

Practical Uses of Immersive Technology

From Design Through Construction

David Ferish

SmithGroup



DAVID FERSH

ARCHITECT, VISUALIZATION TECHNOLOGY LEADER

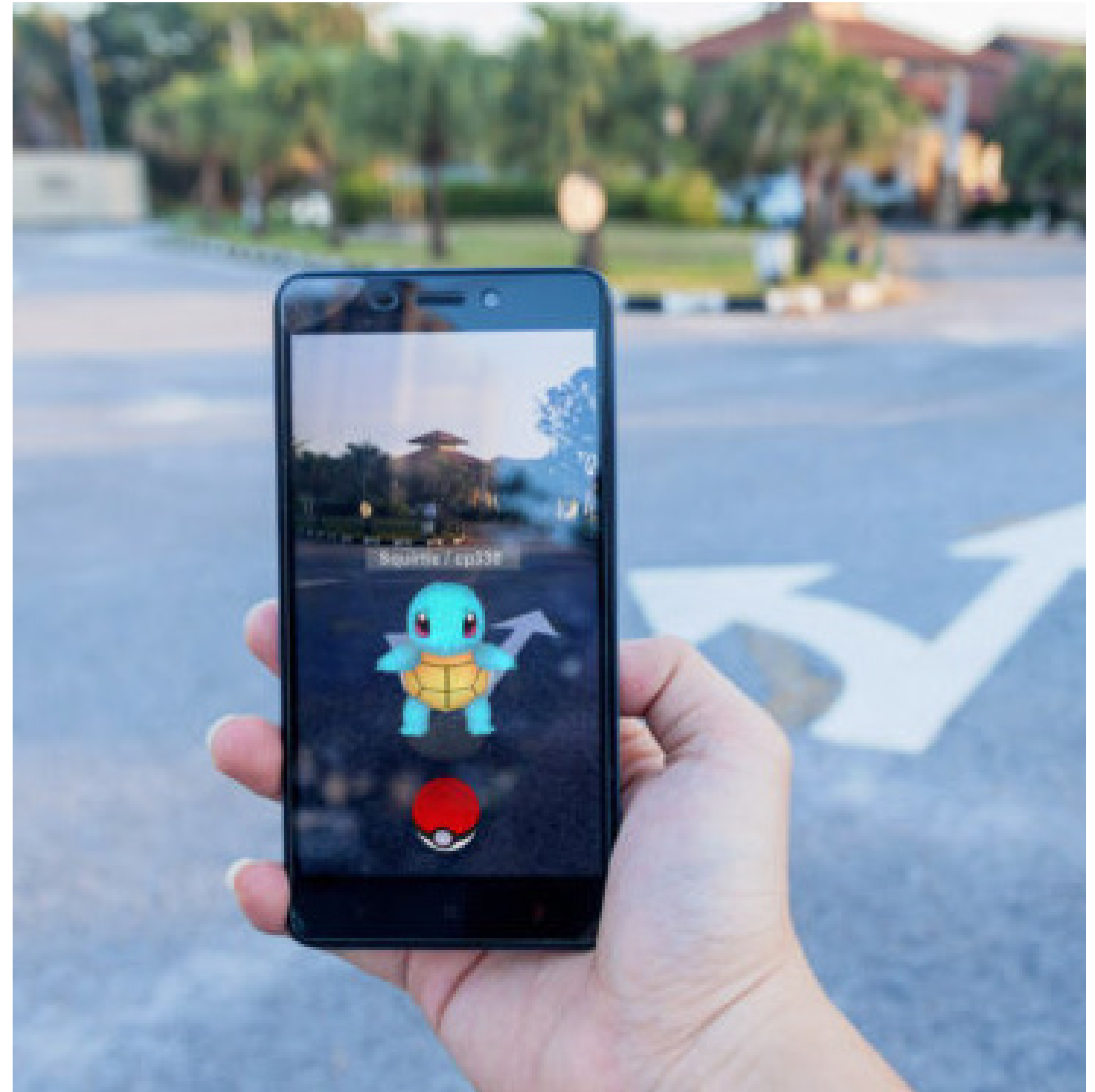
SMITHGROUP



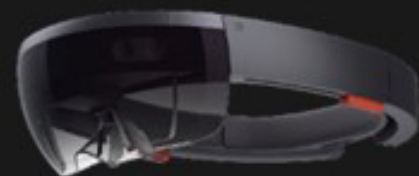
VIRTUAL REALITY(VR)



AUGMENTED REALITY (AR)



PHYSICAL WORLD



DIGITAL WORLD

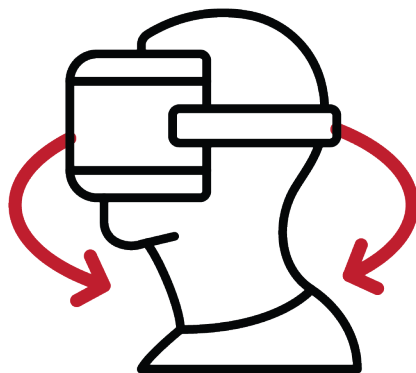
AUGMENTED REALITY

VIRTUAL REALITY

MIXED REALITY SPECTRUM

DEGREES OF FREEDOM

3 DEGREES



YAWING



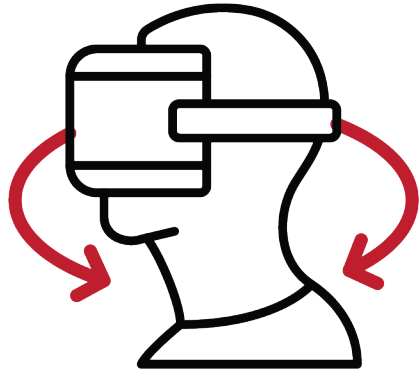
PITCHING



ROLLING

DEGREES OF FREEDOM

6 DEGREES



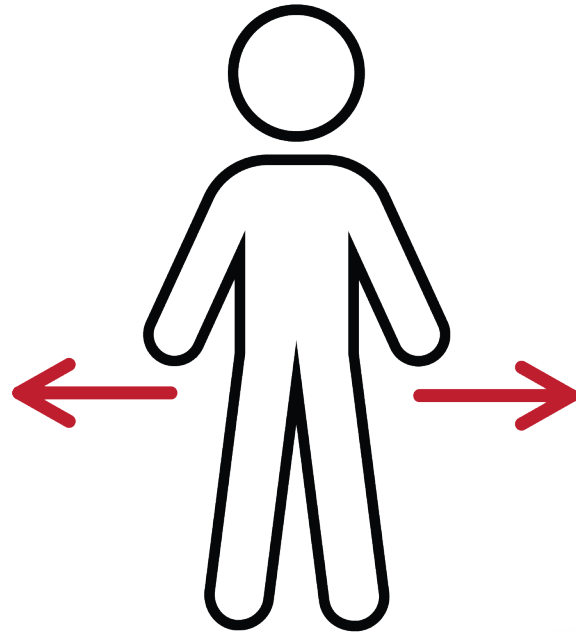
YAWING



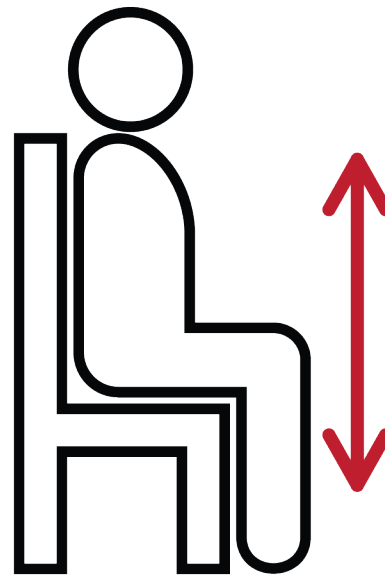
PITCHING



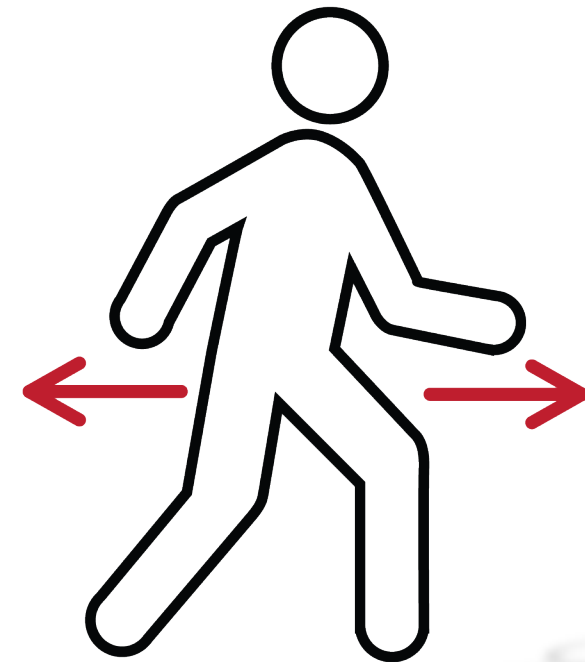
ROLLING



STRAFING



ELEVATING



SURGING

VIRTUAL REALITY DEVICES

3 DEGREES OF FREEDOM



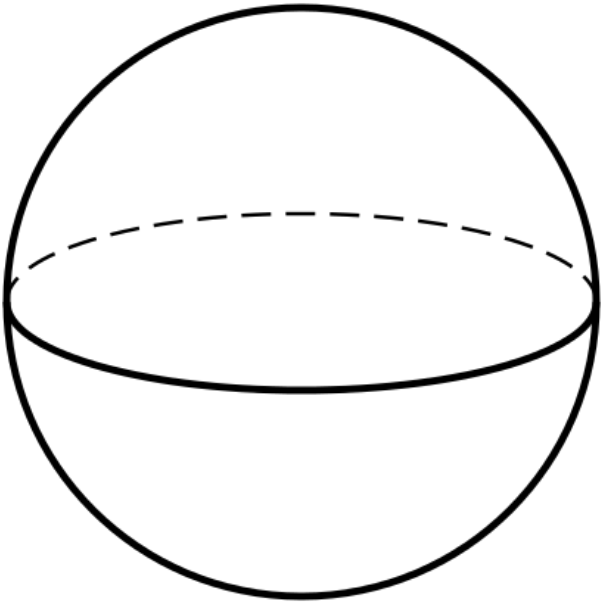
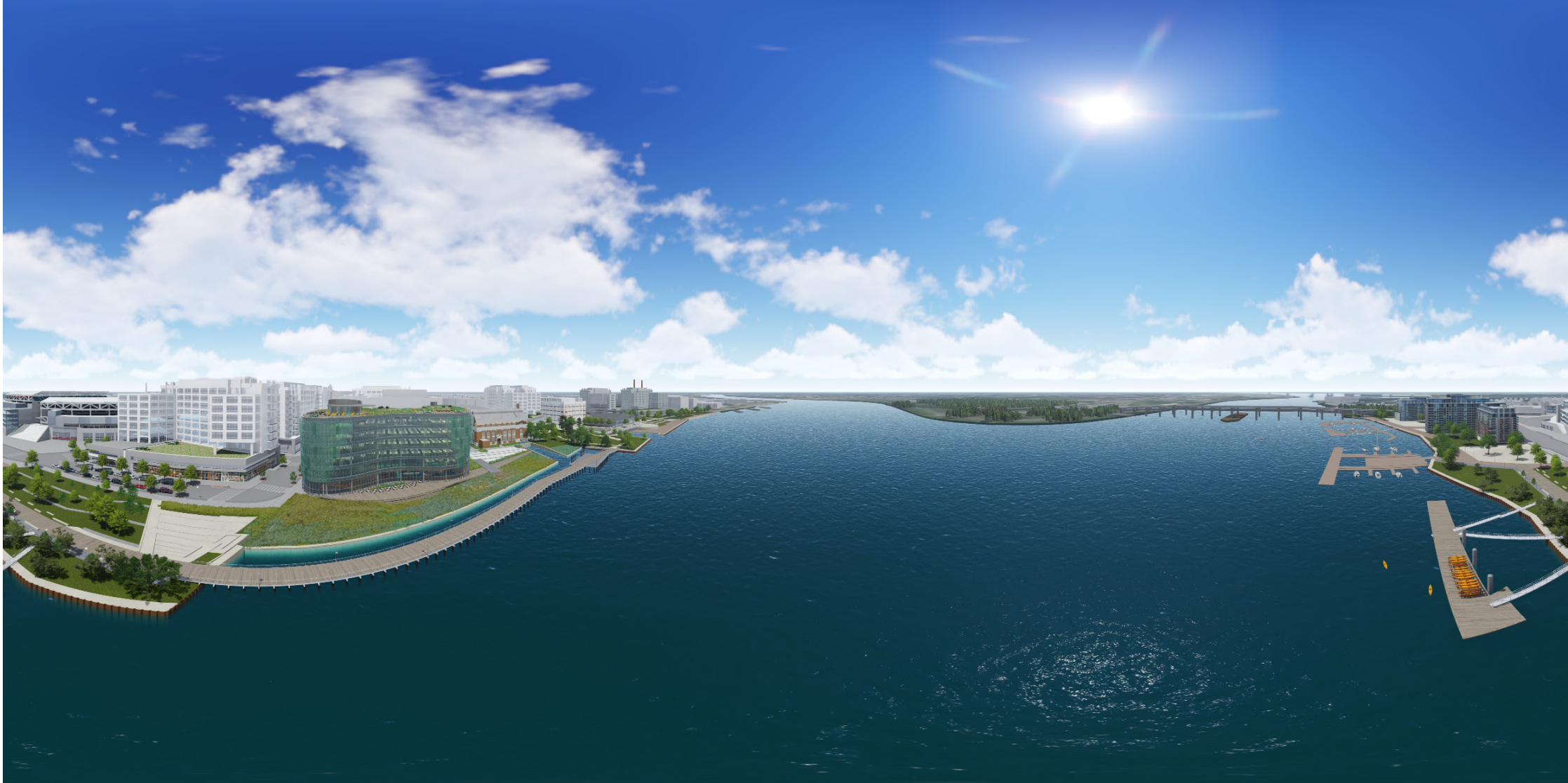
MOBILE VR

3 DOF

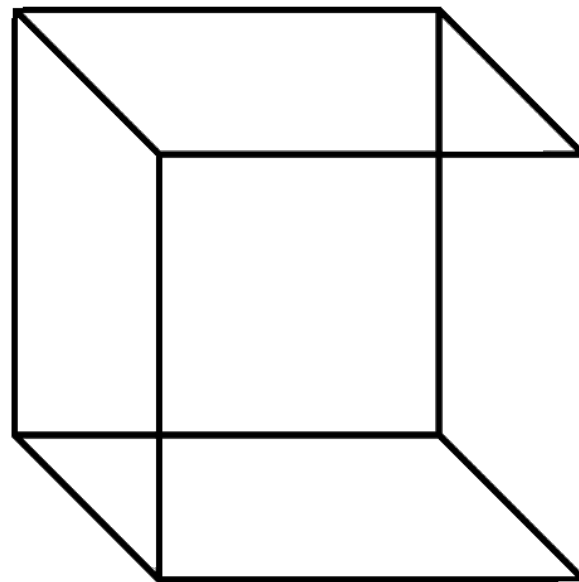
- EXPERIENTIAL
- SIMPLE TO CREATE
- ACCESSIBLE TO ALL



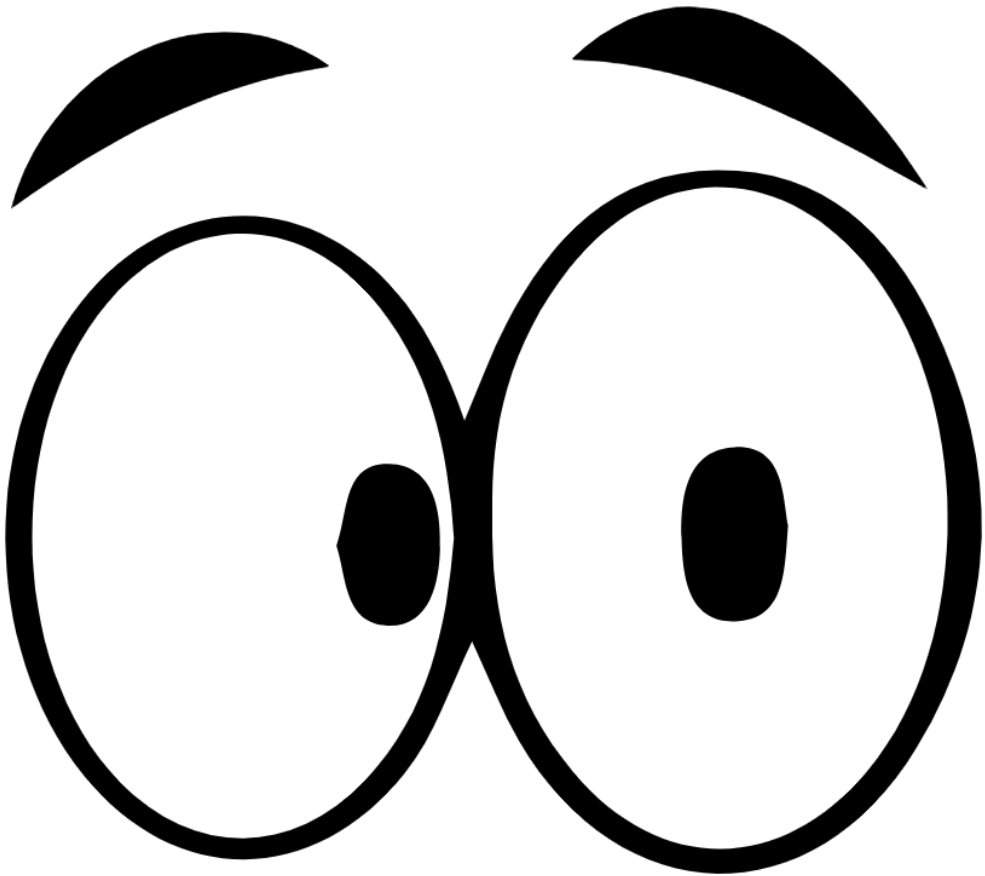
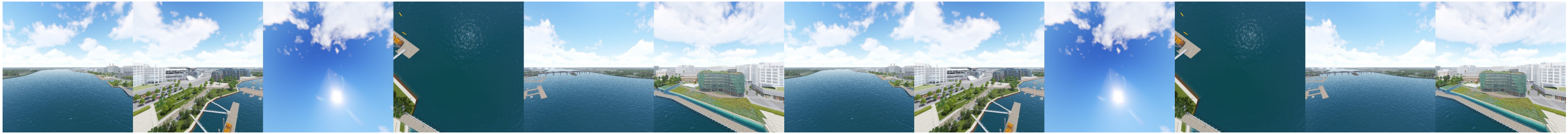
SPHERICAL



CUBEMAP



STEREO PANORAMIC



RENDERING SOFTWARE

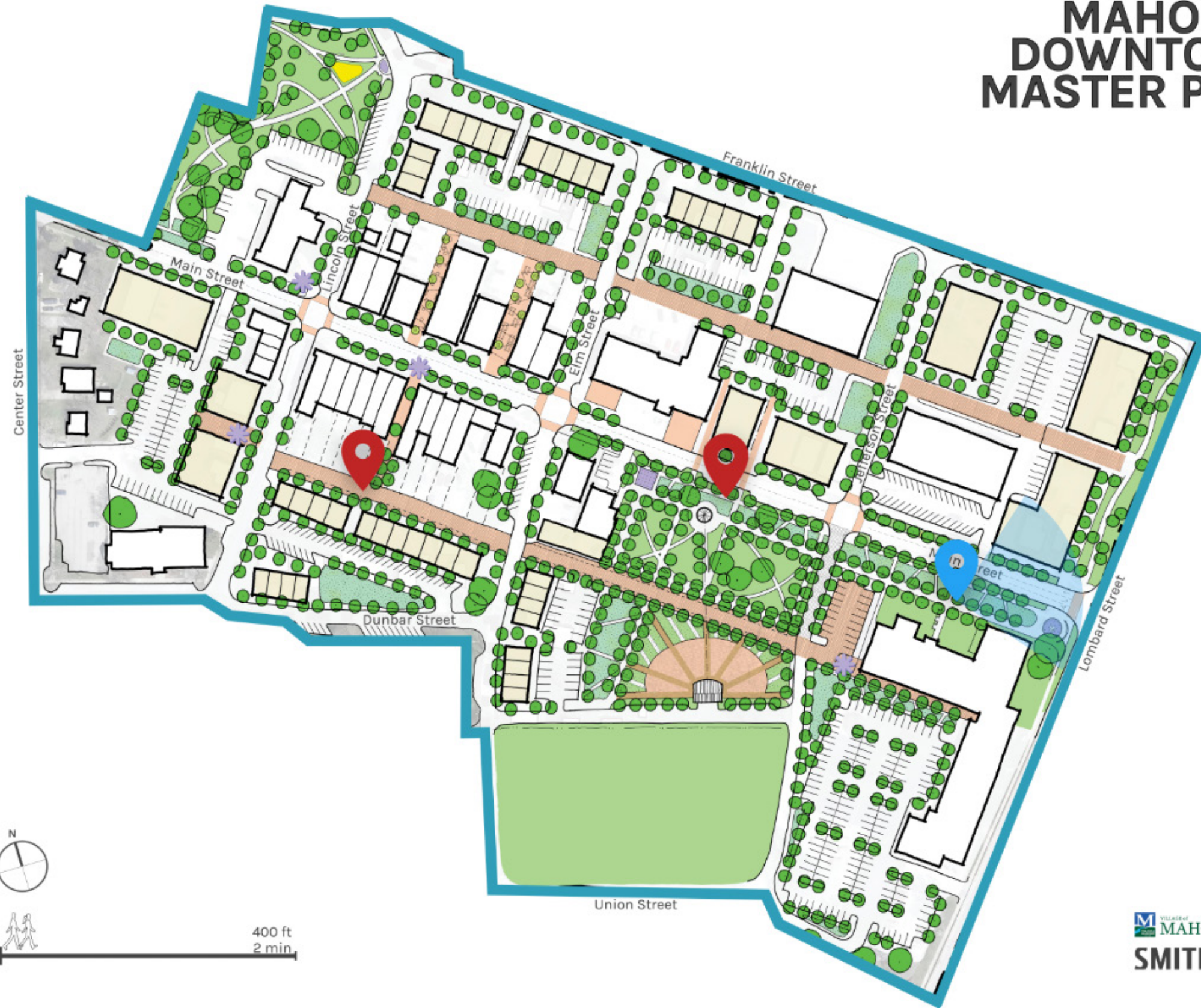


YULIO^{VR}

360 CAMERAS



MAHOMET DOWNTOWN MASTER PLAN



400 ft
2 min



Promenade: Today

Downtown Mahomet
Promenade: Tomorrow





VILLAGE OF MAHOMET
DOWNTOWN MASTER PLAN
EXPERIENCE THE VISION



SCAN THIS

VIRTUAL REALITY DEVICES

6 DEGREES OF FREEDOM

OCULUS RIFT



OCULUS QUEST



VIVE COSMOS

HTC VIVE



WINDOWS “MIXED REALITY”

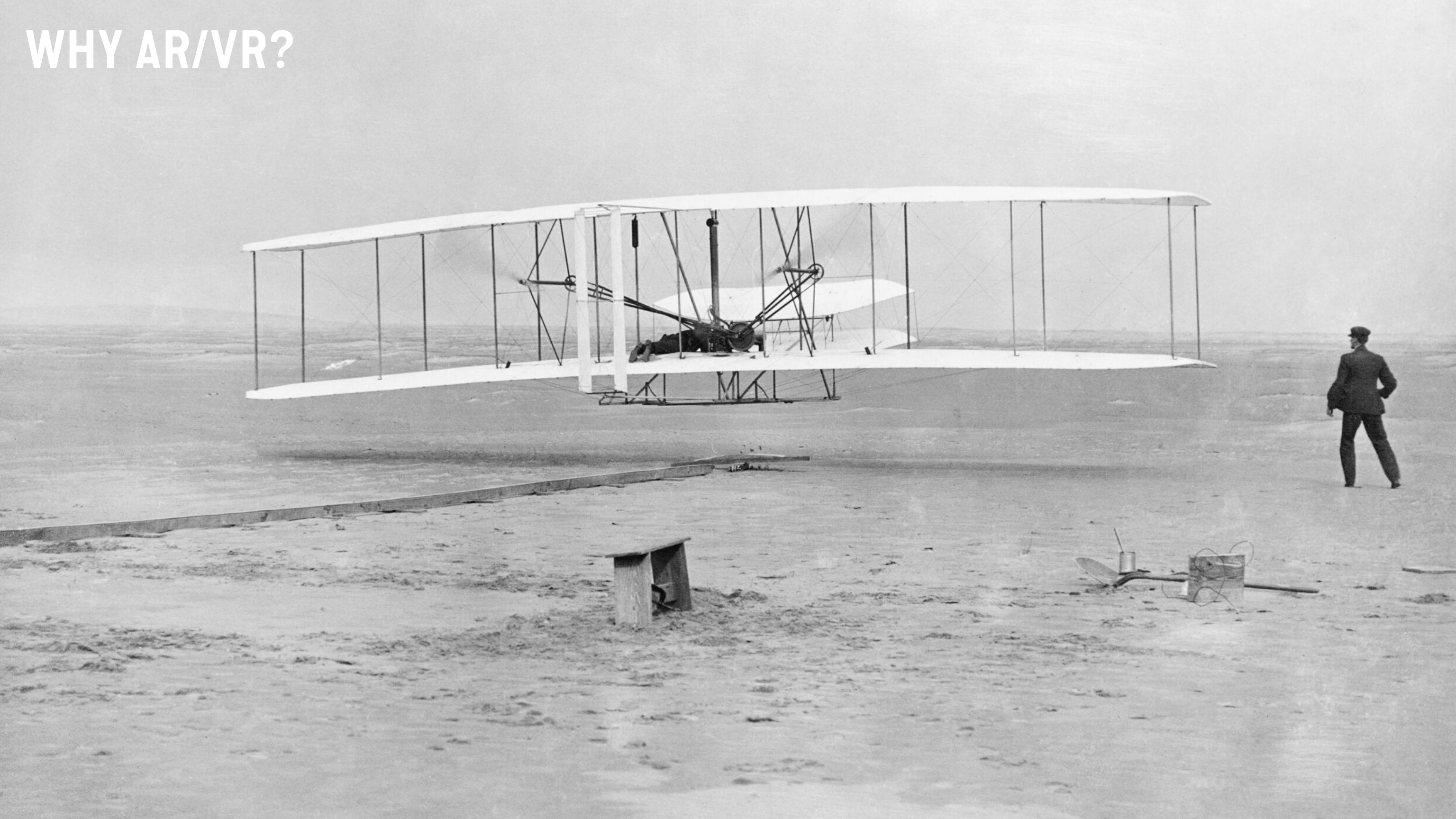


WHY AR/VR?

Disney · PIXAR
**INSIDE
OUT**

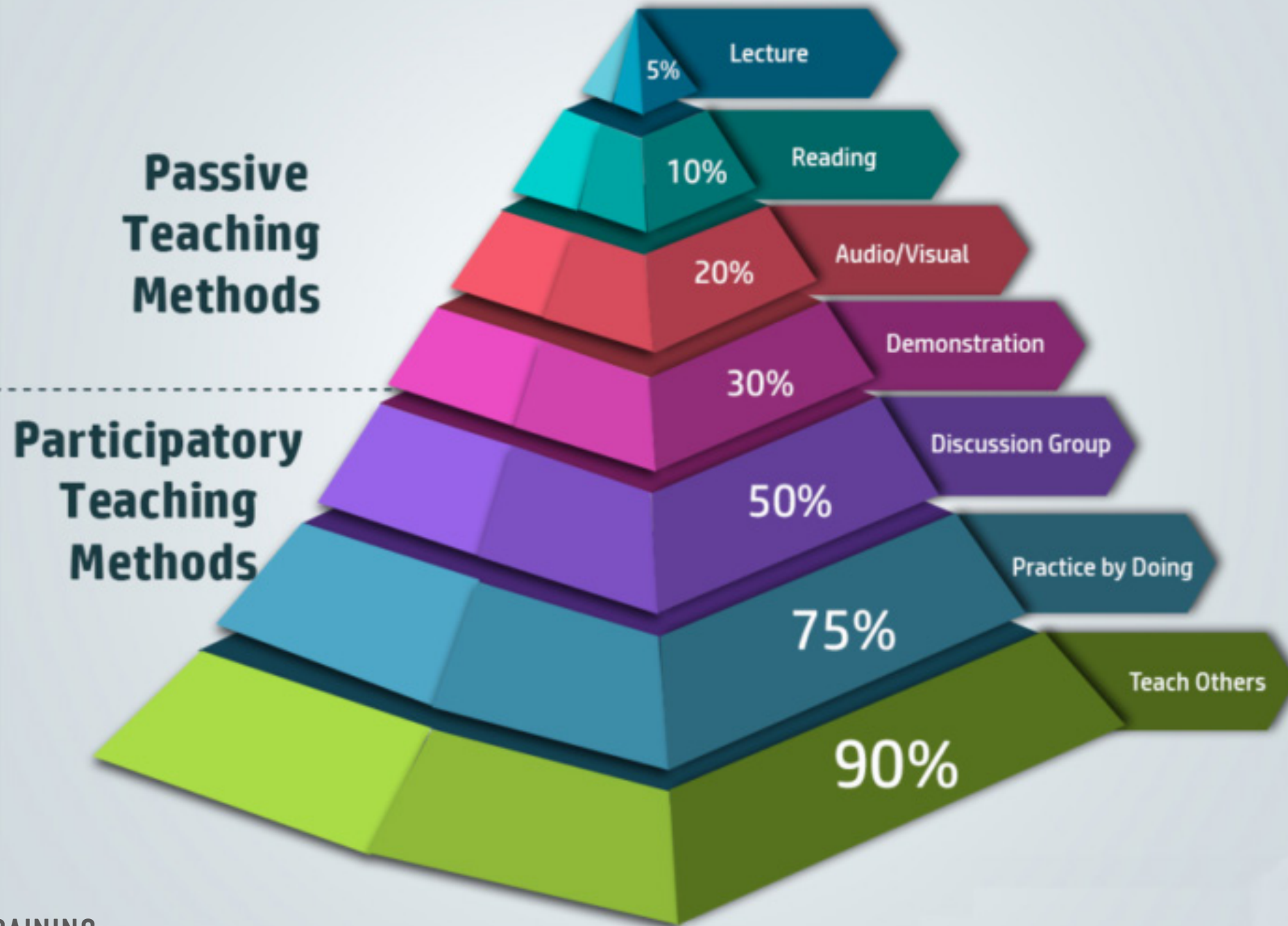


WHY AR/VR?



THE LEARNING PYRAMID

KNOWLEDGE RETENTION RATES





WORKFLOW IMPACTS

SIMPLE TRANSITION TO VR IS VITAL

- ACCURATE, HIGH QUALITY MATERIALS IN DOCUMENTATION MODELS
- INCREASED MODEL FIDELITY AND DETAIL
- ENTOURAGE IN REVIT



WoodFloorOakRustic_Gls.jpg



WoodFloorOakRustic_Nrm.jpg



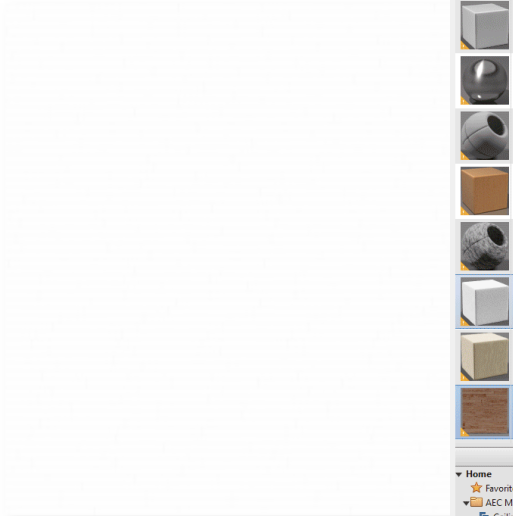
WoodFloorOakRustic_Rph.jpg



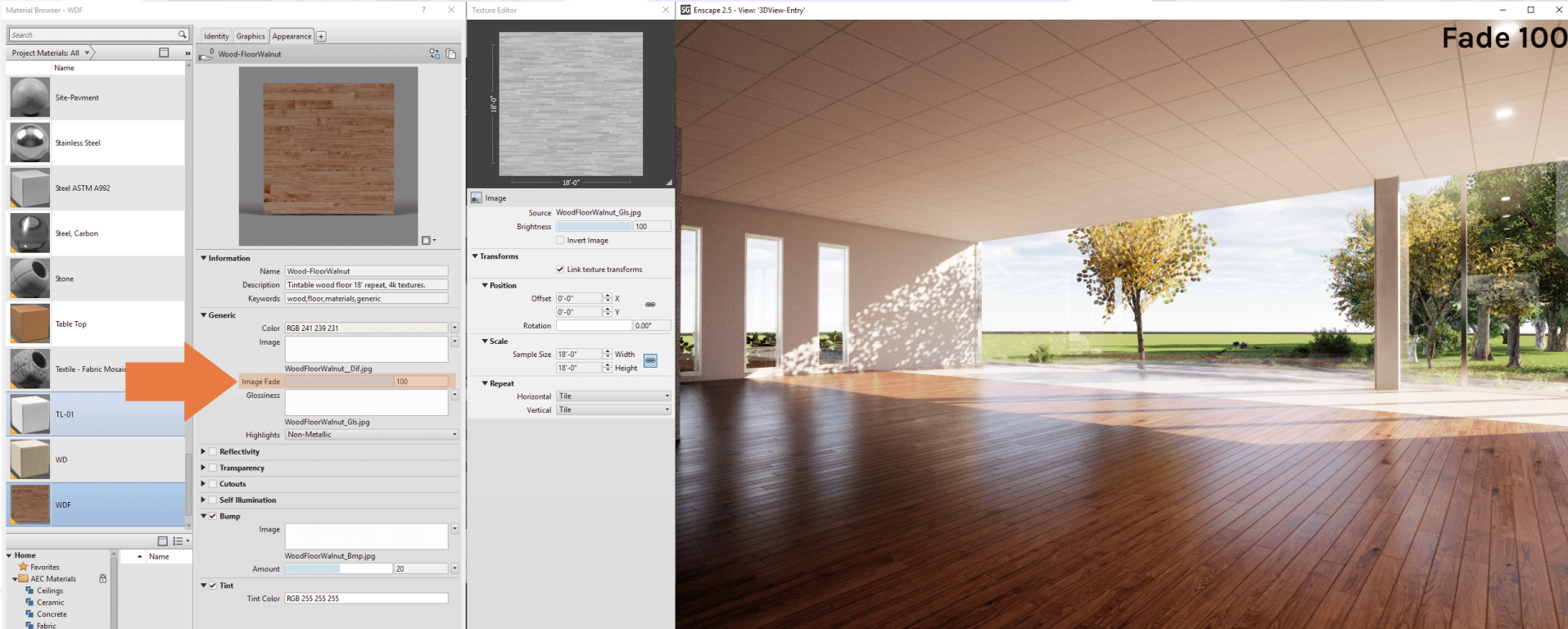
WoodFloorPineKnotty_Bmp.jpg



WoodFloorWalnut_Dif.jpg



WoodFloorWalnut_Bmp.jpg

























10/10/2017
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10/10/2017
10/10/2017

Dynamo Player



Filter...



-  Door_HostInfo  Ready
-  Elements_LinkedRoomInfo  Ready
-  GetParameter_SetParameter  Ready
-  GetParameter_SetTypeParameter  Ready
-  InPlaceFamilyList  Ready
-  IssuanceCheckingTool  Ready
-  LS_Copy Occupant Load Factors  Ready
-  LS_Set Up Function Of Space Key  Ready
-  LS_Tag Fire-Smoke Walls  Ready
-  MaterialLegend_Alphabetical  Ready









COLLABORATIVE VIRTUAL REALITY



AUGMENTED/ MIXED REALITY DEVICES



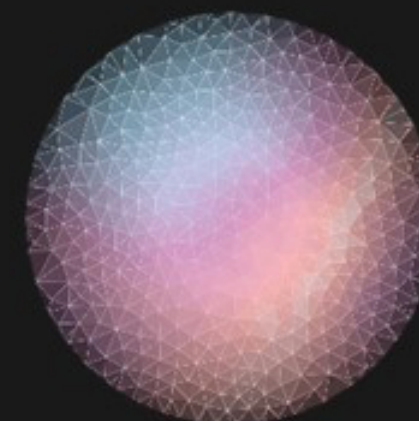
HEAD MOUNTED DISPLAYS



MOBILE DEVICES

PHYSICAL WORLD

DIGITAL WORLD



AUGMENTED REALITY

VIRTUAL REALITY

MIXED REALITY SPECTRUM

PHYSICAL WORLD

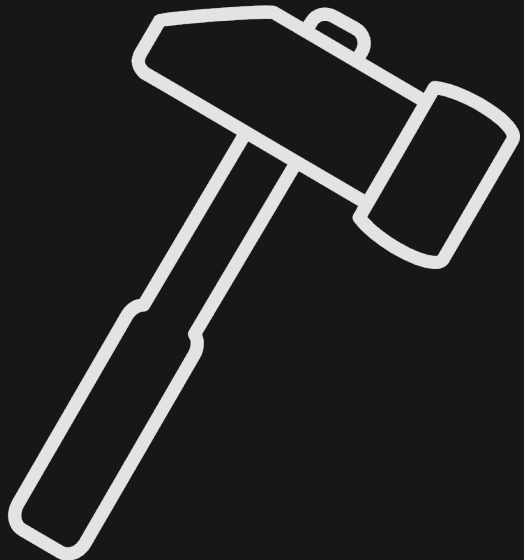
DIGITAL WORLD



AUGMENTED REALITY

VIRTUAL REALITY

MIXED REALITY SPECTRUM





NOBLIS, L'ENFANT PLAZA – WASHINGTON DC









DC WATER HEADQUARTERS

FORM DIAGRAMS

DC WATER HEADQUARTERS

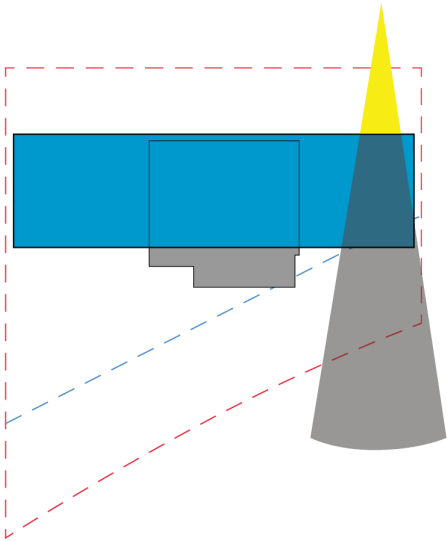


Figure 1:
Standard Office footprint. Expensive structure above O Street Pumping Station.

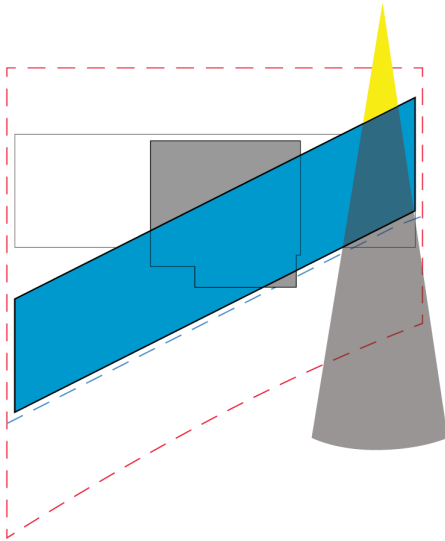


Figure 2:
Push Office footprint as far off of O Street Pumping Station as possible.

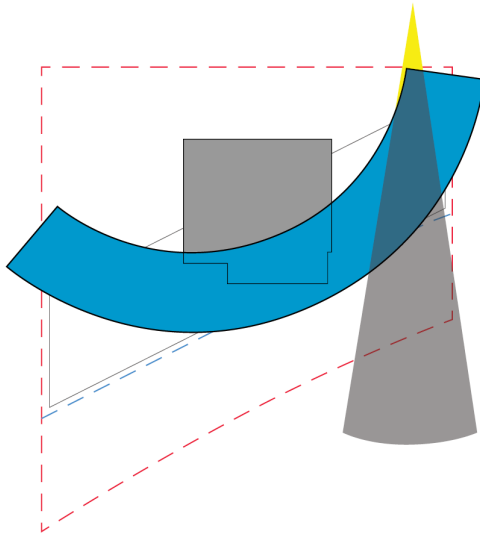


Figure 3:
Make Office footprint narrower to create better views and daylighting. Capture southeast corner of O Street Pumping Station within footprint of the new building.

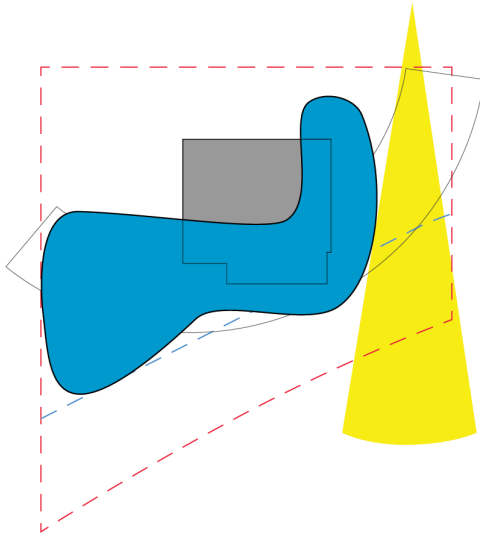


Figure 4:
Bend Office footprint up on east and west to maximize views and to maintain Canal Street View Shed.

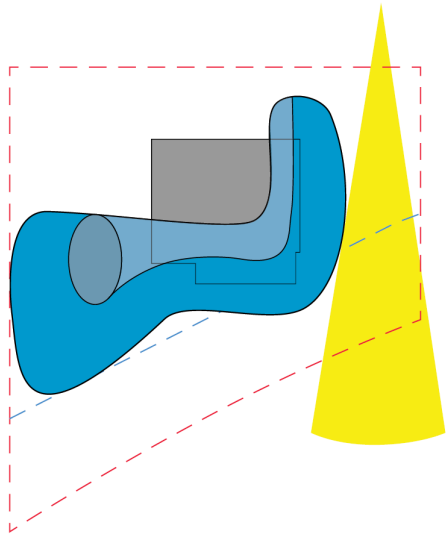
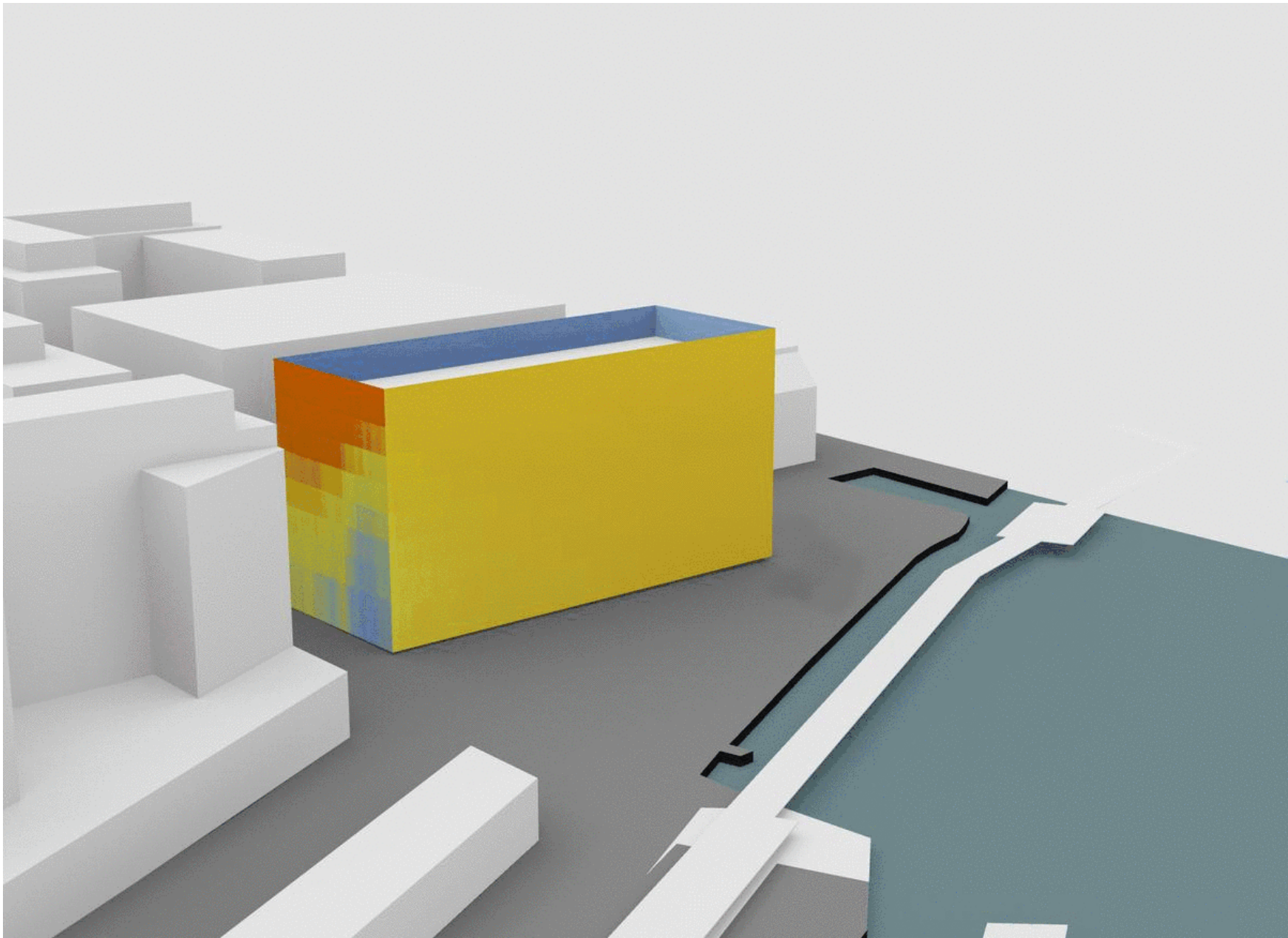
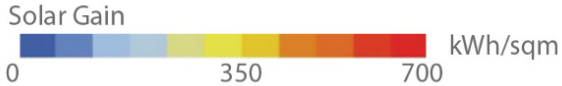


Figure 5:
Placing the core at the deepest portion of the footprint creates an ideal office layout. A 35-foot zone of open office with expansive views and optimal daylighting and a 15-foot zone for support spaces and private offices which are provided with windows to the north as needed.

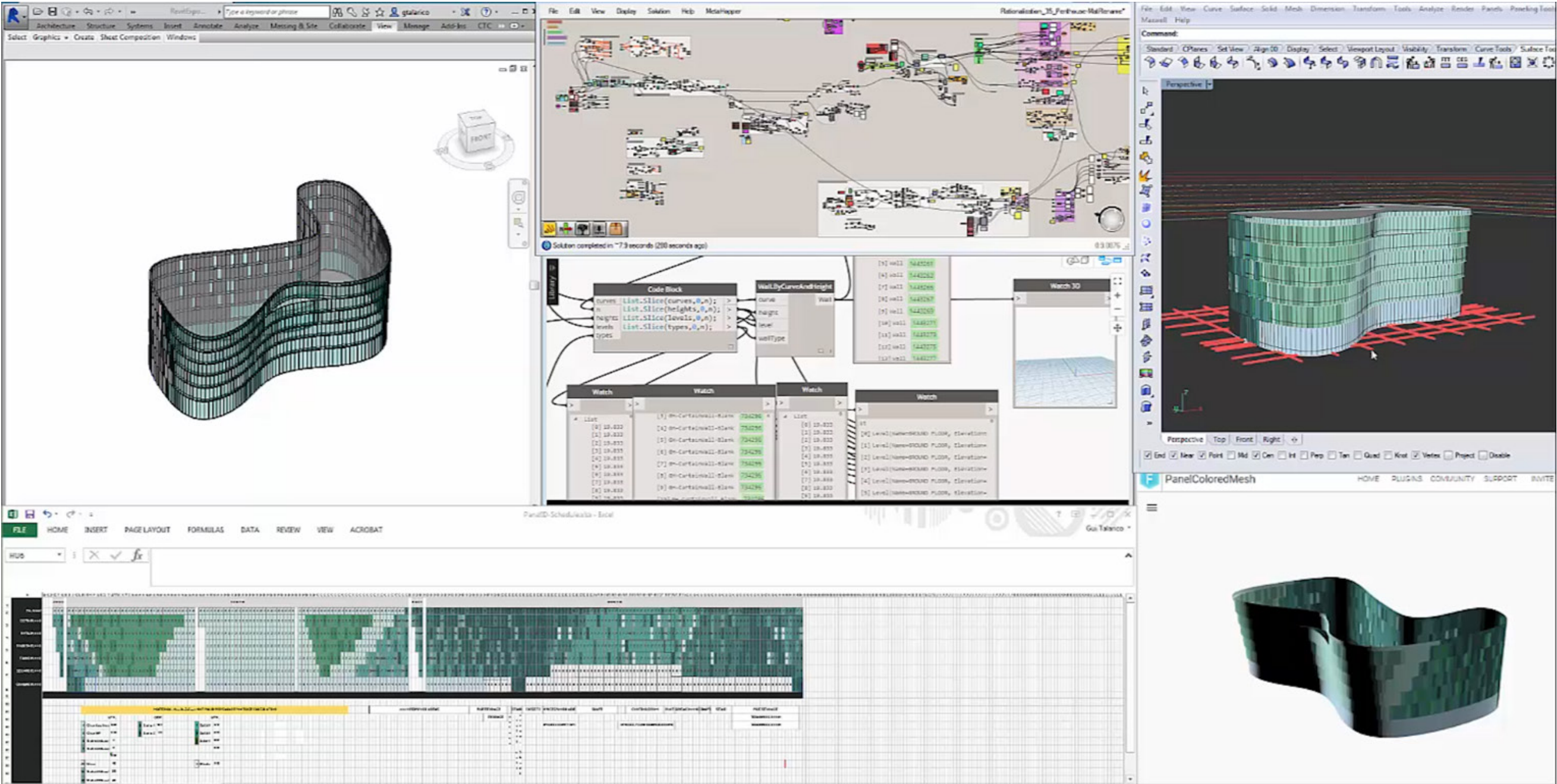
NET SOLAR HEAT GAIN

DC WATER HEADQUARTERS



DESIGN SOFTWARE

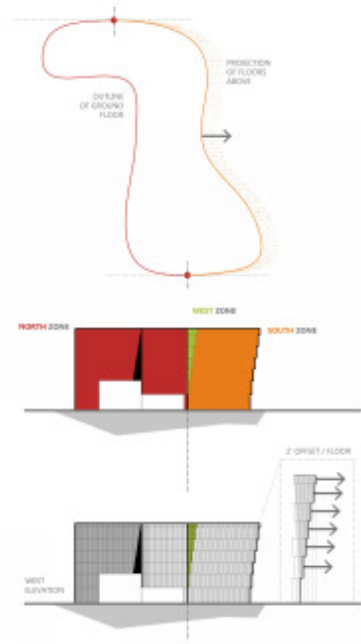
DC WATER HEADQUARTERS



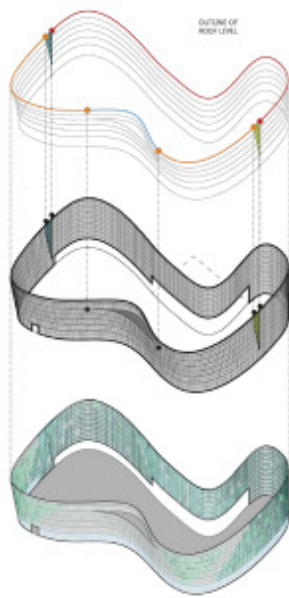
	WEST ZONE	SOUTH ZONE										SOUTH ZONE										EAST ZONE										EAST ZONE										NORTH ZONE									
ROW	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40											
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FLATTENED ELEVATION - PANEL ID | SYSTEM ID | MATERIAL ID

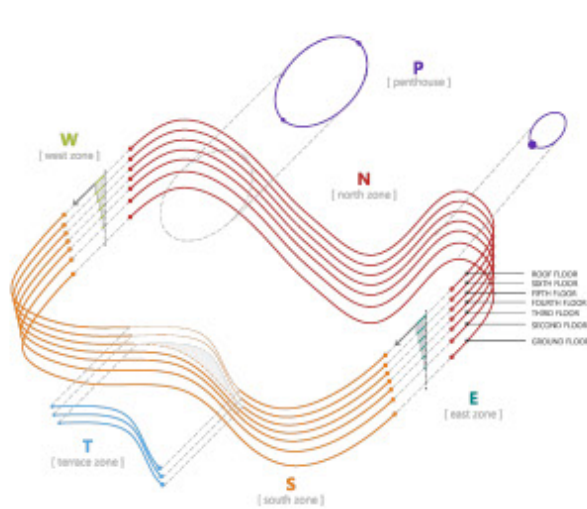
BUILDING GEOMETRY DIAGRAM



BUILDING - ZONES



ZONE SYSTEM

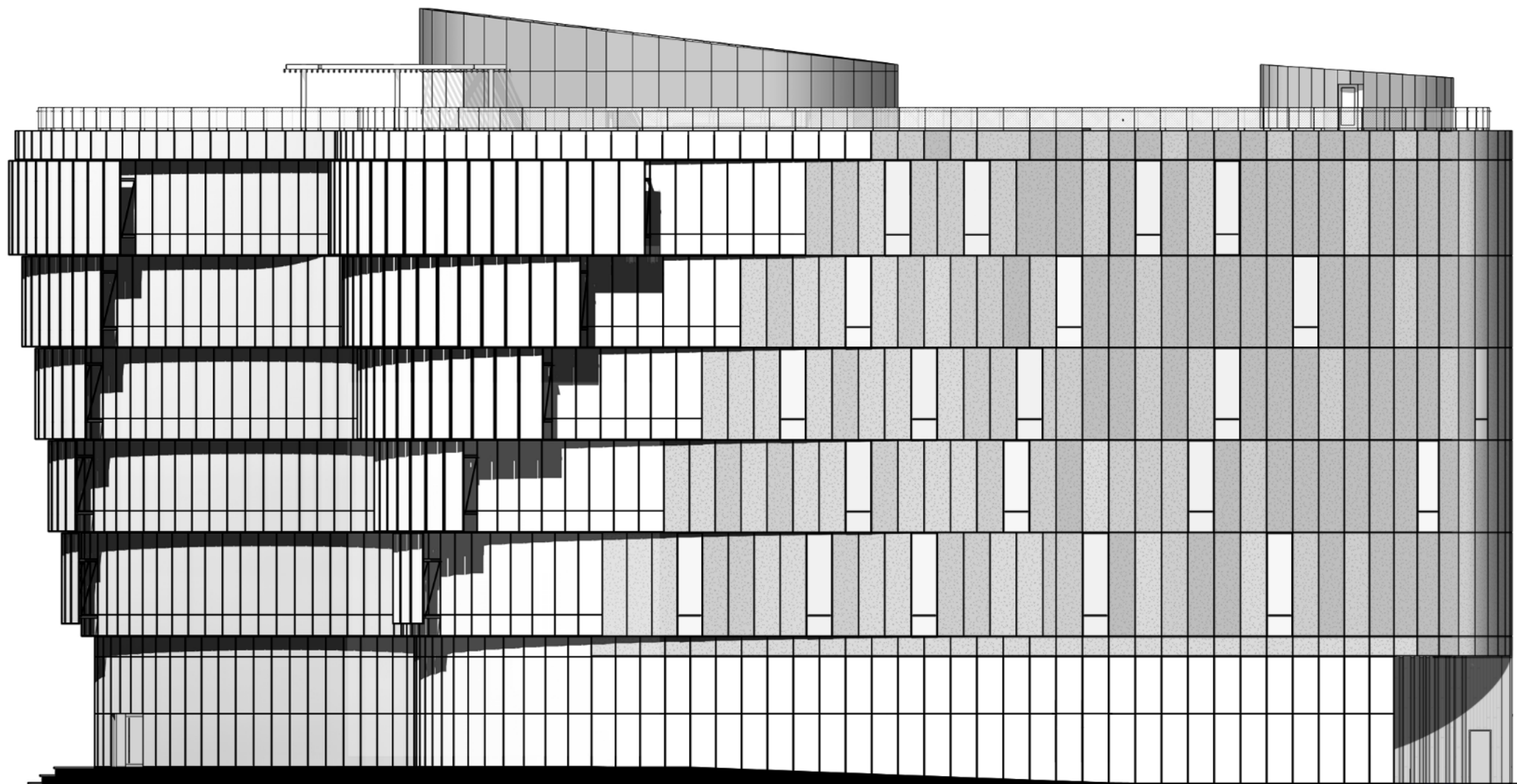


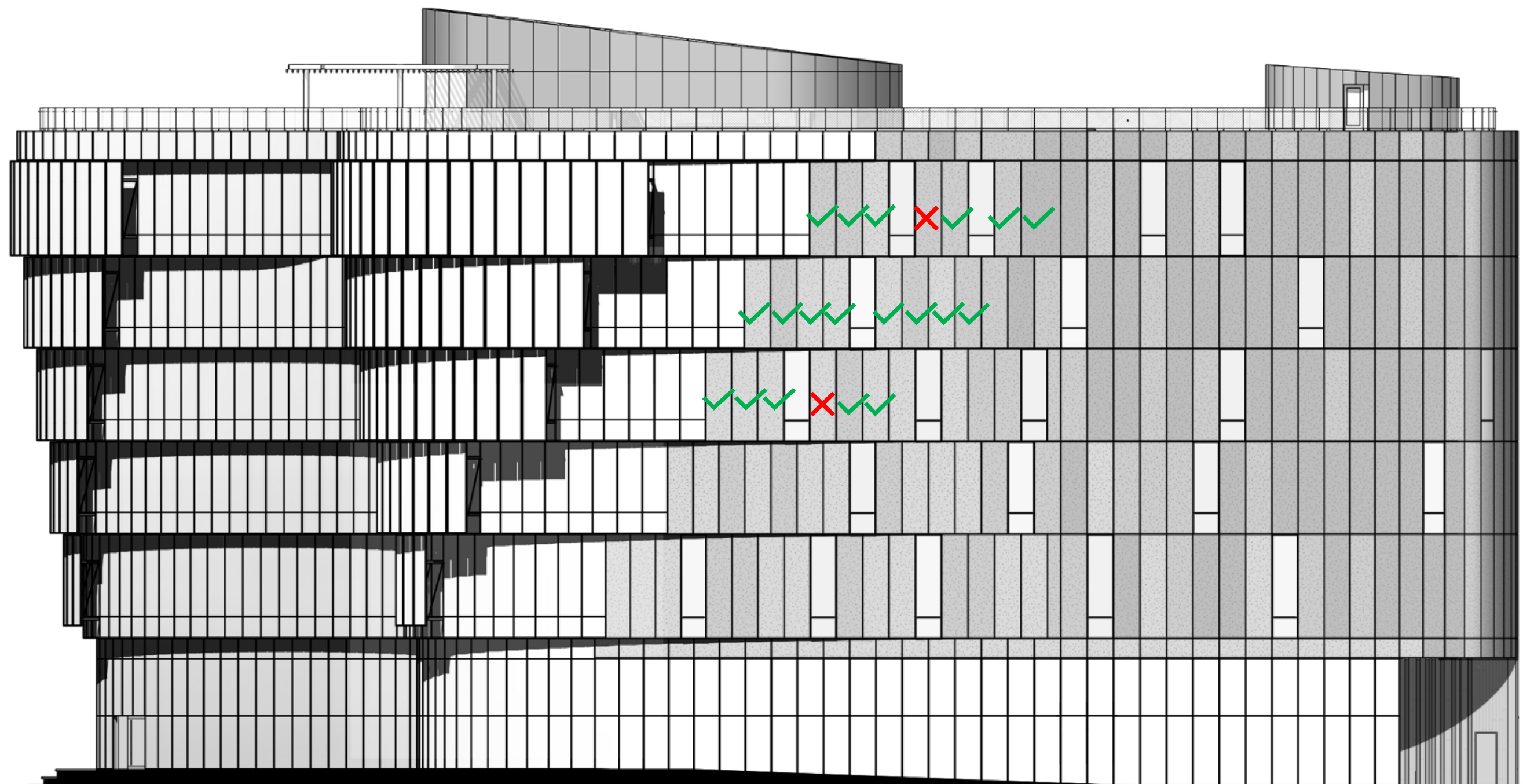
PANEL_ID SYSTEM

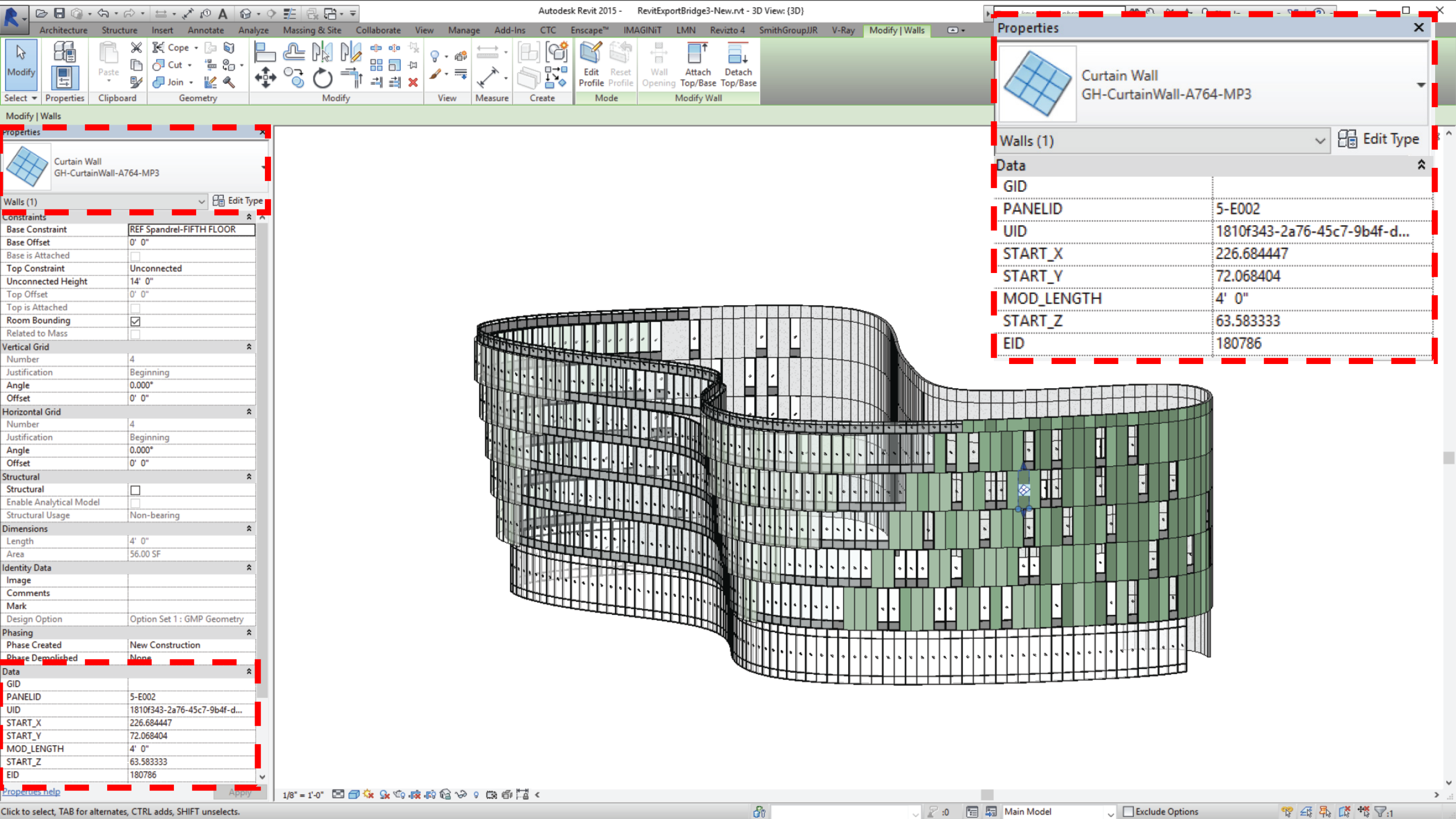
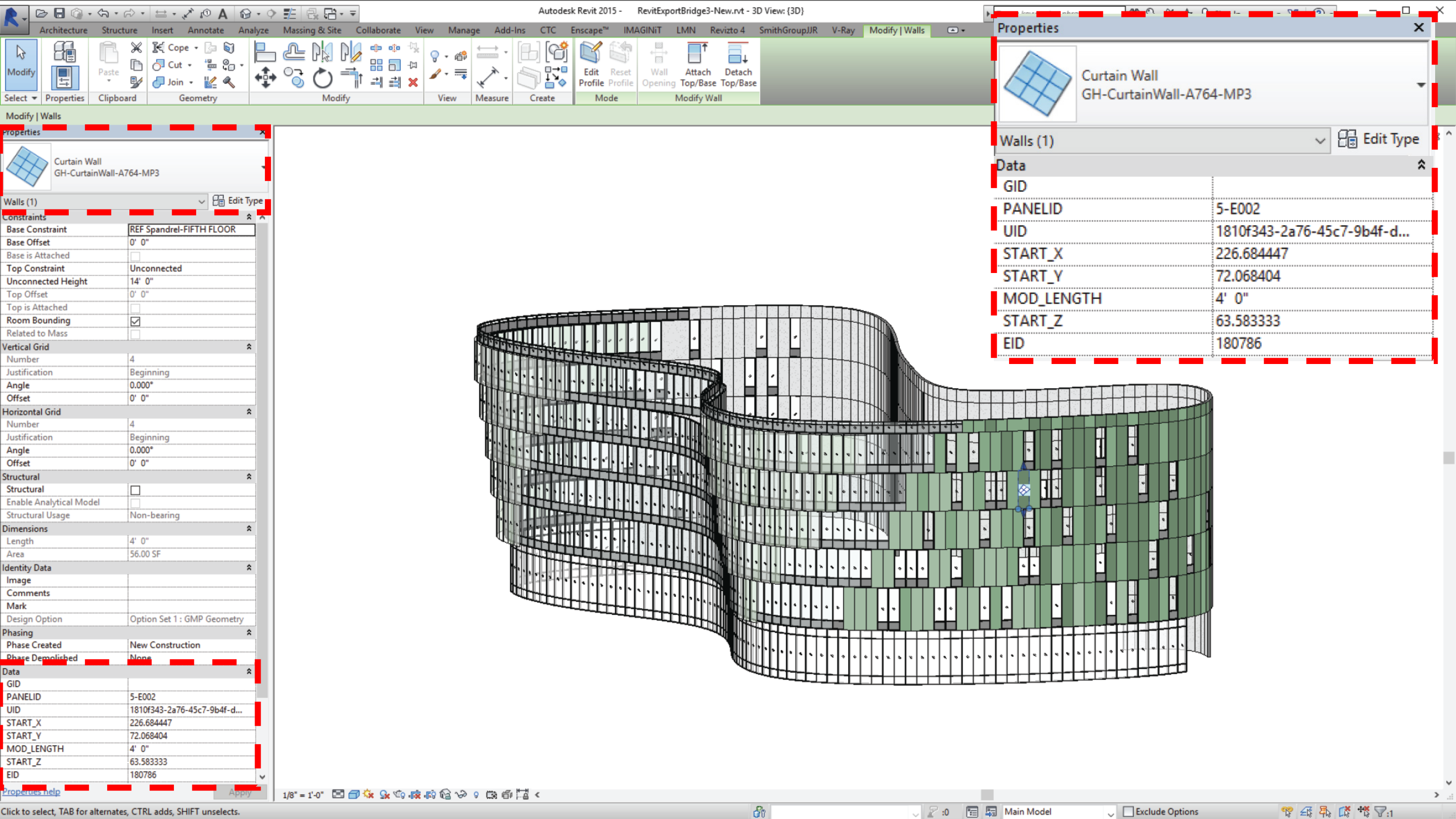


PANEL COLLECTION ORDER AND OVERVIEW

	NORTH ZONE		EAST ZONE		SOUTH ZONE		WEST ZONE		TOTAL
ROOF FLOOR	7-N001 → 7-N104	7-E001 → 7-E003	7-S001 → 7-S005	7-W001 → 7-W003	307				
SIXTH FLOOR	6-N001 → 6-N104	6-E001 → 6-E003	6-S001 → 6-S005	6-W001 → 6-W003	307				
FIFTH FLOOR	5-N001 → 5-N104	5-E001 → 5-E002	5-S001 → 5-S005	5-W001 → 5-W002	305				
FOURTH FLOOR	4-N001 → 4-N104	4-E001 → 4-E002	4-S001 → 4-S005	4-W001 → 4-W002	305				
THIRD FLOOR	3-N001 → 3-N104	3-E001 → -	3-S001 → 3-S005	3-W001 → -	301				
SECOND FLOOR	2-N001 → 2-N104	2-E001 → -	2-S001 → 2-S005	2-W001 → -	301				
GROUND FLOOR	1-N001 → 1-N104	- → -	1-S001 → 1-S005	- → -	199				
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Properties

3D View

3D View: SKIN Filtered- Edit Type

Constraints

Browser_View Group

Browser_View Category

Graphics

View Scale 1/8" = 1'-0"

Scale Value 1: 96

Detail Level Medium

Parts Visibility Show Original

Visibility/Graphics Overrides Edit...

Graphic Display Options Edit...

Discipline Architectural

Show Hidden Lines By Discipline

Default Analysis Display Style None

Visible In Option all

Sub-Discipline

Sun Path

Extents

Crop View

Crop Region Visible

Annotation Crop

Far Clip Active

Far Clip Offset 1000' 0"

Section Box

Camera

Rendering Settings Edit...

Locked Orientation

Perspective

Eye Elevation 8' 6 171/256"

Target Elevation 1' 1 59/128"

Camera Position Adjusting

Identity Data

View Template <None>

View Name SKIN Filtered-

Dependency Independent

Title on Sheet

Workset View "3D View: SKIN Filtered-"

Edited by dfersh

View Group XX-working

View SubGroup AR

View Type

Filter Parameter

Phasing

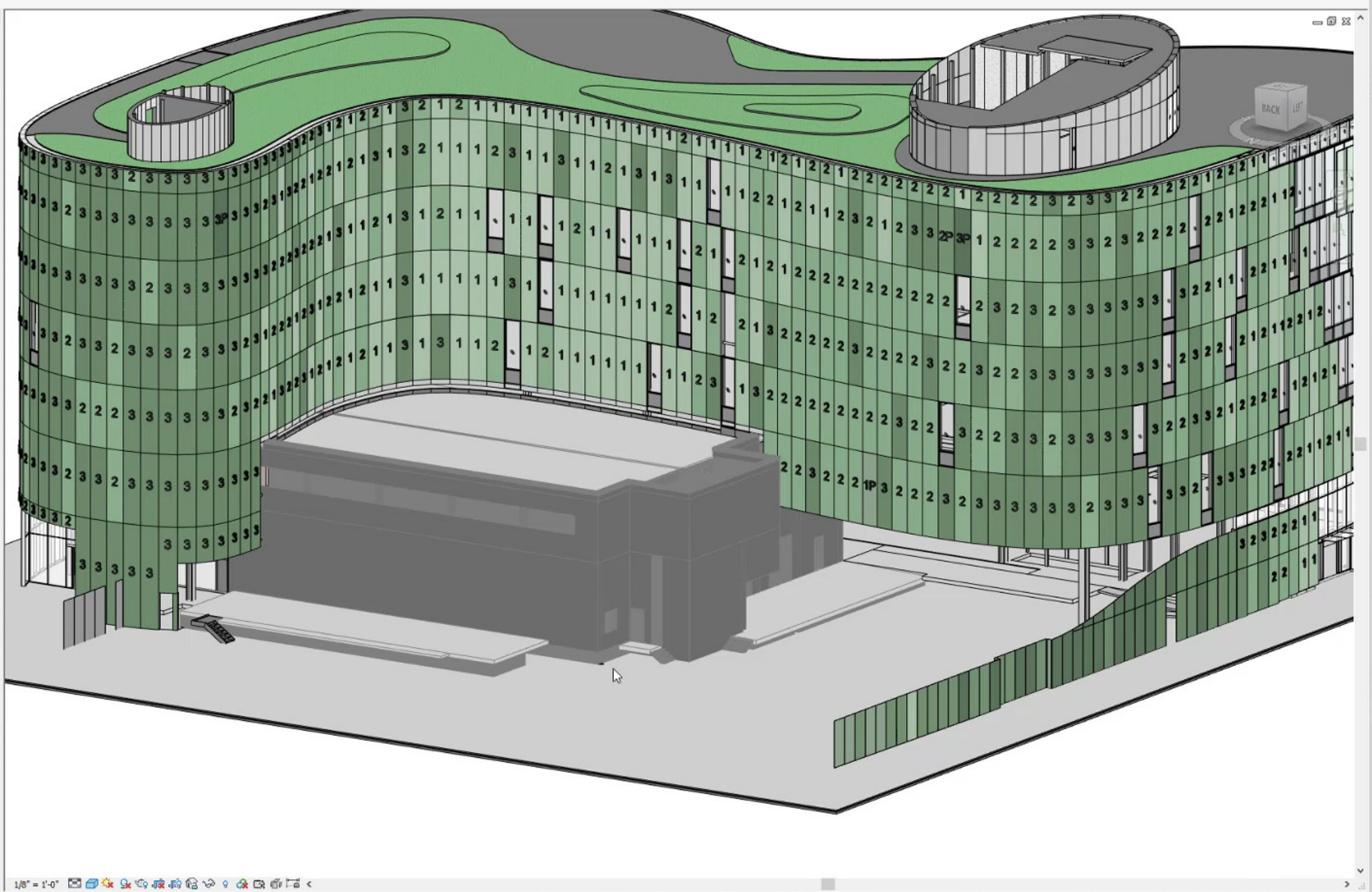
Phase Filter Show Previous + New

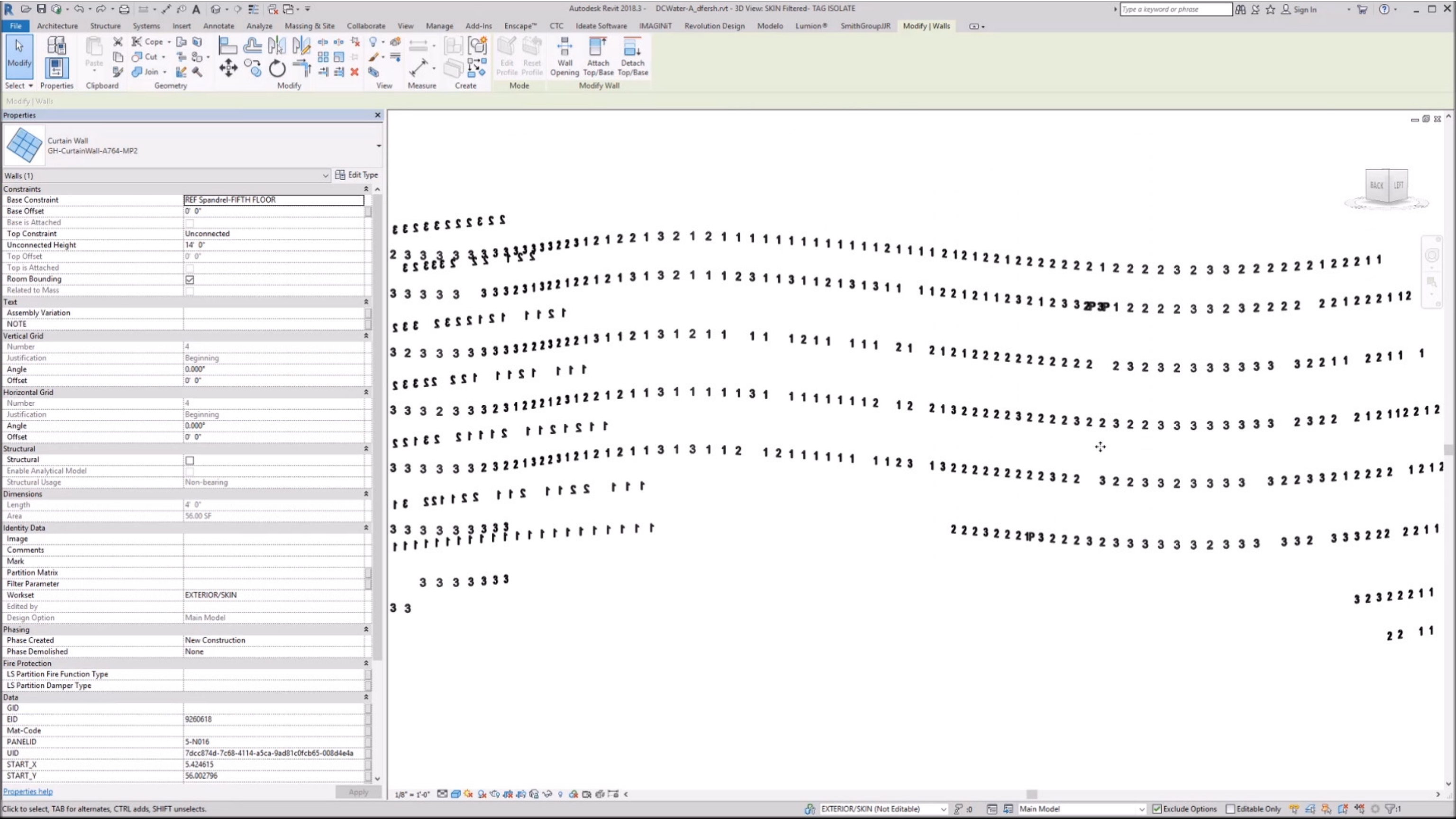
Phase New Construction

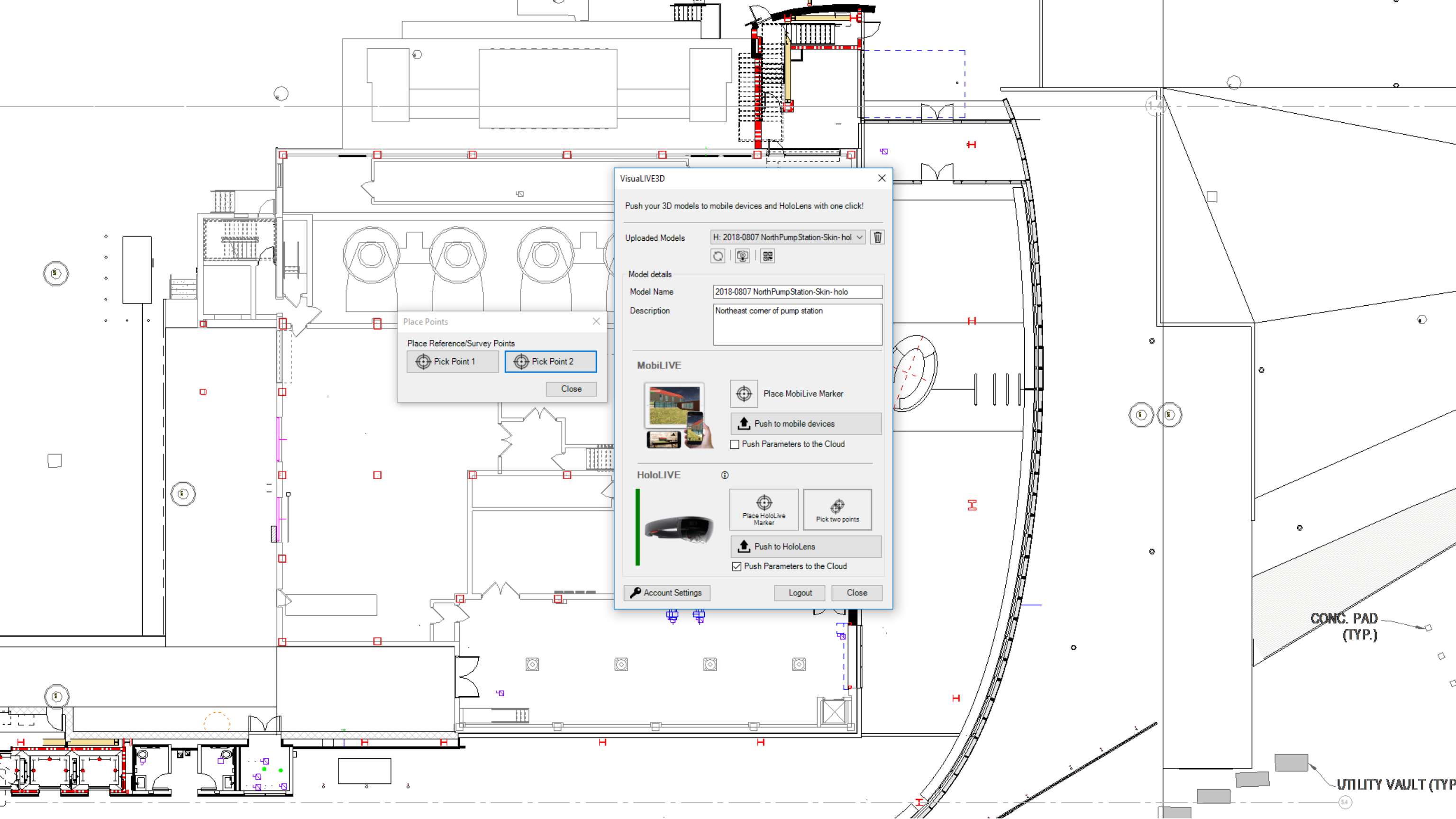
Other

View Use

Apply









Place Points

Place Reference/Survey Points


 Pick Point 1




 Pick Point 2

Close

VisuaLIVE3D

Push your 3D models to mobile devices and HoloLens with one click!

Uploaded Models H: 2018-0807 NorthPumpStation-Skin- hol 


  


Model details


Model Name 2018-0807 NorthPumpStation-Skin- holo

Description Northeast corner of pump station

MobiLIVE





 Place MobiLive Marker


 Push to mobile devices


☐ Push Parameters to the Cloud

HoloLIVE




 Place HoloLive Marker

 Pick two points

 Push to HoloLens

☒ Push Parameters to the Cloud

 Account Settings

Logout

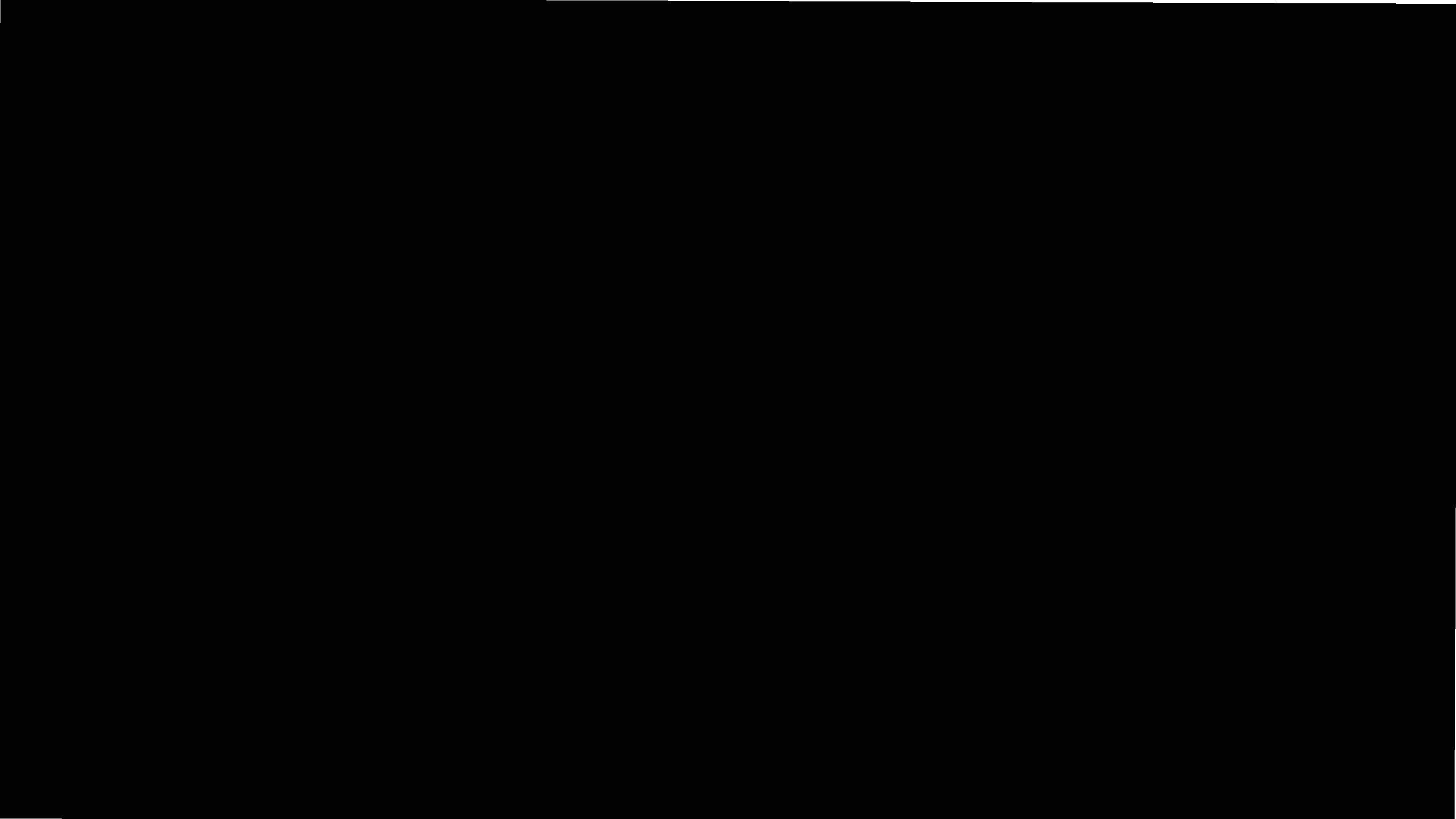
Close

CONC. PAD
(TYP.)

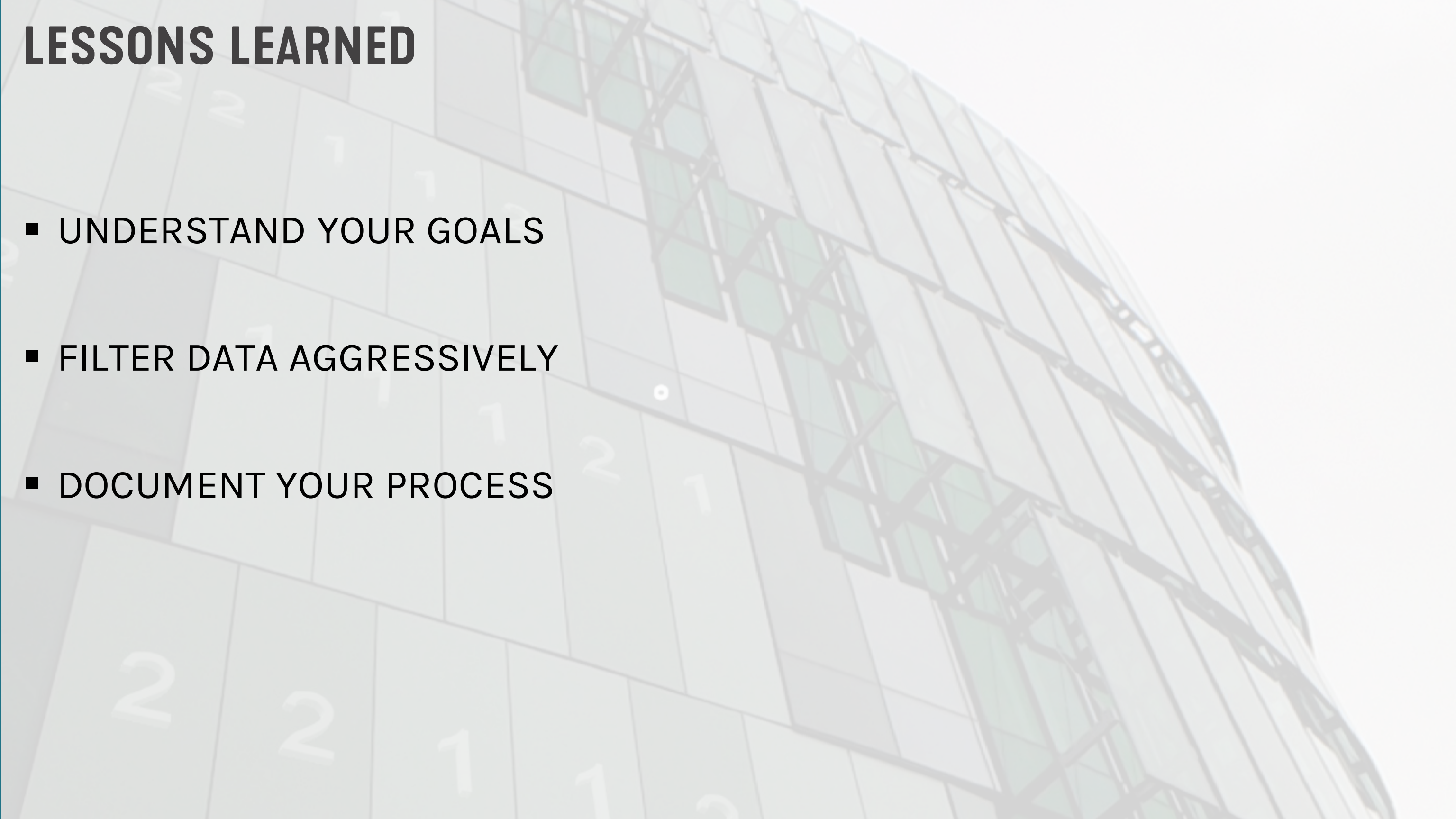
UTILITY VAULT (TYP.)











LESSONS LEARNED


- UNDERSTAND YOUR GOALS
- FILTER DATA AGGRESSIVELY
- DOCUMENT YOUR PROCESS

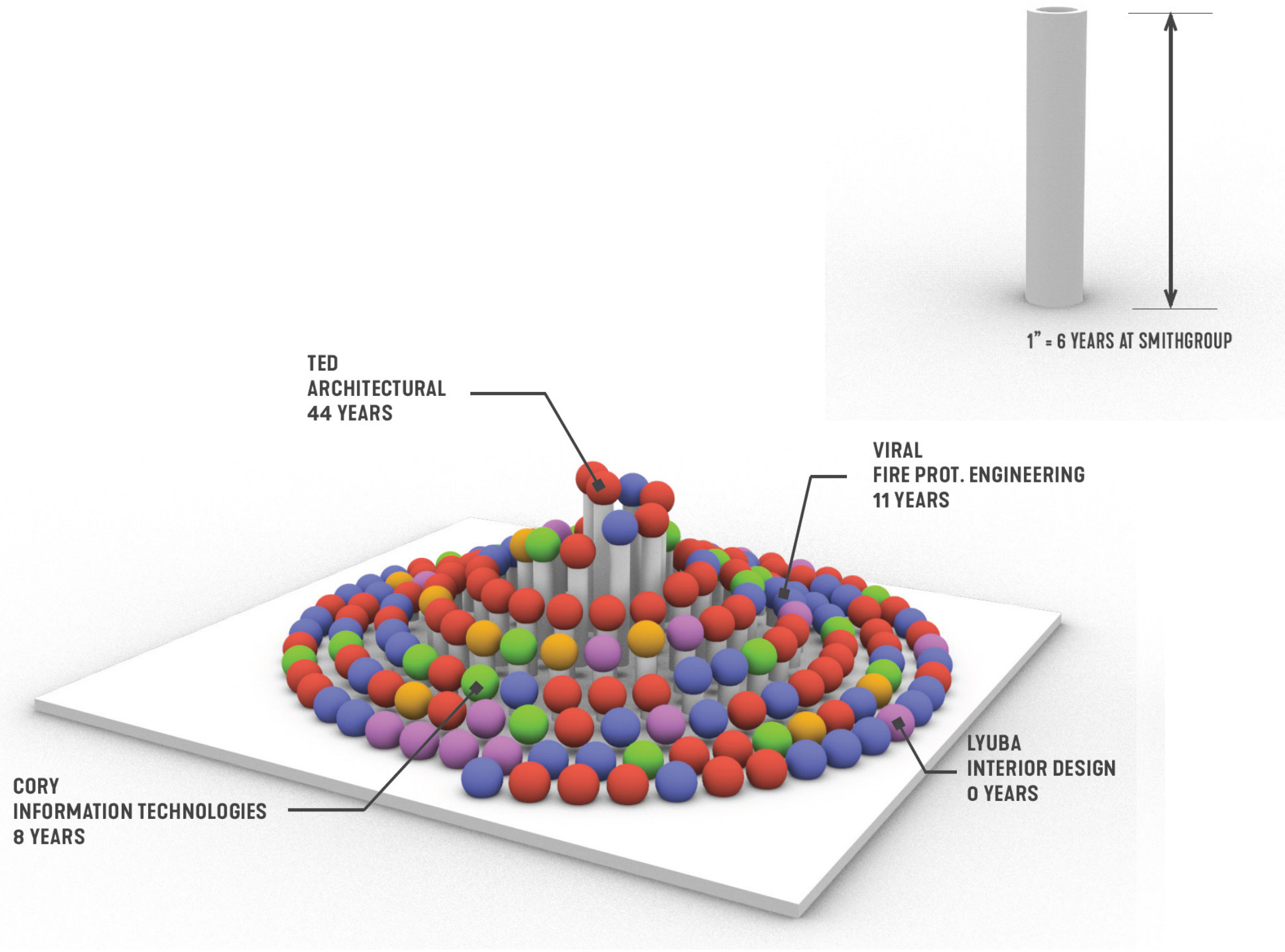


WHATS NEXT

THE FUTURE OF IMMERSIVE TECHNOLOGY

DONUTS AS DATA

-  ARCHITECTURAL, PLANNING
GLAZED
-  ENGINEERING
POWDER
-  INTERIORS
JELLY
-  IT, HR, CA, OFFICE CLERICAL & SPEC
CHOCOLATE
-  MARKETING
BLUEBERRY





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