

BLD137818

Architecture and Beyond: Enscape™ Best Practices from Around the World

Phil Read - Read | Thomas

- Understanding Enscape best practices for lighting and materials
- Learning how Enscape VR dramatically improves design decisions
- Thinking outside the box and across industries
- Invigorating communication with design partners and clients

Enscape™ allows anyone to quickly and easily explore and present their design in a beautiful and natural looking real-time VR environment. No time wasting and error prone exporting or post production required! Enscape simply updates as the design changes, allowing you to focus on what matters. But the advantages of real-time and VR go well beyond Architecture.

This enlightening session will present the best of the best techniques for using Enscape from around the world and across multiple industries: Building and Infrastructure, Industrial Design, Media / Entertainment and more. By the end of this inspiring presentation you'll be able to go back to your office and immediately implement these best practices into your workflow that save time, money, win more work and keep you ahead of the competition!

Your AU Expert

Phil is the co-founder of Read | Thomas - an AECO consulting company focused on connecting designers, builders and owners through cross-discipline technology integration. He has nearly 25 years experience in Architecture and Engineering including 16 years implementing Autodesk Revit: the world's only fully integrated platform for the parametric design of buildings and infrastructure. Thanks Leonid!

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Introduction

We've all been there before. A big deadline approaches and you're up all night rendering the project. Who wants to be that person? That's right– *nobody*.

Design can be an incredibly stressful and time consuming process. It's incredibly important that we don't confuse the rest of the team. We need to communicate as accurately as possible.

We also want to be **proud** of our work. We want to be proud of our work and we want to make our team proud of their combined efforts. We want the customer coming back for more. We want to be part of the team that is eagerly pulling in the same direction.

Unfortunately, it's incredibly embarrassing and frustrating when we've miscommunicated the design intent and have to start over wasting precious time and money. Yet we don't simply want to save time at the cost of quality. The ultimate goal is to create a better experience for the customer. How can we dramatically improve the design process? By allowing the design teams and customer to experience the design as accurately and emotionally as possible.

The adoption of 3D design and a BIM has had an enormous downstream benefit in terms of concurrent information: integrated design, documentation, analysis, visualization and more. Design is only going to get faster and more automated. If you don't get started now you're simply going to get left behind– and your business is going to pay the penalty. The sooner you adopt real-time visualization the sooner you succeed because it benefits everyone involved: you're a design team, Your design partners and ultimately your customer.

Nobody wants to be the person that is disrupting the design process. Everyone needs to pull together and at the same time. If you're waiting for renderings to complete before an important deadline you're just adding stress to everyone else and the entire design process. Everyone's reputation is at risk. When this keeps happening you put yourself at risk. In the worst case in scenario guess who's name rises to the top of the list when there are cutbacks and people have to be cut from the team?

The goal isn't **Rendering**. The goal isn't **Communicating**. Communication alone merely **Informs**. The goal is creating a great **Experience**. Great experiences are memorable. Memorable experiences can **Inspire**.

Hands up – who wants to stop waiting and start **Experiencing**?



TRILOGY
PARTNERS



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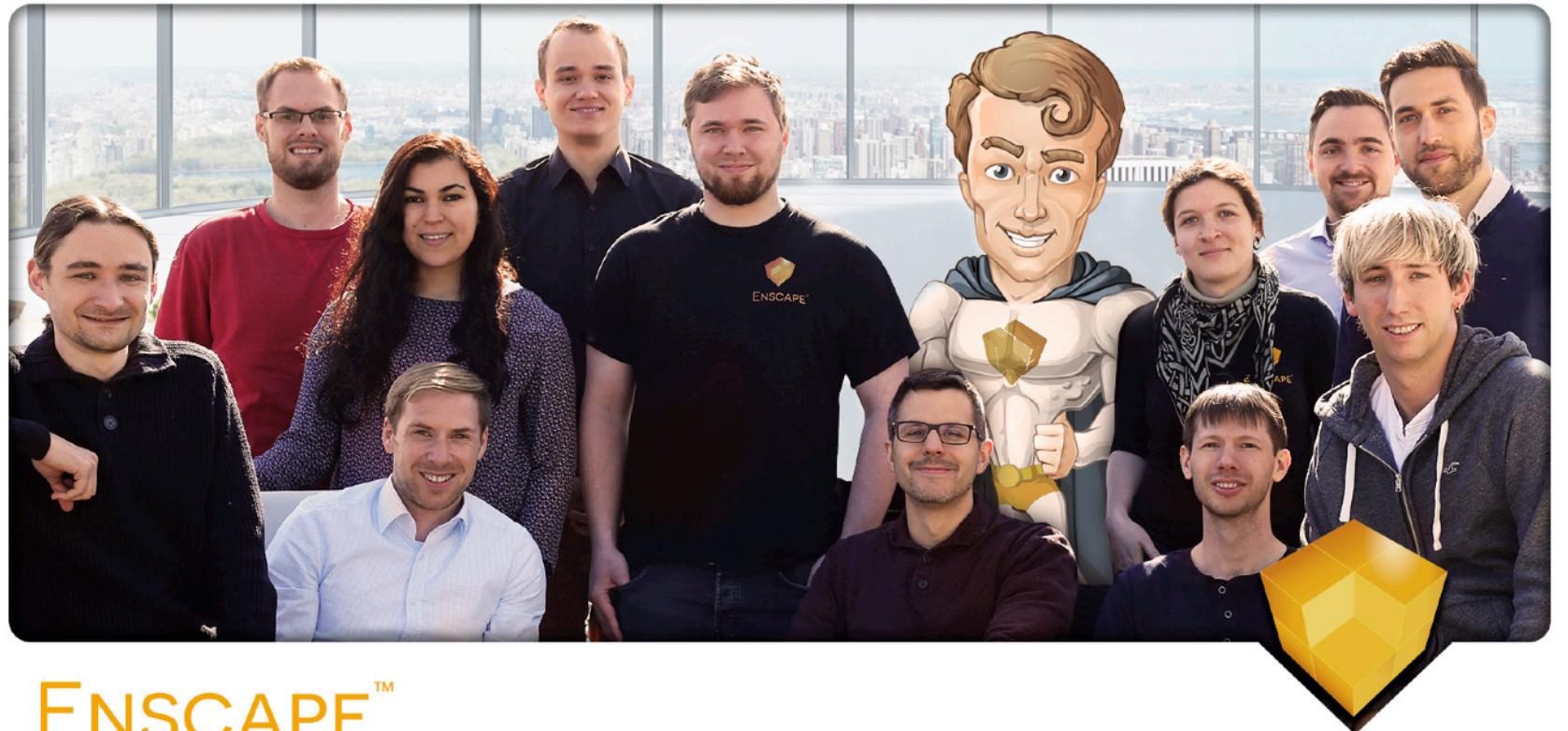
Special Thanks.

It's truly wonderful to be working with so many talented and dedicated team:)

First, huge thanks to the Enscape team. You're all incredibly talented, dedicated and I'm amazed at how much you get done between releases. You're willing to try new things and even when we stumble, we quickly learn something new and move forward. This is incredibly refreshing and shows great leadership. Thanks for allowing ReadThomas to be part of your team.

Second, thanks to all the and people and teams that made this presentation possible. I'm inspired every day by seeing your new ways of thinking, working and solving problems. It's a pleasure working with customers on the leading edge, willing to try new things and implement new technology. You guys the best of the best!

Finally, thanks Adam, Roy and all the rest of the "silent but deadly" Read Thomas team. You guys do the most incredible work while supporting our partnership with the Enscape. I'm on the road a lot I couldn't do without you guys. Thanks for holding down the fort and making the stress totally worth it!



What's New in Enscape 2.1

The next update of Enscape is just around the corner! Enscape version 2.1 has some incredible new features.

Revit™

- Display of Graphics or Appearance material
- Horizon options and improved procedural sky
- Improved view selection and search
- Improve progress bar during updates
- Support for linear, rectangular, spherical and disc-shaped lights (Revit and Rhino)
- Support for azimuth/altitude sun settings (Revit and Rhino)
- Support for procedural materials (improved wood, metal and glass)
- Improved support for nested light families
- Presentation Mode for saved views (also saved to EXE files)

SketchUp™

- Placement of sound sources is supported
- Load and reference external SketchUp files
- Coming soon: more detailed support for material textures

Rhino™

- Supports Rhino 5.0 (64 bit)
- More used material parameters and material keywords (most notably grass/water)
- Import sun and geolocation for correct lighting
- View synchronization (similar to the SketchUp feature)
- Support for links and attached files

Overall

- One installer for all applications and *without* Admin privileges
- Support for multiple sound file formats (*.ogg, *.mp3, *.flac, *.aiff, *.au and *.raw)
- Sound is embedded in the exported EXE file
- Support for QR codes such as Copy Link, Copy QR Code and Save QR Code
- Automatic Noise Reduction
- Support for non-symmetric IES file
- Rotate and adjust the brightness of skyboxes
- Mini map enhancement

What's Next?

- Archicad™ :)



AUTODESK
REVIT



SketchUp



Rhinoceros®

Industries

When I sent an email earlier this summer asking Enscape users for unique and special use cases of Enscape, there were so many valuable and interesting suggestions I didn't know where to start! I received surprising and fascinating case studies from a multitude of disciplines illustrating very high level of expertise. From this enormous list I had to narrow down the very best of the best.

Ultimately I decided to keep the list of submissions as balanced as possible. There were so many disciplines types to choose from. A number of submissions came from very well known firms. Yet some submissions came from practically unknown teams doing extraordinary work.

I decide to select the broadest number of use cases across firm types and industries. I believe this illustrates how different industries are often trying to solve very similar kinds of problems. The cross pollination of ideas across industries is incredibly valuable!

Architects tend to use Enscape to explore and review design decisions internally and externally. They're interested in a high level and real world fit and finish.

Engineers seem less concerned about natural and beautiful looking material studies. They're more interested in coordination and information. In other words, "how it works". Particularly when it comes to understanding the utility and function of the space.

Builders and Contractors are interested in real-world level of detail that explains how things fit together. In some cases the detail is down to the level of grout lines, hardware and connections. The goal is to communicate at a level of detail that removes any ambiguity about the proposed finished condition.

Fabricators need to communicate and understand very high-level of assemblage between the design team, client and those actually doing the fabrication.

Civil Infrastructure projects are primarily concerned with understanding the coordination, function and access within the space. This group also seems to be the most concerned with issues of health, safety and welfare. Egress signs are illuminated in low light conditions. Materials such as anti-skid surfaces indicate safety and function. Maintenance accessibility must be maintained around complex systems

Film and Stage users are by far the most rigorous 3D modelers. They need to communicate the experience of the design as inspirationally as possible while solving the practical challenges of fabrication and installation.



Applications

Enscape supports **Revit**, **SketchUp** and **Rhino** (and soon...**ArchiCAD**). Although the end products from these applications may be very similar, each design application has its own strengths.

Revit is predominantly being used to the building space. Because Revit is purpose built for buildings, Revit can have limitations where SketchUp and Rhino may not (as those tools are more generic modelers). On the other hand Revit's parametric workflow and associativity between building, content and documentation that gives Revit many unique strengths.

SketchUp is also mostly being used to the building space. But there are a number of interesting use cases around construction, coordination and fabrication often displaying an unusually high fit and finish.

Rhino is also mostly being used in the building space as well. But there are a number of interesting use cases where it's being used for highly resolved museum and public art installations as well as film and stage design. In the future I expect to see Rhino and Enscape increasingly used for exploring product and industrial design.

Overall, the majority of **Revit**, **SketchUp** and **Rhino** users are using Enscape to visualize, explore and resolve *building* design issues. But the edge conditions - where the design is not strictly a habitable building - is incredibly interesting and inspiring!

Before we continue to the use cases, let's take a step back and revisit some important best practices and workflow tips.



Best Practices

Enscape is incredibly easy to use – but Revit, SketchUp and Rhino have their quirks. Rather going into a lot of detail, I'll provide a high level highlights with links to more detailed information. If you're new to Enscape, these articles are a **must** read.

Hardware ([link](#))

Enscape is very GPU intensive and requires specific hardware to run properly. 2gb of memory on the graphic card is a stated **minimum**, so I wouldn't encourage anyone to go out and buy graphic cards with 2gb of RAM. 2gb of RAM on the GPU won't get you very far and you're just going to be frustrated in your day-to-day workflow. In my experience, **2gb** of RAM on the GPU is sufficient for a standalone EXE file but not for live design review workflow.

For design review workflow, **4gb** RAM on the GPU is the **minimum** in order to avoid the annoying delays when updating changes in Enscape.

For using Enscape with a VR headset, I recommend **8gb** of RAM as a minimum. I also strongly recommend using consumer level gaming cards over “professional” graphic cards due to lower price and on-par or higher performance in VR. Don't be fooled by the **FUD**. **Consumer level gaming cards work great with Revit.**

As for VR, Enscape supports both the [Oculus Rift](#) and the [HTC Vive](#). The visual quality of either option is comparable. A year ago I would've suggested that these VR head sets were really more *toys* than *tools*. But during the last year I've changed my mind completely and believe that VR is an essential part of design workflow.

I like both the Rift and the Vive. But lately my preference has been tipping toward the **Oculus Rift** for a couple of reasons. First of all, the Oculus headset is lighter. This makes a big difference if you're wearing the headset a lot because it reduces neck and shoulder strain. Secondly, the Oculus Rift includes headphones rather than as an expensive add on. Third, the Oculus Rift has fewer pieces and parts and is much easier to setup and takedown for presentations. And finally, there's been a significant price drop with the Oculus Rift (< USD\$400) versus the HTC Vive (USD\$600).

The bottom line is that price is no longer a barrier to adoption for using VR to explore and experience your designs. Ironically, the revenue lost due to the meeting to discuss whether or not to purchase a VR headset will be multiples more than simply purchasing a VR headset.



Workflow

Enscape is very GPU intensive. It won't run on simply any hardware—and that hardware needs to have enough compute and memory resources to handle the design. Provided you have supported hardware, there are a couple of things that you can do to maximize performance in Enscape.

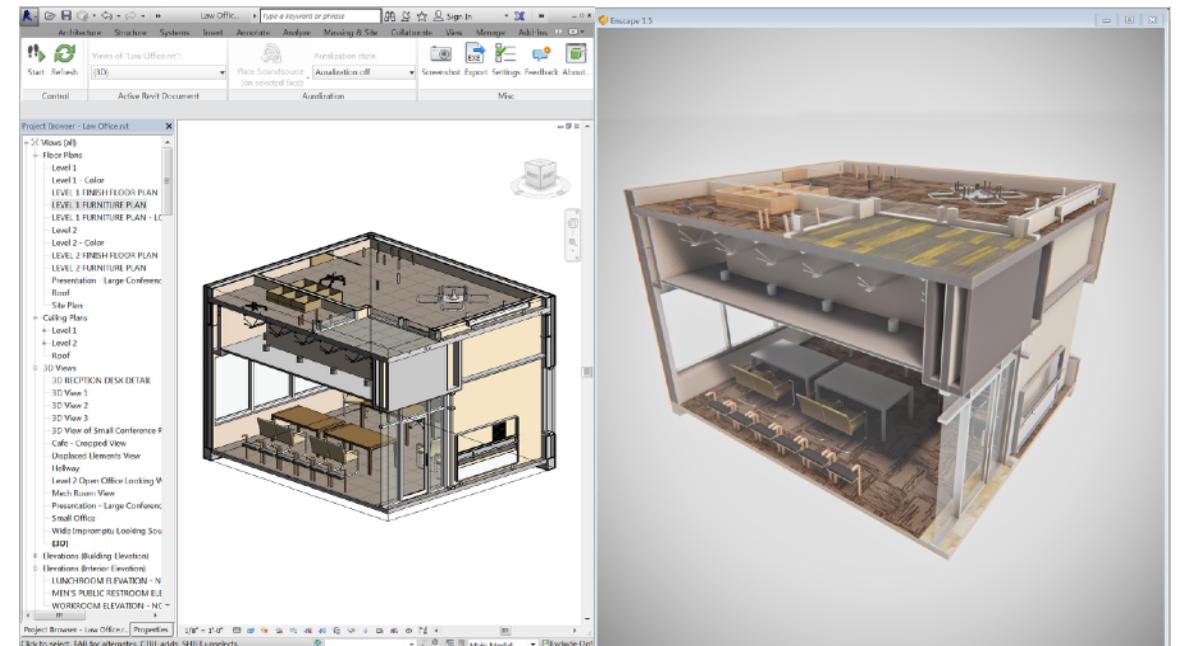
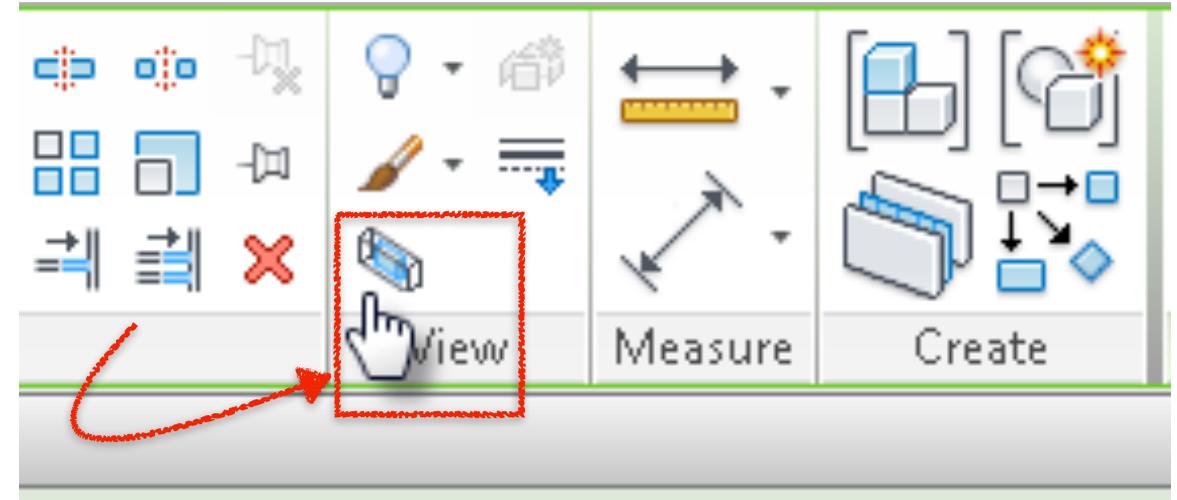
First of all, **screen resolution** matters. If you're viewing the Enscape window on a second monitor, performance will dramatically increase if you drop screen resolution from 3k or 4k to 1k or 2K. 4K resolution is displaying nearly 16 times the detail of 1K resolution. The reality is that once you sit back at a typical working distance from your screen, your eyes can't tell the difference between 1K and 4K resolution. Stop stressing your graphic hardware to do something that you can't see.

Next, Revit's **Selection Box** and **Section Box** can be used to quickly isolate part of a large project. Doing so will significantly increase update speeds when making changes (versus waiting for changes to update in Enscape when viewing the entire project).

If you're working on an large project but need to focus on a specific area, you can still make holistic changes in Revit, which will update very quickly in Enscape. Putting a section box around part of your project also has the advantage of helping the design team focus on the specific part of the project while minimizing distractions during review.

Consider creating and saving a few 3D views with section boxes already active. Then use the Active Document drop down option to quickly jump between those areas of the building in Enscape.

In Enscape v2.1 you can even highlight your favorite views in Revit, SketchUp and Rhino and have them display in a side menu in the Enscape view window! Favorite views are also available within exported EXE files.



Lighting ([link](#))

Lighting in Enscape it looks beautiful and natural. Enscape 2.1 has increased support for Revit light objects as well as non-symmetric IES light objects. But sometimes those Revit and IES light objects aren't accurate enough it comes to illumination. There are also many sources of ambient light that simply can't be created in Revit.

This is where illumination via Revit's self illumination comes to the rescue. You can model geometry for increased realism and accuracy and then tell that geometry to glow. This is great for recessed and accent lighting, illuminated geometry and even illuminated materials like television screens, computer screens and other appliances.

Materials ([link](#))

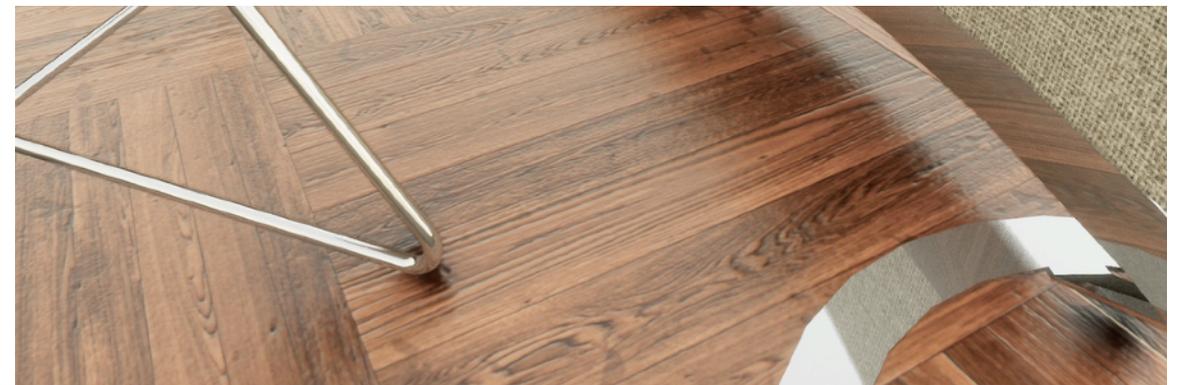
With a bit of care, also look beautiful and natural in Enscape. It's important to use a properly sized image map of at least 1K resolution. Searching Google images with the keywords "tiled" and "seamless" produces results that look fantastic when rendered. After selecting the appropriate material, the three most important setting you should consider the **asset type**, **bump** and directional **grain**.

The **asset type** in Revit is incredibly important. I tend to use the **Default>Generic** asset types for all of my materials. This gives the most careful and subtle control of how the material is displayed. Secondly, practically every material has some **bump**. I'd use the same material for the **bump** setting (not a separate bump map material). Finally, many materials need to display a unique **grain** in different directions for different surfaces of the same geometry. In these cases it's important to use the paint tool and assign an appropriate material to the appropriate directional face.

Graphics ([link](#))

Managing material origins by repeatedly and manually adjusting offset X and Y values is needlessly tedious. A better method is to create and assign a custom **model pattern** to the material. The model pattern can be used to quickly and easily move the origin of the material to the correct location. This locks the material origin to the component.

Once the model pattern is assigned, you can also use the Align tool to select the model pattern and move the pattern origin of the image to the exact location (which hides the model pattern). This technique also allows you to stop over modeling geometry and use materials to communicate accuracy, realism and detail - just like your favorite video game!



Custom Backgrounds and Photospheres ([iOS](#) and [Android](#))

There are a couple options for creating custom backgrounds in Enscape. You can use an **image** (even a solid color) and you can also use a spherical **photosphere** or skybox.

If you want to use a solid color or flat image, simply make sure the image has an aspect ratio of 2 to 1. For example, use an image size of 2000 pixels wide by 1000 pixels high.

Creating a custom photosphere doesn't require a special spherical camera or hardware. I recommend using the **Google Street View** app with practically any mobile device. Once you install the app, the process is simple and straightforward. Then save the image from your mobile device and load into Enscape.

Issue Tracking for Contextual Coordination ([link](#))

When you discover a design issue that needs further attention, it's very useful to save that view in the moment using the **Create View** feature in Enscape. This feature will allow you to create a perspective view camera in Revit from the location of your Enscape camera. When you use this tool, I'd recommend two additional suggestions.

First, map the Create View function to a **keyboard shortcut**. This will allow you to quickly and easily initiate the feature. Secondly, I'd recommend naming the perspective view with the name of the person responsible for resolution and a brief description of the design issue to be changed. Naming the view with this manner also allows you to sort and filter for quick resolution.

Membrane Layers and Frit Patterns ([link](#))

Rather than apply a frit pattern as a material in a trivial manner (which cannot be controlled parametrically) it's better to embrace the old saying, "build it like you build it."

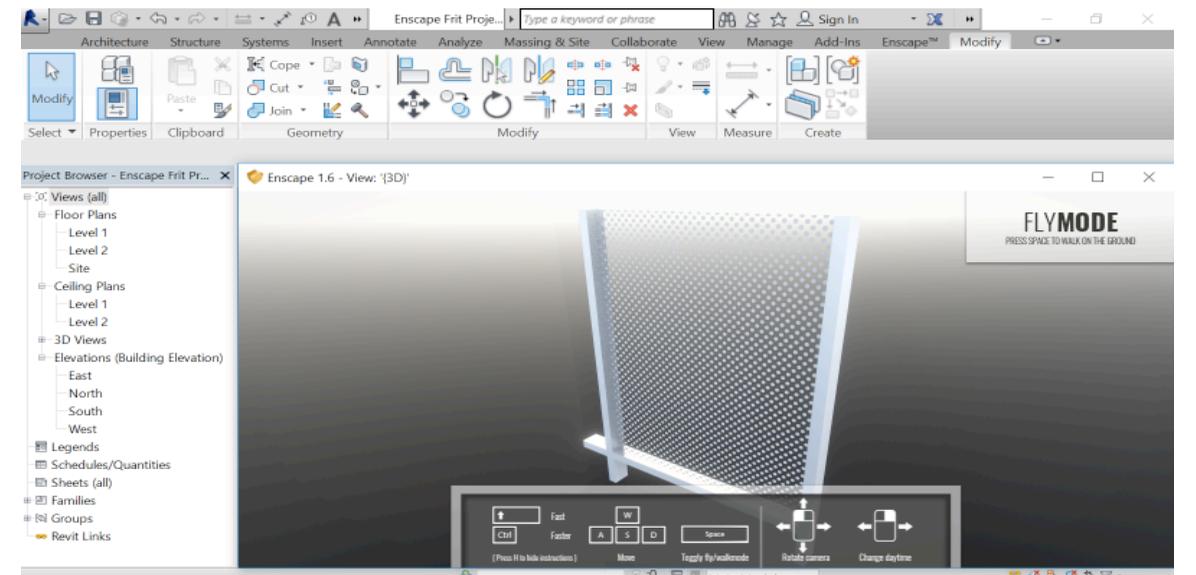
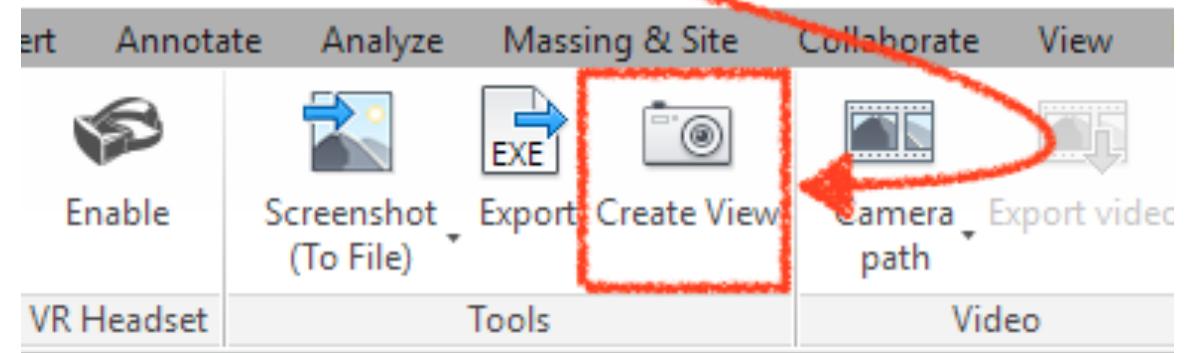
I suggest adding a 1mm membrane layer to glazing for curtain panels, doors and windows. This gives your family components the flexibility of displaying frit patterns with a parameter. The frit pattern material may also be parametrized as well.



Google Street View

Google, Inc.

OPEN



Adding Sound to Your Project and Family Components ([link](#))

Moving through a space that contains the ambient sounds of music, nature, water, conversation and other context is incredibly engaging. You feel like you're really inside the space and it definitely the experience. Sound gives the design review and presentation greater emotional connection.

Although you can add sound directly in the project environment, I found it's useful to nest the Enscape sound component within the Revit family. This technique guarantees that the sound is automatically associated to the component family when placed and moved in the project environment.

When the sound is controlled within the family component as an instance parameter—not every family needs to render a sound during project review and exploration. In other words— you may have many trees, but only a few trees need to render the sound of songbirds! And in v2.1 the sound files are imbedded in the Enscape EXE file.

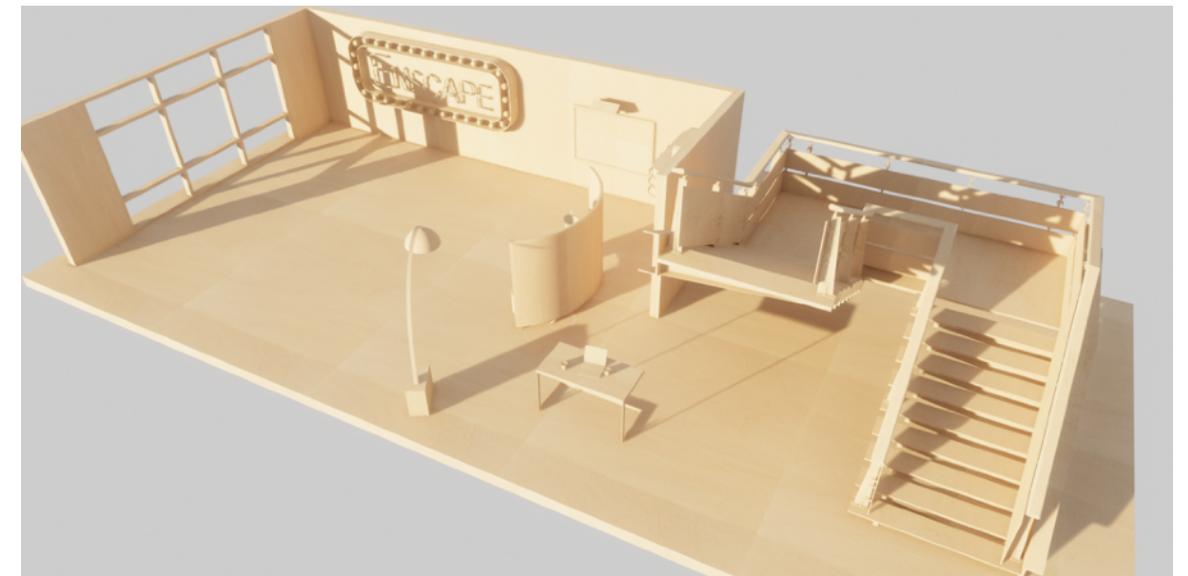
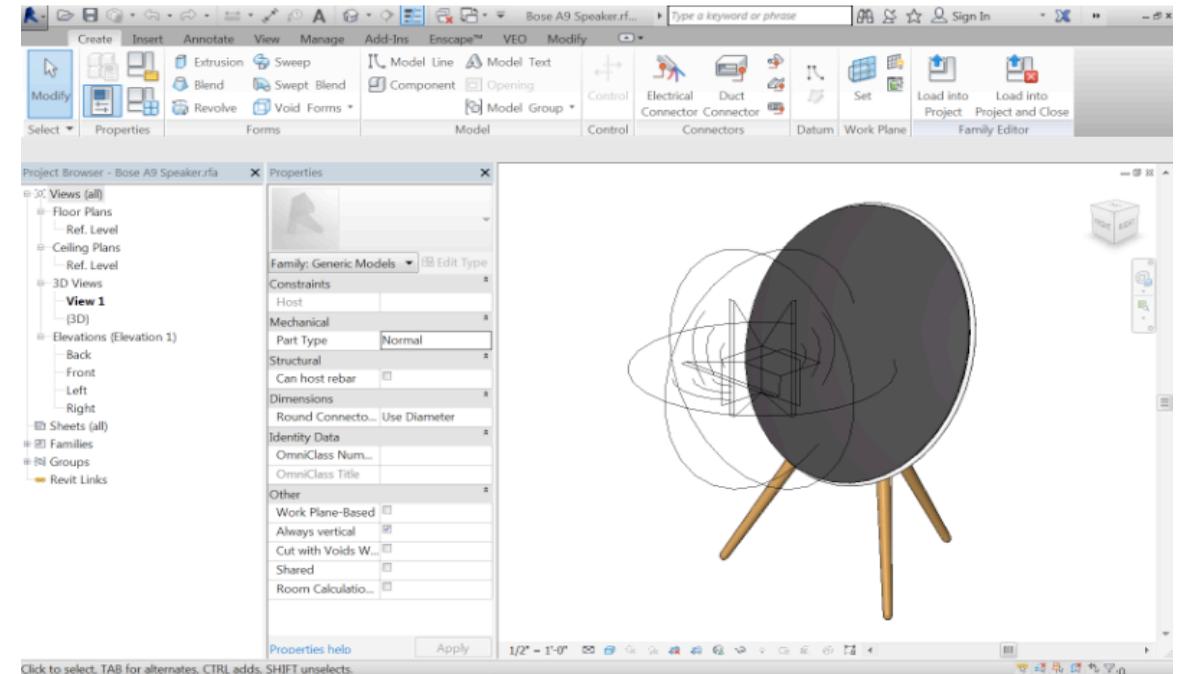
Simulating Physical Models with Phasing Override ([link](#))

New technology does not always need to do something “new” to be useful and interesting. In many cases, new technology can do something that already exists but in an improved way that is already deeply familiar. In this manner, new technology helps to improve an existing process within a well understood metaphor.

Physical models made of wood, cardboard, paper, etc. are immediately understandable. These scale models are useful because they helped communicate form, function, light and shadow in the abstract rather than the literal.

Using a simple Phase override in Revit, you can quickly and easily apply a ubiquitous texture to your project and immediately review the results in Enscape.

Now let's get on to the **Honorable Mentions!**



Honorable Mentions

Selecting the most compelling use cases for the Top 10 was incredibly difficult and probably a bit subjective. With that disclaimer - here my list of Honorable Mentions. All of these workflow suggestions are easy to implement in your projects to improve communication, save time and money.

Boxman Studios / Prototypes for Fabrication

Boxman Studios designs, develops and deploys temporary and permanent container shipping-like spaces around the world. Their projects are for variety of use cases including Hospitality Suites, Concession Suites, On-Demand Retail and more.

From concept through fabrication details, Boxman uses SketchUp to bring their designs to life. Being able to explore and experience their designs with Enscape in first person is incredibly valuable to the success of their projects.

<http://boxmanstudios.com/>

CPPI / MEP and Structural Coordination Review and Sun Studies

CPPI often bypasses Navis in favor of design review coordination directly inside of Revit using Enscape. The goal is coordination of MEPFP with Architectural and Structural. The focus is on the interstitial space full of piping and duct and cable tray that is “a confusing mess”.

In order to make sense of so many complex systems during review, CPPI applies color to the duct and pipe material by System in Revit. The design teams are quickly able to easily discern the different systems when reviewing the design in Enscape.

Another great technique at CPPI is creating sun path studies with Enscape. But depending on the length of the animation, this can take a significant amount of time. And unfortunately, the resulting animation doesn't show the time of day. To avoid long rendering times and display the time of day, CPPI uses a screen capture tool and then animates the sun path live. Time savings: 20 seconds versus 1+ hours for a 10-15 second animation.

<https://cpqi.com/>

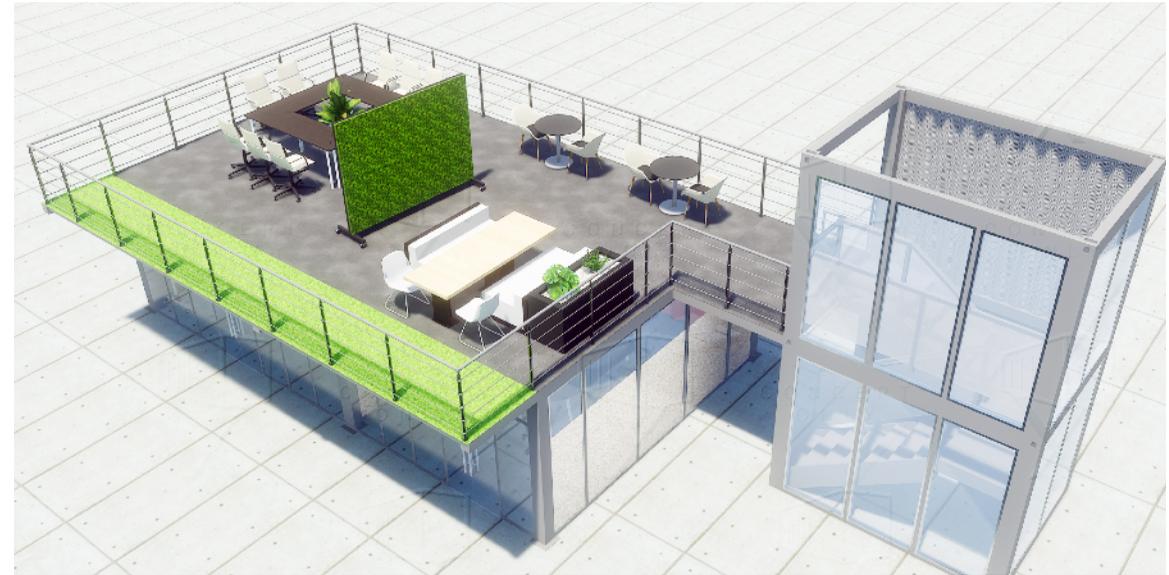


IMAGE CREDIT: BOXMAN STUDIOS

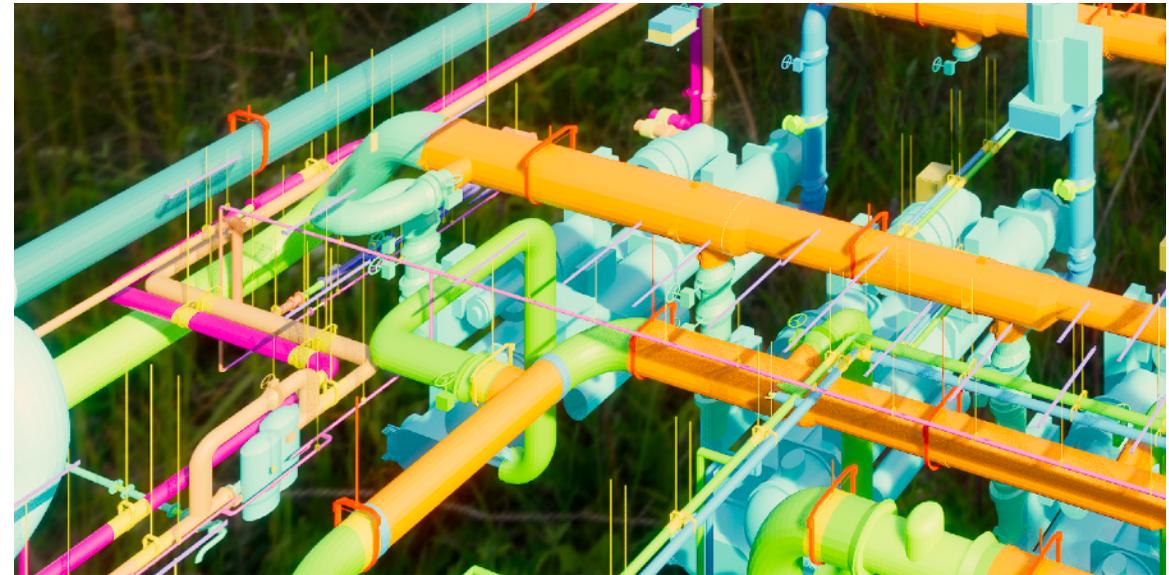


IMAGE CREDIT: CPPI

Goettsch Partners / Generic Asset Types for Materials

When it comes to curtain systems, exterior glazing and interior atrium studies, Revit's procedural material assets can leave a lot to be desired. There's simply not enough control in quality or fit and finish of materials. For this reason Goettsch uses Default>Generic Asset Types.

The result is an unparalleled quality of material and lighting that can be adjusted in Revit and immediately displayed in Enscape. Goettsch often starts with neutral material tones in early design to communicate reflectivity and transparency. Once these early design issues are resolved the designers increase the realism by using more real-world materials that display material, color, tone and grain.

<http://www.gpchicago.com/>

SOM / Living Wall Systems

SOM uses Revit to resolve the design through construction of buildings that are often monumental in scope and scale. For such projects, large interior atriums and light shafts are designed to allow controlled and filtered light to flood the interior spaces containing Living Wall Systems. These living walls are used to not only stimulate visual interest and occupant well being, but to soften what might otherwise become large, cold and impersonal volumes.

To simulate these Living Wall Systems, SOM uses a standard Revit Planting family that is nested into a bucket family. These Bucket families are in turn nested and arrayed inside a Curtain Panel family.

The result is a modular Living Wall system that can be quickly created and modified using the standard curtain Wall tool. The results are and immediately available to explore in Enscape.

<http://www.som.com/>



IMAGE CREDIT: GOETTSCH



IMAGE CREDIT: SOM



KTA LTD / Construction Details

The image to the right illustrates the detail of a fire suppression system modeled in Revit and rendered in Enscape. The images are used for a manufacturer's technical brochures and web sites. According to KTA, Enscape is instrumental to their workflow in terms of speed realism and ease of use.

The detailed models are initially created in Revit, exported to AutoCAD and detailed as solid models. Since both files use the same origin points, the AutoCAD model is then linked back into Revit and materials are applied to the Object Styles>Imported Objects category so they can be quickly and easily rendered in Enscape.

Notice the special care to apply materials based on grain or material direction. Different materials have been applied based on the different surface grain, side grain and end grain. This is done in the Revit material editor using the paint tool to apply materials selectively to each surface. The result is much more natural and realistic in appearance compared to assigning a single material and entire piece of geometry.

<http://www.kta.co.nz/>



IMAGE CREDIT: KTA LTD

HKS / Procedural Materials

Enscape can display grass (and other materials) procedurally. For grass, Enscape does this by visually “draping” the selected material over procedural grass-like geometry.

Using Enscape, HKS creates natural looking sports fields by using a single high-resolution material that represents the entire sports field. The image includes all the materials for the field including the grass, field striping, team insignias and other graphic features.

When this single, hi-resolution material is procedurally draped over the Enscape procedural grass-like shapes, the result is a beautiful and natural looking sports field that is visually compelling while being computational light.

<http://www.hksinc.com/>



IMAGE CREDIT: HKS

Freese and Nichols / Health and Safety

Enscape gives Freese and Nichols the ability to take their models in Revit at any level of design and quickly and easily generate views throughout a facility. This is far more useful to the client because they truly understand the design in a way that is much clearer than simple plan views and elevations. Experiencing the facilities accessibility for operations is underscored by health and safety issues.

Enscape also allows the client to explore the design and fully appreciate the scope and scale. This size of this raw water pump station is lost when reviewing scale drawings as the main floor is over 300' long and being designed to handle over 200 million gallons per day. Using Enscape, the client experiences this project in first person. Viewing this project as an object doesn't communicate the complete experience compared to experiencing in first person.

An added bonus is Enscape's panoramic views. Freese Nichols uses Enscape's panorama feature through iPads or smart phones (using Google cardboard). According to Freese Nichols, "Enscape takes collaboration with our client to another level with simplicity and ease!"

<https://www.freese.com/>

Spillman Farmer Architects / View Templates for Design Options

Being able to review multiple different Design Options from the same location helps the design team and client distinguish what is and isn't changing between options.

Spillman Farmer begins by creating news views in Revit from Enscape. Next, the new view is set to the Active Document in Enscape. Finally, View Templates are assigned to the views specifying the desired Design Option (and other settings). The design team can quickly switch between each of the View Templates during design review.

The view the updates in Enscape from the same location and the team can easily identify the changes between options.

<http://www.spillmanfarmer.com/>

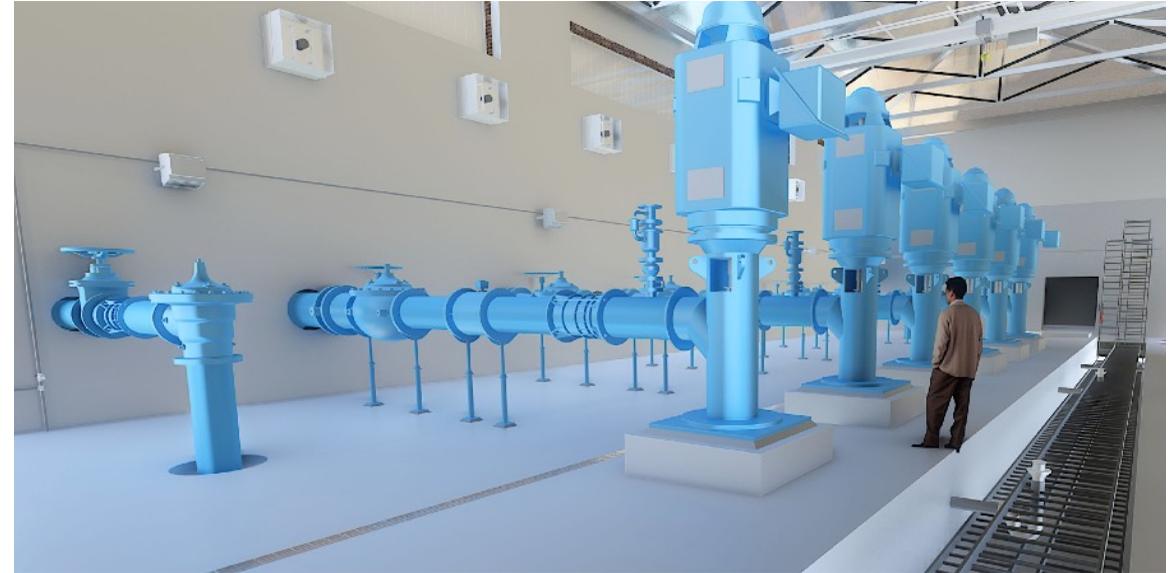


IMAGE CREDIT: FREESE NICHOLS



IMAGE CREDIT: SPILLMAN FARMER ARCHITECTS

Ledcor / Digital Prototypes

Using SketchUp and Revit, Ledcor combines proposed conditions for review as digital prototyping in order to save the time and money compared to building physical mockups. To do this, a very detailed SketchUp models from the curtain-wall sub-contractor is superimposed with the Revit model from the design team.

By viewing the combining models in Enscape, Ledcor can very quickly have a more meaningful & efficient solution to show to the client and other project stakeholders important differences between the proposed design condition (Revit) and the proposed fabricated solution (SketchUp).

This process not only eliminates the cost and time of building a physical mock up - but the virtual review in Enscape provides a photorealistic experience in VR. The design team and owner are quickly able to approve the solution developed by the curtainwall sub-contractor.

<http://www.ledcor.com/>

Thanks to everyone that submitted and received an Honorable Mention!

And now - on to the **Top Ten!**

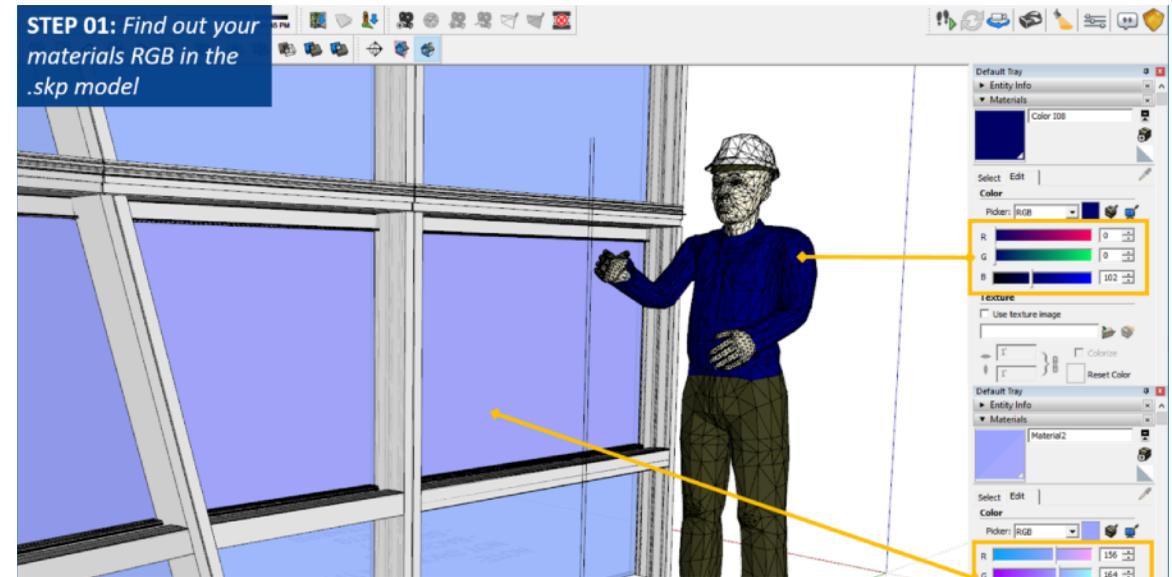


IMAGE CREDIT: LEDCOR

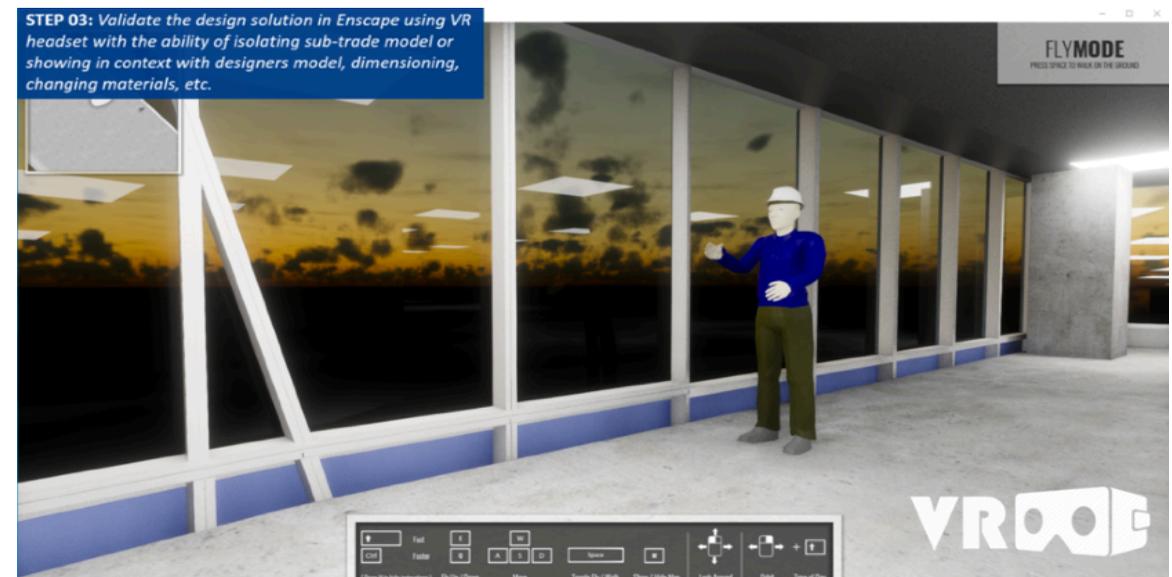


IMAGE CREDIT: LEDCOR

Top Ten

How did I select the Top Ten? These are the techniques that I've seen presented or submitted in over this year that demonstrate an uncommon rigor and innovative attention to detail that dramatically improve workflow. Not only are these solutions incredibly elegant – they're easy to implement!

Interactive Smart Boards

Turner Fleischer

At least a couple of times a month I'll get a request from a customer using Enscape for a markup tool. I totally get it - it would be great if there was an easier way to mark up, share and track design comments *within* Enscape.

On the other hand, Turner Fleischer realized that a market tool is so important to their workflow that they stopped waiting. More importantly– they come up with a solution that is incredibly interactive and collaborative.

They simply started using SMART™ interactive screens.

<https://home.smarttech.com/>

The benefit of having a large screen as a markup space compared to a desktop workstation cannot be understated. Is this solution more expensive? Initially yes. But is this more expensive than the time and money saved by implementing a viable and elegant solution now? Apparently not!

Increasing understanding is about finding more effective ways of communicating. While many people are happy waiting for a software update as a solution, Turner Fleischer is up and running!



IMAGE CREDIT: TURNER FLEISCHER



IMAGE CREDIT: TURNER FLEISCHER



TURNER FLEISCHER

Scale Model Review in VR

Architectus

How much do you care about customers experience? I don't get motion sickness or car sickness very easily. But I can tell you my first experience in VR was very unpleasant. In less than 10 seconds I was overcome with motion sickness. The experience was so unpleasant it put me off trying VR again for nearly a year. Now imagine if your customer had a similar experience in VR during and design review.

Your customer's experience in VR needs to be incredibly polite and friendly. You don't want to **embarrass** them in any way. Putting on a VR headset in a room full of highly technical people is very intimidating for someone that is not highly technical. It's often very unsettling to experience being **physically** in one space while **virtually** in another.

Architectus found a much better way.

First, Architectus carefully modeled their conference room in Revit down to a very fine level of detail, including materials, light switches, fixtures, matching furniture and other features of their real-world conference room.

Next, Architectus exports their Revit project files from a variety of 3-D views, such as views with section boxes that cut away the building in elevation or section.

Finally, these exported Revit models are then linked *back* into their virtual Revit conference room model. The linked models are scaled-down and placed upon the virtual conference room table. Updates to the models are easily re-exported and the links are refreshed in Revit.

The result is incredibly familiar and satisfying. When a customer puts on the VR headset they immediately understand that they are in a virtual space that is simulation of their physical space. And their project is in front of them, ready to be inspected from any view and angle.

When I experienced this for the first time the stress of being in VR was completely eliminated! No fear of standing up and walking around or bumping into something unseen - it's all there in the *virtual* conference room. Moreover, being able to see the project at scale gives you a holistic appreciation and understanding of the design before reviewing the project at full-scale. Incredible!



IMAGE CREDIT: ARCHITECTUS



IMAGE CREDIT: ARCHITECTUS

Design Review and Coordination

VisionRez | Alpine | ITW

When you're multibillion-dollar custom home manufacturer, small errors multiply and can add up to a lot of wasted time and money. And using Revit isn't enough if you can't **discover** design and coordination problems quickly and easily. Moreover, not every design clash actually touches. Sometimes you need to experience the space to realize something isn't right.

To solve their design, coordination and fabrication issues, Alpine builds separate Revit files for the architectural and structural models. The challenge is reviewing the structural model in context with the architectural model without having the architecture model obscure the proposed structural model.

Their solution is fast, easy and immediately beneficial. First, Alpine links the structural model into the architectural model. Then using a simple phasing override, the entire architectural model is rendered translucent gray, while the structural model is left intact. This gives context to the proposed design within the proposed structure.

Design issues are immediately discovered: missed blocking behind casework, incorrectly sized window and door openings and incorrect stair, floor and roof framing. Both architectural and structural models could be updated and refreshed in real-time and the results are immediately validated in Enscape. Want to see it this in action?

During Autodesk University, Alpine, an ITW Company and the leading software developer of residential construction tools for Revit and Navisworks will be showcasing the latest VisionREZ release. Four individual modules: Architecture, Structure, Options Management and Fabrication encompass the latest Revit release, along with a plugin for automating takeoff's in Navisworks. VisionREZ software enables users to streamline work flows, deliver more accurate construction documents and produce higher-quality designs.

Be sure and stop by their booth #C321 at Autodesk University!

<http://alpineitw.com/products/software/residential-bim-solution/>

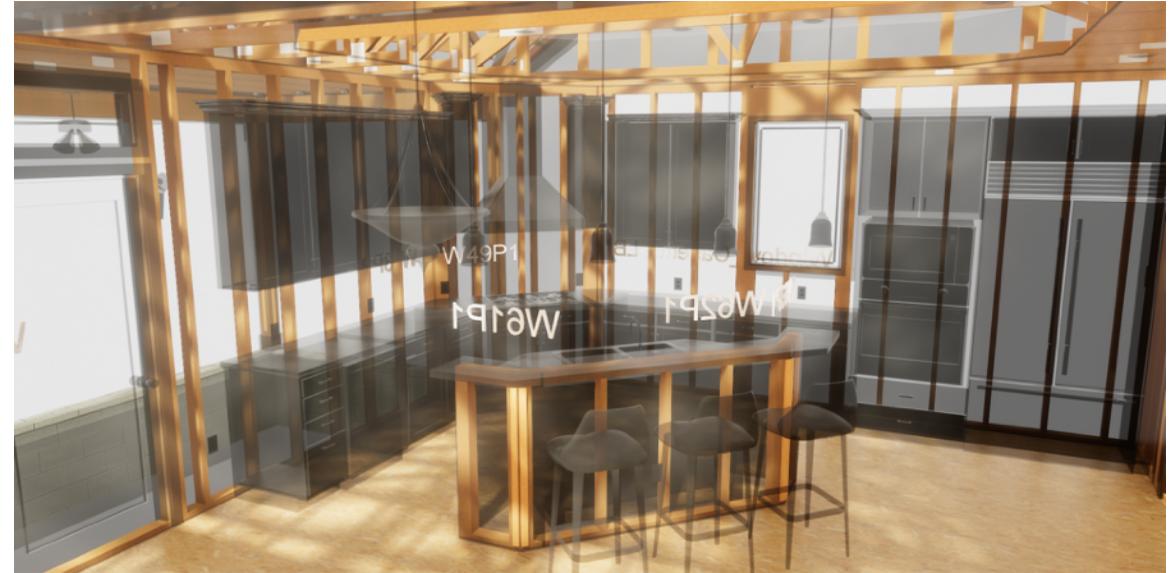


IMAGE CREDIT: ALPINE ITW



IMAGE CREDIT: ALPINE ITW

Self Illumination and Lighting for Film and Stage Design

Bryan Sutton / Set Designer

The work of Bryan Sutton been unmistakably brilliant in Revit circles for the last decade and a half. Over that time he has worked on more than one major project a year using Revit. His models have a level of detail and care that is unmatched in the traditional architectural design space.

Additionally, film and set designs move at a pace that is uncommonly fast. Without exaggeration, what happens in a day in Bryan's world takes a week or longer in AEC traditional design space. What happens in Bryan's week takes a typical design firm a month.

When Bryan first experienced Enscape over two years ago he was incredibly impressed, sending me untouched images a recent projects. These kinds of projects do not lend themselves to standard Revit light objects. As a result, Bryan uses self-illumination of geometry to create the most elegant and subtle lighting effects imagined.

It turns out that using self illumination has an enormous benefit to real-world architectural projects!

Accent lighting and recessed rope lighting can't be easily accomplished in Revit using standard Revit or even EIS light objects. Moreover, many system and component families, cannot accommodate nested and controllable Revit light families - shared or not.

This is particularly true with stairs, balusters and railings. For example, getting a Revit light source nested into a baluster family in order to properly illuminate a stair tread is an exercise in futility.

The better solution is assign a material to the stair, railing or baluster and then assign that material to be self-illuminating in Revit. Then raise a glass in the direction of Vancouver, Canada (Bryan's hometown)!

Thank you Brian! Your many projects may be (in your words), "Silly comic book films" but in truth your work challenges Architects and Designers to consider the possibility of using Revit not merely to design, coordinate and document - but to truly inspire.

<http://www.imdb.com/name/nm1340613/>



IMAGE CREDIT: BRYAN SUTTON



IMAGE CREDIT: BRYAN SUTTON



Daylighting Studies

Renzo Piano Workshop

When it comes to designing a highly tectonic curtain systems and atrium spaces no one has time to constantly push the render button and wait thankless long hours for feedback on subtle design changes. 2D and 3D object models alone are not useful. The design has to be experienced in the first person narrative *during* design.

According to Renzo Piano Building Workshop, Enscape uniquely helps the design team understand the materiality of all the elements as well as the intersection between those elements and light entering the atrium space. Spaces that often appear to read well in Revit are often misleading. After reviewing the project in Enscape the design team quickly realizes those spaces would appear too under or over exposed in the real-world.

Using Enscape and Revit side by side, the design team modifies the atrium space so that it's properly proportioned with the layout of the plan, while allowing appropriate light levels to enter the atrium. The result is more demonstrable confidence, less stressful ambiguity within a highly refined design workflow.

Overall, Enscape helps RPBW enjoy their uncommonly rigorous design process.

<http://www.rpbw.com/>

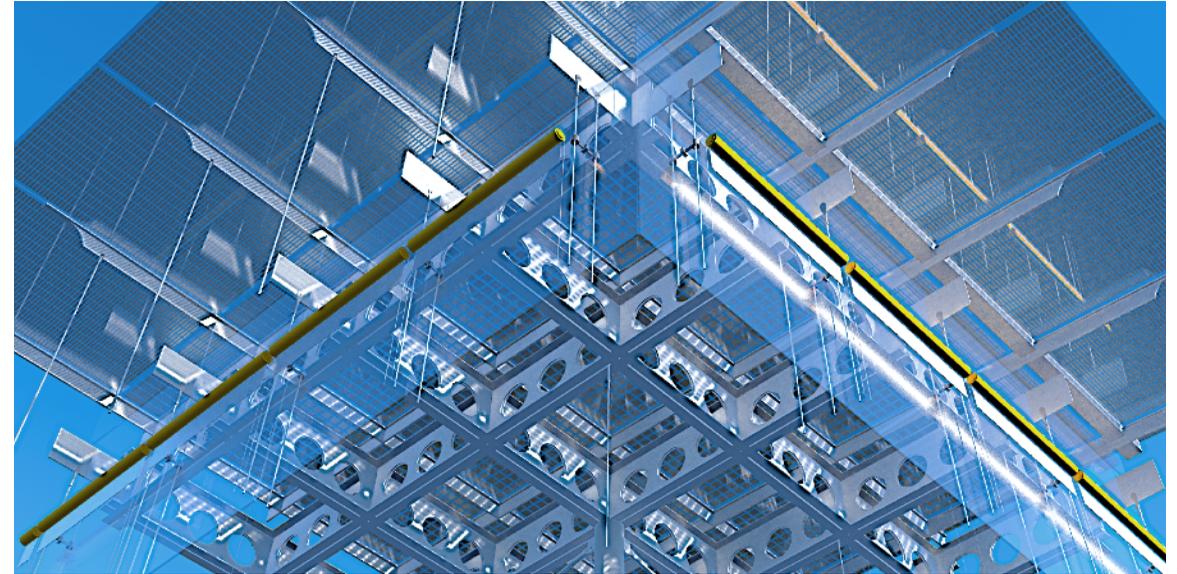


IMAGE CREDIT: RENZO PIANO WORKSHOP

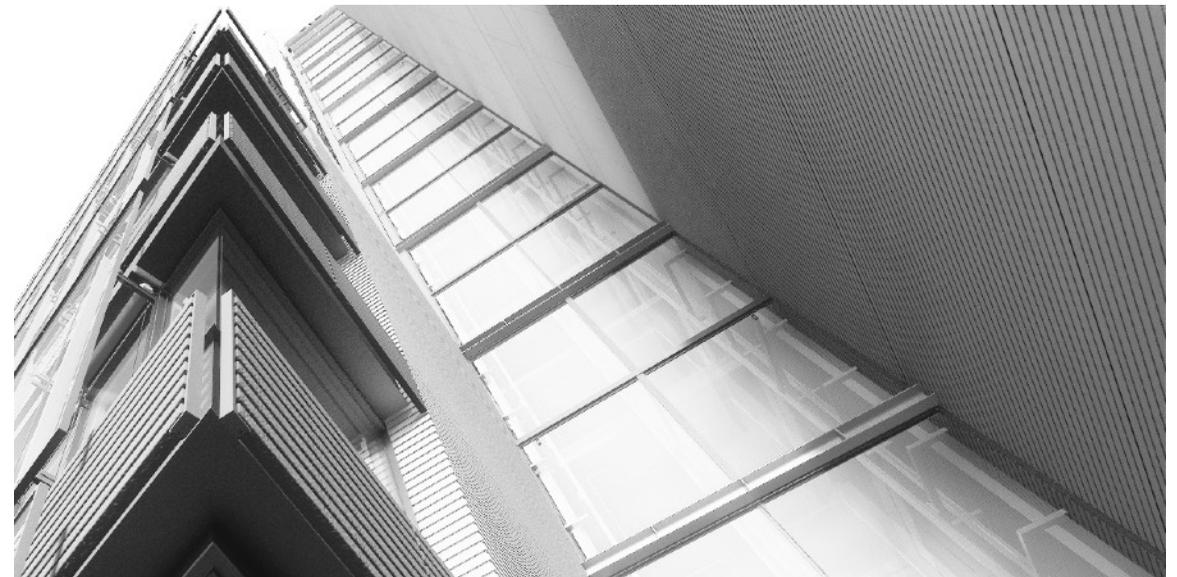


IMAGE CREDIT: RENZO PIANO WORKSHOP

Details, Doors and Design Reviews

Trilogy Partners

Using SketchUp, Trilogy Partners rebuilds the design from 2D CAD files to a **very** high level of detail. This not only helps Trilogy discover and resolve design coordination issues ahead of construction, but it also gives the client the ability to review and suggest changes to the design while in VR.

During the VR review, the client is free to explore and suggest design changes in real-time. The design is modified *live* in SketchUp and the client can immediately validate (or dismiss) the design change.

Finding little problems that bring the focus to a higher level is a fantastic advantage. And by higher level of detail, I mean phillips head vs flat head screws on the hardware. LOD OMG. ;)

Trilogy's customers are spending millions of dollars on their private residence. When those customers don't understand the design proposal it can be an incredibly stressful for everyone involved. Enscape removes the stress by helping the customer not only understand - but truly embrace the design process. Changes are *welcome*. What's unwelcome is disruptive changes during construction because the client didn't truly understand the design.

While reviewing Trilogy's workflow, I discovered the following unique characteristics:

- **Hardware matters.** It's what we touch. Great hardware and detail underscores the natural feeling and experience during review.
- **Open doors are awesome.** It's easy to feel "isolated" reviewing a series of closed rooms. Opened doors help the customer experience the flow of the design and builds anticipation when they can see beyond their immediate location.
- **VR is essential.** It's about helping the customer experience. When you experience the design, it ultimately creates an emotional connection that is deeply satisfying.

<https://trilogybuilds.com/>



IMAGE CREDIT: TRILOGY PARTNERS



IMAGE CREDIT: TRILOGY PARTNERS

VR for Sculptural Installations

Weta Workshop in Collaboration with Sabin Howard

Great design isn't about the object. It's about the experience. But how to experience a proposed WWI Memorial that's 4m tall and 20m long and literally monumental in scale? If you're world renowned sculptor Sabin Howard you collaborate with Weta Workshop in New Zealand. And you use Enscape!

Here's the background on the Howard's challenges and vision:

Sabin Howard: A Soldier's Journey, A WWI Memorial

- <https://youtu.be/NqLfyorr4t8>

100 Years: World War I and The Weight of Sacrifice

- <https://youtu.be/qtmXMnaB3uo>

Weta Workshop used a variety of 3D tools to capture, create and assemble Howard's design digitally. Weta then used CNC and 3D printing to build physical scale models. The technical processes are described in detail by Weta CEO Sir Richard Taylor:

Weta Workshop CEO Sir Richard Taylor (starts 9:42:30)

<https://youtu.be/GBTb2C8ABA8>

But how to fully understand the design in first person? Ultimately, Weta used Enscape to allow Howard and others to experience the massive sculpture in VR.

According to Weta, "He was absolutely blown away."

<http://wetaworkshop.com/>

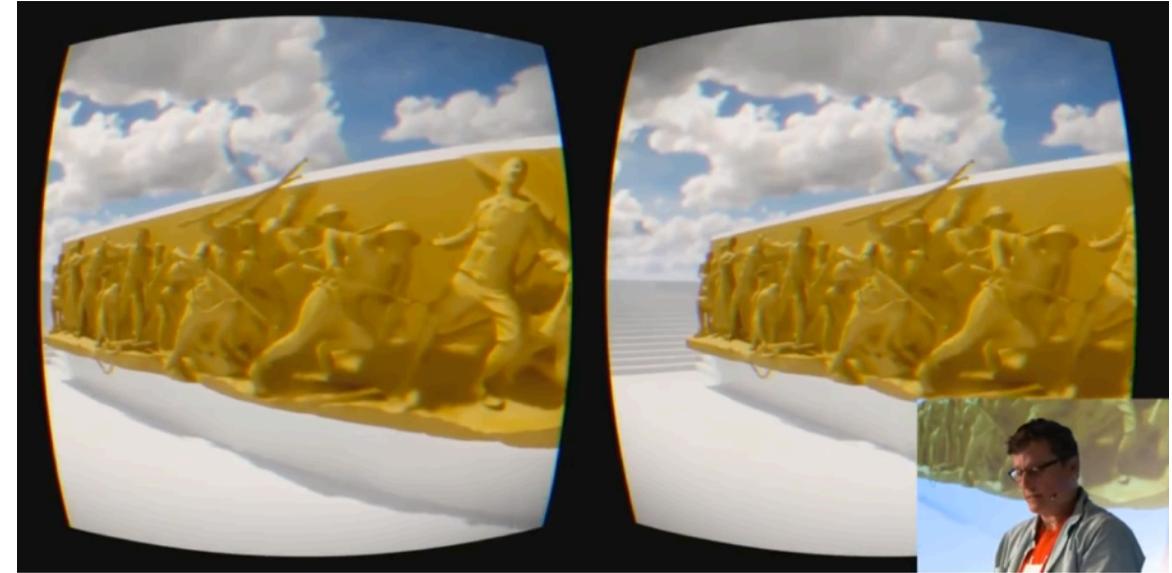


IMAGE CREDIT: WETA WORKSHOP



IMAGE CREDIT: WETA WORKSHOP

QR Codes for Marketing, Coordination and Construction

Raging Wire Data Centers

Getting the client to quickly and easily make the leap from 2D to 3D can be a challenge at times. For Raging Wire, the client required a more curated process. Something for the non-technical between 2D (not enough info) and 3D (too much info) - a sort of 2½D?

Using Enscape, Raging Wire Data Centers created beautiful and compelling rendered 2D images and panoramas of their projects for their customer to review. In the context of these rendered images, the designers place QR codes from Enscape in the corner of the 2D images. The QR code can be scanned with practically any mobile device, which immediately opens a Google Cardboard ready stereo panorama of the still image in a web browser.

This technique is great for marketing brochures, retail concepts, real estate proposals and even construction documentation. What better way to communicate the finished design in context with the construction detail?

It's all about improving communication by allowing people to experience the design. But sometimes you may have to limit the experience to 2½D in order to enhance it.



IMAGE CREDIT: RAGING WIRE DATA CENTERS



IMAGE CREDIT: RAGING WIRE DATA CENTERS

Set Dressing for Prototypes

Corgan

Corgan is working on series of shipping container prototypes. The units have a variety of use cases such as post acute patient rooms, extended living quarters for elderly relatives, self-contained rental units and more. They're designed to be installation ready - plug and play.

It's a joint venture project with one of Corgan's clients. According to Corgan, Enscape was used to resolve a multitude of issues. But overall - it's about creating a compelling and engaging experience. In this respect Corgan goes well beyond the typical conceive, coordinate and construct level detail found in a BIM project.

Not only is the fit and finish set to a natural and and compelling level of detail, note how Corgan uses entourage (see the plants and magazine), materials as graphics (photos and TV screens). Even hardware is added to casework in order to completely set dress the design in a way that is welcoming, warm and believable.

<http://www.corgan.com/>



IMAGE CREDIT: CORGAN



IMAGE CREDIT: CORGAN

Self Hosting for Panorama Files

Jasmax

According to Jasmax, Enscape drives every aspect of their VR experience in order to pursue, win and deliver the highest value to their clients. Real-time isn't an add-on afterthought - Enscape is used alongside Revit as an everyday working tool.

Jasmax's calls this side by side Revit and Enscape workflow "Optioneering". And it's proving to be a powerful method for communicating the design to the design team, which *includes* the client.

Beyond the architectural design, Jasmax uses Enscape to identify coordination issues between discipline models. This creates "de-risking" for the project because it communicates so much more than other more time consuming and less satisfactory technologies.

Together, these techniques are creating additional revenue streams for Jasmax. For example, consider their curated, immersive, mobile ready and web hosted 360 pano tours generated from Enscape. By hosting the resulting panorama files internally, Jasmax careful controls and augments the overall experience by adding iconic hyperlinks and even sound to compliment movement between spaces.

Here's the The Grid Project ([link](#)). Here's the Shed Project ([link](#)).

This innovative design and business thinking from Jasmax is uniquely compelling. They're not merely using a new technology to improve an *existing* process. Jasmax uses Enscape as a **new** technology to create **new** opportunities resulting in **new** revenue.

Eventually the competition may "catch up". But by this time, competition will have discovered they've embraced a commodity. Because if history is a guide, Jasmax will already be off and running ahead toward the next opportunity.

Why? Because in the words of Ricky Bobby, "If you're not first, you're last!"

<https://www.jasmax.com/>



IMAGE CREDIT: JASMAX



IMAGE CREDIT: JASMAX

In Conclusion

We've all been there before. A big deadline approaches and you're up all night rendering the project. Who wants to be that person? **Nobody.**

Design is a team effort. Who wants to hold up the team or make the client stressfully wait to make an informed decision? **Nobody.**

The goal isn't **BIM**. BIM is a commodity. And it's not simply about the **tool**. It's about the **team**. Who wants to be part of a process that willingly accepts time consuming, uninteresting, ambiguous and stressful workflow? **Nobody.**

The goal isn't **Rendering**. Rendering is a commodity. Expectations have considerably increased during the decade.

The goal is (and always has been) **Communication**. But Communication alone is merely about **Informing**. Beyond Communication means creating and delivering a better **Experience**. And great experiences **Inspire**.

A wise man once said, *"Anyone can learn from their own mistakes. The wise man learn's from someone else's mistakes."* We can help and we're an email away.

Okay, hands up – who wants to start **Experiencing**?

Better yet - who wants to start **Inspiring**?

Now look around the room. See all the raised hands?

That's your Competition.

All the best -

Phil Read
phil@readthomas.com
November 2017



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Suggested Resources

Some of what I've read, watched, and listened to over the last year. Mileage may vary. Contents under pressure. Do not puncture or incinerate. Handle with care.

Books

[“Win Bigly: Persuasion in a World Where Facts Don't Matter”](#) by Scott Adams (2017)
- *Making sense of the 2016 US Presidential Election*

[“How to Fail Almost Everything and Still Win Big”](#) by Scott Adams (2013)
- *The value of a strong “talent stack”*

[“The Freak Factor: Discovering Uniqueness by Flaunting Weakness”](#) by David Randall (2015)
- *Finding value in your annoying, natural inclinations*

[“Gates of Fire: An Epic Novel of the Battle of Thermopylae”](#) by Steven Pressfield (2005)
- *What is the opposite of fear?*

[“The Third Wave”](#) by Alvin Toffler (1984)
- *What happens when third world smashes against first world*

[“Creativity, Inc.: Overcoming the Unseen Forces That Stand in the Way of True Inspiration”](#) by Ed Catmull (2014)
- *The compelling and near failure of Pixar*

[“Lee Kuan Yew: The Grand Master's Insights on China, the United States, and the World”](#) by Graham Allison (2013)
- *Father of Singapore. Brilliant and modern political statesman.*

[“Contagious: Why Things Catch On”](#) by Jonah Berger (2013)
- *Anticipating change*

Movies

[“The Pruitt Igoe Myth”](#) (2011)
- *Failure of modern myopia*

[“La La Land”](#) (2016)
- *Ryan Gosling learned to play the piano.*



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Music

[Bob Dylan: The 30th Anniversary Concert Celebration](#) (1993)
- *Madison Square Garden celebration*

[Neil Finn and Paul Kelly Going Your Way](#) (2015)
- *Two unparalleled Australian and New Zealand poets put word to song*

[The Complete Collection: Lynard Skynard](#) (2008)
- *Southern wit and wisdom. Neil Young not included.*

Podcasts

[Hardcore History](#) by Dan Carlin
- *Start with the "Wrath of the Khans" series*

[Common Sense](#) by Dan Carlin
- *Political insights and big questions*

[Reason Podcast](#)
- *Free minds and free markets*

[The Jordan B. Peterson Podcast](#) by Dr. Jordan Peterson
- *Toronto psychologist and free speech advocate*

[The Rubin Report](#) by Dave Rubin
- *Big ideas and free speech*



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