

Accelerate the Design Review Cycle

Autodesk Design Review and DWF enable building designers to conduct fast, effective all-digital design reviews with non-CAD users.

Architects and engineers understand that competing in today's building industry demands increasingly seamless collaboration with all project team members—even non-CAD users. In response, they are exploring all-digital ways to make design collaboration with non-CAD users more automated, clearer, and faster. A report¹ recently issued by the Aberdeen Group highlights this fact, noting that CAD publishing, especially 3D publishing, is the fastest growing form of collaboration within design-dependent industries. Successful approaches to design collaboration will require effective ways to publish, share, and comment on designs both during the design review process and throughout the building lifecycle.

Knowing that a myriad of problems can result when project team members lack ready access to design information, many building industry participants are scrambling to build secure, electronic, and collaborative 2D and 3D design review capabilities. When they cannot provide electronic access to designs, designers must depend on traditional paper-based methods, including delivery and fax, for exchanging and reviewing designs with clients, consultants, and contractors who are non-CAD users. These methods are not only slower than electronic processes, they are also more error-prone, disconnected, and harder to control and manage. Moreover, lack of electronic access to designs causes problems beyond the design stage of the building lifecycle, resulting in inefficiencies during building construction and operation. Problems common with traditional processes include:

- Inefficient design review cycles in which reviewers handwrite comments and designers generate multiple design drafts per cycle
- Lack of time for valuable back checking, increasing the risk of errors, miscommunications, and version control problems
- Incomplete design data for non-CAD users, forcing designers to waste valuable time clarifying the rich details of designs, such as measurements and 3D elements
- Excessive costs associated with printing, distributing, and storing designs throughout the life of the building

From planning to building to facility operation, Autodesk® Design Review software and DWF™ technology power more effective and clearer design collaboration between CAD and non-CAD users by delivering easy-to-use tools that allow all project team members to view, review, and mark up designs. During preliminary design, the software automatically tracks markups, and thanks to tight integration with Autodesk® design software, allows designers to incorporate comments and changes into designs quickly and seamlessly. Autodesk Design Review then streamlines communication around design issues with contractors before and during construction, helping to prevent delays. The usefulness of Autodesk Design Review does not stop when a building is complete. After construction, Autodesk Design Review enables facility managers to view, share, and annotate as-built drawings, driving more efficient facilities management processes.

By enabling architects and engineers to effectively share designs and collaborate with clients, consultants, and contractors, Autodesk Design Review and DWF save time, reduce the risk of errors, and help control costs throughout the building lifecycle. Just as importantly, architectural and engineering firms that incorporate these effective collaboration tools into projects—sooner rather than later—stand to gain a competitive advantage.

In this white paper, we will explore how building project teams that use Autodesk Design Review and DWF are able to keep projects moving forward effectively by connecting processes at every stage of the building lifecycle.

Faster, More Connected Building Processes

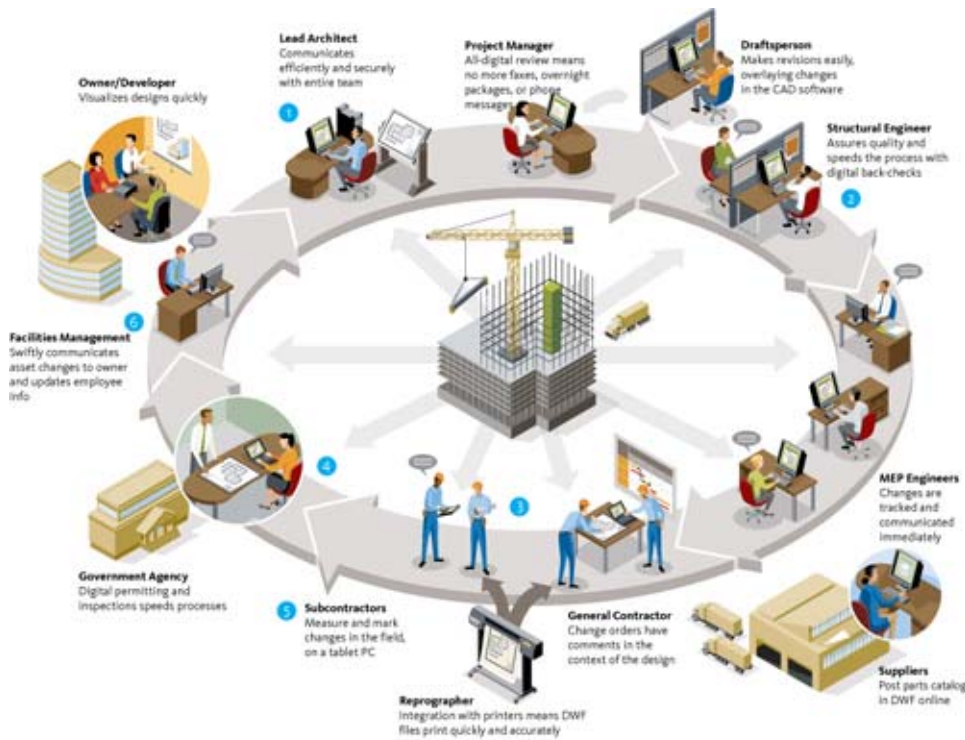
By introducing projects teams to Autodesk Design Review and DWF, architects and engineers can deliver easy-to-use, accurate, and powerful design collaboration capabilities to non-CAD users. Project architects simply publish DWF files of designs directly from within Autodesk® Revit® software-based applications, Autodesk® Architectural Desktop, Autodesk® Building Systems, or AutoCAD® software products. Clients, contractors, and other stakeholders view, review, measure, and mark up those DWF files electronically with Autodesk Design Review. Consultants can securely share information without exchanging printed drawings or huge DWG™ files. As a result, there are faster and fewer design reviews, change orders are documented automatically, and project teams communicate more clearly. Additionally, Autodesk Design Review is integrated with all design software from Autodesk, the world's leading provider of design software to architects and engineers according to Gartner's annual updateⁱⁱ on the AEC market.

Let's look more closely at how Autodesk Design Review and DWF transform and accelerate the way project teams complete building projects.

MKM & Associates Shortens the Design Review Process with Autodesk Design Review

"Writing down 30 comments could take us four hours or more. But with Design Review, you can put your comments within the context of the design, which makes things so much easier for both the engineer and the contractor. In fact, we can do the same amount of work in half an hour or 45 minutes."

—Mark Douglas,
MKM & Associates



Why DWF?

With DWF, organizations enjoy electronic design viewing, markup, querying, plotting, and security capabilities. DWF technology is ideal to power design sharing in the building industry because:

DWF is complete: Architects and engineers can publish and share all of their designs accurately, directly from within Autodesk Revit-based applications, Autodesk Architectural Desktop, Autodesk Building Systems, or AutoCAD software products. DWF files scale with powerful precision and can include data from 3D building information models and measurements.

DWF is compact: As a highly compressed, compact format typically 1/20 the size of corresponding DWG files, DWF enables organizations to share complete representations of complex 2D and 3D designs digitally.

DWF is compatible: DWF is integrated into all Autodesk design applications. For customers working in a multi-CAD environment, DWF files can be published utilizing free* Autodesk® DWF™ Writer software. Furthermore, DWF can be integrated into existing systems with a free developer toolkit, the Autodesk DWF Viewer, and easy-to-use Autodesk Design Review APIs (application programming interfaces).

DWF is connected: Communicating around designs is easy for clients, consultants, and contractors who view building information using the free* DWF Viewer. Additionally, markups made in Autodesk Design Review can be quickly incorporated into AutoCAD, Autodesk Architectural Desktop, and Autodesk Revit-based software for a faster, more accurate revision process.

DWF is controlled: DWF allows organizations to select which design data they want recipients to see. Files readily support multiple pages, passwords, and object properties—so rich engineering and architectural details are preserved for use in design review, construction, and facilities management.

Streamlined Design

Autodesk Design Review accelerates design review cycles, speeding up the pace of the entire design process. The architectural team publishes DWF files for the client and lead architect to review and mark up. The lead architect uses markup tools in Autodesk Design Review to give detailed comments on the design for the draftsman to execute. Overlaying the DWF file in his design software, the draftsman makes the changes quickly. The client then views, reviews, and marks up the design in DWF with Autodesk Design Review. Thanks to the free* Autodesk DWF Viewer, people in the client's organization who do not need markup capabilities can view the design as it evolves.

Agile Consultant Collaboration

As engineers become involved, Autodesk Design Review makes design collaboration across the extended team faster and clearer. Project engineers publish designs as DWF files from within their design software. They then e-mail them to the project team or post them on one of Autodesk's on-demand collaborative project management offerings, such as the Autodesk® Buzzsaw® or Autodesk® Constructware® services. Because they do not have to share DWG files with other consultants, their work is secure and protected against unauthorized changes. The team uses Autodesk Design Review to comment on designs and to request changes. Digital back checks reduce the risk of errors and automatic markup tracking enables consultants to review design status and changes.

Faster Construction Validation

Autodesk Design Review and DWF facilitate earlier and more efficient collaboration with contractors. Working with the architect, the client shares DWF files of preliminary designs with the general contractor. The contractor reviews the files for constructability. When the contractor has questions or concerns, he makes comments using Autodesk Design Review. The project manager collects all project construction cost estimates and timelines in Autodesk Design Review, which tracks changes automatically. Because the contractor's insights are included earlier in the process, the team sets the stage for a more hassle-free construction phase. The general contractor can also distribute drawings digitally to subcontractors for faster bids and estimates.

Better Building Permitting

Digital permitting with DWF and Autodesk Design Review further accelerates the project—while saving a significant amount of paper. The architect submits DWF files of building plans to the local city planning agency, which accepts DWF-based plans. City planners review and mark up the plans in Autodesk Design Review. The architect and the draftsman overlay the comments on the original design and quickly make the changes. After checking the changes, the planning department issues the necessary permits and is able to efficiently archive the compact DWF files.

Coordinated Construction

With Autodesk Design Review and DWF, the contractor, client, architect, and engineers can all collaborate to resolve construction issues in record time. The contractor marks up DWF files with comments when he has questions. The design team is able to respond almost immediately. Autodesk Design Review tracks and archives all change orders automatically. At the job site, the construction team can print accurate DWF files of plans for subcontractors thanks to integration with large-format printers. And Autodesk Design Review enables the construction team to measure elements within designs, minimizing the need to use phone or fax to verify measurements.

Efficient Facilities Management

Both Autodesk Design Review and DWF contribute to more efficient facilities management processes by making designs more available to owners, facilities managers, and occupants. When the building is complete, the design team delivers DWF files of the building to the owner. During the operational phase, the facility manager can then use the files to streamline maintenance activities and to populate facilities management tools, such as Autodesk FMDesktop software. Autodesk Design Review and DWF enable the facility manager to easily share designs and collaborate around evolving facility needs with team members over the intranet.

SOM Communicates Complex Design Changes Faster

Skidmore, Owings & Merrill LLP (SOM) is one of the world's leading architecture, urban design, and engineering firms. Since its founding in 1936, SOM has completed over 10,000 projects around the world and won more than a thousand awards for quality and innovation. That level of innovation is why owner/developer Silverstein Properties picked SOM to design the Freedom Tower, the first building to rise on the site of the former World Trade Center.

After a competitive software selection process, SOM chose Autodesk® Revit® Building software as the project's primary architectural design tool. To share the 3D building models created in Revit, SOM uses Autodesk Design Review and DWF. Autodesk Design Review provides all project stakeholders—even non-CAD users—with custom markup and approval tools. These tools enable the extended project team to communicate complex design changes with speed and clarity as the firm moves to all-digital processes.

Conclusion

As reportedⁱⁱⁱ by the AberdeenGroup, the necessity for efficient, digital design collaboration is rippling through design-dependent industries. In Autodesk Design Review and DWF, Autodesk offers a complete solution for successful design collaboration that leverages the world's most popular building design software. DWF allows any team member to view designs with the free* DWF Viewer. Autodesk Design Review extends the power of DWF to allow clients, consultants, and contractors to easily review, mark up, and measure drawings. By adopting Autodesk Design Review and DWF, architectural and engineering firms can accelerate the design review process and design collaboration at every stage of the building lifecycle. Moreover, firms that turn to effective all-digital collaboration ahead of the competition are likely to see a business advantage in the form of more satisfied clients and accelerated projects.

Design firms like SOM and MKM are using Autodesk Design Review and DWF to shave days off of design review processes and reduce the number of review cycles per project. They are achieving these tangible results by helping ensure clients, contractors, and consultants can collaborate successfully and connect processes that have traditionally been disconnected. With Autodesk Design Review and DWF enabling more effective design collaboration, building industry participants can:

- Conduct faster, more efficient design review cycles
- Decrease the risk of errors and miscommunications with improved back checking capabilities
- Share more complete and easier to understand designs with non-CAD users
- Reduce the costs associated with printing, distributing, and storing designs throughout the building lifecycle

Find out how Autodesk Design Review can make your building projects and processes flow faster. Visit us on the web at www.autodesk.com/designreview-building.

ⁱ AberdeenGroup, *The Product Lifecycle Collaboration Benchmark Report*, 2006.

ⁱⁱ Gartner Dataquest, *Market Share: AEC Applications Software, Worldwide*, 2005.

ⁱⁱⁱ AberdeenGroup, *The Product Lifecycle Collaboration Benchmark Report*, 2006.

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