2.1
3D
Design work-flow

Digital Fabrication Facilities for Architecture

LSBU

A guide for 3D model to visualisation workflow

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ADDITIONAL RESOURCES

This guide will show you the work-flow to create design presentation by using Rhino model with Adobe Photoshop and Illustrator. To use this guide, you need to have you 3D model finished.

Please note the document shows you the principle and in practice details may vary.

Disclaimer:

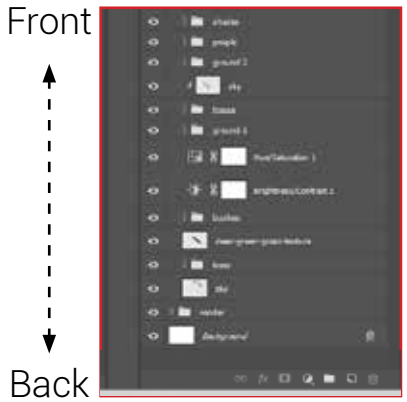
This guide is intended to help you improve your design project's presentation. You are still required to develop your design ideas in accordance with your studio tutor.

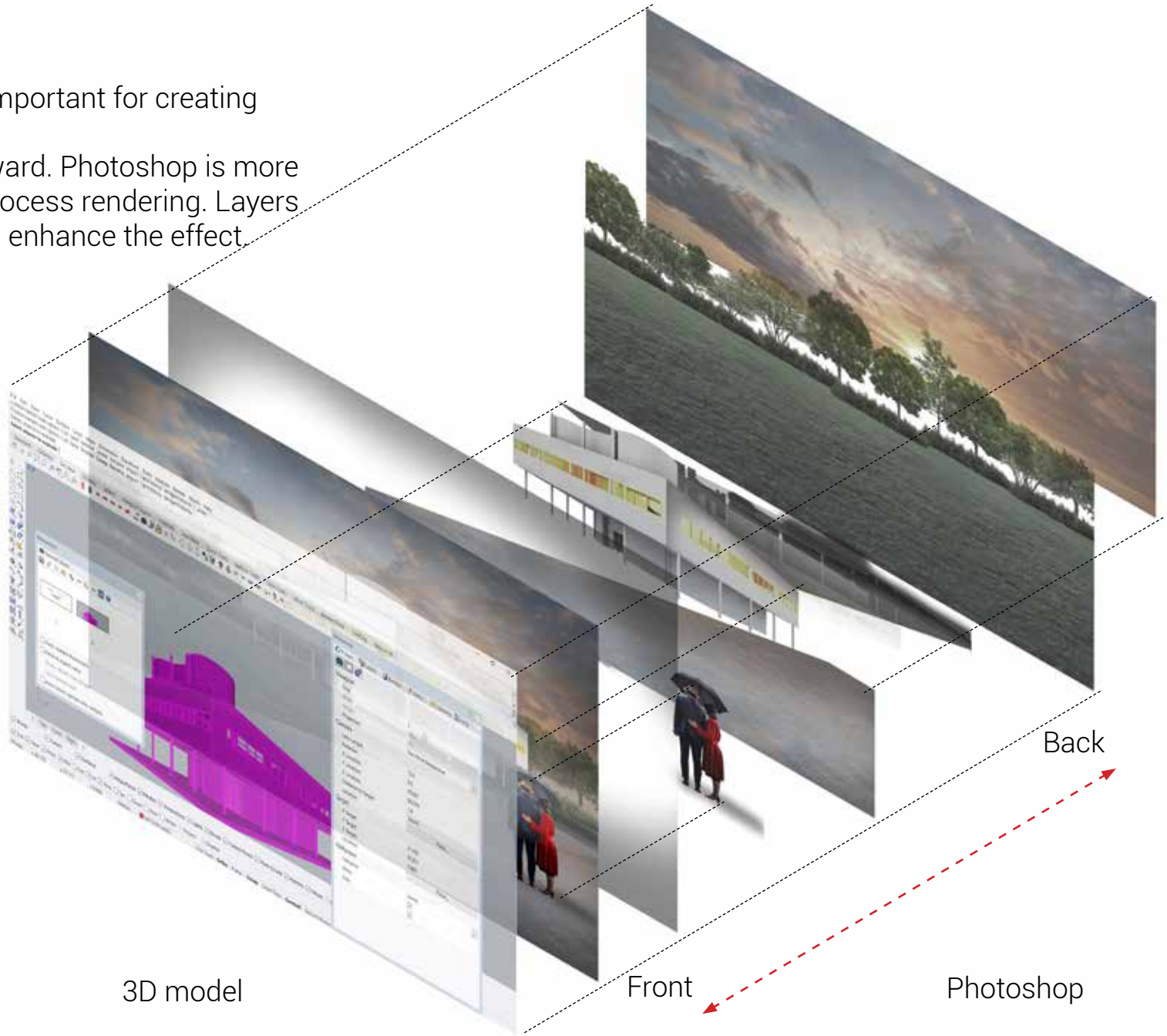
Intro

Photoshop and Illustrator are important for creating illustrations.
Illustrator is pretty straight forward. Photoshop is more complex and is used to post-process rendering. Layers are important in this process to enhance the effect.

Layer categories:

- Shades
- People
- Building
- Ground
- Vegetation
- Sky





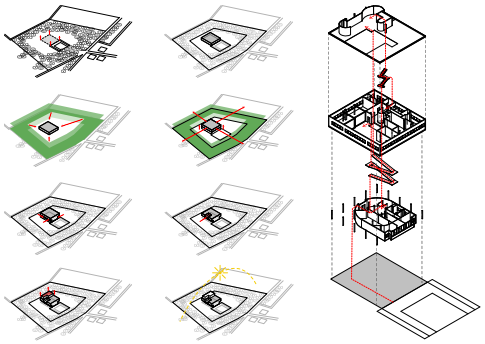
Rhino 3D model

Export DWG

Render

Illustrator

Diagram



Illustrator+Photoshop

Section

Elevation

Photoshop

Interior render

Plan

Exterior render

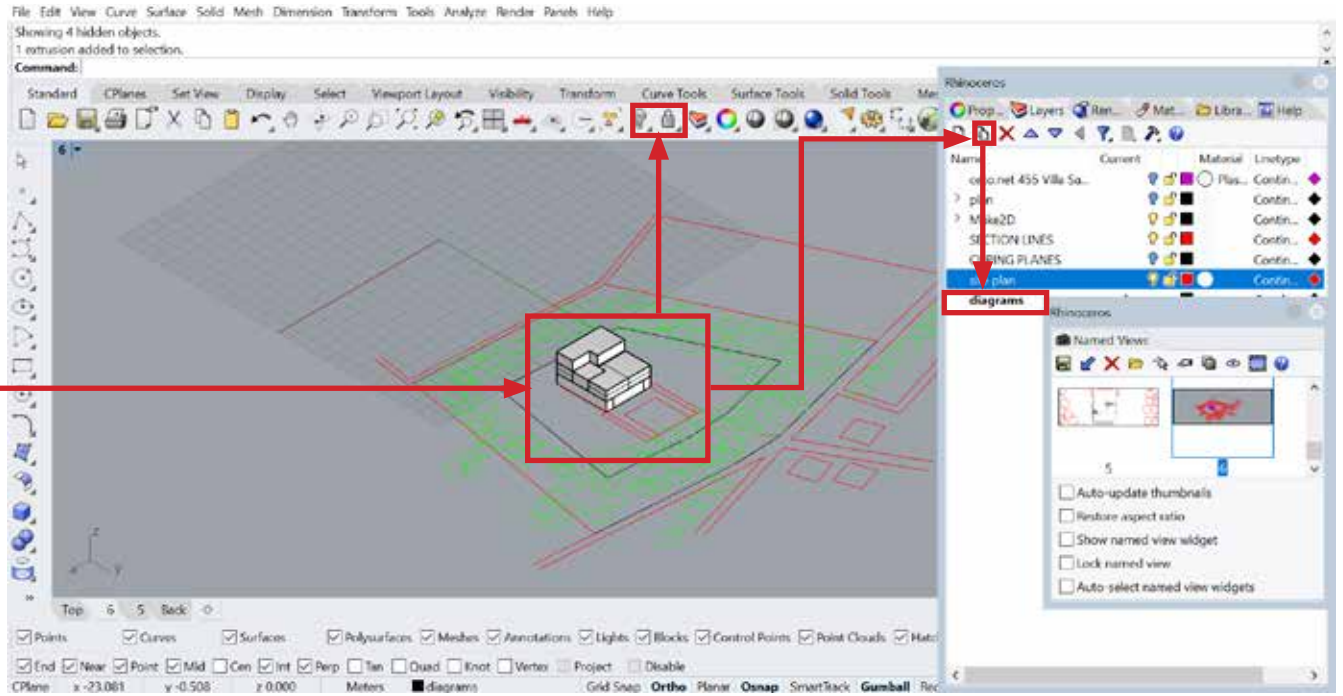
Diagrams

Diagrams will help you present your design ideas in a simple and concise manner. In this chapter, you will learn to use the diagrams to show form. You will also learn how to make axo-diagrams of your finished model. Here are the steps you need to follow:

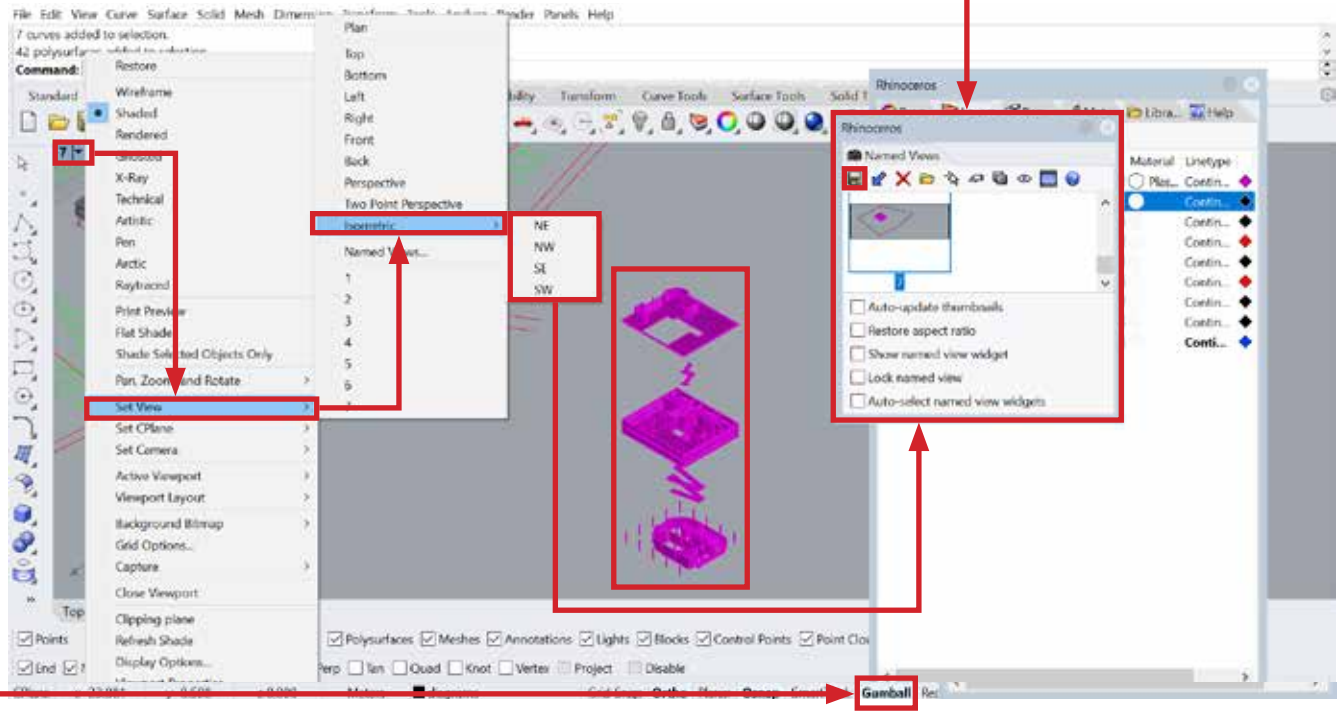
1. Prepare Rhino models for export
2. Export rhino 2D drawings to illustrator
3. Compost diagrams in illustrator

1. Create block models showing form transformation and place them under “sublayers”. The idea of diagrams is to show gradual transformation in steps so it is ideal to have the option to turn off layers as you progress to a different steps.

You can also use the lock and hide options if you don't want to create too many layers

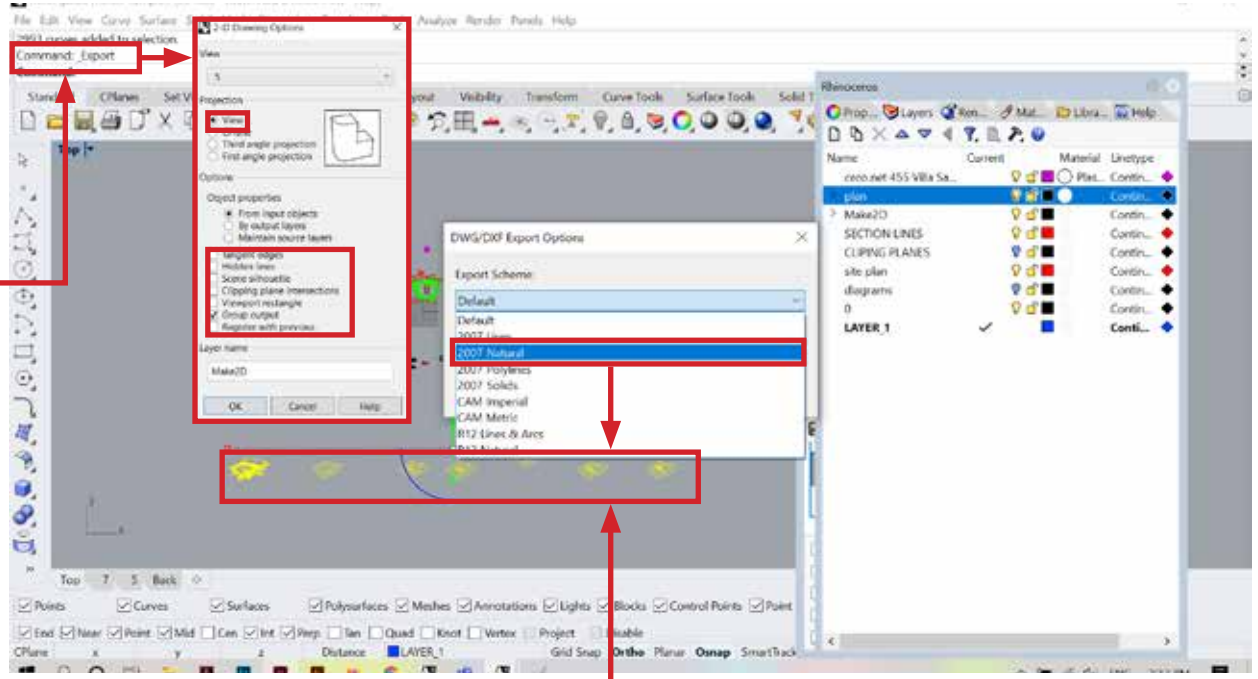


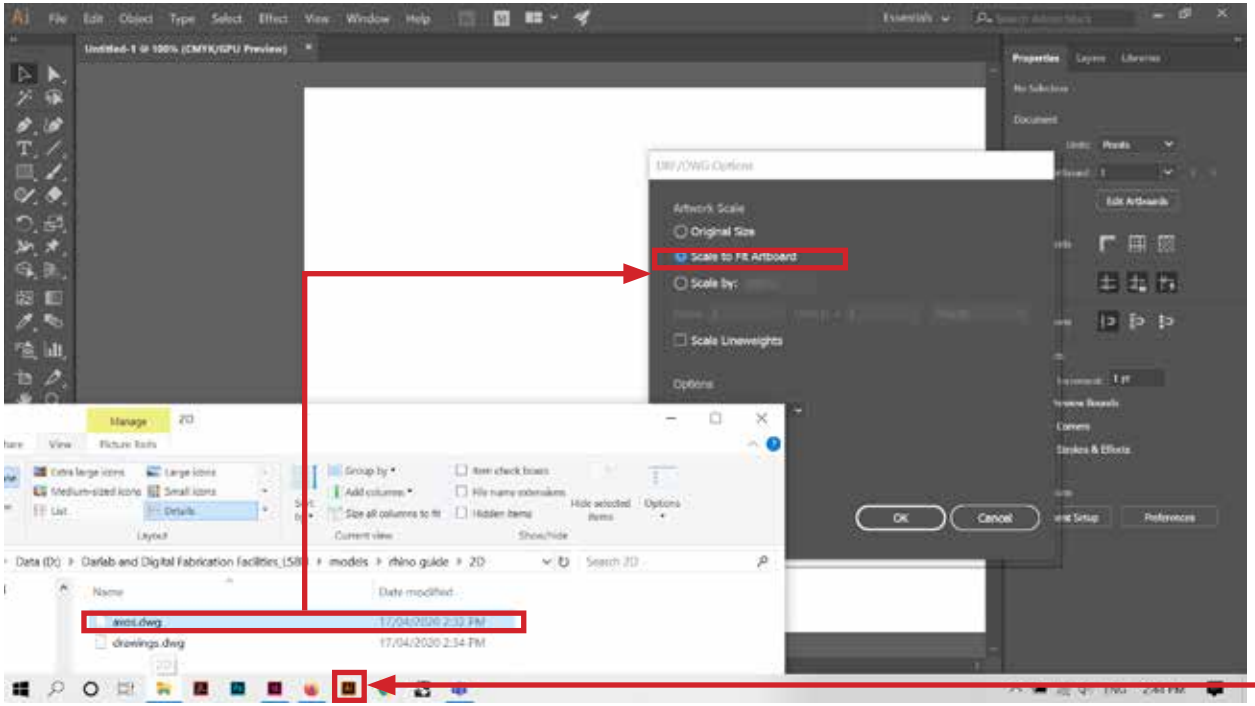
2. Use isometric view options in the drop down menu, this is a must. You can save the view in named views panel. To adjust the view, hold down "shift" and use left mouse button to pan around the view. If you don't hold down "shift", you will enter the rotating mode and lose the isometric view you established.



3. Use "Gumball" to move your existing model to prepare a model to pull it apart. It is recommended to make a copy of your original model before exploding it into a axonometric model.

4. Use the command “make2D” to convert selected 3D model into 2D vector lines drawing. Make sure you are exporting the current view. You will have the options to include hidden lines if needed.

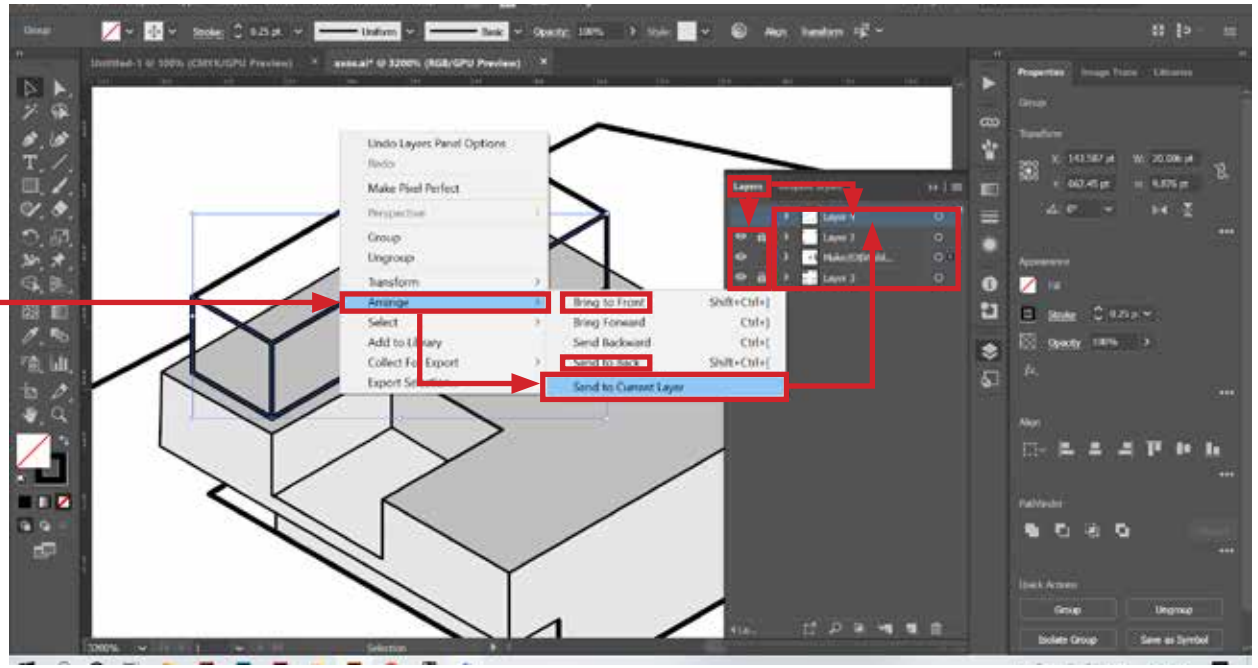


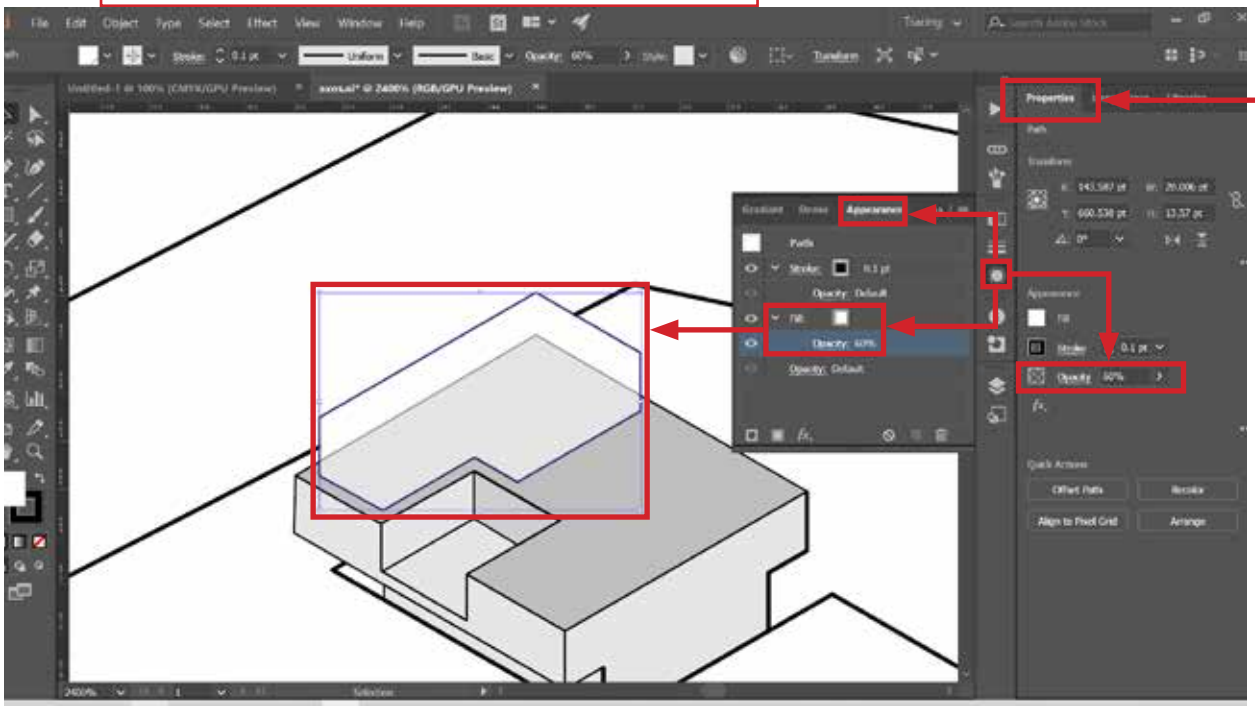


5. Use command “exportSelected” to for the selected 2D graphics. Make sure you are exporting it to DWG/DXF. It is recommended to choose 2007Nautral especially there is a lot of curved shapes.

6. Now you can open up Illustrator to import your 2D graphics. You can create a new file with the size and orientation of your desire. Then you can drag your DWG file into the file. And you will have the option to “Scale to Artboard”. This is helpful especially for diagrams that doesn't require scales.

7. Once you have your graphics in illustrator, it is important to organise them. You will have the options to use layers as well as moving objects back and forth. You will be able to see all the objects in the drop-down menu inside the layer and move them back and forth. To change an object's layer, select the layer of destination, and right click on the selected object and click "Send it to Current Layer". You should also utilise the hide and lock features for layers to improve your work-flow.

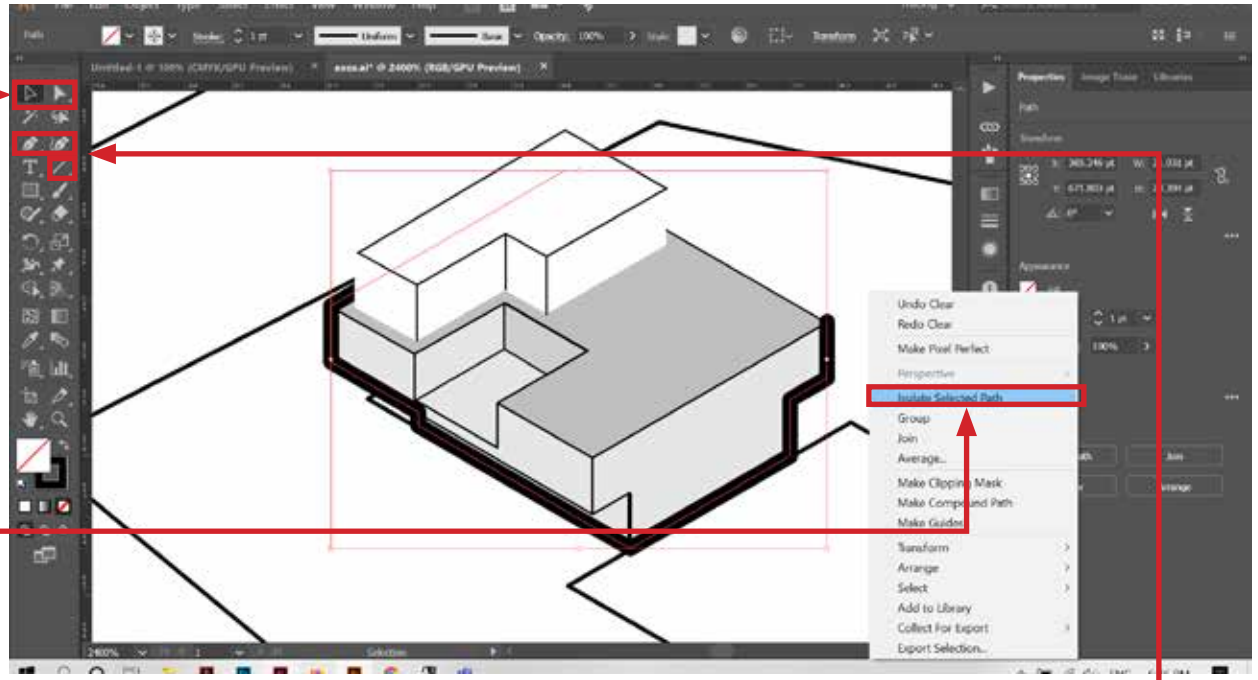


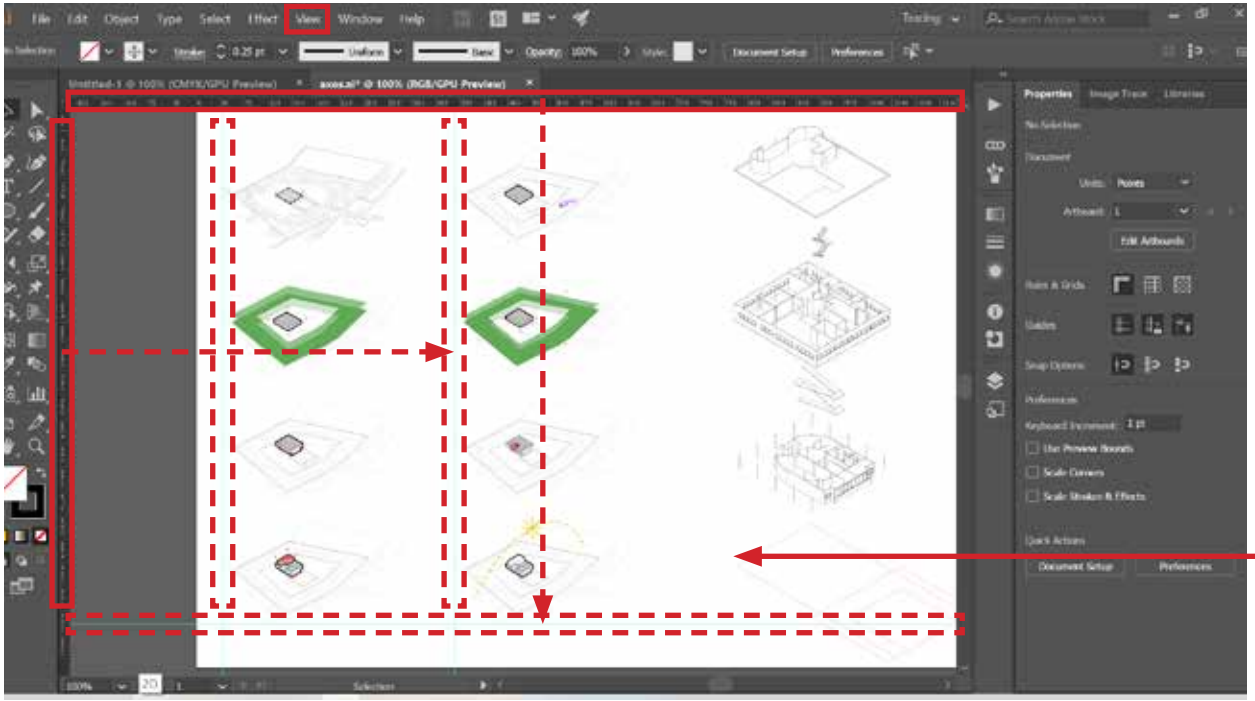


8. Transparency is a crucial elements of the illustrator's graphics. It helps you build up complexity and colour variation in a simple straight forward manner. You can change the opacity of the object directly in the properties panel. However, this will change the opacity of the entire object. If you want to have advanced option, go to the Appearance panel and change the opacity of the fill so you can have a transparent object with a non-transparent outline. This will help you emphasis elements in your drawings.

9. It is important to use the correct selection and drawing tools to get the result you want. The left tool selection allows you to select the whole object and the right selection tool let you edit the control points in an object.

10. You can have the option to edit objects in isolation. This will prevent interference from other objects in the workspace.





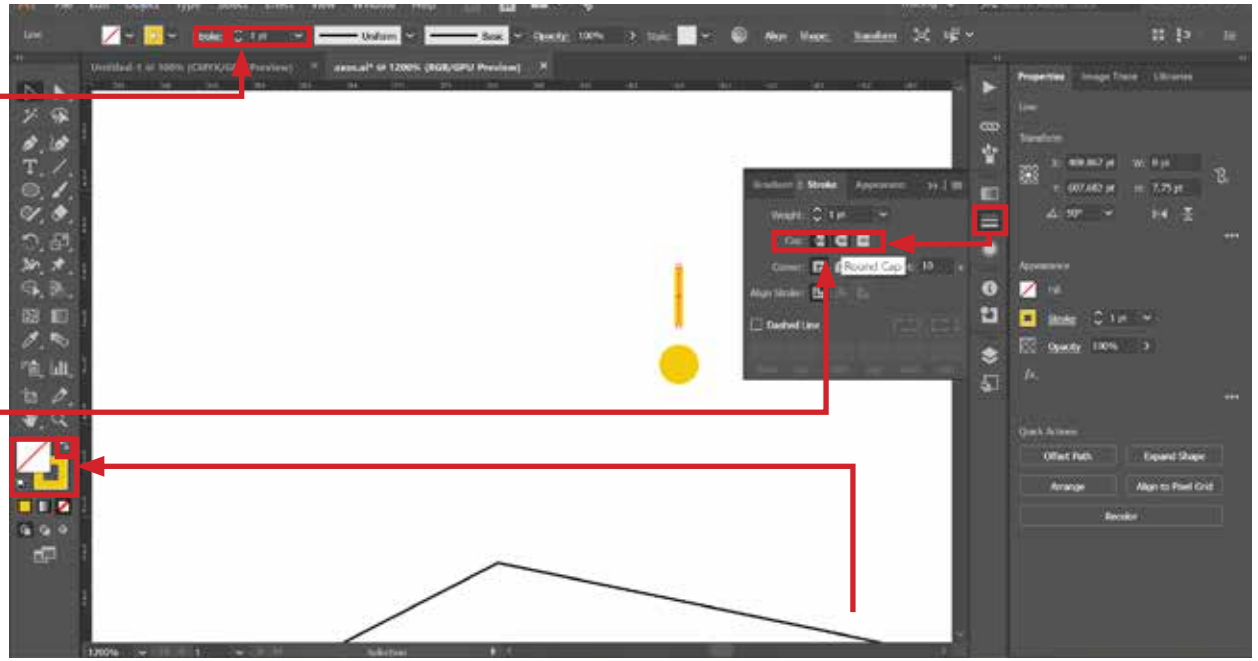
11. The left pen tool allows you to draw straight lines and the right pen tool lets you draw curves. It is worth paying attention to the mouse cursor while using the pen tool. And sometimes it is worth creating a new layer while locking the current layer while tracing over objects. You can also use the line tool to draw simple straight lines.

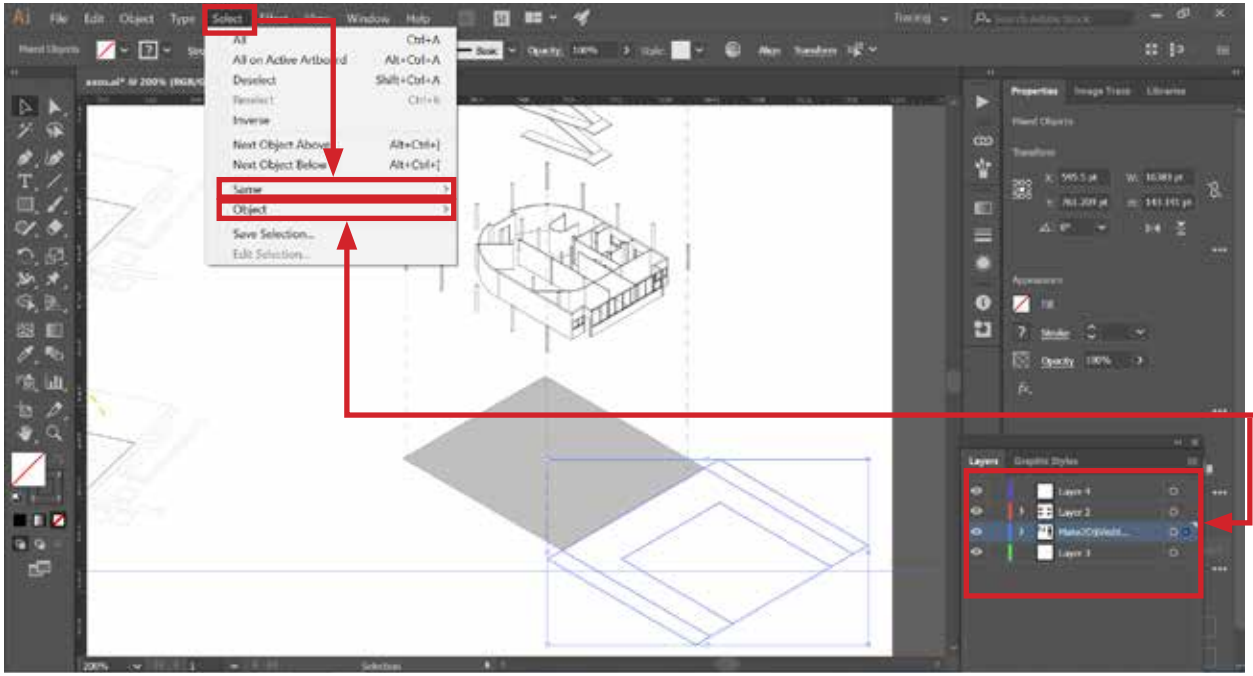
12. You can activate rulers in the workspace, which will help you arrange you graphics to produce clean and neat presentations. You can simply drag from the side panels to activate guidelines on the workspace.

13. You should utilise the line weight and line type for your diagrams. Under the stroke drop-down option, you can use dotted line and putting arrows into your graphics.

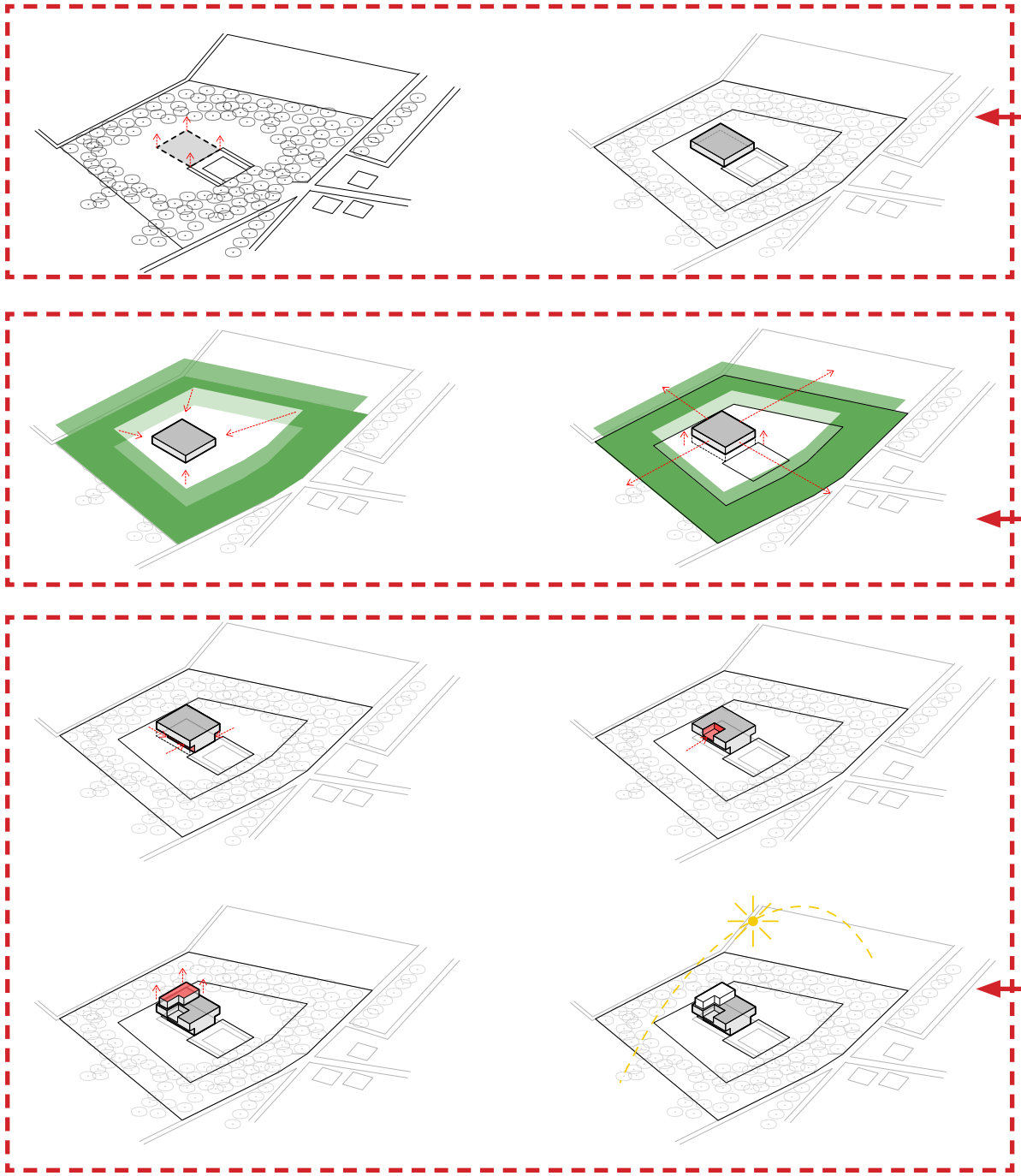
14. You can have refined control for your line graphics. For example, changing the end condition of a curve. This will enhance th equality of your diagrams.

15. Use the quick switch to change between colours or flipping colours of infill and border of a selected object.





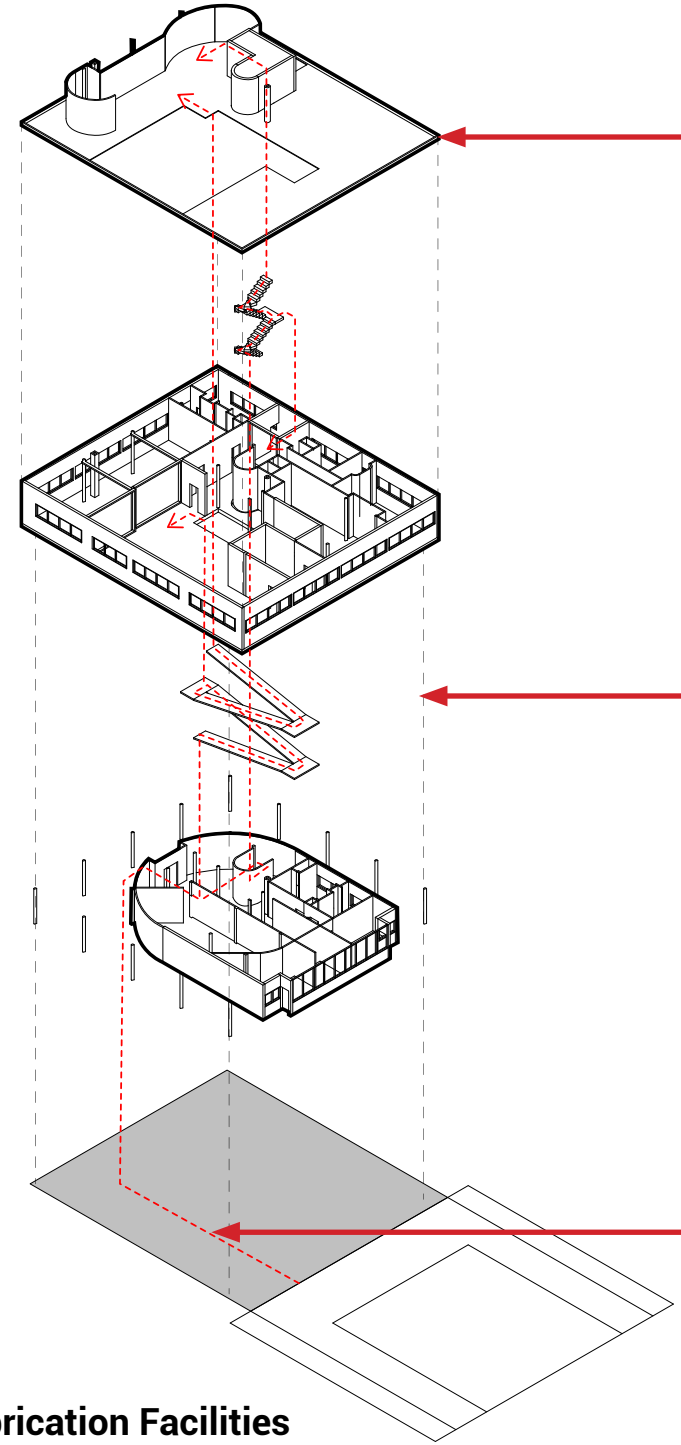
16. Under "select menu", you will be able to find the refined selection tools, which will significantly enhance your productivity. It should be used in conjunction with the locking and hiding mechanism in the layer options. For example, you can lock the unused layers and use select all options to select everything on the unlocked layer. In addition, "same" and "object" allows you to choose specific objects. For examples lines with the same colour.



17. Having gradual changes in each steps of the diagrams to show your design ideas. Make sure that each step has some resemblance to the previous diagram. You can also play around with transparency setting to fade out the objects from the previous step to make sure the diagram get-ting too clustered.

18. It is important to show some logics in the diagrams. Utilise arrows to help you convey the message. For examples, the diagrams first show the surrounding trees providing priva-cy for the plot. In the second diagram, the arrow shows that by lifting up the living space, The house will be able to gain better views over the tree line.

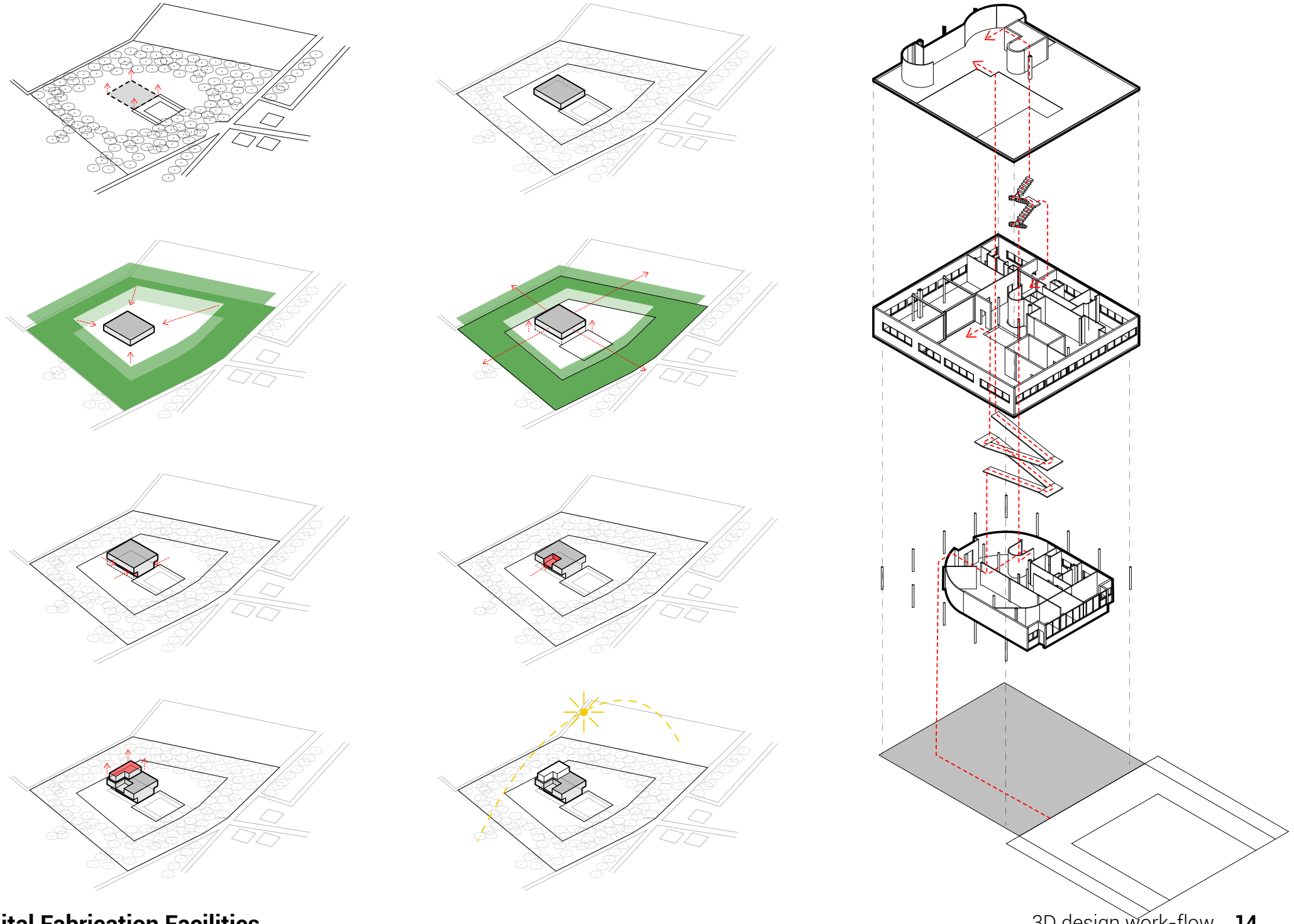
19. Use the arrows and colours to show the evolving form each steps of the way. It is also helpful to use icons in the diagrams. For example, the sun icon shows that the design will help getting access to sunlight.



20. Use heavier line weight to emphasise the border of the drawing to enhance your graphic.

21. Apply dotted line to show how different part of the building fit together.

22. Use dotted lines to highlight the circulation of the building.



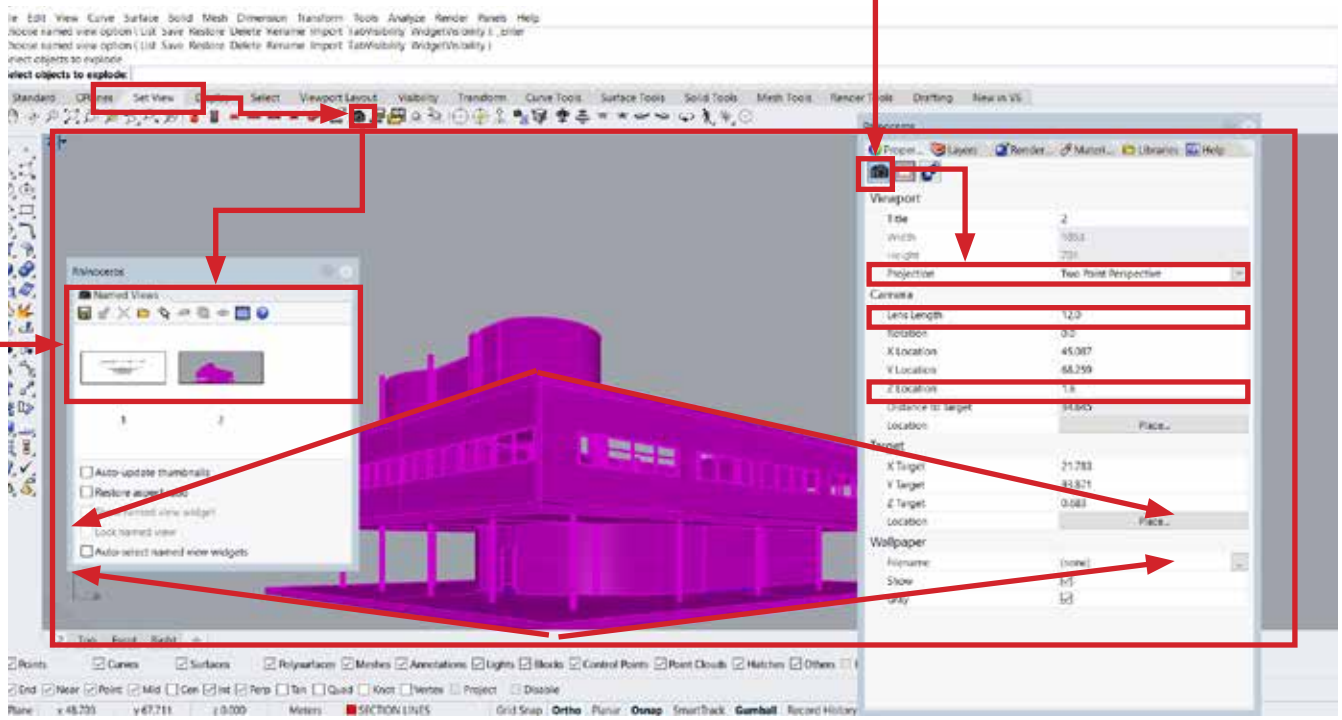
Renders

Renders are effective for visualizing your design scheme. This section will show you how to do exterior and interior presentation with default rhino render, Photoshop and Illustrator.

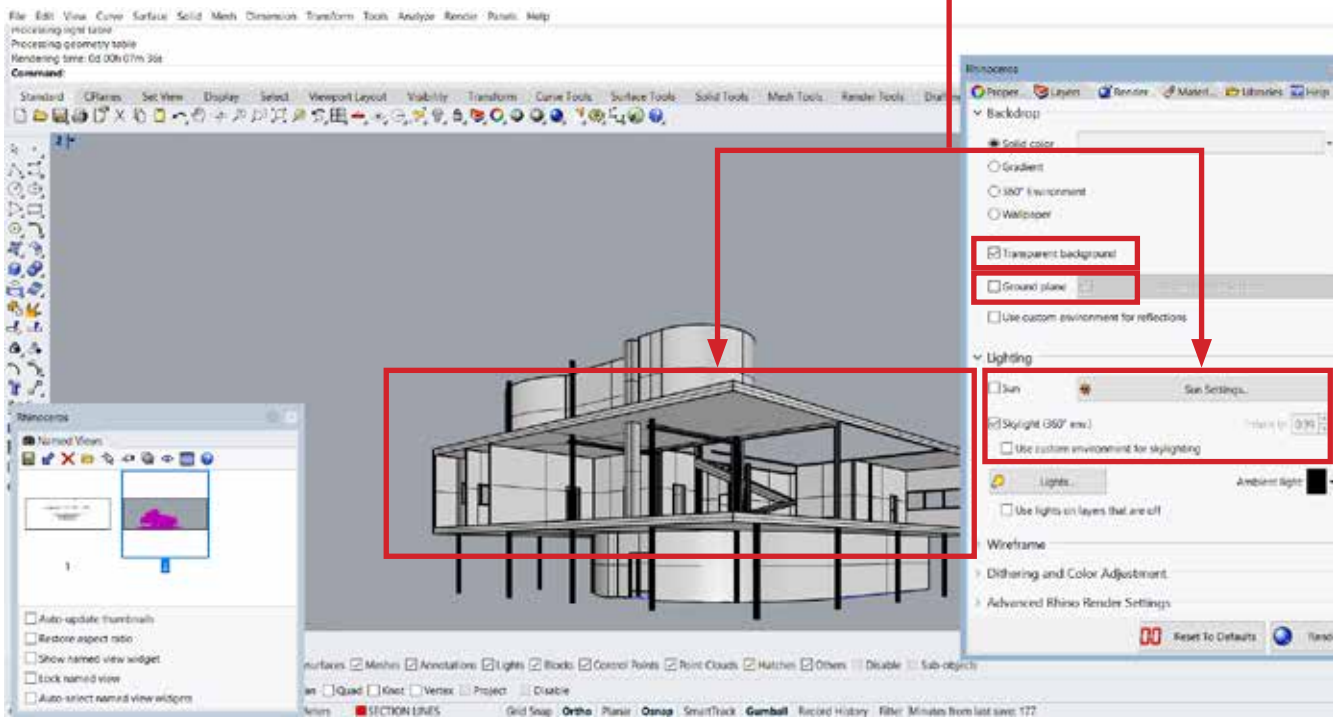
1. Prepare Rhino models for render.
2. Set up Photoshop in conjunction with illustrator.
3. Compost renders in Photoshop.

1. Make sure you set up a good angle for your model. You can adjust the settings in the view property. Use “two point perspective”, adjust the camera height to human eye level and reduce the camera length.

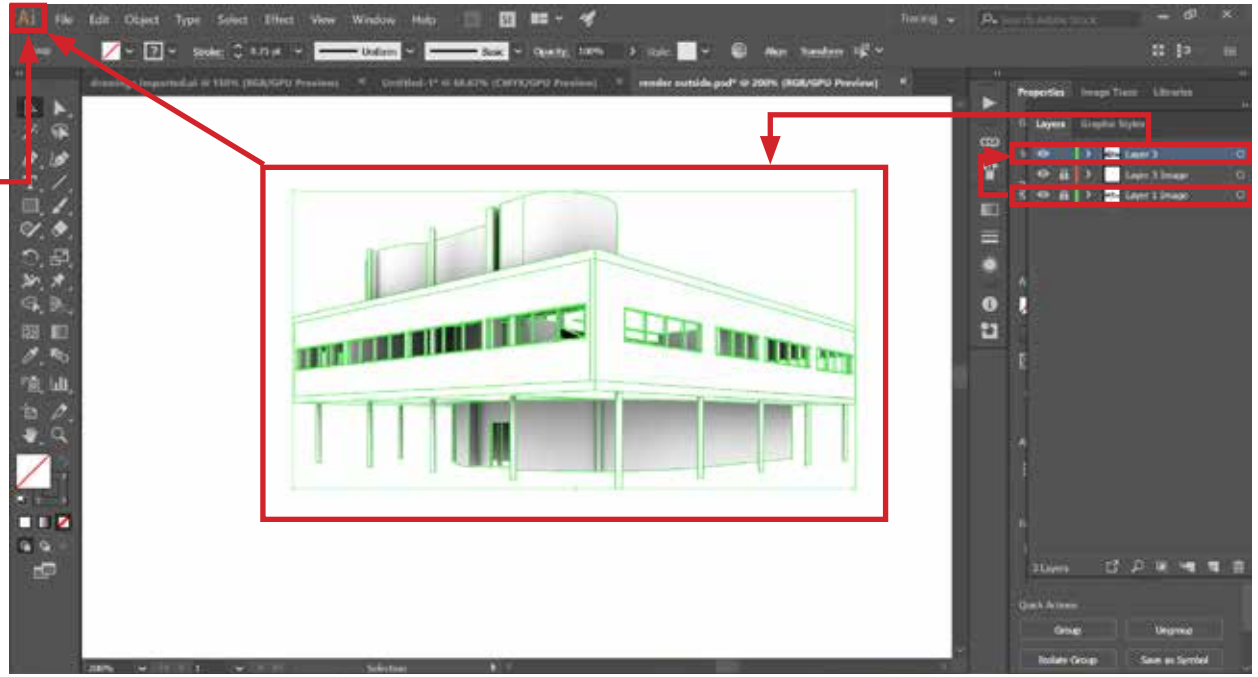
2. Once you have finalised the angle, make sure you save it into the “Named views”.

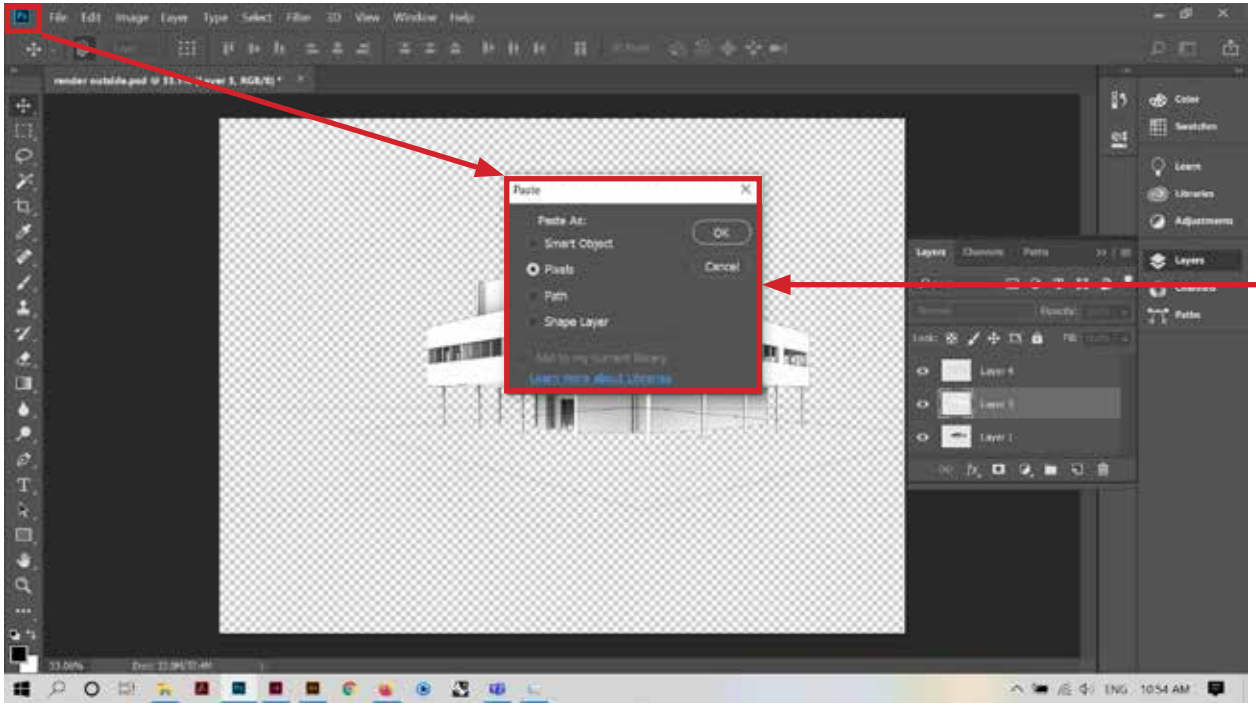


3. Play around with the render environment settings for lighting. Be sure to use the transparent back-ground. Disable the ground plane when needed. Turn off some layers (ie turn off layer with front facade) and render model facade separately for better editing.



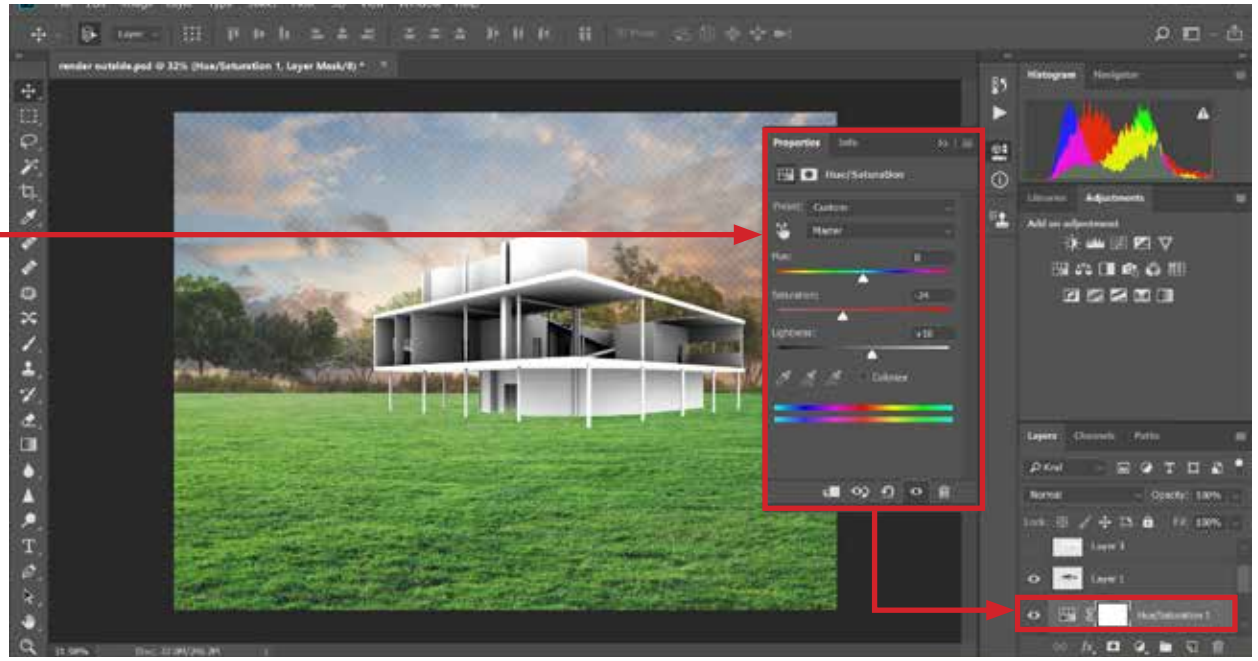
4. Use Illustrator to edit 2D graphics exported from rhino and prepare it to overlay on the rendering. Make sure to use layers to separate the lines from the image.

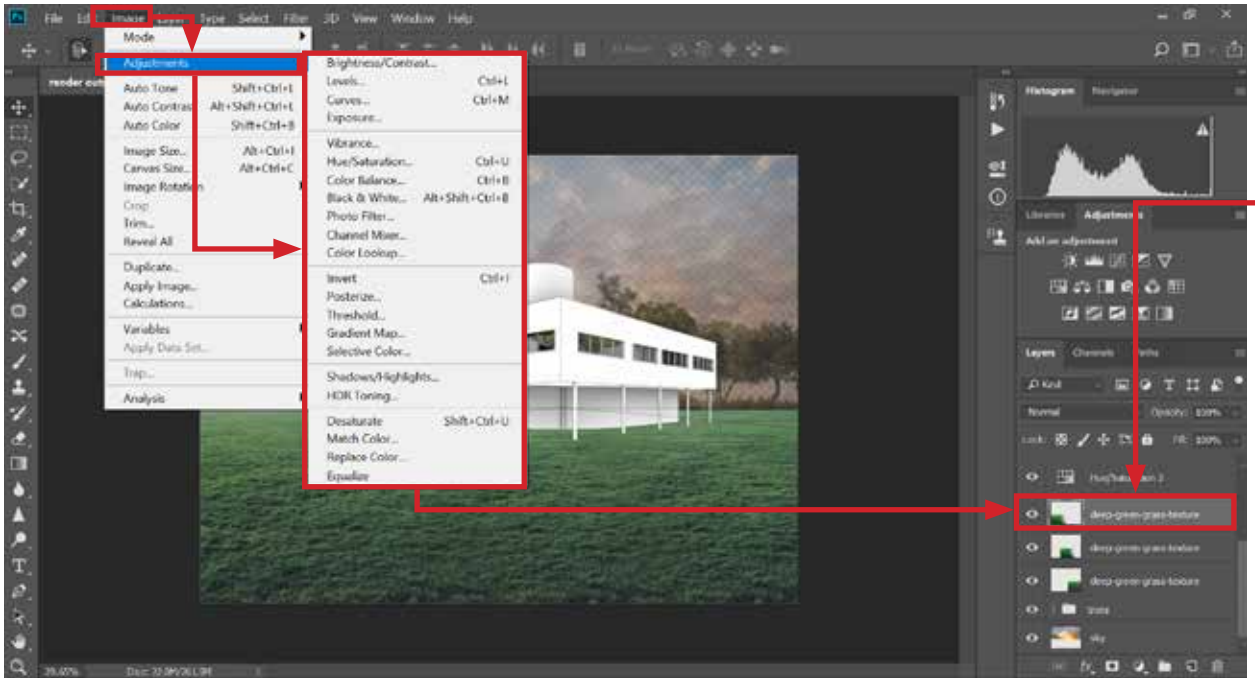




5. You can directly copy and paste objects between Photoshop and Illustrator. Make sure you are importing it as pixels to prevent complications.

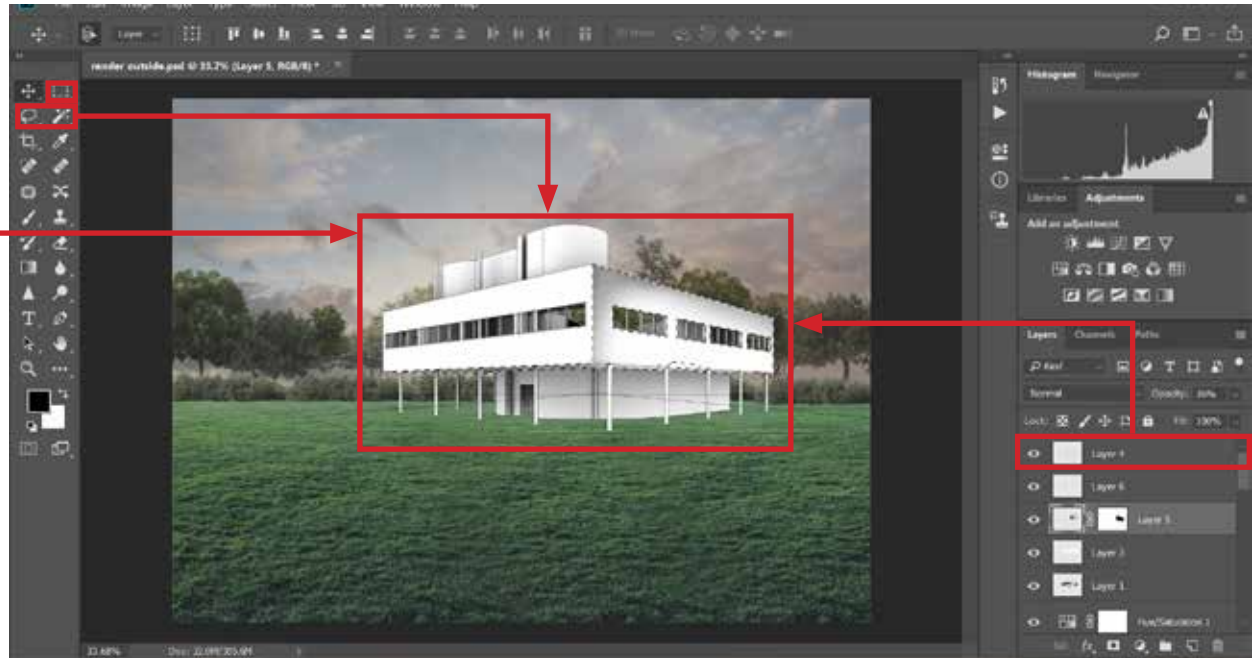
6. Get some PNG images from the Internet to insert into the render. Use adjustment layer to mass apply to different image layers. Adjustment layer can be reversed because itself is also shown as a layer. Simply hide or delete to reverse changes.

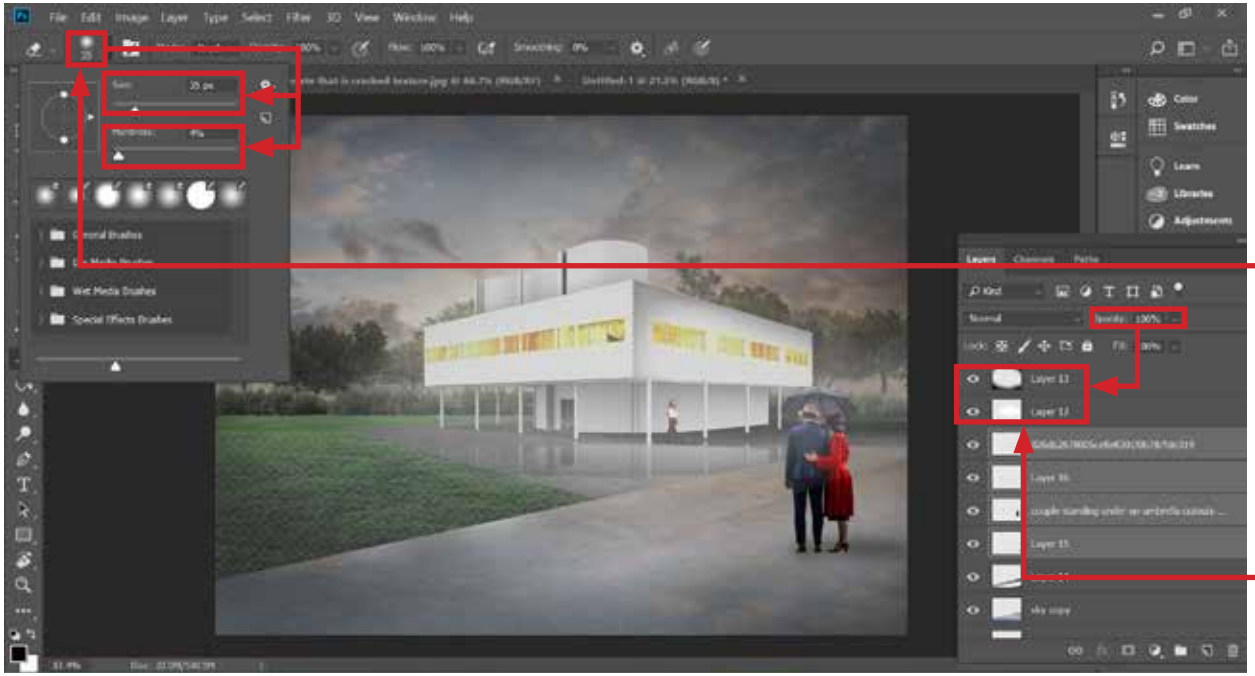




7. You also have the option to adjust layers directly from the image panel. However, the editing is not reversible with this method.

8. Utilise different selection tools to help you select parts for editing. Use it in conjunction with the line drawing layer from Illustrator. For example, You can select the line drawing layer and use it in conjunction with the "Magic wand" to select a part quickly. But before editing, make sure you select the correct layer.

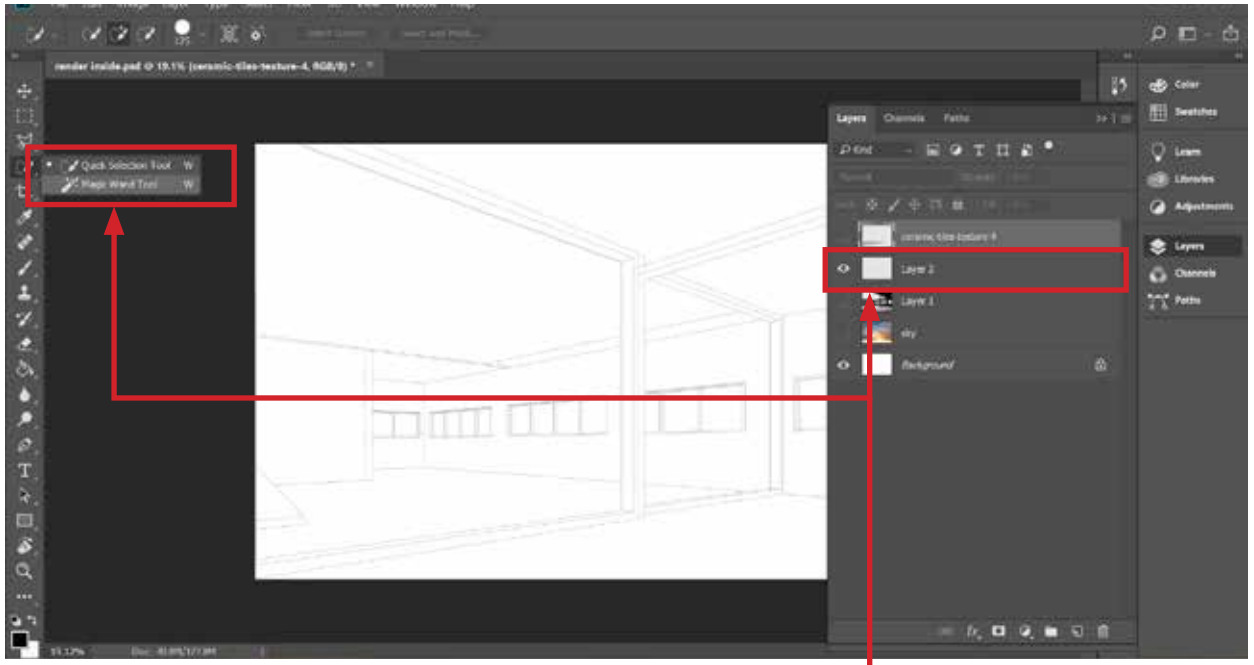


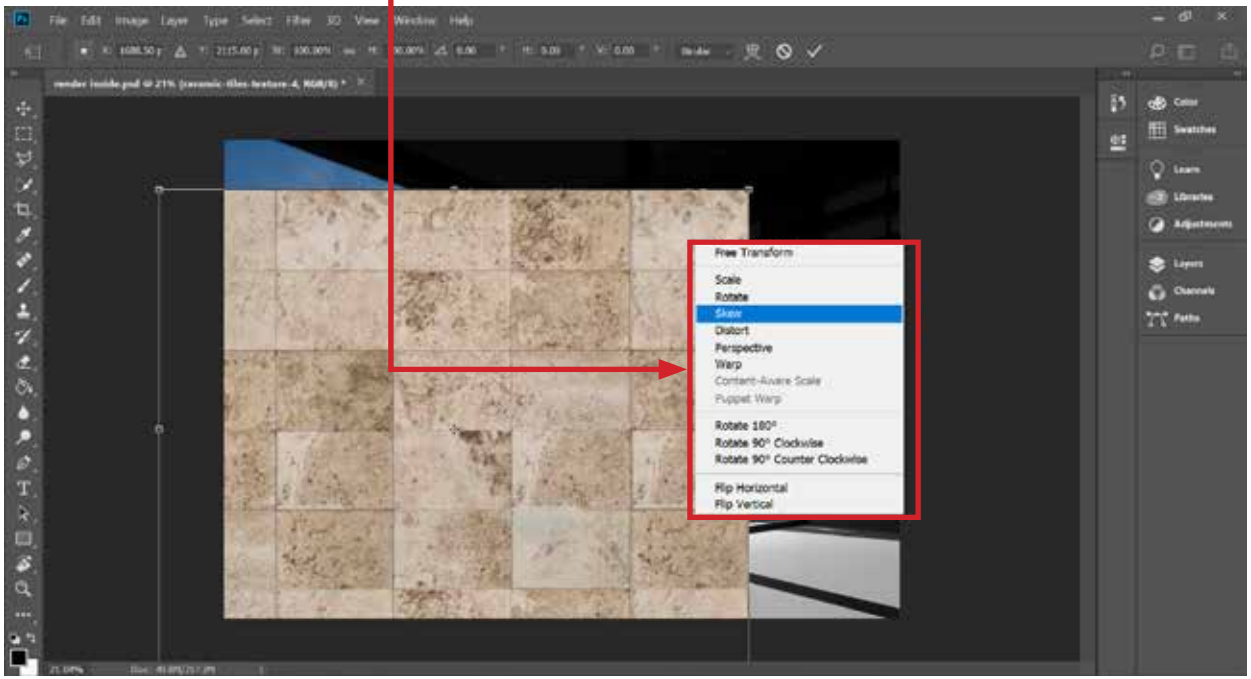


9. Your brush can be adjusted for both painting and erasing. Adjust its size and hardness to get the optimal results. And basically lover hardness can be used to bur and blend images, which has crucial usefulness.

10. Opacity is a highly important tool. You can thin out solid colours to apply to the render and create lights and shadows effects..

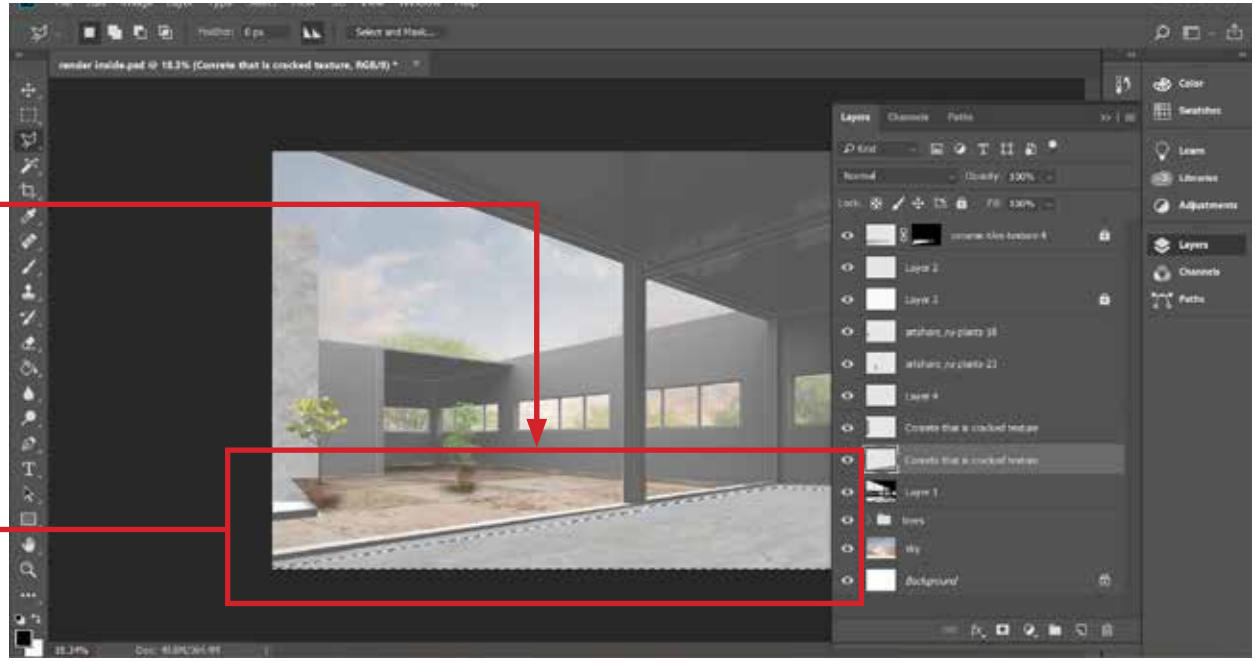
11. Interior rendering also has a similar work flow. And you also have the option to apply texture. First, you will need to adjust the image to fit the into the perspective. Press “Control+ T” to activate editing and right click. Use “skew” and “distort” for best results.

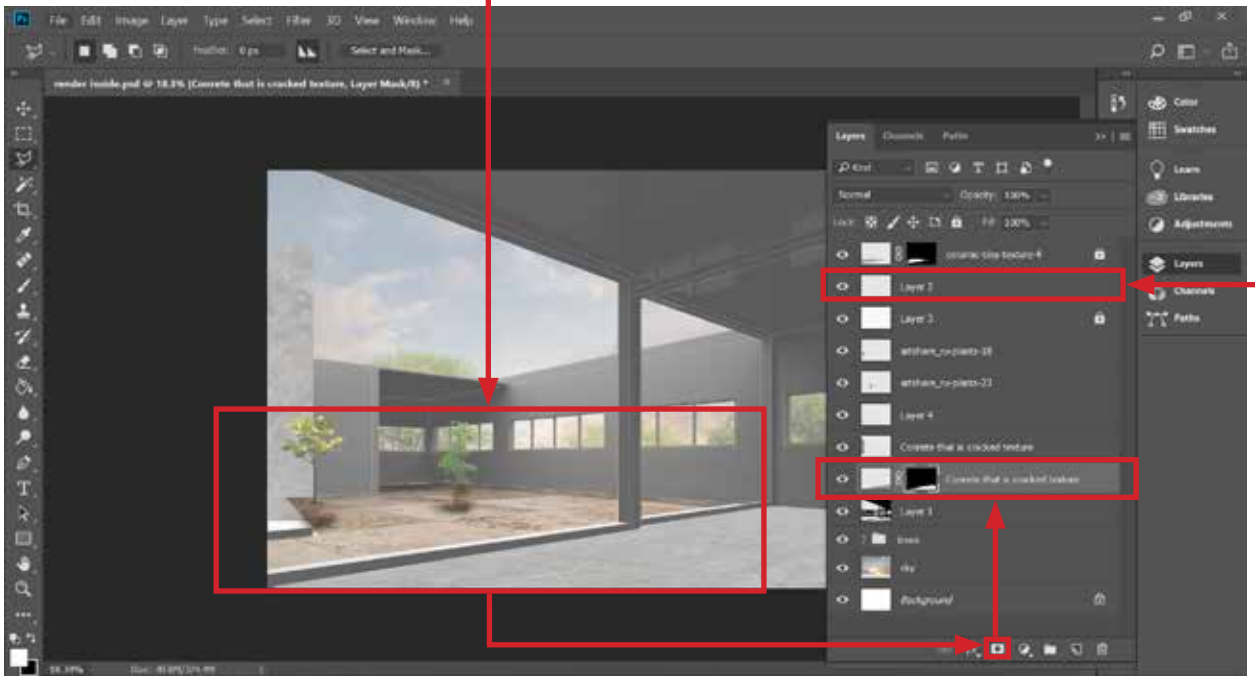




12. Utilises the Selection and the line layer to help you speed up the work flow.

13. Use the selection tool smartly in conjunction with layer mask. First, select the region that you want to keep, then click the layer mask tool to activate change. The change can be reversed if necessary



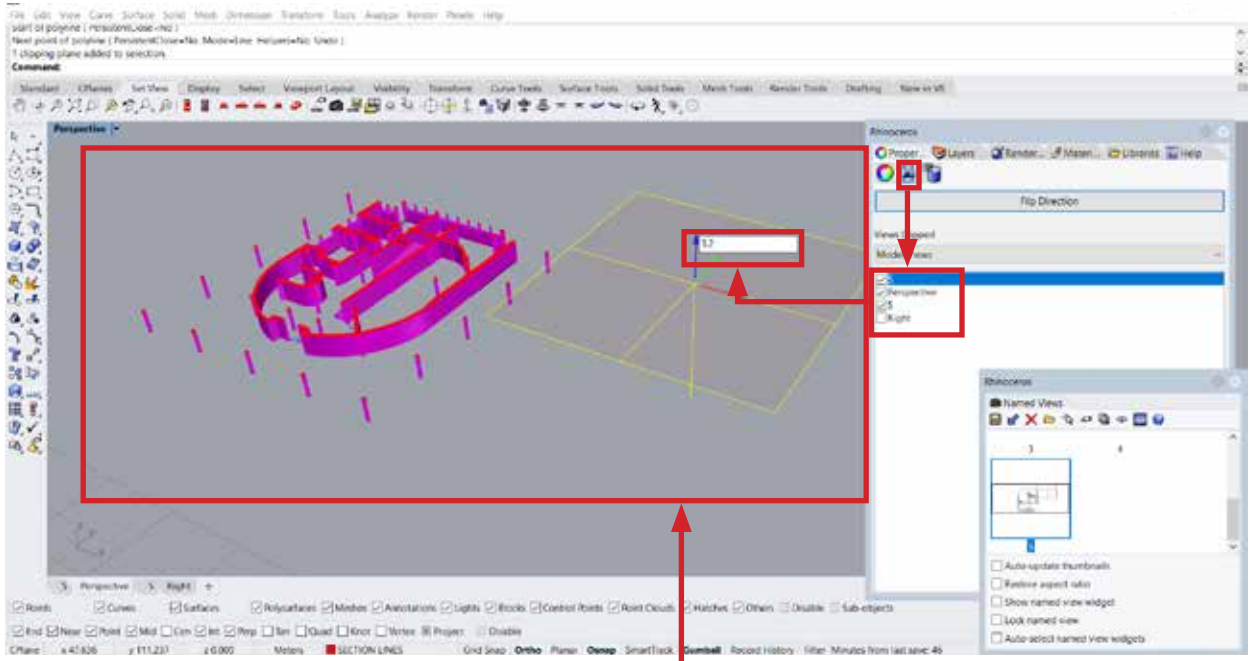


14. In this example, will can also use the line drawings(dwg) as a feature to enhance the render. Drag and drop dwg file into Photoshop and open them as pixels. Then simply invert its colour.

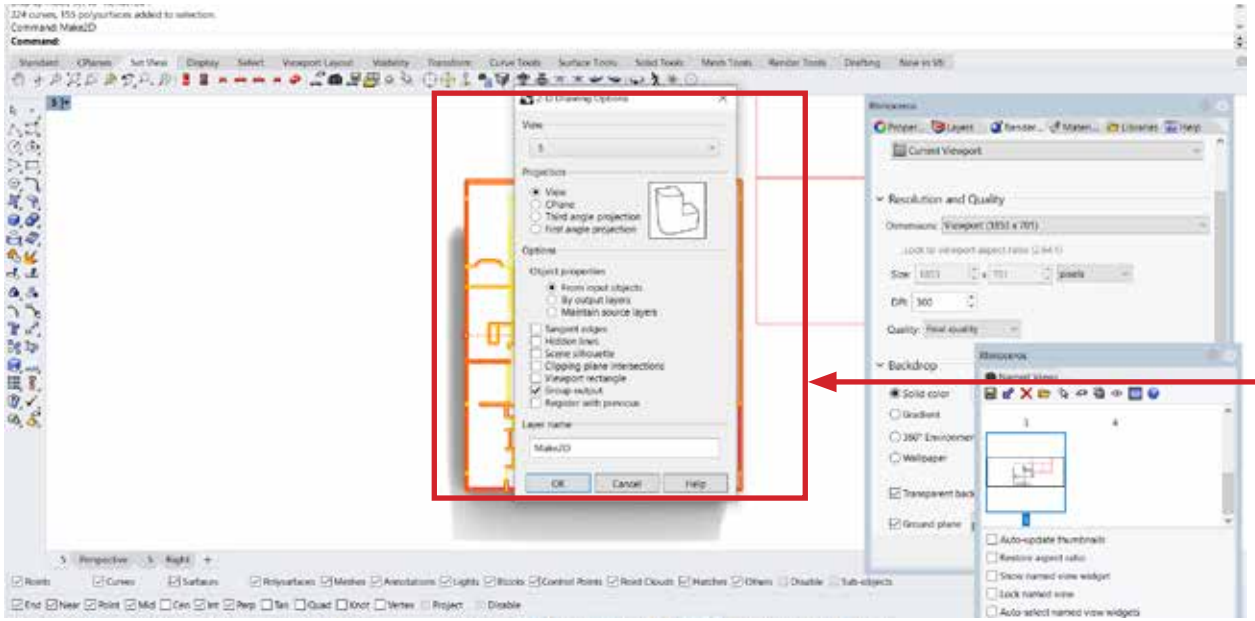
Plans

Plans are crucial for your design scheme. This section will show you how to do improve your plans for presentation with default rhino render, Photoshop and Illustrator.

1. Prepare Rhino models for rendering plans.
2. Compost plans in Photoshop.

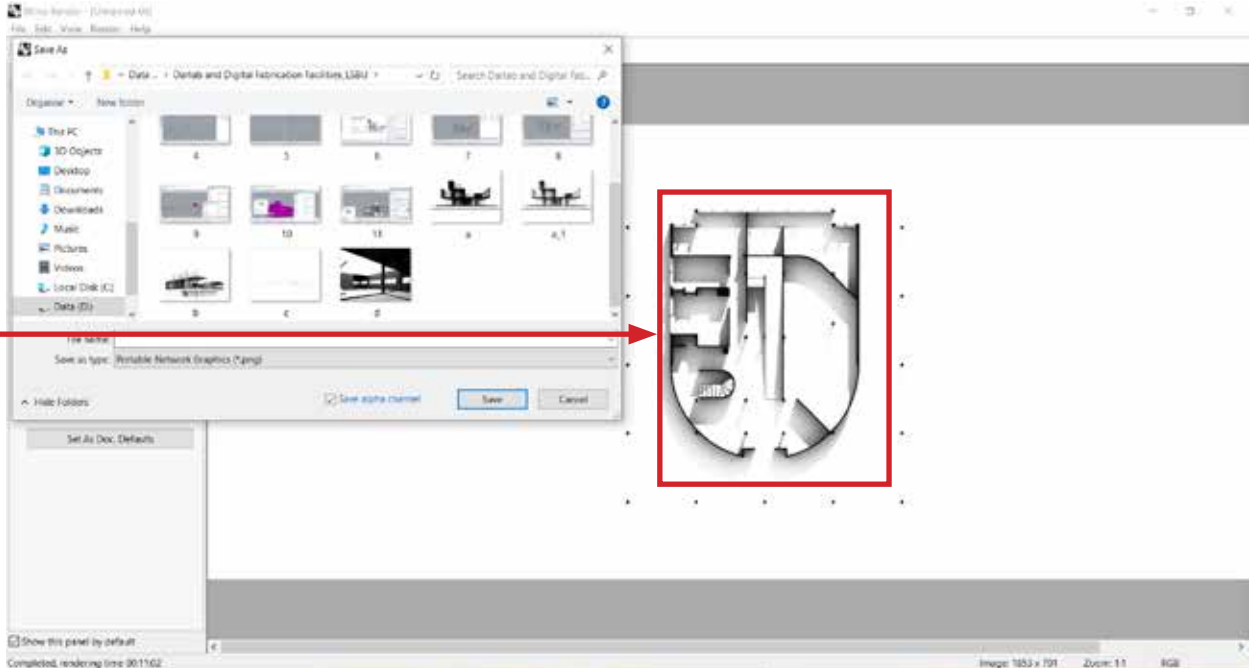


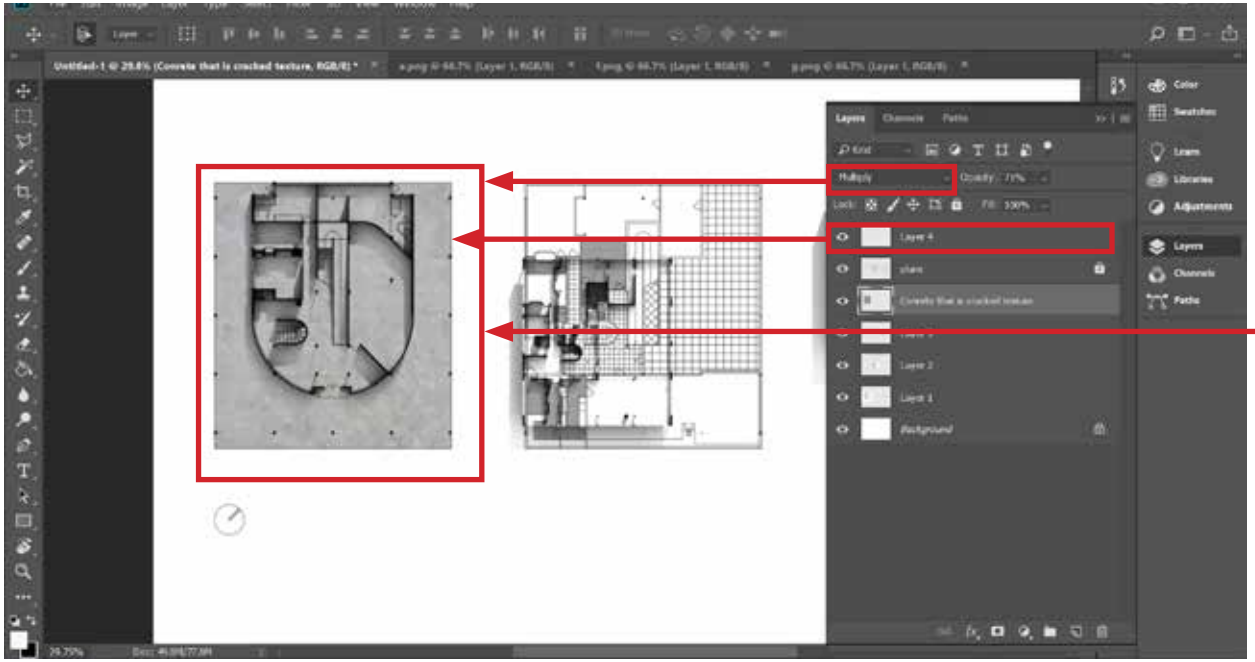
1. Use clipping planes to make plans for rendering Make sure they are showing the crop in the right viewing windows. Make sure the hight of the clipping plane make sense. In convention, plan is a section that is 1.3 metres fro the floor level.



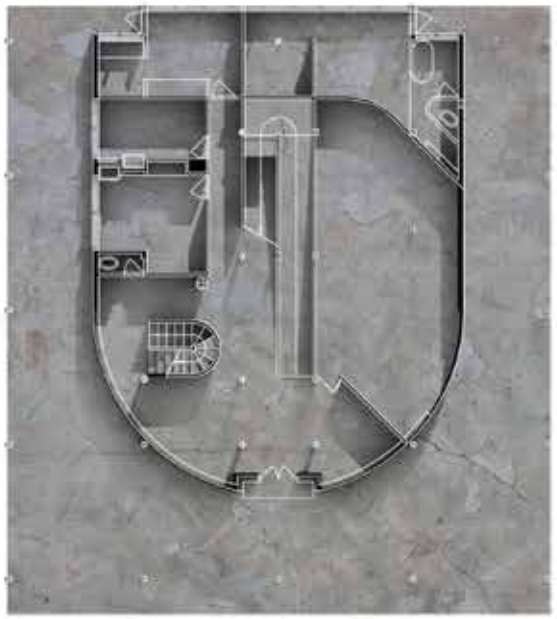
2. Make sure you have the plans in vector line drawings ready as well.

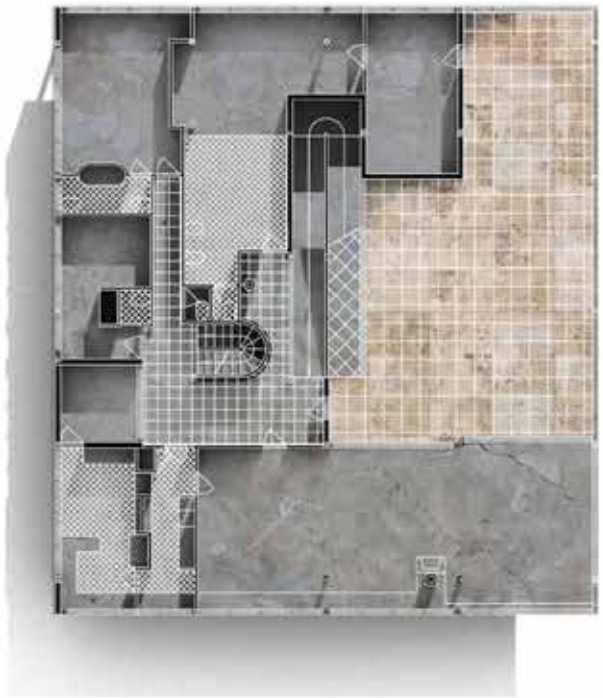
3. Plans are relatively straight forward to make. But be sure that the view you have picked has some shadows, which will improve your presentation

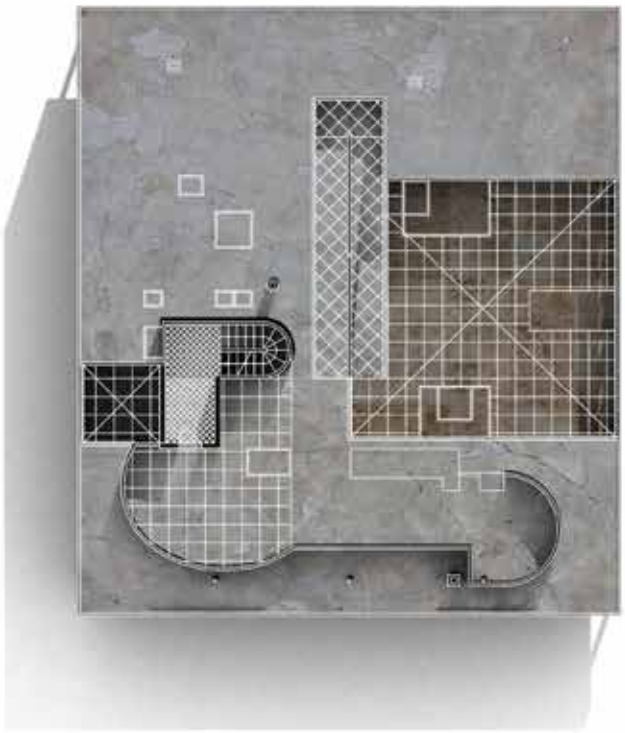




4. Overlay some textures and line drawings to the render. Play around with layer-over effects as well as try invert the colour of the line drawings for enhancement.



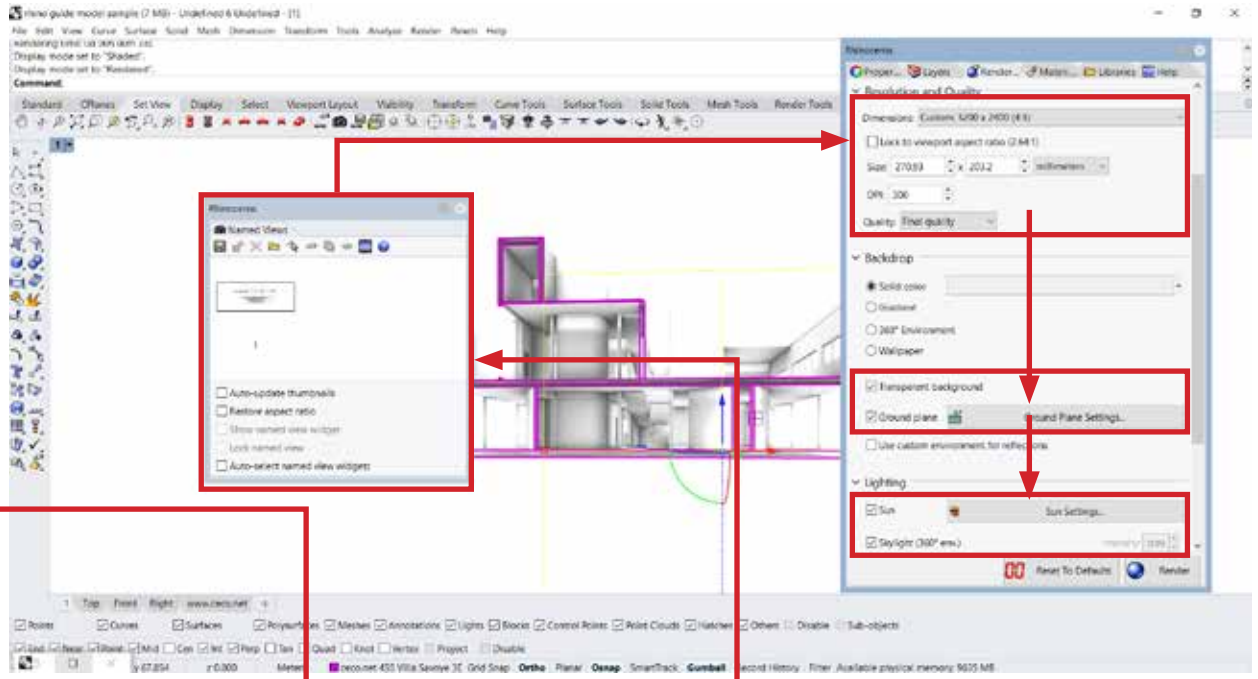


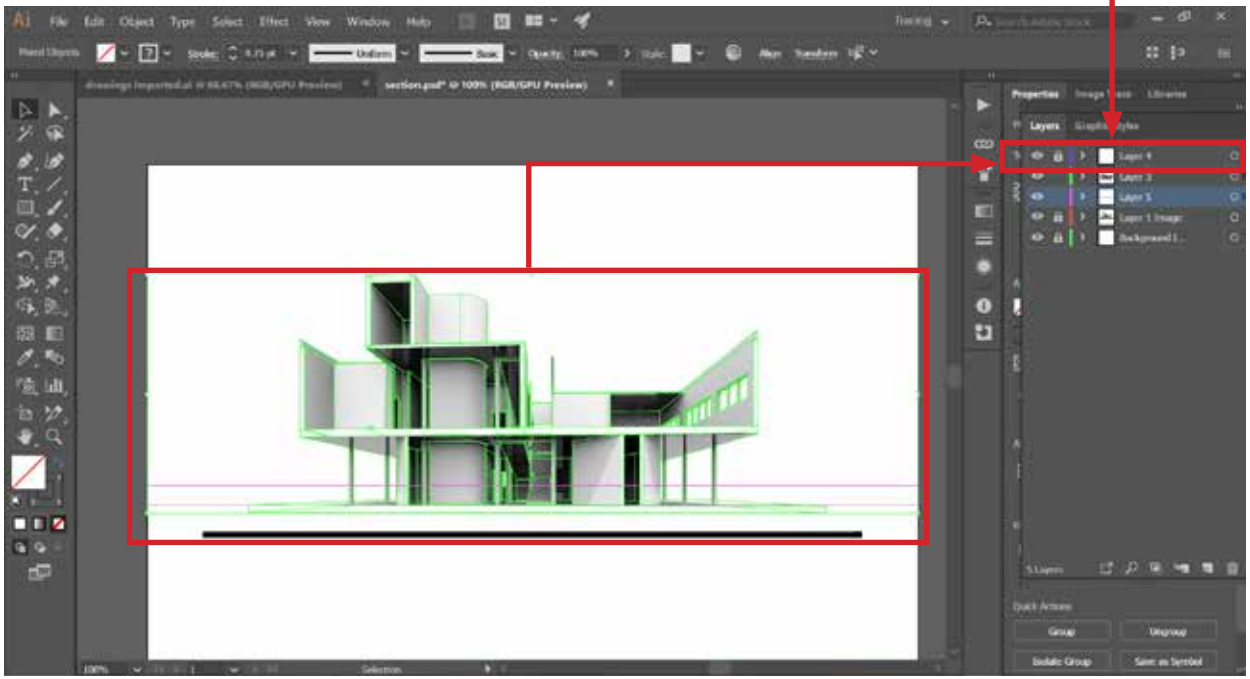


Section

Section is also important and in this example, you will use the techniques from both rendering and plans

1. Follow the steps shown previously to make 2D lines to overlay on your Photoshop file. In addition, make sure to have a layer dedicated to show the section cut.





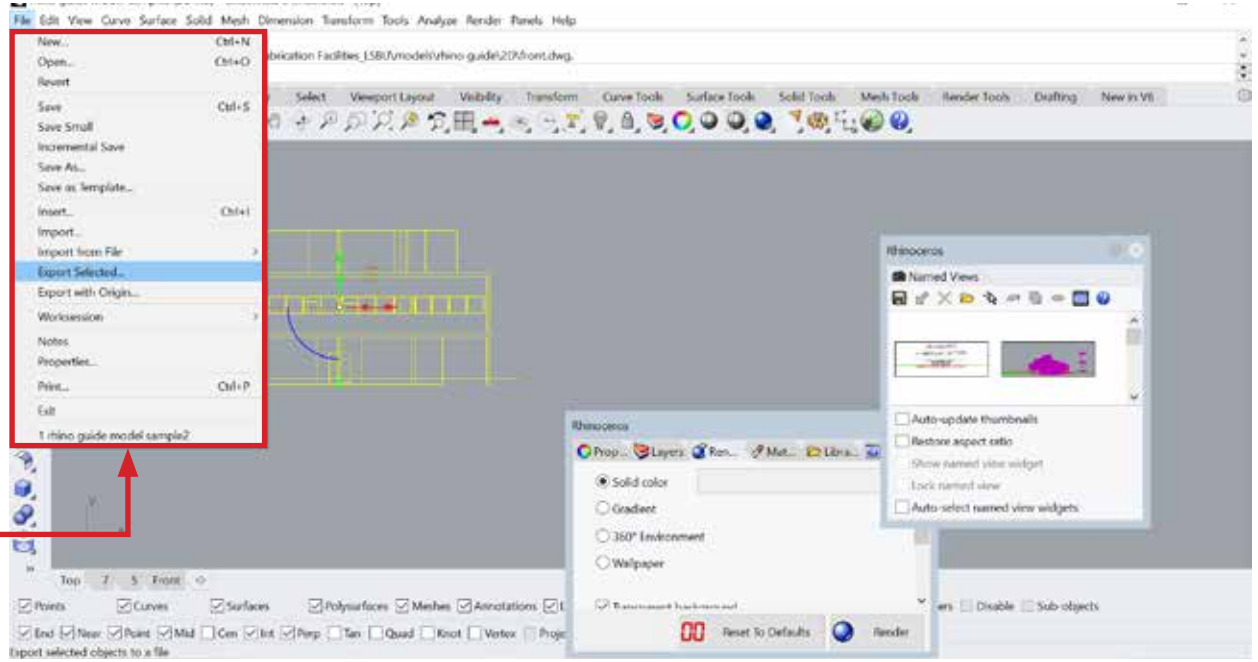
2. Make sure you pick a good angle and play around the light settings. You can use a high resolution setting as output. And be sure that the clipping plane is activated in your view window.

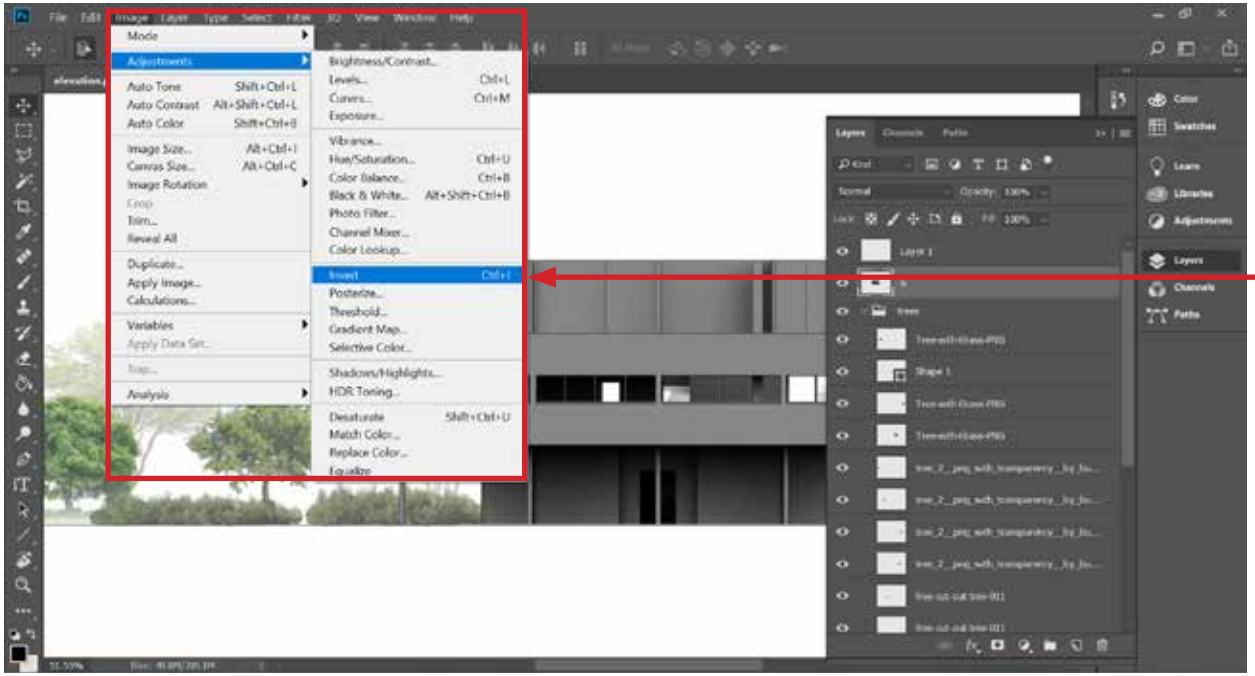
This screenshot also shows you the render output options for rhino. Make sure you have a desirable resolution. Also, if you are using a resolution different from the "viewport" it is recommended to use the render preview to adjust the view before actual rendering tak-ing place.

Elevation

Elevation follows the same process of making a plan with the addition of putting background behind your building.

1. This screenshoot shows you the location of export selected option in case you are wondering where it is.





2. This screenshot shows you how to invert the colour of the line drawings in case if you are wondering where it is.

Elevation