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How IMC Construction Reduced Quantity Takeoff Time by 40%

Cloud-based quantification is changing the face of construction, making quantity takeoffs easier and more accurate. This has enormous potential to improve productivity across the project lifecycle and improve profitability and productivity.

For IMC Construction (IMC), connected quantification has impacted everything about their business, transforming the way they do construction data management and improving how they deliver projects.

Customer Snapshot

FIRM SIZE: <500
FIRM TYPE: GENERAL CONTRACTOR
REVENUE: \$48 MILLION
FOCUS AREA: COMMERCIAL
HQ: MALVERN, PA, US

PHASE:



PRODUCTS:



VALUE DRIVERS:



Cost



Quality

Better Construction Data Management Enables Model-based Takeoffs

IMC's Director of Construction Innovation, David Maser, says the team turned to Assemble within Autodesk Construction Cloud™ to provide a new lens for managing construction data across projects.

IMC is one of the largest full-service general contracting firms based in the Philadelphia suburbs. Projects span a diverse set of industries across the Mid-Atlantic, and the firm takes pride in providing the best value approach to customers through innovative and collaborative project delivery.

Before implementing Assemble, the project team at IMC was constantly exporting data from Autodesk Revit to Excel, or overlaying different sets of drawings to compare different iterations of the design to determine what had changed, and by how much it had changed, in order to determine the cost and schedule implications.

Maser sums up the challenge the team faced: "It was a painstaking and time-consuming process. It was really a challenge to stay on top of the current data set and understand the cost drivers of the project."

Peter Gehring, Director of VDC at IMC Construction, adds, "Designs change all the time. Even once the CDs come out, the design is going to change. Assemble makes it easier to tackle the design changes. When we get a new model or update our models, we can instantly put it in Assemble and visualize what's changed."





The estimators found tremendous value in Assemble for their preconstruction workflows. “Assemble helped us reduce our quantity takeoff time by as much as 40%,” says Maser.

IMC Construction Senior Estimator Andy Chain adds, “The less time you spend doing your takeoff, the more time you can spend finding more cost-effective solutions for the client. Utilizing Assemble makes things faster, more efficient, and more reliable.”

Cloud-based Quantification Enables Project Insights

As the next natural step in their innovation journey, IMC began implementing Assemble’s Power BI integration to continue delivering on the promise of improved project insight.

Two major challenges IMC wanted to tackle using Power BI reporting was:

1. Reducing the amount of time and effort to produce trending and variance reports.
2. Improving communication with owners and other project stakeholders.

The firm desired to communicate design scope changes and track project quantities and schedules without a heavy administrative burden.

Before this could be achieved, Maser and the team first had to tackle data quality and normalization.

“We have six full-time estimators in-house creating models. For one project, we may receive five different sketches of a single structure element, which we need to establish different budgets for the facade and structure. We use Assemble to create our own detailed models with detailed quantities. But in that process, we are always asking ourselves: how can we improve our process, how do we deal with different data sets, how do we standardize our data to analyze cost drivers over the course of time?”

IMC also wanted its teams beyond preconstruction to leverage model data and model-based takeoffs without the requirement of being a Revit expert.

“Assemble is easy,” says Maser, “You don’t need software or fancy equipment to access model views remotely.”

The end goal at IMC was to have multiple users collaborating on the same data set, normalized to be the standard across multiple projects and models.

Cloud-based Quantification Starts with In-Person Collaboration

Data standardization is critical to accurate cloud-based quantification. Maser and his team began by gathering stakeholders across teams for discussions about data prioritization.

“The first thing we did was sit down as a team and look at what we model for most projects and discuss what else do we want for ALL projects,” says Maser. “We began to define standards in data so that we weren’t relying on architects to name model elements the same way and so that they could create a consistent internal template.”

Secondly, the IMC team took the time to draw dashboard sketches with color pencils and paper. Every dashboard was first visualized in this way, from cost driver tracking to field installation and productivity reporting.

It sounds complex, but Maser says the team took care to reduce complexity up front.

“We wanted to start simple with the things we know we are going to get on every job.”

In the end, it was a relatively quick, collaborative, and cheap process that kept the firm’s first steps of implementing Power BI simple. It also ensured quantity estimators, project teams, and VDC understood the end goal of conditioning data sets for different users.

“This effort has allowed us to leverage our data in Assemble in the way our company needs to see it, and it has helped open our eyes into different standards and possibilities with our clients,” says Maser.

Connected Quantification Improves Construction Workflows

IMC’s efforts to normalize data from their models and turn it into insightful reporting in Power BI yielded numerous workflow improvements and time savings. The company uses dashboard reporting to track and present scope changes, quantities, schedules, and installation productivity from facade to concrete to structural steel.

IMC has identified the cost drivers to be tracked from project to project. Specific to their tracking of the façade, Maser says, “we are literally going in the model and assigning doors, windows, curtain wall systems, and other data elements, classifying critical components as a percentage of the facade. Power BI’s coding allows us to combine multiple models to elevate this data for any single project in the facade dashboard.”

This allows IMC to track the percentage of façade materials like glazing and masonry across design iterations and maintain accurate quantity takeoffs



throughout the project lifecycle.

IMC can also track all of this data across multiple projects, comparing costs and quantifying data to determine and manage key cost drivers.

The same applies to the firm’s capacity for structural steel and concrete reporting. “These dashboards represent what our estimators, project managers, and schedulers wanted to have to use in scope reviews, budget reviews, and schedule updates,” says Maser.

Consistency is Key to Effective Construction Data Management

Maser says that consistency is key. IMC’s efforts to standardize data based on an understanding of how their teams best consume it has enabled them to easily track, report, and compare key data points across models.

Their efforts have reached critical path scheduling as well.

The innovation team sat down with IMC’s operations stakeholders, including a couple of superintendents, and drafted out a dashboard specific to MEP installation.

“I thought they were crazy at first,” admits Maser. “It’s not easy to select every piece of ductwork and pipe, but we wanted to try a new workflow, because it had been a challenge for the field in the past and we needed a better system.”

The team achieved this task. They used Navisworks within the Autodesk Construction Cloud™ to filter what was coming into Assemble, filtering to select only key MEP components to keep their data clean. Then, they created the reporting views in Assemble so it was easier for the field to use. Per the field’s request, they created filters to view each system on each floor, making progress easy to update from an iPad by a superintendent.

“

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-Andy Chain
Senior Estimator,
IMC Construction

“Now we are tracking our progress, quantity installed by date, percentage installed, average production per day, and days remaining based on current production,” lists out Maser. “As superintendents are populating this data, we can report it however we want. By percentage complete in line with project schedule, or by subcontractor, or status of install of each system. Whatever is helpful for project management and scheduling.”

This level of quantity reporting capability has become critical for project collaboration, speeding up quantity takeoffs and communication, and ensuring transparency. Maser describes how IMC might do an entire floor overview, sitting down with schedulers, owners, and the design team to collaborate and review payment and schedule.

The same reporting structure allows superintendents to view even a large 400 unit, multi-building apartment complex by building and by elevation, getting insight into what is deliverable against every five days – instead of what had previously been tracked for every 40 days.

The field tracks quantity takeoffs and productivity by contractor, viewing how long the contractor duration was by elevation and planning details by scaffolding shifts and contractor moves based on the insight provided.



The capacity to measure and report against the plan at a view that is user friendly across project phases has become critically important to how IMC delivers its buildings on time and at a high level of quality and safety.

“Dashboards are free in Power BI, and once you understand how to use it, you can group and create a view based on any criteria a different user would need” says Maser.

Cloud-based Construction Data Management Keeps it Clean

Despite IMC’s original method of simplifying the data points it is using in Power BI, the company has steadily made additions that improve the detail of reporting and efforts in collaboration.

The benefits have been profound, but as Maser points out, “it only works if you trust the data you are looking at.”

Core to data management workflows at IMC are two critical quality check processes, both enabled by Assemble’s templated quality tests.

IMC’s team uses this functionality to group data based on their predefined naming standards for how they are communicating scope and quantity. They can then visually check the quality of the data, looking for wide-scale count and quantity changes as model versions are uploaded and noting any oddities.

Secondly, the team uses Assemble’s quality templates to report on all parameters they have defined within Power BI’s dashboards. They review the percentage of model elements that have been assigned a CSI code, an estimated item name, units – again visually ensuring all the data is appropriately populated and assigned.

Construction Data Management Yields Rewards

Implementing cloud-based construction data management and cloud-based quantification is no small task, but it’s been worth it for IMC. The company has effectively:

- Reduced take-off time by 40%
- Reduced time to produce a variance report by 70%
- Reduced time to produce trending report by 40%

Qualitatively it has yielded:

- More informed decision making
- Greater collaboration
- Faster, more reliable schedule updates
- Faster, more reliable payment application review process

“Being able to go back and analyze any two points in time is very powerful when you are sitting in a meeting with an owner,” says Maser. “If you must go back a couple of days to analyze PDF drawings or sketches, then you’ve lost that critical moment of communication with the owner.”

This improved communication with owners, combined with the other benefits of cloud-based construction data management, have provided more than enough return to justify their investment, now and into the future.

