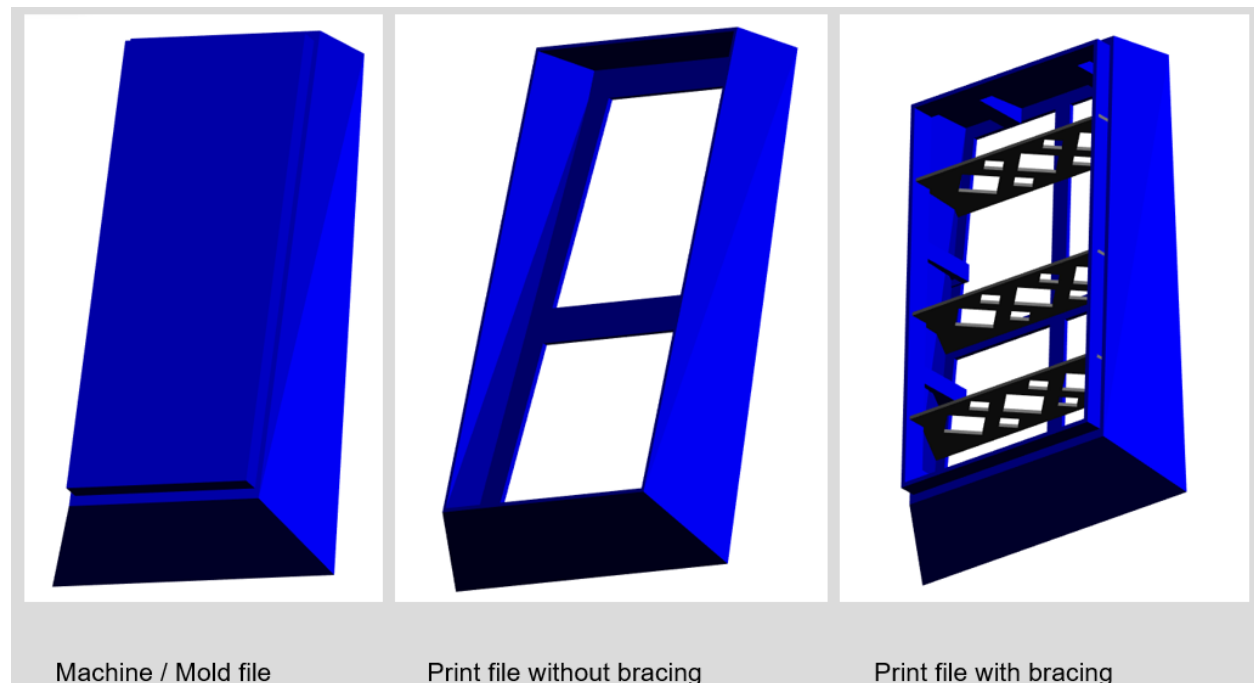


How the R& D Process Helped/worked

3D Printing has been around for quite a while BUT Large Scale Additive Manufacturing has not. A no one had tried to build a mold for concrete production of this magnitude before. Therefore, the R & D process needed to be very well thought out and painstakingly coordinated. Well then, the project schedule came rolling in like a freight train and we had just under 3 months to design, test and prove that 3D printing of precast molds would work so production could start.



The only way this was going to happen was to use Design assist, share our models and coordinate every change immediately as we went thru the process.



Photos of the finished product







