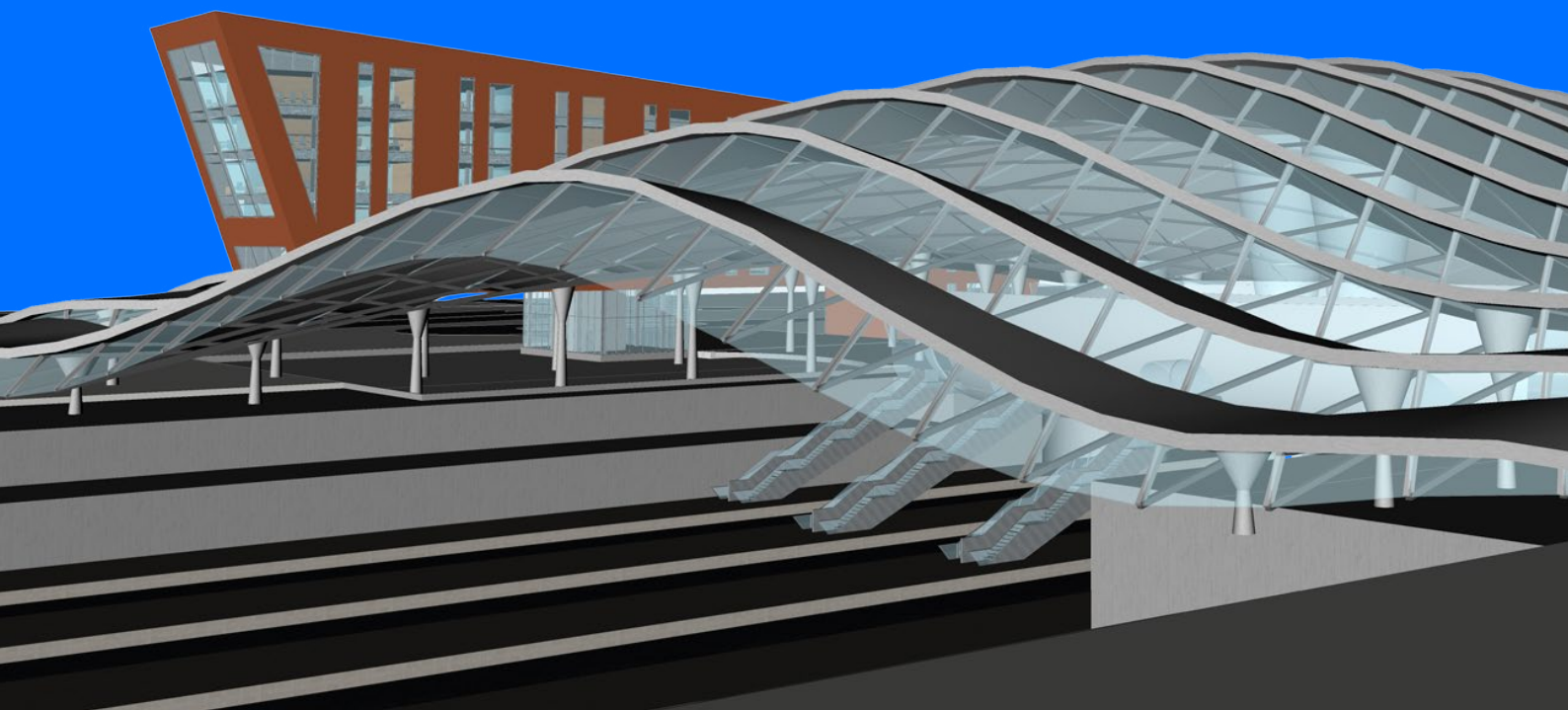




Why BIM?

Why BricsCAD® BIM?

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The business case for making the move to Building Information Modeling continues to grow. The potential for a better end-to-end design workflow is driven by the concept of a BIM as a 'single source of truth' in building design. Principals love the marketing power of BIM, citing the strong competitive advantage they get from it. This is especially true when firms solicit business from new clients.

- Business Value of BIM report, McGraw-Hill Publishing 2017

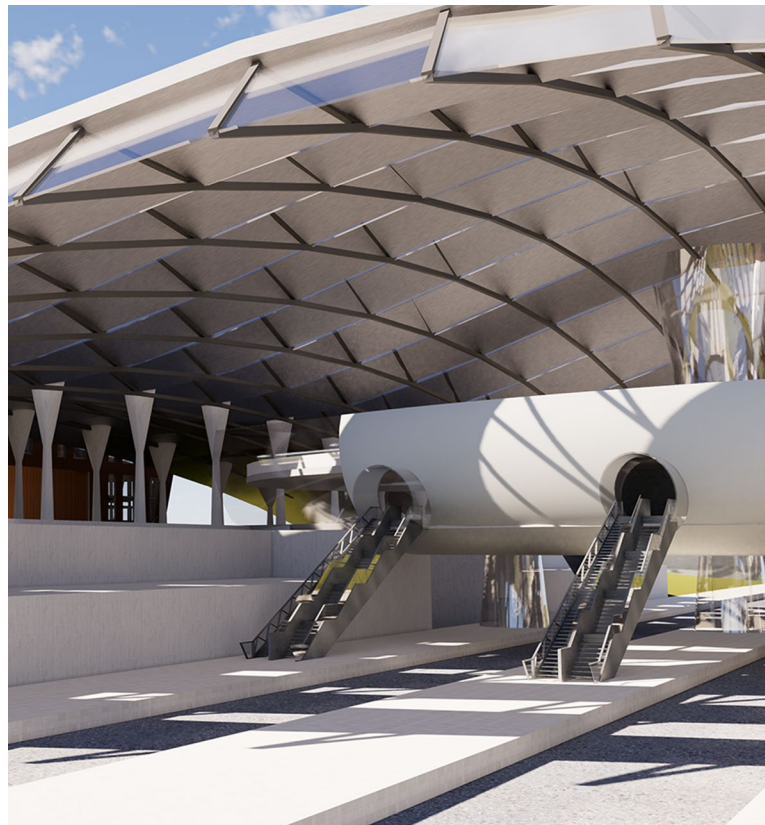
1. Why Building Information Modeling (BIM)?

The business benefits of BIM are clear and well-founded. Better document coordination with reduced potential for design errors can lead to savings of money and time in all phases of a building's lifecycle. The authors of the McGraw-Hill report state that building owners also see the long-term value of BIM. They appreciate the fact that more accurate as-built documentation facilitates, and simplifies, maintenance and remodeling projects.

But we'll make a safe bet that your firm has not yet made a full transition to BIM. That's OK – 4 out of 5 companies have not. There are hundreds of reasons not to adopt BIM – both business and technical reasons. You can probably recite quite a few of these reasons without our help.

Bricsys wants to make a proposal to you. We declare that you should not fight the BIM wave – you should transition to riding it. You can dive into a flexible transition workflow that supports the way you work today. We suggest that you can move your firm from a 2D CAD-based design workflow to BIM in a timely, cost-effective way. As you make the move, you can continue to use tools that you already know and leverage a streamlined workflow that doesn't require an advanced engineering degree to understand.

Interesting? We thought so. But first, let's look at the underlying concepts behind Building Information Modeling. →



2. What is a Building Information Model?

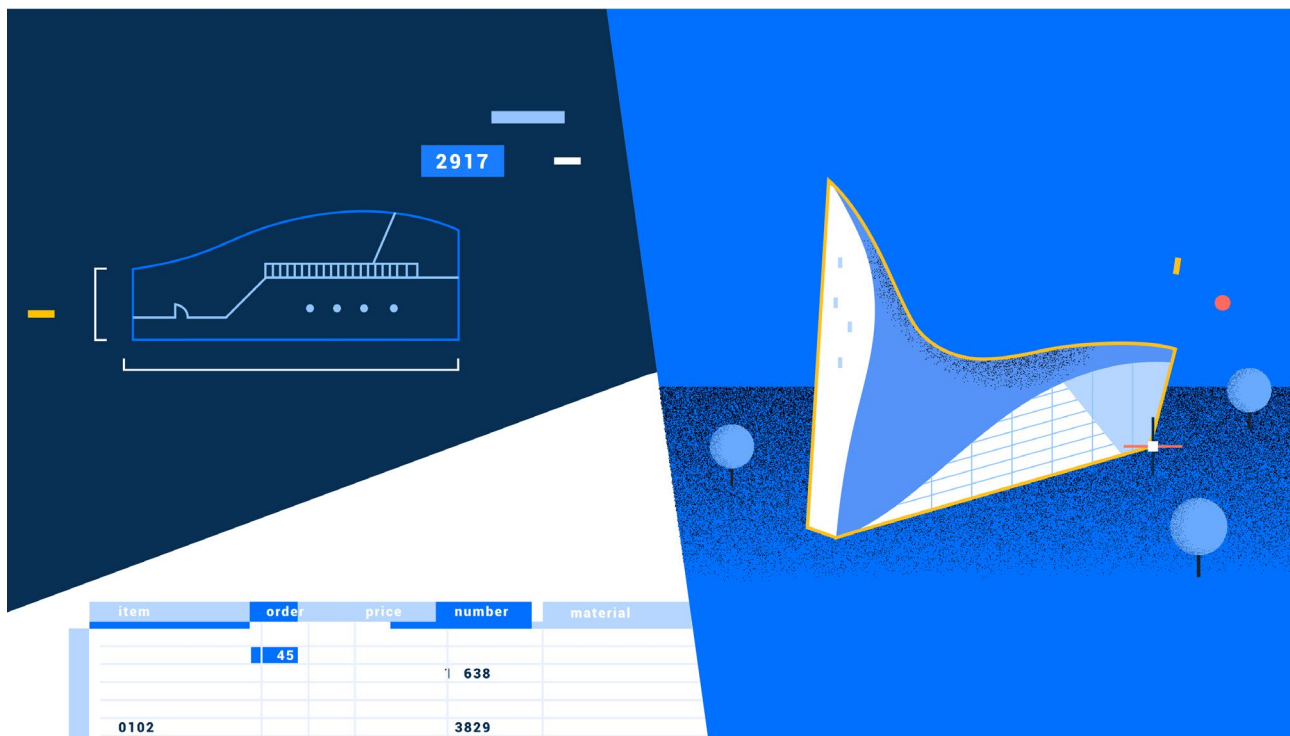
A BIM is a virtual, digital representation of your building. As you make design choices and add information to a BIM, the level of development (LOD) of the BIM increases. And as LOD increases, the BIM becomes a progressively richer source of design data. A BIM represents the concept of a single source of truth about a building project.

You may have heard that there's a lot of up-front work in creating a BIM, and that work adds time and effort to a project. Yes, it's true that a BIM workflow is different from a 2D drafting-centric workflow. But the effort that you put into creating a BIM can dramatically reduce the downstream potential for errors, and expensive change orders. This concept of a single source of truth is valid, viable and valuable to all.

For the foreseeable future, 2D drawings will remain the ultimate output of any building design project. But creating them sheet-by-sheet in 2D CAD is an error-prone and archaic workflow. Managing hundreds of drawing sheets manually is a frustrating and time-consuming process. Managing and maintaining the dependencies between these drawings as the design evolves is even more daunting.

In a BIM workflow, the Building Information Model itself is the generator of the drawing sheets that make up your project's construction documentation. The value of this 3D to 2D workflow cannot be overstated. Every stage of the design process is fully integrated in a proper BIM workflow – from schematic design to construction documentation, through building lifecycle management.

Next, let's roll up our virtual sleeves and discuss how a 3D BIM workflow differs from 2D drafting-centric design & documentation methods. We'll also take this opportunity to point out some of the deficiencies in the "traditional" (i.e., industry-standard) BIM tools that are in wide-spread use today.

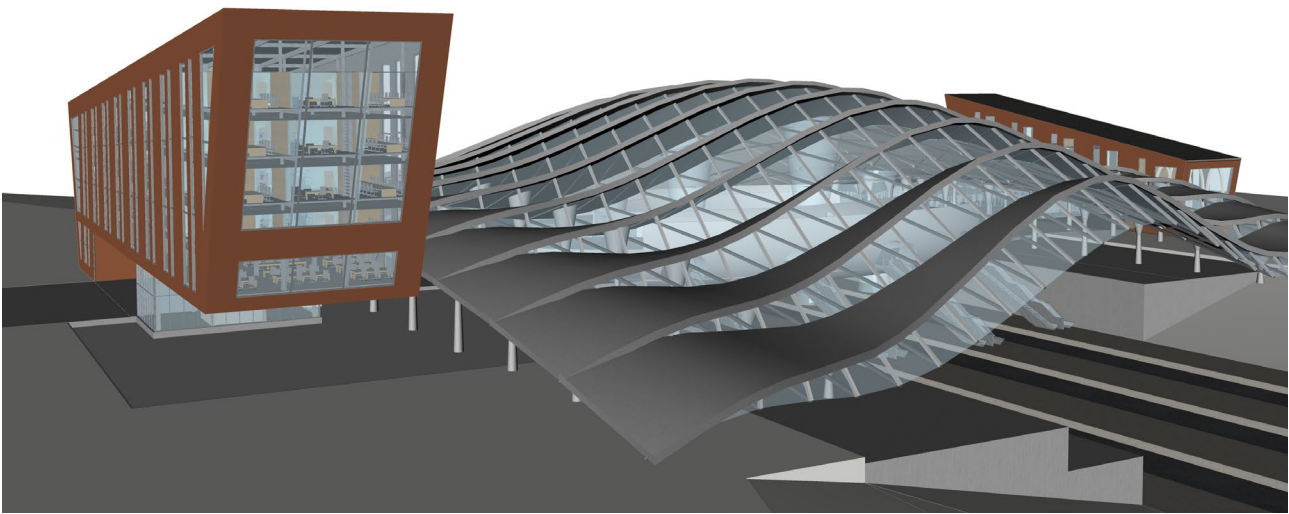


3. 2D Drafting vs. Traditional 3D BIM

Physical study models vs. design capture via 3D modeling

In most 2D drafting based workflows a combination of maquettes, hand drawings and renderings are used as visuals when pitching a design concept to a client.

Over the last decade, many firms have moved to surface modeling tools (e.g. Trimble's SketchUp) to create and render study models. These 3D models allow designers to create realistic, high fidelity visualizations of designs, to help secure client approval. Today, even if firms don't use BIM, they do use 3D massing & study models to capture, portray and share their design ideas.



Transitioning from concept to detailed design

After client approval, users of 2D drafting workflows often attempt to “dissect” their 3D study models, to assist in the creation of drawing views. Because of limitations of these single-precision, faceted models, the transferred geometry is often inaccurate. It's generally simpler and safer to just start each drawing sheet from scratch, to ensure that accurate dimension information is extracted from the linework.

In a traditional BIM workflow, the approved study model is handed over to a BIM technician. The tech then works to translate the study model into a valid BIM model.

Unfortunately, this can be a “start from scratch” episode, too. The inaccuracies in the study model, created for visualization purposes, not drawing creation, limits its re-use. Carrying this “bad geometry” forward into a BIM is bad idea, as you might imagine. At the least, using inaccurate geometry does not further the trust relationship between architects and contractors.

In terms of the transition between concept and detail design, traditional BIM users don't fare a lot better than their peers using 2D drafting techniques.

Management of project documentation

In a 2D drafting based workflow, the output drawings are independent DWG files, often with many dependent external reference files (XREFs). These files are typically organized into sheet sets and managed file-by-file. As changes are made to the design, documentation updates are managed manually. Ensuring the integrity of each view of every drawing in a sheet set becomes a complex process with high potential for error.

In a 3D BIM workflow, the building model and its associated metadata are stored in a database. This database is managed automatically, as are the sheet sets that make up the final drawing deliverables. Changes to the 3D BIM model trigger updates to all generated drawing views, automatically. The changed drawing views are flagged for detailed review, helping to ensure sheet set accuracy and integrity.



Updating of project documentation

Limited connections exist between project files in a 2D drafting workflow. Individual drawings are likely grouped into sheet sets, but dependencies between drawing files and their XREFs are managed manually. Because of this need for manual management each individual DWG file is treated as a stand-alone entity. Also, each sheet needs to be “set up” manually. The views are created, organized and annotated one at a time. When the design changes, the potential for error through missed sheet/view/annotation updates is very high.

The truth is that in 2D workflows, bad things can happen. This is mainly because of a lack of data continuity. More drawings need to be checked more frequently, and errors can creep in. When the project documentation fails to reflect your design with the highest fidelity, expensive errors can occur in the construction phase. It's one situation when the print is misread by a sub-contractor; it's a very different issue when the print is incorrect and signed by you.

In the 3D BIM paradigm, there is high integration between all the files in the project. Generated BIM sections (plan views, elevations, room sections, et al) are the source for the views on the project's drawing sheets. Because of the “information centricity” of a BIM, changes made to the model ripple across all sheets automatically. The software will also highlight changed sheets for closer review, helping to ensure higher accuracy.

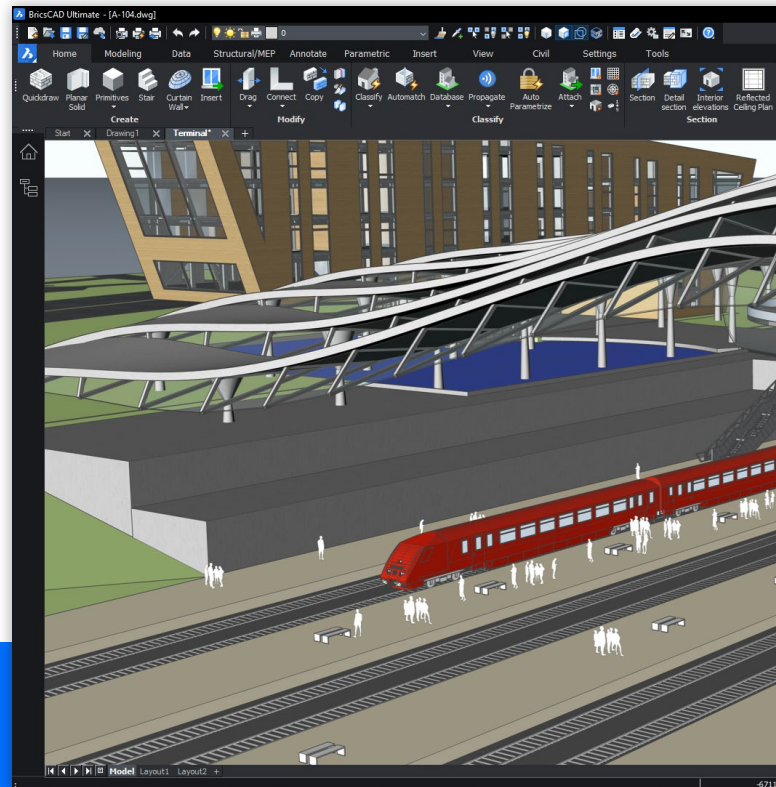
When you change your BIM, all associated drawings update automatically. An integrated BIM workflow means that fewer drawings need to be checked repeatedly. In a BIM shop, the focus can be on design changes, not the downstream effects of those design changes. This frees you to do what you do best, and lets you use your computer to do what it does best: help collect and manage your design decisions.

4. Why choose BricsCAD® BIM?

Because Traditional BIM is not enough

We've compared 2D drafting-based design workflows to 3D BIM based design concepts. And it's clear that Building Information Modeling workflows offer a better choice than 2D drafting-based design workflows. But traditional BIM systems don't always offer an ideal workflow. Part of this is because of legacy, and part because of the way that these traditional systems were designed. Regardless, we are here to offer you a unique BIM workflow; one that delivers on the promise of BIM, and more.

Next, let's discuss the intrinsic value of the BricsCAD BIM approach from several points of view. We'll tell our BIM story by addressing what we see as the limitations of the traditional BIM workflows described above.



The Bricsys BIM story starts with DWG

Unlike making a move from 2D to traditional 3D BIM, Bricsys can offer you an incremental change in your existing workflow. How? First, we offer a familiar environment: one that current users of DWG-based CAD products already know and appreciate. We declare that users of DWG-based CAD software have 80% of the knowledge that they need to use BricsCAD BIM in an effective way. We invite you to contrast this with the hundreds of hours of training required to get started with traditional BIM products.

The commands and procedures that you already know from 2D CAD work seamlessly in BricsCAD, and therefore inside of BricsCAD BIM. Also, your macros, menus, templates and LISP routines load directly into, and work seamlessly in BricsCAD BIM. Finally, using tools that are familiar lets you work smart - with a safety net. It's about approaching the move to BIM at your speed, and on

your schedule. Another benefit? Your huge collection of existing models and drawings can be re-used directly. Working in DWG also offers a unique ability to divide your BIM model into smaller pieces. XREFs are familiar, and they are BIM-ready. The workflows are very well known and supported by the majority of file storage and management applications. XREFs are supported across the entire BIM workflow in BricsCAD BIM. This is important because your BIM models can be split into smaller, light-weight models / components. The spatial relationships between the XREFs are managed automatically in the database that underlies the BricsCAD BIM workflow. Bricsys is a founding member of the Open Design Alliance – the industry recognized second source for DWG compatibility. We are one of the largest contributors to the consortium. This helps ensure the highest compatibility with the DWG file format, now and into the future.

BricsCAD BIM supports open standards

The database underneath BricsCAD BIM is a direct, one-to-one mapping with the OpenBIM Industry Foundation Classes (IFC) 4.0 schema. We don't force you into a walled garden – we understand that freedom of choice is important, and we enable you to collaborate freely through these open standards. It's a huge part of who we are at Bricsys. We support open standards in every aspect of the product, including the BIM Collaboration Format (BCF) for in-context display and resolution of design issues.

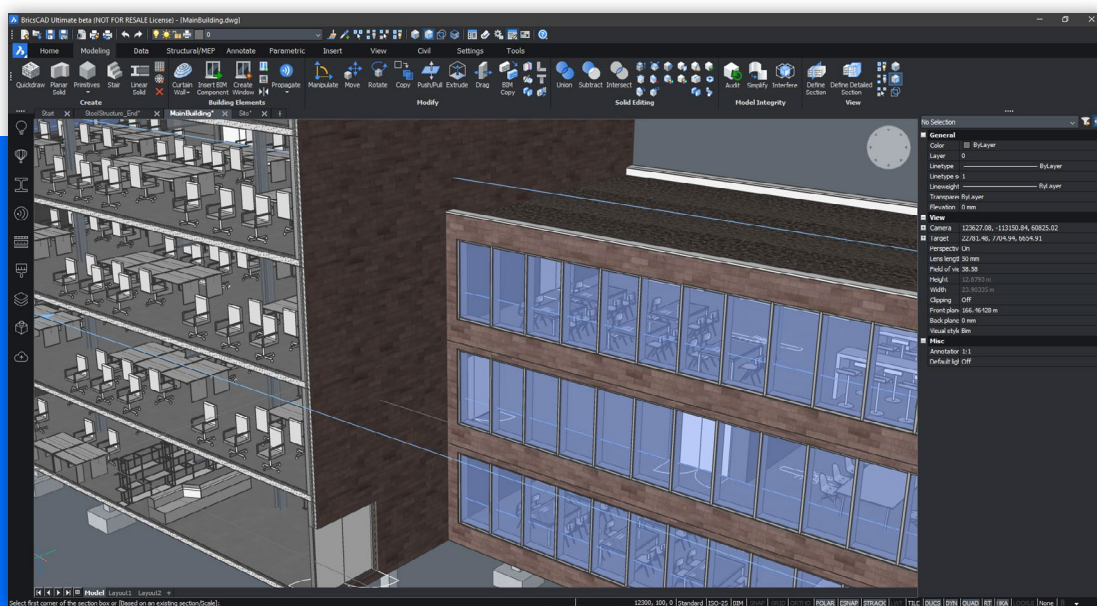
One product, one platform

While traditional 3D BIM systems let users create concept models directly within the BIM editor, the amount of effort required to do so varies greatly. Starting directly in a traditional BIM system is a good choice when you know exactly what you want to build. When you don't know exactly what you want to build, the use of more flexible tools (again, SketchUp) is the norm. Only after approval of the design will a BIM technician take the study model and re-create it as a BIM. This start/stop workflow incurs additional costs and can open the door to errors in “design translation”.

Unlike conventional BIM, with stop/start workflows - BricsCAD BIM enables full, CAD-accurate 3D modeling from the very start. We offer simple and accurate modeling tools that separate the process of geometric modeling from BIM data. What does this mean? It means that you can begin with a CAD-accurate massing model, where any geometry can be classified as any BIM type. You are not restricted by libraries of parts, where you need

to know in advance what you want to model. Your model can remain light and responsive, because it's not over-constrained. There is a direct link to Rhino / Grasshopper from McNeel & Associates to deliver algorithmic design capabilities to ensure that your greatest ideas can be realized in the BricsCAD BIM workflow.

More than this, BricsCAD BIM offers a single product / platform for BIM and mechanical design. This opens the possibility to use mechanical assemblies in a BIM model, or to design & detail manufactured building components directly in BricsCAD BIM. Think about the sheer number of products in a building that are manufactured. The ability to go from conceptual design of a building element to fully detailed manufacturing drawings is a dream in other BIM systems, but it's a feature of BricsCAD BIM. And the mechanical design tools in BricsCAD Mechanical run side-by-side with BricsCAD BIM, in one product, on one platform. That's design innovation from Bricsys.



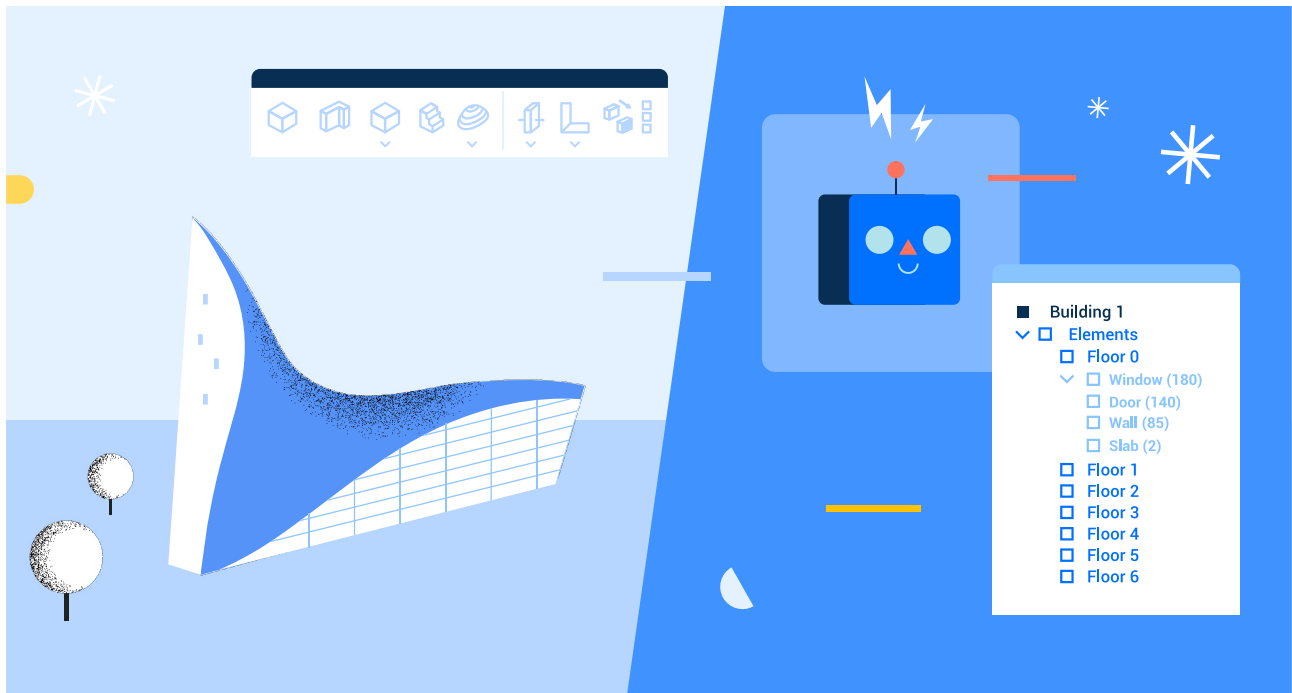
The power of machine learning / A.I.

The freedom to model without limitations, creating geometry without regard for entity type is a hallmark of the BricsCAD BIM workflow. But a real BIM requires strict entity classification. Here's where the power of machine learning shines in the BricsCAD BIM approach. When your concept design is complete, you can automatically classify BIM geometry with our BIMIFY machine learning / A.I. workflow.

BIMIFY examines each component in the model and automatically assigns it an IFC entity classification. This functionality can save hours of work in building a BIM. The massing model becomes the BIM, it's just that simple. And since BricsCAD BIM stores geometric data in industry-standard DWG files, BIMIFY works across

multiple external references (XREFs). This workflow is well known in the industry, by engineers, architects and designers alike.

BIMify is not the only of the use of A.I. in our 3D BIM workflow. Our PROPAGATE workflow allows you to speed the increase in a consistent level of development across your entire BIM, automatically. For example, you can adjust a composition ply at a ceiling / wall juncture and automatically propagate the change across the entire model. With the PROPAGATE tool, the user always has full control over changes made versus changes deferred – and the option to accept or reject changes is noted graphically, directly on the BIM model.



Detailing

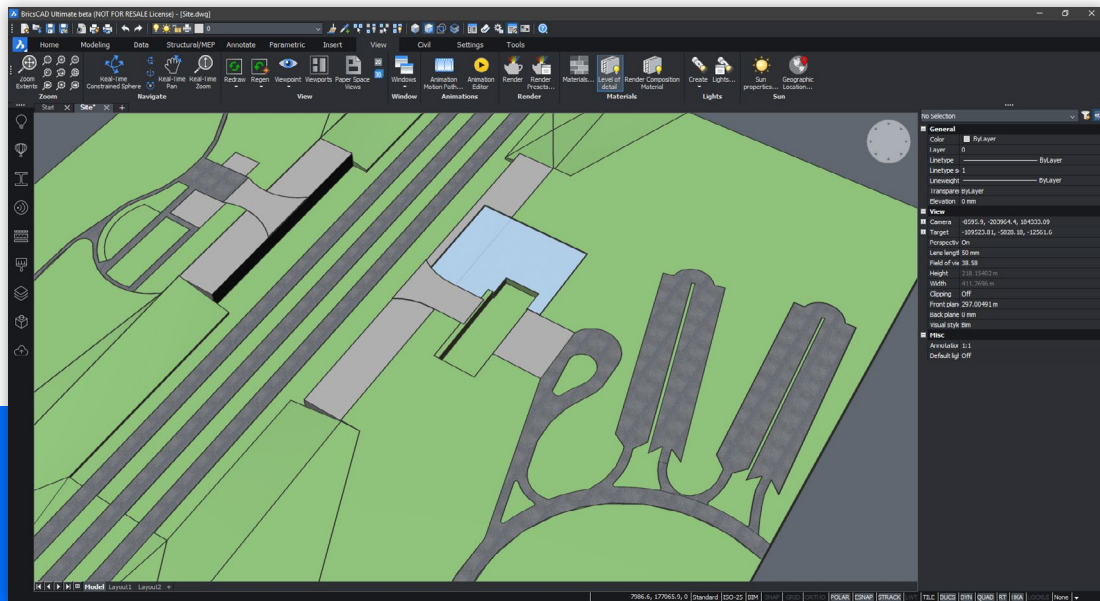
Why is model accuracy important? As we've stated earlier, one of the most powerful benefits of a BIM workflow is automated generation of drawing views for the creation of construction documentation. BricsCAD BIM ensures CAD-accurate drawings, driven by the BIM model, and detailed in the industry's best drafting workflow – again, all in one product. And when the

BIM model changes, all associated drawing views are automatically regenerated to ensure that documentation stays in sync with the model. In BricsCAD BIM, drawing view generation is threaded across multiple cores of your PC's CPU, to let you keep working as the drawings are updating.

Modern, performance-focused software

We are constantly evolving BricsCAD and BricsCAD BIM to take advantage of the today's computer hardware and operating systems. BricsCAD BIM uses the Redway3D graphics pipeline, and supports powerful multi-threading for model loads, rendering and drawing sheet creation. You shouldn't need a supercomputer on your desktop to work in BIM, and we are constantly striving to deliver

the best product performance possible on the hardware that you already own. Our machine learning / A.I. team is working to automate repetitive tasks in both 3D modeling and 2D drafting. When your software is optimized to manage these tasks, you can spend more time doing what you do best – designing the future.



Try BricsCAD BIM today

Imagine BIM-ready modeling from the concept stage, with no design effort lost, ever. You can buy BricsCAD BIM perpetual licenses once and keep them up to date with BricsCAD Maintenance, or you can subscribe if you wish. And whichever license type you choose, we offer honest price that works for your business.

To find out more, and for your 30-day free trial, visit: <https://www.bricsys.com/bim/>