CASE STUDY

Proactive Construction: Generating $2.5M value-add for Catalyst Development through VDC and BIM technology

A West Michigan developer was looking to build a large multi-use building in Kalamazoo. The design-assist cast-in-place post-tension project was very complex and required the use of VDC and BIM technologies to be proactive during the construction process, instead of reactive, and coordinate all of the trade partners as far in advance as possible. The BIM process resulted in more than $2.5M in value add for the project.

THE CLIENT

Catalyst Development is a real estate development and property management company based in Kalamazoo, Mich. The developers were looking to build a mixed-use building at 180 E. Water St., which is located in downtown Kalamazoo.

The 7-story building, dubbed the Warner Building, is made up of two floors of residential space, four floors of Class A office space, and approximately 300 parking spaces within a multi-level parking structure. This building houses:

- Warner Norcross + Judd LLP
- Southwest Michigan First
- The Kalamazoo Promise
- Communities in Schools of Kalamazoo
- Stryker Johnston Foundation

AT A GLANCE

Benefits

- Brought the architect, engineer, and trade partners together to analyze the project and resolve design oversights
- Dissected the build to provide a holistic view of the construction
- Lookaheads were created to help coordinate aspects of the project a year in advance

"We truly enjoyed the fact that the CSM Group team approached the project as a partnership from the beginning to the end."

CSMGROUP

This mix of businesses and nonprofits, all with high levels of community involvement, were chosen by Catalyst intentionally, to better complement the project's residential offerings.

THE PLAN

This was a design-assist cast-in-place post-tension project. CSM Group was chosen as the construction manager and we were tasked with bringing in all the key trade contractors to do the structural concrete foundations, exterior facade, electrical and mechanical design. We hired the contractors very early in the construction process so they could assist in the design phase.

We determined that it would be most beneficial to this project to utilize VDC and BIM technology on the project and explained to the owner how it would be helpful to them. Not only would we be able to coordinate all of the trade contractors and map out the design phase before the concrete was poured, but we could also provide a comprehensive summary of the costs that would arise as we completed phases of the project.

THE CHALLENGE

Due to the complexities of cast-in-place concrete and post-tensioned slab construction, the design intent needed to be verified and ready to be installed in concrete pours before the structure was actually built. We also needed to ensure that all trade contractors working on the project were 100% coordinated before the concrete was poured. Once the concrete is down, trying to make adjustments or changes is very difficult and expensive. We needed to utilize BIM technology to be proactive, instead of reactive, so that we could get ahead of the project in every way possible.

We did extensive research and determined that we needed design-assist partners with experience in these complexities, however, at the time, there were very-few-to-no BIM experience contractors in West Michigan. We needed to educate our trade partners while also maintaining quality service to the client. We also needed to overcome some of the negative connotations that inexperienced contractors or those with poor previous experience with BIM had, and quell some of the hesitations that come with adopting new technology.

THE RESULTS

We used BIM technology to look at a 3D model of the build before the concrete slabs were poured in order to see all the post-tension cable locations and determine where everything needed to go and move things around as necessary. We also utilized a 5D model of the build for materials quantification within a 5-10% tolerance.

The BIM process allowed us to create 3- and 6-month lookaheads to identify any design oversights and shortcomings. We used the technology to see the issues ahead of time and plan to overcome them and adjust the budget accordingly. By catching issues ahead of time, we were able to avoid construction standstills and costly mistakes.

We spent almost 2,300 manhours on BIM and VDC coordination for this $98 million project and generated approximately $2.5 million in value add through the use of BIM and VDC technology.

THE TAKEAWAY

The use of VDC and BIM technology was a successful collaborative process for this project. We were able to bring in architects, engineers, and trade contractors to analyze the project and resolve design oversights. The BIM services dissected the build to provide a holistic view of the construction and what elements would and wouldn't work out. Because we had visibility everywhere, we were able to make necessary changes before actually building. The lookaheads we created helped us to coordinate some aspects of the project a full year in advance – which was helpful in keeping certain aspects of the project from being overly expensive. And by taking all the information from VDC and BIM services and incorporating it into the field, we were able to ensure we met the design intent and that the building was structurally solid.