Making Game Engines Work for Engineers

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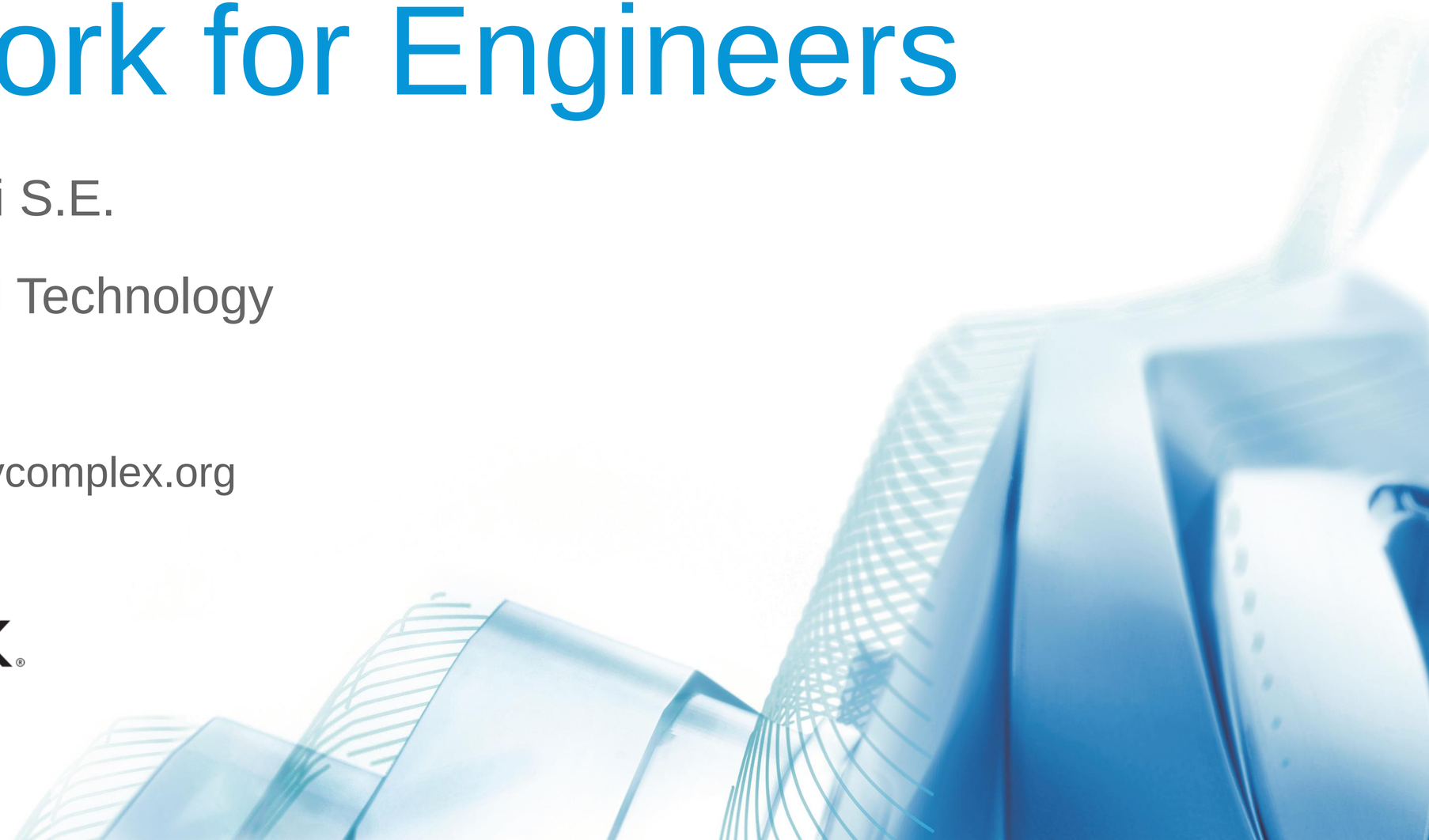

Game Engine Intro Hardware Roles

Enscape
Unity
CryEngine
Unreal
Interactive (Stingray)
Misc.

VR
AR
XR
MR
So Many R

BIM Director
VR Specialist
Design Tech
AR Director

DOWNLOAD DATASETS HERE

https://static.wixstatic.com/archives/03f07d_3722f41f77f9441faaee875358bf0df4.zip

https://static.wixstatic.com/archives/03f07d_48e1214d0d744a87aee48df504faad2c.zip

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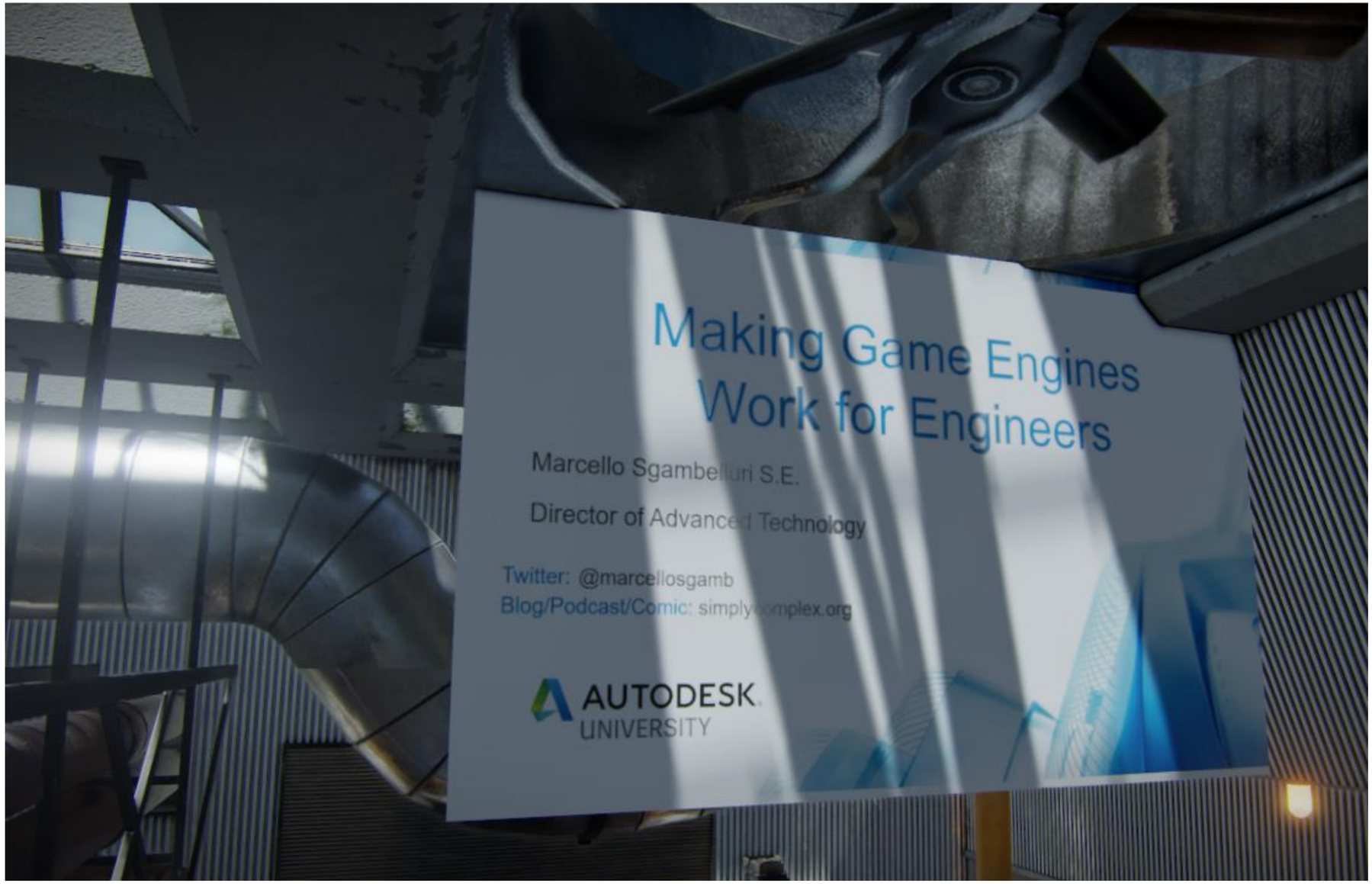
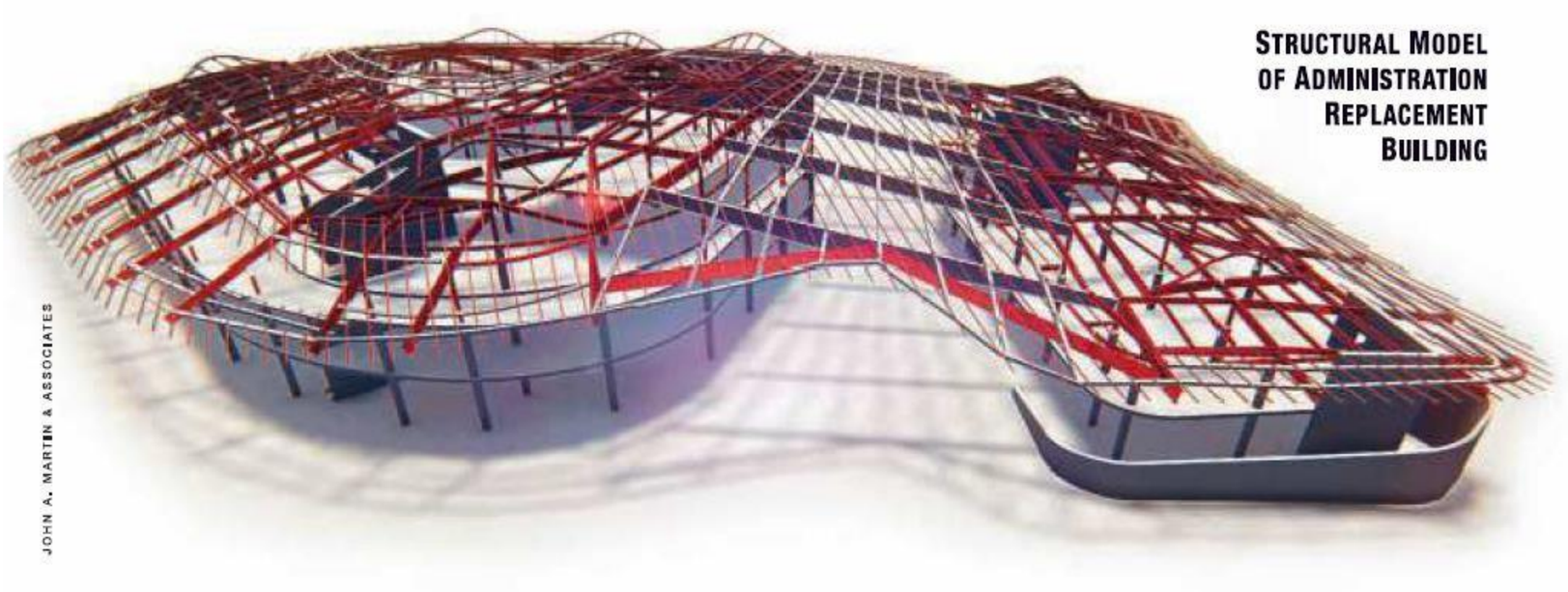
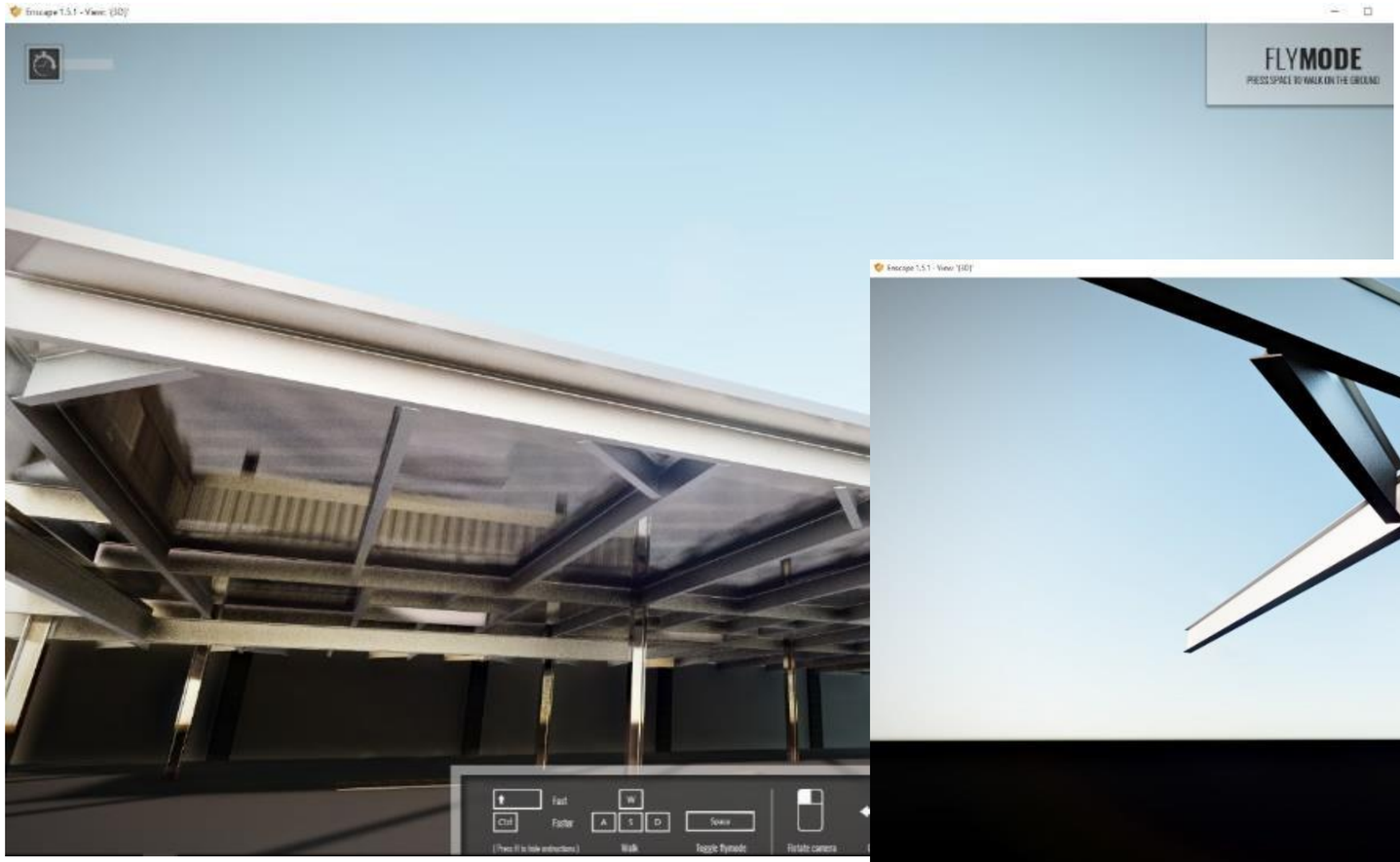
Game Engine Intro Game

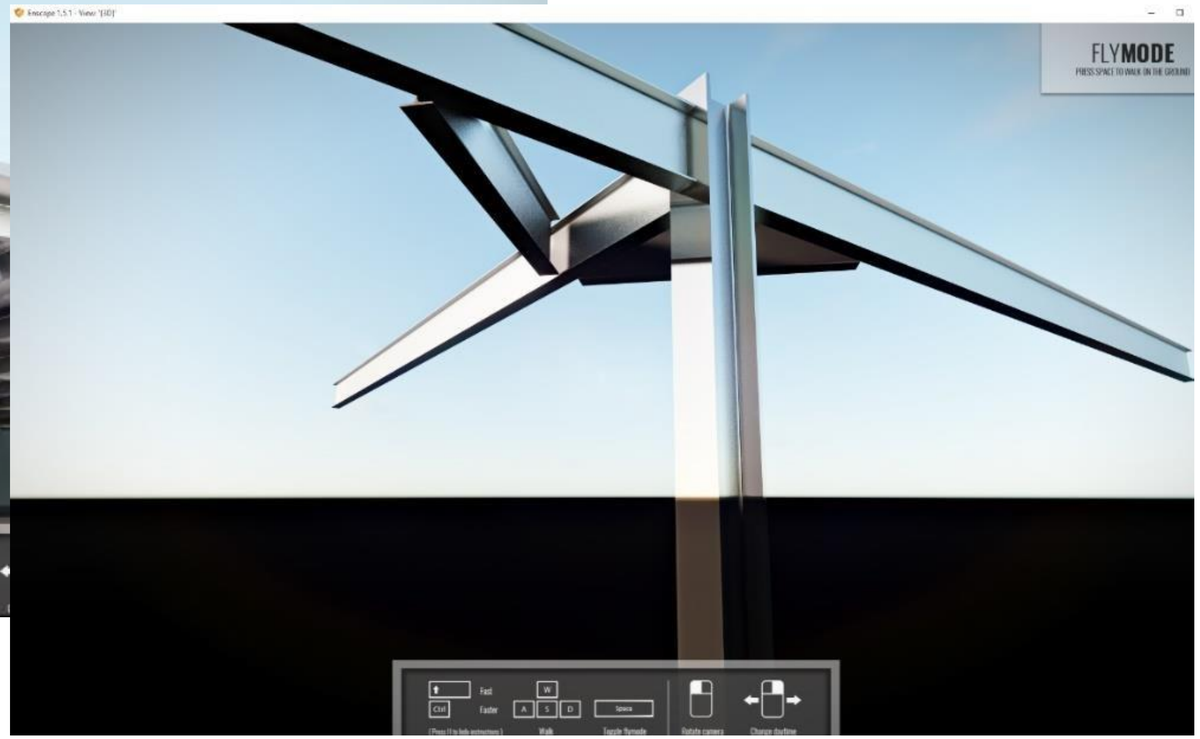


Presentations and Telling your Story
Render Times = Seconds



Deployed Enscape for Story Telling



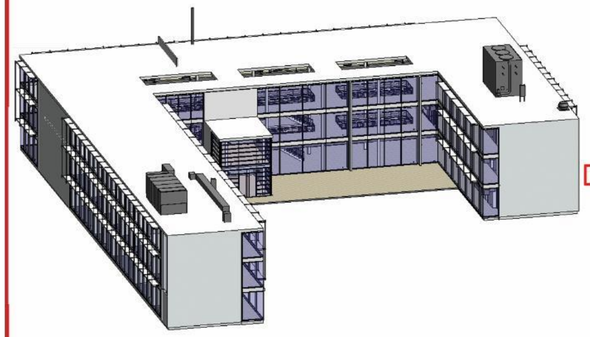


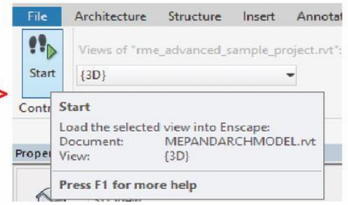
Coordination and You!

DEPLOY REVIT PROJECTS VIA ENSCAPE

1. REVIT TO ENSCAPE

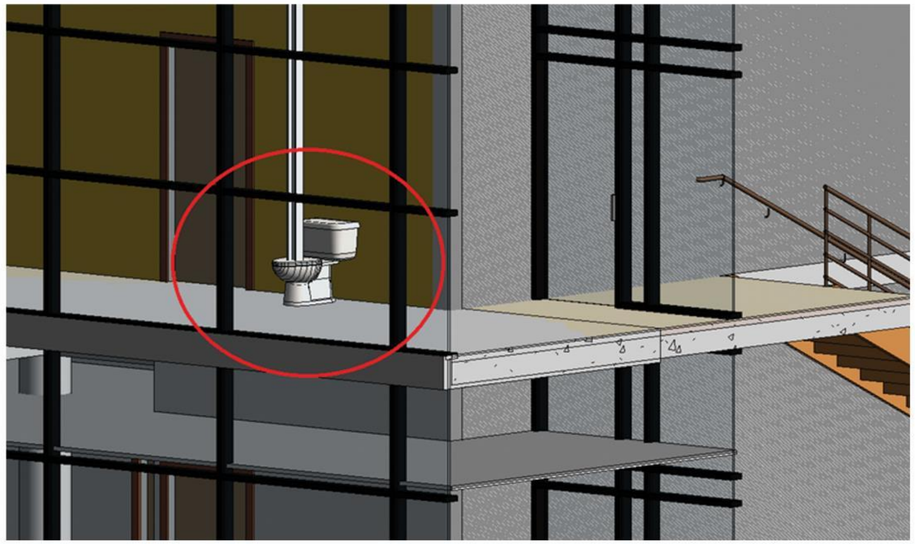
OPEN REVIT AND GO TO A 3D VIEW
CLICK ON ADDINS
CLICK ON ENSCAPE
CLICK ON START





REVIT MODEL

ZOOMED IN VIEW

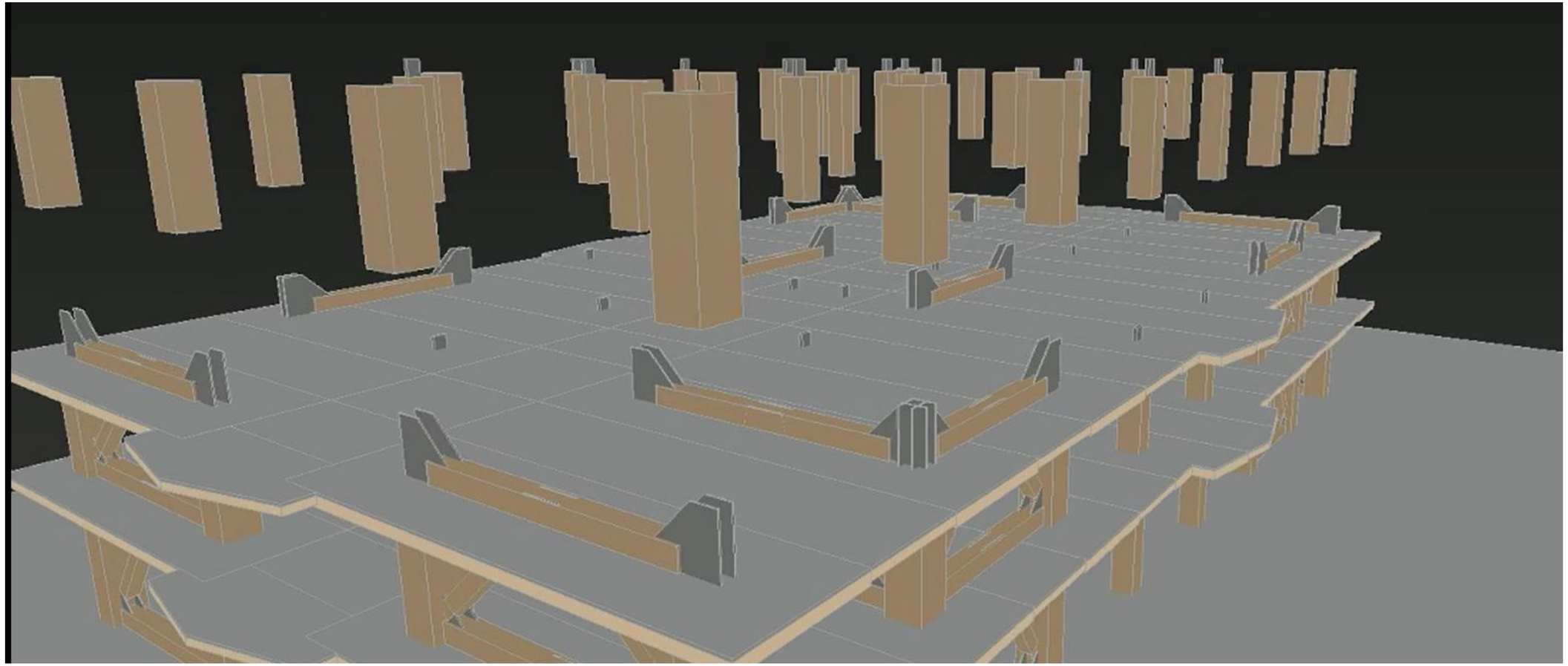


ENSCAPE MODEL

THE REASON TO CREATE A STANDALOG .EXE FILE IS TO SHARE WITH OTHERS YOUR ENSCAPE SCENE. THE EXE FILE COULD BE OPENED BY OTHERS WHO DO NOT HAVE ENSCAPE. NOTE THAT IT TAKES ALOT OF COMPUTER RESOURCES TO VIEW THE STAND ALONG EXE FILE FROM ENSCAPE AND SOME PEOPLE MAY NOT BE ABLE TO OPEN OR VIEW THE .EXE FILE.

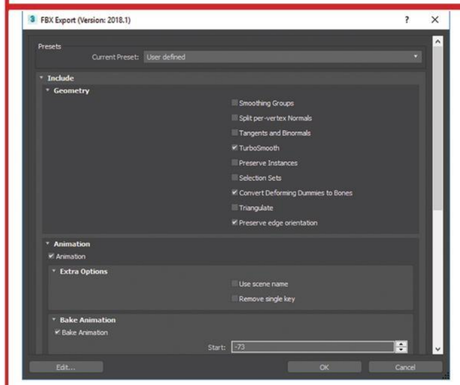
NOTES

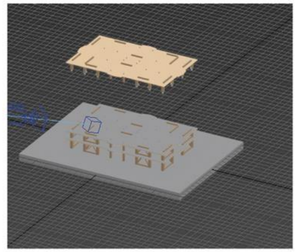
Construction Animation



INTERACTIVE: SIMPLY CONSTRUCTION ANIMATIONS

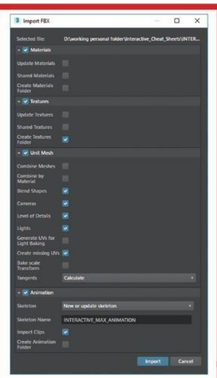
MAX





STEP 1

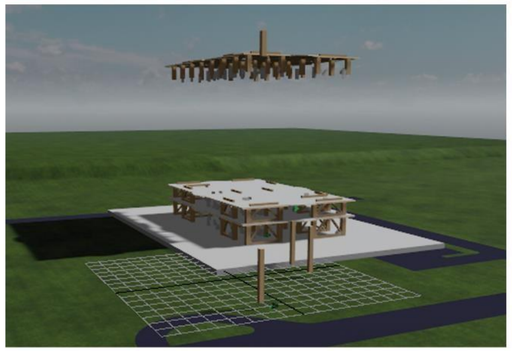
OPEN MAX FILE AND SET UP ANIMATIONS. SELECT THE ELEMENTS AND EXPORT “FBX SELECTED. VERIFY THAT ”BAKE ANIMATION” IS CHECKED

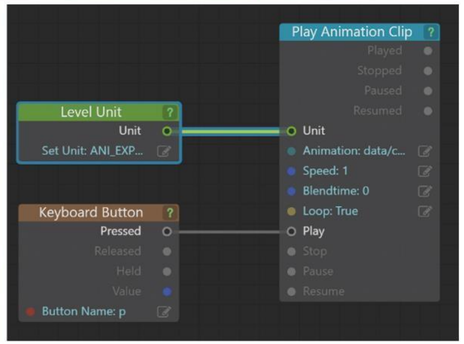


STEP 2

OPEN INTERACTIVE FILE (BEST RESULS WITH LIVE TEMLATE- AND IMPORT THE FBX.

INTERACTIVE





STEP 3

AFTER FBX IMPORT PLACE THE ASSET IN SCENE. ADD FLOW NODES AS SHOWN TO CONTROL THE ANIMATION (ANIMATION CONTROLER IS NOT NEEDED) CONSIDER ADDING A “STOP” CONTROL AS WELL. TEST AND DEPLOY! NOW YOUR USERS COULD ZOOM AND PAN AS ANIMATION RUNS. NO MORE STATIC ANIMATION CAMERAS

NOTES

NOTE

FOR ELEMENTS WITH ANIMATION ITS MORE STABLE TO EXPORT VIA FBX AND THEN IMPORT INTO INTERACTIVE THEN TO USE THE MAX TO INTERACTIVE LINK

Telehandler Drive And Construction Logistics plan, moving, jumping etc

REVIT TO MAX TO INTERACTIVE: VEHICLE

STEP 1
OPEN REVIT AS SHOWN

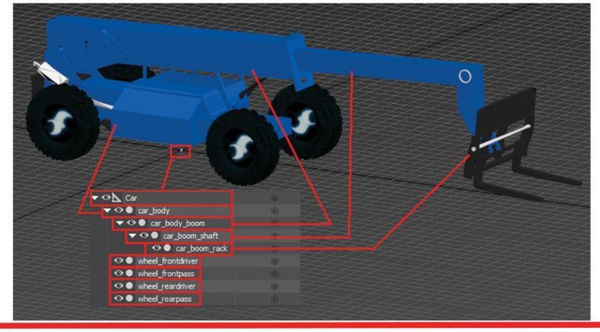
EXPORT AS FBX

REVIT

STEP 2
OPEN FBX FILE IN 3DSMAX

CREATE DUMMY OBJECT AND RENAME PARTS AS SHOWN AND PLACE UNDER DUMMY

MOVE PIVOT POINTS TO CENTER OF TIRES, ETC



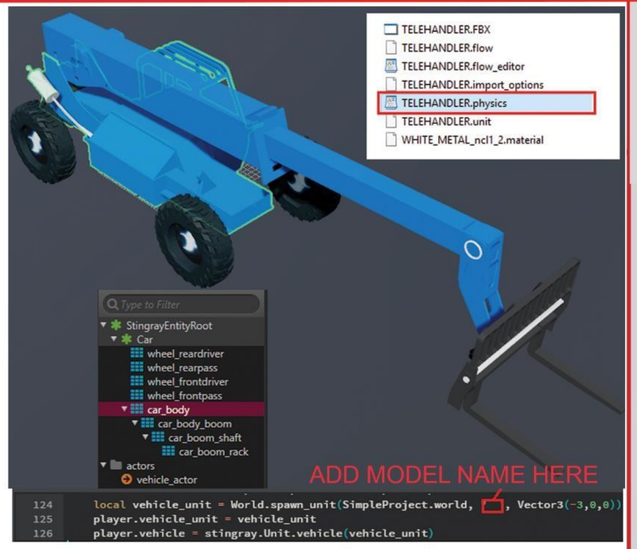
MAX

STEP 3
CREATE OR OPEN EXISTING VEHICLE TEMPLATE IN STINGRAY

IMPORT TELEHANDLER FBX

OPEN IN UNIT EDITOR
CREATE ANY PHYSICS ACTOR

COPY ALL CONTENTS FROM PREVIOUS .PHYSICS CAR TEMPLATE FILE AND PASTE IN TELEHANDLER.PHYSICS FILE



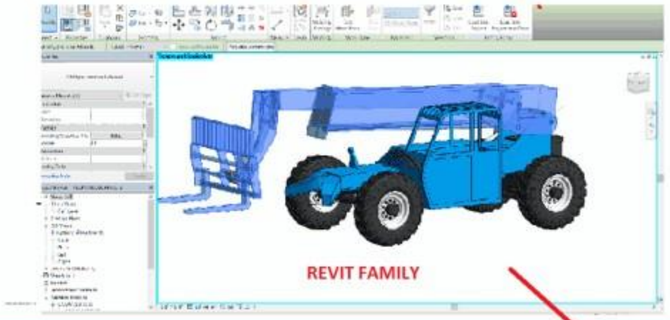
INTERACTIVE

NOTE
THIS METHOD SHOWS HOW TO GET A REVIT VEHICLE FAMILY INTO STINGRAY TO MAKE IT DRIVABLE. MAKE SURE TO MOVE ALL THE PIVOT POINTS OF EACH VEHICLE ELEMENT TO ITS C.G.
ALSO NOTE THAT THE DUMMY OBJECT LOCATION WILL BE THE CG OF THE VEHICLE IN STINGRAY

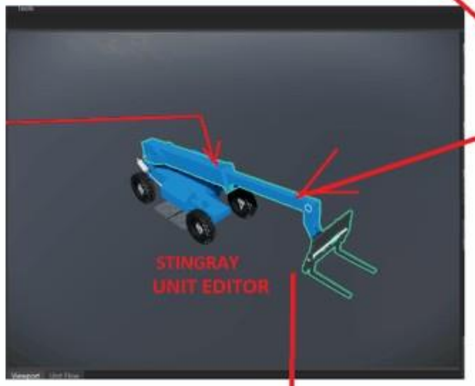
NOTES

LEARN HOW TO GET YOUR REVIT FAMILIES TO MOVE IN THE AUTODESK STINGRAY GAME ENGINE (CLASS PROPOSAL 2017)

REVIT FAMILY



STINGRAY UNIT EDITOR



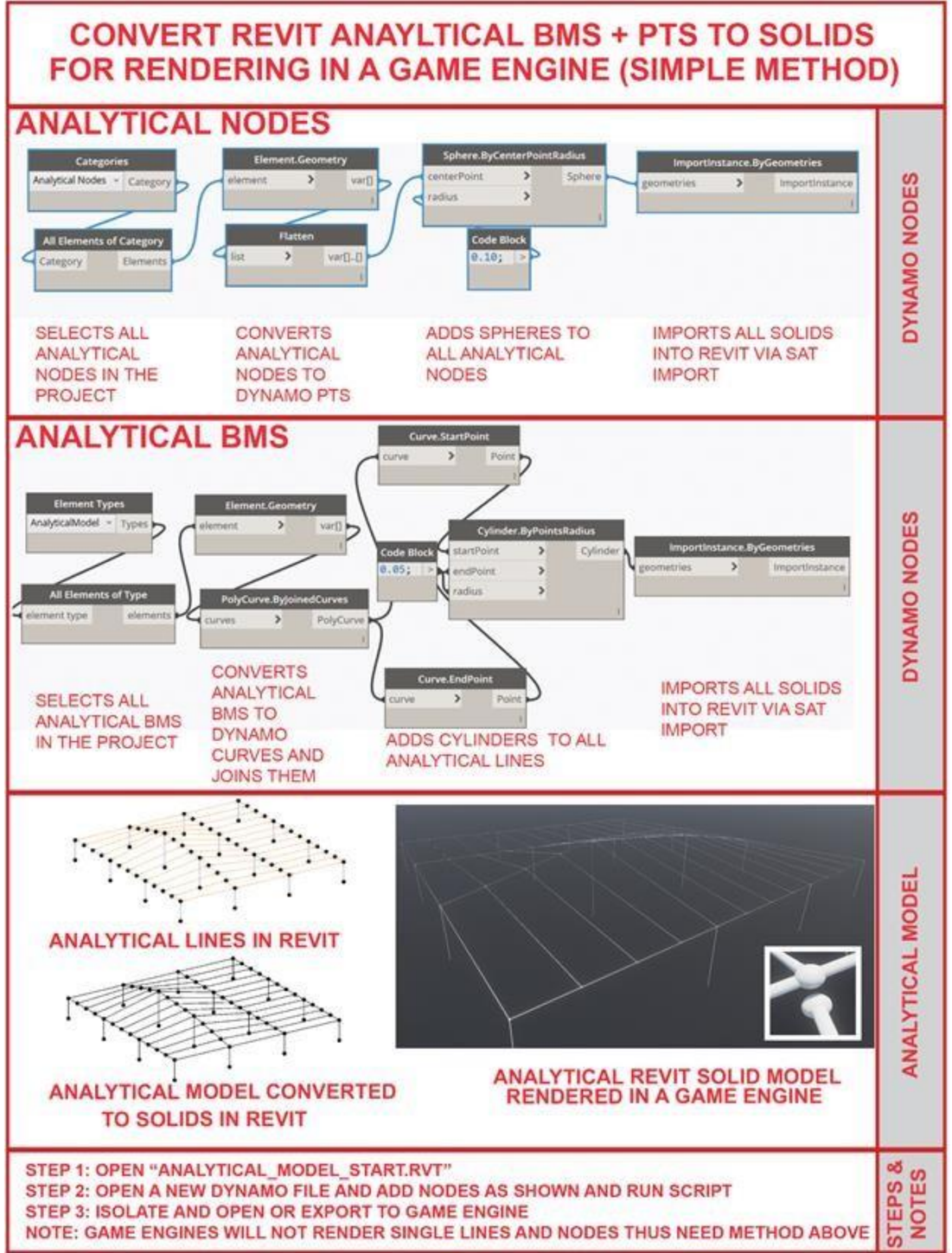
STINGRAY GAME ENGINE

NOTES

NOTE:
THE TYPICAL WORKFLOW IS REVIT TO STINGRAY, SOME FAMILIES REQUIRE REVIT TO 3DSMAX TO STINGRAY

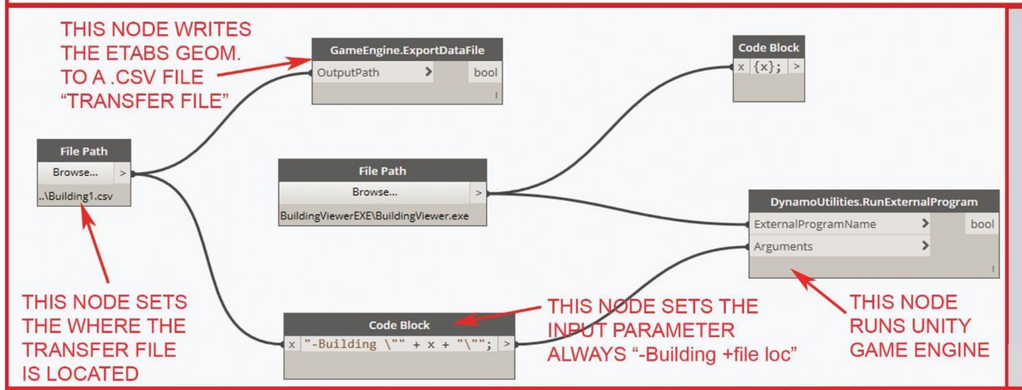
Improving Visualization and Modeling

Visualization of Revit Analytical Model in Enscape

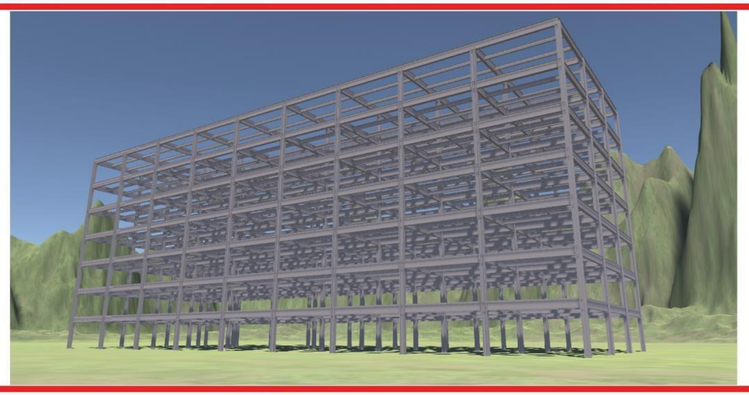


Structural Software into Unity

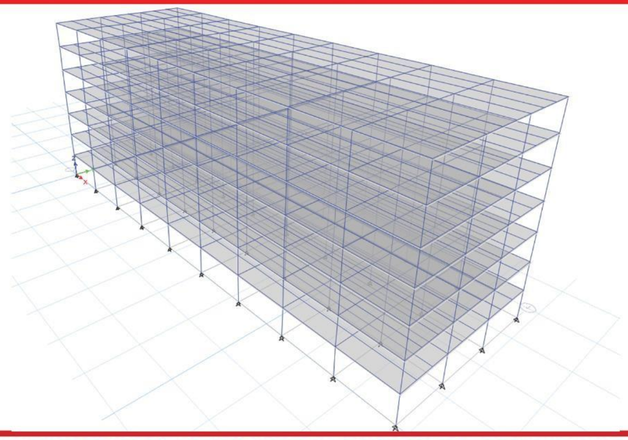
GET ETABS GEOMETRY TO GAME ENGINE



DYNAMO NODES



GAME ENGINE GEOMETRY



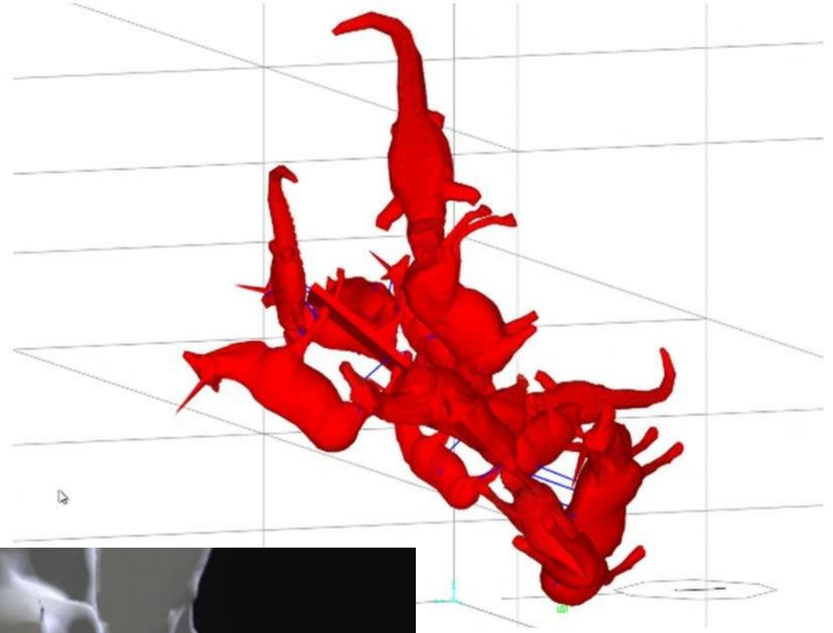
ETABS GEOMETRY

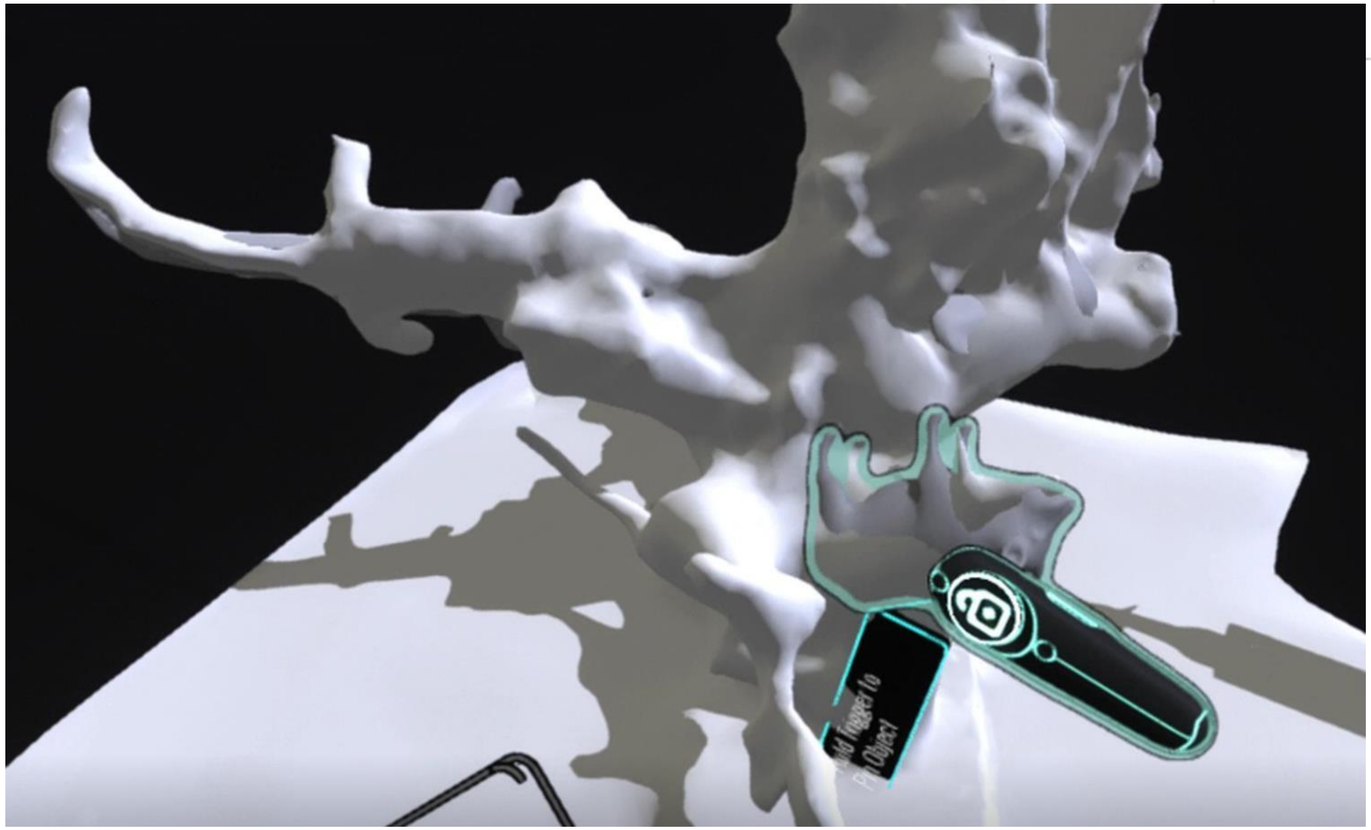
STEPS: 1. OPEN ANY ETABS MODEL "ETABS MODEL VIEWER.EDB" OPEN DYNAMO
2. OPEN ADD THE NODES ABOVE

NOTES: 1. BEST IF DYNAMO FOR ETABS IS RUN IN MANUAL-
2. ONLY FRAMES ELEMENTS ARE SHOWN IN GAME ENGINE

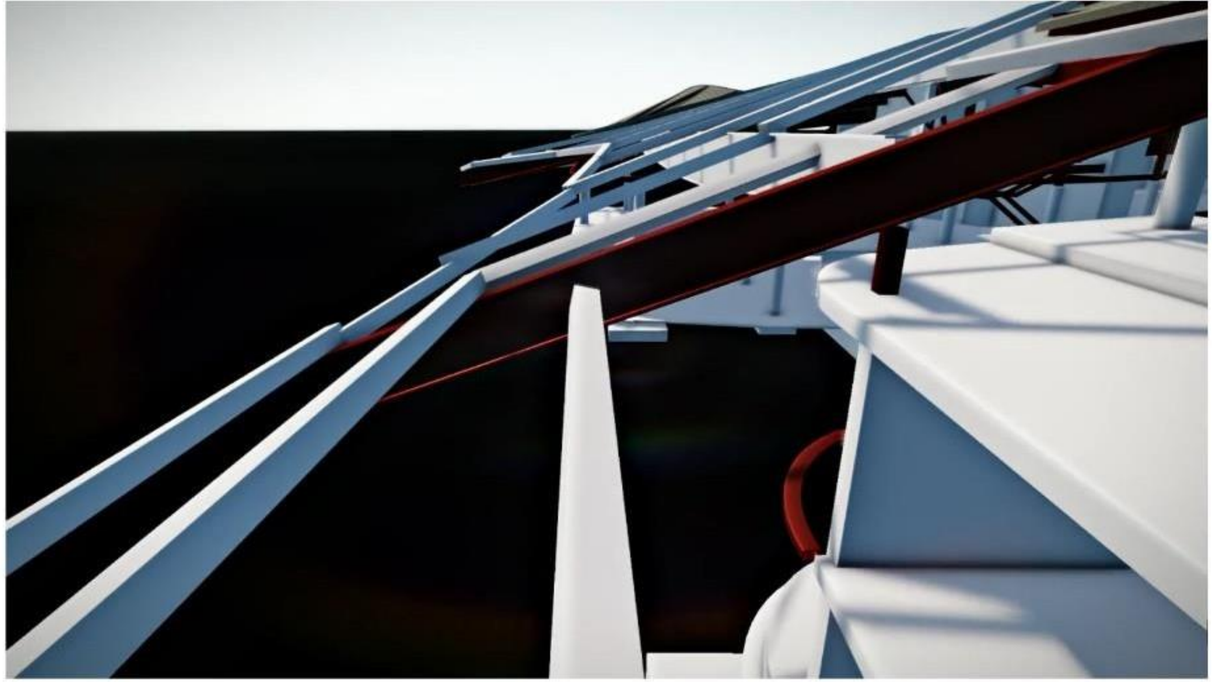
STEPS & NOTES

Building Model with VR





Using Physics

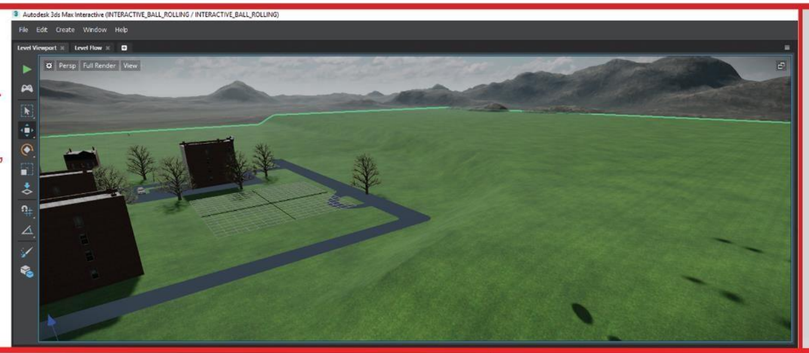


Ball Rolling For Grade

INTERACTIVE: BALL ROLLING PHYSICS

STEP 1

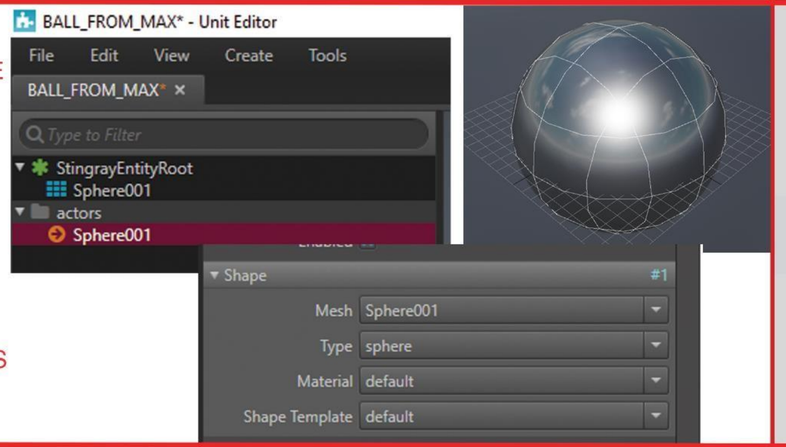
OPEN AN INTERACTIVE PROJECT WITH TOPO, BEST TO CRETE WITH LIVE SERVICE FROM REVIT



INTERACTIVE

STEP 2

CREATE A SPHERE IN MAX AND IMPORT INTO INTERACTIVE VIA FBX. OPEN THE SPHERE ASSET IN THE UNIT EDITOR AND ADD A DYNAMIC PHYSICS ACTOR WITH A SPHERE SHAPE AS SHOWN



INTERACTIVE

STEP 3

PLACE THE SPHERES IN SCENE ABOVE THE GROUND PLANE AND TEST THE LEVEL IN GAME MODE. THE PHYSICS WILL AUTOMATICALLY ACTIVATE AND SIMULATE FALLING SHPERES

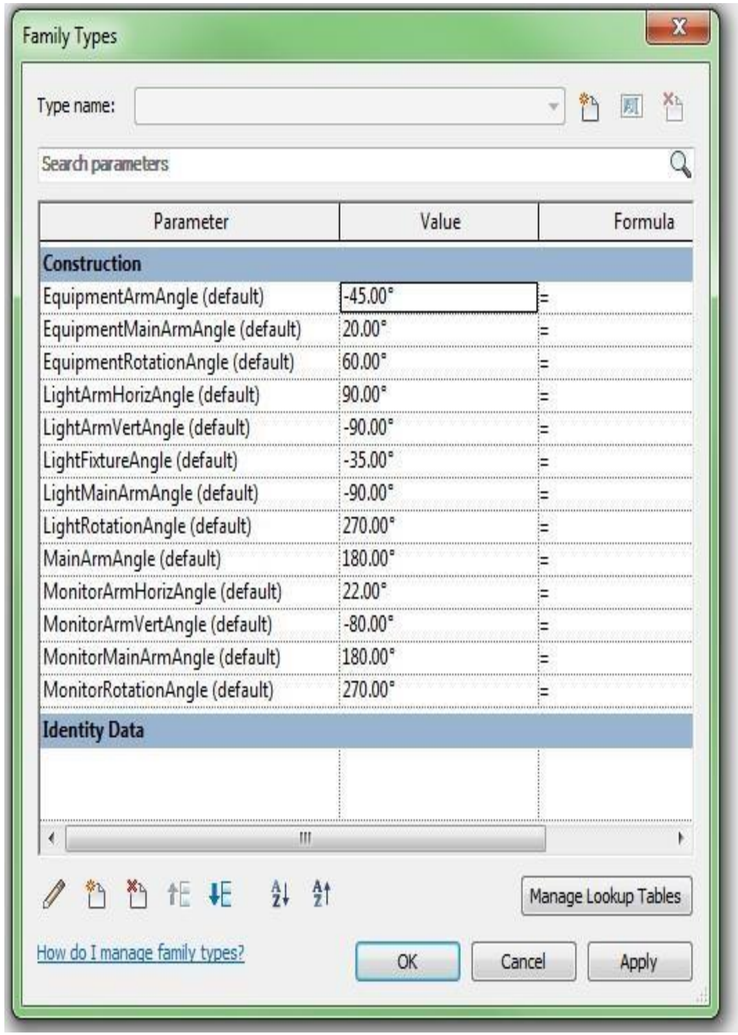
INTERACTIVE

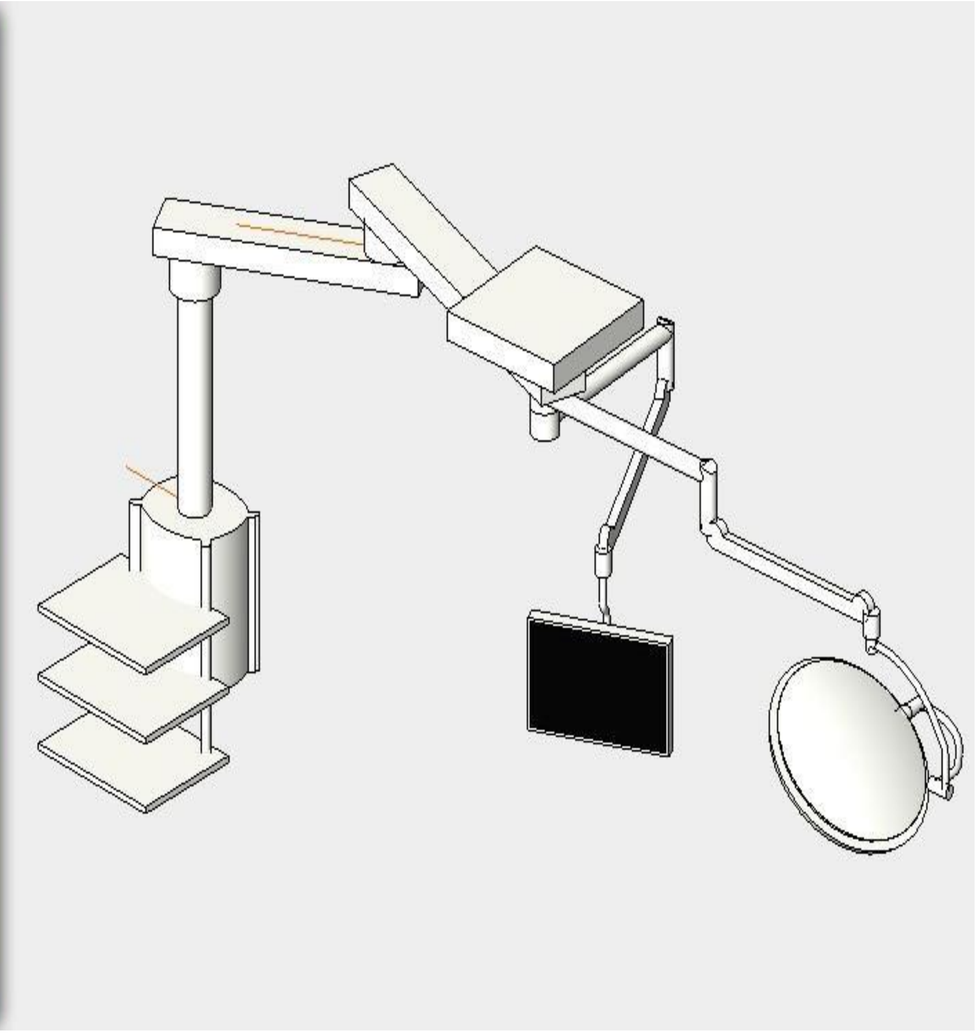
NOTE

INTERACTIVE HAS A PHYSICS ENGINE AND SHOULD BE USED! THIS MEANS ADDING SPHERES TO SCENES TO SEE HOW “RAIN” WATER WILL RUN OFF AND HOW SITES ARE GRADED TO “CATCH” WATER. ALSO, THIS COULD BE DEPLOYED AS A STAND ALONE GAME TO BE SHARED TO TEAM

NOTES

Equipment Use Cases
Moving Parts



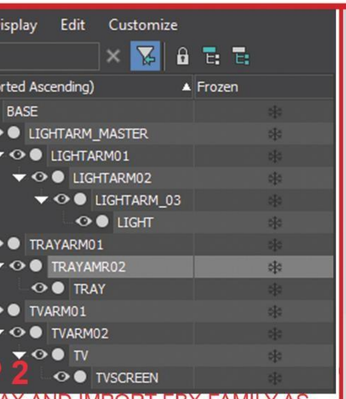


REVIT FAMILY TO MAX: MOVING EQUIPMENT

REVIT

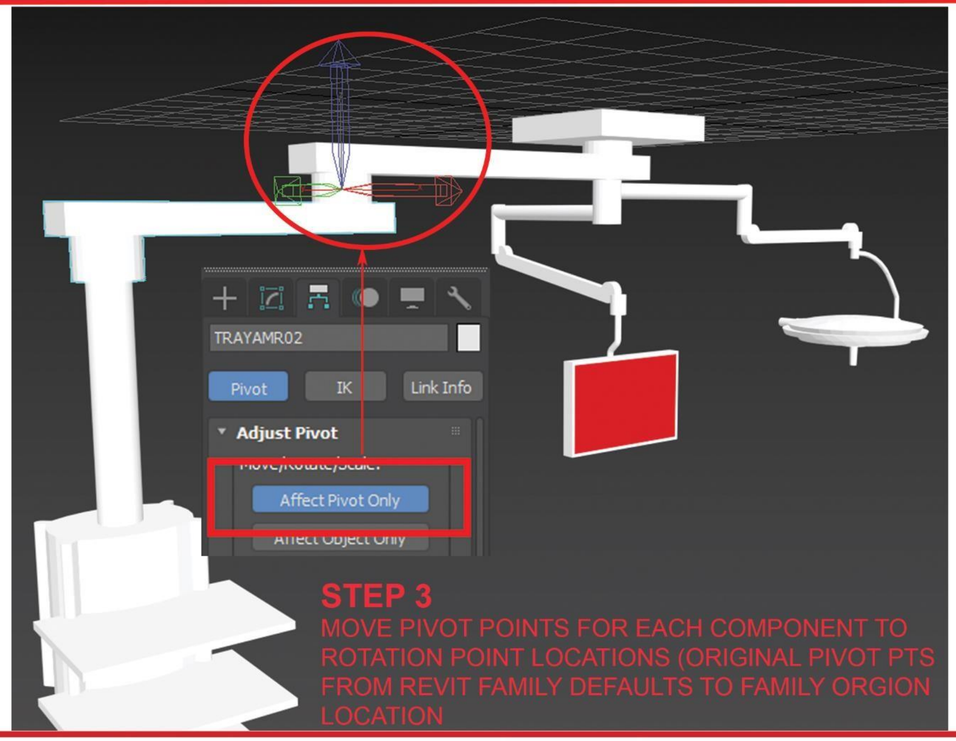
STEP 1
OPEN REVIT FAMILY AND EXPORT AS FBX. AND SAVE TO LOCATION (FAMILY BY DON BOKMILLER)

MAX



STEP 2
OPEN MAX AND IMPORT FBX FAMILY AS FBX AND ARRANGE COMPONENTS HIER-ARCHY SO EX: SHOULDER MOVES ARM, ARM MOVES HAND ECT

MAX

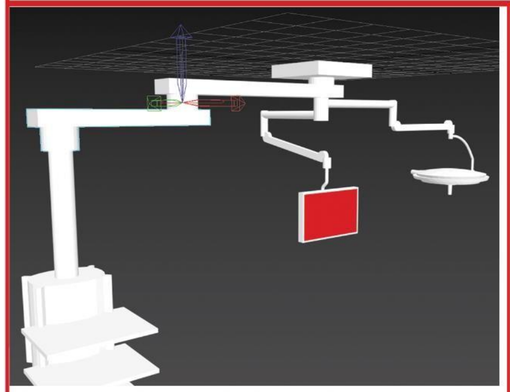


STEP 3
MOVE PIVOT POINTS FOR EACH COMPONENT TO ROTATION POINT LOCATIONS (ORIGINAL PIVOT PTS FROM REVIT FAMILY DEFAULTS TO FAMILY ORGION LOCATION

NOTE
IN ORDER TO SKIP STEP 3 (ADJUST PIVOTS) BUILD THE REVIT FAMILY SUCH THAT EACH “ARM” IS NESTED WITHING EACH CONTROLING PART WITH ITS ORIGIN AT ITS PIVOT POINT. THIS MAY NOT BE DESIRABLE TO DO IN A REVIT FAMILY SO IT COULD BE ADJUSTED IN MAX AS SHOWN

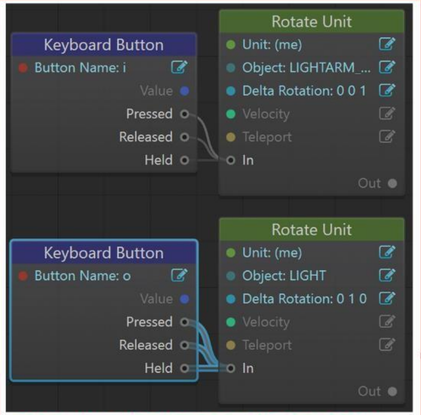
NOTES

INTERACTIVE: CONTROLLING MOVING EQUIPMENT



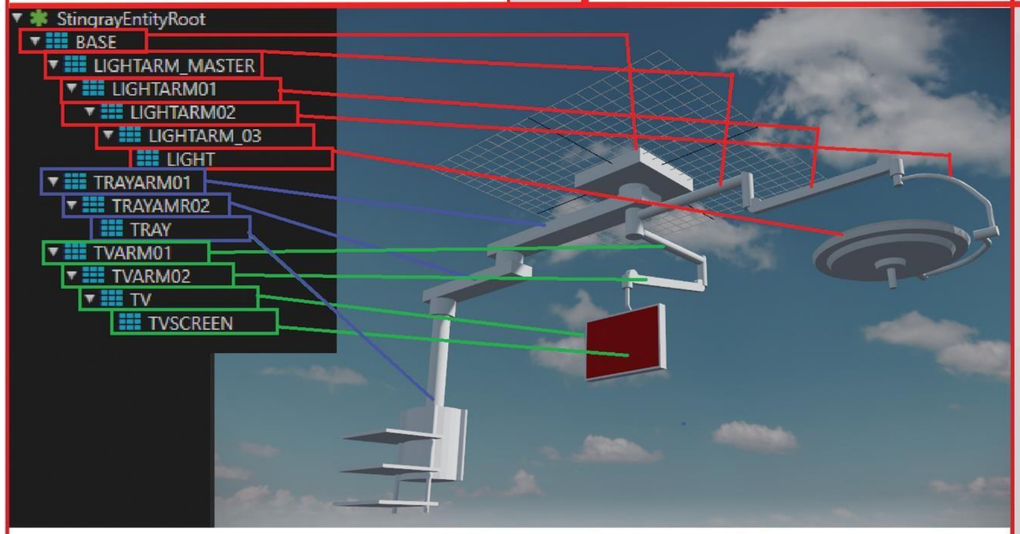
OPEN MAX FILE AND EXPORT VIA MANUAL FBX EXPORT AND SAVE FILE.

MAX



OPEN IN UNIT EDITOR AND ADD CONTROL FLOW NODES

MAX



DEPLOY FROM INTERACTIVE TO A STAND ALONE GAME. THE LIVE TEMPLATE WORKS BEST.

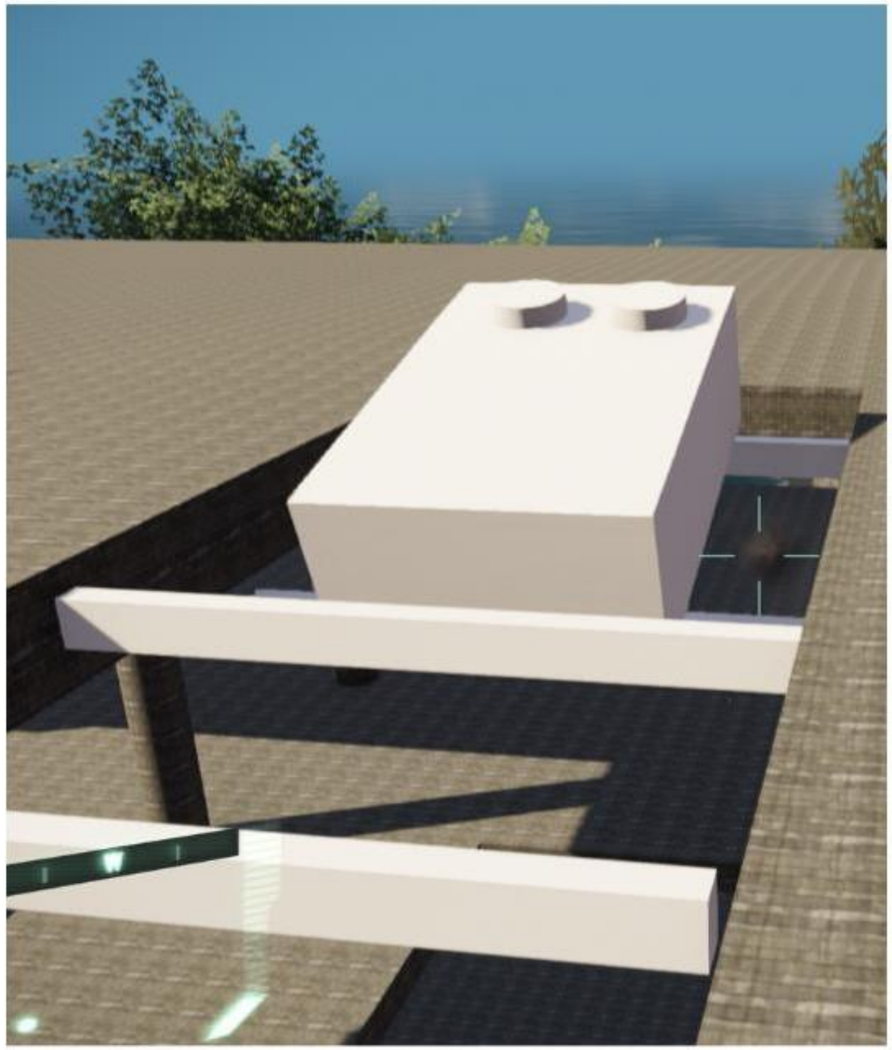
INTERACTIVE

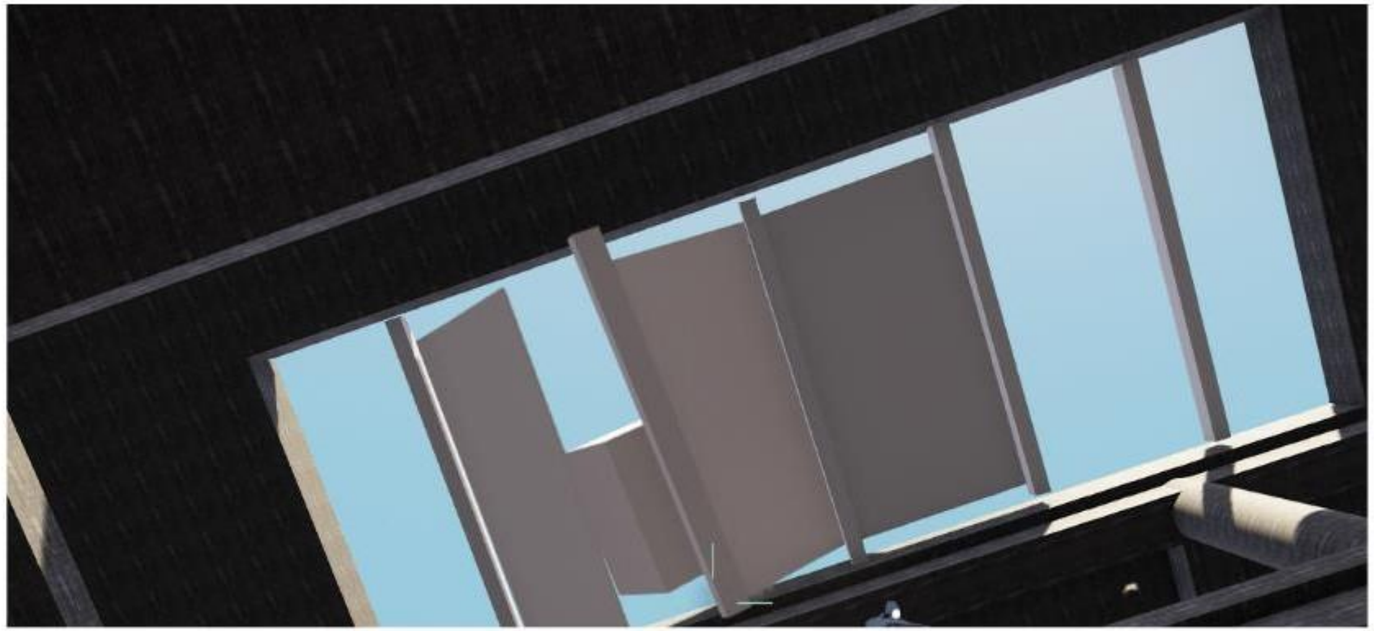
NOTE
GETTING AN ASSET FROM MAX TO INTERACTIVE THAT REQUIRES FLOW NODES TO CONTROL THE MOVEMENT WORKS BEST WITH USING THE MANUAL FBX EXPORT NOT THE LIVE LINK OF MAX TO INTERACTIVE

NOTES

Transformer

Weight and Mass





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