7 Essential Capabilities of MEP Detailing Software

Trimble®

Contents

As an MEP detailer, you are tasked with generating models that precisely reflect what your company is contracted to build. You must confirm dimensional accuracy, ensure quality, and create usable and reliable outputs for downstream work—all while staying on schedule.

Your efficient and quality work is critical to the MEP operations leader, project manager, and business owner. It can ensure a steady flow of projects, preserve profits, and win repeat business for your company.

But MEP design and detailing jobs are technically complex and challenging under the best circumstances. Not only do you face disruptions and inevitable rework requests, but most basic modeling software only prompts you to indicate whether an item is a pipe, duct, or conduit. This software doesn't necessarily show or capture fabrication details such as weights, manufacturers, ratings, labor hours, specification data, or part numbers that translate to procurement and fabrication outputs.

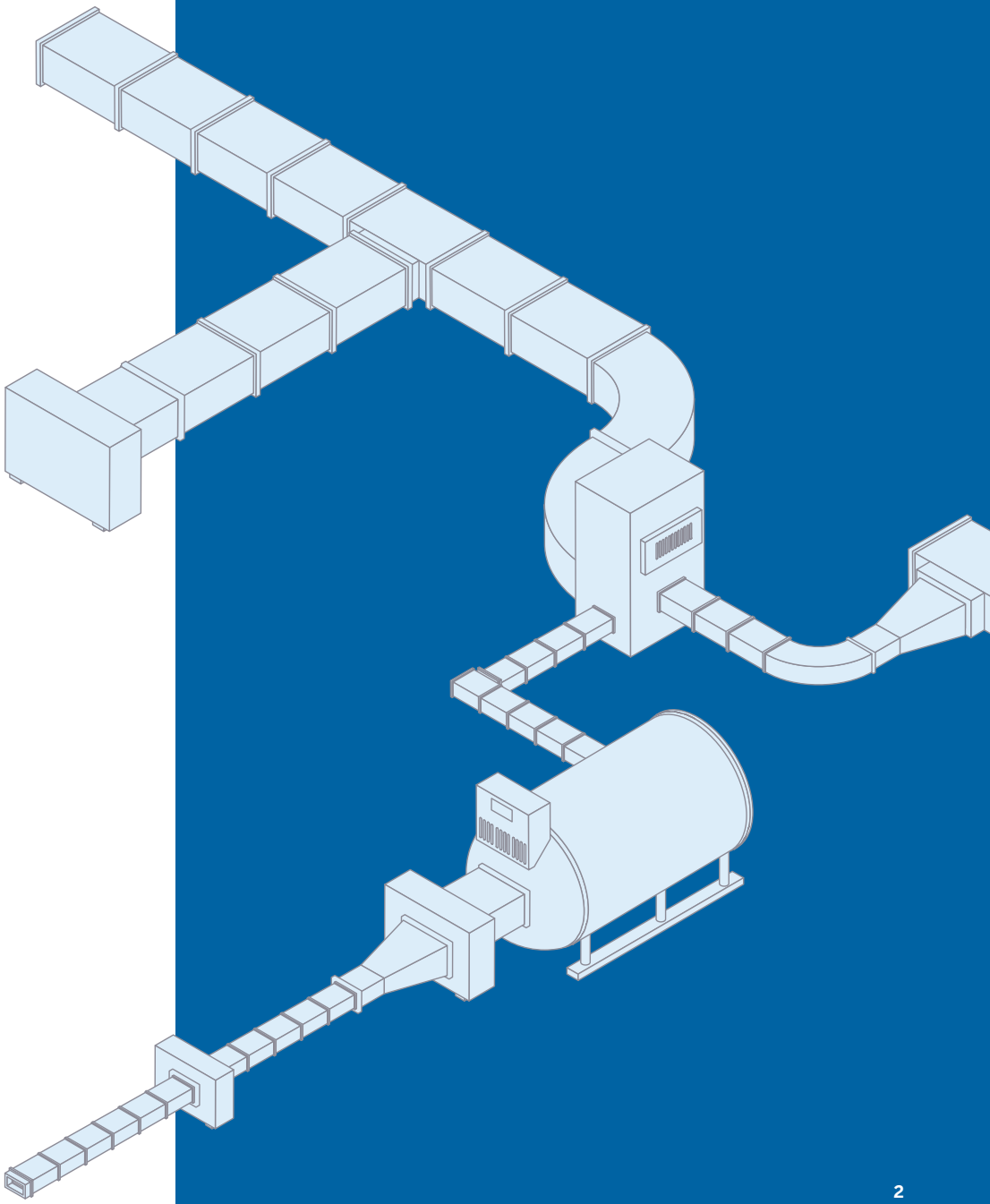
Better construction starts with MEP detailing.

Fortunately, there are companion tools and add-ins that will help. No matter how you've integrated building information modeling (BIM) in your workflows, better MEP-specific tools can help you meet the demand with more reliable, managed data that you can plug into your specific processes.

One of the MEP-specific tools to consider is model detailing software for fabrication that works on top of your chosen design platform, whether that's AutoCAD or Revit. This software provides trade-specific user interfaces as well as specification-driven content selections, including common assemblies, hanger tools, prefabrication tools, and integrations to shop machinery.

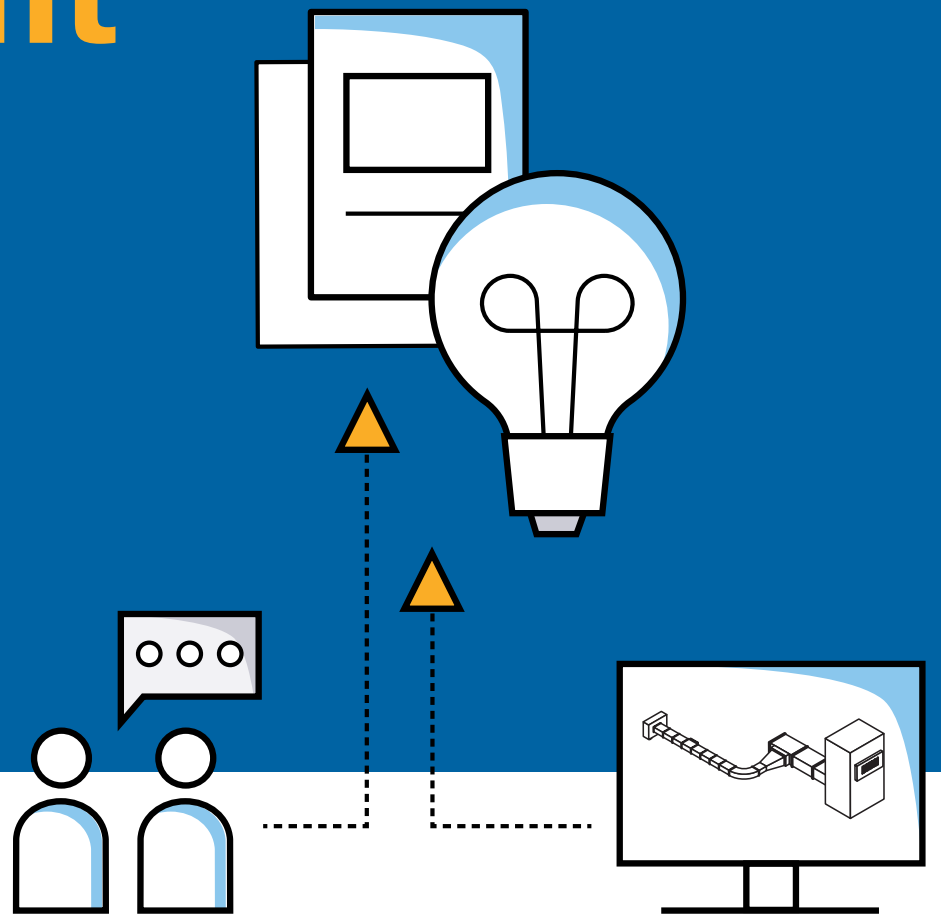
In this eBook, you'll discover seven key capabilities to look for when selecting MEP model detailing software for fabrication. You'll learn how to find a solution that will enable you to produce fast and accurate models, reports, and fabrication outputs by:

- Generating models based on rich data at the detailing stage,
- Raising the quality of the entire design-to-construction process,
- Making turnaround times faster, and
- Equipping your team to accomplish your prefabrication goals with collaborative, digital workflows.



1

Managed content



Access managed content libraries in your MEP detailing software.

"Content" refers to the in-line commodity items to build mechanical, electrical, plumbing, process piping, and HVAC systems. These items can include pipes, valves, fittings, strainers, junction boxes, conduit bends, electrical boxes, ducts, dampers, and a variety of trade specialties that comprise the systems you're modeling.

Besides geometry and connection types, part of the data you manage should be enriched with labor units and material pricing. Without this data, you risk leaving out essential planning information, which means someone else will have to plug it in manually.

Maintaining content in-house may look like a tempting option. After all, most of the work an MEP firm installs on any given job is likely contained within a database of +/- 10,000 items—that's not too much to handle, right? And after you also factor in all the last-minute demands and object modifications, it's easy to see how your data could easily become corrupted with incorrect values.

> "Bad data may have caused $1.8 trillion in losses world-wide and may be responsible for 14% of avoidable rework, which amounts to $88 billion in costs." (Autodesk, 2021)

To avoid the pitfalls and costs of inaccurate content, look for MEP model detailing software for fabrication that tackles the problem head-on and furnishes libraries of managed content, and make sure the software provider has the headcount and process in place to manage all this data systematically.

INTERSTATES

How Interstates makes smooth interconnections with managed digital content

Interstates specializes in design-build electrical projects, plant floor automation, and mission-critical operational technology support. They knew that speed and accuracy were critical to their success. But the company was bogged down by old technology, which made it difficult to track on-site craft labor expenses and demanding schedules. To maintain its advantage, Interstates deployed model detailing software for fabrication with access to a library of managed digital content. This solution saved them from building the content themselves, which could have taken up to two years. As a result, the company was able to spend 50% less time producing spool sheets for prefabrication.

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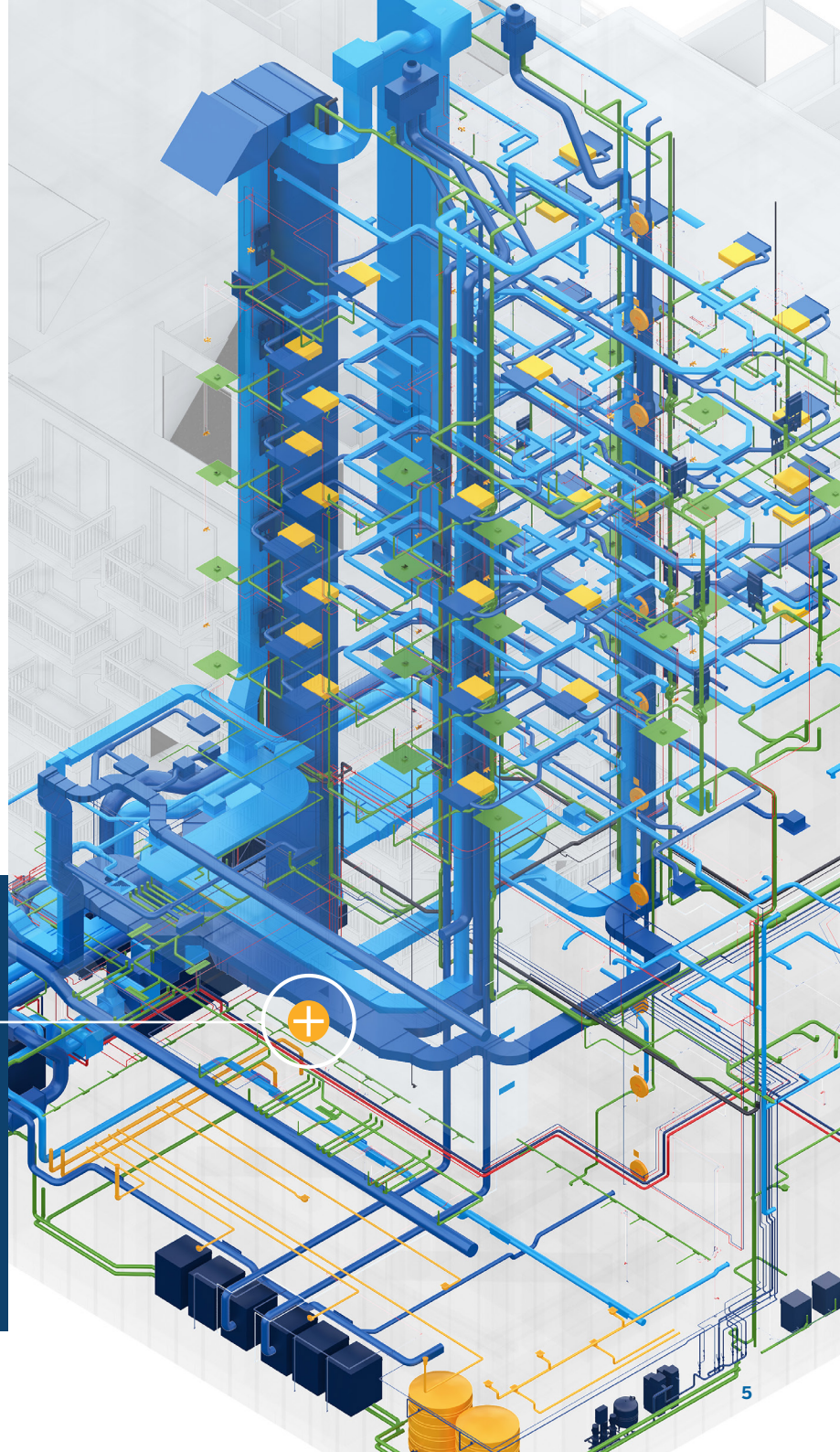
You should easily find specific content that the software provider has updated with the correct dimensional, labor, and transactional information. Having updated and accurate data will lead to seamless end-to-end workflows across your teams (project managers, purchasing agents, and so on).

Important capabilities

- Managed libraries that ensure up-to-date content in the file type you need (e.g., ITM, RFA, MultiView Parts)
- Maximum levels of detail—LOD 400+
- Content that comes with a rich set of data (e.g., labor and material values, connection types, patterns, dimensions, specifications)
- Shared collaboration system and libraries with consistent data that integrates into any workflow



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Automatic task completion

Improve BIM efficiency by automating manual work.

One of the great virtues of software is the way it eliminates manual tasks. But many standalone design platforms, such as AutoCAD and Revit, do not automate common MEP detailing tasks, whether hanger placements, point layouts, shop drawings, and more. And if you're not automating these repetitive tasks, you may be wasting the valuable skills of your team members while raising the chances of errors and rework.

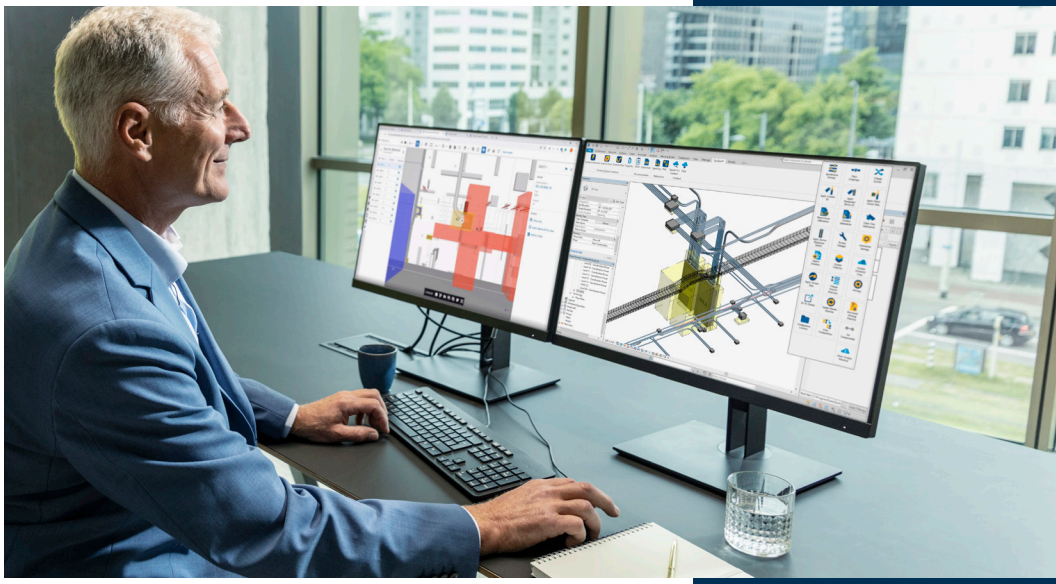
To save you both time and energy, look for model detailing software that automatically applies the rules of a specification and converts generic systems into fabrication-ready models. See if the software automatically lets you place commonly repeated objects like wall assemblies, coil hookups, conduit saddle bends, pump trees, and more. These types of automation raise the LOD of your model and provide detailed instructions for your fabrication shop in fewer steps. In short, it's all about speed and precision.

Some other automation examples include:

- Spooling your work into repeatable templates with views and schedules for fabrication
- Adding in layout points for hangers, sleeves, pads, panels, and more for layout in the field with robotic total stations
- Exporting files from your modeling software to your shop machinery to automate the manufacturing process
- Publishing an estimate of a work package, or any section of your model, to a teammate for them to estimate and compare bid values
- Publishing a bill of materials (BOM) to a procurement platform for a teammate to solicit competitive pricing or procure under established project pricing from your local suppliers

Important capabilities

- Digitized, model-driven procurement of materials
- Specification-driven modeling for coordination
- Cloud extensible so that teams can access project data on any device via the cloud
- Automatic annotating, detailing, and scheduling from your model
- Hanger placement with layout points
- Clear fabrication and prefabrication outputs for the shop
- Clear assembly instructions for the field
- Visibility that you are tracking toward your bid estimate at each stage of the project



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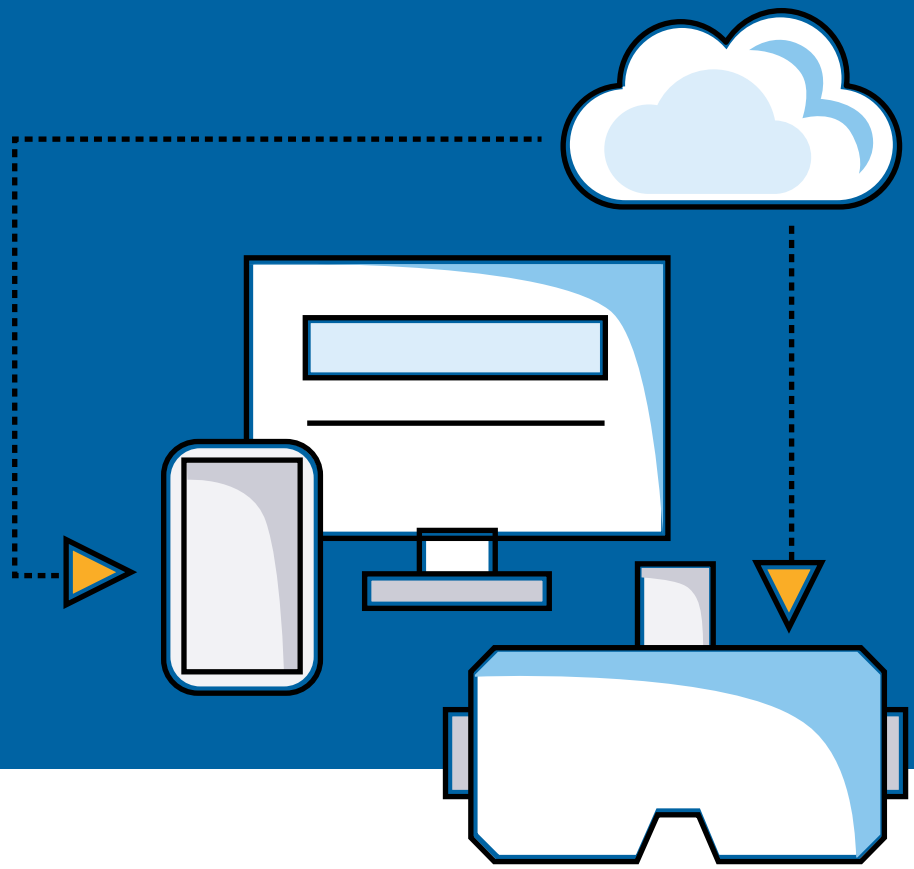
Project management



Source all information and procure all materials from one place.

Your model is the single reference point when managing change orders, submittals, RFIs, and more. But the information contains little or no benefit if the project manager lacks easy access to the model. You don't want all your team members, for example, to spend hours learning a niche software application to retrieve a simple piece of information. And if they aren't very tech-savvy, then the whole workflow becomes inundated with inefficiencies.

Therefore, to effortlessly expand access for your team, look for capabilities in your MEP detailing software that allow you to share the output with other applications and stakeholders (e.g., requesting the information).

This access benefits project managers and stakeholders who want a more informed, data-driven look into their projects. They can determine critical path issues that need resolution or visualize construction progress easily, even if they don't know how to use the program where the model was made, such as Revit or AutoCAD. With this level of access to information, project managers have more meaningful interactions with the model data and any issues that arise, giving them confidence as they drive the project forward.

Important capabilities

- Ability to see model views without using BIM software
- Access to downstream data such as a BOM, spools, or build sheets
- Visibility into project tracking information (e.g., through connected apps)
- Conveniently access up-to-the-second project information on mobile devices–anywhere, at any time

Cooper Est. 1954
Electrical D/B • Instrumentation • Calibrations

Cooper Electrical Construction takes the lead with prefab efficiency

In Greensboro, North Carolina, Cooper Electrical Construction was facing an uphill battle. Fierce competition, shrinking schedules, communication silos, and clunky technology formed a perfect storm that was making it difficult to get ahead. But when David Faircloth, BIM manager at Cooper, implemented lean construction project management methods along with MEP detailing software to organize and drive fabrication and procurement processes, it was a game changer. Through technology leadership, Cooper is now recognized as an industry leader and trusted partner on critical projects, setting the standard for trade coordination, material management, labor productivity, employee safety, and quality.

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Common data environment

Share data in a common data environment to improve collaboration.

Your MEP detailing software enables you to generate data valuable to other project phases and collaborators. You are compiling vital information, such as the relationship between your BIM outputs, cost estimates, and construction schedules.
But team members often hamper their collaboration efforts by filing project information in disconnected silos. Even file transfer methods such as email can increase the risks of miscommunication because of how outdated information propagates, resulting in rework and an incomplete, inaccurate audit trail.

Now you can improve communication and collaboration by connecting teams and stakeholders to all project data in what is called a Common Data Environment (CDE). A CDE helps avoid disputes by functioning as a single reference point that teams and stakeholders can access on any device. It maintains a full, accurate version history for complete visibility into progress and associated dollar amounts.

Incorporating a CDE also makes pertinent project information accessible to everyone based on their defined role and permission set. For example, when an on-site worker or project manager has a question, they can access the CDE for answers or highlight their question for you or others. And once you populate your CDE with data, such as labor hours and material costs, this information is linked to every step in the process, helping you view, manage, and forecast costs as the project progresses.

Important capabilities

- All project stakeholders can access, share, and collaborate on all project documents from a centrally stored location
- Streamlined document review and approval, including submittals, RFIs, and change orders
- Centralized BIM modeling support with real-time detailing collaboration
- Project stakeholders can view and extract data from BIM models without BIM software access

Figure. How construction companies implement a common data environment (CDE).

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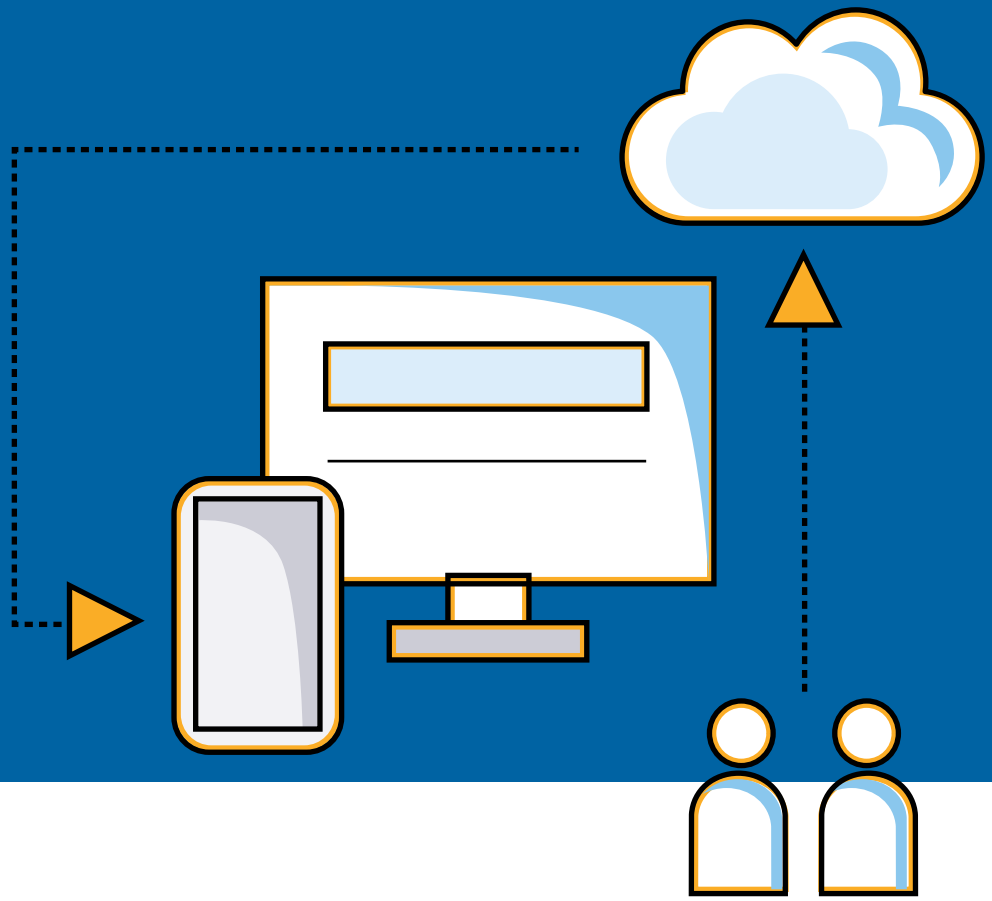
Widespread compatibility



Select MEP detailing software that works across multiple platforms and with other tools.

It's no surprise that an increasing number of companies in the MEP trades conduct their work using various technologies. This digital toolbox of software typically includes a platform of choice (e.g., AutoCAD MEP or Revit) combined with multiple applications and add-ons that address specific parts of project workflows.

But when using multiple tools, your workflows can become rigid and disjointed, restricting your ability to share project data and collaborate with relevant stakeholders. This arrangement ultimately raises the chances that you'll experience more communication breakdowns, misunderstandings of shared goals, and even a lack of ownership for the project's success.

Therefore, look for MEP detailing software that can accomplish the following:

- Integrate seamlessly with your preferred software platform.
- Be compatible with the other software and hardware in your company's workflows.
- Fit into an overarching operations strategy that includes management, shop, and so forth.

You should be able to transition easily from your fabrication application to your platform of choice and other applications and add-ons, without compromising the unified workflow you need to establish. With a CDE as your single reference point, your MEP detailing software benefits you most when it has a real-time connection to your estimating, project management, collaboration, and other activities.

If you would like to implement new processes in the future, or if you have other plans, your model detailing software should also support future requirements, changes, and endeavors—whatever they may be.

Bundled solutions address the bigger picture

Many North American MEP groups use a collection of design products, such as AutoCAD, AutoCAD MEP, and Revit. These organizations need model detailing software for fabrication that works with their design platform to create accurate MEP outputs in a short amount of time with a minimal budget. If that describes your team, then seek a bundled solution that addresses your productivity needs with:

- Model detailing software that works with the design platform of your choice
- Collaboration software that connects team members and workflows
- Manufacturer content in the format you need

Important capabilities for compatibility

- Flexibility to work with the BIM technologies and CAD platform of choice (e.g., AutoCAD, AutoCAD MEP, Revit)
- Provides a clear path to achieving greater BIM efficiency
- Makes data easily accessible to other teams and relevant stakeholders
- Ability to integrate different tools for collaboration, estimation, project management, on-site hardware, and more

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Easy on business operations

Reduce the workload of your IT team.

MEP detailing software is a vital step to improving your design and construction process and realizing the full potential of BIM. But owning software involves much more than downloading and installing an application, especially when using it with multiple other applications. Owning software often requires the labor expense of your IT team's oversight, not to mention the cost of downtime when they can't immediately fix an error.

Therefore, consider model detailing software that frees up your people and capital for more important things. A subscription model, for example, should keep you and other team members connected to all of your construction management software in one easy-to-access place.

When you incorporate software into your processes, your business enters a relationship with the company behind the software, so make sure they have a good reputation. It's important to know how often they update their software, what security mechanisms they use, and how they maintain data privacy.

Important capabilities

- Does not require a large IT staff to maintain
- Minimizes security risks and protects data
- One platform that serves all MEP disciplines and other construction management software
- One subscription that supports the entire design workflow
- Assisted onboarding for expert-led implementation

MYCO MECHANICAL

For Myco Mechanical, speed to market is the competitive advantage

In June 2021, Pennsylvania-based Myco Mechanical was finishing up a middle school project. Their VDC team leaders understood that speed to market would give them a competitive advantage, but a lack of compatible technology posed a serious obstacle. Myco was able to quickly export field points from their detailers' computers and transfer them to the field for use on tablets and iPads. The feedback they received from their project supervisors was resounding and unanimous. Placing sleeves and hangers increased by 90% in efficiency and Myco was able to now place up to 600 points per day.

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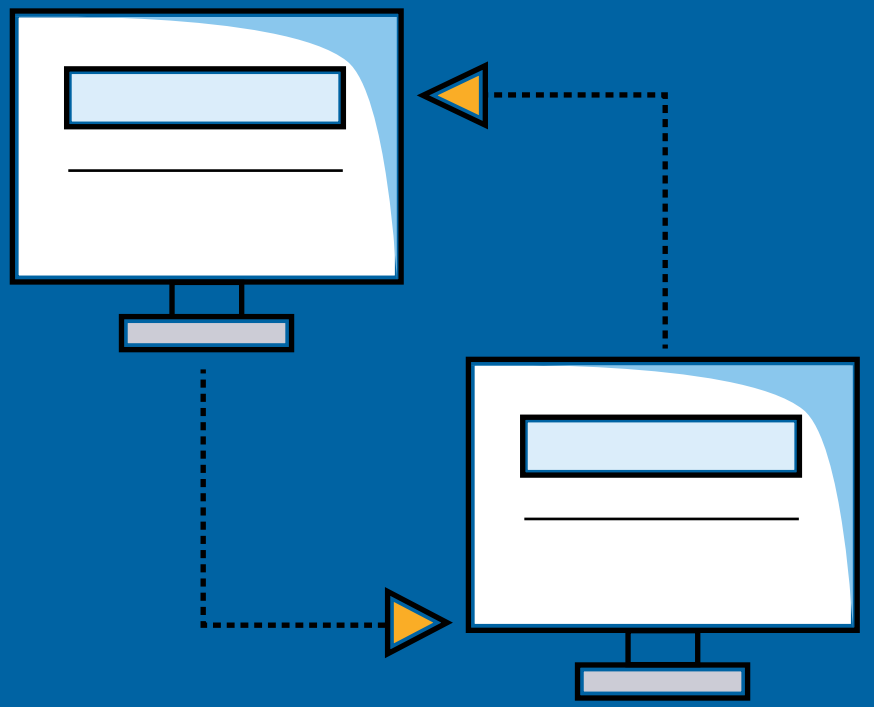
7

Connected workflows



Every part of your workflow relates to every other part.

A model is the ideal visualization tool for many reasons. It can help you track construction progress, issues, and change orders. It's useful when updating the budget, and it can be used to compare actuals to bid assumptions.

But conventional MEP detailing software often lacks these abilities because it cannot flow the model data seamlessly across all these workflows. Instead, a detailer exports the data, manipulates it in a spreadsheet, and sends it to their colleague, who then imports that data into another application for another specific task.

In this manner, team members rarely realize actual analysis and synergy with other teams. Not to mention, these kinds of import/export workflows are tenuous, labor intensive, and easily subject to errors and omissions.

To realize team-oriented problem solving, the first step is to put as much actionable data in the hands of the stakeholders and give them a more convenient way to visualize and interact with each other.

When choosing a solution to drive prefabrication at your company, look for software that plugs into a proven, stable connected environment and fuels the connections to project management, procurement, and fabrication shop operations.

When the modeled work is extended to a CDE that informs everyone else on the team about the data they need to do their job, you have the foundation for true collaboration, accountability, and profitable project management. Anyone can access the model, from mechanics to project managers to upper management, and have specific information delivered to their computer, tablet, or smartphone.

Important capabilities of a connected construction workflow

- Easy data handoffs from the model
  - To coordination software: Sharing the output as a single reference point and collaborating in real-time with all stakeholders
  - To estimating software: Creating a BOM and developing an accurate estimate for the project
  - To fabrication shop management software (where relevant): Managing the inventory to track materials and equipment in different facilities
  - To procurement software: Automating the processes of purchasing materials and inventory management
  - To field layout software: Taking the accurate digital data in an information model and using it to inform accurate construction, operations, or maintenance in the field or on-site

- Unified collaboration through shared model visibility
  - Clear fabrication and prefabrication data for the shop
  - Clear assembly instructions for the field
  - Clear coordination capabilities to identify, document, and manage issues
  - Augmented reality views to superimpose the model on the job site (e.g., for applications like clash detection)
  - Coordinated estimate tracking at each project phase for more accurate project executions

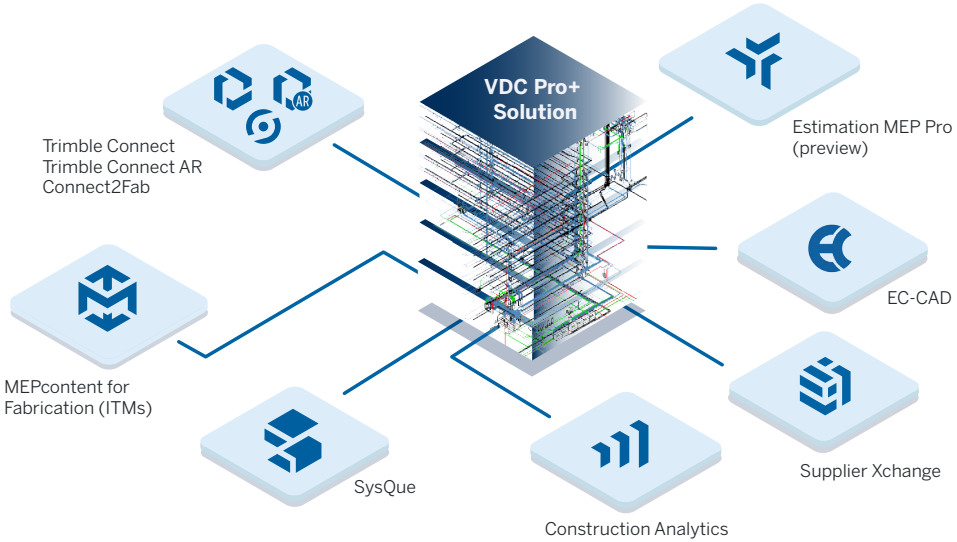
- Conveniently access up-to-the-second project information on mobile devices—anywhere, at any time

Trimble's approach

As an MEP detailer, you're one of the few who fully understand the complexity of every project. You also recognize that a single technology solution employed throughout your company can significantly impact accuracy and efficiency as you plan and build constructible models.

But getting the right technology—one with the 7 essential capabilities mentioned in this eBook—is no easy task.

This is why Trimble's VDC Pro+ solution gives you everything you need to design, fabricate, plan, and collaborate on real-world constructible models. With one value-packed subscription, you can take advantage of industry-leading design and detailing software, managed manufacturer content, a model-based estimating workflow, collaboration tools, and analytical insights.



Sustainability in MEP design

Addressing climate change has become everyone's business, especially throughout the construction industry, where building materials and construction contribute 20% of annual global CO2 emissions (United Nations Environment Programme, 2021). But when incorporating sustainable building practices in your MEP-centric workflows, there isn't much clarity on how to make it easy and profitable.

Fortunately, you can better manage a sustainable construction workflow while reducing your operational impact (and costs) with your MEP detailing software. Through managed content, integrated calculations, and a CDE, it's much easier to be conscious of the materials used and the amount of waste reduced.

When evaluating MEP detailing software, ask to what degree it supports sustainable construction. Make sure it helps you:

- Reduce the energy consumption of a building, such as through heat loss and cooling load calculations
- Reduce the number of materials needed for a project through sophisticated prefabrication/spooling capabilities
- Reduce project turnaround times with the help of a CDE/viewer and issue management

About Trimble

Trimble is an industrial technology company transforming the way the world works by delivering solutions that enable our customers to thrive. From purpose-built products to enterprise lifecycle solutions, Trimble is transforming industries such as agriculture, construction, geospatial, and transportation. Core technologies in positioning, modeling, connectivity, and data analytics connect the digital and physical worlds to improve productivity, quality, safety, transparency, and sustainability.

Trimble Construction technologies give users control of their operations with best-in-class solutions and a common data environment. This innovative approach improves coordination and collaboration among stakeholders, teams, phases, and processes across the construction lifecycle. Trimble MEP provides software solutions to make mechanical, electrical, and plumbing engineers and contractors more productive and profitable.

Discover more about
MEP detailing software at
mep.trimble.com/detailing

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