

A complex, white wireframe architectural structure composed of interconnected triangles, resembling a modern building or a large-scale sculpture. It features multiple arches and organic, flowing forms. The structure is set against a plain white background.

Using Revit and A360 Rendering for Presentations and Virtual Reality

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Digital Design Manager

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The Autodesk University logo, featuring a stylized 'A' icon followed by the text 'AUTODESK UNIVERSITY' in a bold, sans-serif font.

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UNIVERSITY

About the Speakers

Victor Martinez



Digital Design Specialist

Islay Burgess, AIA



Digital Design Manager

About Gensler

Firm Overview

Top 50 Best Places to Work in US 2016

Glassdoor's Employees' Choice Awards

50
Years in business

5,500+
Staff firmwide

46
Locations worldwide

3,000+
Current projects

NORTHWEST
Oakland
San Francisco
San Jose
Seattle

SOUTHWEST
Denver
Los Angeles
Las Vegas
Newport Beach
Phoenix
San Diego

NORTH CENTRAL
Chicago
Detroit
La Crosse
Minneapolis

SOUTH CENTRAL
Austin
Dallas
Houston

NORTHEAST
Boston
Morristown, NJ
New York
Pittsburgh
Toronto

SOUTHEAST
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Charlotte
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Philadelphia
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Seoul
Shanghai
Singapore
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Tokyo



Cadillac HQ, NY

Gensler

Pano2VR Slide

<http://pano.autodesk.com/pano.html?url=jpgs/7ef9d1dd-33d3-470f-a7ab-bf01b0ea12d6>

What is the Cloud?

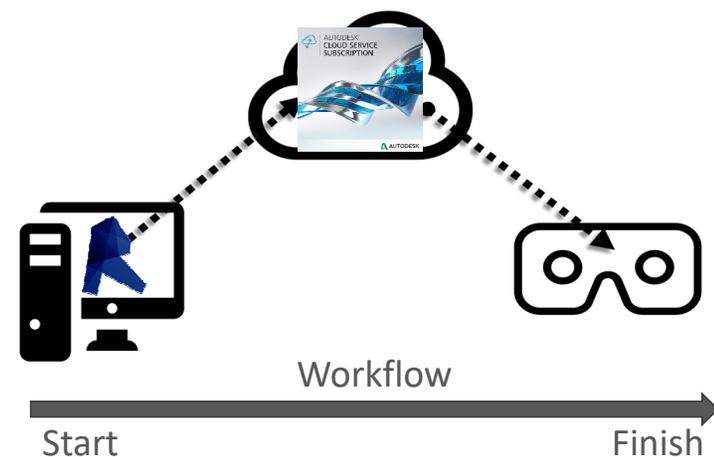
- Infinite Computing Power
- Faster Photorealistic and High-Resolution Images
(64 CORES SIMULTANEOUSLY)

Why use Revit and the cloud for rendering?

- Renderings Based on the Current Revit model
- No Need to Model in a Different Environment
- Multiple Renders for Design Options
- Fast Updates for Design Changes

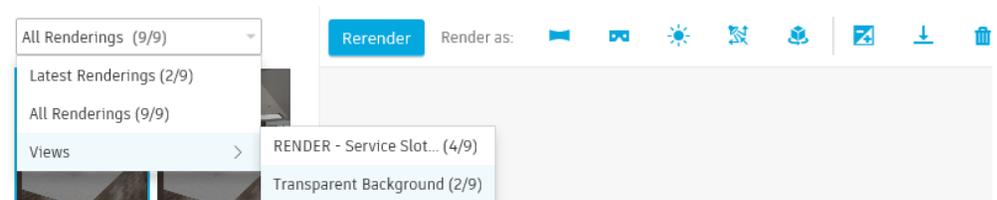
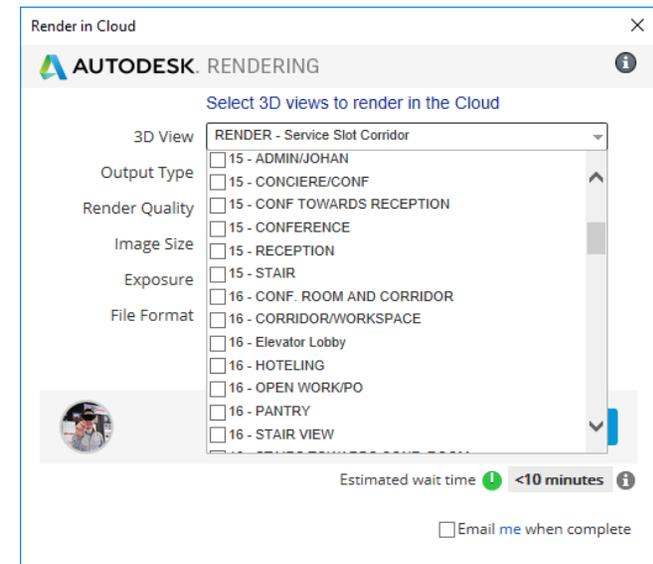
Why work this way?

Because doing something twice is wasted effort...



Additional benefits of rendering in the Cloud

- Continue to work locally when using cloud rendering
- Batch render
- Images are web accessible
- Private A360 project for sharing with project teams and clients
- Great for process renders
- Largest image size is 4k x 4k (16 MP)



What does it take to get a great cloud render from a Revit model?

- Proper Modeling
- Setting View Properties
- Control scope of Content in View
- Accurate Lighting
- Development and Application of Materials
- Project Location and Sun Settings
- Defining Render Settings
- Adjusting Exposure and Post Process Settings in the Cloud

Interior of a design project:

Leveraging VR for interior spaces

First-person point of view

Immersive Process

Human scale

Texture, Materiality, and Light in Detail

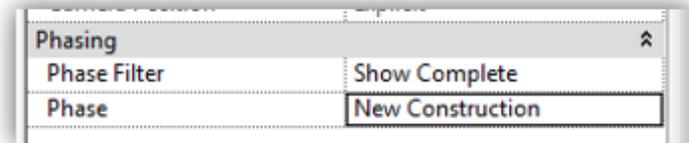
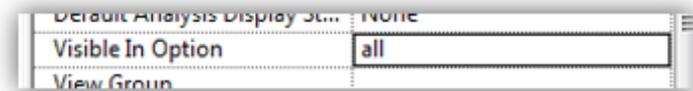
Design Options

Within the interior of a space lighting is a critical component, understanding the impact how the lights interact with materiality and geometry is a great feature when working toward a design understanding with clients.

Workflow

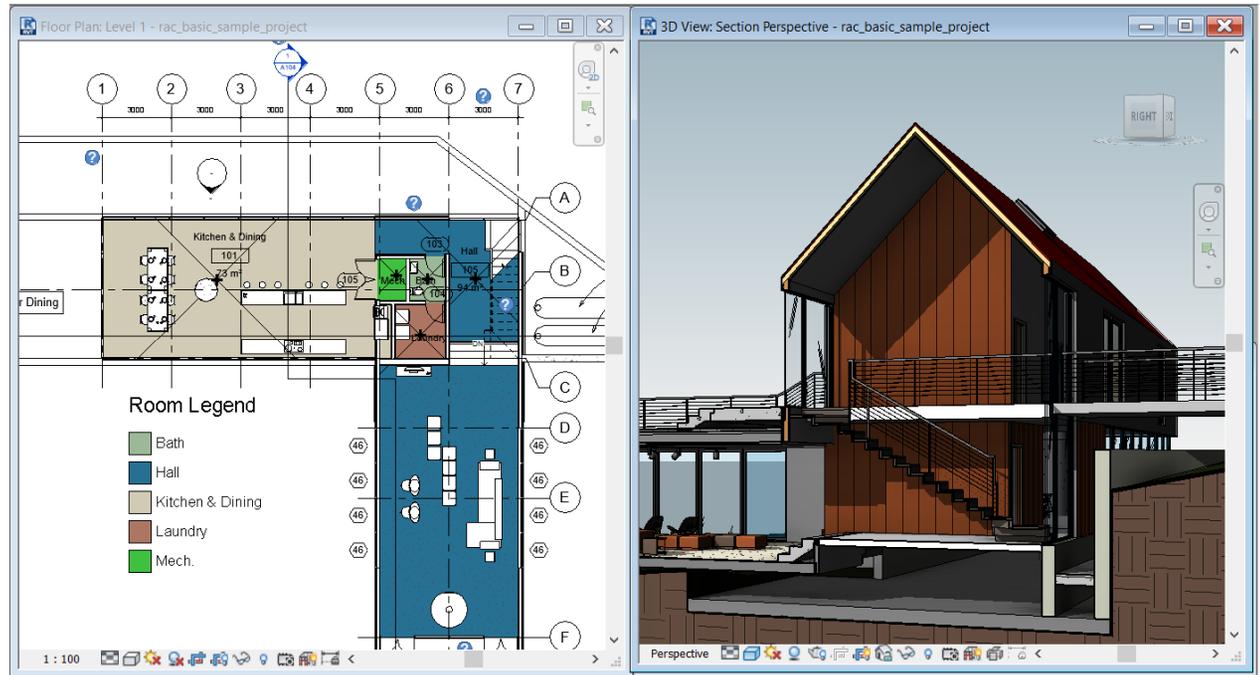
Workflow

- Proper phase settings and QA views for management of filters
- Design option setup prior to modeling to reduce post modeling clean up time
- Set proper workset as well



Workflow

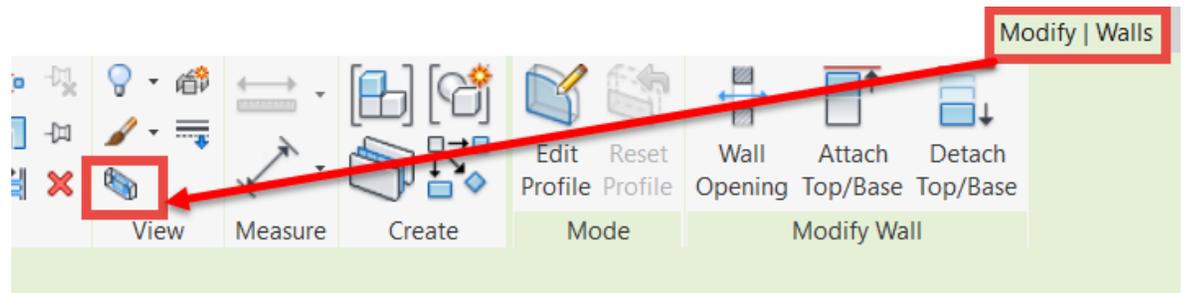
- Work in 2D and 3D views simultaneously



Autodesk

Workflow

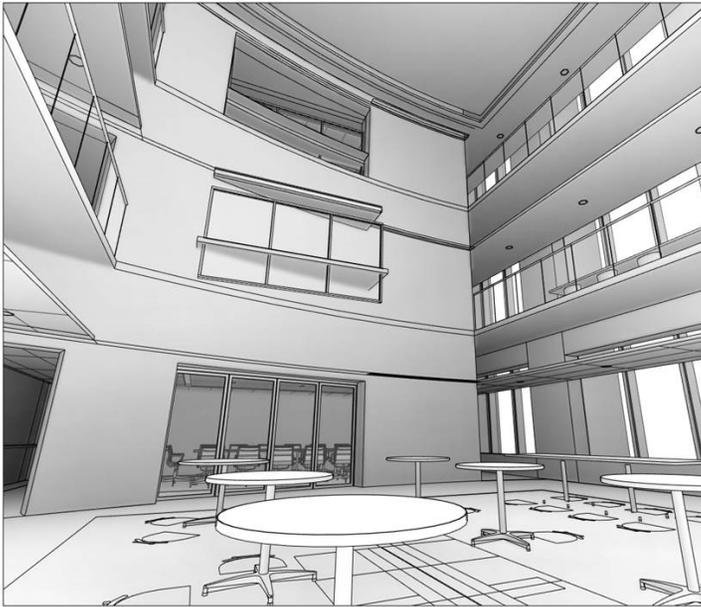
- Use Selection Box tool



Selection Box (BX)
Isolates selected elements in the current view (if a 3D isometric view) or the default 3D view.

Proper Modeling

Proper Modeling



System Family Modeling

- All geometry faces such as walls, floor boundaries and ceilings, should be properly aligned (use tools like align, pick line, join geometry)



Align



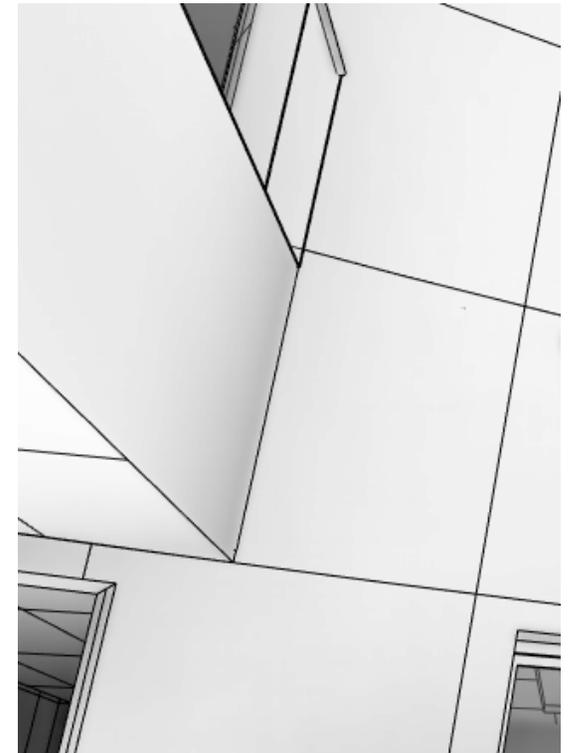
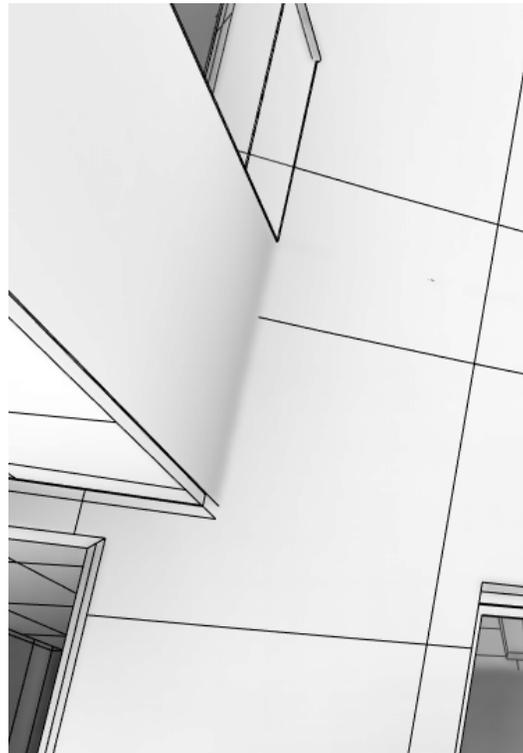
Pick Line



Linework



Join Geometry



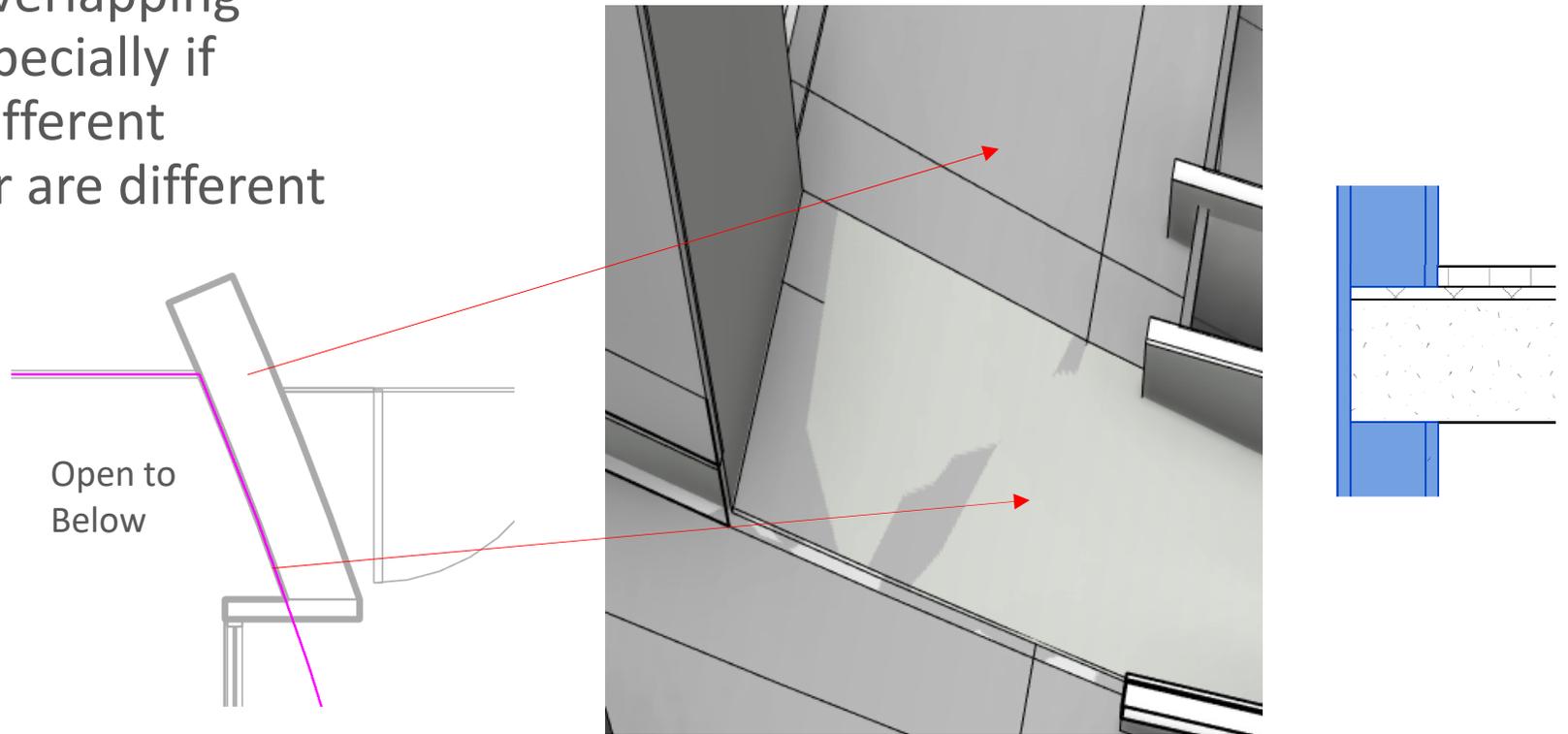
System Family Modeling

- Always model 1:1 as it would be built in the field
- Ceilings should be separate pieces as needed



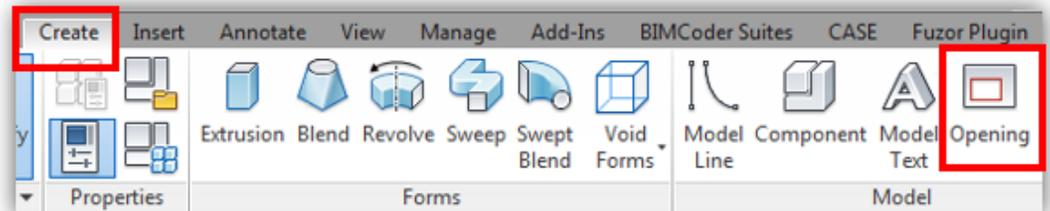
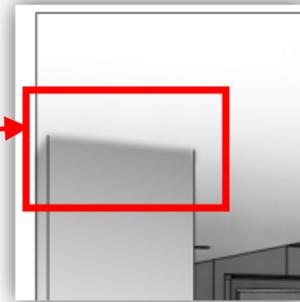
System Family Modeling

- Avoid any overlapping surfaces, especially if they have different materials, or are different categories



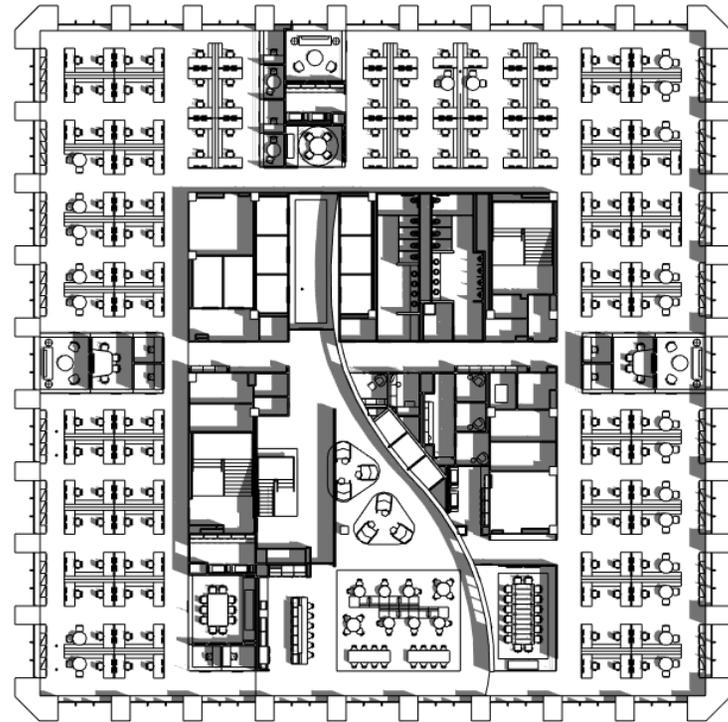
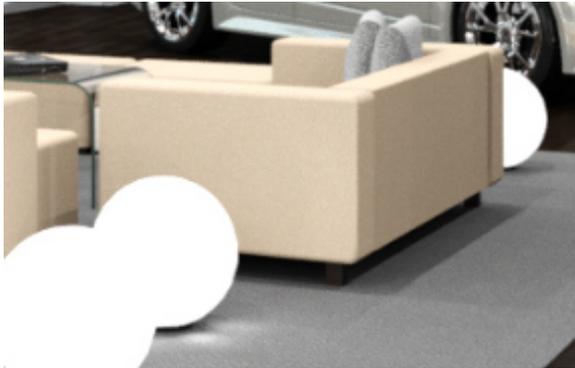
System Family Modeling

- Walls and columns should be modeled to bottom of floors, or ceilings edited as needed for clean edges



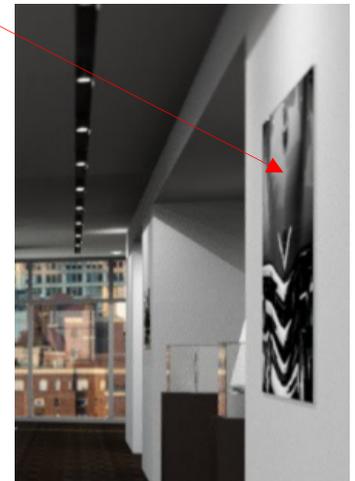
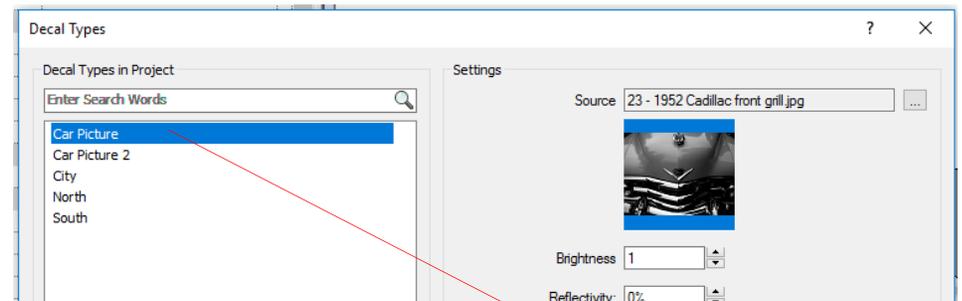
System Family Modeling

- Model all floors and place objects in proper Z axis (elevation) to ensure contact shadows to improve ambient occlusion shading.



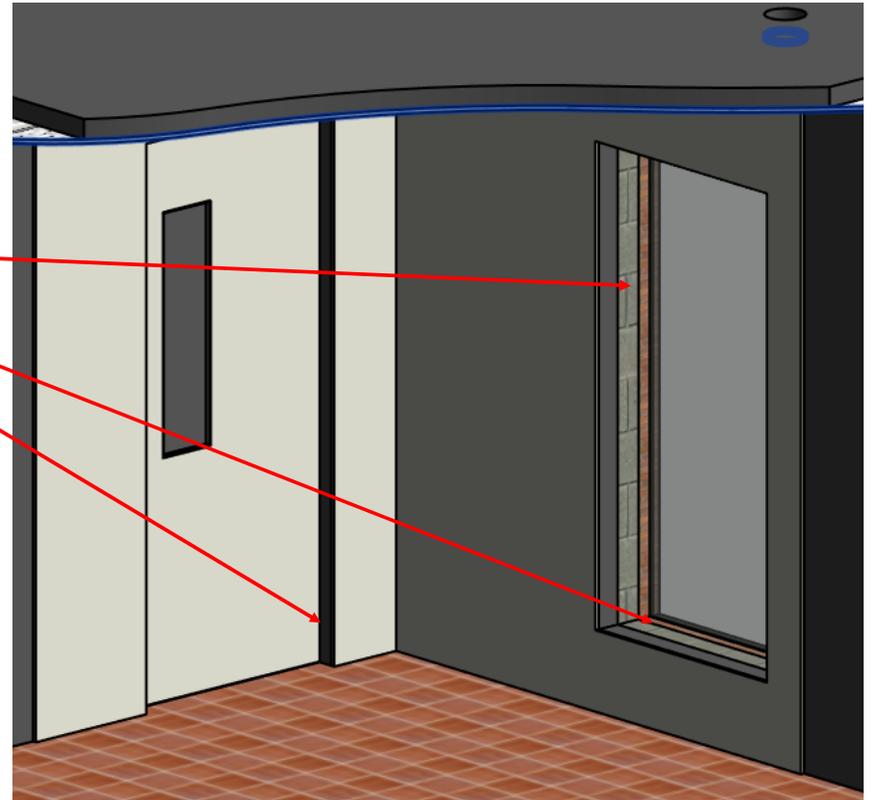
System Family Modeling

- Make use of the Decal tool to add images such as artwork or other graphics to the scene
- You can also use the decal tool to apply a background image to walls placed on the exterior of a model to render a desired environment
- Sweeps and Reveals are useful but use sparingly



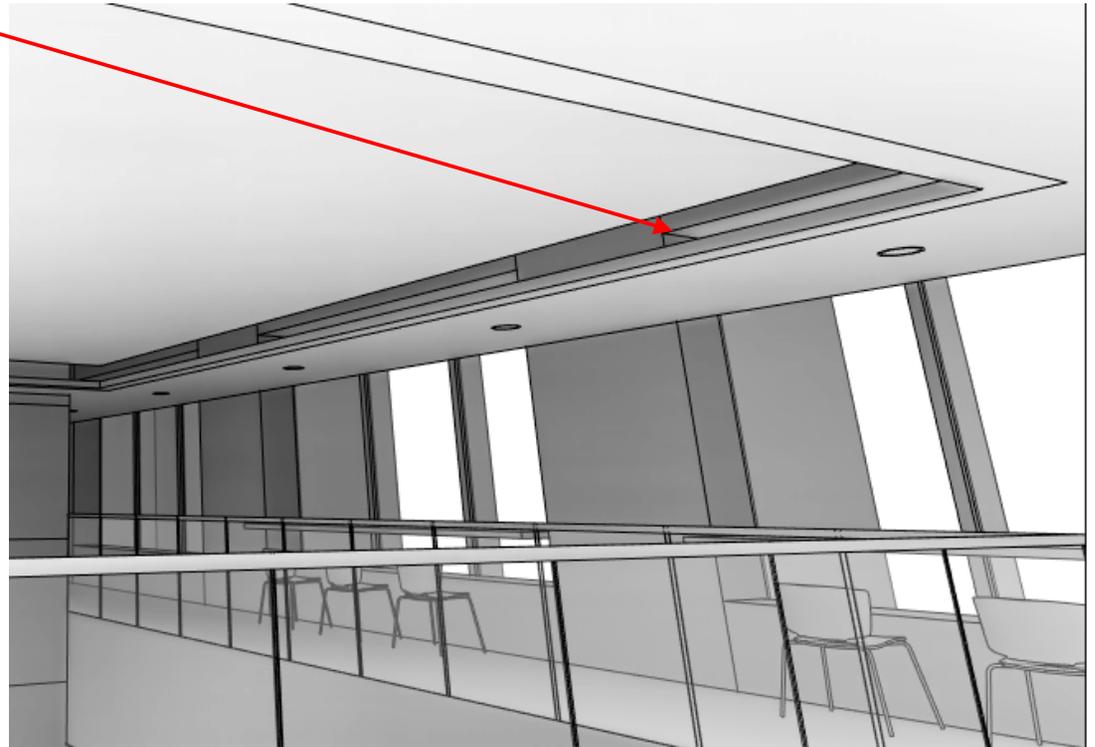
System Family Modeling

- Cutouts created by some families (Ex: no modeled frame) need to have faces of host objects painted so materials show correctly



System Family Modeling

- Model around dropped ceilings and soffits to prevent light leaks
- Create a visualization workset (off by default) for fill-in content



System Family Modeling

- Multiple materials automatically mean multiple components
- Use tools such as:



Create Parts

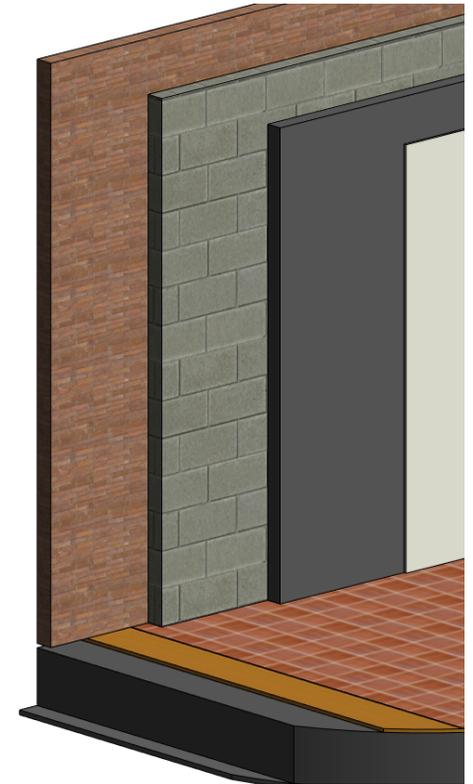
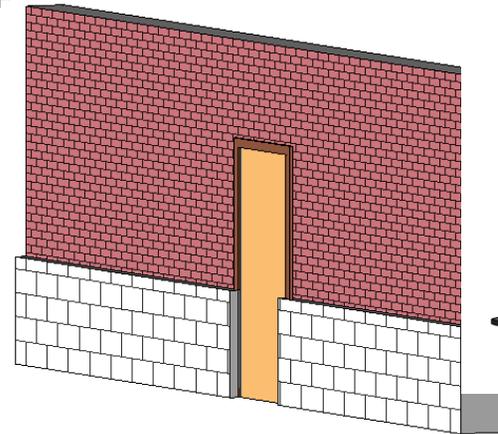
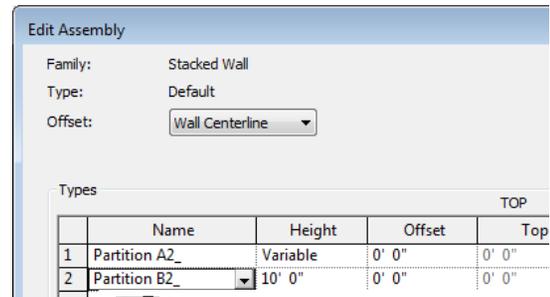
| PROPERTY | VALUE |
|--------------------------------|-----------|
| Parts Visibility | Show Both |
| Visibility/Component Overrides | |



Split Face

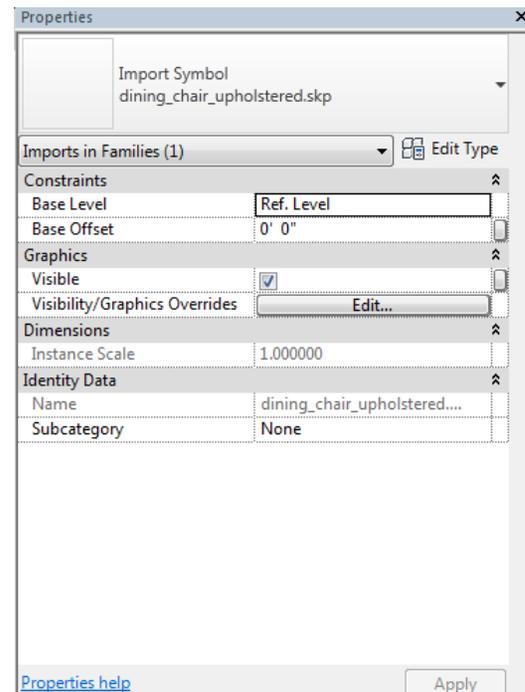


Paint Face



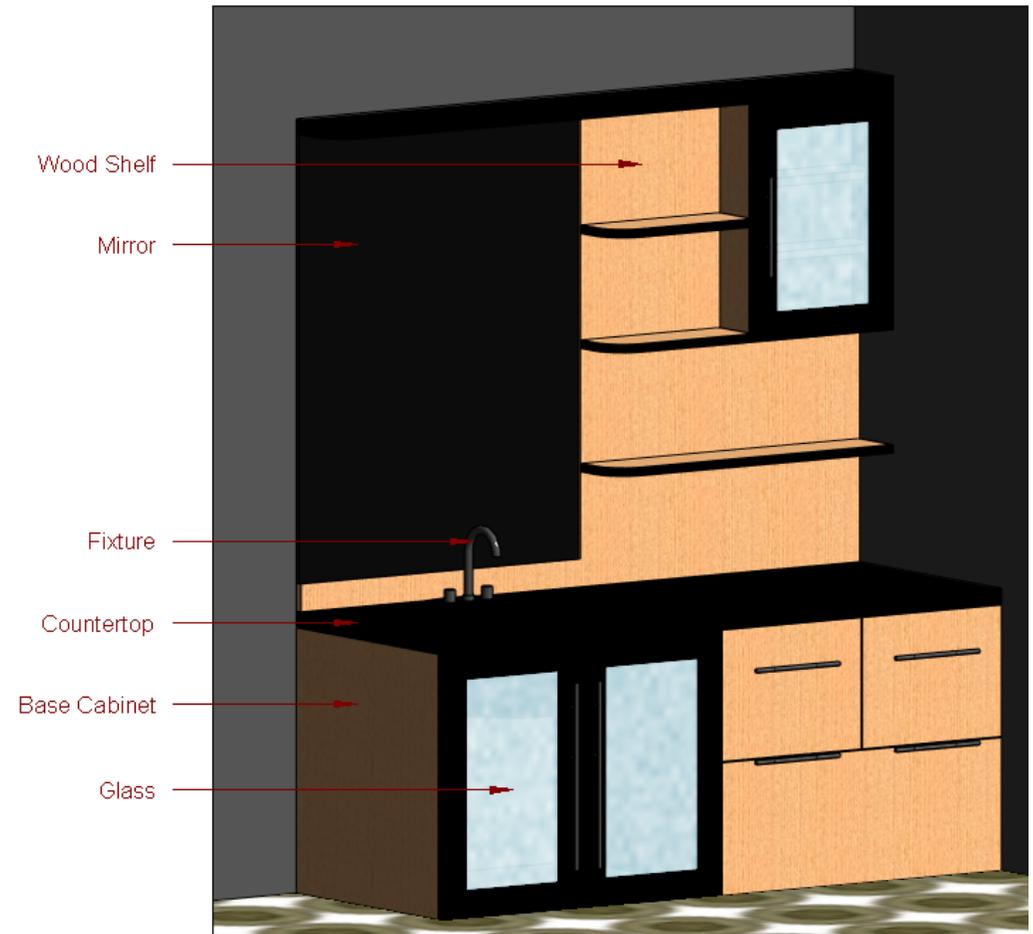
Loadable Family Modeling

- Native Revit geometry produces best results
- .skp, .dwg, and .sat models can be used in families though material assignment will be problematic.
- Inspect .skp and .sat files for quality prior to placing in the model



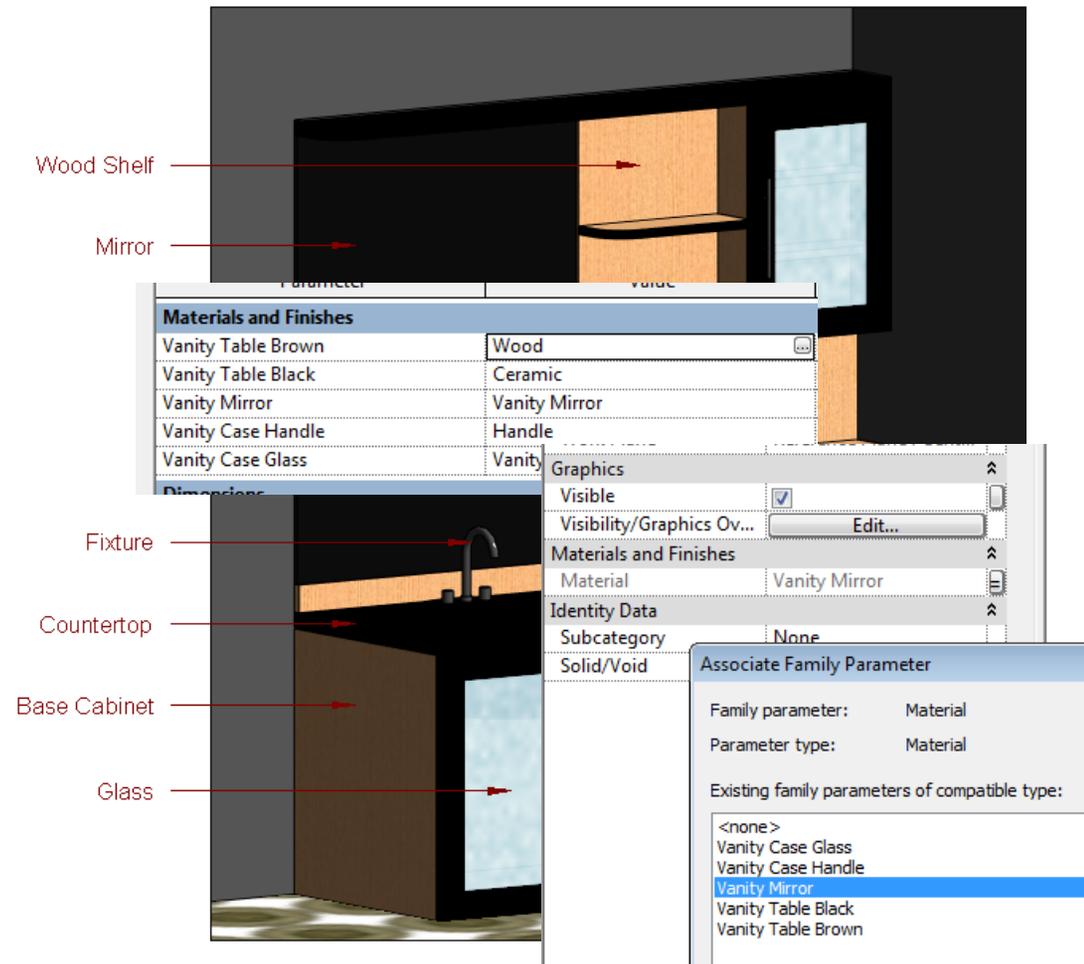
Loadable Family Modeling

- Start to build your material list
- Objects that require a specific material are modeled as separate objects
- Always purge families before loading into your project



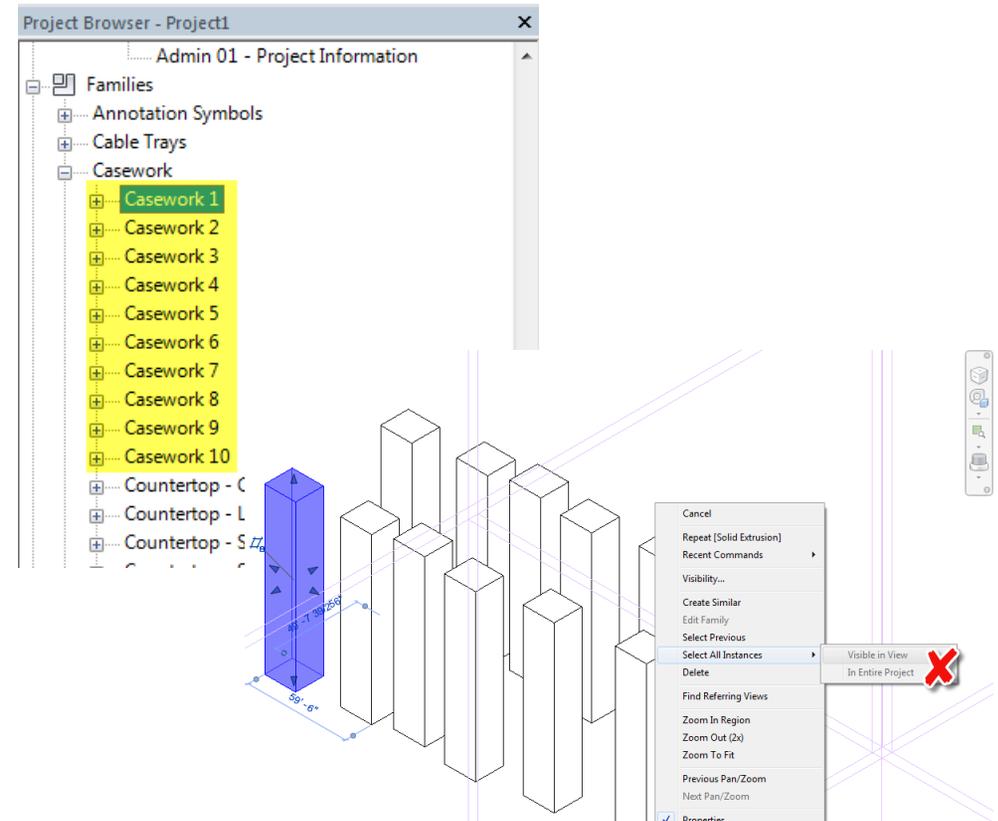
Loadable Family Modeling

- Link all geometry material parameters to family parameters
- Set the parameters as Type or Instance as needed
- Manage materials within a project instead of editing the family for each material change
- **An exception would be a product from a manufacturer that only comes in 1 finish*



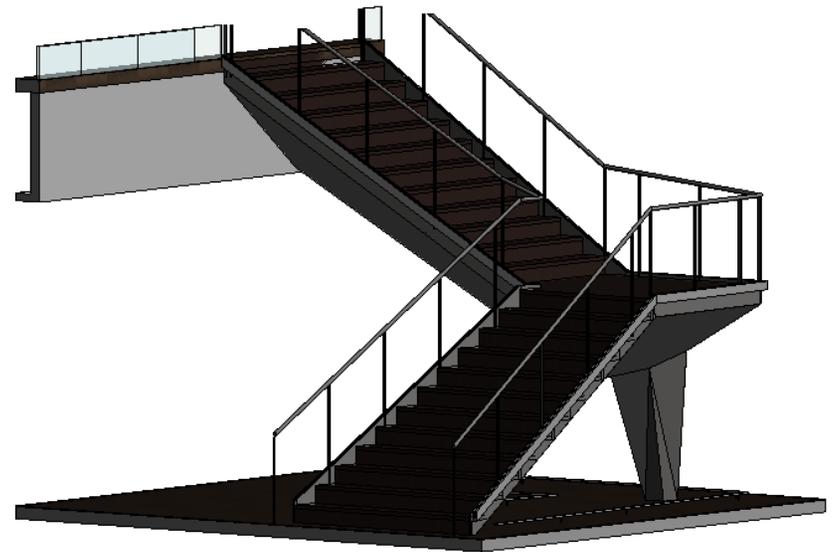
InPlace Family Modeling

- Similar to modeling loadable families
- Each copy is a unique instance, means that “Select All” will only return 1 element.
- Huge increase in file size if copied throughout the model because each family is defined individually.
- **Tip:** In-place families can be saved out and brought back in as loadable families if needed.



When to Use an InPlace Family

- Unique “one-off” design pieces that need to relate to the surrounding context.
- Complex System-families



Maximize Materials

Category: Material Parameter

- Ceramics: Finish Bumps and Relief Pattern
- Concrete: Bump
- Fabrics: Bump
- Flooring: Bump (Terrazzo), Finish Bump (Vinyl)
- Gas: Bump
- Glass: Bump (Glass Brick), Relief Pattern (Glass Matte, Glass Frosted)
- Insulation: Bump
- Masonry: Relief Pattern (Brick), Finish Bumps & Weathering
- Metal: Relief Pattern (Aluminum), Bump (Chrome)
- Misc: Render, Beige, Smooth (Finish Bumps & Weathering), Bump (Asphalt Shingle)
- Plaster: Bump (Plaster)
- Plastic: Finish Bumps and Relief Pattern (Acrylic)
- Stone: Finish Bumps and Relief Pattern (Stone), Bump (Rubble)
- Tile: Finish Bumps and Relief Pattern (Tile, Porcelain), Finish Bumps & Weathering (Ceramic Tile)
- Woods: Bump (Walnut), Relief Pattern (Pine, Scots)

Cement



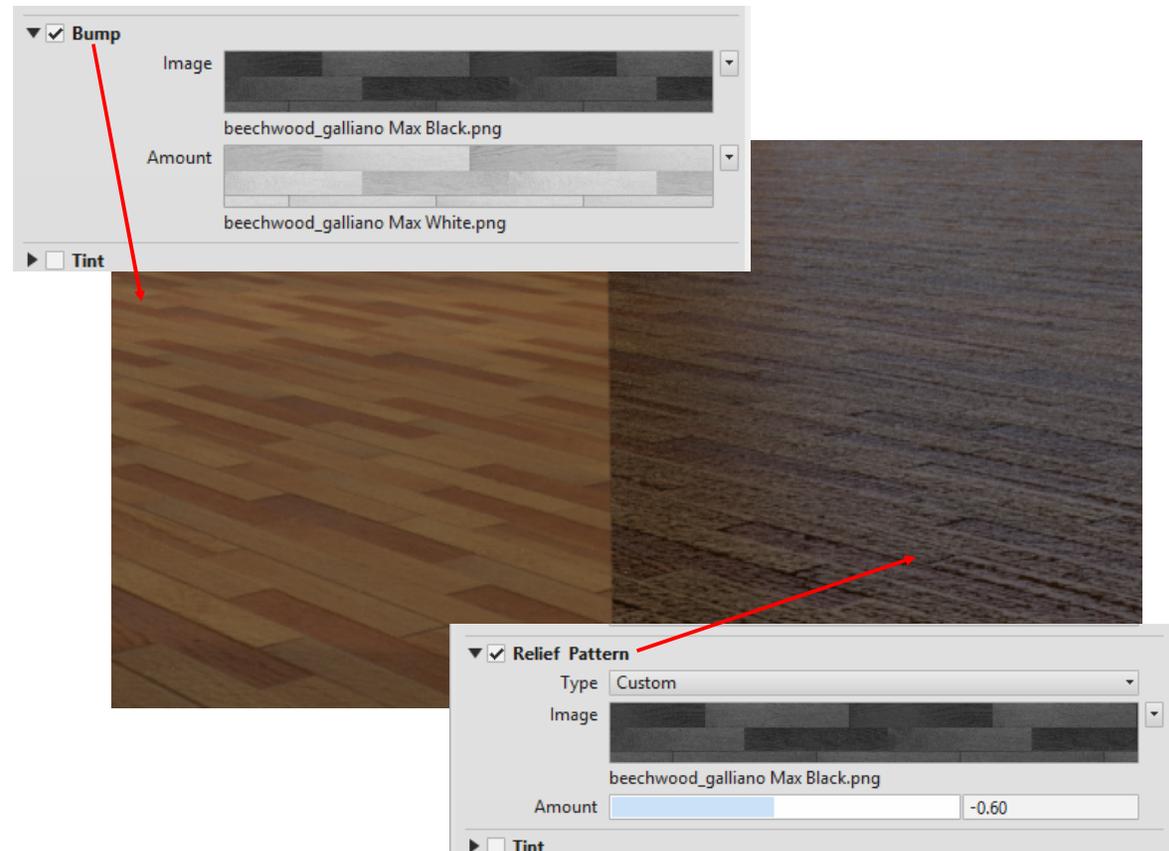
Tile, Porcelain



Maximizing Materials

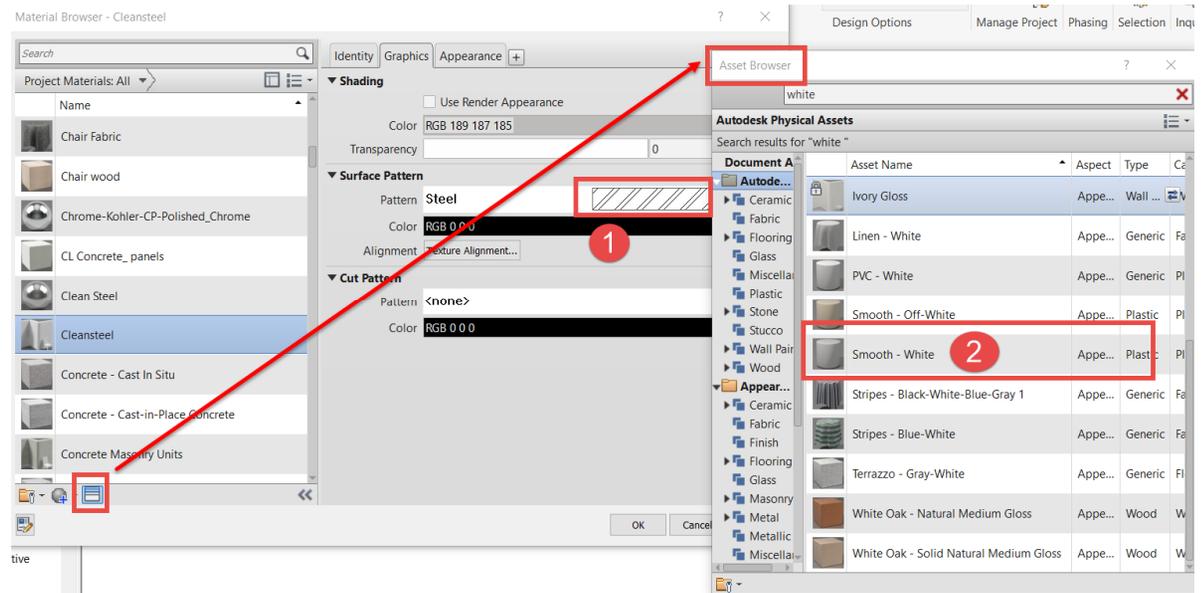
- A bump map simulates a bumpy or irregular surface and should be a black and white image at least 512 by 480 pixels (darker colors, the greater the bump; use map and/or slider to control amount)
- Relief patterns (most woods) are similar to embossing (darker areas in a B & W image) and result in shade and highlights

<https://knowledge.autodesk.com/support/revit-products/learn-explore/caas/CloudHelp/cloudhelp/2014/ENU/Revit/files/GUID-5D7E0A7E-DF17-4FE9-A739-5E8CB372FA24-htm.html>



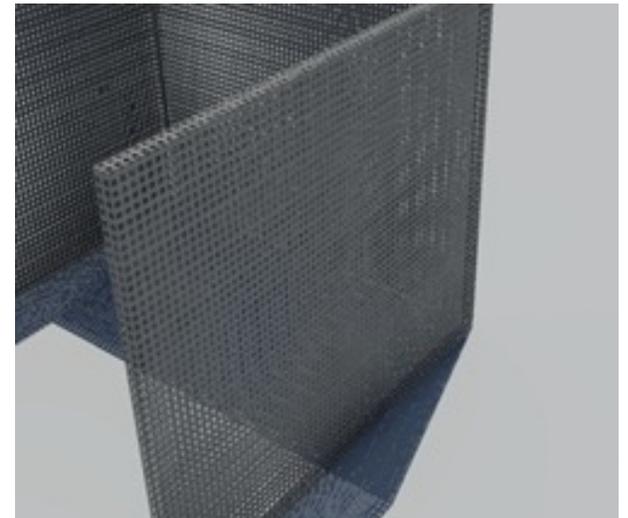
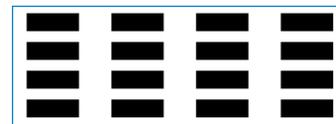
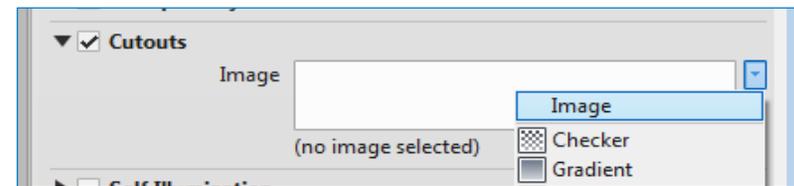
Maximizing Materials

- Use the same asset for multiple materials if you need different surface and cut patterns (Ex: White model render)



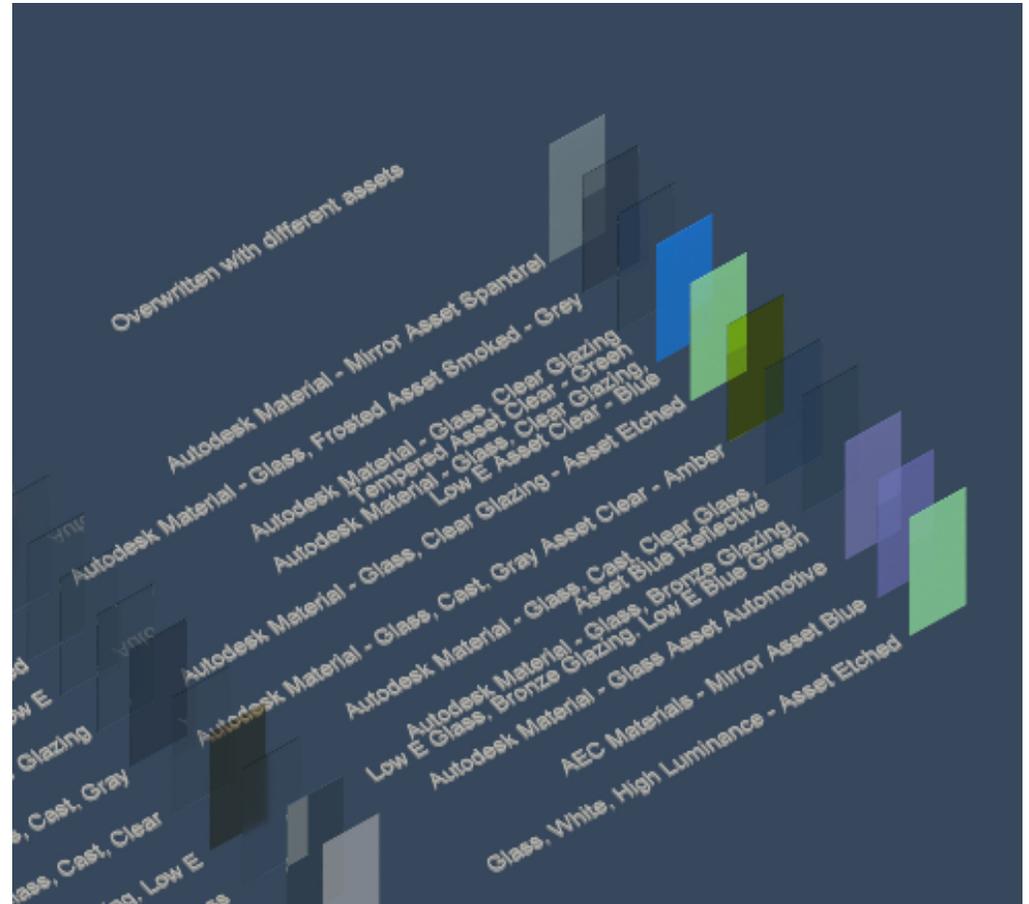
Maximizing Materials

- Make use of cut outs (black pixels are treated as transparent) and/or transparency map options to avoid modeling things like chain link fences or meshes
- Using small, high-res, seamless textures to generate custom materials seems best
- B & W images will be sharper where grey scale will result in partial transparency



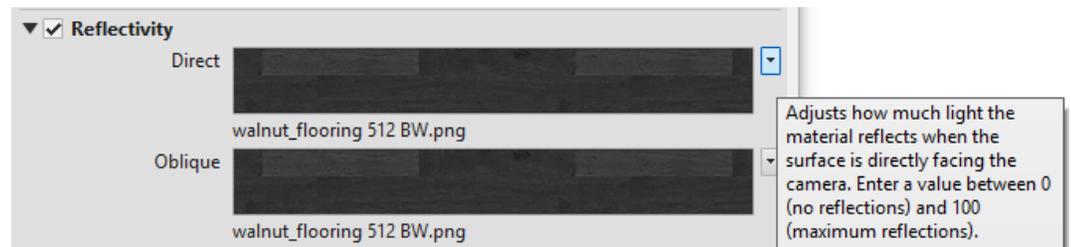
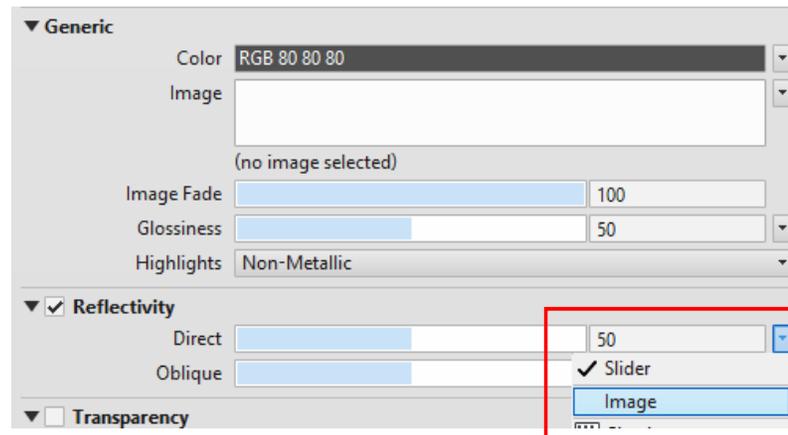
Material Libraries

- Autodesk or AEC libraries?
- Having a render sample file for reference will make selecting materials much easier
- Establish a material naming convention



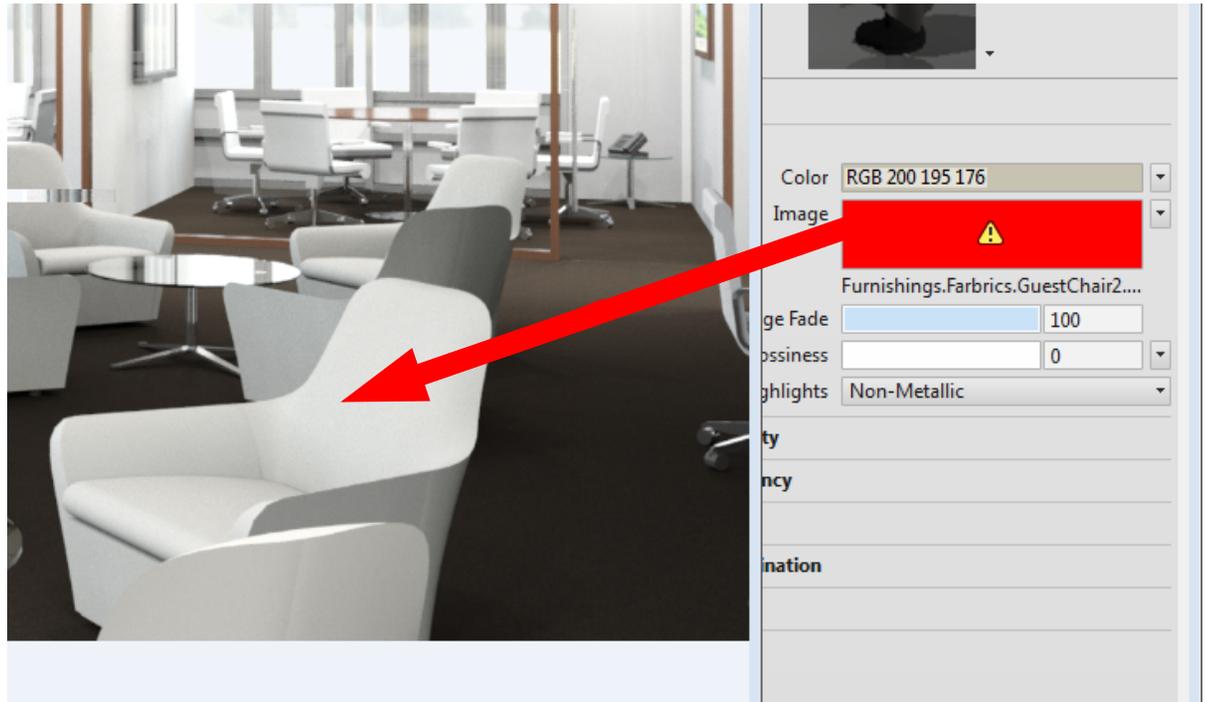
Maximize Parameters

- Use maps if possible for all available parameters
- Review tool tips for each parameter and tweak, tweak, tweak!



Material Organization

- Place all maps on a shared network location so all team members will be able to render



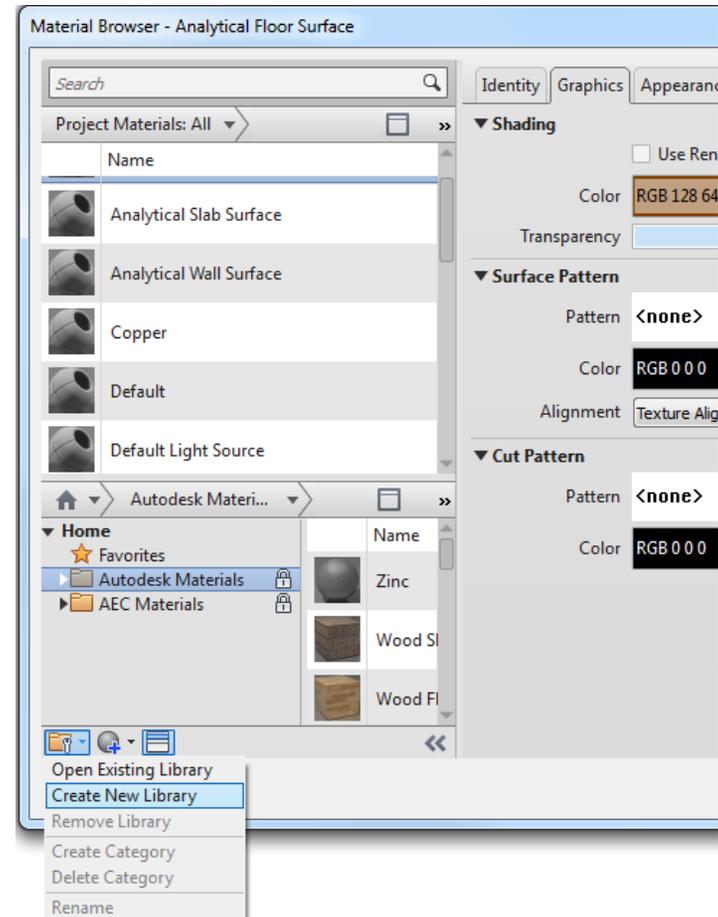
Material Maps

- Make sure to use tile-able material maps for better renders
- There are lots of tutorials on the web on how to do this
- <http://www.designpanoply.com/blog/how-to-turn-a-photo-into-a-seamless-tileable-texture-in-photoshop>



Material Libraries

- Save your materials to a library on your network to share it or use for future project work



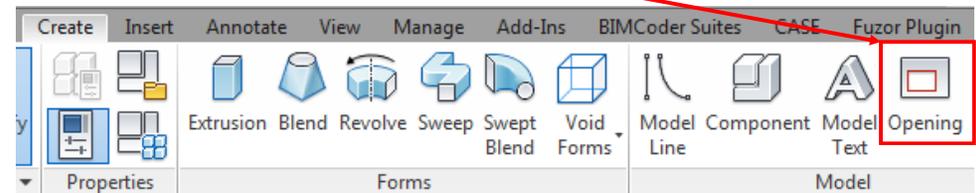
Lighting

Light Fixture Modeling – Why it Matters



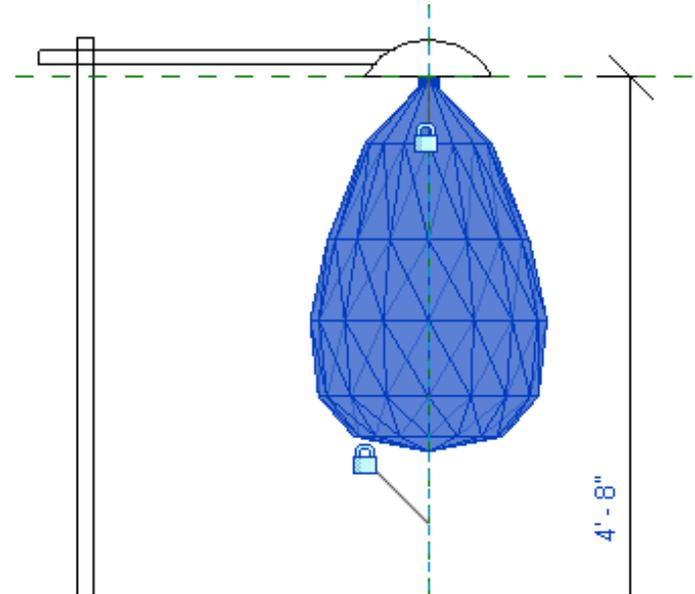
Light Fixture Modeling

- Less is more. The **fewer parts (fewer faces)** in a family, the lighter the model. This will result in faster render times and overall higher performance
- For best results, use **only Revit geometry** in families
- Make sure all faces of geometry are **aligned** that need to be and avoid any overlapping surfaces, especially if they will have different materials
- Use the **opening tool** in your family if your family needs to cut a wall, floor, or ceiling
- Always model **to real world scale**
- Use **the AEC material** library when creating materials
- Assign **material parameters** to all parts of the family
- Multiple materials require **multiple pieces of geometry** (housing, lens, brackets, etc.)
- Always **purge families** before loading into your project



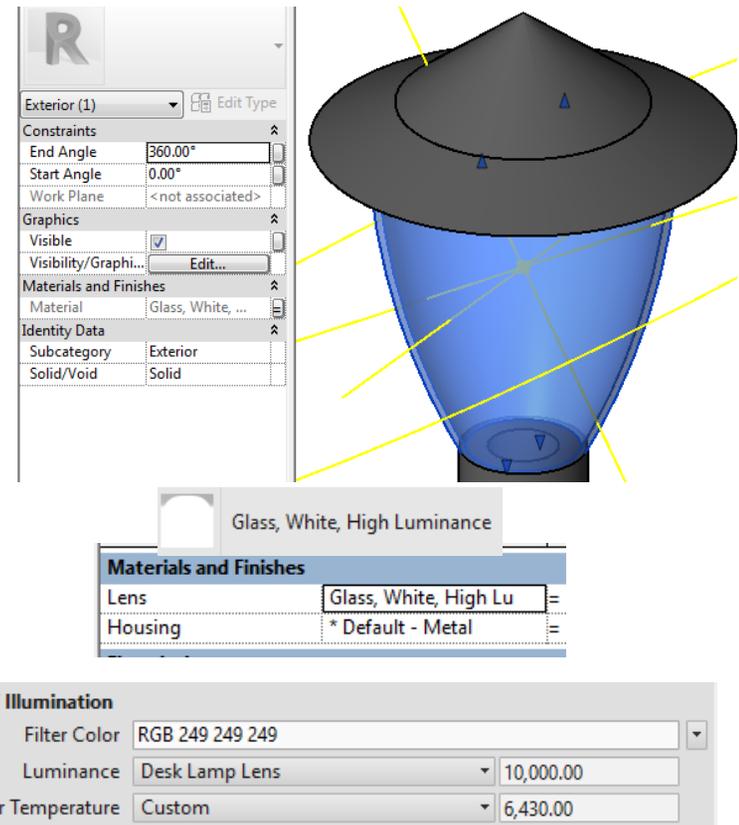
Light Fixture Modeling

- Light sources positioned just below geometry where light will emit from, or within hollow geometry.
- Make sure no geometry obstructs the light source.
- If the light source is obstructed your renderings will render very dark or black



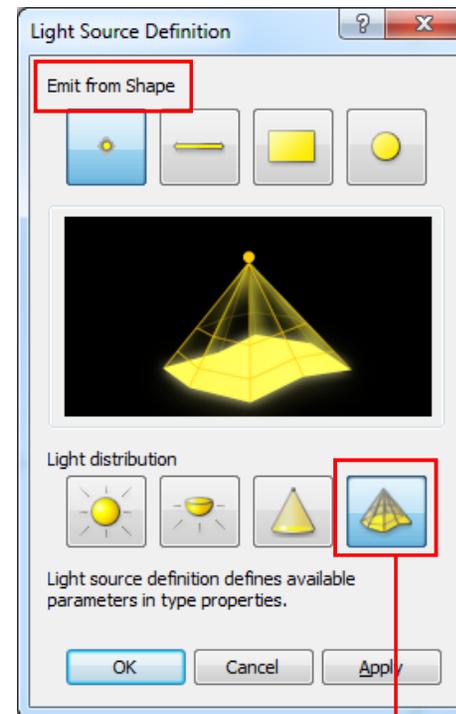
Light Fixture Modeling

- Apply a transparent luminance material to lens or bulb geometry so light will render like it is turned on



Light Source

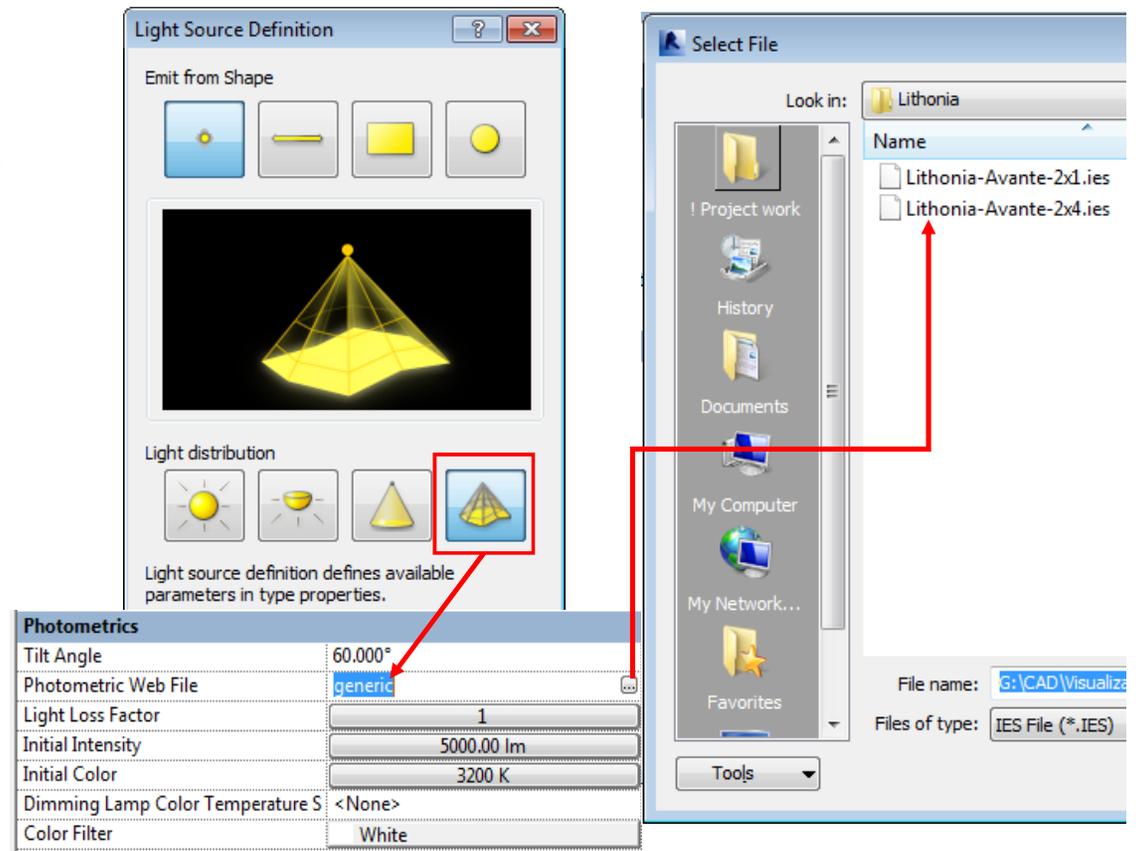
- Adjust the light source shape to match the kind of light you are using. Choose the Photometric Web option in order to get access to the Photometric Web file parameter to choose an IES file



| Photometrics | | |
|----------------------|-----------------------|---|
| Light Loss Factor | 1 | = |
| Initial Intensity | 400.00 W @ 25.00 lm/W | = |
| Initial Color | 3200 K | = |
| Dimming Lamp Color T | <None> | = |
| Color Filter | White | = |
| Photometric Web File | generic | = |
| Tilt Angle | 60.00° | = |

Assign IES Files

- An IES file describes how light is emitted from a fixture and takes into account all geometry, color, reflectivity and all other characteristics of the fixture. Using IES data results in more realistic renders.
- If you cannot find a specific IES file, choose one as close to the fixture as possible. It is even possible to create an IES file if you need to

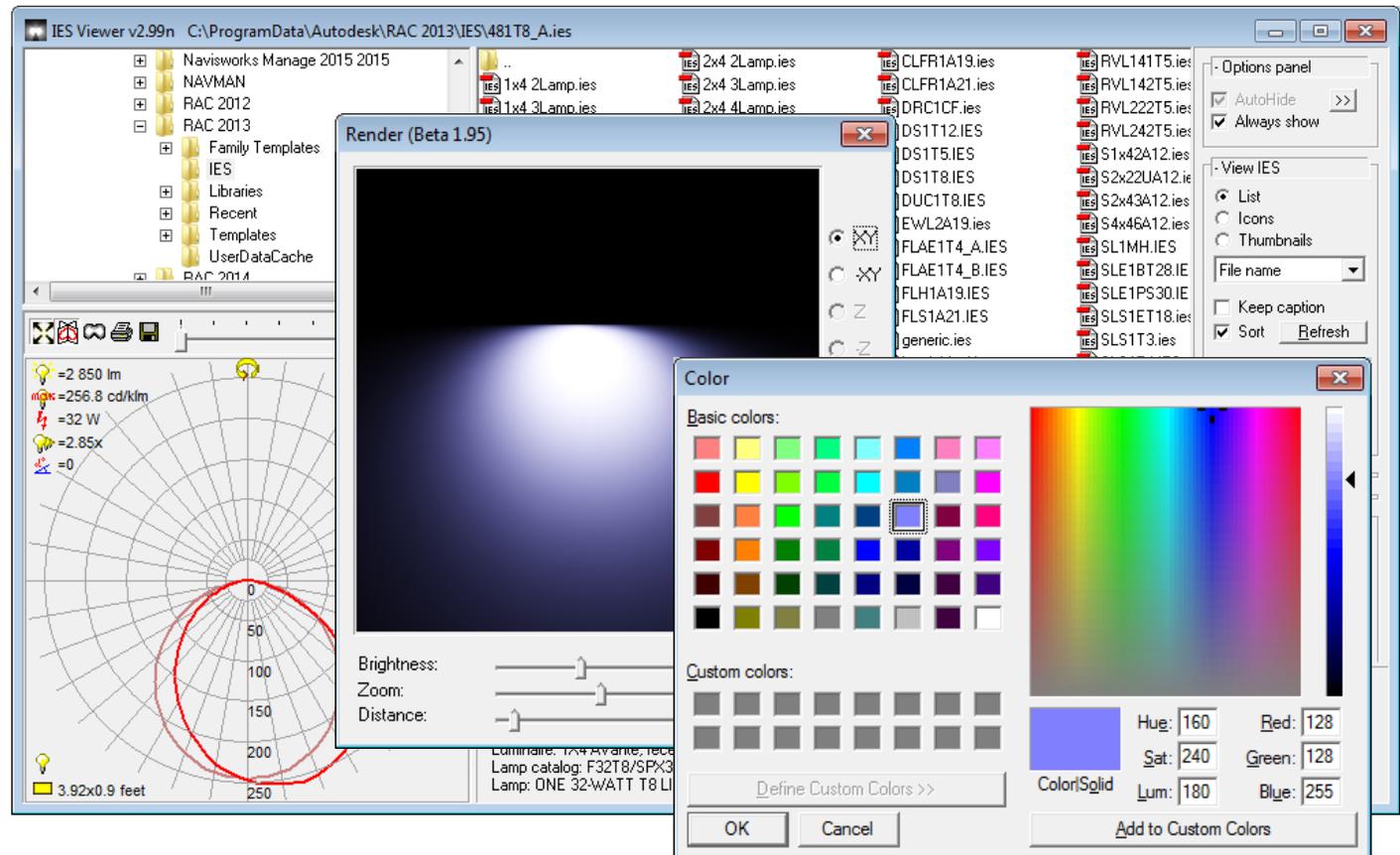


Light Fixture Modeling – IES Viewer

- A free IES file viewer is available here:

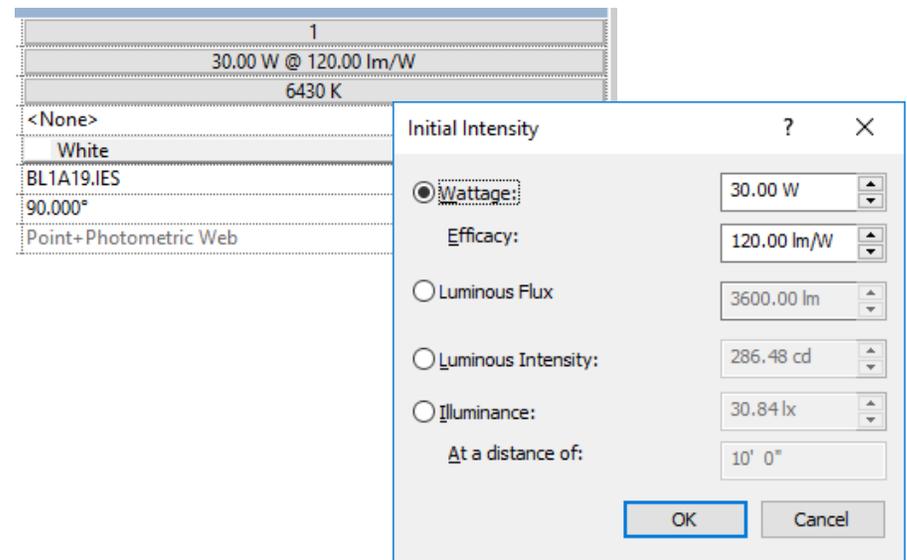
<http://www.photometricviewer.com/>

- IES (Illuminating Engineering Society of North America) files



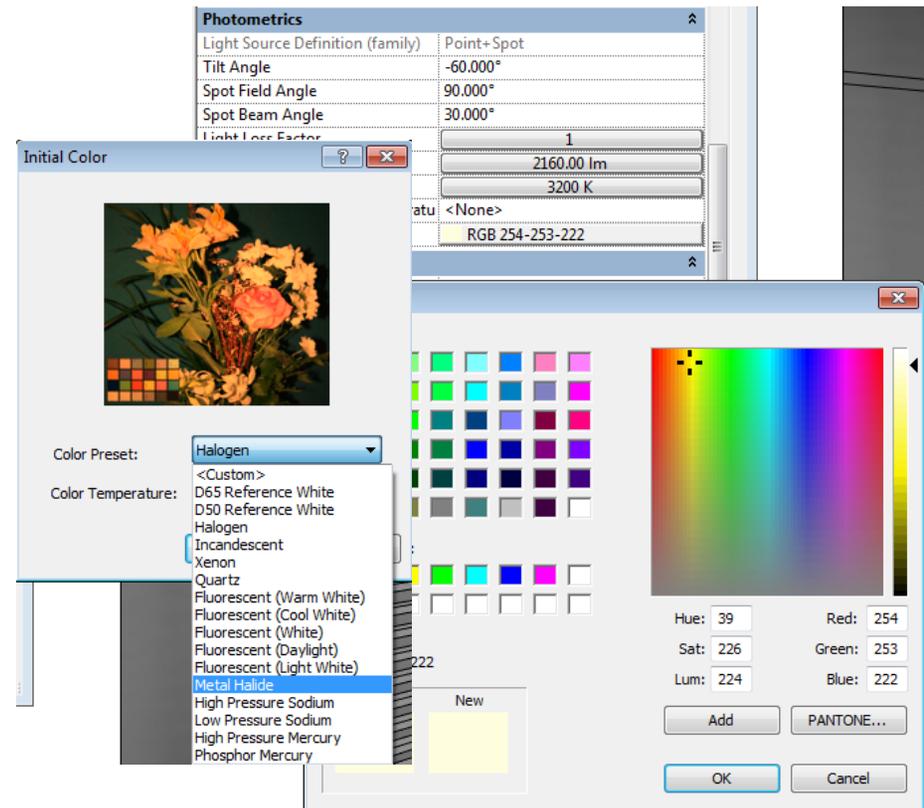
Light Fixture Intensity

- Set the required wattage/output (we typically use wattage and set the efficacy between 3x to 4x the wattage)
- Use fill lights for large areas without a lighting design



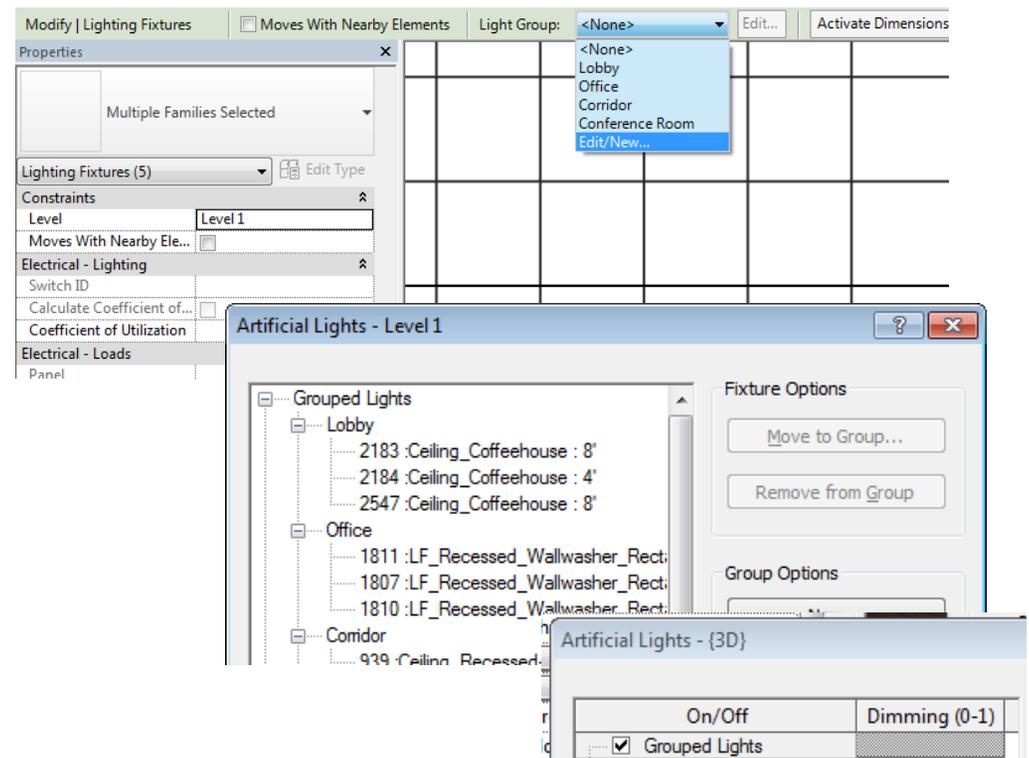
Light Family Settings

- Render using Fluorescent (Daylight) to verify chosen materials. Then try other color temperatures since light is never 100% white



Lighting Groups

- After placing your lights in the model, group them based on their spaces
- Grouping lights will allow you to control which lights are on and off as you render
- Able to adjust the dimming level



Build an Environment

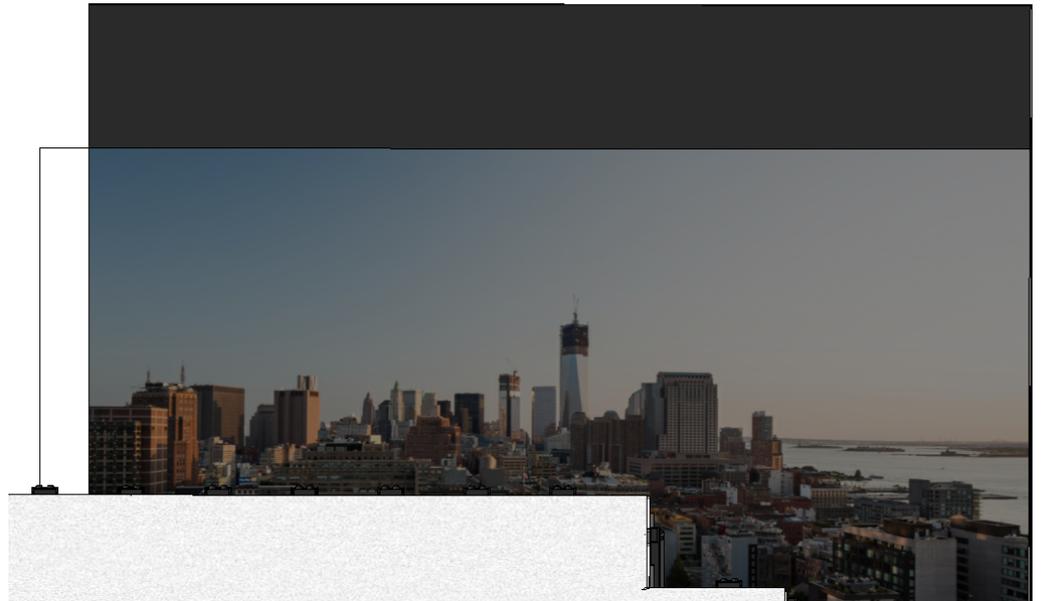
Entourage (update images)

- Adding entourage adds detail to your renders and your VR environment.
- Entourage elevates your clients experience of your design
- Use RPC families for a touch of added realism



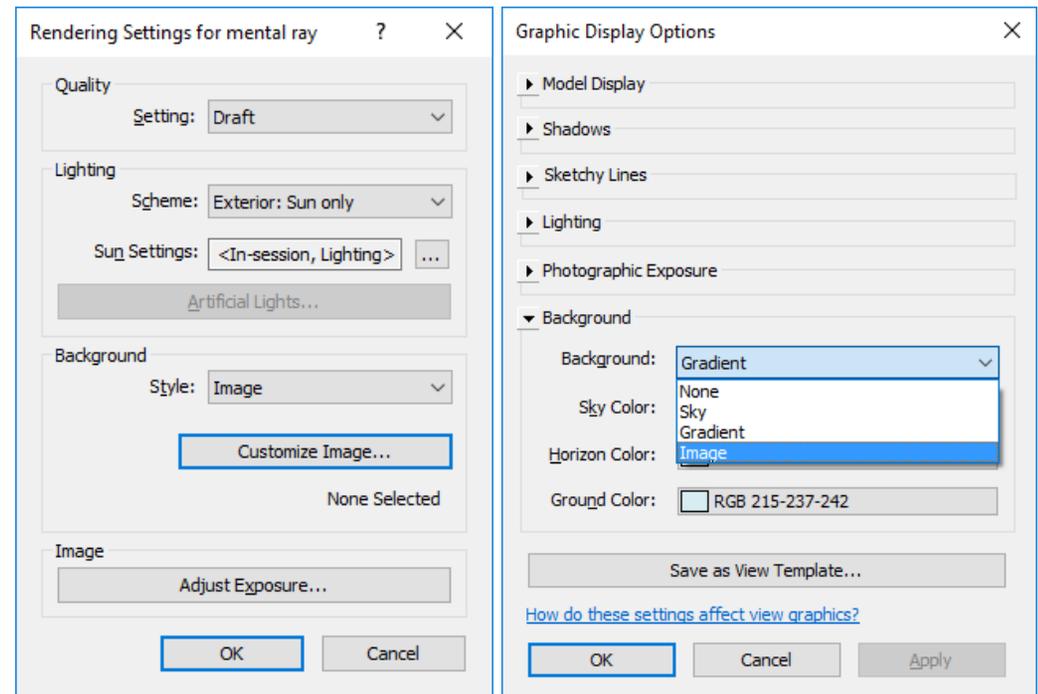
Build an Exterior

- Create walls and either assign a material with a mapped image
- Create decals to those walls of the surrounding environment



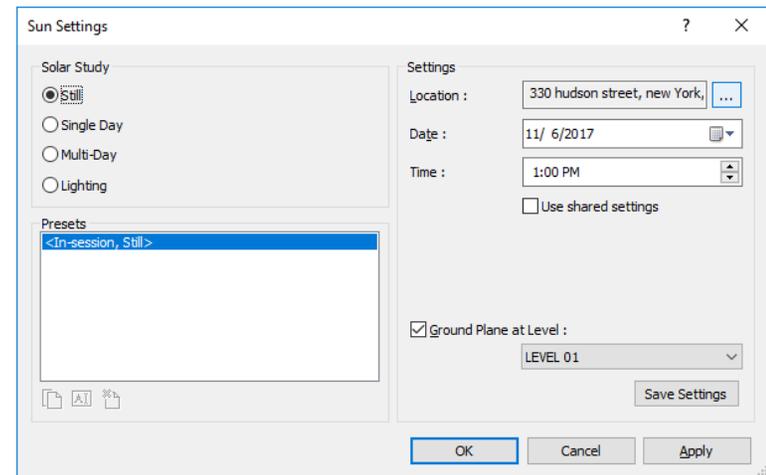
Apply Custom Background

- Choose a custom background either in the render settings dialog or in the Background area in Graphic Display Options window
- Only good for still renders, not panoramas



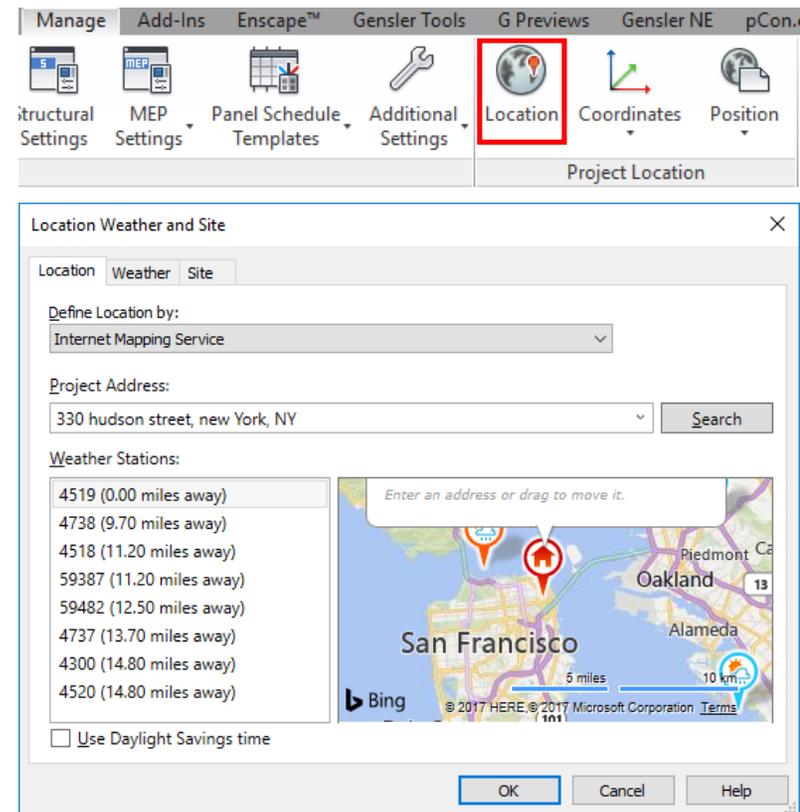
Set Date and Time

- Specify the date and time of day
- Set the Ground Plane



Location Location Location

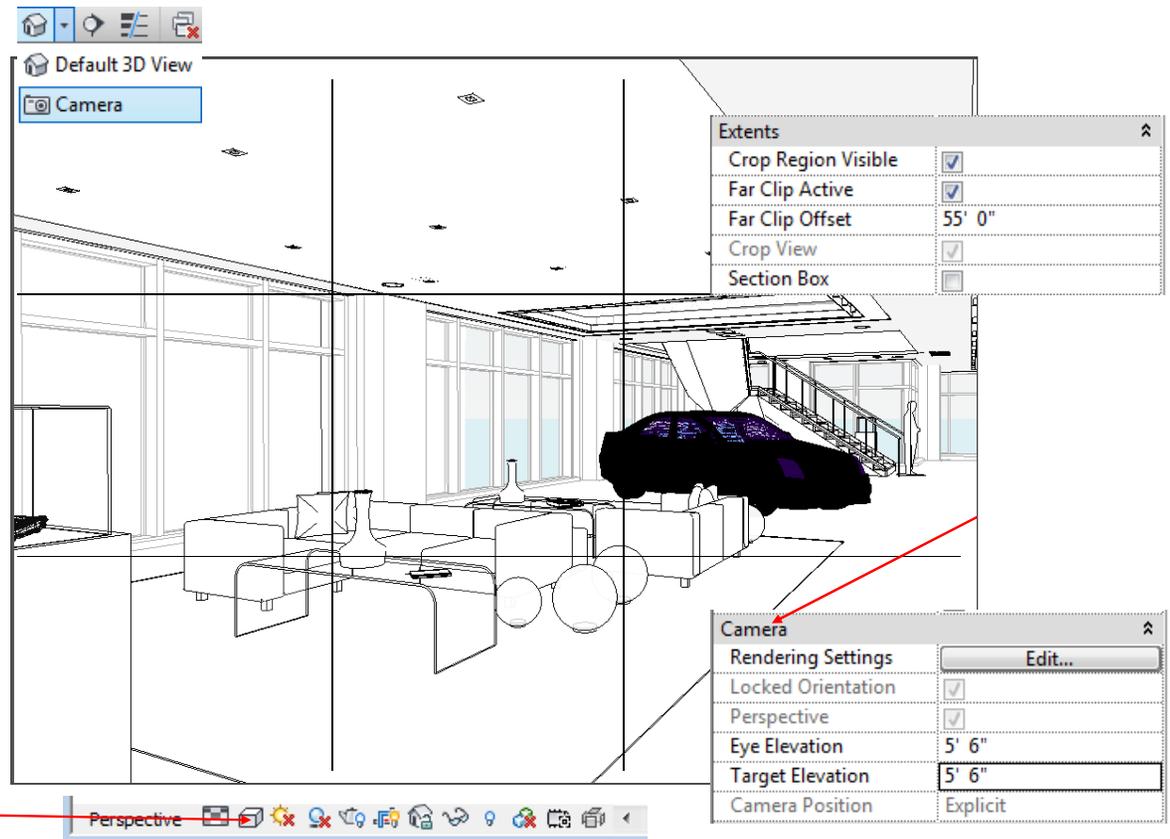
- Entering real world coordinates to set the true north project location in your Revit model will result in more accurate shadows should you be doing shadow/solar studies and/or illuminance renders



The View

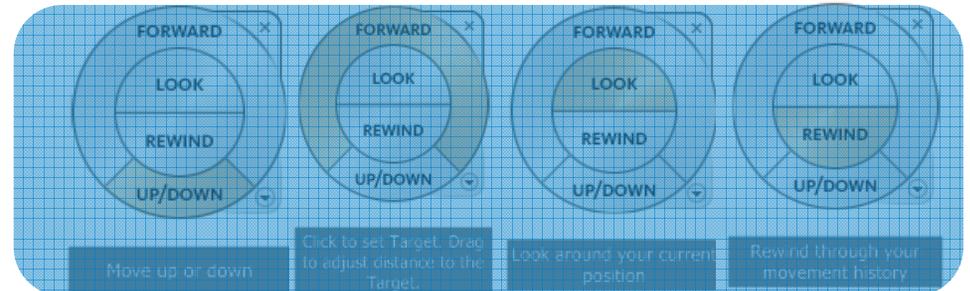
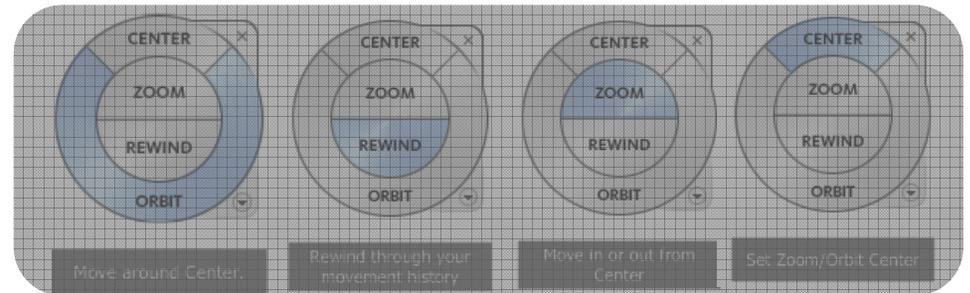
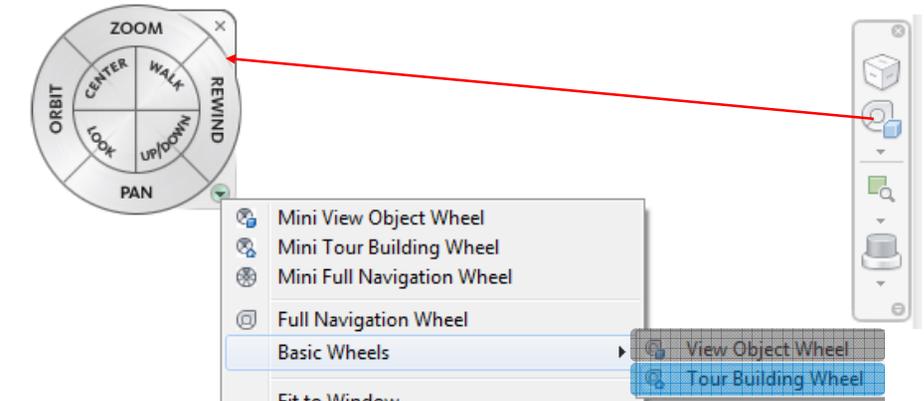
Create the View

- Place your camera
- Geometrical Composition Guides...
- Adjust camera elevation before other settings
- Turn on far clip to reduce redraw time
- Keep views on hidden line until you're done with adjustments to your camera!



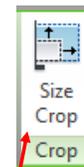
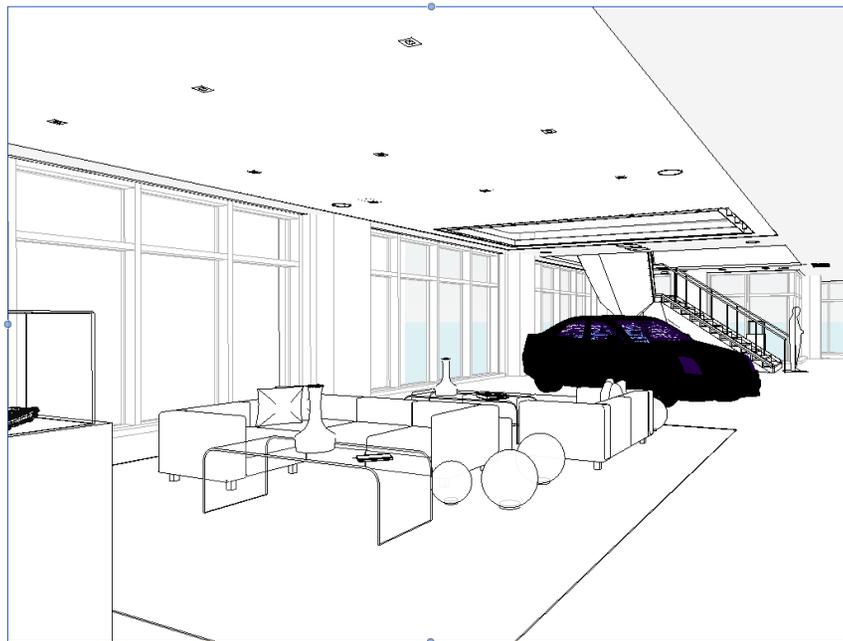
Camera Tweaking

- Using these tools work best for camera adjustments instead of the standard pan and zoom or selecting and stretching your crop region using grips



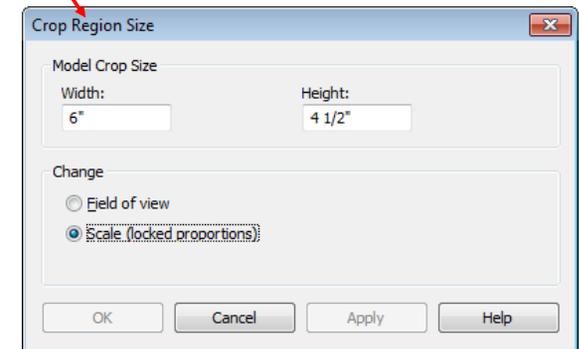
Crop Region Adjustment

- It is best to select the crop region and click the Size Crop icon in the ribbon to specify the size of the region.
- Editing this way will keep camera distortion to a minimum



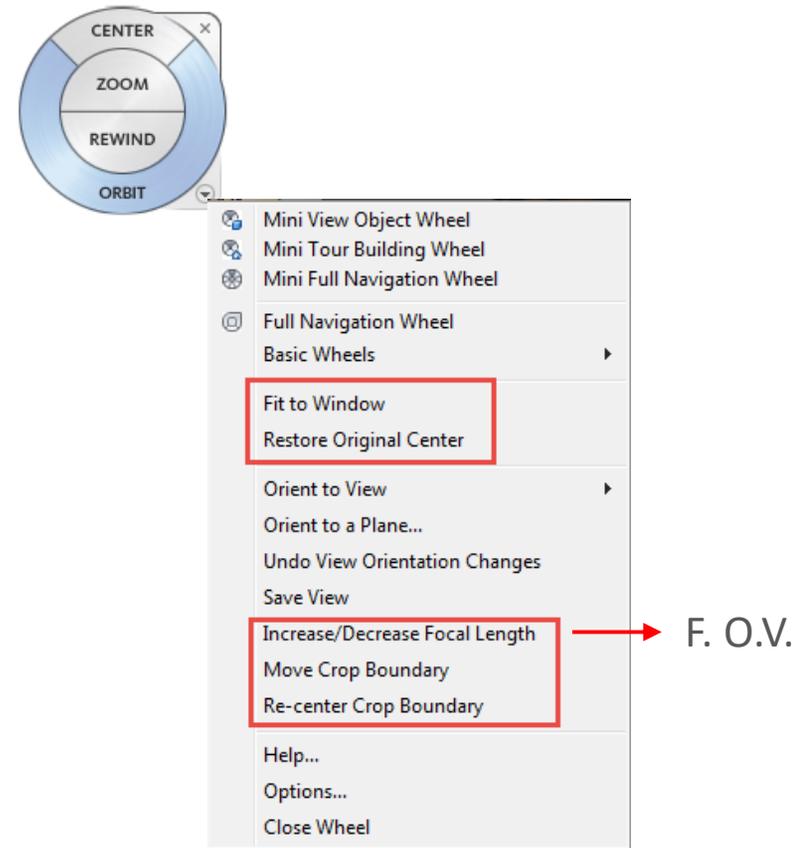
- [1]. 20" x 12 1/2"
- [2]. 20" x 11 1/4"
- [3]. 17 1/2" x 10 15/16"
- [4]. 16 11/16" x 12 1/2"
- [5]. 16 11/16" x 10 11/16"
- [6]. 13 3/8" x 10 11/16"
- [7]. 8 3/8" x 6 1/4"

- For 1920 x 1200 @ 72dpi
- For 1920 x 1080 @ 72dpi
- For 1680 x 1050 @ 72dpi
- For 1602 x 1200 @ 72dpi
- For 1600 x 1024 @ 72dpi
- For 1280 x 1024 @ 72dpi
- For 800 x 600 @ 72dpi



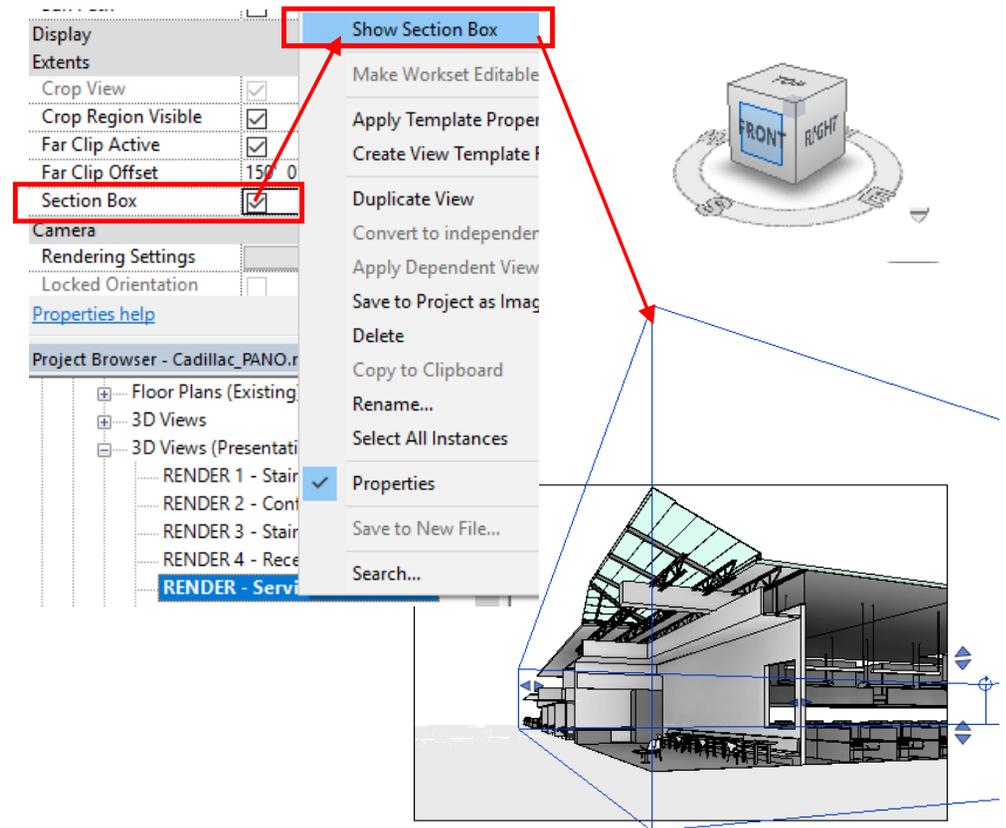
Additional Camera Tools

- Fit to window
- Restore original Center
- Increase/Decrease Focal Length (camera angle)
- Move Crop Boundary
- Re-Center Crop Boundary



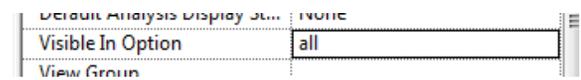
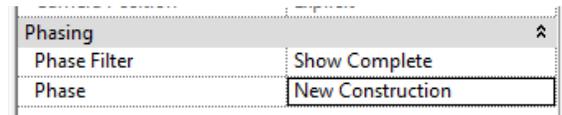
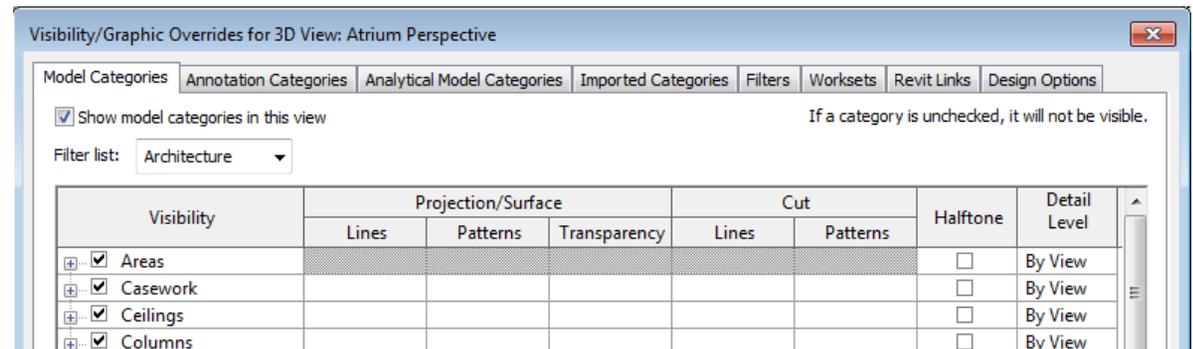
Section Boxes

- Use a section box to define specific areas
- Section boxes limit the amount of geometry that needs to be processed
- Section boxes are viewable in all views, right click view in browser with 3D view open
- Use orthogonal views with view cube to adjust faster



View Settings

- Turn off any unwanted categories such as lines, DWG's, or other content you don't want to see
- If in use, turn on Visualization workset
- Set your phase filters
- Set specific categories to higher detail level



View Settings

- Remove any material in graphic overrides tab
- Make sure linked models are properly mapped regarding phasing

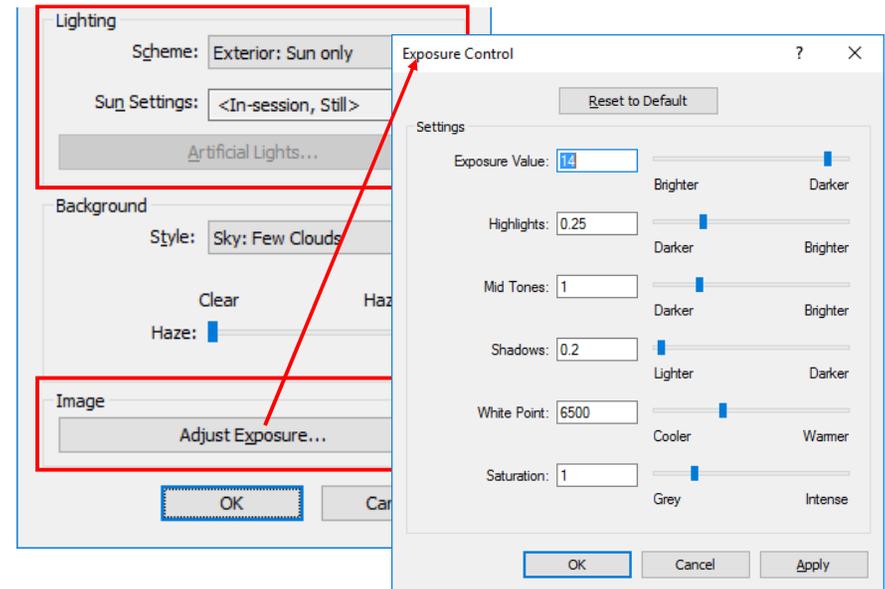
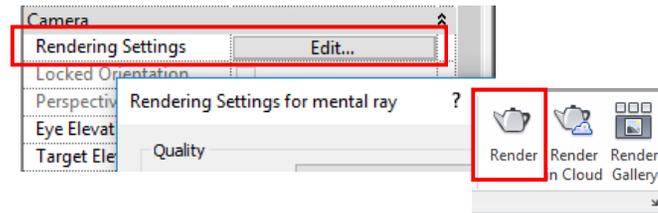
The screenshot displays the software's ribbon and several dialog boxes. The ribbon includes tabs for 'Manage', 'Add-Ins', 'BIMCoder Suites', 'CASE', 'Fuzor Plugin', 'Gensler Tools', 'Gensler NE', 'VEO', 'Revolution Design', and 'Extensions'. The 'Phasing' panel is active, showing 'Project Phases', 'Phase Filters', and 'Graphic Overrides' tabs. A red box highlights the 'Graphic Overrides' tab, which contains a table with columns for 'Phase Status', 'Projection/Surface', 'Cut', 'Halftone', and 'Material'. The 'Material' column is highlighted with a red box. Below this, the 'Other' dialog box is open, showing 'Reference Type' set to 'Overlay' and 'Phase Mapping' with an 'Edit...' button. The 'Phases' dialog box is also open, with the instruction 'Specify which phase in the linked model is equivalent to each phase in this project.' and a table mapping 'Existing Conditions' and 'New Construction' to 'Existing Conditions' and 'New Construction' in the linked file.

| Phase Status | Projection/Surface | | Cut | | Halftone | Material |
|--------------|--------------------|----------|-------|----------|--------------------------|----------|
| | Lines | Patterns | Lines | Patterns | | |
| Existing | | | | | <input type="checkbox"/> | |
| Demolished | | | | | <input type="checkbox"/> | |
| New | | | | | <input type="checkbox"/> | |
| Temporary | | | | | <input type="checkbox"/> | |

| Phase | Phase from linked file |
|---------------------|------------------------|
| Existing Conditions | Existing Conditions |
| New Construction | New Construction |

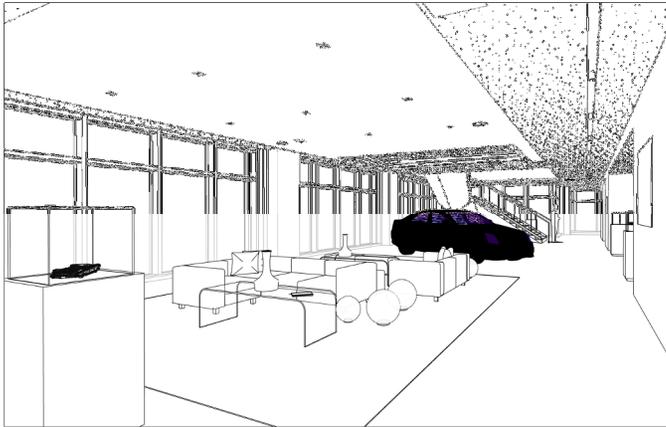
Render Settings

- Edit Render settings button on the properties palette of the 3D view or the Render button on the view tab
- Adjust exposure settings prior to submitting to the cloud or adjust after initial render
- Very important: Set the type of lighting scheme you need (interior or exterior)
- Turn on, off, or dim artificial lights



Types of Visualization

Visualization Styles



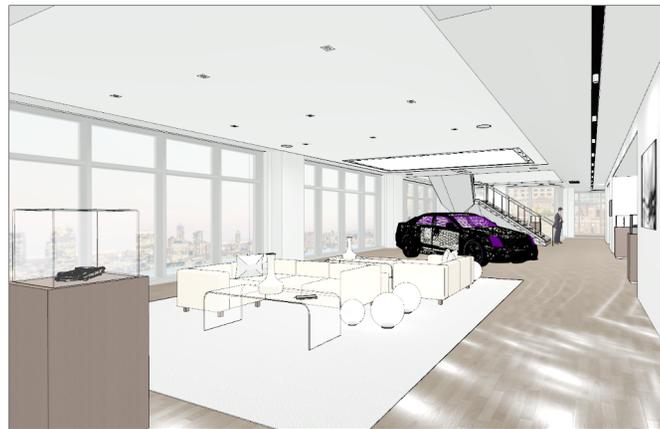
HIDDEN LINE



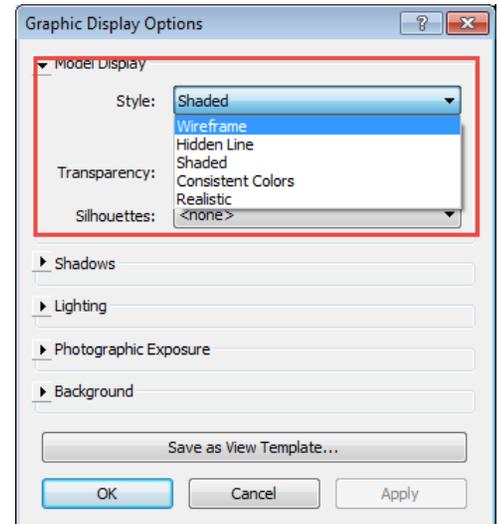
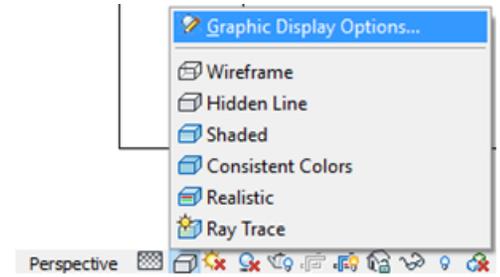
SHADED



CONSISTENT COLORS

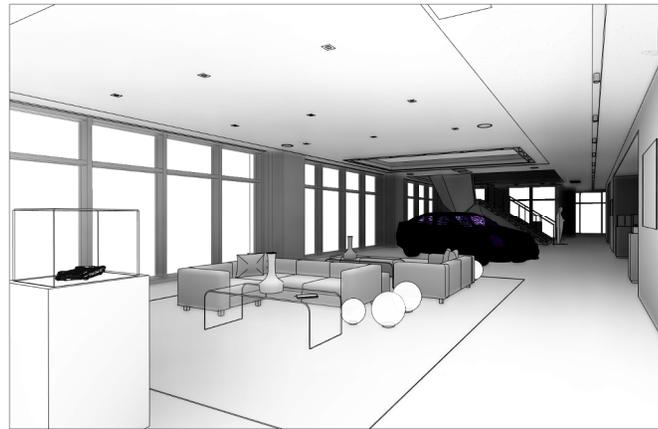


REALISTIC



Adding Shadows

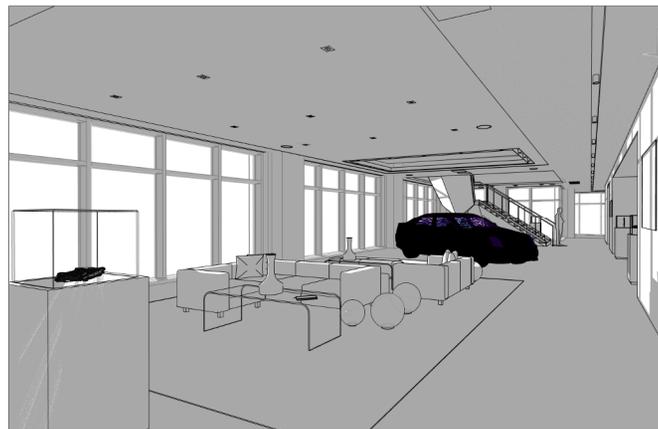
- Shadows slider only works when Cast Shadows is turned on
- Sun and ambient sliders only work with shaded or realistic style



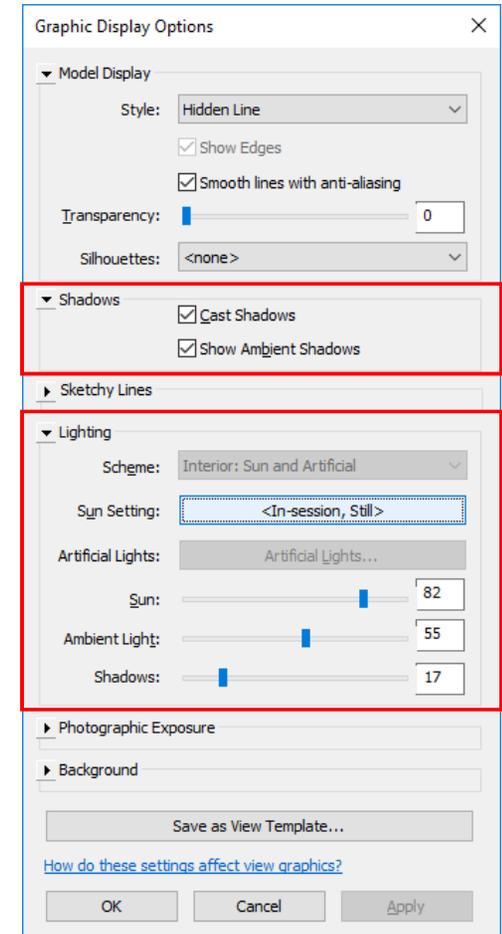
AMBIENT SHADOWS



CAST AND AMBIENT SHADOWS



CAST SHADOWS



Additional Options

- Sketchy lines and silhouette overrides will not render



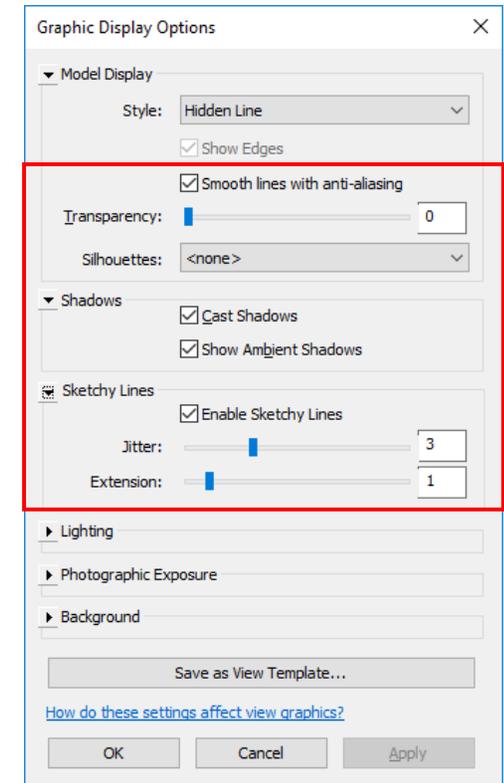
SHADED WITH SKETCHY LINES



CAST & AMBIENT SHADOWS, SKETCHY LINES



HIDDEN LINE, SILHOUETTES AND TRANSPARENCY



Background Options

- Applying a custom image here will not render it in the cloud



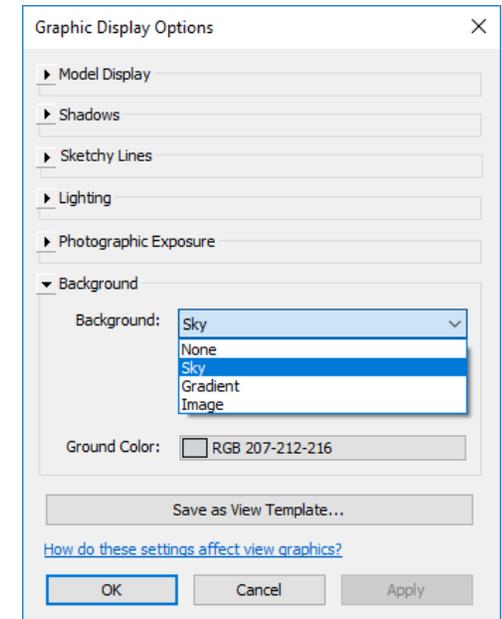
CUSTOM IMAGE



GRADIENT BACKGROUND



SKY BACKGROUND



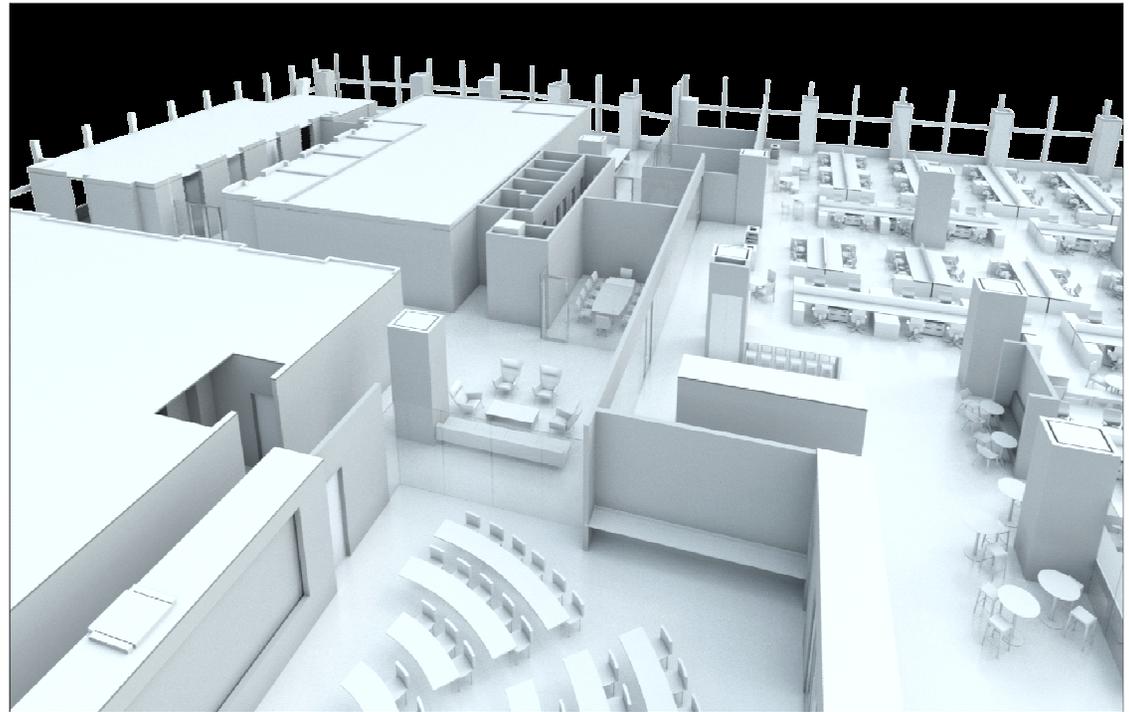
Bonus Trick

- For the following render style, turn on shadows and ambient shading, set an empty design option current and then export the view. Adjust settings further in Photoshop.



White Model Render

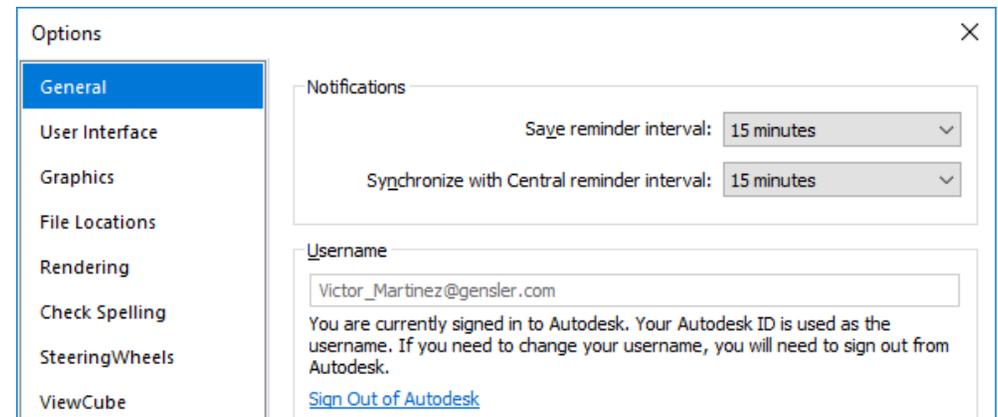
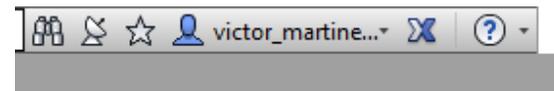
- Set all loadable and system families to <By Category> (except for glazing) and apply a white material to the category in object styles. Use cast shadows and ambient shadows for added affect



A360 Cloud Rendering

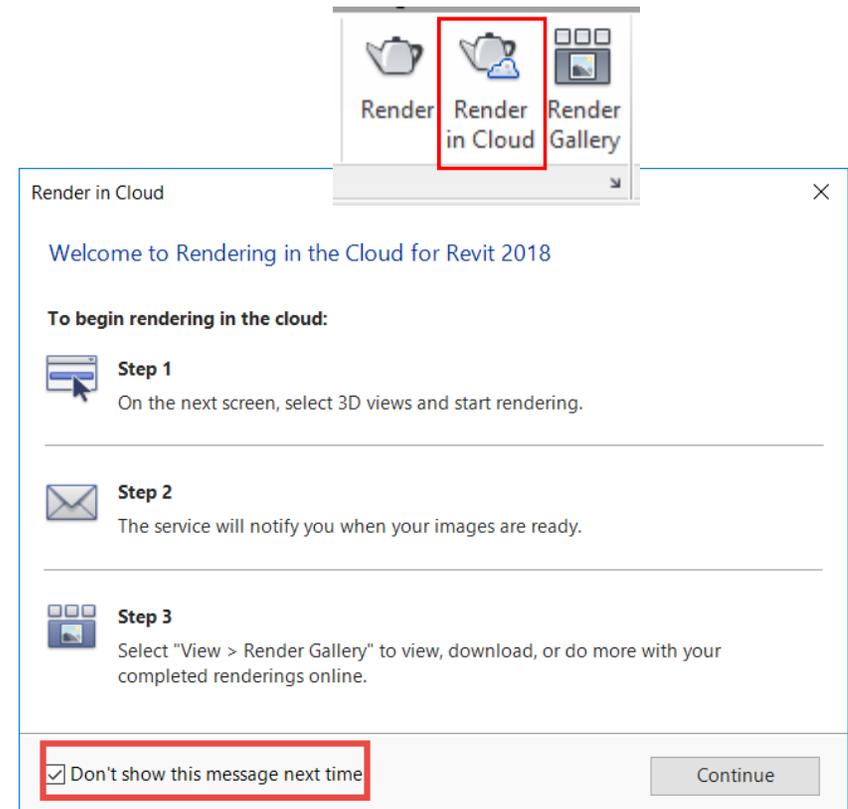
Logging into Cloud Rendering

- Log into Autodesk 360 with your info at the top right of Revit
- If you are using worksharing, make sure your Revit username is the same as the login name for A360, otherwise you will not be able to render the file at first



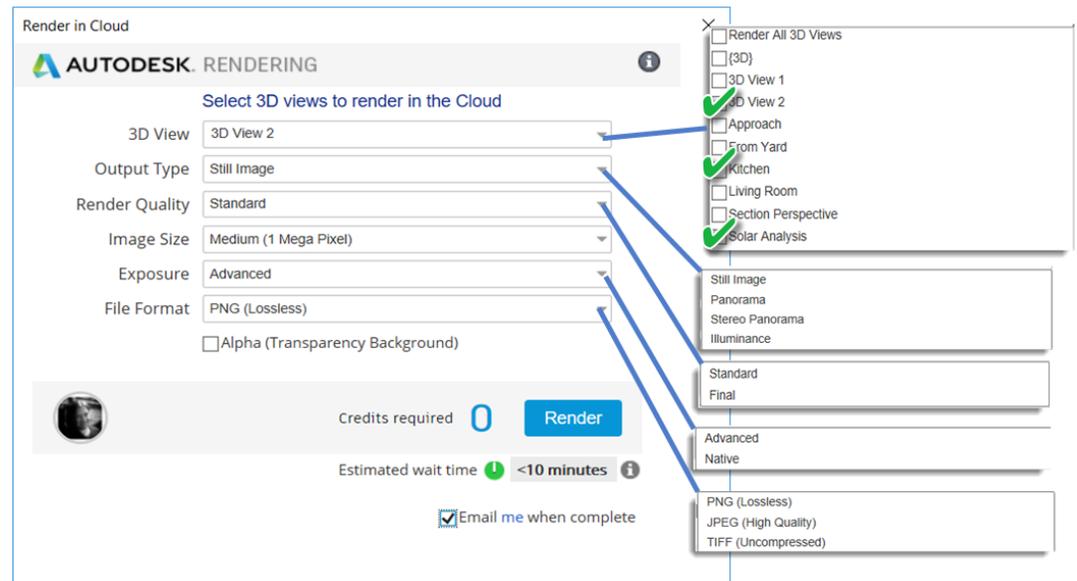
Submitting Views to Render

- From the View tab, in the graphics group, click Render in Cloud
- A dialog box will appear with some instructions, you can select “Don’t show this message next time” and then select "Continue".



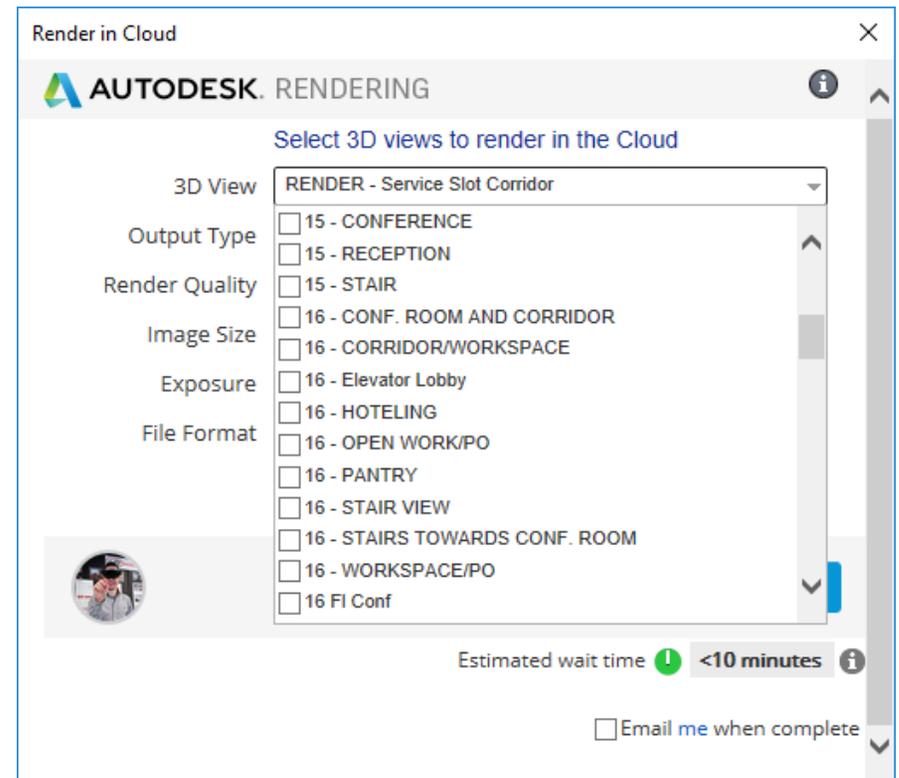
Preliminary Render Options

- List of 3D views
- Output Type
- Render Quality
- Image Size
- Exposure
- File Formats



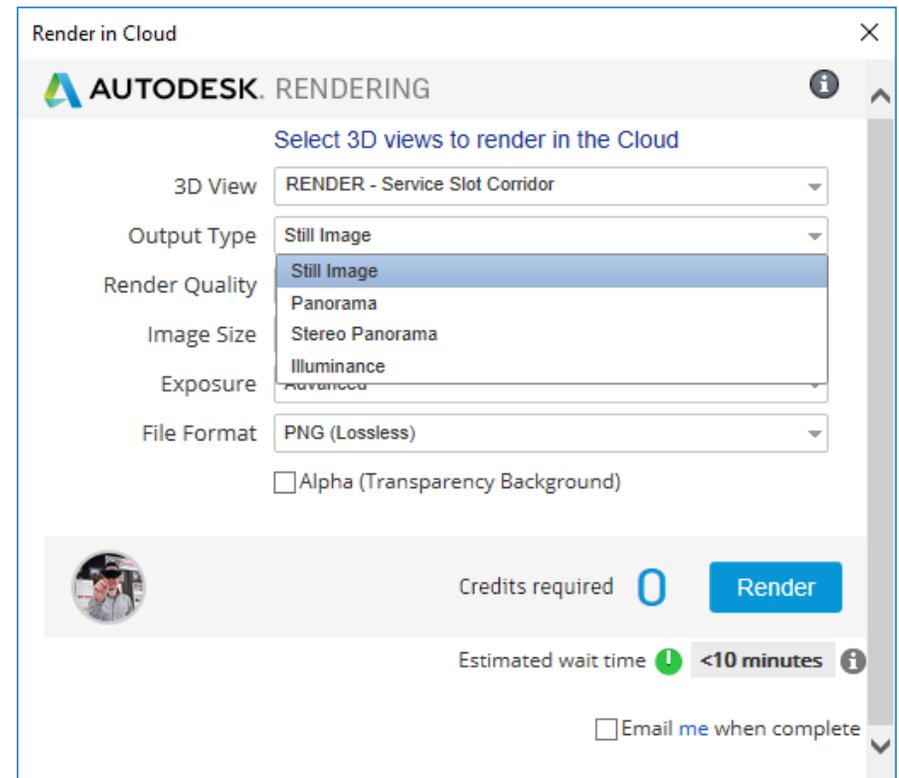
Choose Your 3D View(s)

- 3D views, select the view(s) to render
- Here is where you can set up your render job for batch rendering



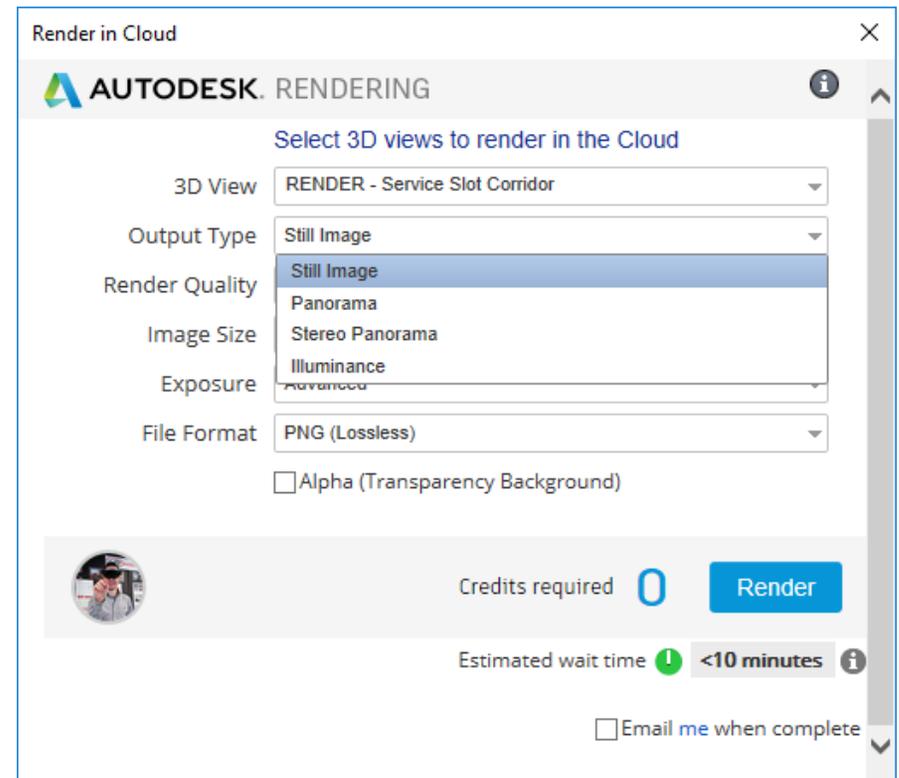
Output Type

- Choose Still Image for output
- Tip: Rendering a **still** first, allows **additional post processing** steps in the cloud prior to converting to a VR ready image. The adjustment of exposure is NOT available if the scene is first rendered as a panorama or stereo panorama



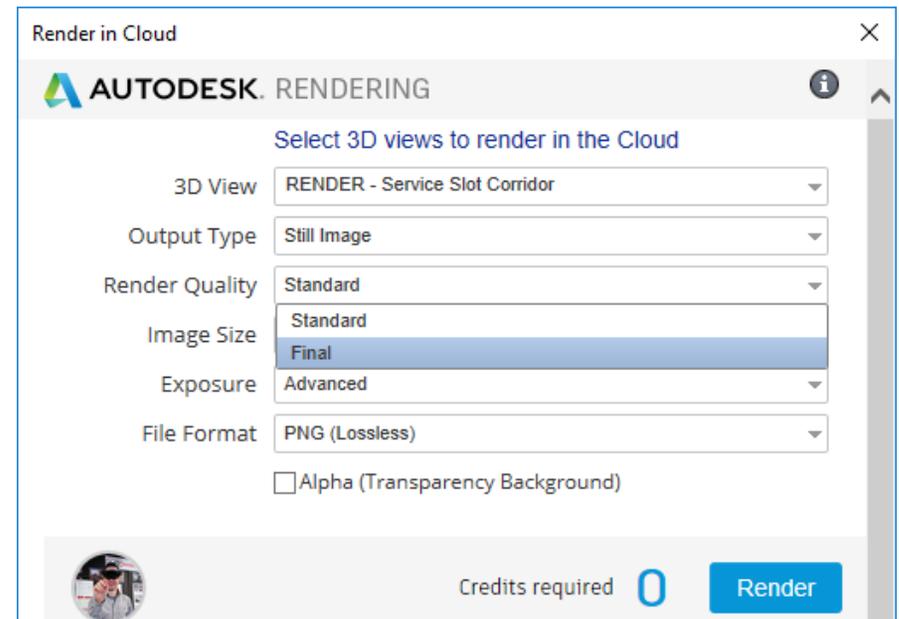
Output Type Cont'd...

1. Still for Presentation Deck
 2. Panoramas to enter into interactive presentations
 3. Stereo panoramas for viewing with VR headsets
- Note: Stills can be re-rendered into panoramas or stereo panoramas but it is not reversible, panos and stereo panos cannot be made into still images



Render Quality

- Choose either Standard or Final (1 credit).
- Keep an eye on the "Credits Required" while selecting the next settings, the higher quality settings will use more credits and might not be needed just for draft and test renderings.



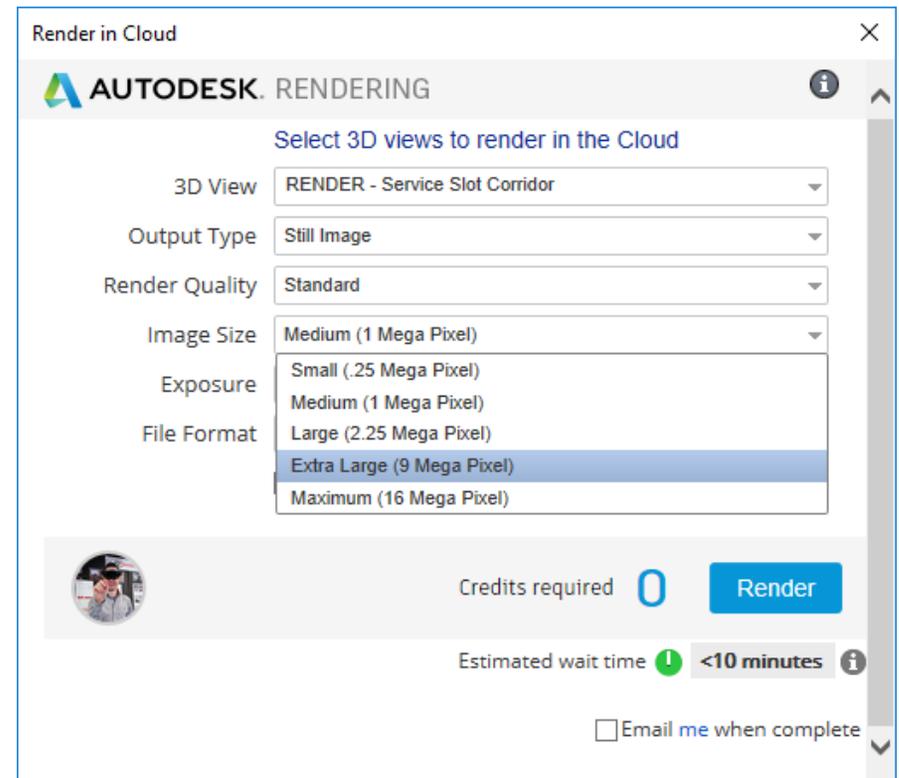
There are two Render Quality settings, each with a different balance of three variables: eye rays, reflection samples, and lighting accuracy.

| Setting | Eye rays variable | Reflection samples variable | Lighting accuracy variable | When to use | Speed |
|----------|-------------------|-----------------------------|----------------------------|--|-------|
| Standard | 4.0 | 1 | Low | More accurate than Draft. Perfect for quick visualization during design. | 4x |
| Final | 32 | 16 | High | Lower noise and broader tonal range than High. Perfect for archival rendering, when speed is not a priority. | 20x |

NOTE: Speed comparisons are relative. The overall rendering time for any image is a function of render quality, image resolution, and complexity of the scene.

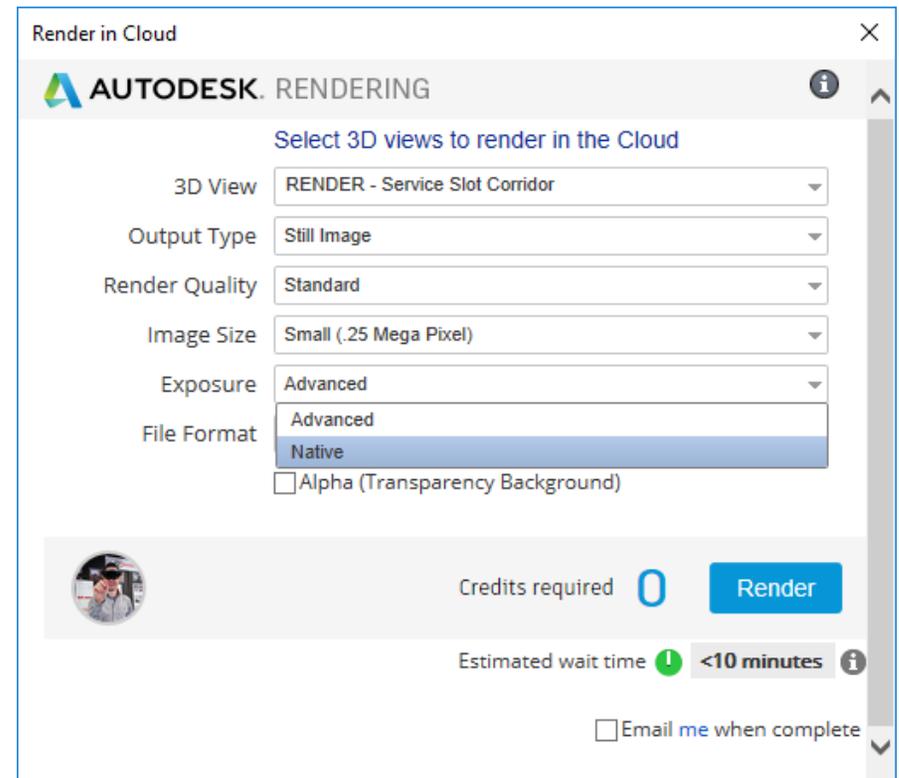
Image Size

- Small: Small is 0 credits and the lowest quality setting
- Medium: Typical starting point, since 0 credits and a little more helpful in seeing how things are developing
- Large: Large is 1 credit and should be saved until verifying the view is looking correct after as medium draft test
- Extra-large: Extra-large is 5 credits and is better quality
- Maximum: Maximum is 8 credits and will yield the best quality and largest size possible to render



Exposure

- There are 2 Exposure options: Advanced and Native. Typically we use Native when starting our process
- Native (Revit exposure settings)
- Advanced (Auto-exposure which is intended to simulate correct lighting conditions)



The screenshot shows the 'Render in Cloud' dialog box in Autodesk software. The window title is 'Render in Cloud'. The header includes the Autodesk logo and the text 'AUTODESK. RENDERING'. Below the header, there is a section titled 'Select 3D views to render in the Cloud'. The settings are as follows:

- 3D View: RENDER - Service Slot Corridor
- Output Type: Still Image
- Render Quality: Standard
- Image Size: Small (.25 Mega Pixel)
- Exposure: Advanced
- File Format: Native (highlighted)
- Alpha (Transparency Background)

At the bottom of the dialog, there is a user profile picture, a 'Credits required' field showing '0', a blue 'Render' button, an 'Estimated wait time' of '<10 minutes' with a green exclamation mark icon, and a checkbox for 'Email me when complete'.

Native



Advanced



File Formats

- There are 3 file formats available as well as an option to render a transparent background (Alpha)
- Tip: Set your Revit view to black to be able to render an environment in the cloud and not have the environment bake into reflections in the render
- Email notification option

Render in Cloud

AUTODESK. RENDERING

Select 3D views to render in the Cloud

3D View: RENDER - Service Slot Corridor

Output Type: Still Image

Render Quality: Standard

Image Size: Small (.25 Mega Pixel)

Exposure: Native

File Format: PNG (Lossless)

Credits required: 0

Render

Estimated wait time: <10 minutes

Exposure: Native

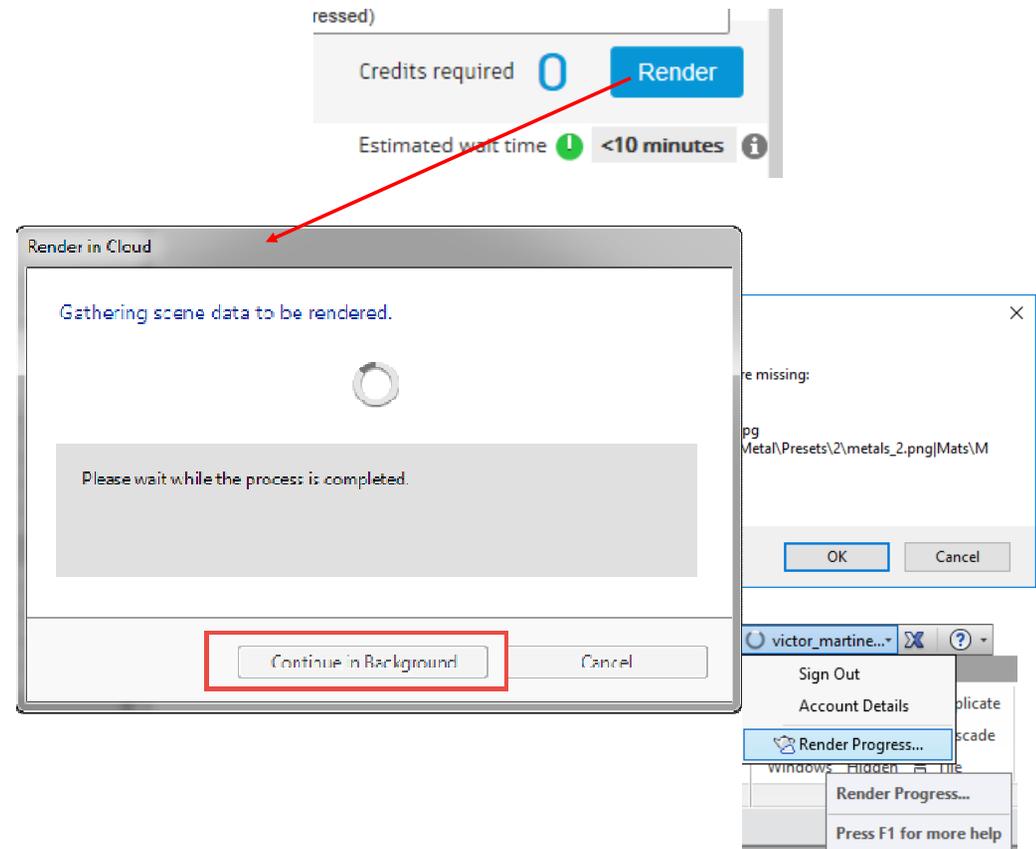
File Format: PNG (Lossless)

Alpha (Transparency Background)

Email me when complete

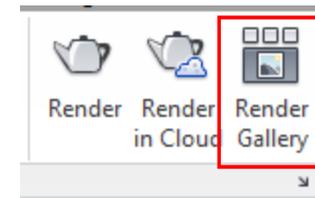
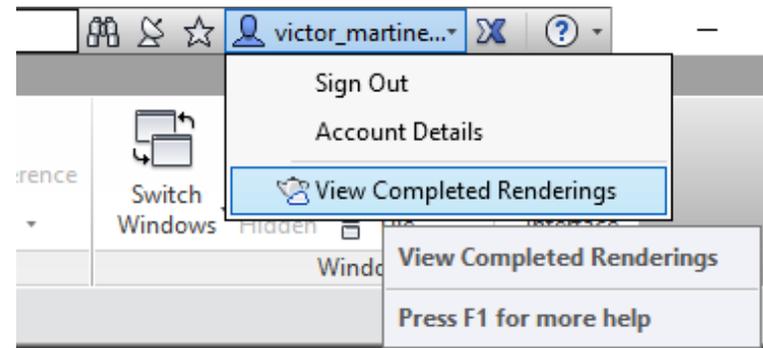
Submitting the Job

- Click the Render button to submit the render to the cloud
- Tip: If the waiting window appears for a long time when submitting the render job, check that there is no dialog underneath waiting for user input due to missing maps



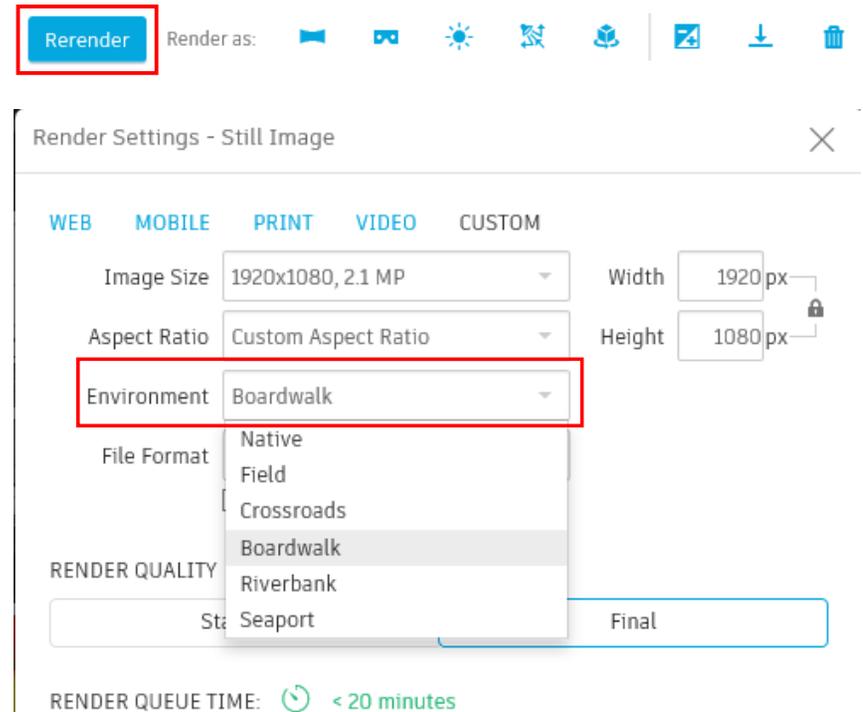
Access the Gallery

- Either click the View Completed Renderings button under the A360 login **or** click the Render Gallery button on the view tab.
- This will open an internet browser to your A360 gallery



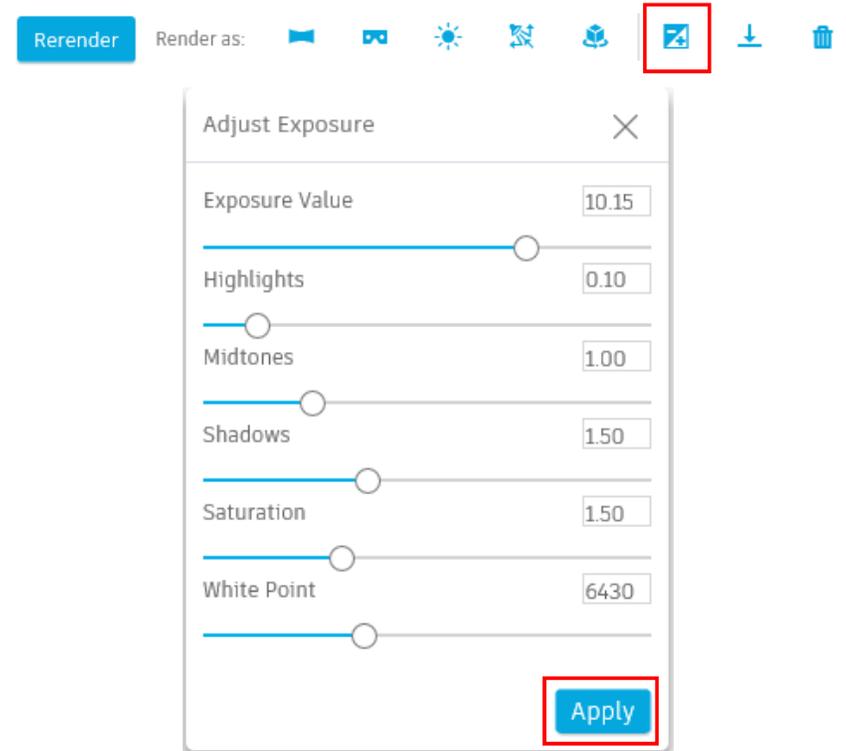
2nd Render

- When the initial render is complete, re-render the image using one of the default environments. This will apply image based lighting (IBL) to your scene.



3rd Render

- Re-render again after adjusting the exposure
- Click "Apply" after making any adjustments to reprocess the view
- This render typically completes very quickly



Re-Re-Render Process

- Using this method allows additional post processing steps of editing the image prior to converting to a VR ready image. The ability to adjust exposure is NOT available if the scene is first rendered as a panorama or stereo panorama



Be Consistent

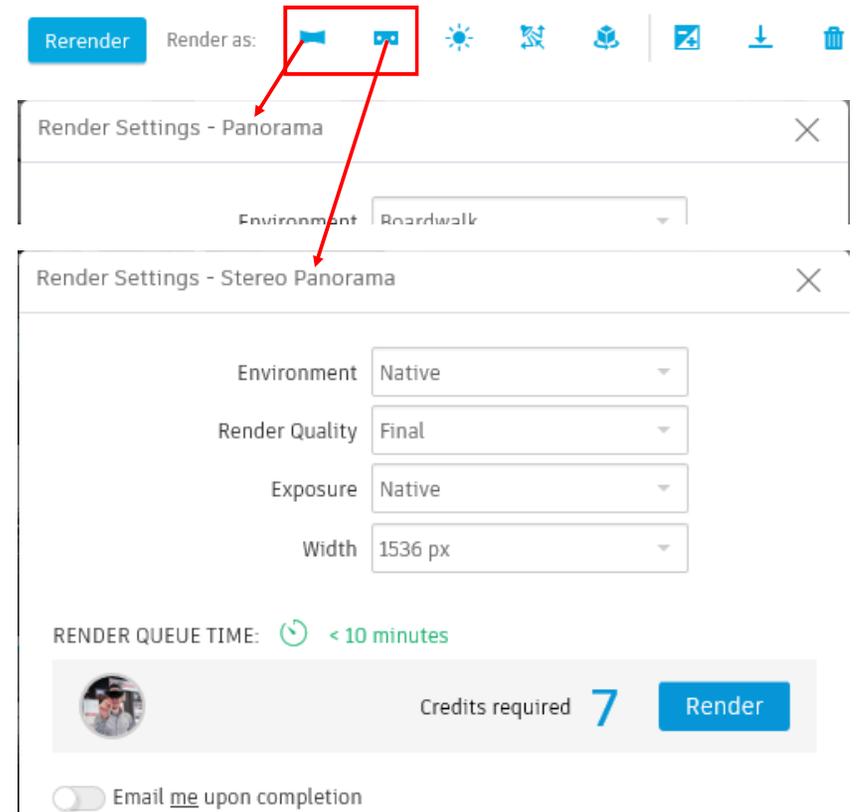
- Pick a process and stick with it
- Note: Exposure controls differ when rendering local



Raytrace

Final Step for VR

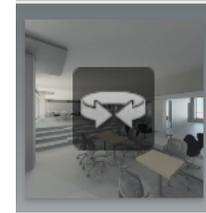
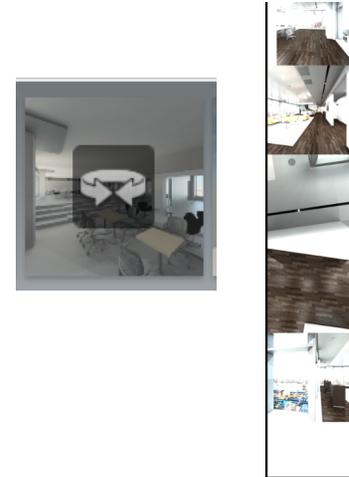
- After the last rendering is complete, re-render as a Panorama or Stereo Panorama
- Re-rendering the still into a pano will require additional rendering credits
- Use a width that is close to the specs of the VR viewer you will be using



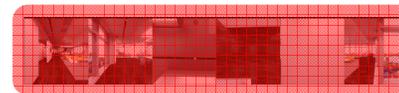
The screenshot shows a rendering interface with a 'Render as:' dropdown menu. Two options are visible: 'Panorama' and 'Stereo Panorama', both highlighted with a red box and red arrows. Below the menu are two panels: 'Render Settings - Panorama' and 'Render Settings - Stereo Panorama'. The 'Stereo Panorama' panel shows settings for Environment (Native), Render Quality (Final), Exposure (Native), and Width (1536 px). At the bottom, there is a 'RENDER QUEUE TIME: < 10 minutes' indicator, a user profile picture, 'Credits required 7', a 'Render' button, and a toggle for 'Email me upon completion'.

Panorama Types

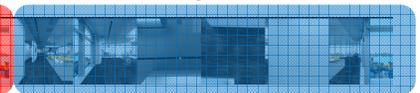
- Panoramas are cube renders of your scene (vertical strip). 6 sides to 1 cube
- Stereo panoramas are also cube renders of your scene (horizontal strip). There are 6 for the left eye and 6 for the right eye.
- Stereo panoramas have more 3D depth and increase the VR experience



Left



Right



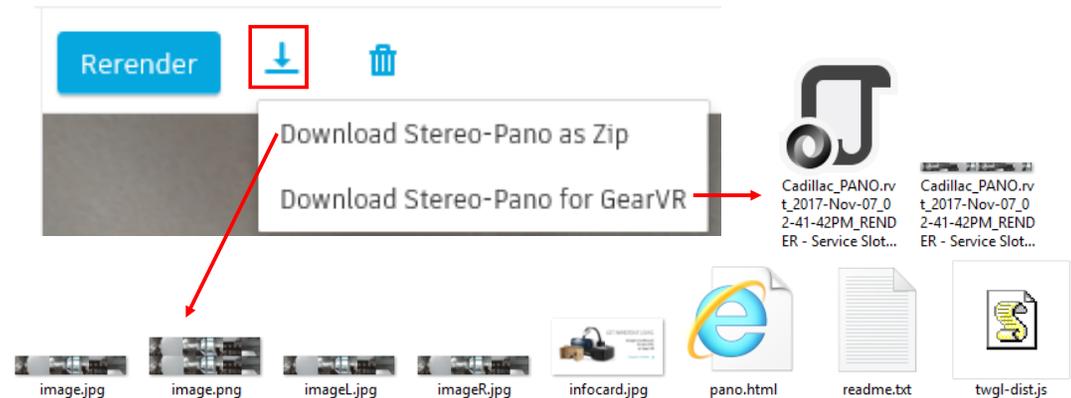
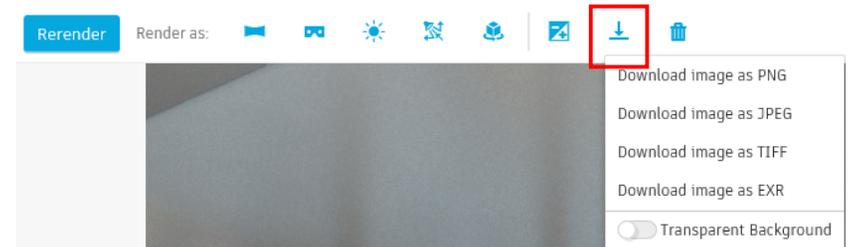
Share Your Panos

- Share icon in the upper right corner to share the pano to the public gallery, an A360 project, or via a link
- Two methods, a QR code that can be scanned or a URL that can be emailed and clicked on to view with any browser



Downloading Your Files

- When downloading your still files, select the image and then click the download button
- To download your panos, select the pano you want to download, and click the download button
- The files will vary depending on what output type has been generated



Summary

With everything that was covered in this session, we want to stress that you will never get a perfect render out of any visualization tool on the first try. Hence the need for some post processing. As you can see, with the images we showed, we went from a draft render to another draft with added entourage for increased detail. Once we were happy with the amount of added entourage, we proceeded to a 2nd and 3rd render. Then the final scene is further improved upon in Photoshop with some quick tilt-shift filters for a standard render.

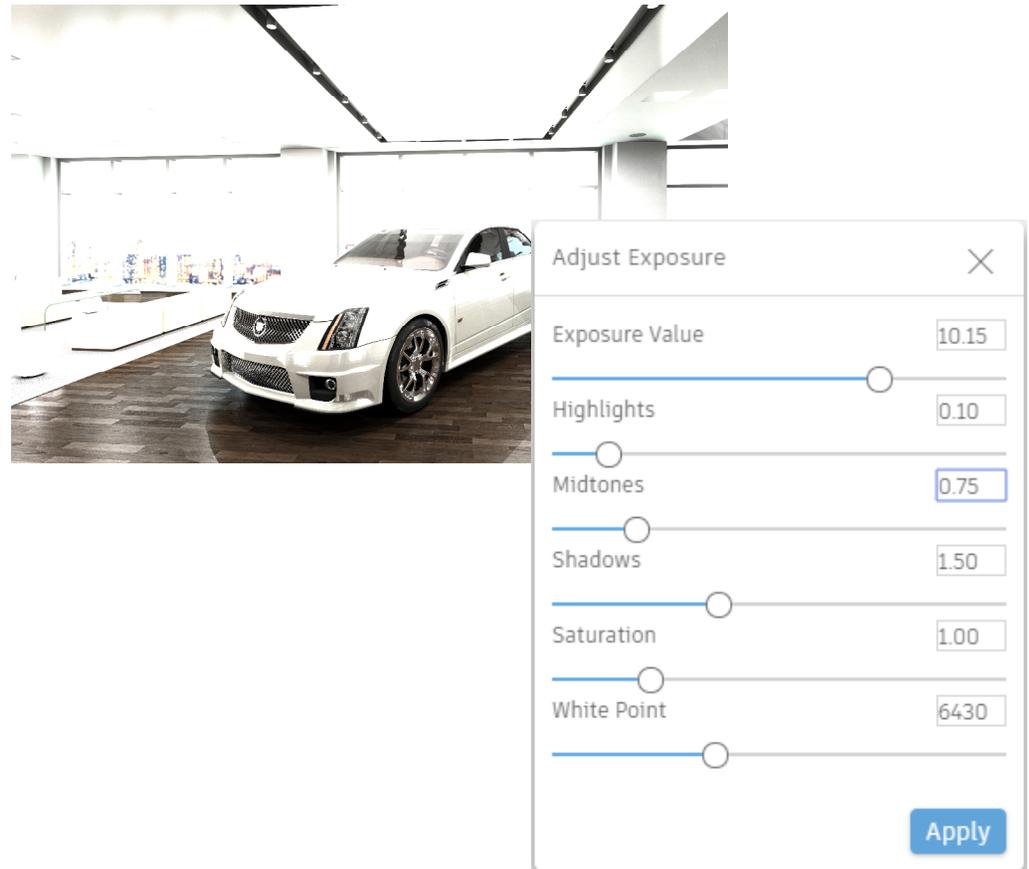
As for VR panoramas, there are tools that will allow you to edit these type of VR files like Adobe Premiere. There is also software named Black Magic Fusion that can be used and the basic version is free, whereas their Pro version is \$299. There is also Blackmagic DaVinci 12 for color grading and other editing features

Summary

Lights are typically set high. This makes it easier to find a balance between the interior and exterior lighting when adjusting exposure

Re-render using one of the available environments. This introduces IBL lighting which improves the render quality.

Render a third time after adjusting the exposure settings. Typically settings shown here but will vary depending on lighting quality and materials.



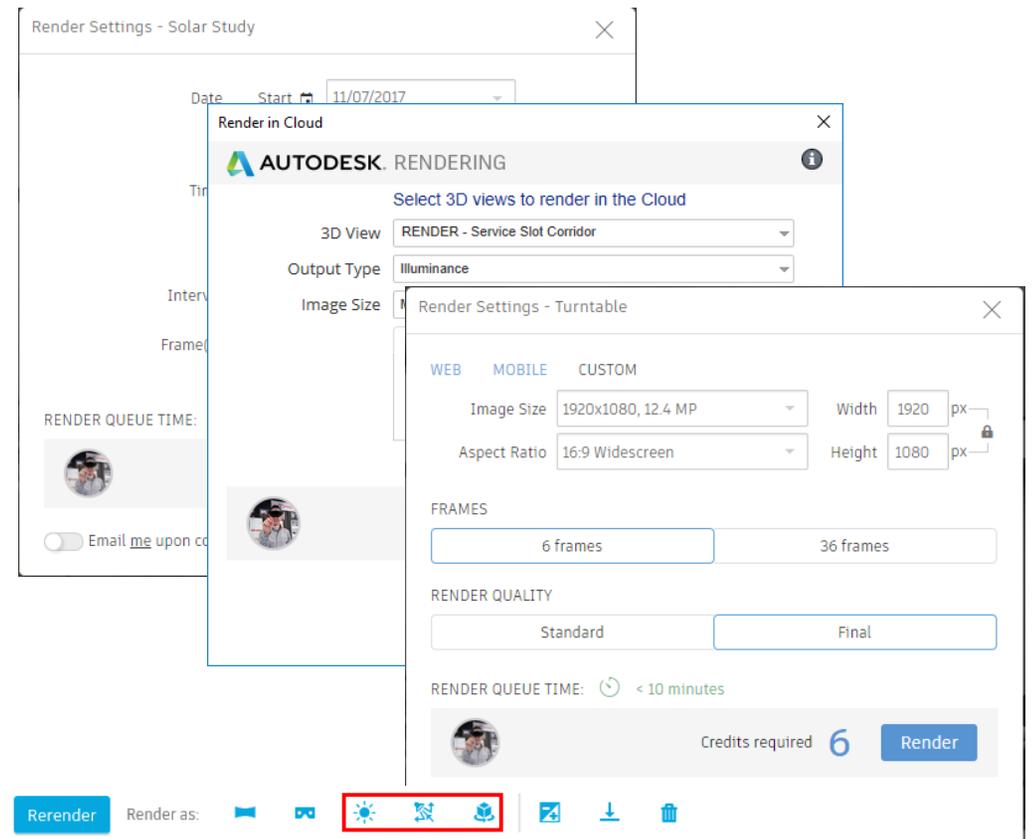
Other A360 Options

- Solar studies

- Illuminance studies

**Turn off any fill lights that may have been added so they do not affect the render*

- Turn table animations



Things to Keep in Mind

Always have a backup when presenting to a client:

- Thumbdrive
- Hyperlinks
- Additional VR viewing app
- Multiple devices

Make sure that all viewable areas that are going to appear in the render have been modeled.

Do not place cameras too close to objects. Look for a spot that is open and shows as much of a space as possible.

Grounding/Shadow for positioning... Safe client practices: motion sickness (sit vs stand, rotating chair), epilepsy, vertigo, disorientation...

Wrap Up



- Various hardware with an appropriate app
- Google cardboard for low entry point
- Higher end VR products (Gear VR or Oculus), free Oculus 360 Photo App
- Some apps will allow you to pair a Bluetooth game controller
- For iphones GoProVR is a good option

Stream Gear VR to a TV:

<http://www.pocket-lint.com/news/141202-gear-vr-now-supports-chromecast-here-s-how-to-stream-vr-to-your-tv>

Hundreds of apps available for viewing panos

References/Resources

Autodesk: <https://knowledge.autodesk.com/support/revit-products/learn-explore/caas/CloudHelp/cloudhelp/2018/ENU/Revit-DocumentPresent/files/GUID-12C2D6B0-71ED-490E-9CC6-AD3C635F092B-htm.html>

Autodesk: <https://knowledge.autodesk.com/support/revit-products/learn-explore/caas/CloudHelp/cloudhelp/2018/ENU/Revit-DocumentPresent/files/GUID-4046977A-9323-4535-9AC0-4EF9A138A5A6-htm.html>

Panorama Information: <http://pano.autodesk.com>

Forum / Community Help: <http://forums.autodesk.com/t5/a360-rendering-general/stereo-panorama-rendering-now-available/td-p/5503731>

Blog posts: <http://autodesk360rendering.typepad.com/blog/>

Twitter Feed: <https://twitter.com/search?src=typd&q=autodesk%20cardboard>

Main Rendering Portal: <https://rendering.360.autodesk.com>

Plan! It's not Just About Revit



Q & A



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