How to Empower Design with Immersive Technologies

Embla Huang | Rotimi Seriki

h+k

November 2018

LEARNING OBJECTIVES

1. Challenges
2. How to apply
3. Design Workflow
4. How to improve

IIDA SCENE LOCAL 2018

Embla Huang
Interior Design Professional

Rotimi Seriki
Visualization Manager

EAT

~~SLEEP~~

DESIGN

REPEAT

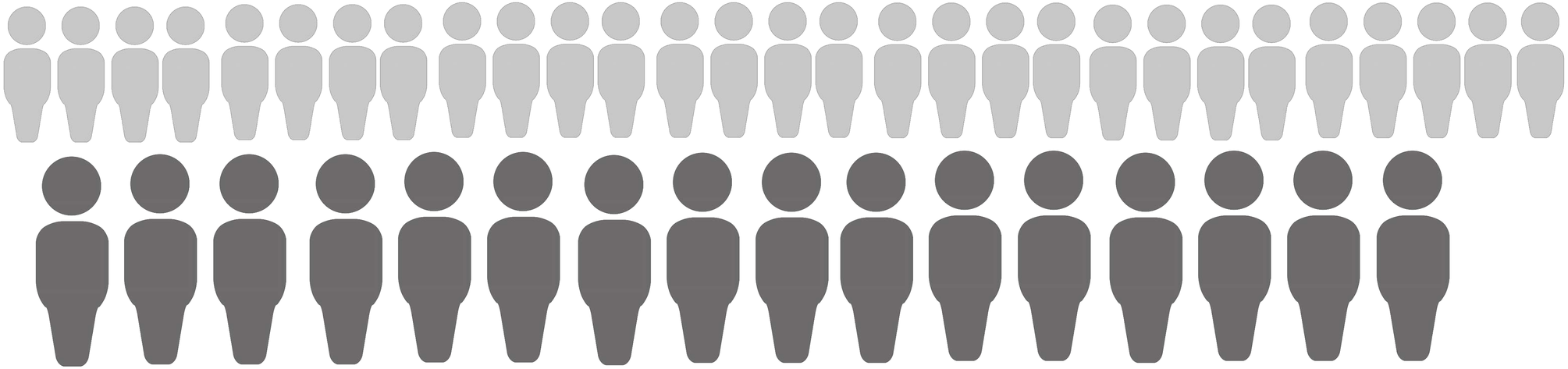
HELLMUTH OBATA + KASSABAUM

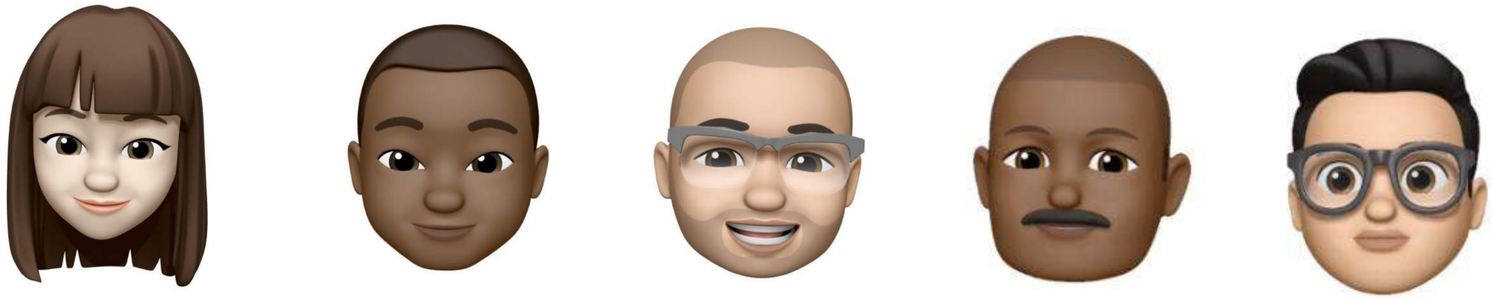
24 Offices

1,700 People

25 buildingSMART

4 BIM People





4 BIM People ?

Building Information Modeling

What are the challenges

XTAL

Panoramic

Samsung Gear VR

Projection Mapping

Motion Tracking

ARCore

360 Video

Immersive Technologies

ARCore

Oculus

AR

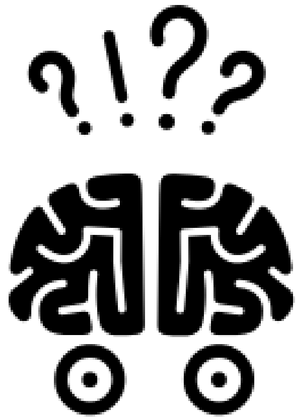
VR

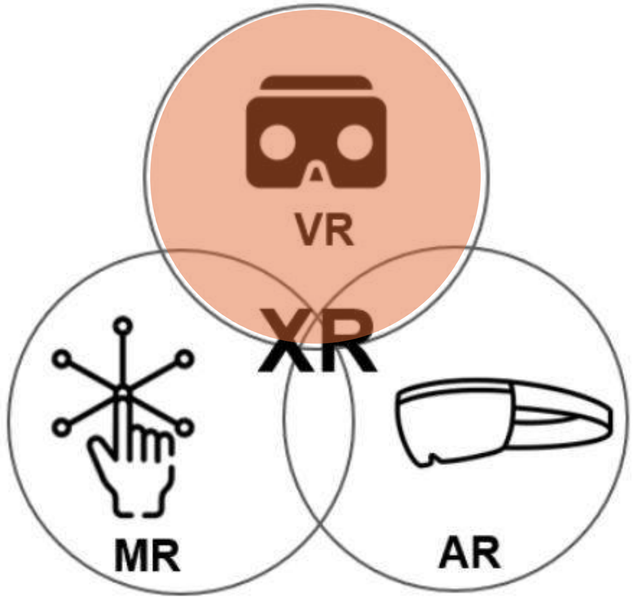
MR

HTC Vive

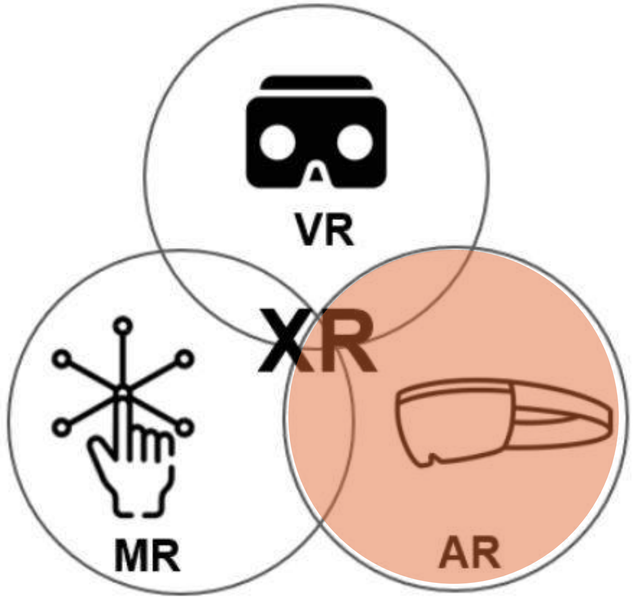
XR

Google Cardboard

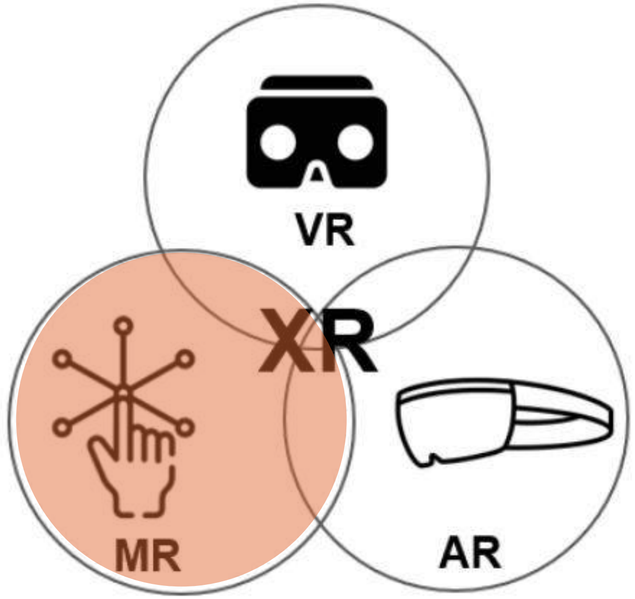




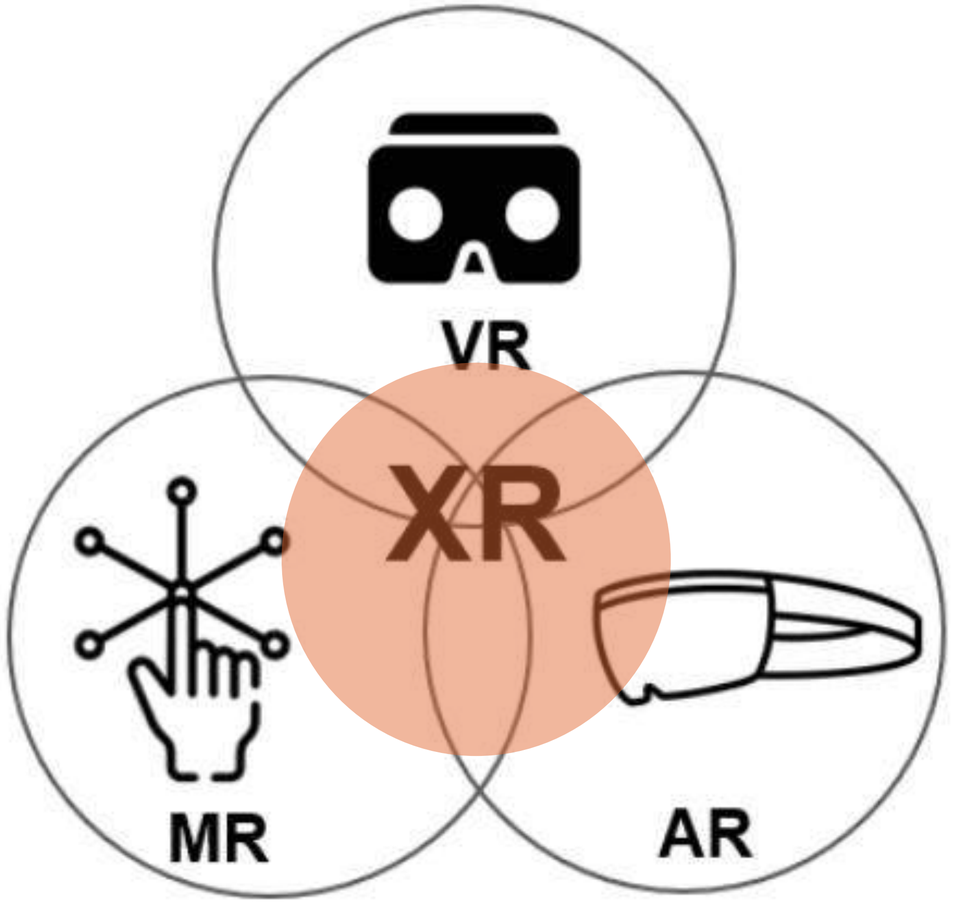
Virtual Reality



Augmented Reality

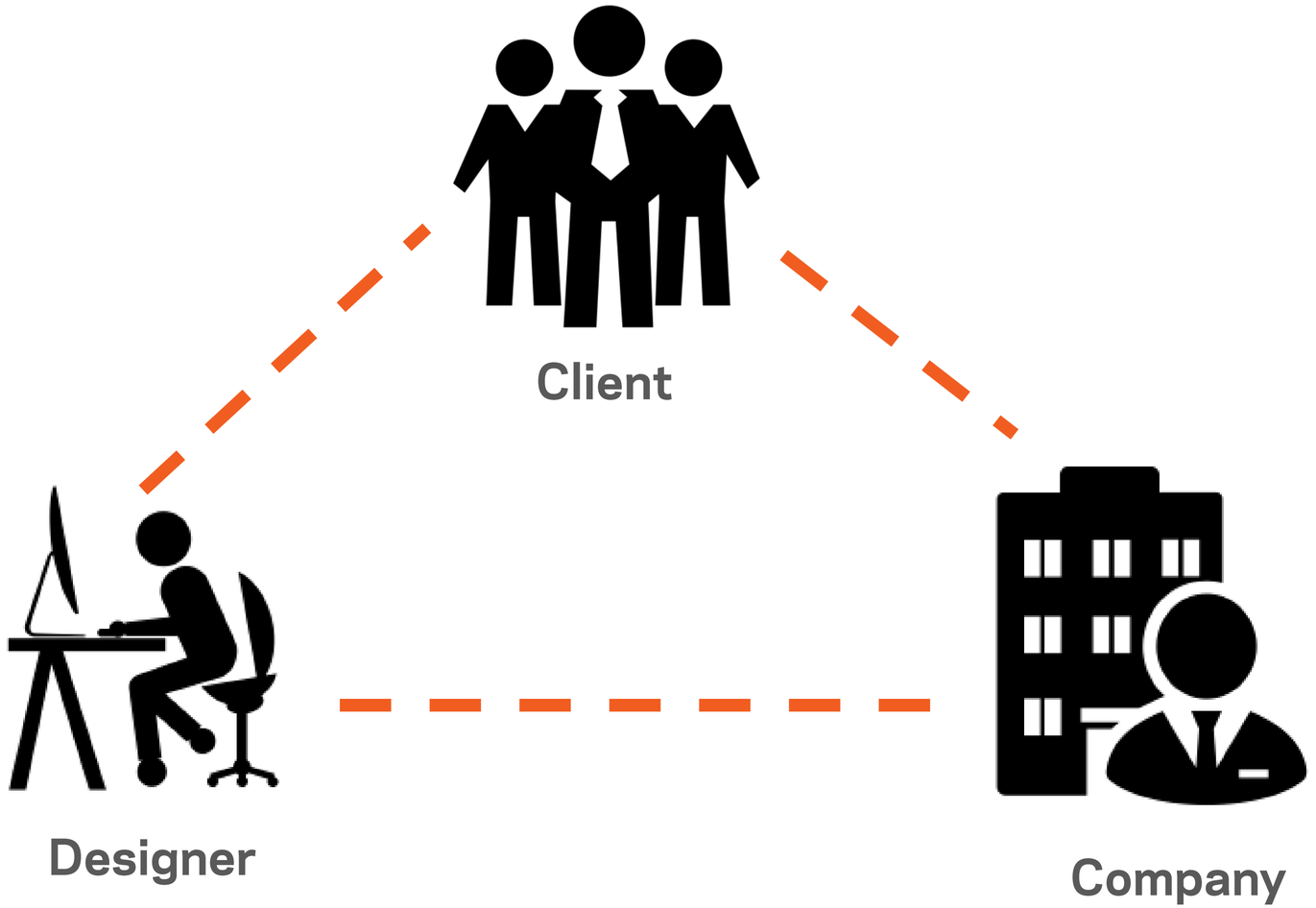


Mixed Reality

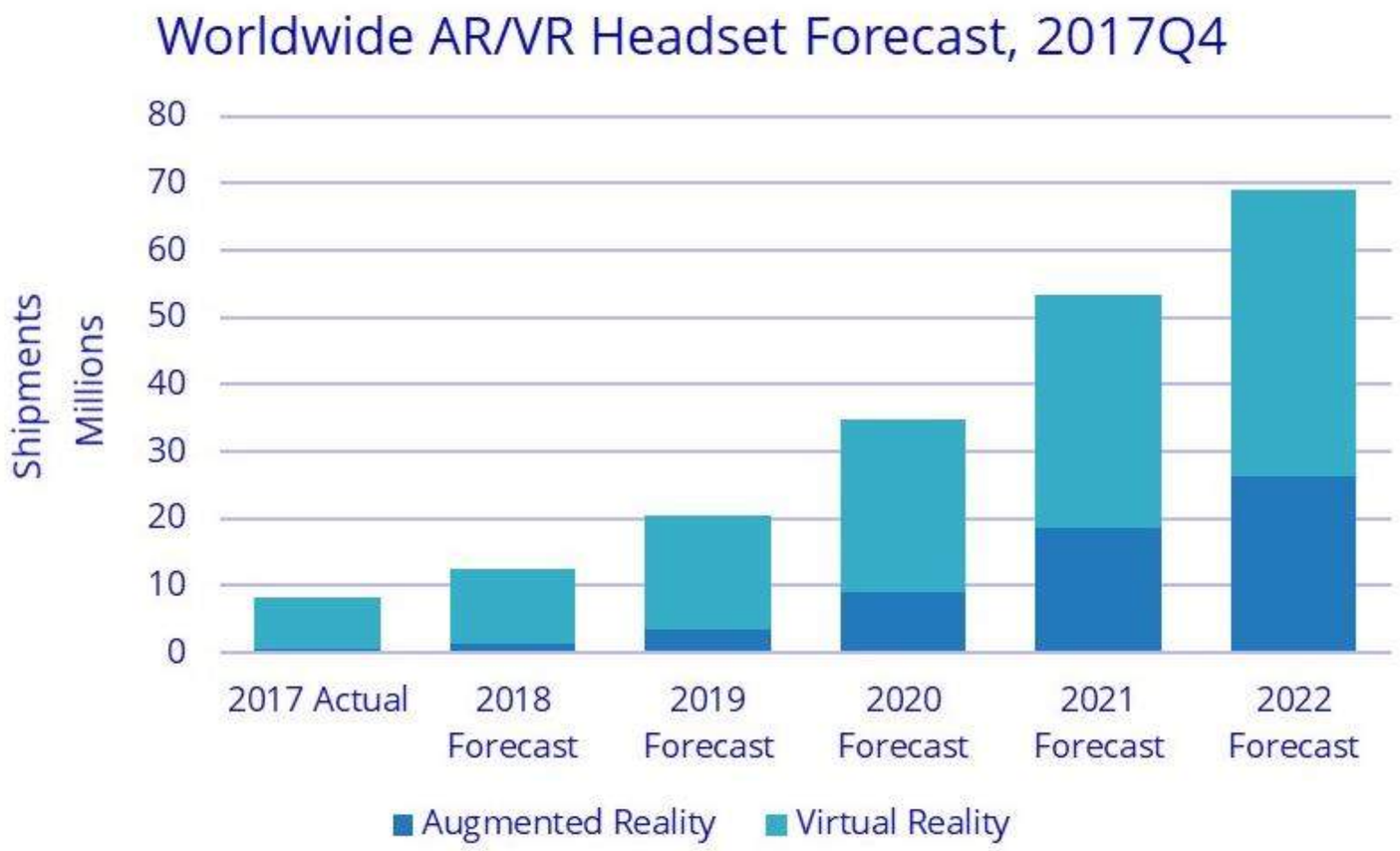


Extended Reality
(X...?)R

Challenges



Demand



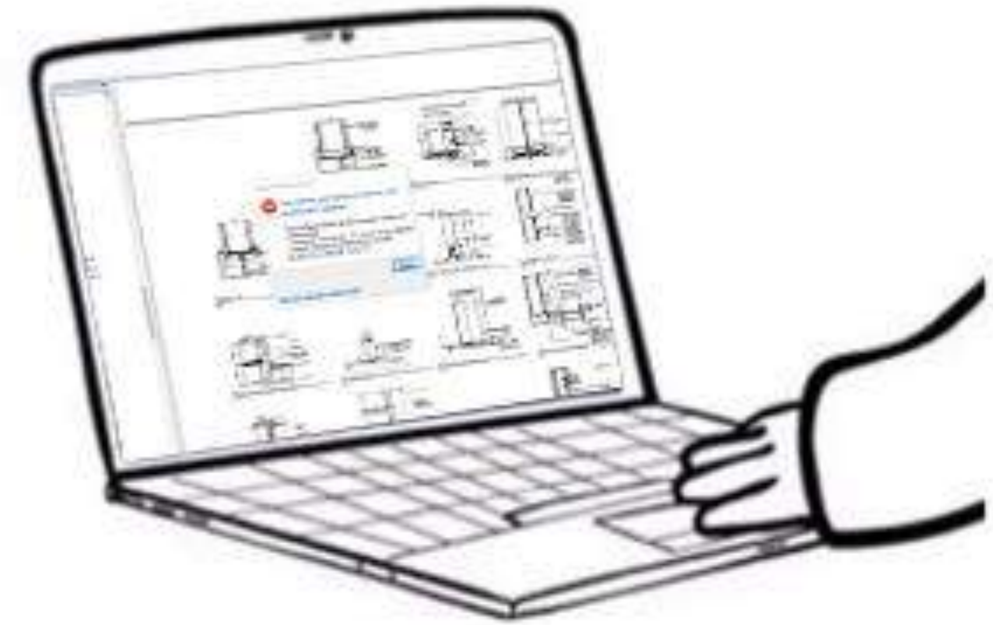
Market size: $15 billion 2017

Investment: $2.5 billion 2017

Forecast: $210 billion for 2022

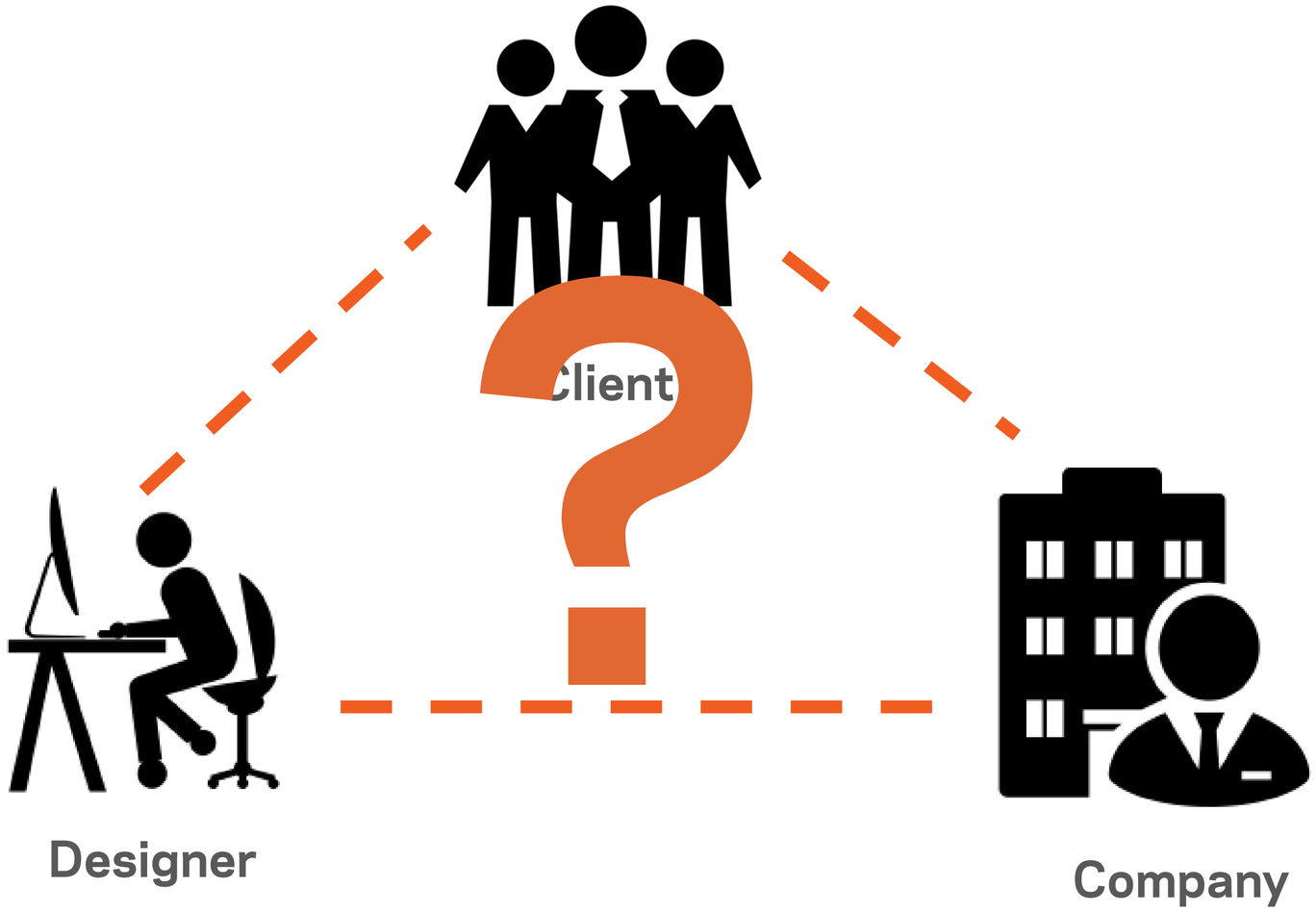
Time & Fee

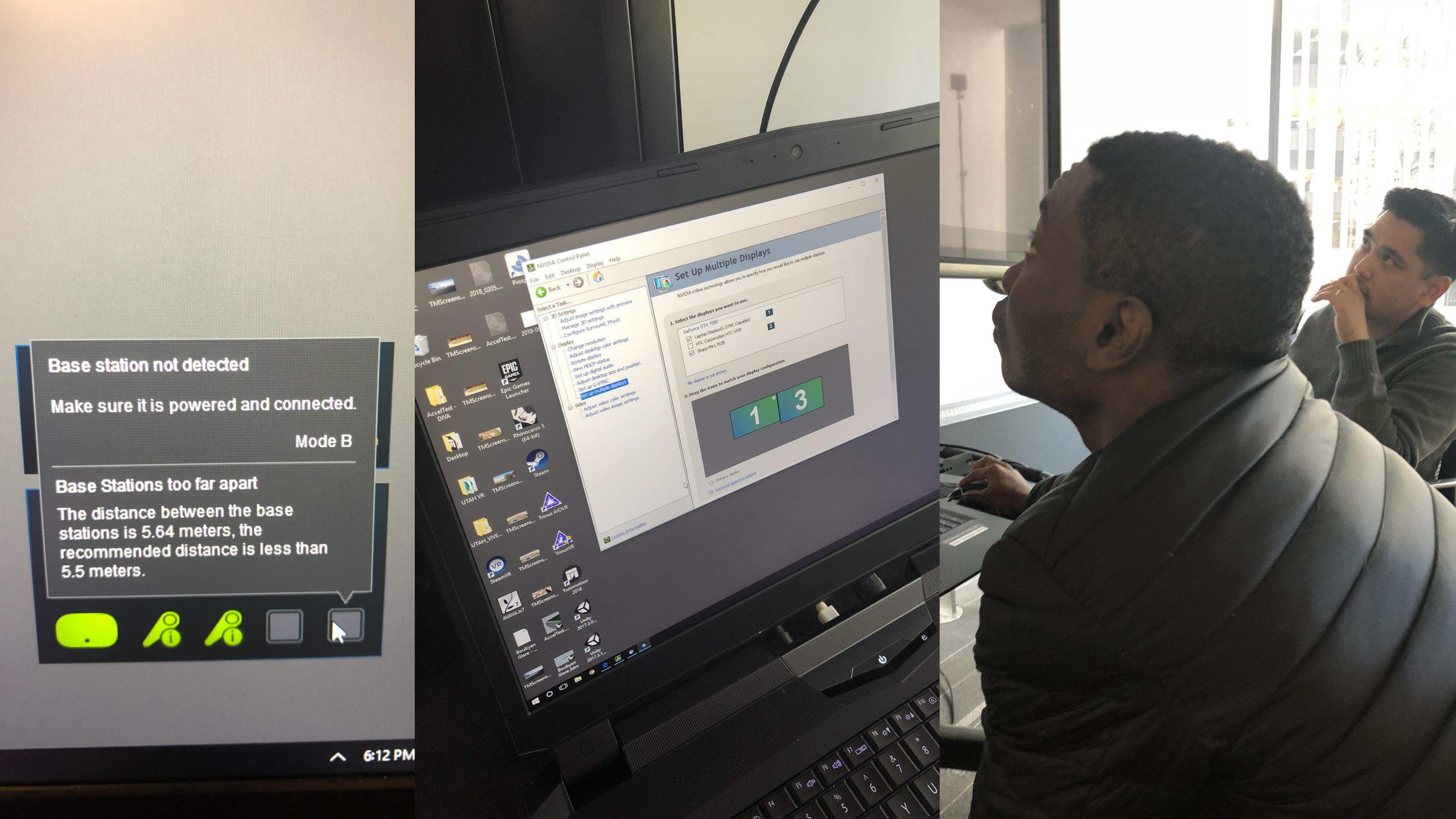
HOW DESIGN IS MADE

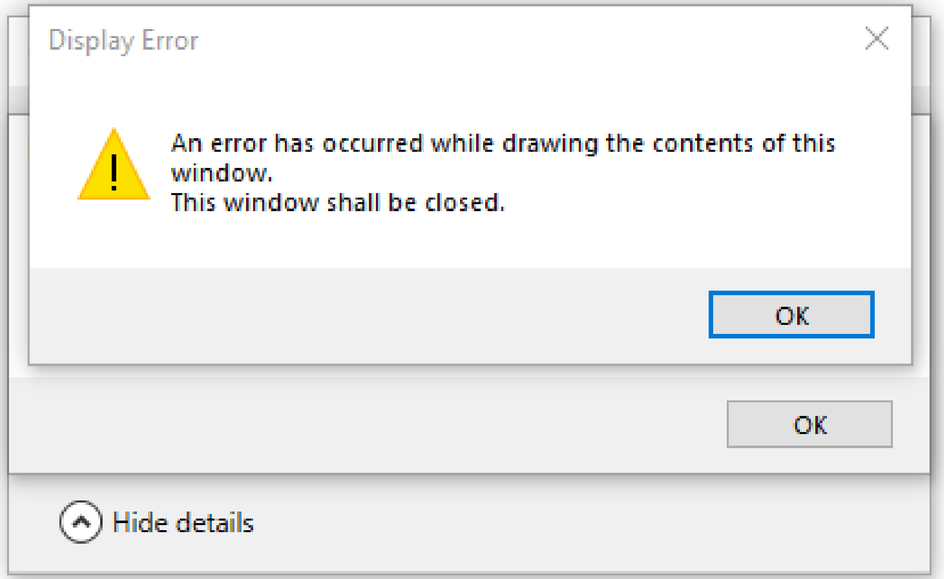


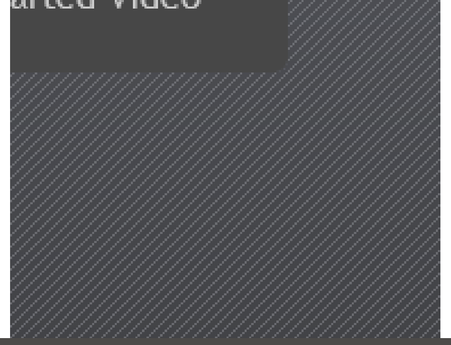
HOW CLIENTS THINK DESIGN IS MADE

Challenges

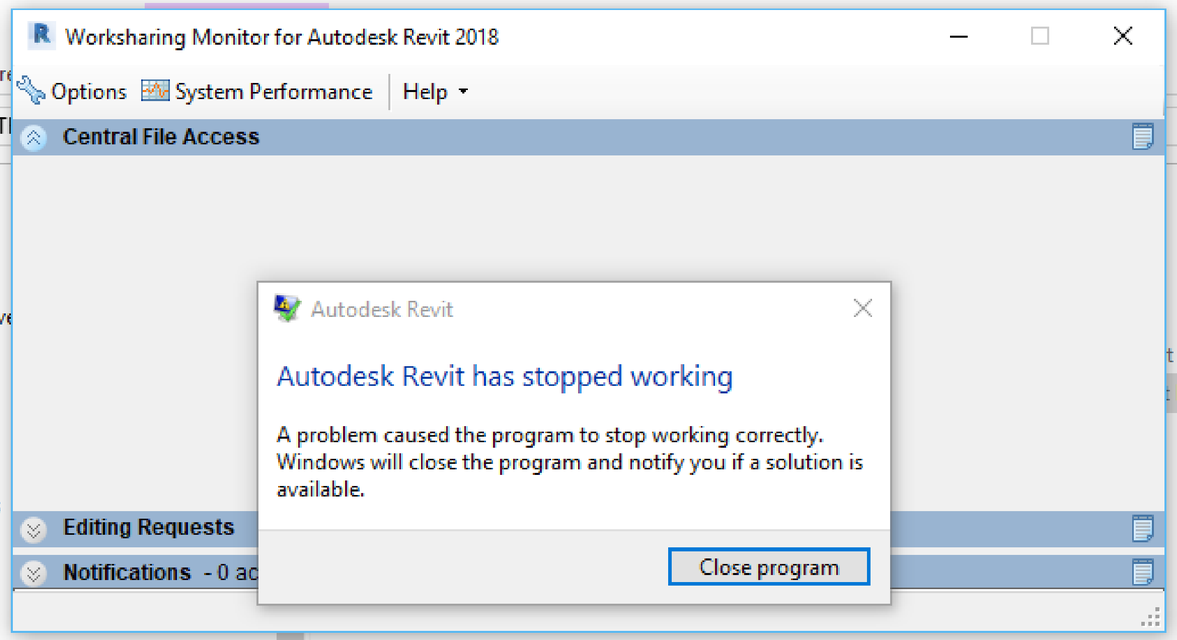



Base station not detected
Make sure it is powered and connected.
Mode B
Base Stations too far apart
The distance between the base stations is 5.64 meters, the recommended distance is less than 5.5 meters.
6:12 PM
NVIDIA Control Panel
File Edit Desktop Display Help
Back
Select a Task...
3D Settings
Adjust image settings with preview
Manage 3D settings
Configure Surround, PhysX
Display
Change resolution
Adjust desktop color settings
Rotate display
View HDCP status
Set up digital audio
Adjust desktop size and position
Set up G-SYNC
Set up multiple displays
Video
Adjust video color settings
Adjust video image settings
Set Up Multiple Displays
NVIDIA nView technology allows you to specify how you would like to use multiple displays.
1. Select the displays you want to use.
GeForce GTX 1080
Laptop Display(G-SYNC Capable)
HTC Corporation HTC-VIVE
Sharp PN-K 7028
My display is not shown.
2. Drag the icons to match your display configuration.
1 * 3
Primary display
Extend desktop onto this display
System Information
Epic Games Launcher
Rhinoceros 5 (64-bit)
Steam
Trimus AIOVR
TrimusVR
SteamVR
Twinmotion 2018
Unity 2017.3.0...
Unity 2017.3.1...





Huang-LEE... Huang-L



Size

t Pr... 49,776 KB

t File 3 KB

R:)

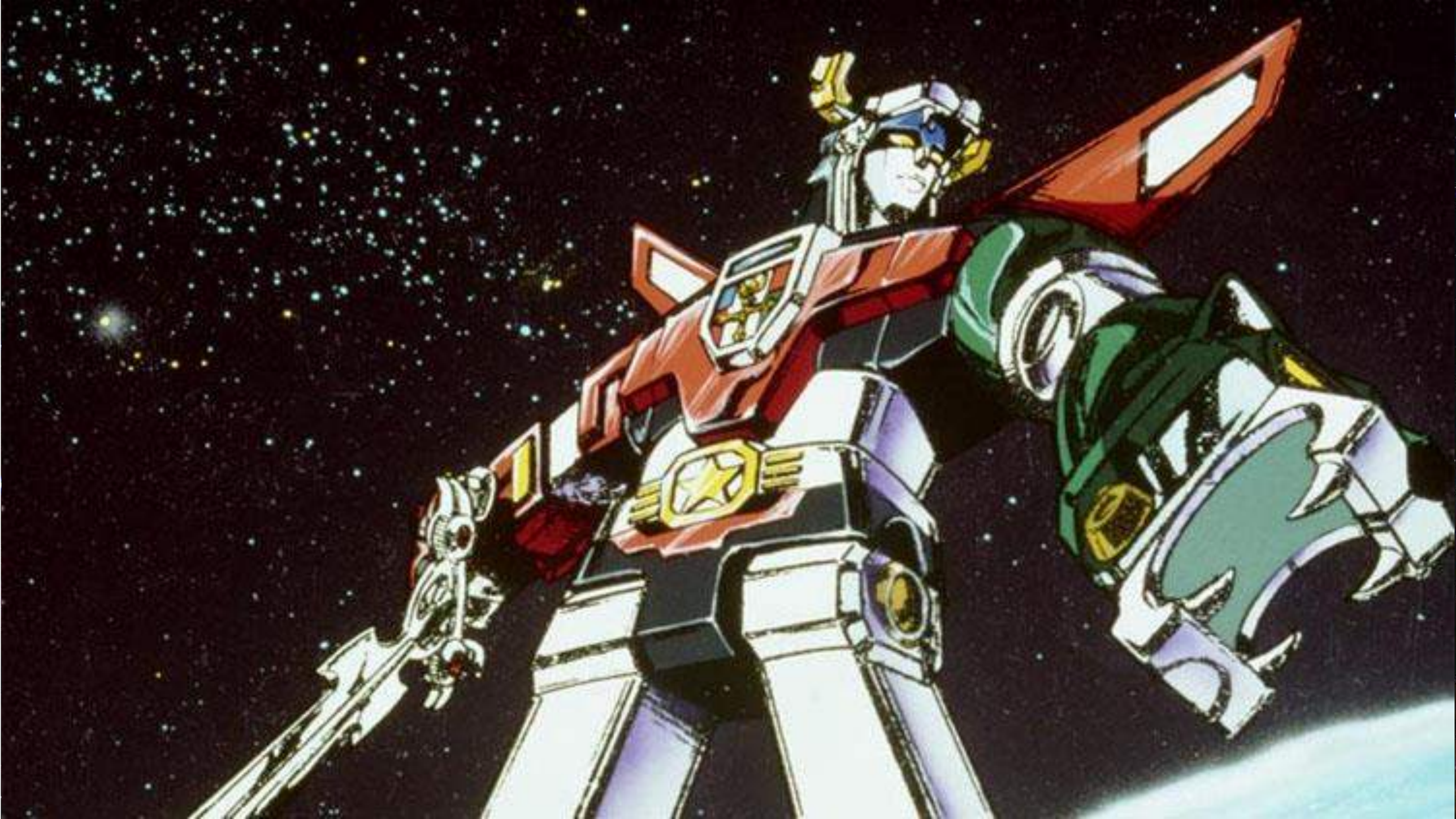
Demand

Time & Fee

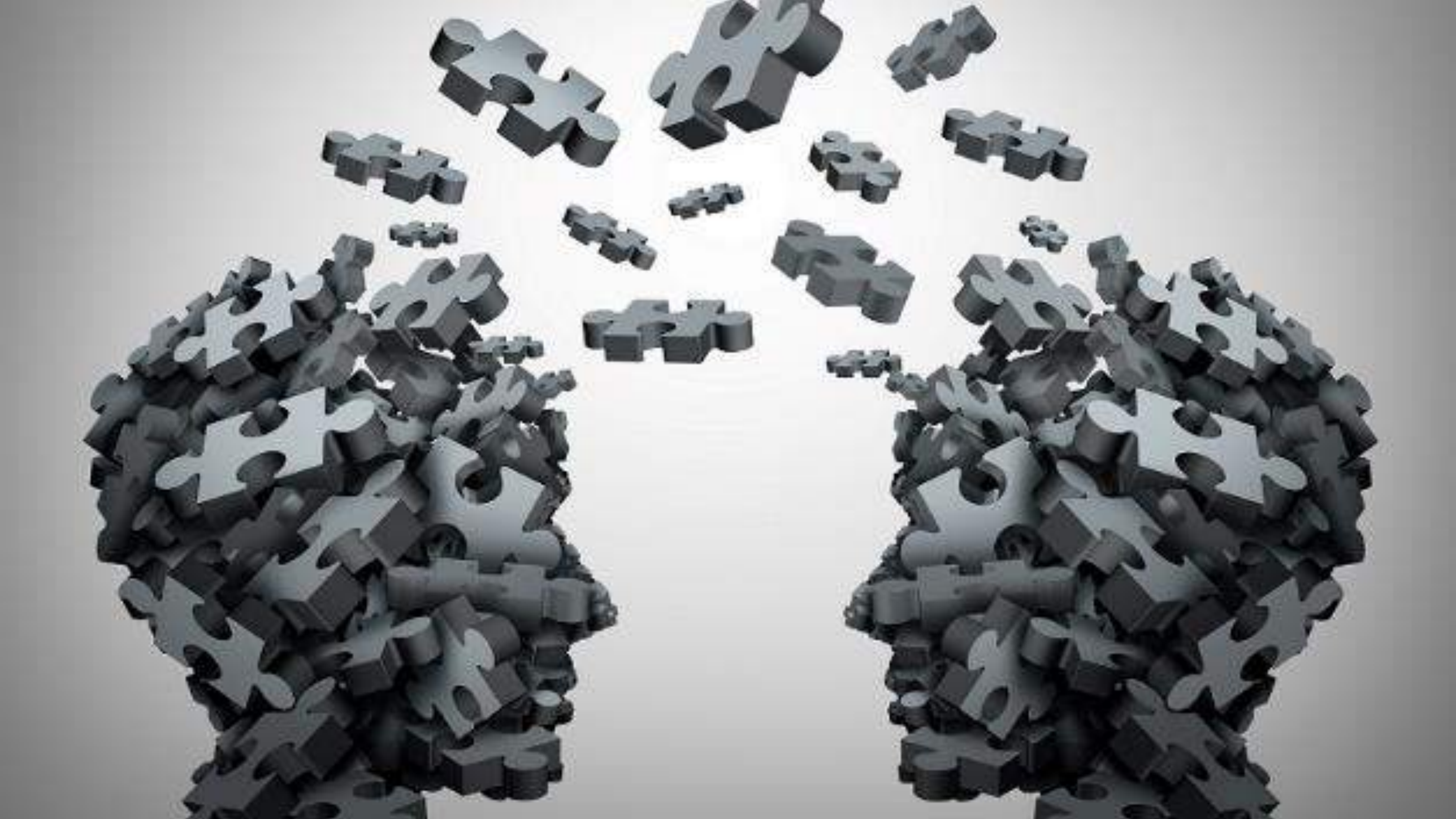
Passion

What are we doing

Immersive Technologies



What is it
Why do I need it
How do I use it



AR or VR

HTC Vive

Magic Leap

HTC Vive Pro

MODELING & COMPUTATIONAL DESIGN:

AUTODESK® REVIT®

Rhinoceros®

SketchUp

Dynamo

grasshopper

AUTODESK® INFRAWORKS®

VISUALIZATION & CREATIVE MEDIA:

v-ray

LUMION

ENSCAPE™

Twinmotion®

AUTODESK® 3DS MAX®

UNREAL ENGINE

AFFINITY PHOTO / DESIGNER

Adobe®

VIRTUAL REALITY

How do I use it

A Presentation Tool

Enscape
Lumion
Iris VR

Schematic Design

Design Development

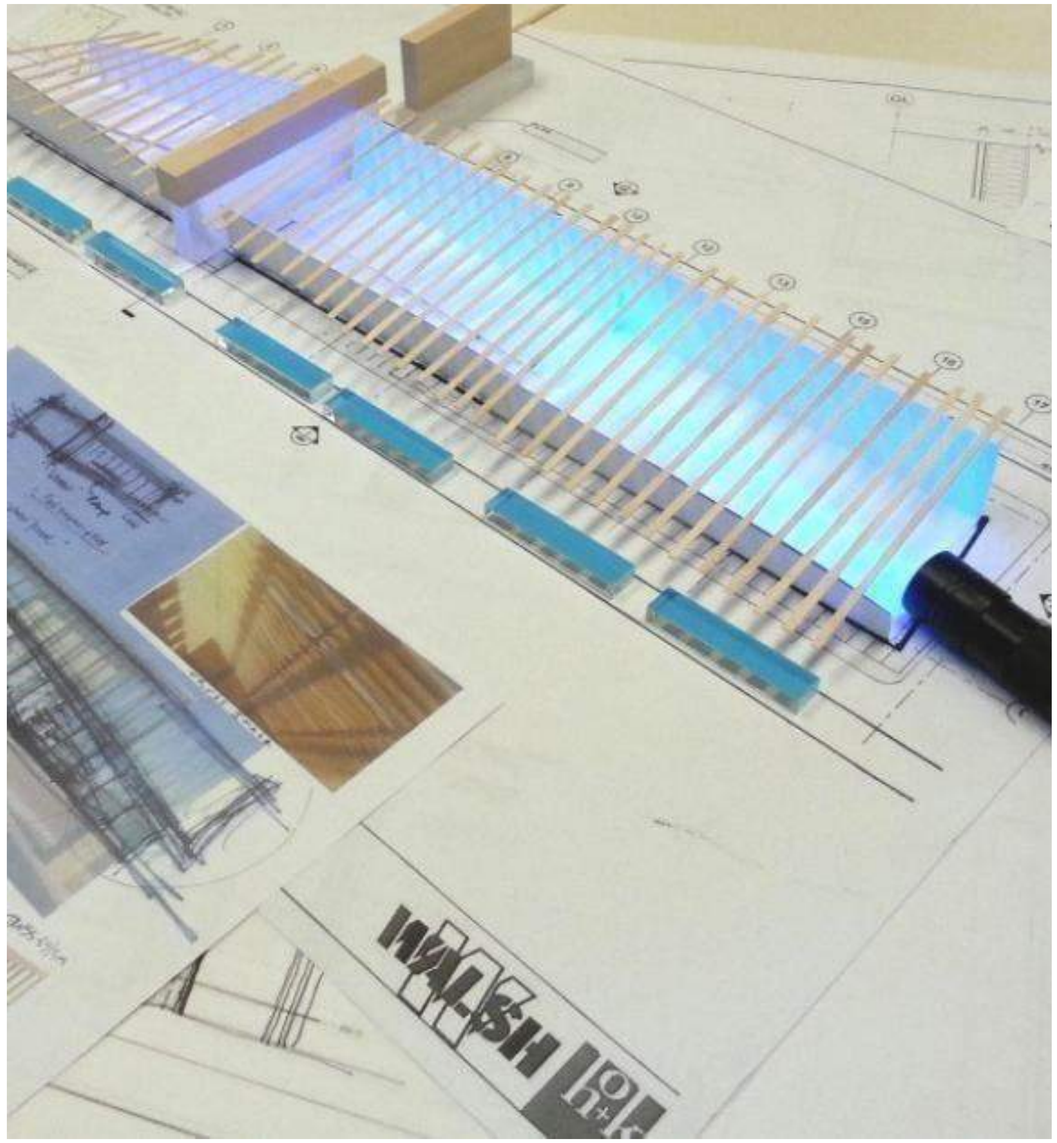
Construction Administration

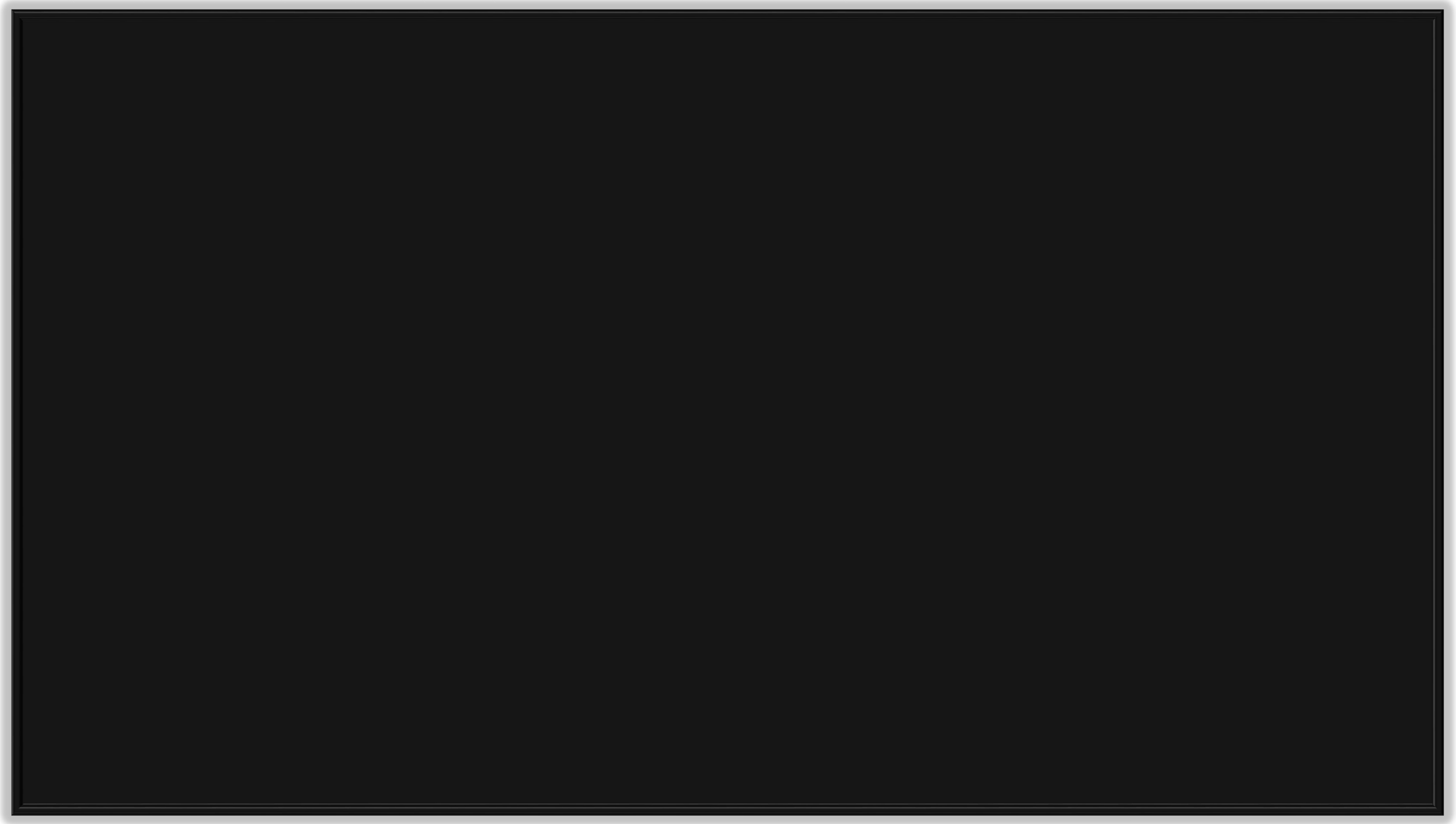
Programming

Construction Document

Sea-Tac Concourse D Hardstand Terminal

Size 25,000 SQFT
2016-2018



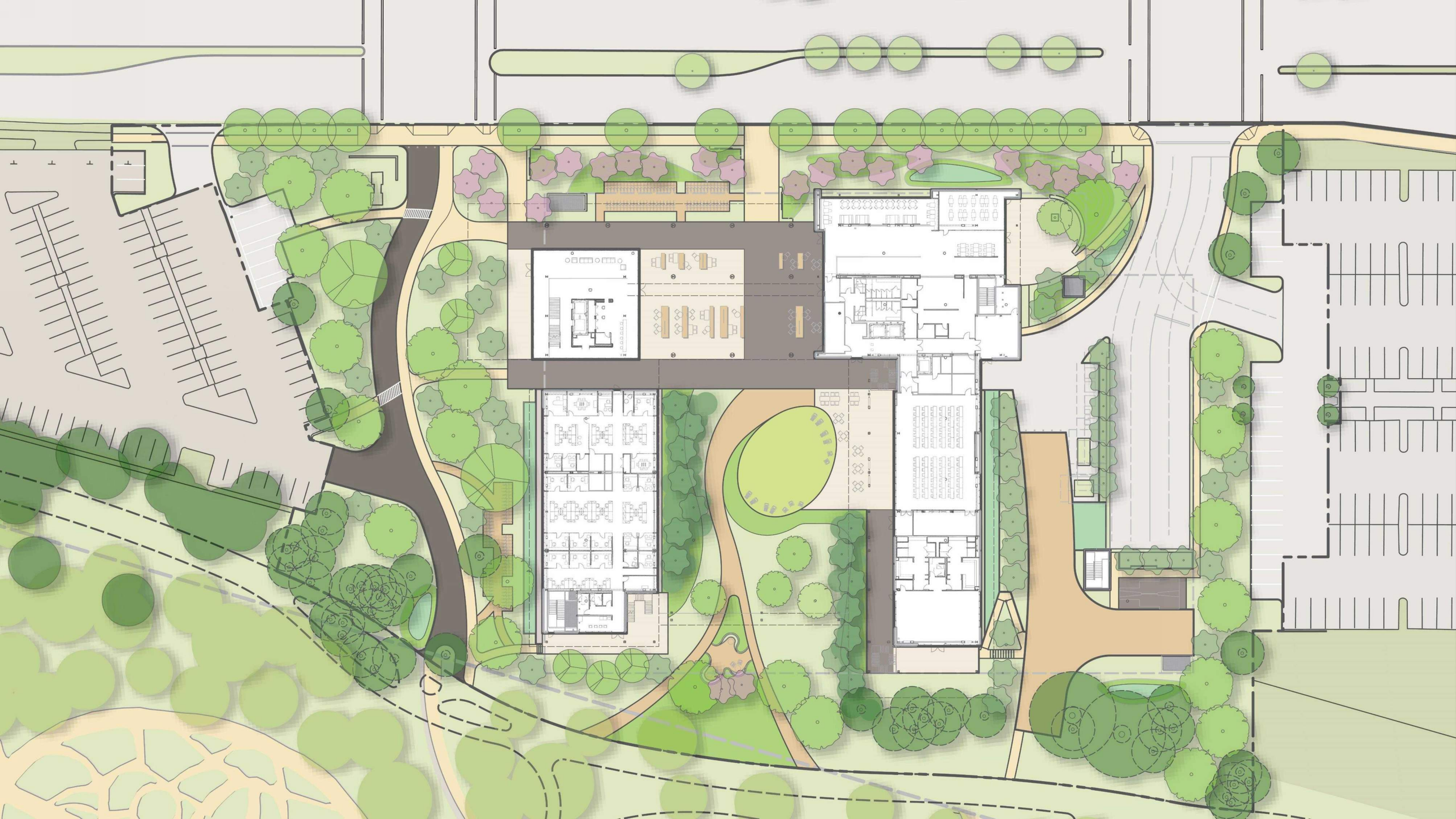


A Design Tool


Tilt Brush
Base stations lost optical sync
There may be something blocking line of sight between the two base stations. If this warning persists between sessions you might consider switching to cabled sync.
Detected: 5:32:23 PM
Dismiss
More info
5:01 PM

Stanford CAM1

CENTER OF ACADEMIC MEDICINE
SIZE 370,000 SQFT
SINCE 2015



The VR Workflow

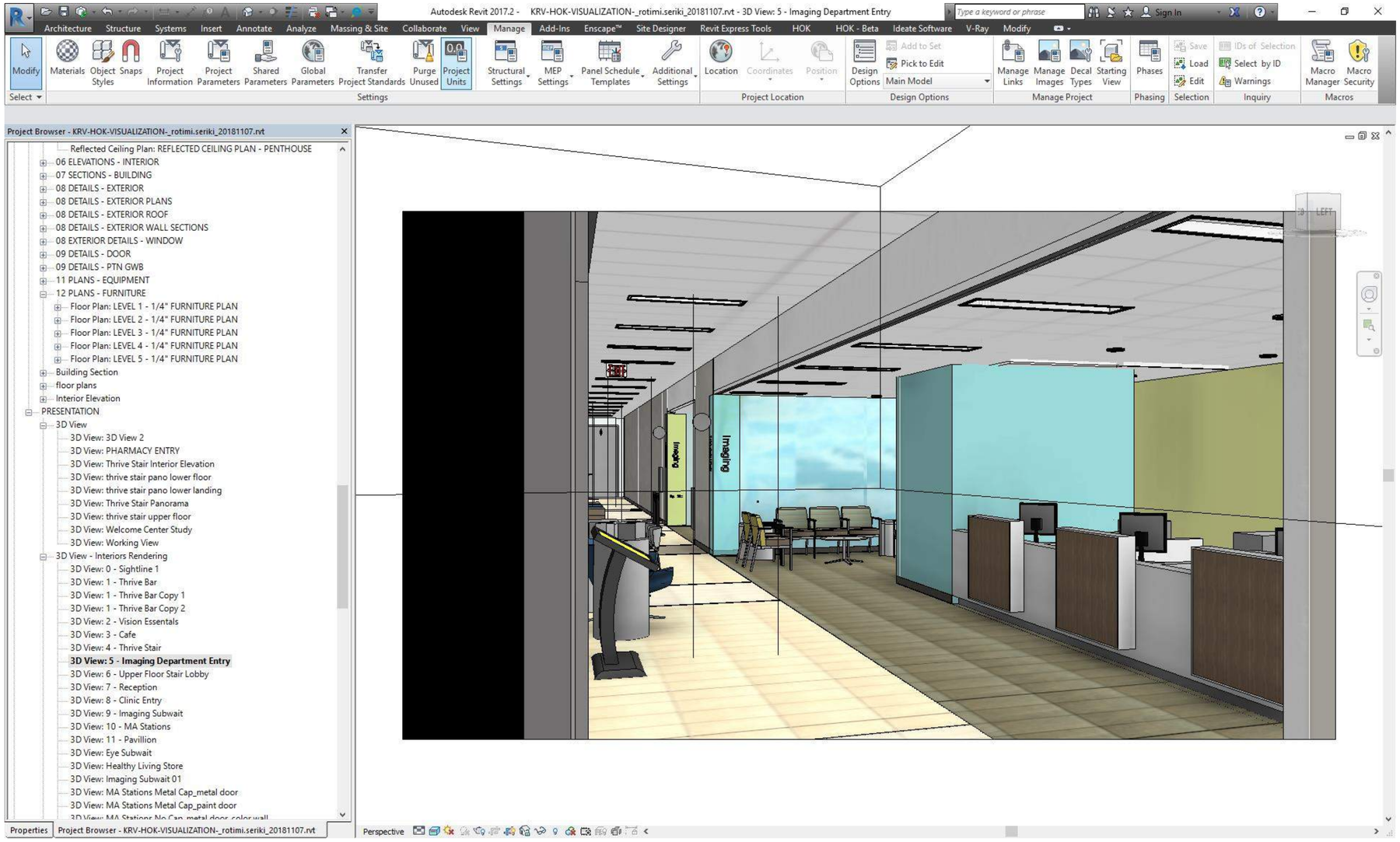
AUTODESK
REVIT

AUTODESK
REVIT

ENSCAPE™

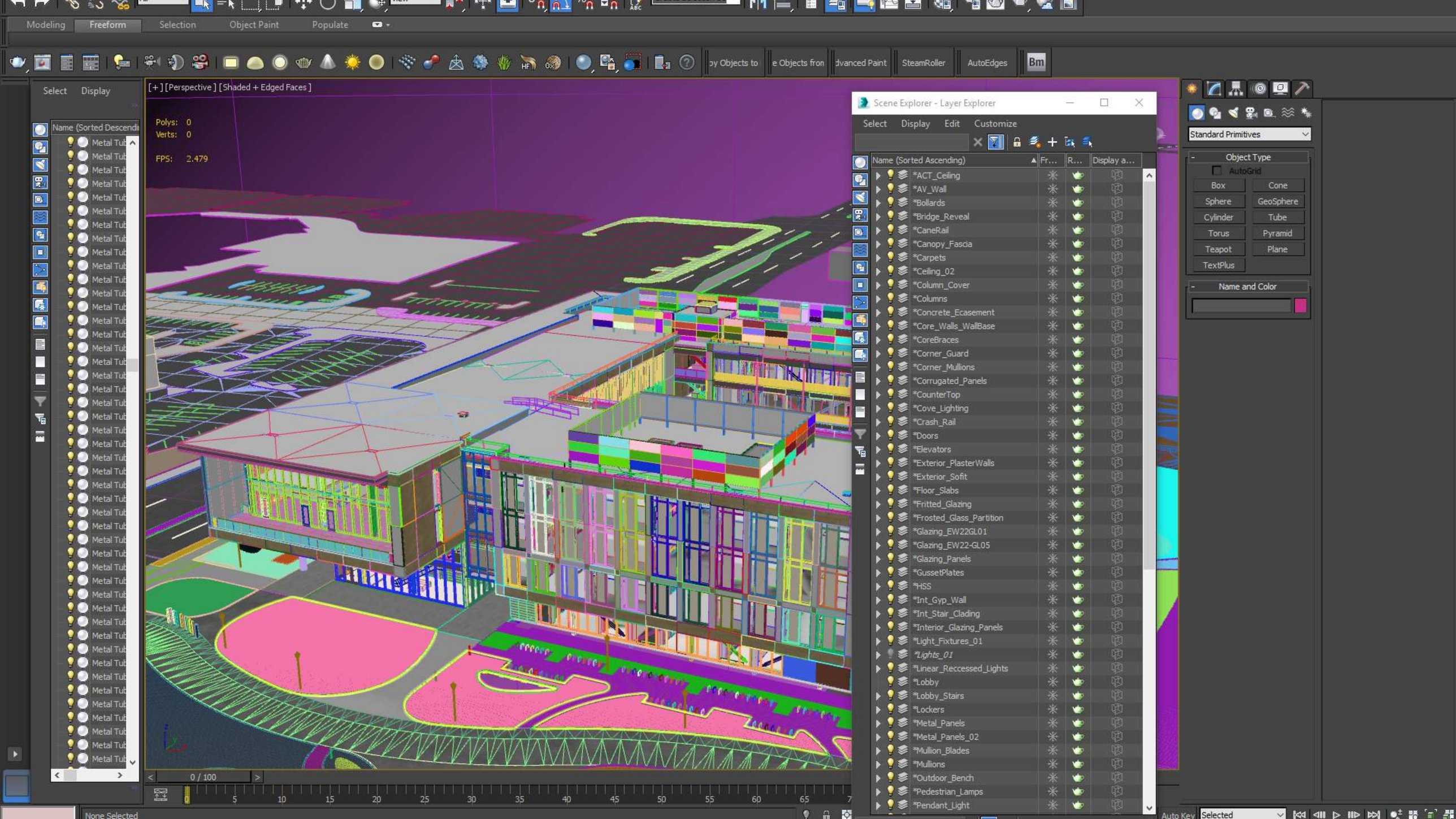
AUTODESK
REVIT

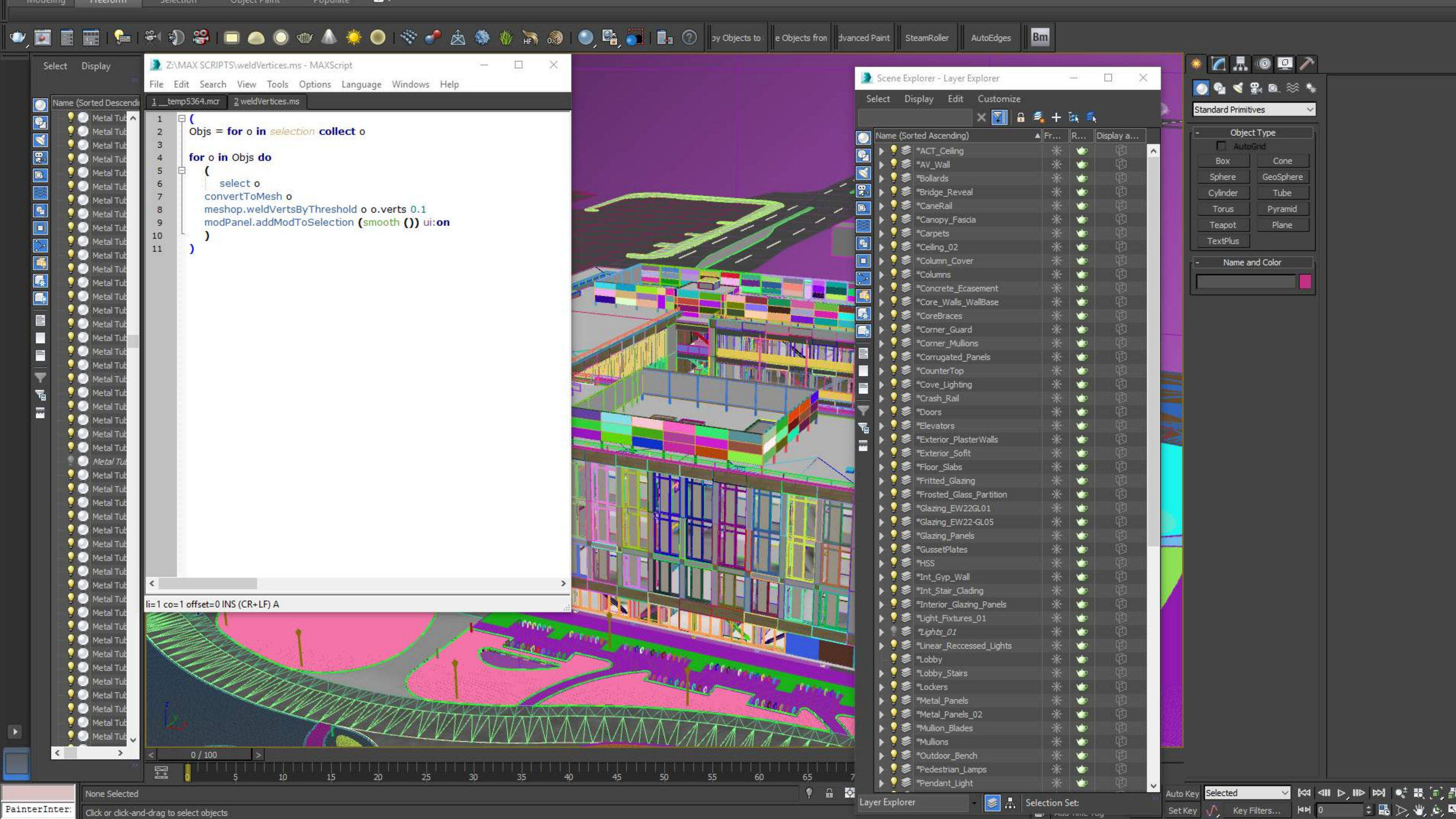
UNREAL
ENGINE


Autodesk Revit 2017.2 - KRV-HOK-VISUALIZATION-_rotimi.seriki_20181107.rvt - 3D View: 5 - Imaging Department Entry
Architecture Structure Systems Insert Annotate Analyze Massing & Site Collaborate View Manage Add-Ins Enscape™ Site Designer Revit Express Tools HOK HOK - Beta Ideate Software V-Ray Modify
Modify Materials Object Styles Snaps Project Information Project Parameters Shared Parameters Global Parameters Transfer Project Standards Purge Unused Project Units Structural Settings MEP Settings Panel Schedule Templates Additional Settings Location Coordinates Position Design Options Add to Set Pick to Edit Main Model Manage Links Manage Images Decal Types Starting View Phases Save Load Edit IDs of Selection Select by ID Warnings Macro Manager Macro Security
Select Settings Project Location Design Options Manage Project Phasing Selection Inquiry Macros
Project Browser - KRV-HOK-VISUALIZATION-_rotimi.seriki_20181107.rvt
Reflected Ceiling Plan: REFLECTED CEILING PLAN - PENTHOUSE
06 ELEVATIONS - INTERIOR
07 SECTIONS - BUILDING
08 DETAILS - EXTERIOR
08 DETAILS - EXTERIOR PLANS
08 DETAILS - EXTERIOR ROOF
08 DETAILS - EXTERIOR WALL SECTIONS
08 EXTERIOR DETAILS - WINDOW
09 DETAILS - DOOR
09 DETAILS - PTN GWB
11 PLANS - EQUIPMENT
12 PLANS - FURNITURE
Floor Plan: LEVEL 1 - 1/4" FURNITURE PLAN
Floor Plan: LEVEL 2 - 1/4" FURNITURE PLAN
Floor Plan: LEVEL 3 - 1/4" FURNITURE PLAN
Floor Plan: LEVEL 4 - 1/4" FURNITURE PLAN
Floor Plan: LEVEL 5 - 1/4" FURNITURE PLAN
Building Section
floor plans
Interior Elevation
PRESENTATION
3D View
3D View: 3D View 2
3D View: PHARMACY ENTRY
3D View: Thrive Stair Interior Elevation
3D View: thrive stair pano lower floor
3D View: thrive stair pano lower landing
3D View: Thrive Stair Panorama
3D View: thrive stair upper floor
3D View: Welcome Center Study
3D View: Working View
3D View - Interiors Rendering
3D View: 0 - Sightline 1
3D View: 1 - Thrive Bar
3D View: 1 - Thrive Bar Copy 1
3D View: 1 - Thrive Bar Copy 2
3D View: 2 - Vision Essentals
3D View: 3 - Cafe
3D View: 4 - Thrive Stair
3D View: 5 - Imaging Department Entry
3D View: 6 - Upper Floor Stair Lobby
3D View: 7 - Reception
3D View: 8 - Clinic Entry
3D View: 9 - Imaging Subwait
3D View: 10 - MA Stations
3D View: 11 - Pavillion
3D View: Eye Subwait
3D View: Healthy Living Store
3D View: Imaging Subwait 01
3D View: MA Stations Metal Cap_metal door
3D View: MA Stations Metal Cap_paint door
Imaging
Imaging
Perspective
Properties
Project Browser - KRV-HOK-VISUALIZATION-_rotimi.seriki_20181107.rvt


FBX


MAX


Modeling
Freeform
Selection
Object Paint
Populate
Select
Display
[+] [Perspective] [Shaded + Edged Faces]
Polys: 0
Verts: 0
FPS: 2.479
Scene Explorer - Layer Explorer
Select
Display
Edit
Customize
Name (Sorted Ascending)
*ACT_Ceiling
*AV_Wall
*Bollards
*Bridge_Reveal
*CaneRail
*Canopy_Fascia
*Carpets
*Ceiling_02
*Column_Cover
*Columns
*Concrete_Ecasement
*Core_Walls_WallBase
*CoreBraces
*Corner_Guard
*Corner_Mullions
*Corrugated_Panels
*CounterTop
*Cove_Lighting
*Crash_Rail
*Doors
*Elevators
*Exterior_PlasterWalls
*Exterior_Sofit
*Floor_Slabs
*Fritted_Glazing
*Frosted_Glass_Partition
*Glazing_EW22GL01
*Glazing_EW22-GL05
*Glazing_Panels
*GussetPlates
*HSS
*Int_Gyp_Wall
*Int_Stair_Clading
*Interior_Glazing_Panels
*Light_Fixtures_01
*Lights_01
*Linear_Reccessed_Lights
*Lobby
*Lobby_Stairs
*Lockers
*Metal_Panels
*Metal_Panels_02
*Mullion_Blades
*Mullions
*Outdoor_Bench
*Pedestrian_Lamps
*Pendant_Light
Standard Primitives
Object Type
AutoGrid
Box
Cone
Sphere
GeoSphere
Cylinder
Tube
Torus
Pyramid
Teapot
Plane
TextPlus
Name and Color
0 / 100
None Selected
Auto Key
Selected


Z:\MAX SCRIPTS\weldVertices.ms - MAXScript
File Edit Search View Tools Options Language Windows Help
1 __temp5364.mcr
2 weldVertices.ms
(
Objs = for o in selection collect o
for o in Objs do
(
select o
convertToMesh o
meshop.weldVertsByThreshold o o.verts 0.1
modPanel.addModToSelection (smooth ()) ui:on
)
)
li=1 co=1 offset=0 INS (CR+LF) A
Scene Explorer - Layer Explorer
Select Display Edit Customize
Name (Sorted Ascending)
*ACT_Ceiling
*AV_Wall
*Bollards
*Bridge_Reveal
*CaneRail
*Canopy_Fascia
*Carpets
*Ceiling_02
*Column_Cover
*Columns
*Concrete_Ecasement
*Core_Walls_WallBase
*CoreBraces
*Corner_Guard
*Corner_Mullions
*Corrugated_Panels
*CounterTop
*Cove_Lighting
*Crash_Rail
*Doors
*Elevators
*Exterior_PlasterWalls
*Exterior_Sofit
*Floor_Slabs
*Fritted_Glazing
*Frosted_Glass_Partition
*Glazing_EW22GL01
*Glazing_EW22-GL05
*Glazing_Panels
*GussetPlates
*HSS
*Int_Gyp_Wall
*Int_Stair_Cladding
*Interior_Glazing_Panels
*Light_Fixtures_01
*Lights_01
*Linear_Reccessed_Lights
*Lobby
*Lobby_Stairs
*Lockers
*Metal_Panels
*Metal_Panels_02
*Mullion_Blades
*Mullions
*Outdoor_Bench
*Pedestrian_Lamps
*Pendant_Light
Standard Primitives
Object Type
AutoGrid
Box Cone
Sphere GeoSphere
Cylinder Tube
Torus Pyramid
Teapot Plane
TextPlus
Name and Color
0 / 100
None Selected
Click or click-and-drag to select objects
Layer Explorer
Selection Set:
Auto Key
Selected
Set Key
Key Filters...


3
MAX


Engine Versions
Add
Learn
Marketplace
Library
4.19.0
Launch
Installed Plugins
My Projects
Launch
Unreal Engine Preview
Unreal Studio Plugins


UNREAL
ENGINE

Community
Learn
Marketplace
Library

Launch
Unreal Engine 4.19.2

Subscription Status:
Unreal Studio Beta
Active

ENGINE VERSIONS

GITHUB SOURCE | RELEASE NOTES | 40.1 GiB

4.19.2
Launch
Installed Plugins

Install

4.20.3
Launch
Installed Plugins

MY PROJECTS

Search Projects

UNREAL STUDIO BETA

LEARNING | DOCUMENTATION | SUPPORT

Exporter Plugins
Get

Unreal Datasmith
Install to Engine

Unreal Project Browser

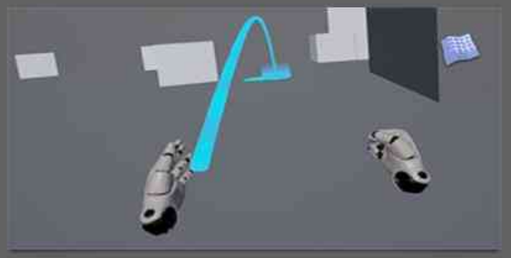
Projects | New Project

Choose a **template** to use as a starting point for your new project. Any of these features can be added later by clicking **Add Feature or Content Pack** in **Content Browser**.

Blueprint | C++ | Unreal Studio

Blank | First Person | Flying | Handheld AR | nDisplay | Puzzle | Rolling | Side Scroller | 2D Side Scroller | Third Person | Top Down | Twin Stick Shooter

Vehicle | Virtual Reality | Vehicle Advanced

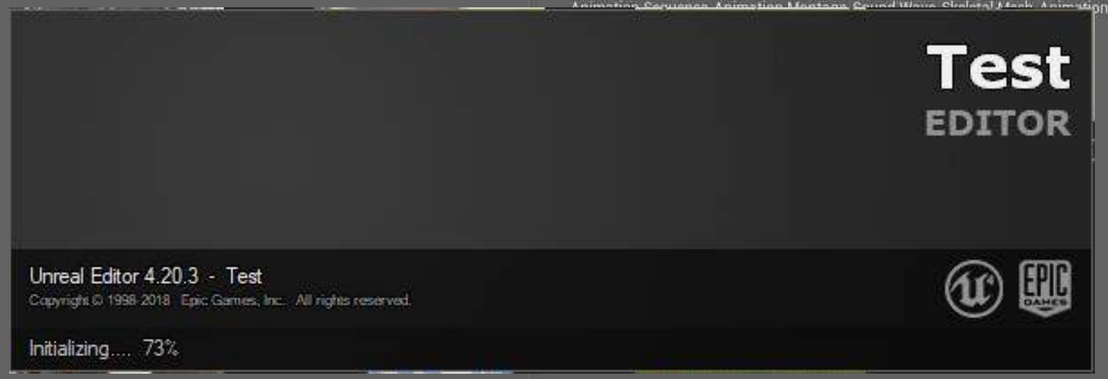


Virtual Reality

Blueprint Virtual Reality Template for Desktop and Playstation VR. The template features two modes of teleport locomotion with separate pawns and maps for each. The MotionControllerMap lets players teleport around using motion controllers. The HMDLocomotionMap lets players teleport using either a Gamepad or point-and-teleport using just the HeadMountedDisplay.

Asset Type References:

Animation Sequence, Animation Montage, Sound Wave, Skeletal Mesh, Animation Blueprint, Skeleton, Static Mesh, Texture.



Choose some **settings** for your project. Don't worry, you can change these later in the **Target Hardware** section of **Project Settings**. You can also add the **Starter Content** to your project later using **Content Browser**.

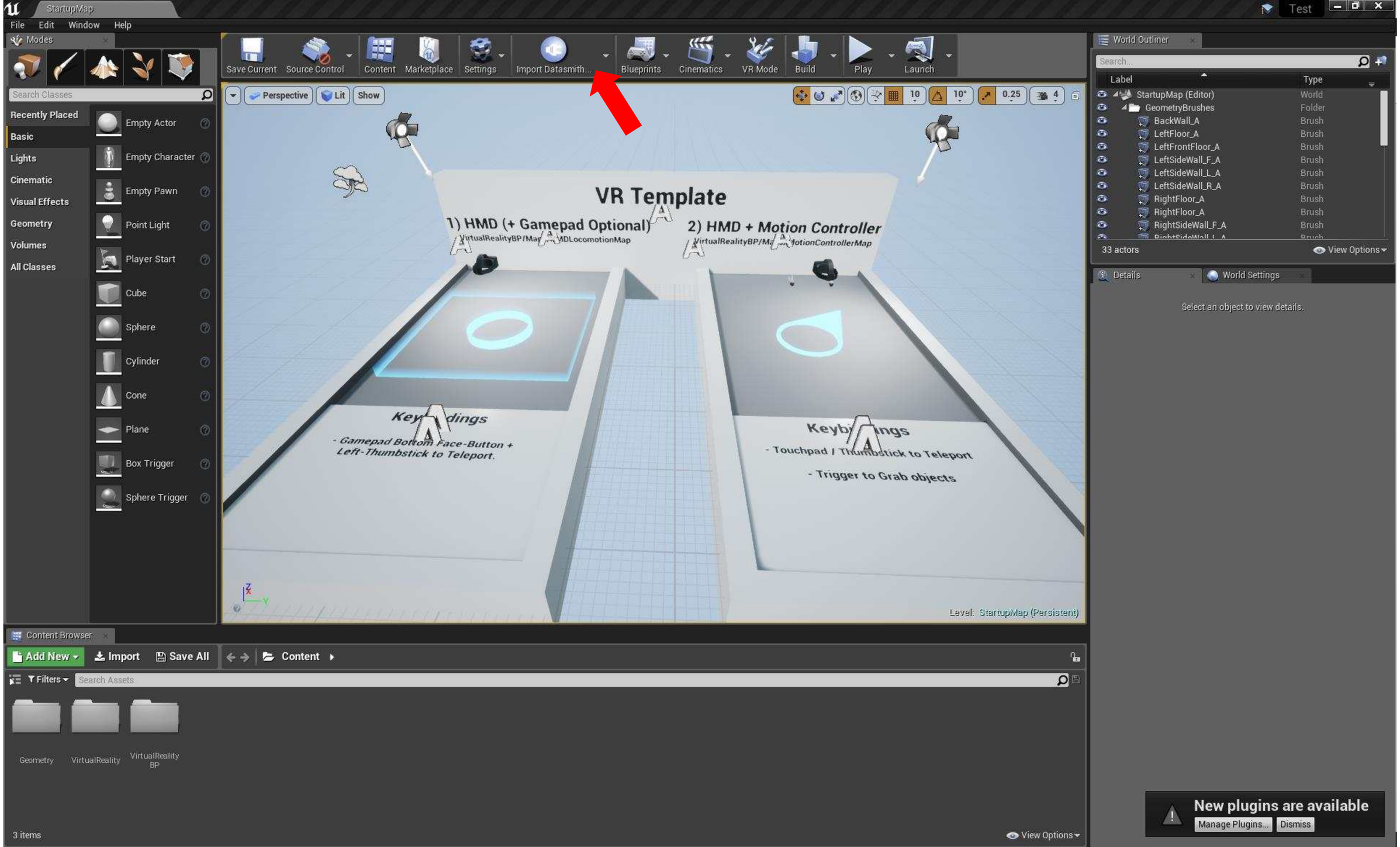
Desktop / Console | Maximum Quality | No Starter Content

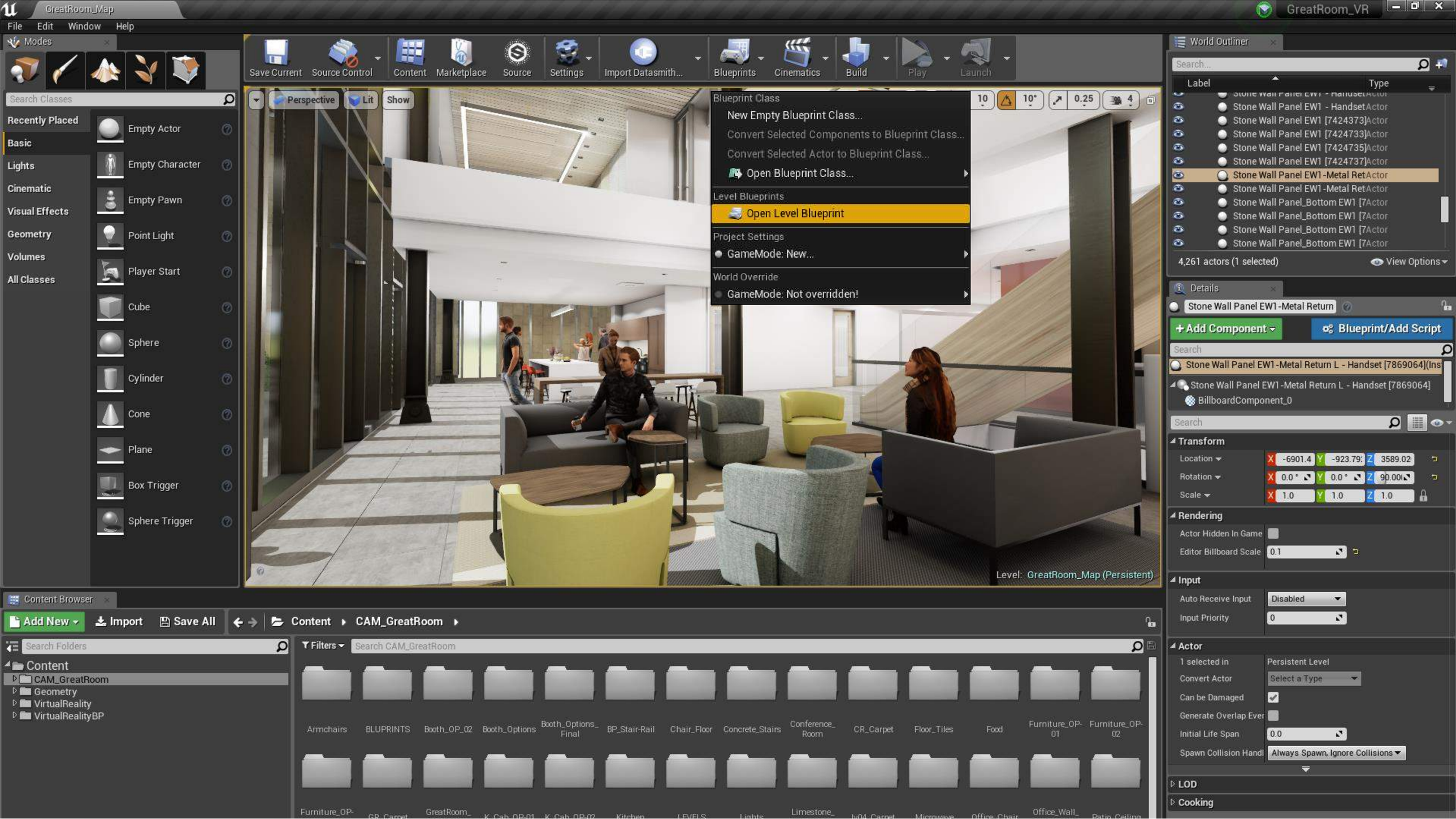
Select a **location** for your project to be stored.

C:\Users\rotimi.seriki\Documents\Unreal Projects\KWRC\U ... | Test

Folder | Name

Create Project


StartupMap
File Edit Window Help
Test
Modes
Search Classes
Recently Placed
Basic
Lights
Cinematic
Visual Effects
Geometry
Volumes
All Classes
Empty Actor
Empty Character
Empty Pawn
Point Light
Player Start
Cube
Sphere
Cylinder
Cone
Plane
Box Trigger
Sphere Trigger
Save Current
Source Control
Content
Marketplace
Settings
Import Datasmith...
Blueprints
Cinematics
VR Mode
Build
Play
Launch
Perspective
Lit
Show
VR Template
1) HMD (+ Gamepad Optional)
2) HMD + Motion Controller
- Gamepad Bottom Face-Button + Left-Thumbstick to Teleport.
- Touchpad / Thumbstick to Teleport
- Trigger to Grab objects
Level: StartupMap (Persistent)
World Outliner
Search...
Label
Type
StartupMap (Editor)
World
GeometryBrushes
Folder
BackWall_A
LeftFloor_A
LeftFrontFloor_A
LeftSideWall_F_A
LeftSideWall_L_A
LeftSideWall_R_A
RightFloor_A
RightFloor_A
RightSideWall_F_A
Brush
33 actors
View Options
Details
World Settings
Select an object to view details.
Content Browser
Add New
Import
Save All
Content
Filters
Search Assets
Geometry
VirtualReality
VirtualReality BP
3 items
View Options
New plugins are available
Manage Plugins...
Dismiss

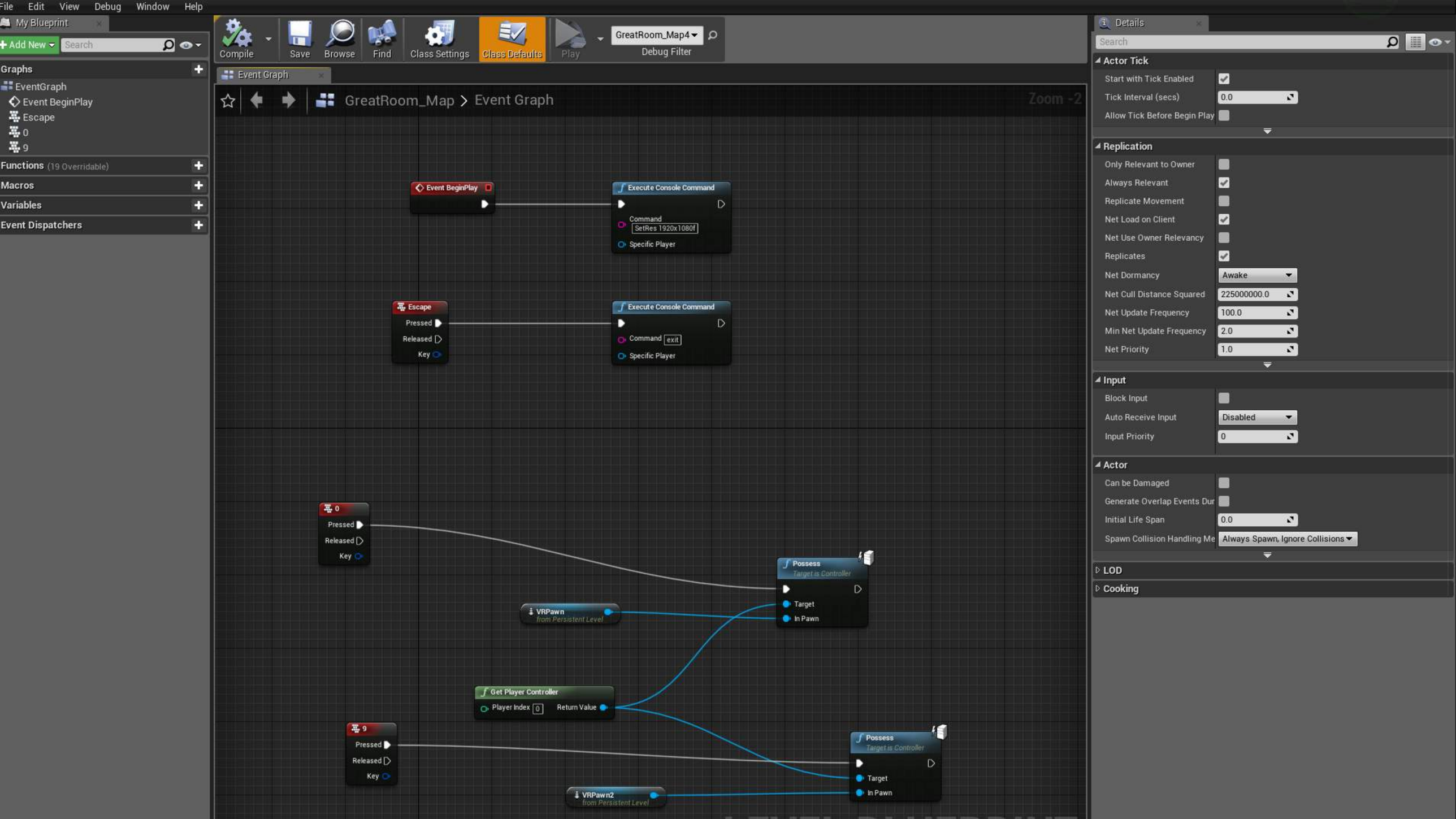

GreatRoom_Map
GreatRoom_VR
File Edit Window Help
Modes
Save Current
Source Control
Content
Marketplace
Source
Settings
Import Datasmith...
Blueprints
Cinematics
Build
Play
Launch
Search Classes
Recently Placed
Basic
Lights
Cinematic
Visual Effects
Geometry
Volumes
All Classes
Empty Actor
Empty Character
Empty Pawn
Point Light
Player Start
Cube
Sphere
Cylinder
Cone
Plane
Box Trigger
Sphere Trigger
Perspective
Lit
Show
Blueprint Class
New Empty Blueprint Class...
Convert Selected Components to Blueprint Class...
Convert Selected Actor to Blueprint Class...
Open Blueprint Class...
Level Blueprints
Open Level Blueprint
Project Settings
GameMode: New...
World Override
GameMode: Not overridden!
Level: GreatRoom_Map (Persistent)
World Outliner
Search...
Label
Type
Stone Wall Panel EW1 - Handset Actor
Stone Wall Panel EW1 [7424373] Actor
Stone Wall Panel EW1 [7424733] Actor
Stone Wall Panel EW1 [7424735] Actor
Stone Wall Panel EW1 [7424737] Actor
Stone Wall Panel EW1-Metal Ret Actor
Stone Wall Panel_Bottom EW1 [7 Actor
4,261 actors (1 selected)
View Options
Details
Stone Wall Panel EW1-Metal Return
+ Add Component
Blueprint/Add Script
Stone Wall Panel EW1-Metal Return L - Handset [7869064](Ins
Stone Wall Panel EW1-Metal Return L - Handset [7869064]
BillboardComponent_0
Transform
Location
Rotation
Scale
Rendering
Actor Hidden In Game
Editor Billboard Scale
Input
Auto Receive Input
Disabled
Input Priority
Actor
1 selected in
Persistent Level
Convert Actor
Select a Type
Can be Damaged
Generate Overlap Ever
Initial Life Span
Spawn Collision Handl
Always Spawn, Ignore Collisions
LOD
Cooking
Content Browser
Add New
Import
Save All
Content
CAM_GreatRoom
Search Folders
Search CAM_GreatRoom
Filters
Content
CAM_GreatRoom
Geometry
VirtualReality
VirtualRealityBP
Armchairs
BLUPRINTS
Booth_OP_02
Booth_Options
Booth_Options_Final
BP_Stair-Rail
Chair_Floor
Concrete_Stairs
Conference_Room
CR_Carpet
Floor_Tiles
Food
Furniture_OP-01
Furniture_OP-02
Furniture_OP-
GR_Carpet
GreatRoom_
K_Cab_OP-01
K_Cab_OP-02
Kitchen
LEVELS
Lights
Limestone_
lv04_Carpet
Microwave
Office_Chair
Office_Wall_
Patio_Ceiling

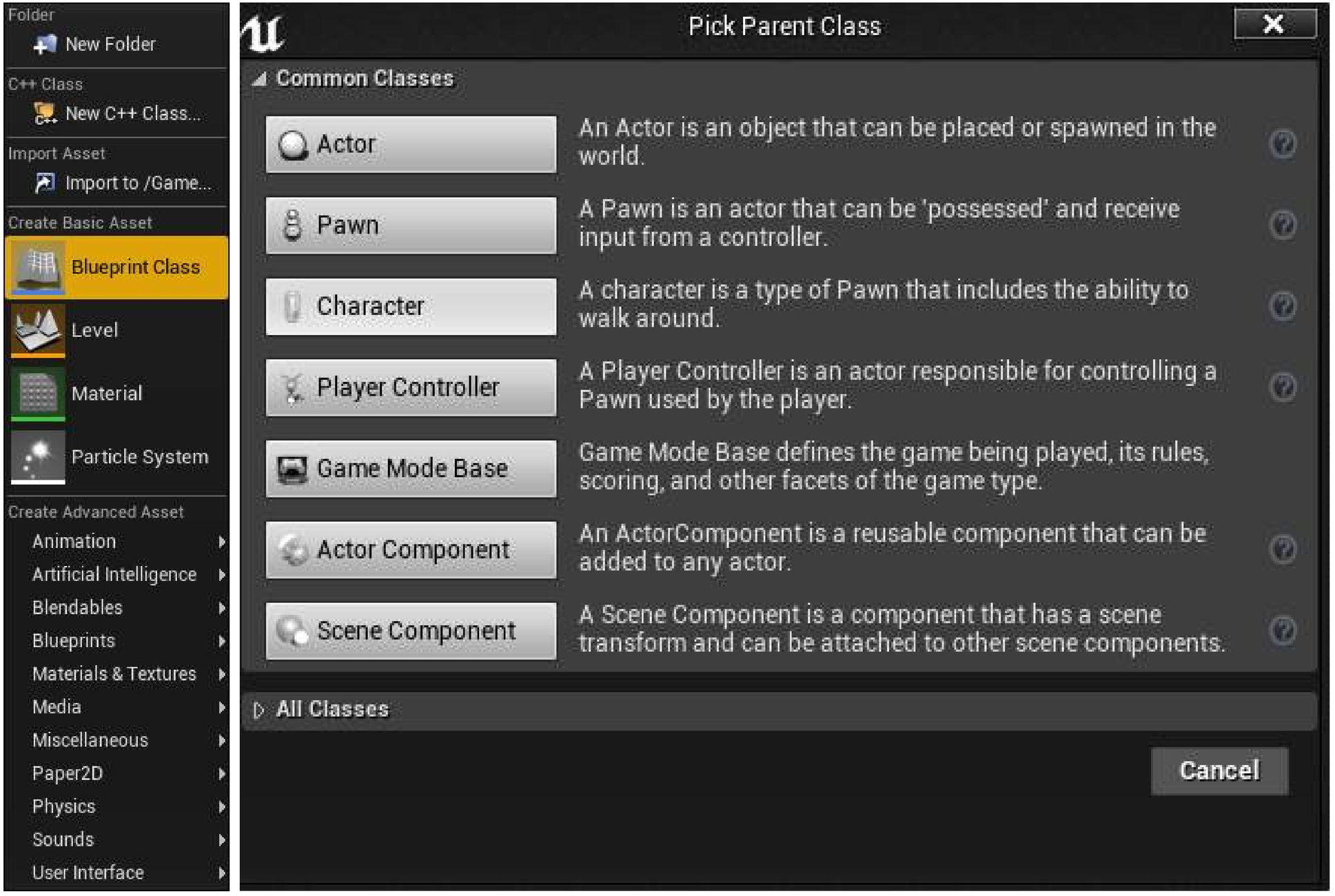
What are Blueprints

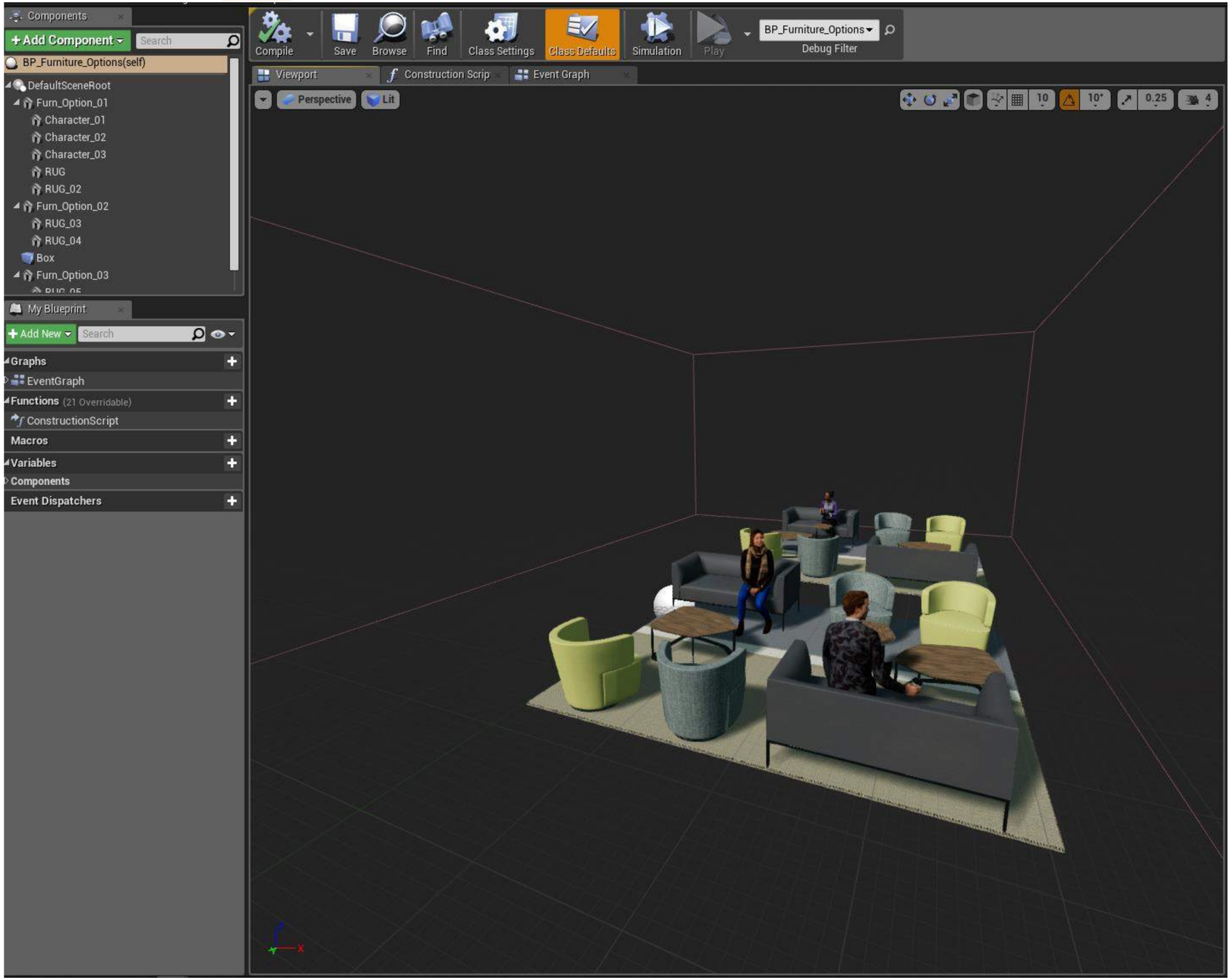
Blueprints is a **gameplay visual scripting system** based on the concept of using a node-based interface to create gameplay elements from within the Unreal Editor.

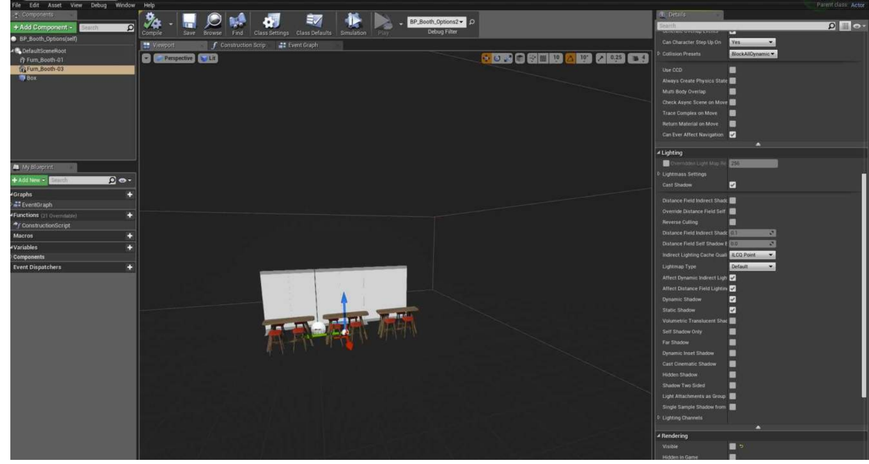
Types of Blueprints

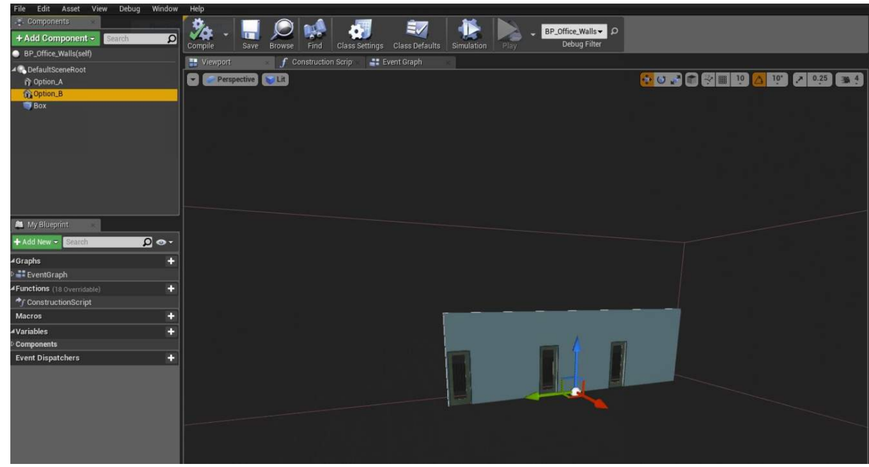
- Blueprint Class
- Data-Only Blueprint
- Level Blueprint

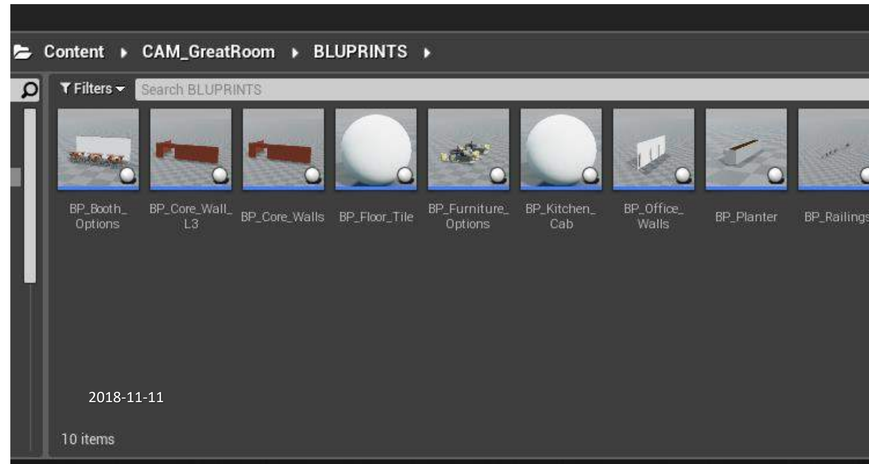

File
Edit
View
Debug
Window
Help
My Blueprint
Add New
Search
Graphs
EventGraph
Event BeginPlay
Escape
0
9
Functions (19 Overridable)
Macros
Variables
Event Dispatchers
Compile
Save
Browse
Find
Class Settings
Class Defaults
Play
GreatRoom_Map4
Debug Filter
Event Graph
GreatRoom_Map > Event Graph
Zoom -2
Event BeginPlay
Execute Console Command
Command
SetRes 1920x1080f
Specific Player
Escape
Pressed
Released
Key
Execute Console Command
Command
exit
Specific Player
0
Pressed
Released
Key
Possess
Target is Controller
Target
In Pawn
VRPawn
from Persistent Level
Get Player Controller
Player Index
0
Return Value
9
Pressed
Released
Key
Possess
Target is Controller
Target
In Pawn
VRPawn2
from Persistent Level
Details
Search
Actor Tick
Start with Tick Enabled
Tick Interval (secs)
0.0
Allow Tick Before Begin Play
Replication
Only Relevant to Owner
Always Relevant
Replicate Movement
Net Load on Client
Net Use Owner Relevancy
Replicates
Net Dormancy
Awake
Net Cull Distance Squared
225000000.0
Net Update Frequency
100.0
Min Net Update Frequency
2.0
Net Priority
1.0
Input
Block Input
Auto Receive Input
Disabled
Input Priority
0
Actor
Can be Damaged
Generate Overlap Events Dur
Initial Life Span
0.0
Spawn Collision Handling Me
Always Spawn, Ignore Collisions
LOD
Cooking

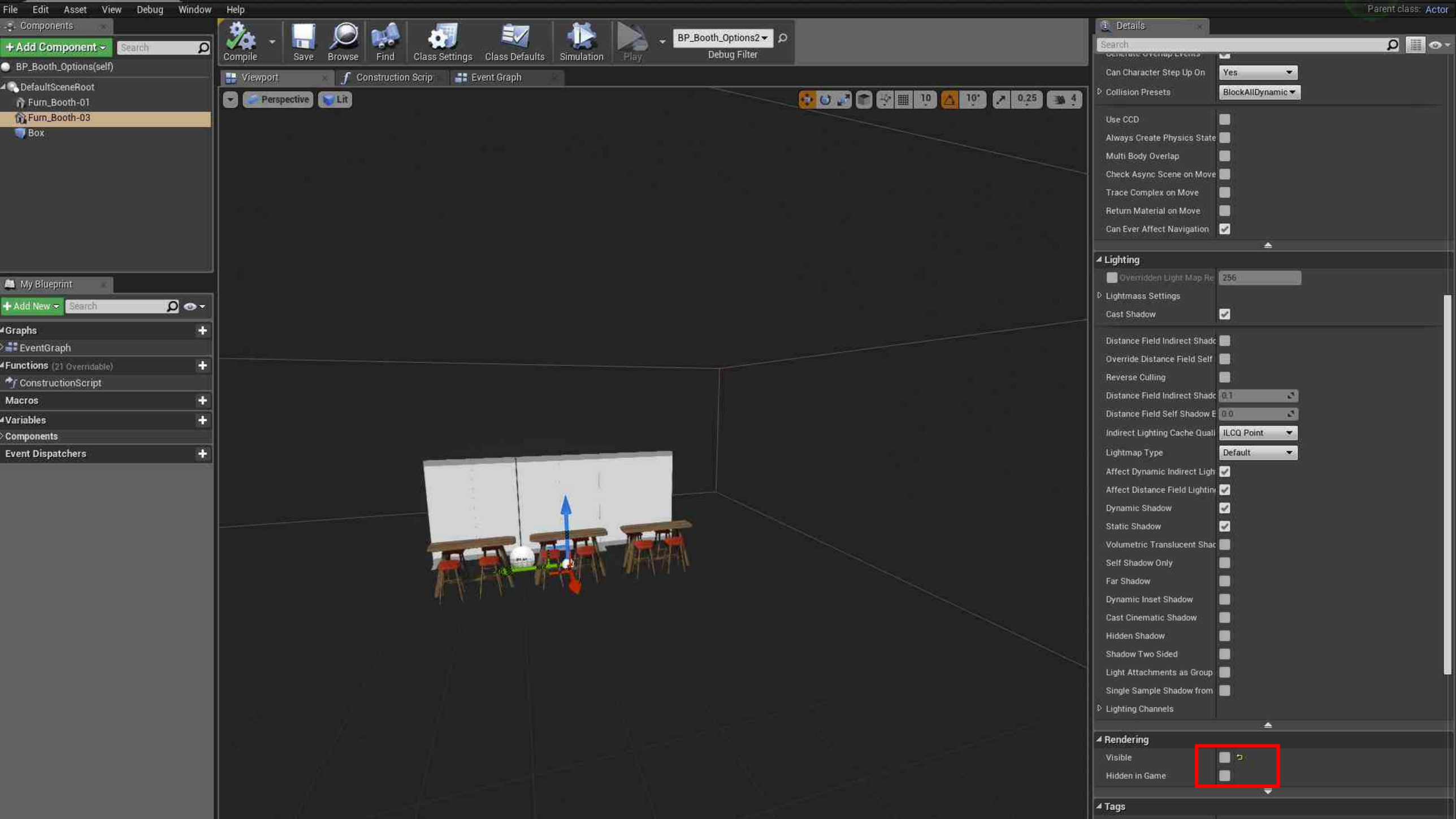

Folder
New Folder
C++ Class
New C++ Class...
Import Asset
Import to /Game...
Create Basic Asset
Blueprint Class
Level
Material
Particle System
Create Advanced Asset
Animation
Artificial Intelligence
Blendables
Blueprints
Materials & Textures
Media
Miscellaneous
Paper2D
Physics
Sounds
User Interface
Pick Parent Class
Common Classes
Actor
An Actor is an object that can be placed or spawned in the world.
Pawn
A Pawn is an actor that can be 'possessed' and receive input from a controller.
Character
A character is a type of Pawn that includes the ability to walk around.
Player Controller
A Player Controller is an actor responsible for controlling a Pawn used by the player.
Game Mode Base
Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.
Actor Component
An ActorComponent is a reusable component that can be added to any actor.
Scene Component
A Scene Component is a component that has a scene transform and can be attached to other scene components.
All Classes
Cancel


Components
+ Add Component
Search
BP_Furniture_Options(self)
DefaultSceneRoot
Furn_Option_01
Character_01
Character_02
Character_03
RUG
RUG_02
Furn_Option_02
RUG_03
RUG_04
Box
Furn_Option_03
My Blueprint
+ Add New
Search
Graphs
EventGraph
Functions (21 Overridable)
ConstructionScript
Macros
Variables
Components
Event Dispatchers
Compile
Save
Browse
Find
Class Settings
Class Defaults
Simulation
Play
BP_Furniture_Options
Debug Filter
Viewport
Construction Scrip
Event Graph
Perspective
Lit
10
10°
0.25
4






Content
CAM_GreatRoom
BLUPRINTS
Filters
Search BLUPRINTS
BP_Booth_Options
BP_Core_Wall_L3
BP_Core_Walls
BP_Floor_Tile
BP_Furniture_Options
BP_Kitchen_Cab
BP_Office_Walls
BP_Planter
BP_Railings
2018-11-11
10 items


File
Edit
Asset
View
Debug
Window
Help
Parent class: Actor
Components
+ Add Component
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DefaultSceneRoot
Furn_Booth-01
Furn_Booth-03
Box
My Blueprint
+ Add New
Search
Graphs
EventGraph
Functions (21 Overridable)
ConstructionScript
Macros
Variables
Components
Event Dispatchers
Compile
Save
Browse
Find
Class Settings
Class Defaults
Simulation
Play
BP_Booth_Options2
Debug Filter
Viewport
Construction Scrip
Event Graph
Perspective
Lit
Details
Search
Can Character Step Up On
Yes
Collision Presets
BlockAllDynamic
Use CCD
Always Create Physics State
Multi Body Overlap
Check Async Scene on Move
Trace Complex on Move
Return Material on Move
Can Ever Affect Navigation
Lighting
Overridden Light Map Re
256
Lightmass Settings
Cast Shadow
Distance Field Indirect Shadc
Override Distance Field Self
Reverse Culling
Distance Field Indirect Shadc
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Indirect Lighting Cache Quali
ILCQ Point
Lightmap Type
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Affect Dynamic Indirect Ligh
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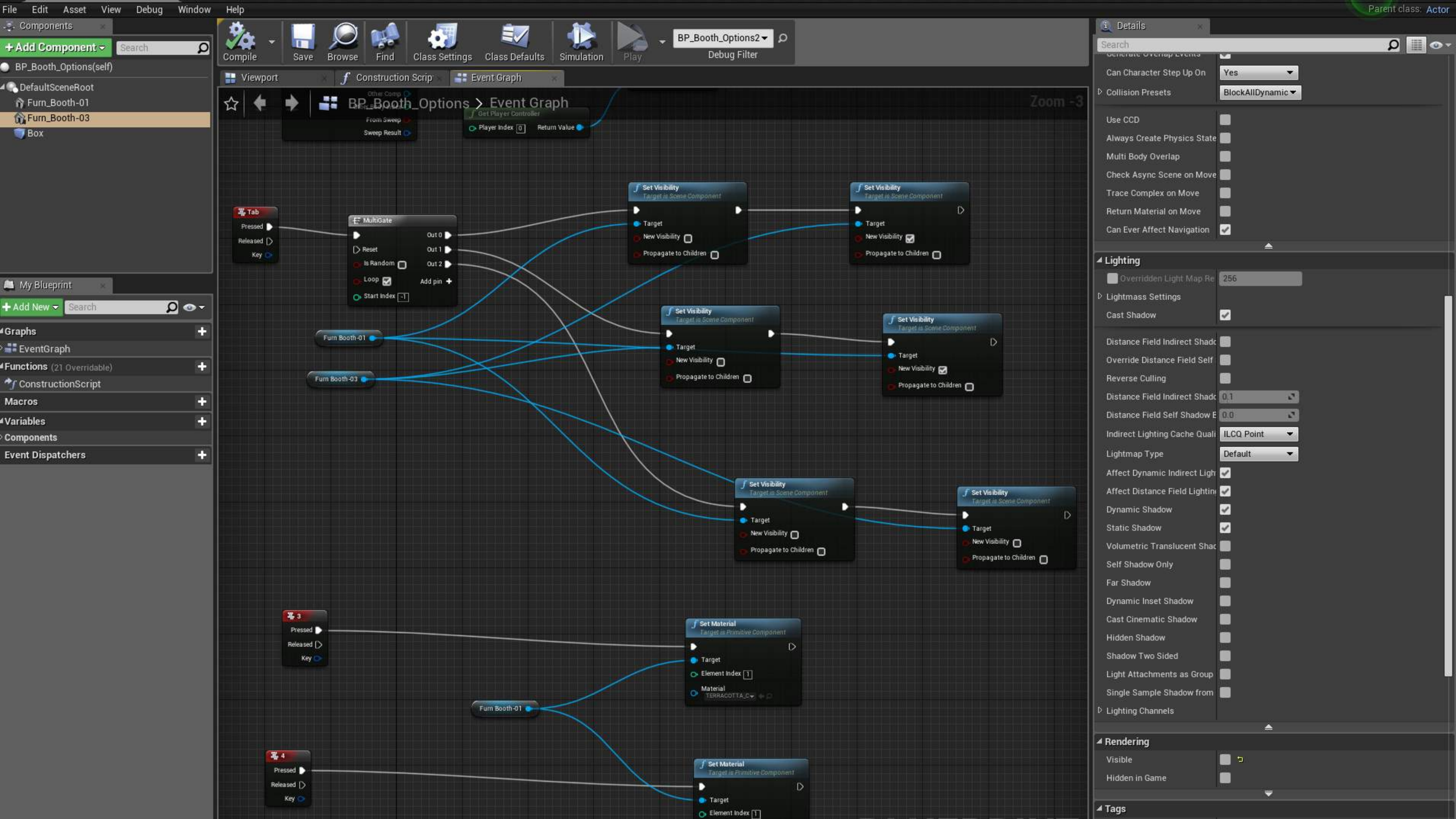
Dynamic Shadow
Static Shadow
Volumetric Translucent Shac
Self Shadow Only
Far Shadow
Dynamic Inset Shadow
Cast Cinematic Shadow
Hidden Shadow
Shadow Two Sided
Light Attachments as Group
Single Sample Shadow from
Lighting Channels
Rendering
Visible
Hidden in Game
Tags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Furn_Booth-01
Furn_Booth-03
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My Blueprint
+ Add New
Search
Graphs
EventGraph
Functions (21 Overridable)
ConstructionScript
Macros
Variables
Components
Event Dispatchers
Compile
Save
Browse
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Class Settings
Class Defaults
Simulation
Play
BP_Booth_Options2
Debug Filter
Viewport
Construction Scrip
Event Graph
BP_Booth_Options > Event Graph
Zoom -3
Tab
Pressed
Released
Key
MultiGate
Reset
Is Random
Loop
Start Index
Out 0
Out 1
Out 2
Add pin
Furn Booth-01
Furn Booth-03
Set Visibility
Target is Scene Component
Target
New Visibility
Propagate to Children
Get Player Controller
Player Index
Return Value
Sweep Result
3
4
Set Material
Target is Primitive Component
Element Index
Material
Details
Search
Can Character Step Up On
Yes
Collision Presets
BlockAllDynamic
Use CCD
Always Create Physics State
Multi Body Overlap
Check Async Scene on Move
Trace Complex on Move
Return Material on Move
Can Ever Affect Navigation
Lighting
Overridden Light Map Re
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Lightmass Settings
Cast Shadow
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Override Distance Field Self
Reverse Culling
Distance Field Indirect Shadc
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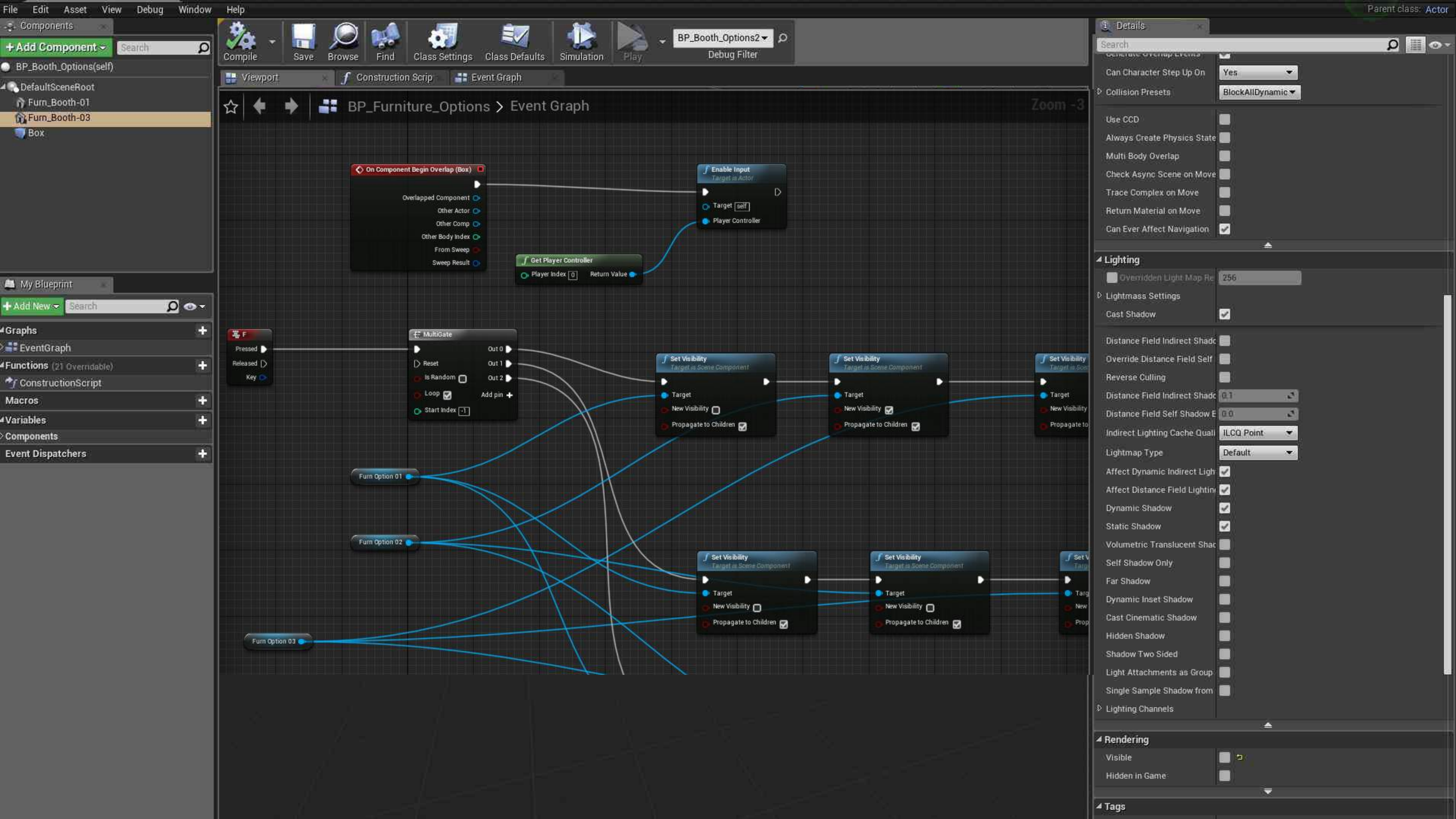
Self Shadow Only
Far Shadow
Dynamic Inset Shadow
Cast Cinematic Shadow
Hidden Shadow
Shadow Two Sided
Light Attachments as Group
Single Sample Shadow from
Lighting Channels
Rendering
Visible
Hidden in Game
Tags


File
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Asset
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Debug
Window
Help
Parent class: Actor
Components
+ Add Component
Search
BP_Booth_Options(self)
DefaultSceneRoot
Furn_Booth-01
Furn_Booth-03
Box
My Blueprint
+ Add New
Search
Graphs
EventGraph
Functions (21 Overridable)
ConstructionScript
Macros
Variables
Components
Event Dispatchers
Compile
Save
Browse
Find
Class Settings
Class Defaults
Simulation
Play
BP_Booth_Options2
Debug Filter
Viewport
Construction Scrip
Event Graph
BP_Furniture_Options > Event Graph
Zoom -3
On Component Begin Overlap (Box)
Overlapped Component
Other Actor
Other Comp
Other Body Index
From Sweep
Sweep Result
Enable Input
Target is Actor
Target self
Player Controller
Get Player Controller
Player Index 0
Return Value
F
Pressed
Released
Key
MultiGate
Reset
Is Random
Loop
Start Index -1
Out 0
Out 1
Out 2
Add pin
Set Visibility
Target is Scene Component
Target
New Visibility
Propagate to Children
Furn Option 01
Furn Option 02
Furn Option 03
Details
Search
Can Character Step Up On
Yes
Collision Presets
BlockAllDynamic
Use CCD
Always Create Physics State
Multi Body Overlap
Check Async Scene on Move
Trace Complex on Move
Return Material on Move
Can Ever Affect Navigation
Lighting
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Cast Shadow
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Override Distance Field Self
Reverse Culling
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Distance Field Self Shadow E
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ILCQ Point
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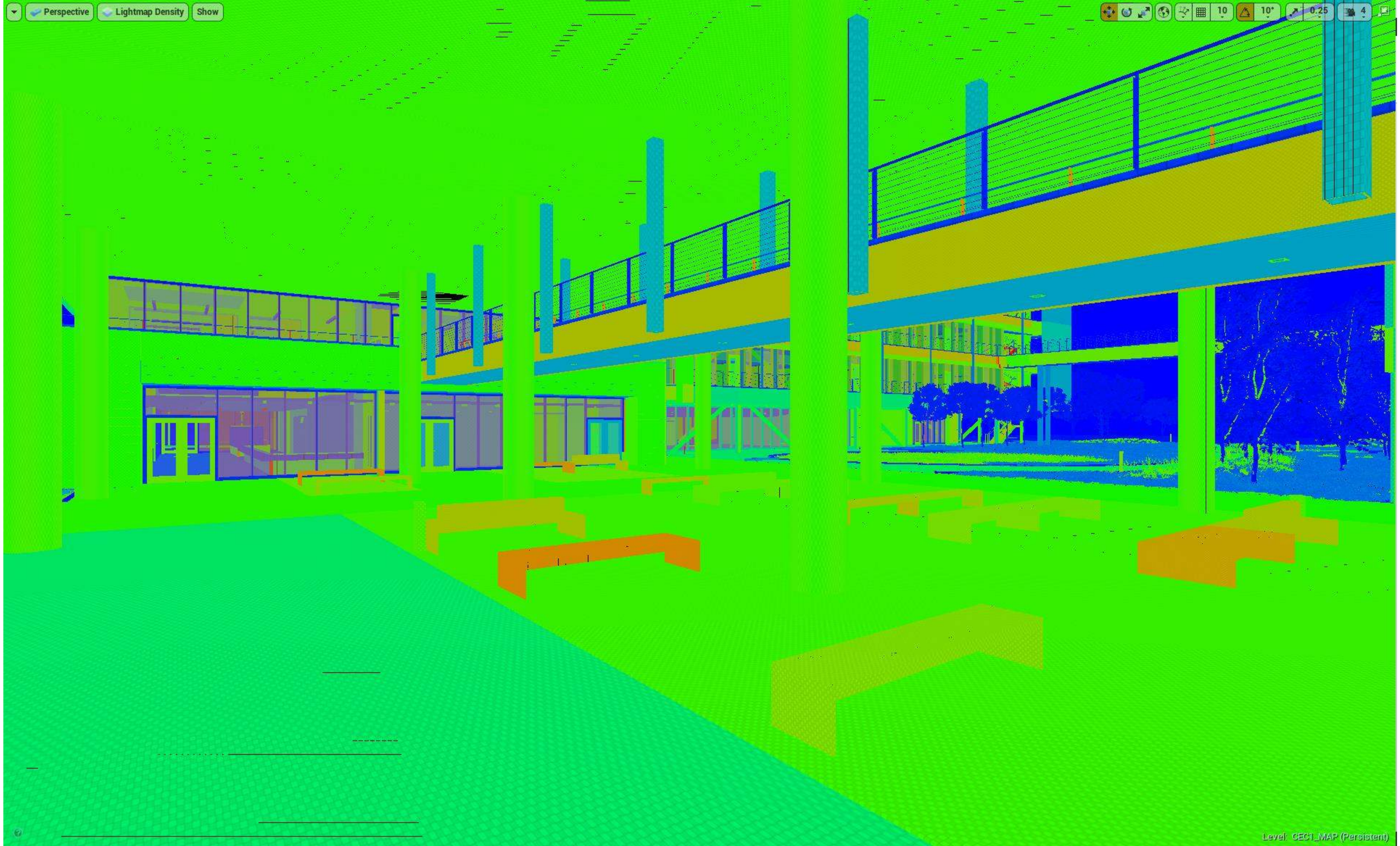
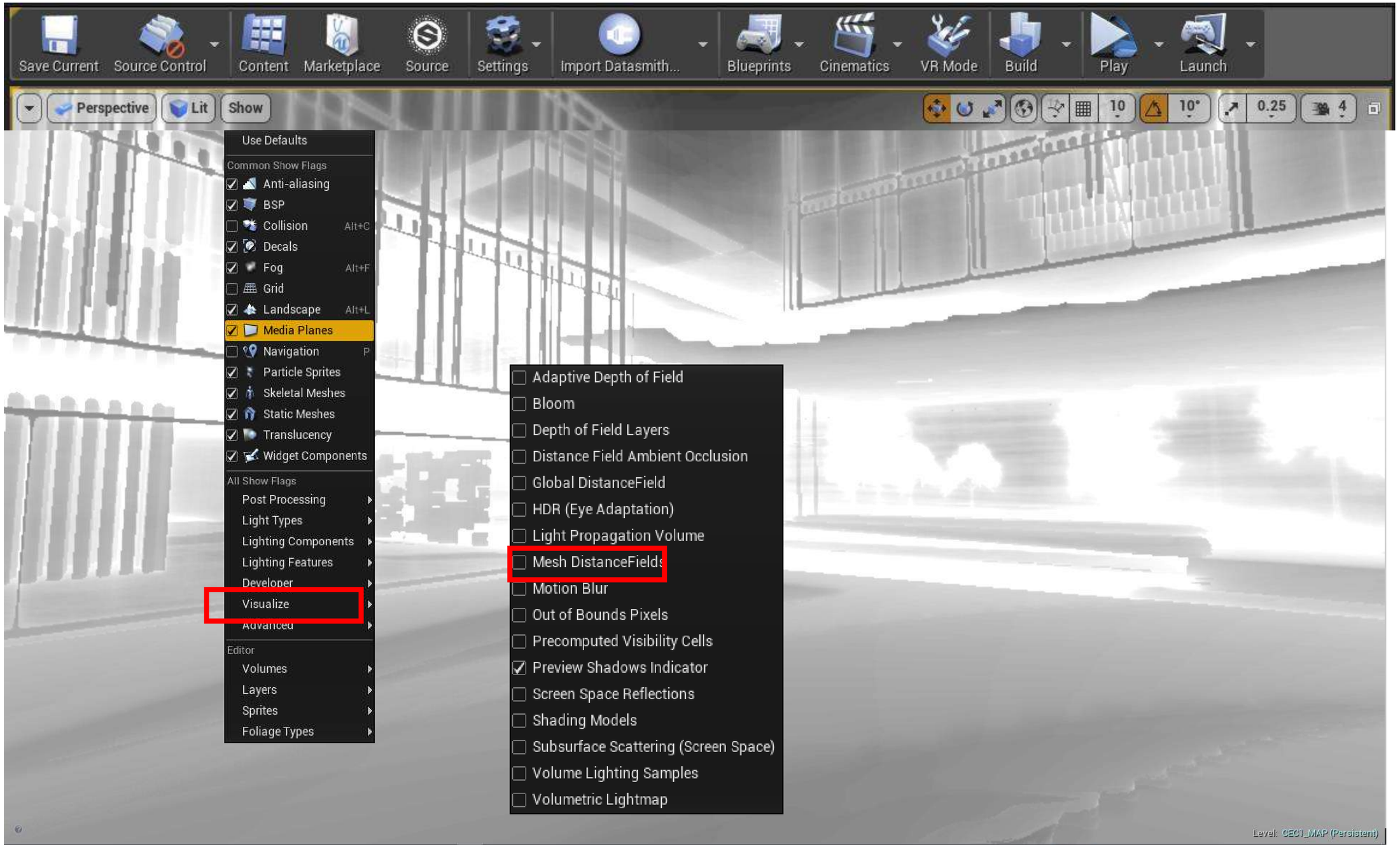
Volumetric Translucent Shac
Self Shadow Only
Far Shadow
Dynamic Inset Shadow
Cast Cinematic Shadow
Hidden Shadow
Shadow Two Sided
Light Attachments as Group
Single Sample Shadow from
Lighting Channels
Rendering
Visible
Hidden in Game
Tags

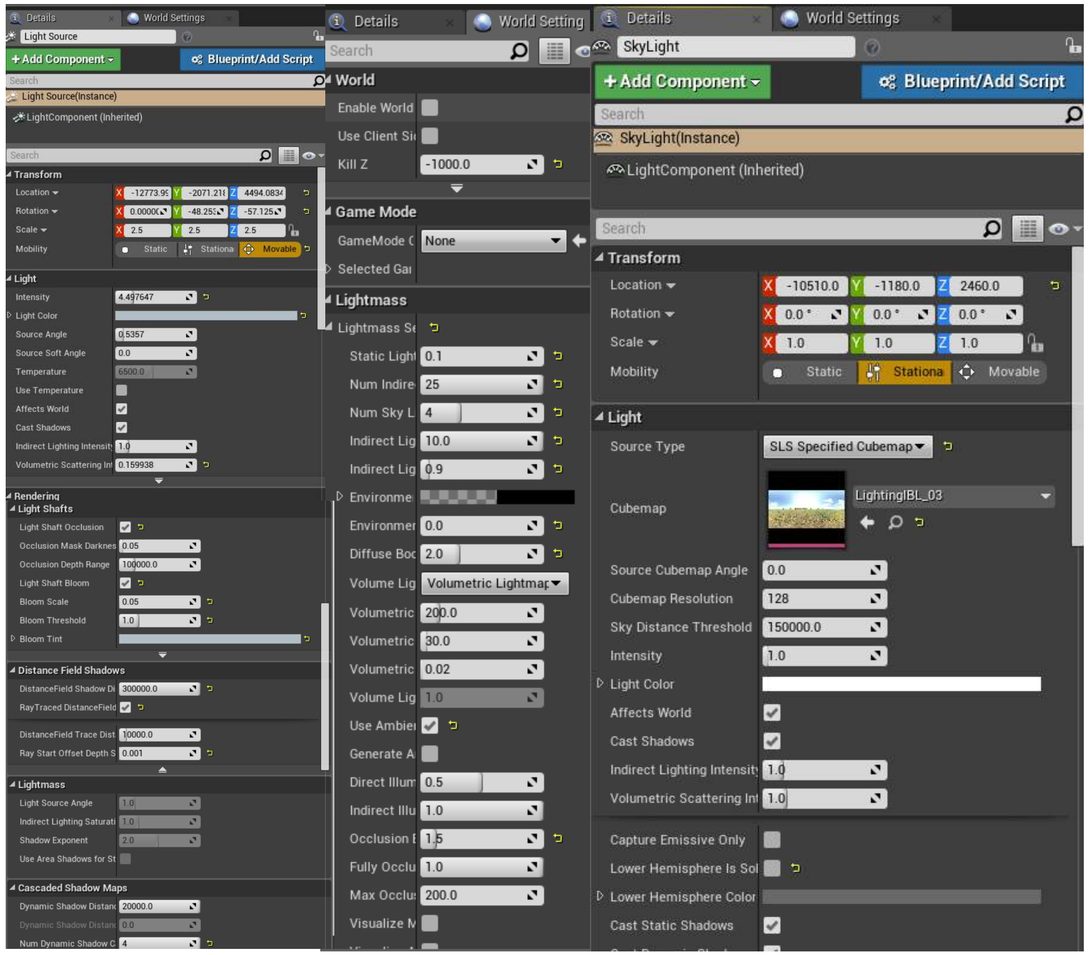
Lighting Methods

There are 3 lighting paths in UE4:

- **Fully dynamic -** with Movable Lights
- **Partially static -** with Stationary Lights
- **Fully static -** with Static Lights


Perspective
Lightmap Density
Show
10
10°
0.25
4
Level: CEC1_MAP (Persistent)


Save Current
Source Control
Content
Marketplace
Source
Settings
Import Datasmith...
Blueprints
Cinematics
VR Mode
Build
Play
Launch
Perspective
Lit
Show
Use Defaults
Common Show Flags
Anti-aliasing
BSP
Collision Alt+C
Decals
Fog Alt+F
Grid
Landscape Alt+L
Media Planes
Navigation P
Particle Sprites
Skeletal Meshes
Static Meshes
Translucency
Widget Components
All Show Flags
Post Processing
Light Types
Lighting Components
Lighting Features
Developer
Visualize
Advanced
Editor
Volumes
Layers
Sprites
Foliage Types
Adaptive Depth of Field
Bloom
Depth of Field Layers
Distance Field Ambient Occlusion
Global DistanceField
HDR (Eye Adaptation)
Light Propagation Volume
Mesh DistanceFields
Motion Blur
Out of Bounds Pixels
Precomputed Visibility Cells
Preview Shadows Indicator
Screen Space Reflections
Shading Models
Subsurface Scattering (Screen Space)
Volume Lighting Samples
Volumetric Lightmap
Level: CEC1_MAP (Persistent)


Details
World Settings
Light Source
+ Add Component
Blueprint/Add Script
Search
Light Source(Instance)
LightComponent (Inherited)
Transform
Location
Rotation
Scale
Mobility
Static
Stationa
Movable
Light
Intensity
Light Color
Source Angle
Source Soft Angle
Temperature
Use Temperature
Affects World
Cast Shadows
Indirect Lighting Intensity
Volumetric Scattering Int
Rendering
Light Shafts
Light Shaft Occlusion
Occlusion Mask Darkness
Occlusion Depth Range
Light Shaft Bloom
Bloom Scale
Bloom Threshold
Bloom Tint
Distance Field Shadows
DistanceField Shadow Di
RayTraced DistanceField
DistanceField Trace Dist
Ray Start Offset Depth S
Lightmass
Light Source Angle
Indirect Lighting Saturati
Shadow Exponent
Use Area Shadows for St
Cascaded Shadow Maps
Dynamic Shadow Distanc
Num Dynamic Shadow C
Details
World Setting
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World
Enable World
Use Client Si
Kill Z
-1000.0
Game Mode
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Fully Occlu
Max Occlus
Visualize M
Details
World Settings
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+ Add Component
Blueprint/Add Script
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SkyLight(Instance)
LightComponent (Inherited)
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Location
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-1180.0
2460.0
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0.0 °
0.0 °
Scale
1.0
1.0
1.0
Mobility
Static
Stationa
Movable
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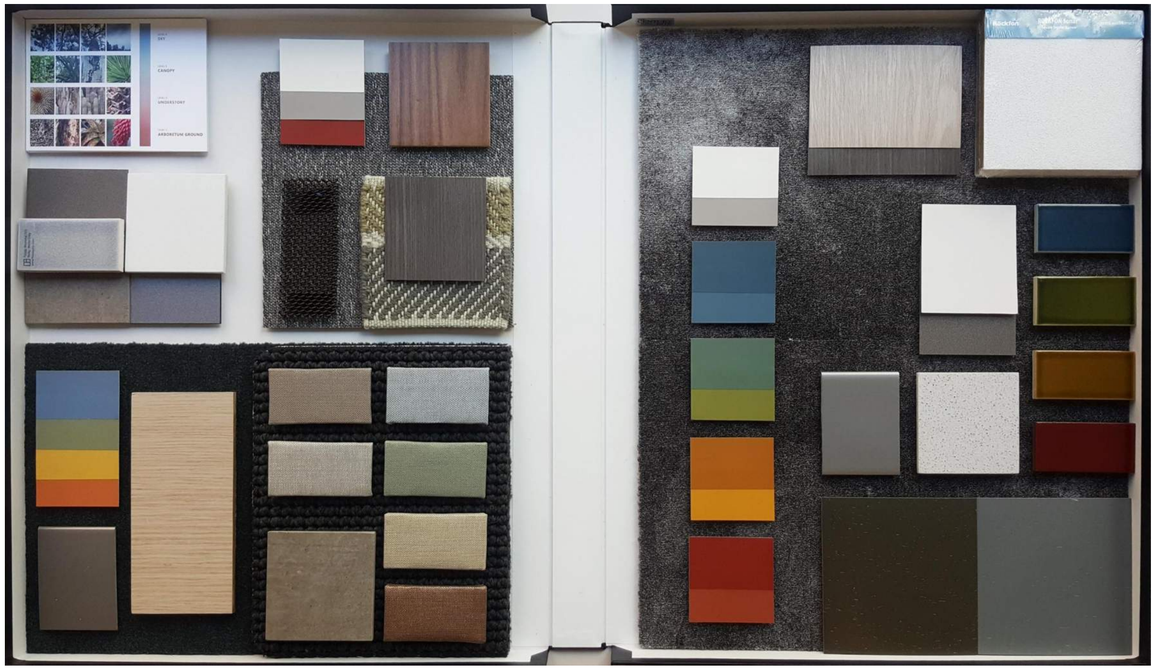
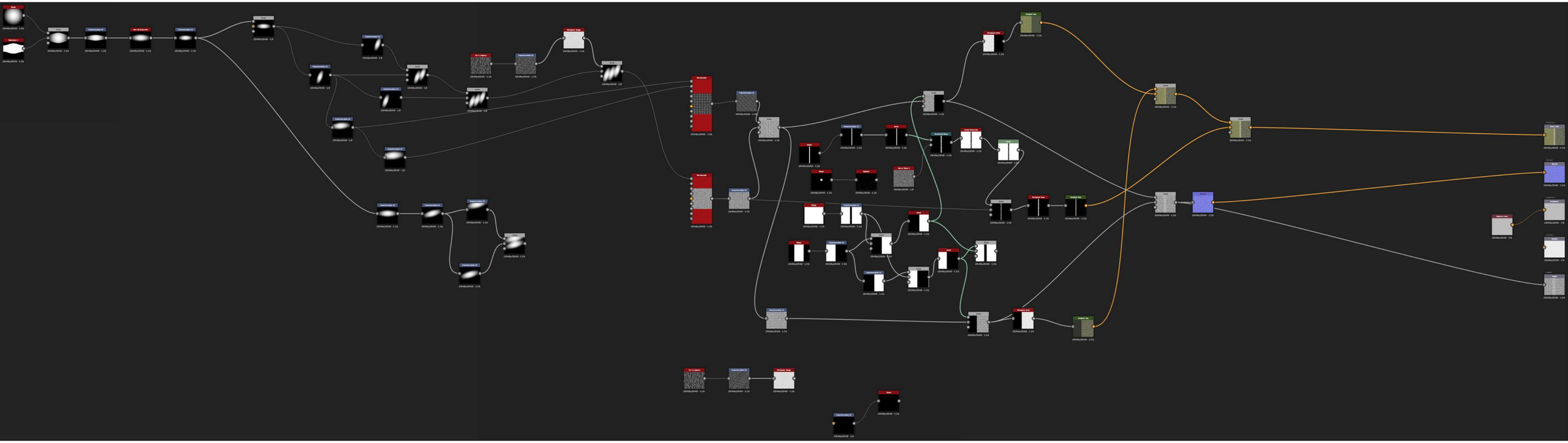
Source Type
SLS Specified Cubemap
Cubemap
LightingIBL_03
Source Cubemap Angle
0.0
Cubemap Resolution
128
Sky Distance Threshold
150000.0
Intensity
1.0
Light Color
Affects World
Cast Shadows
Indirect Lighting Intensity
1.0
Volumetric Scattering Int
1.0
Capture Emissive Only
Lower Hemisphere Is Sol
Lower Hemisphere Color
Cast Static Shadows
Perspective
Lit
Show
Details
Parameter Defaults
Search
Physical Material
Phys Material
None
Material
Material Domain
Surface
Blend Mode
Opaque
Decal Blend Mode
Translucent
Shading Model
Unlit
Two Sided
Use Material Attri
Subsurface Profil
Translucency
Screen Space Ref
Contact Shadows
Lighting Mode
Volumetric NonDirectional
Zoom -4
MATERIAL
MaterialEditor_Stats
Stats
Base pass shader without light map: 81 instructions
Base pass vertex shader: 88 instructions
Texture samplers: 1/16
Texture Lookups (Est.): VS(0), PS(1)

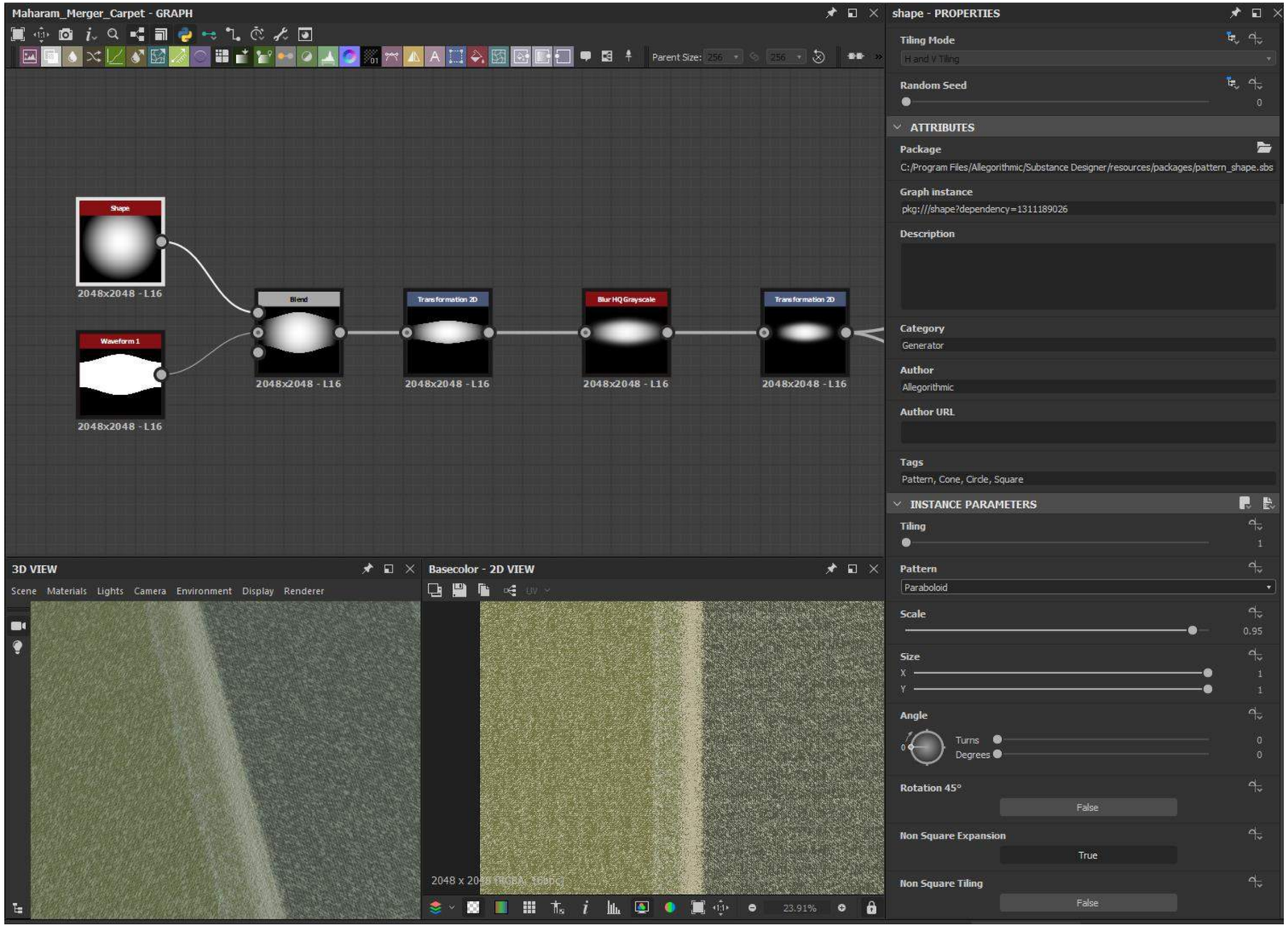


SUBSTANCE
DESIGNER

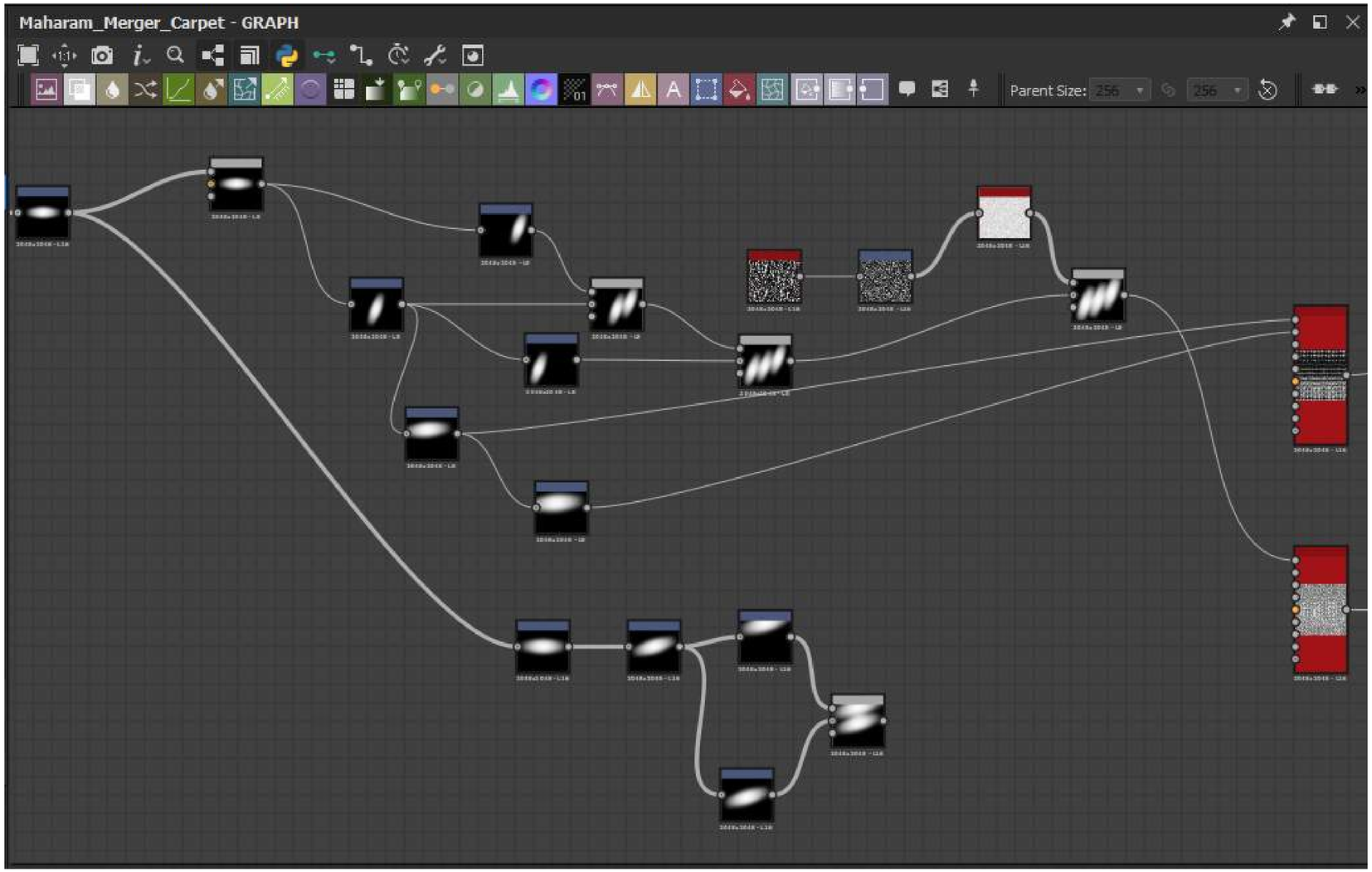
SUBSTANCE
PAINTER



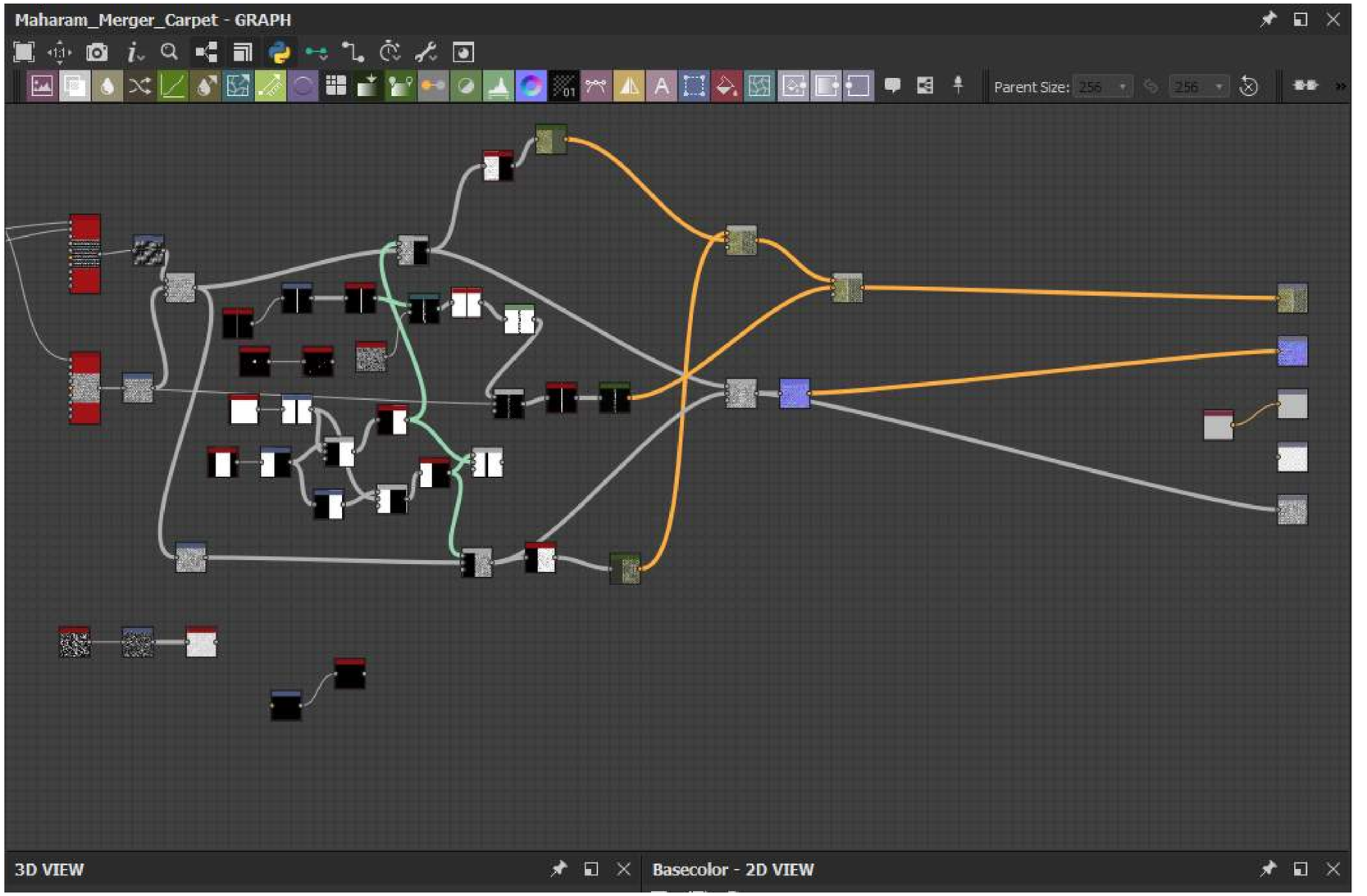
SUBSTANCE
DESIGNER



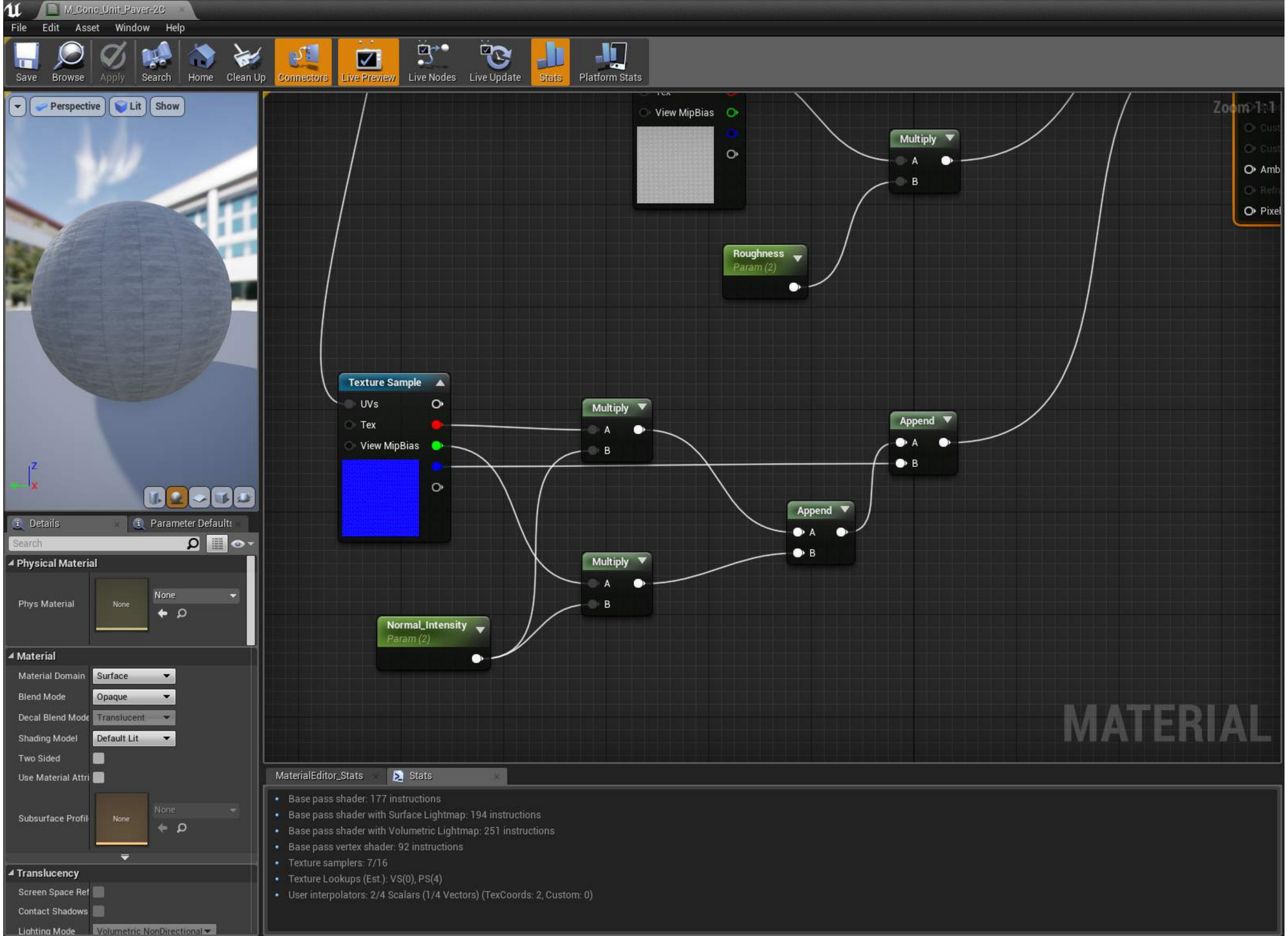
SUBSTANCE
DESIGNER



SUBSTANCE
DESIGNER

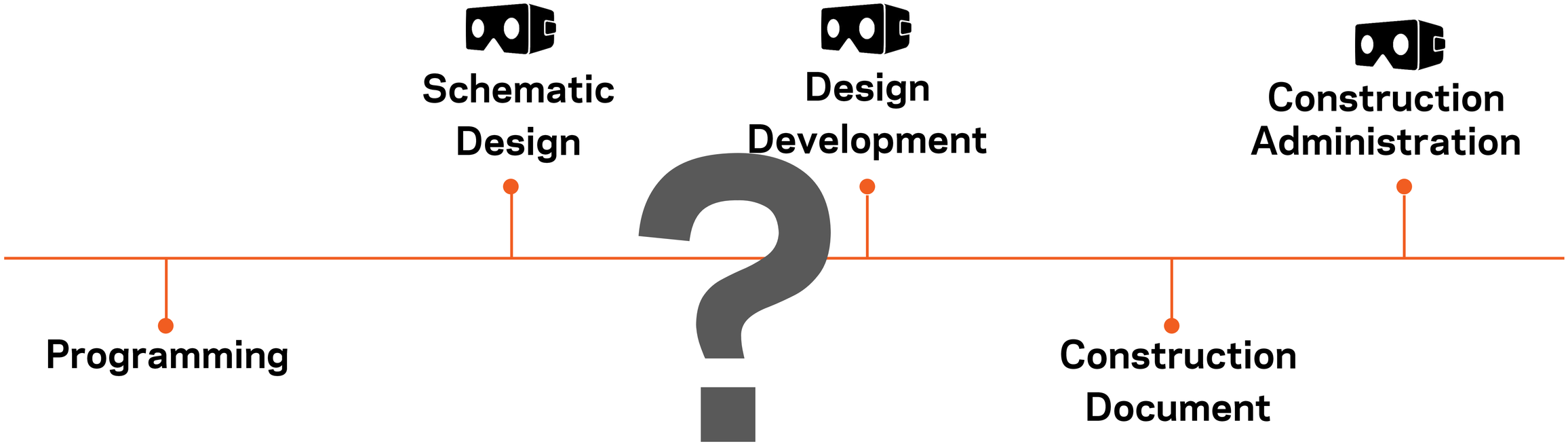


SUBSTANCE
DESIGNER


M_Conc_Unit_Paver-2C
File
Edit
Asset
Window
Help
Save
Browse
Apply
Search
Home
Clean Up
Connectors
Live Preview
Live Nodes
Live Update
Stats
Platform Stats
Perspective
Lit
Show
Details
Parameter Defaults
Search
Physical Material
Phys Material
None
Material
Material Domain
Surface
Blend Mode
Opaque
Decal Blend Mode
Translucent
Shading Model
Default Lit
Two Sided
Use Material Attri
Subsurface Profil
Translucency
Screen Space Ref
Contact Shadows
Lighting Mode
Volumetric NonDirectional
View MipBias
Multiply
A
B
Roughness
Param (2)
Texture Sample
UVs
Tex
Append
Normal_Intensity
Param (2)
Zoom 1:1
Amb
Pixel
MATERIAL
MaterialEditor_Stats
Stats
Base pass shader: 177 instructions
Base pass shader with Surface Lightmap: 194 instructions
Base pass shader with Volumetric Lightmap: 251 instructions
Base pass vertex shader: 92 instructions
Texture samplers: 7/16
Texture Lookups (Est.): VS(0), PS(4)
User interpolators: 2/4 Scalars (1/4 Vectors) (TexCoords: 2, Custom: 0)

What's next

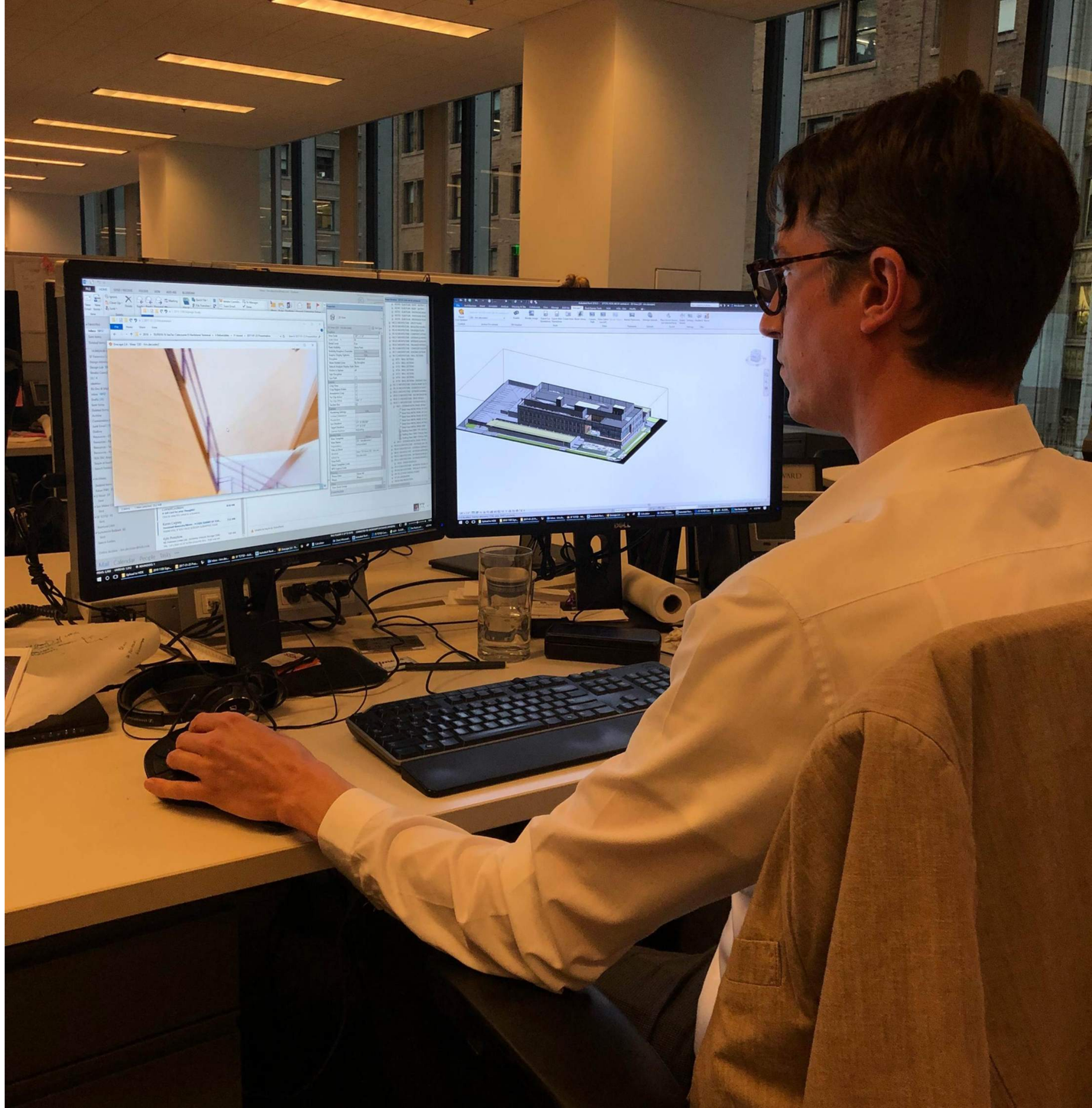
Rendering Quality?
Time & Fee?
Design Meeting?
Design Workflow?


Schematic Design
Design Development
Construction Administration
Programming
Construction Document

Markup?


40 MIN PRESENTATION
50 MIN Q&A
APPROVALS
DESIGN
PRINCIPLES
SITE SPECIFIC
EXAMPLES

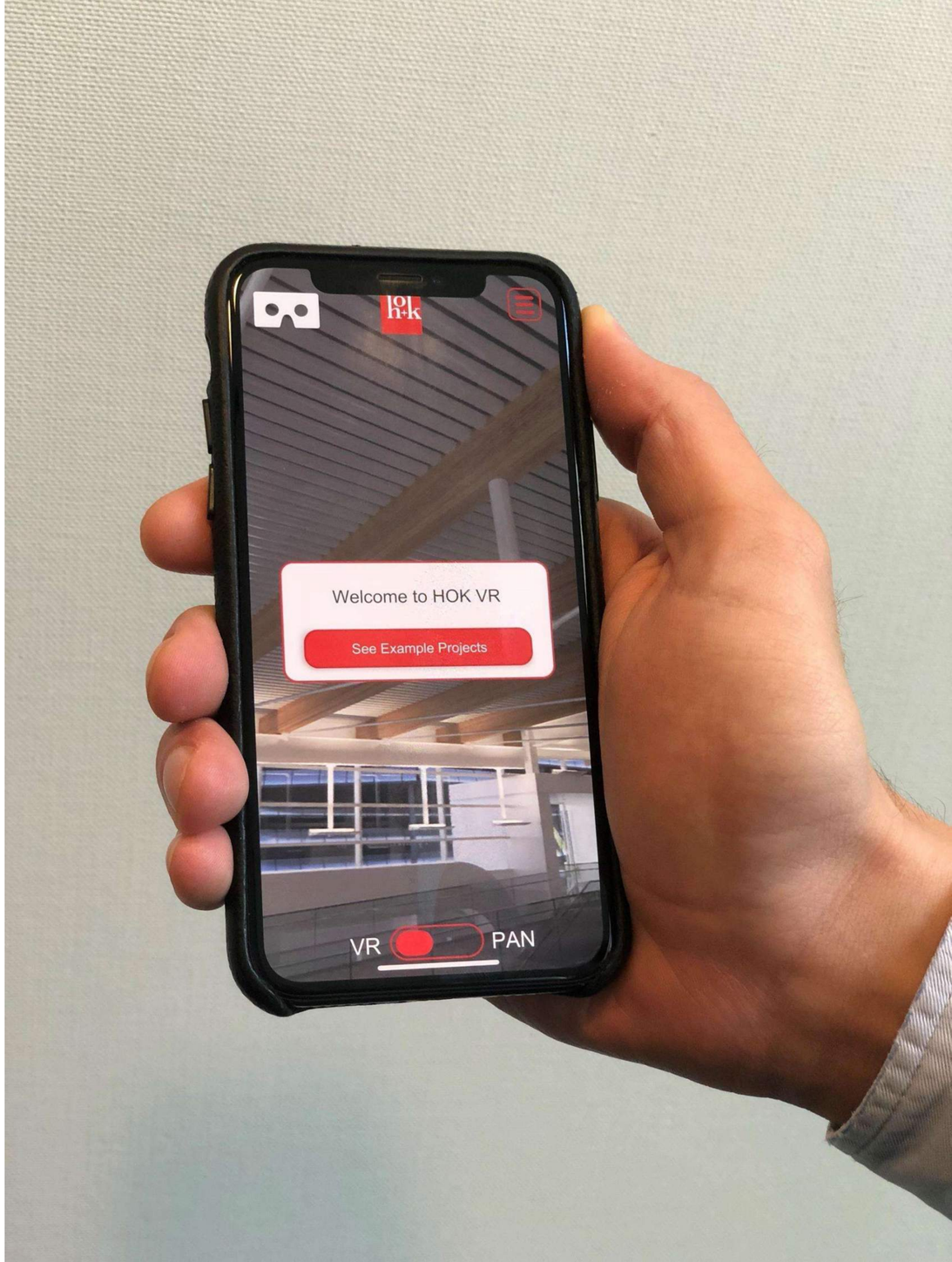
Quality Assurance & Quality Control?



Collaboration?

Key Feature

- Upload Visualizations
- Unique Access Code
- Shared Reality




nytVR
Google

The Future

"We shape our buildings; thereafter they shape us"

-Winston Churchill

Q & A