

# Designers Lighting Forum

Get Real!

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



## Learning Objectives

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At the end of this course, participants will be able to:

1. Identify the benefits of game engine and Realtime lighting technologies and how they can be used in a lighting design workflow.
2. Describe how these technologies can inform early design decisions and streamline client approval with “accurately” illuminated renderings
3. Compare available platforms and assess the appropriateness of their accuracy in terms of inputs and results.
4. Analyze labor costs between traditional calculations and design presentation materials with the combined solution of real time lighting calculations.



## The Ask

“We understand the façade lighting design elements, but we want to spin the building around and see the options.”



# The Answer

Sure thing!

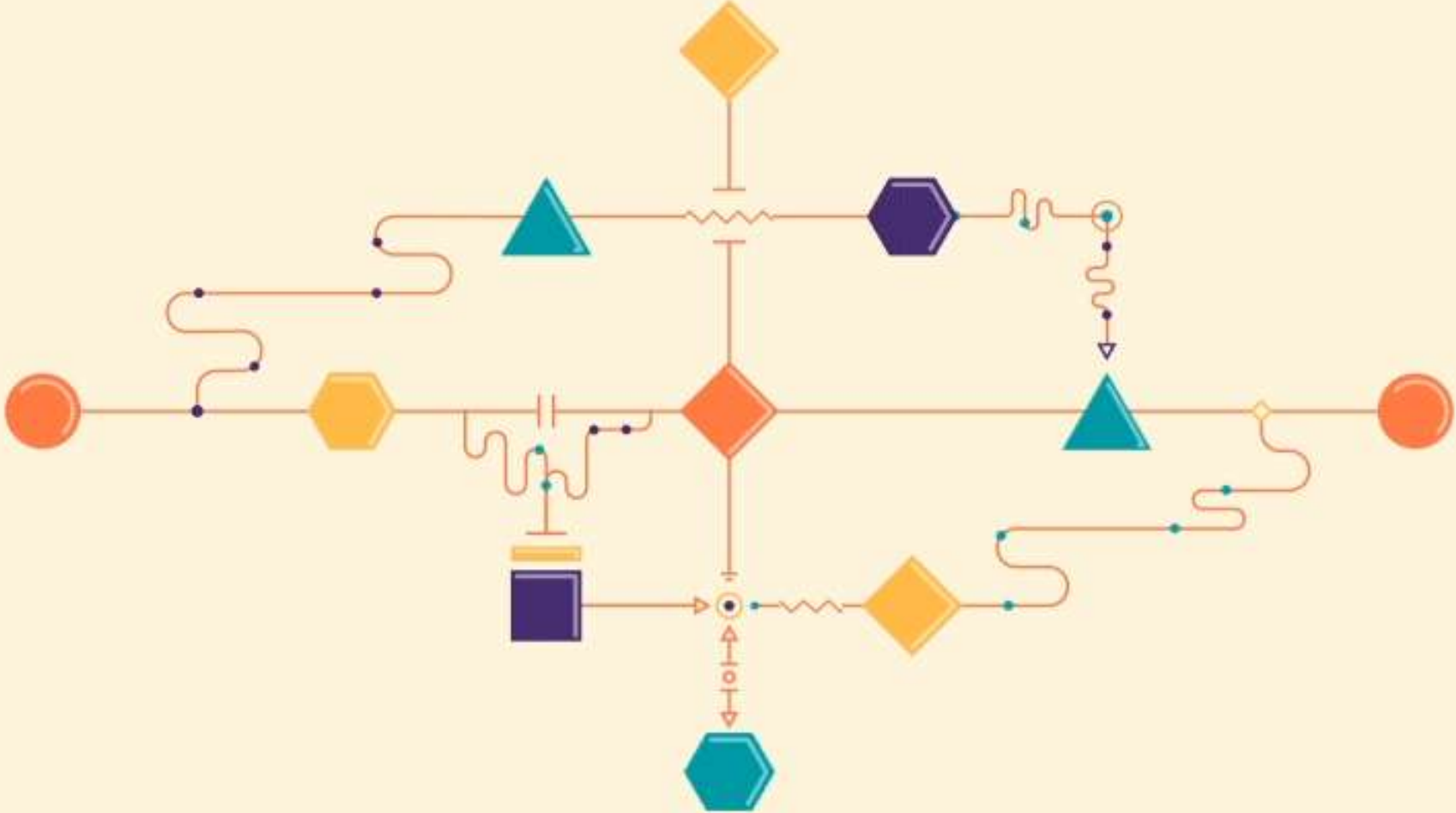


# Hold Up



How did we get here?

# Design



Process

## Project Example CHOP

Details:

Research tower

Prominent skyline

Client savvy w/ rgbw façade lighting

Architecture not finalized

Round One:

Lighting narrative

Illustrator Diagrams

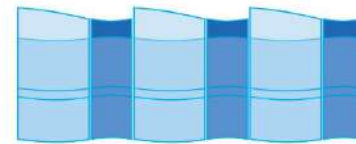
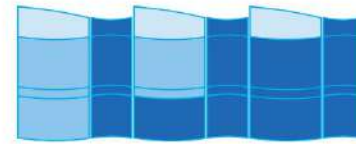
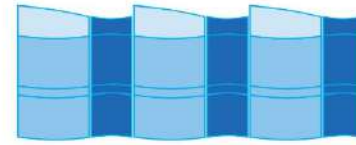
Client Response:

Mixed

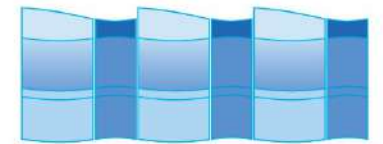
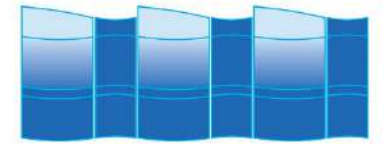
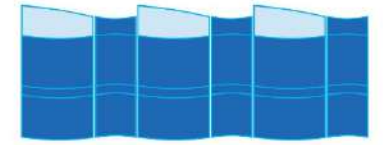
## 3 Façades – Areas and Relationships



Facades



1 2 3



1 2 3

Options



## Project Example CHOP

Details:

Research tower

Prominent skyline

Client savvy w/ rgbw façade lighting

Architecture not finalized

Round Two:

Lighting presentation

Photoshop renderings

Client Response:

Mixed

Here we got the Ask.



## Project Example CHOP

Details:

Research tower

Prominent skyline

Client savvy w/ rgbw façade lighting

Architecture not finalized

Round Three:

In person presentation

Realtime rendering

Client Response:

Approved



# Go Realtime!

10 min



# Let's Talk Accuracy

Game engines are as efficient as possible.

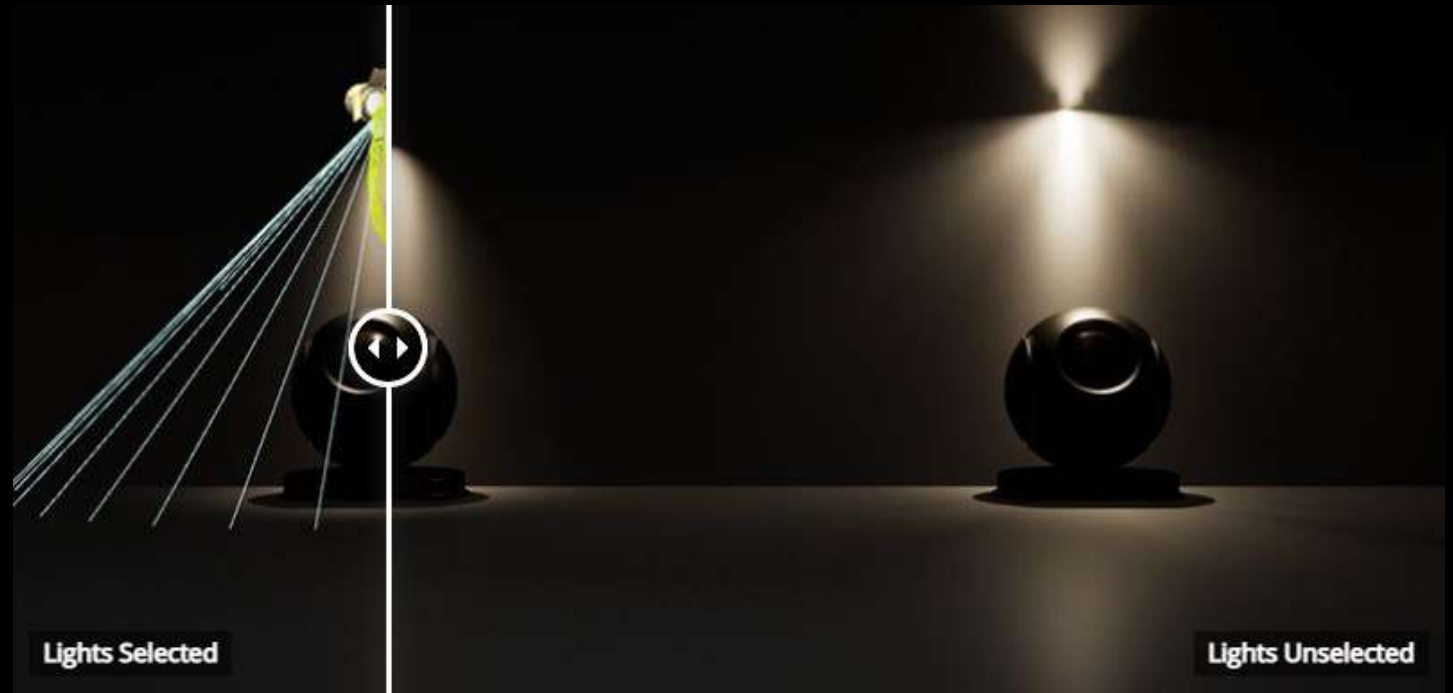


## “Accuracy” in Realtime

Depends on the Engine.

Read the documentation. Most engines come with specific descriptions of how they are processing lighting.

If they can't / don't explain why ies files are not acting correctly, don't use the engine



Usage	
<b>Light Specific Properties</b>	
Radius	Radius of the disc.
Focus	A control to shape the spread of light. Higher focus values pull light towards the center and narrow the spread.
Focus Tint	Off-axis color tint. This tints the emission in the falloff region. The default tint is black.
Cone Angle	Angular limit off the primary axis to restrict the light spread.
Cone softness	Controls the cutoff softness for cone angle.

## IES files in Realtime

Details:

Some engines only use first polar curve.

Others first polar curve is converted to 2d gradient

Works fairly accurately on point source lights

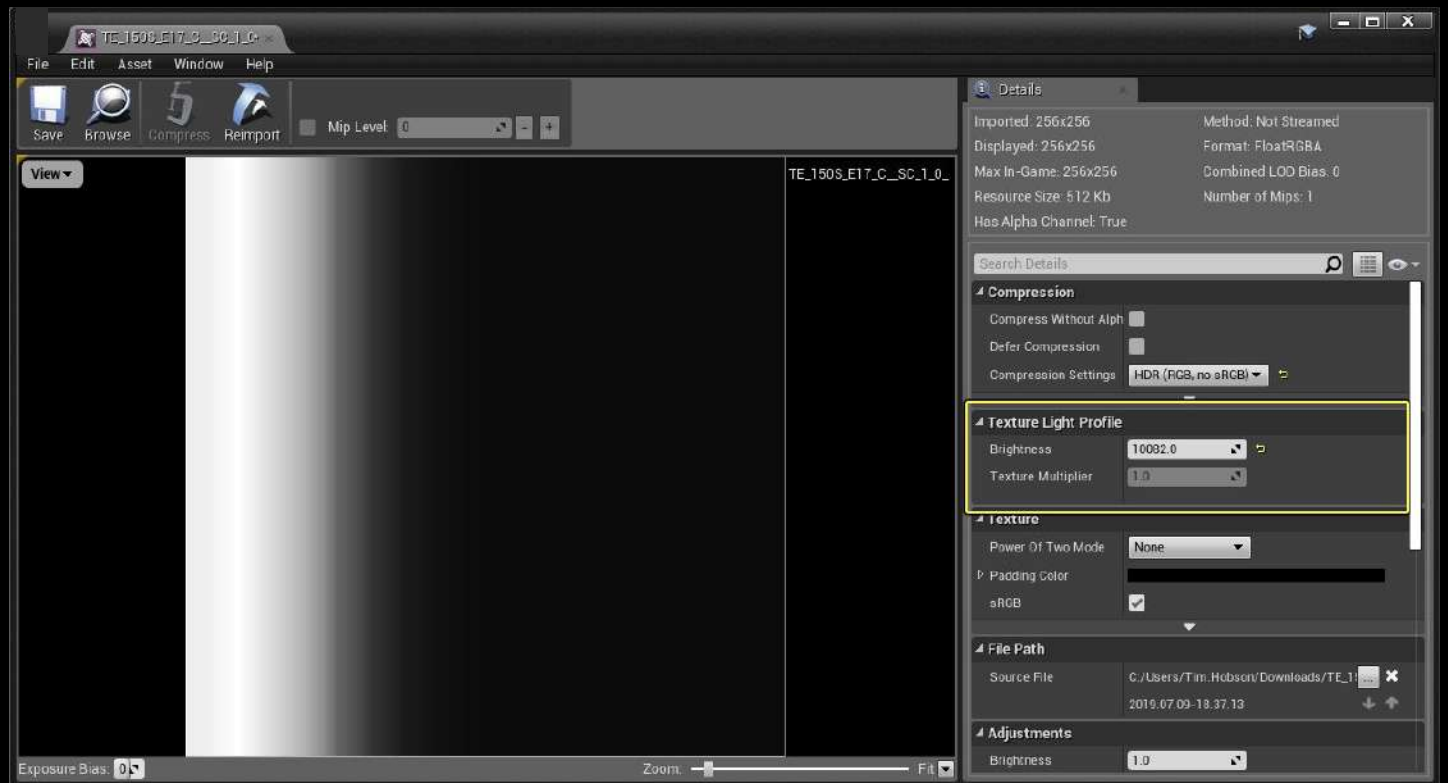
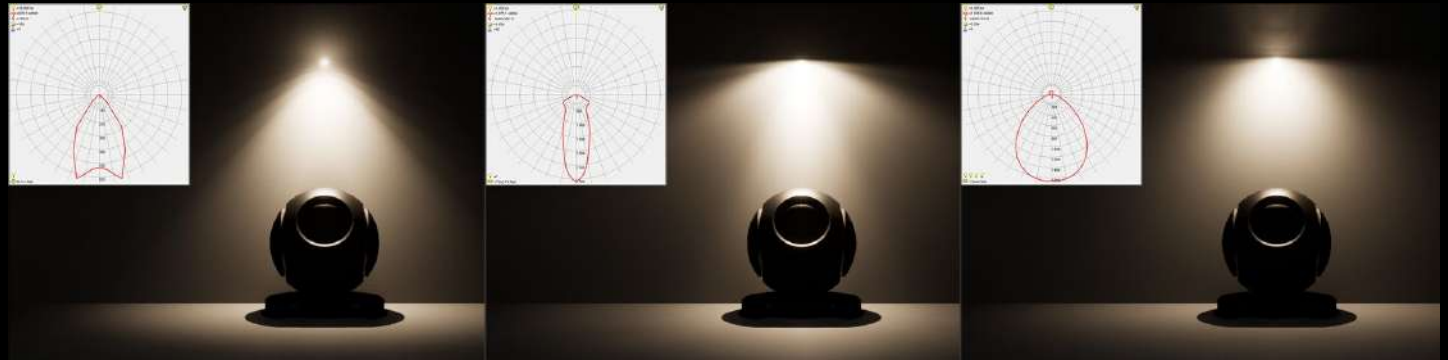
Diffuse linear sources can be adjusted as needed

Attenuation, intensity, and other factors (not available in the real world) have adjustability

Downsides:

No asymmetric ies file support

Direct / Indirect linear may require two separate ies files





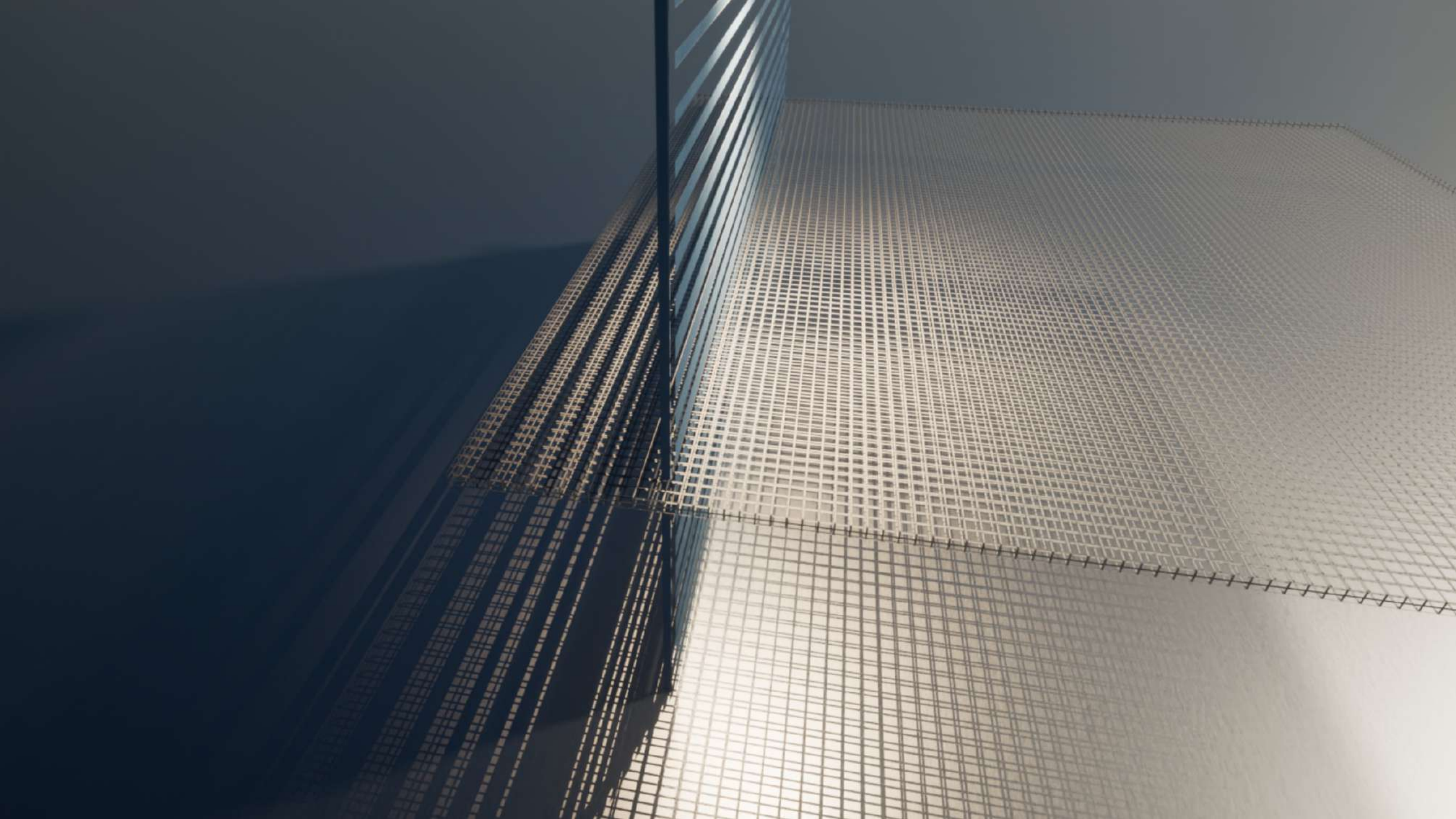
# Hold Up

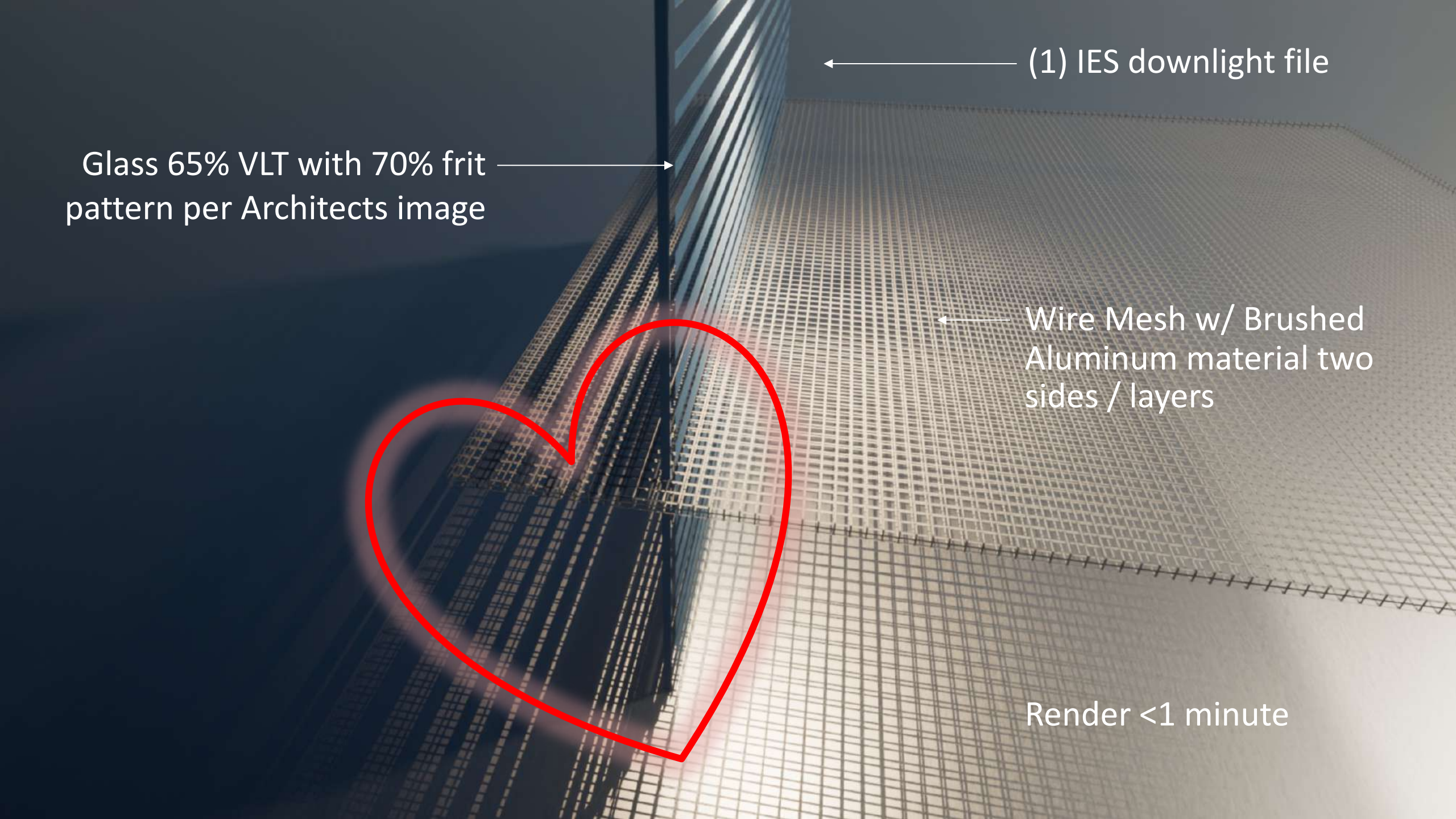


Reconsider the Design Process









(1) IES downlight file

Glass 65% VLT with 70% frit pattern per Architects image

Wire Mesh w/ Brushed Aluminum material two sides / layers

Render <1 minute

## Project Example St. Johns

Details:

Higher Education

Architectural Lantern Features

Extensive site pedestrian lighting

Round One:

AGI partial areas of building

Calc time 12min per lantern

Client Response:

Mixed



## Project Example St. Johns

Details:

Higher Education

Architectural Lantern Features

Extensive site pedestrian lighting

Round Two:

Full site ingame.

IES files for site direct only symmetric fixtures.

Interior lighting approximated to match AGI Raytraced images.

Image export/renders <2 minutes.

Client Response:

Approved





# Go Realtime!

10 min



# Need Better Cost Image





## Cost

Hardware: To make it affordable now (2023) you need a physical computer.

Graphics card - \$\$\$

Storage - \$\$

Portability - \$\$\$

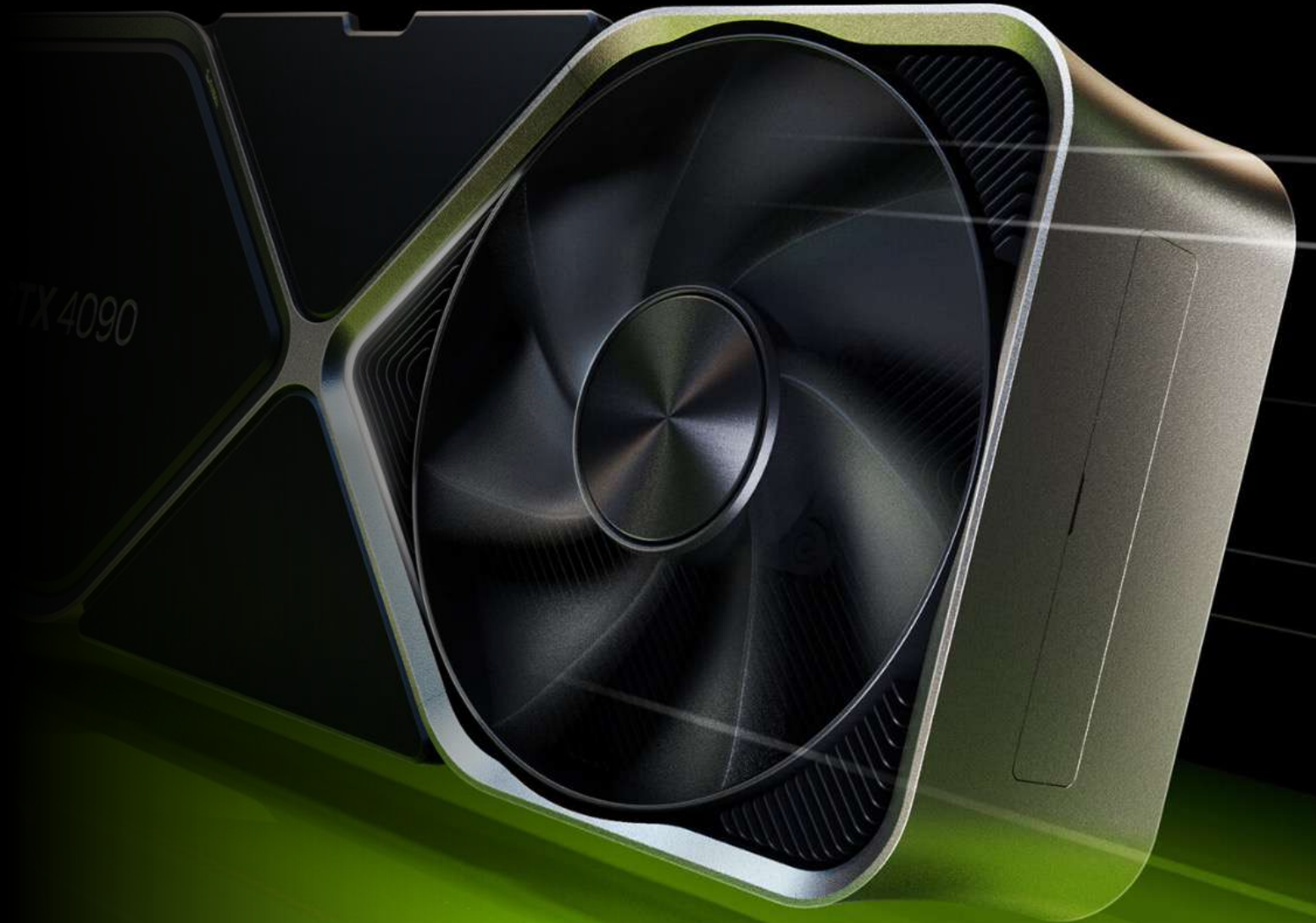
Laptop/equipment Budget

\$2500 - \$3500

This should last 2 to 3 years.

Software: Prices vary, but free to learn/explore.

Programming knowledge not necessary.



## Basic Savings

CHOP Static presentations (3 meetings)

Photoshop 7 views/options two people:

12 hours.

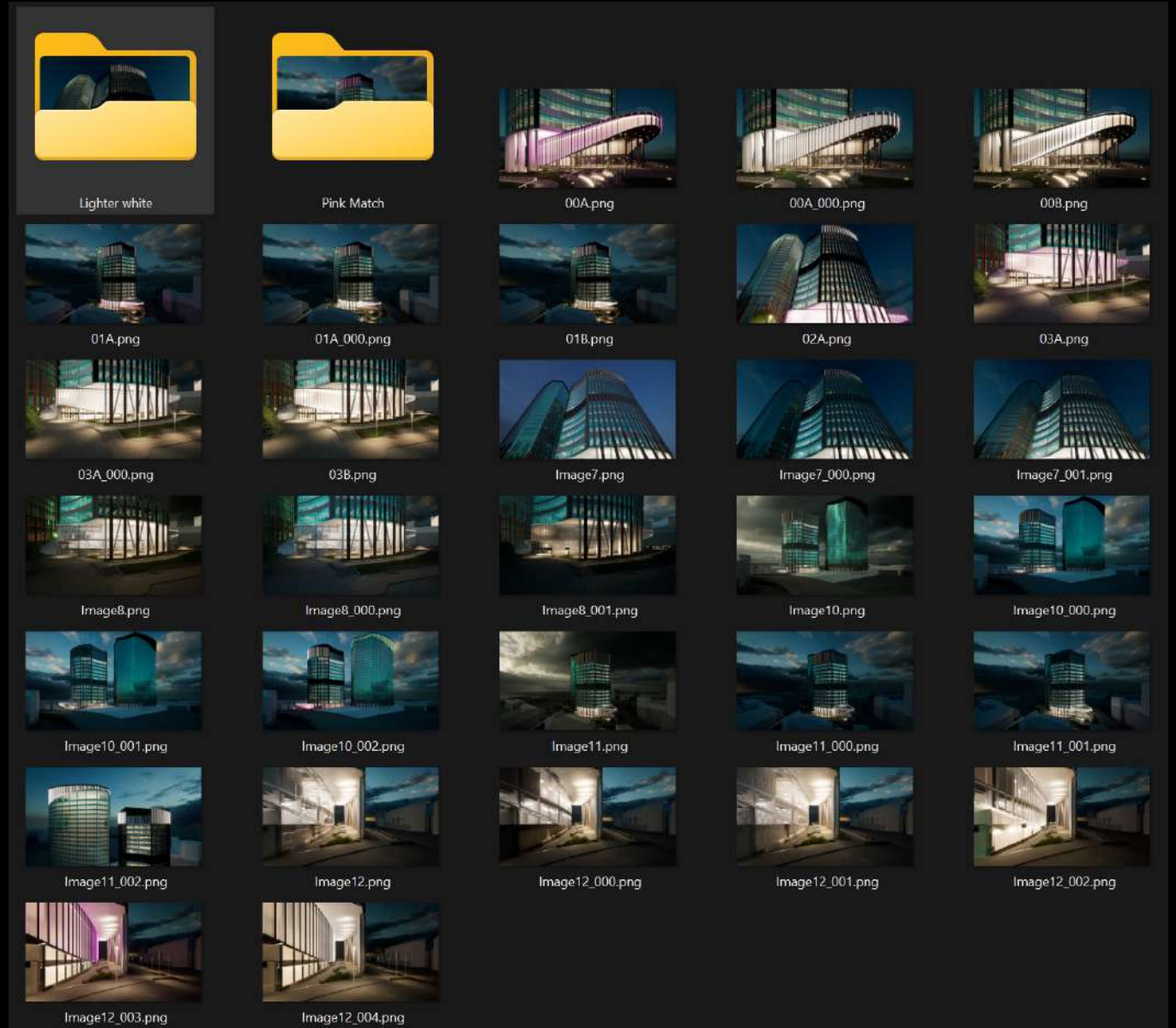
In engine 7 views, 1 to 6 options on each view for a total of 30 images. Render time on Cannondesign Cloud computer 15 minutes each:

450 minutes or 7.5 hours

Same file same engine on physical laptop 2 minutes each:

60 minutes or 1 hour

Or just present live...





## Realtime Teamwork

Realtime rendering is pretty great.

Realtime collaboration is better.

2021-2022 we tested these workflows for rendering and it was amazing.

Cant wait for the next version!



### Open, Interoperable

- > Based on **USD**, **PhysX**, and **MDL** open-source standards
- > Connect full-design-fidelity datasets from disparate 3D ecosystems
- > Simulate and visualize at full-scale with physical accuracy



### Multi-GPU, Multi-Node Scalable

- > Ingest massive, full-fidelity scenes and simulate in real time
- > Scale your RTX compute as your workloads increase



### Easily Extensible

- > Modular and flexible platform for highly customizable and interoperable development
- > Low-code, graph-based or Python-based development
- > Customize all NVIDIA-built extensions and apps at a source code-level to suit your needs.



### Accessible for Every Audience

- > Supercharge creative workflows and tools
- > Develop connections and enhanced solutions
- > Connect enterprise teams, local or remote



This concludes The American Institute of Architects Continuing  
Education Systems Course



Seamless integration

**Real-time environment**

High-quality assets

Storytelling tools

Exporting & sharing

## Real-time environment



Work in context with real-time rendering

Develop and refine your design while working at full photorealistic quality. With Twinmotion, the changes you make update in real time—no more guesswork, no more waiting for renders. You can even jump into VR mode to really get a sense of your project at human scale.



### High-fidelity real-time lighting

As all architects and cinematographers know, lighting plays a huge part in setting the mood for your scene. With real-time rendering, you can instantly see the effects of adjusting your lighting to craft exactly



### Interactive creation tools

Paint on vegetation with a brush; define paths for vehicles and pedestrians to follow with a couple of clicks; adjust a few parameters to make a custom, self-opening door to fit the space you need. With

# Industry-leading real-time visualization for designers

Fast, easy, and the only visualization plugin that is 100% integrated into your favorite design tools.

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