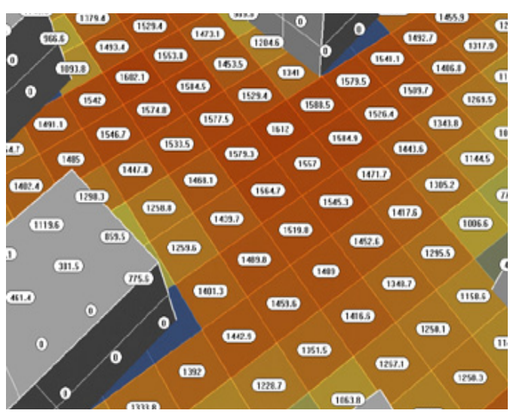
DESIGN COMPUTATION

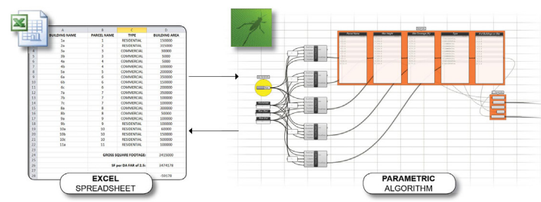
nbbj

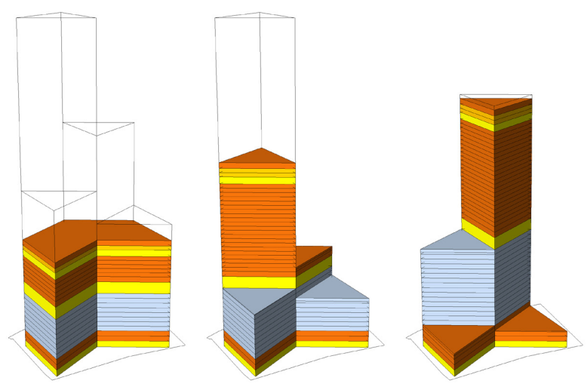
WHERE DOES IT PROVIDE VALUE?

METRIC-PROVEN DESIGN SOLUTIONS

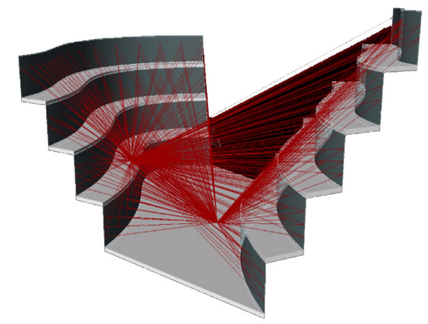


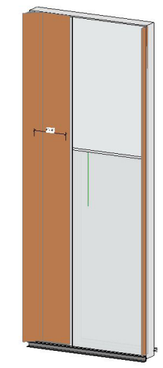
SYSTEM-DRIVEN EFFICIENCIES

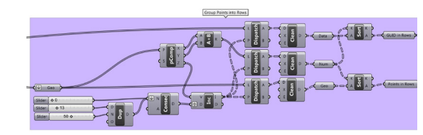


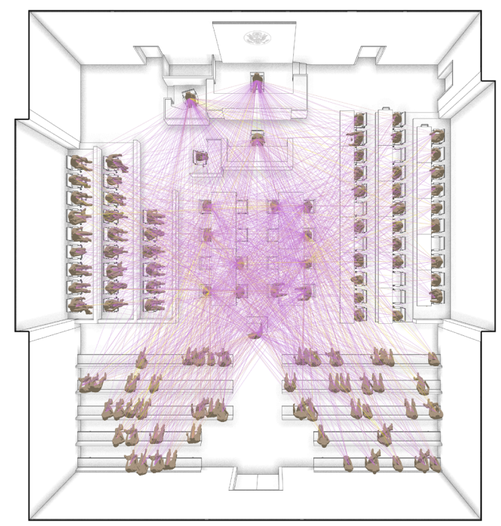


MODELING HUMAN EXPERIENCE

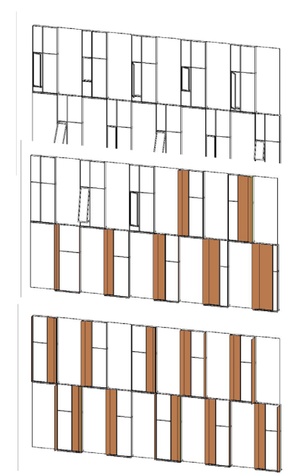








COLLABORATION AND DELIVERY

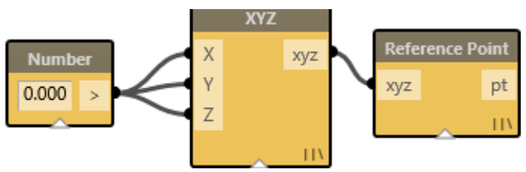


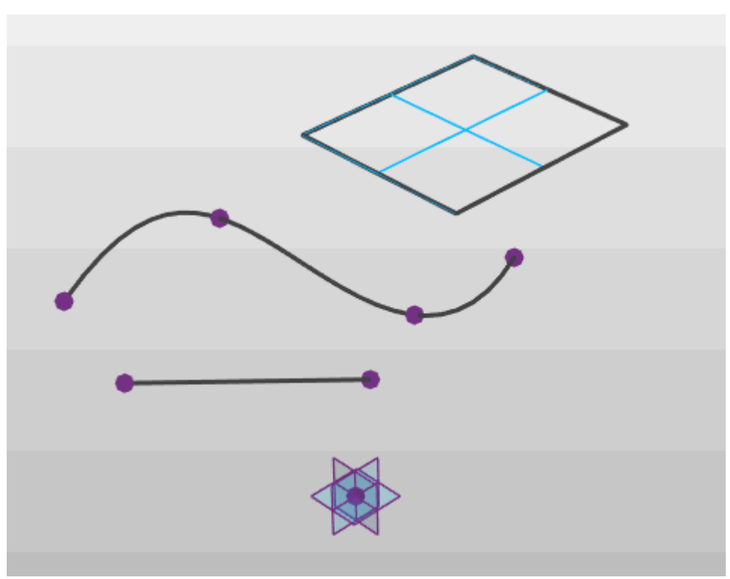
What problems are you trying to solve?

Develop Simple, Modular Tools.

PRINCIPLE CONCEPTS: GEOMETRY AND DATA

POINTS, CURVES AND SURFACES





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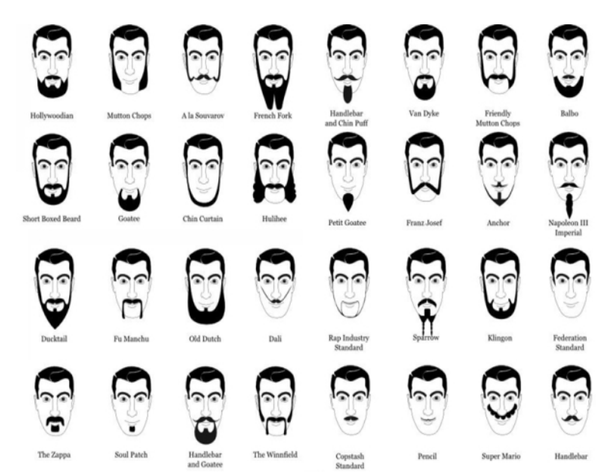
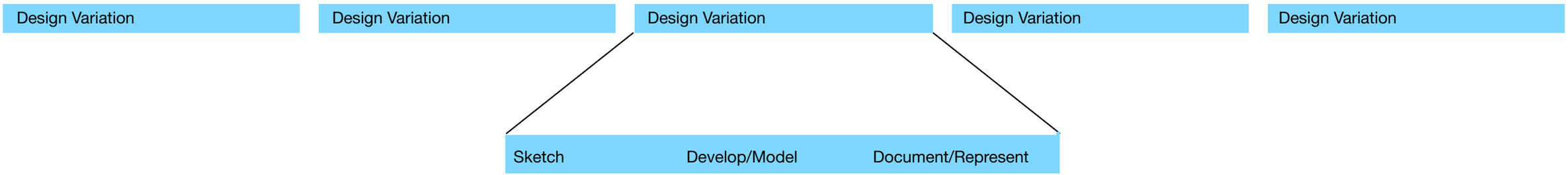
LISTS AND COLLECTIONS

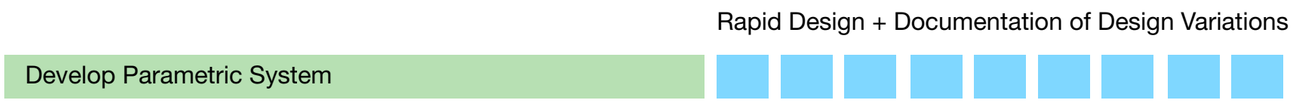


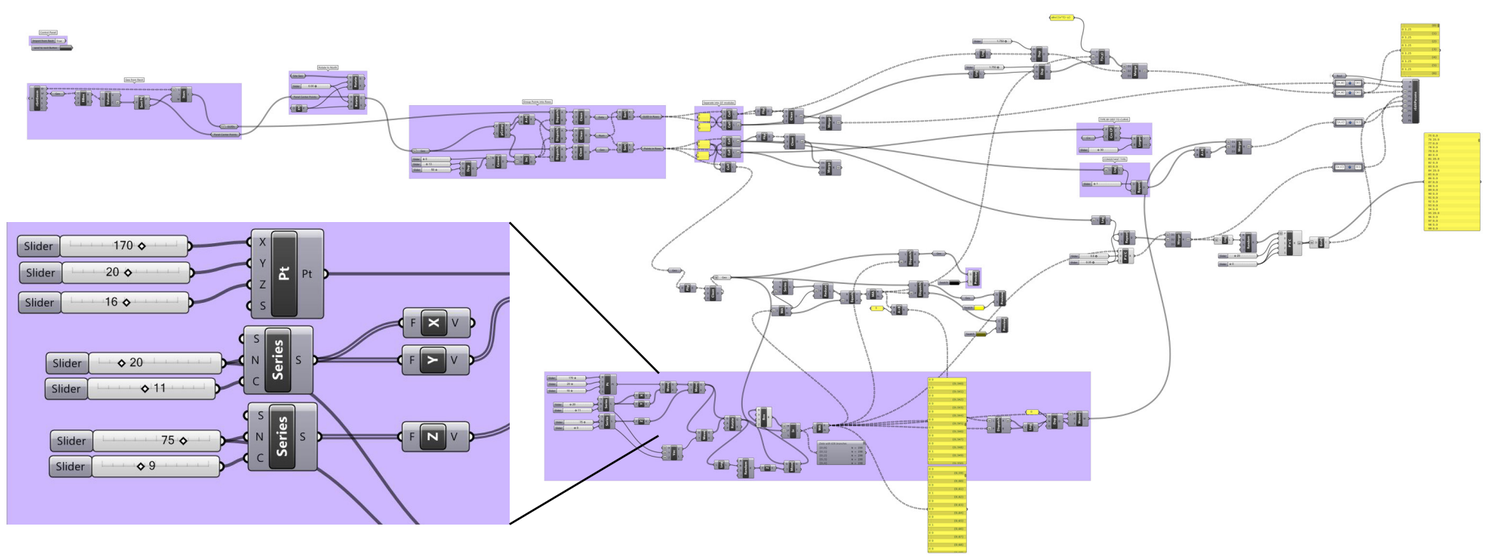
HOW DOES IT FIT INTO THE PROCESS?

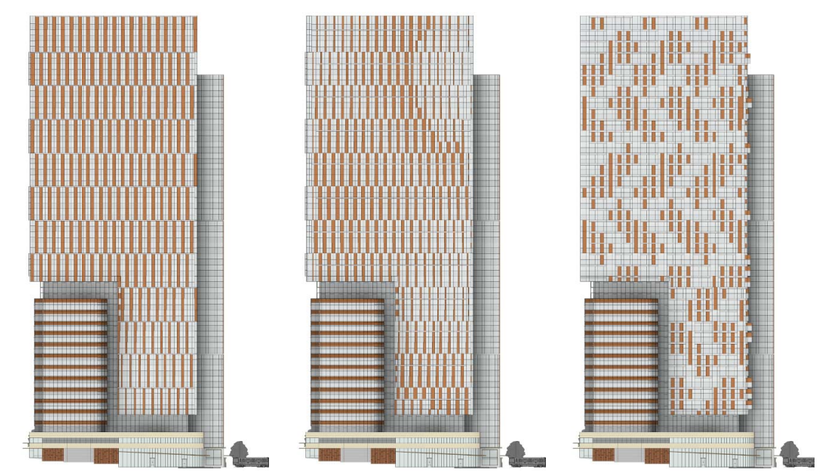
Traditional Process



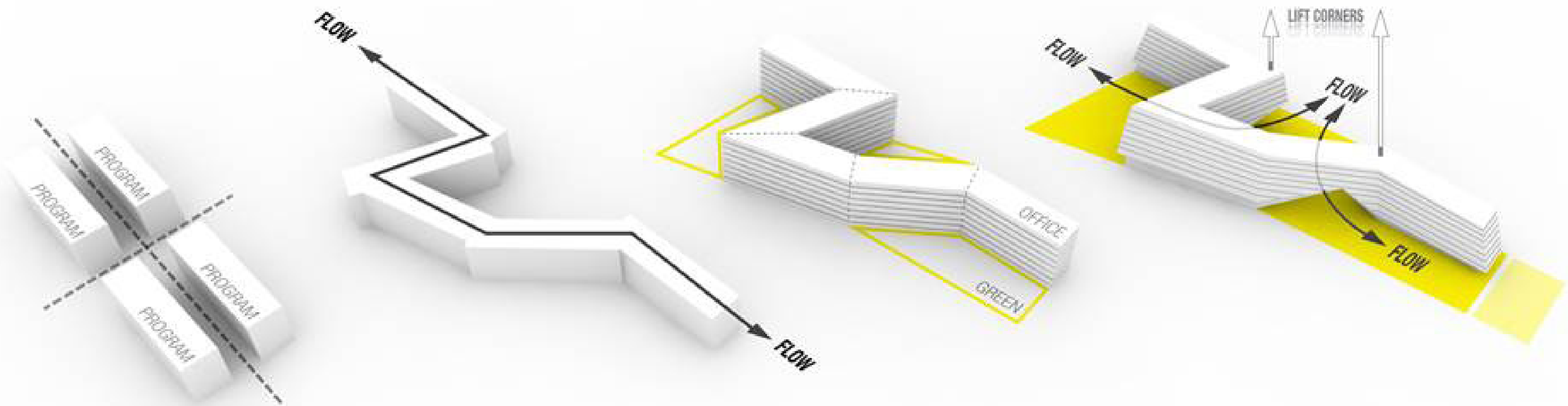
Parametric Process



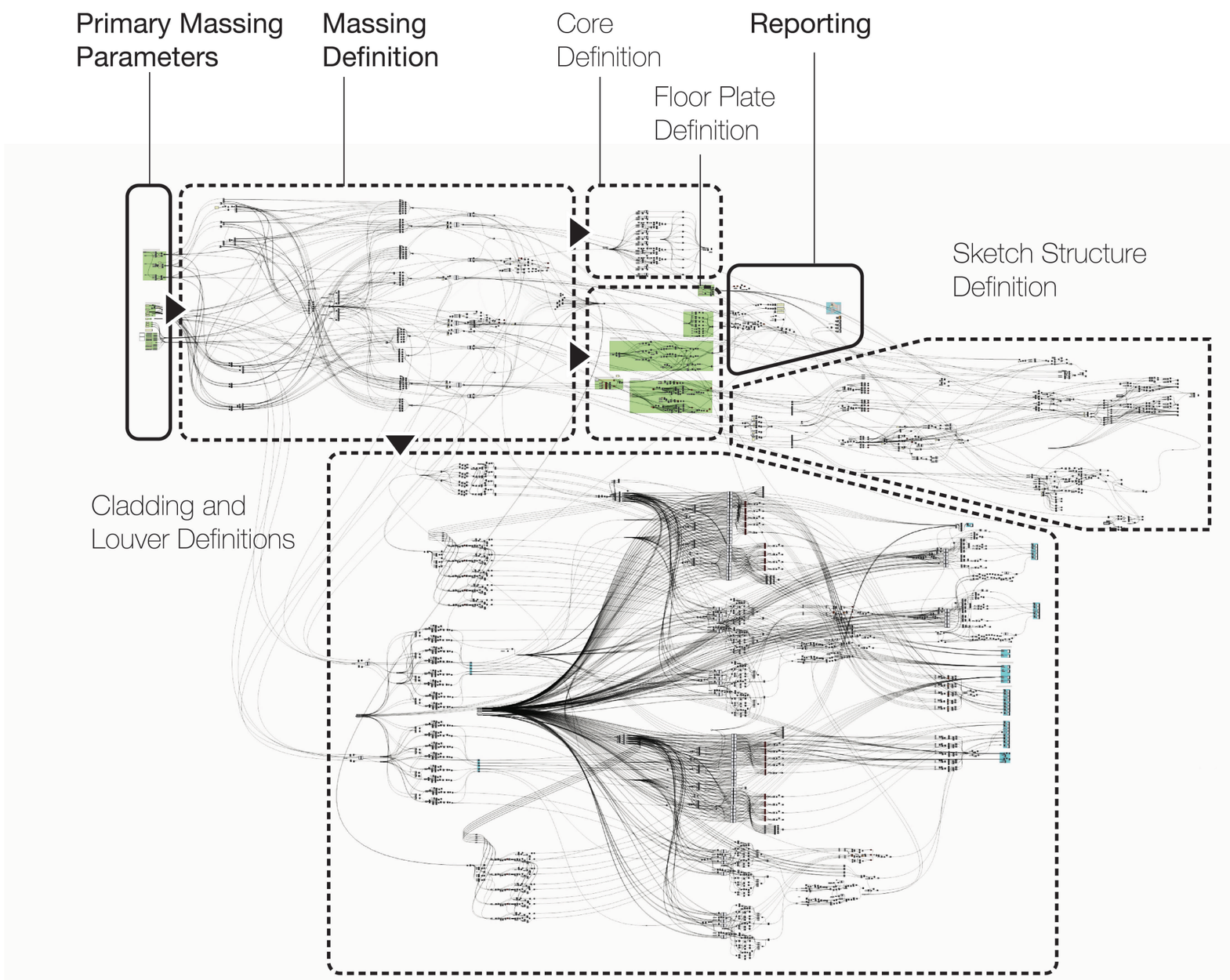




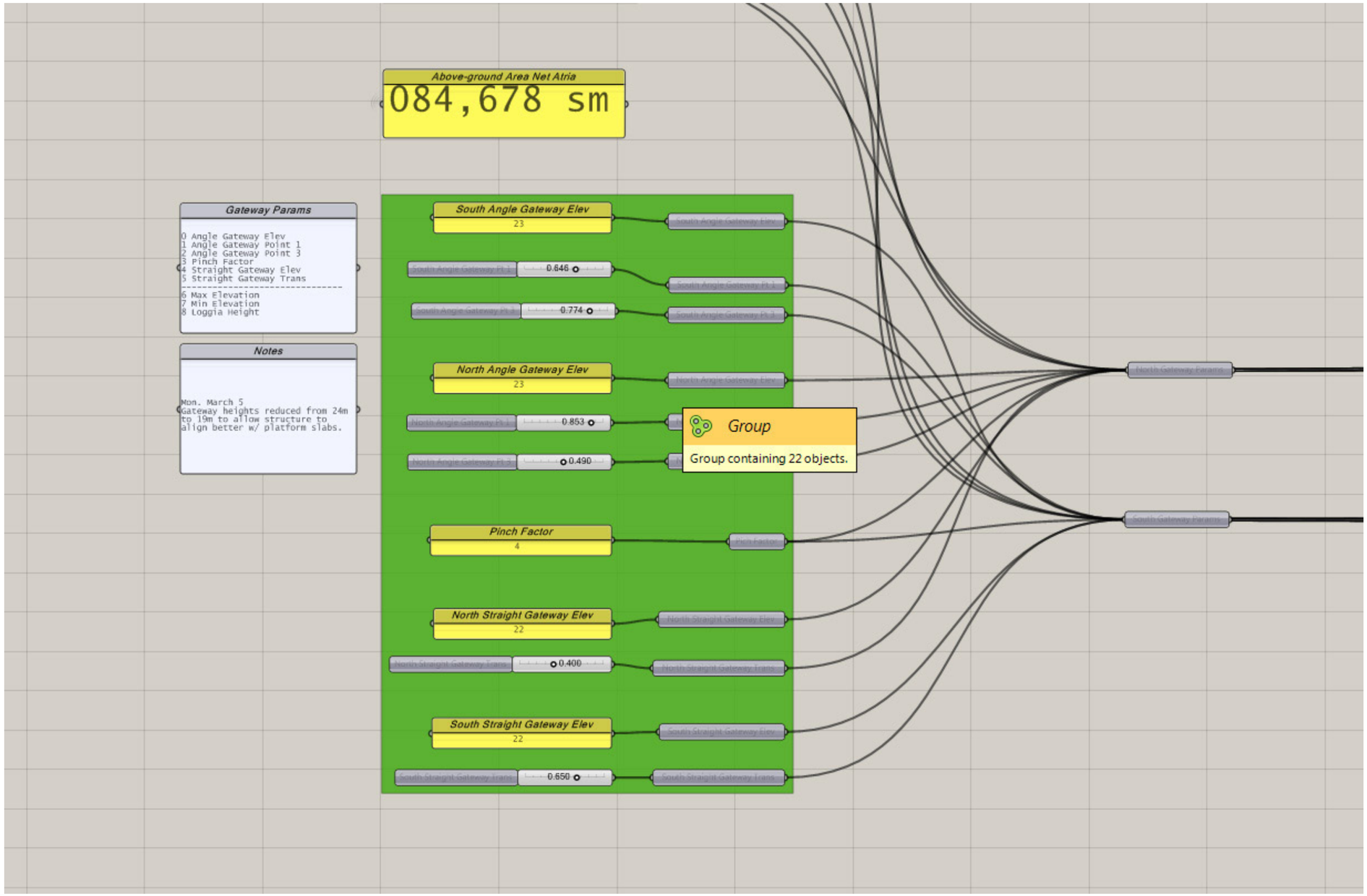
CASE STUDY: MASSING ORGANIZATION CONCEPT



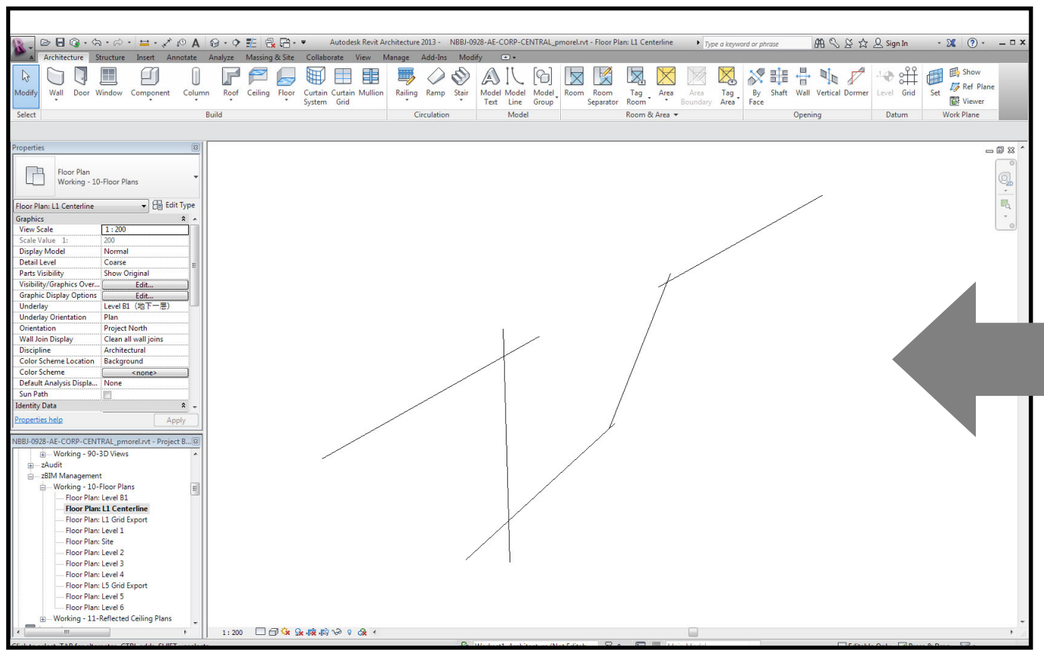
MASSIVELY INTEGRATED PARAMETRIC MODEL

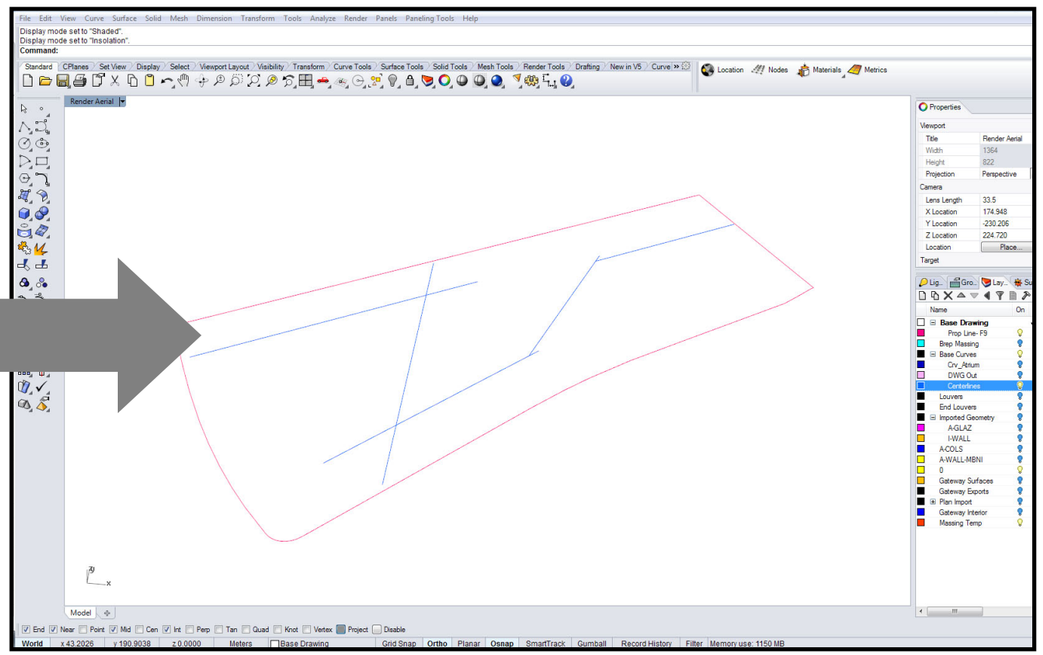


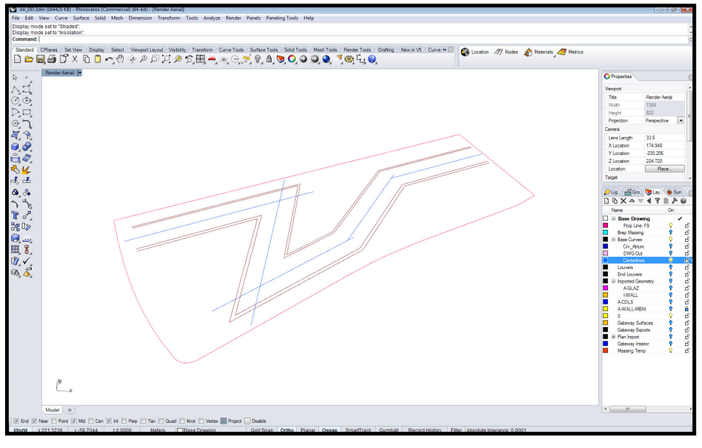
CONTROL PANEL

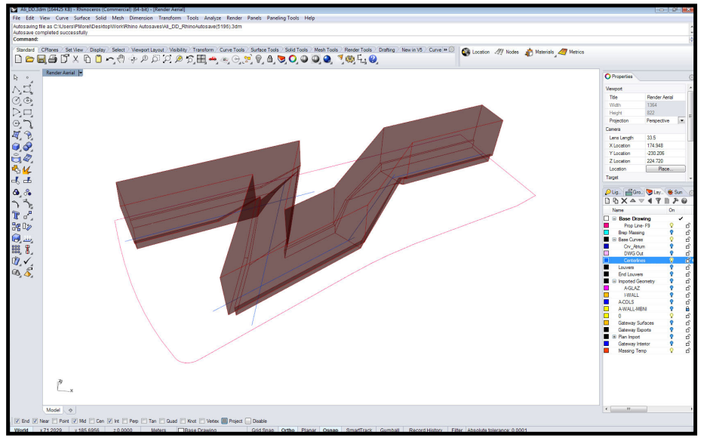


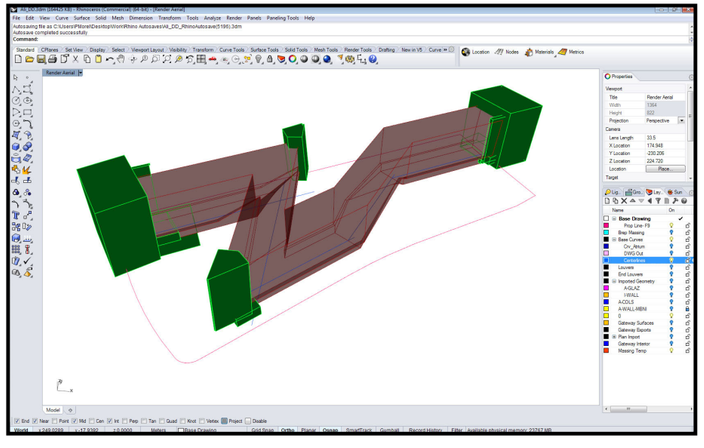
INTEROP PROCESS



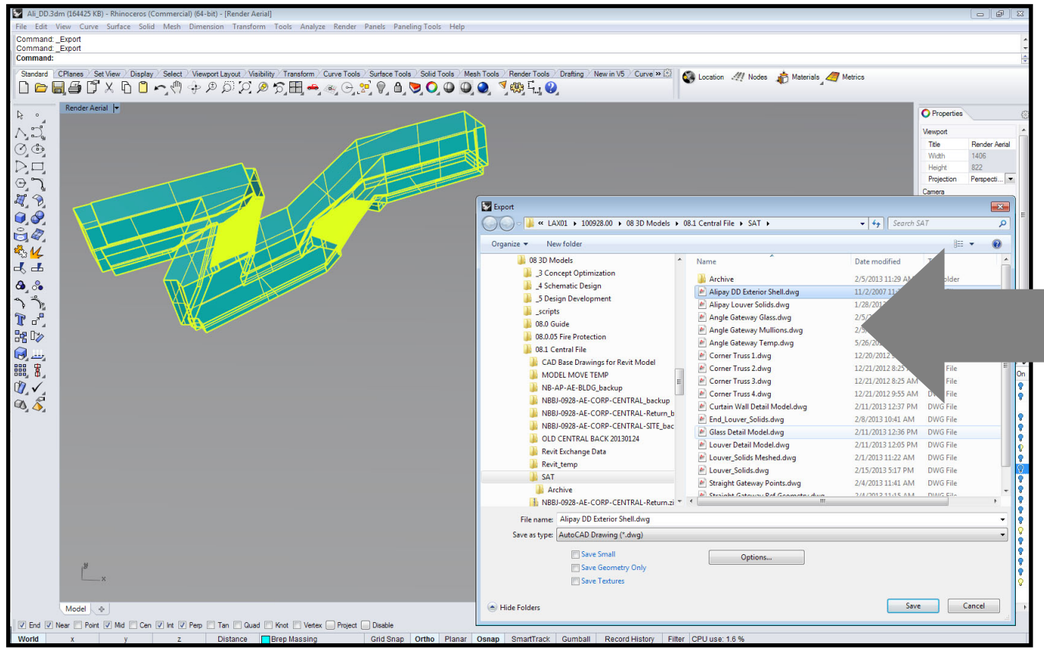


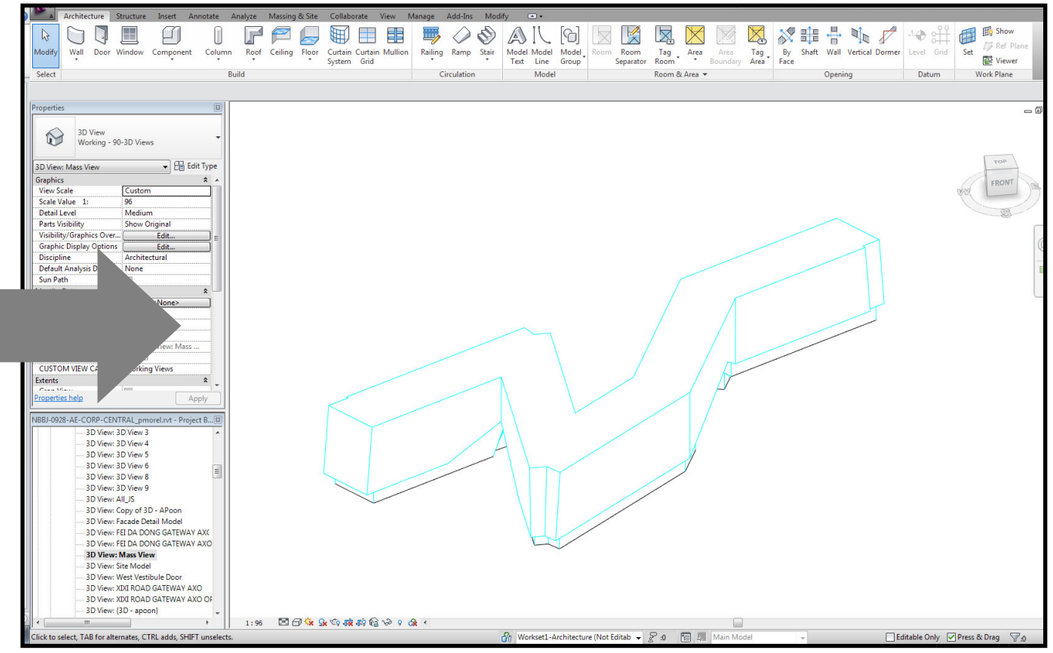


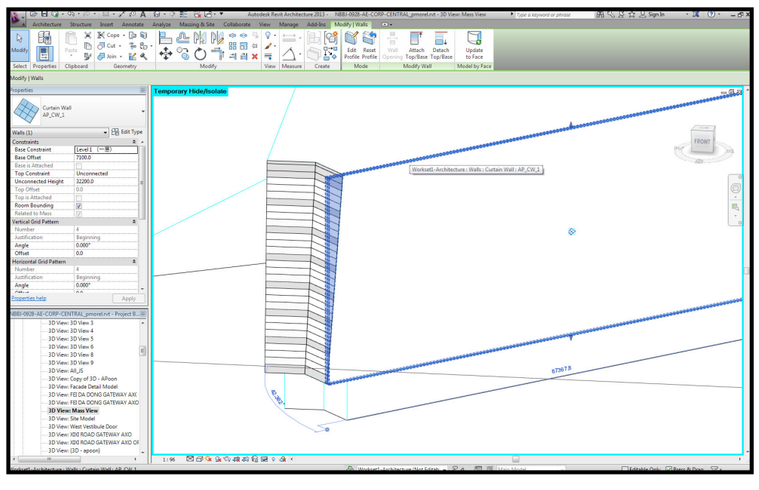


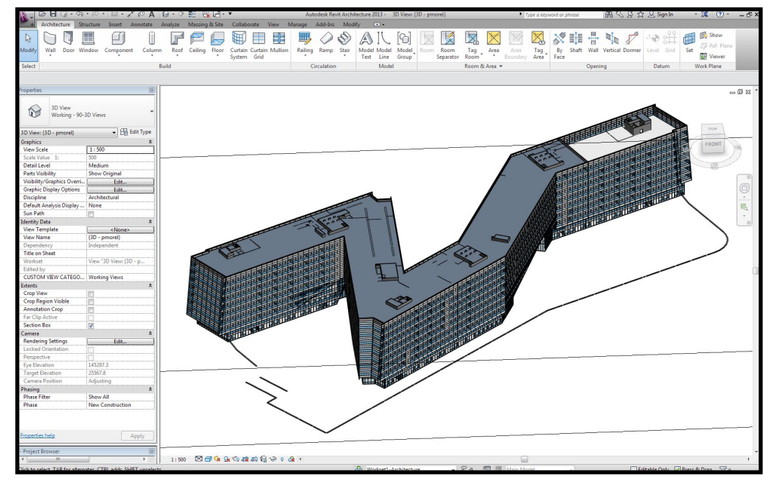


INTEROP PROCESS

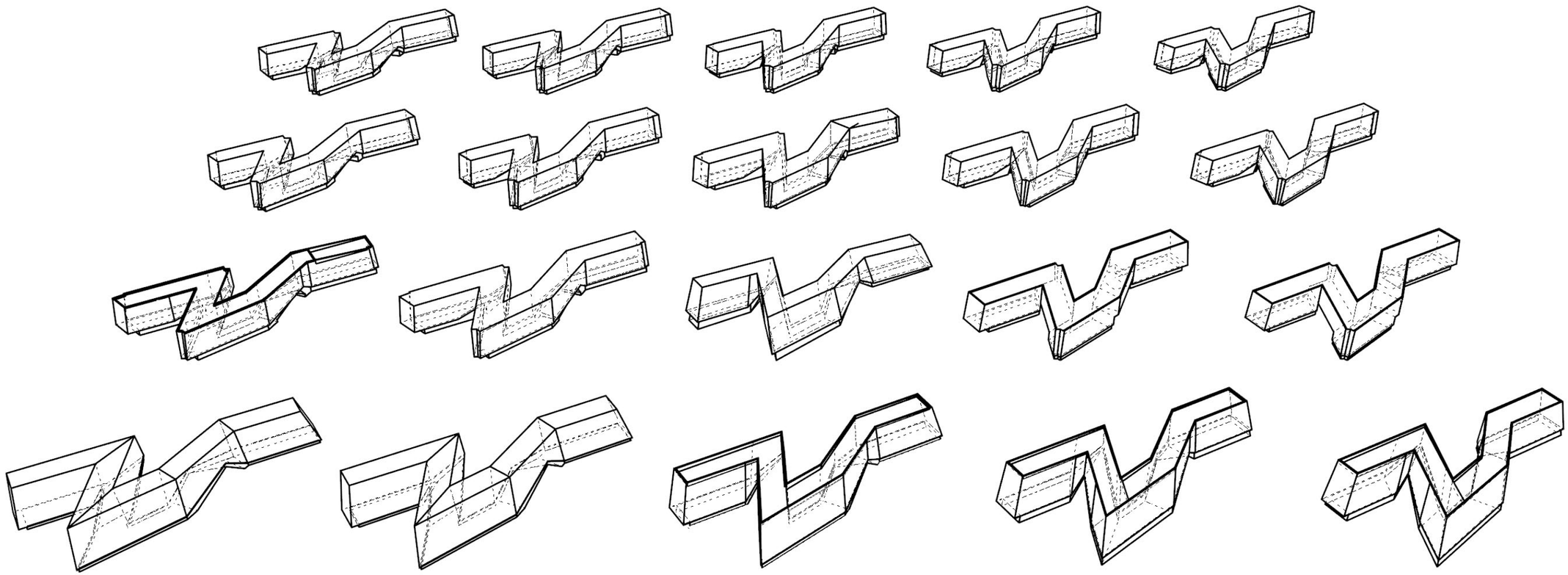




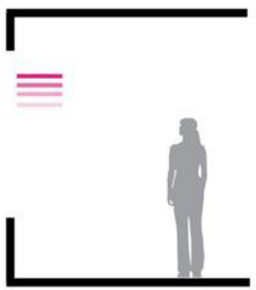




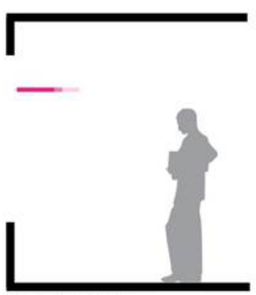
20 VARIATIONS DEVELOPED OVER THE COURSE OF THE PROJECT



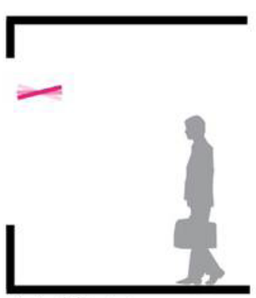
CASE STUDY: DAYLIGHTING



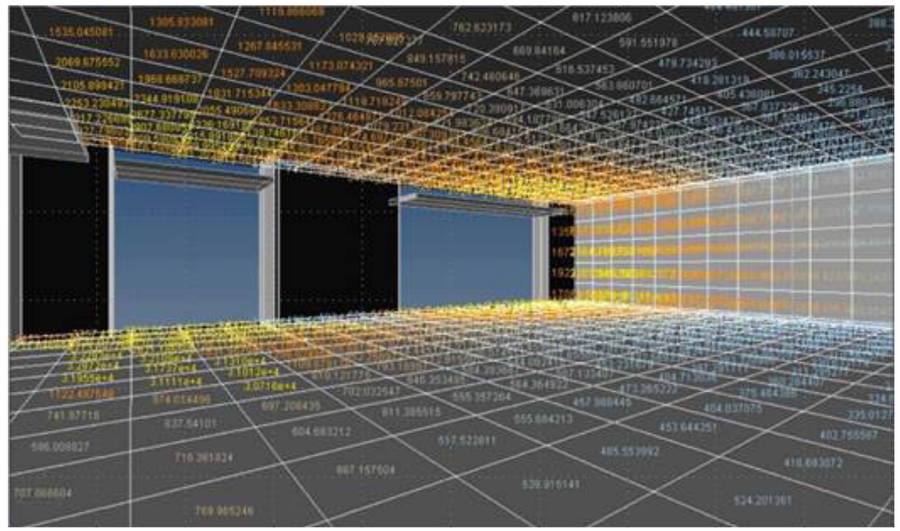
HEIGHT

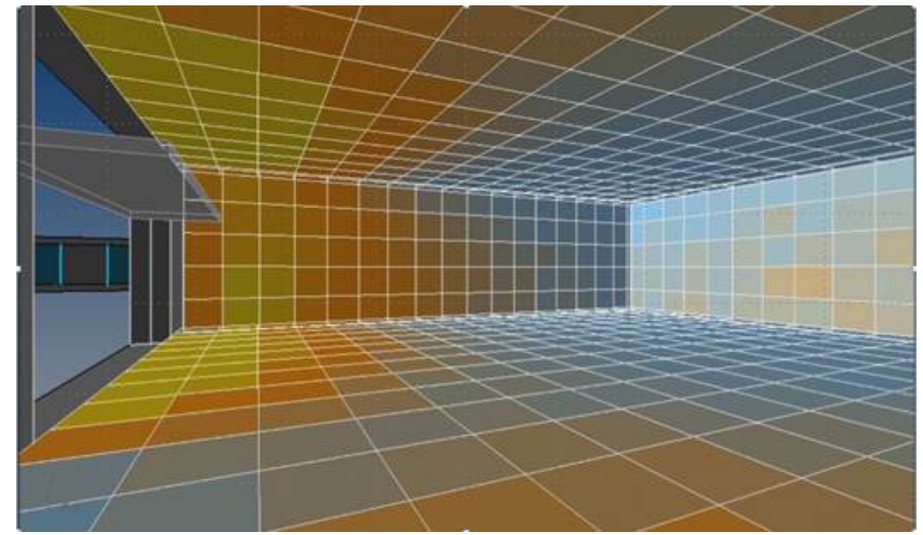


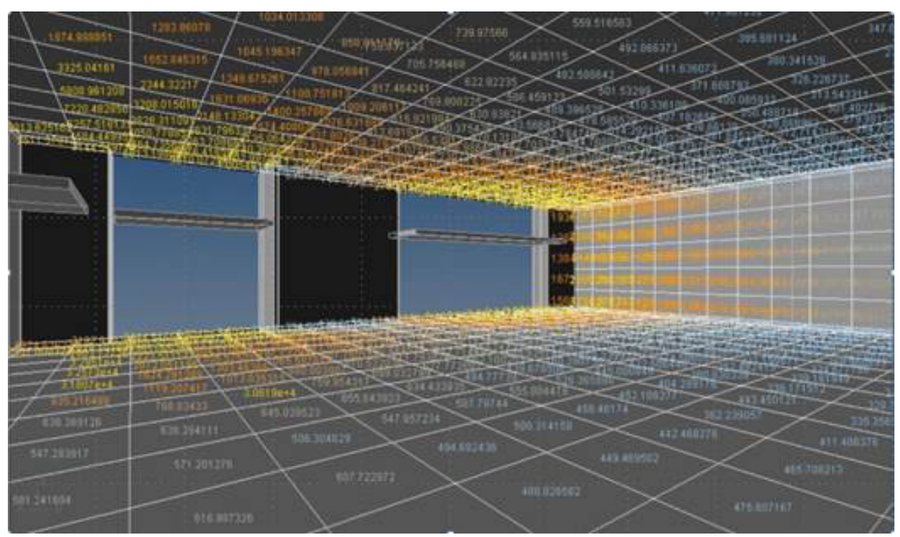
DEPTH

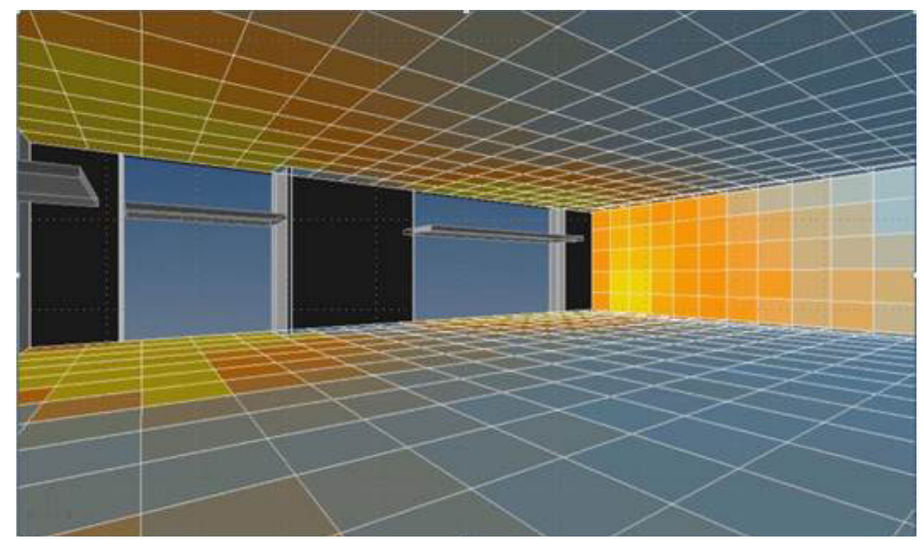


ANGLE

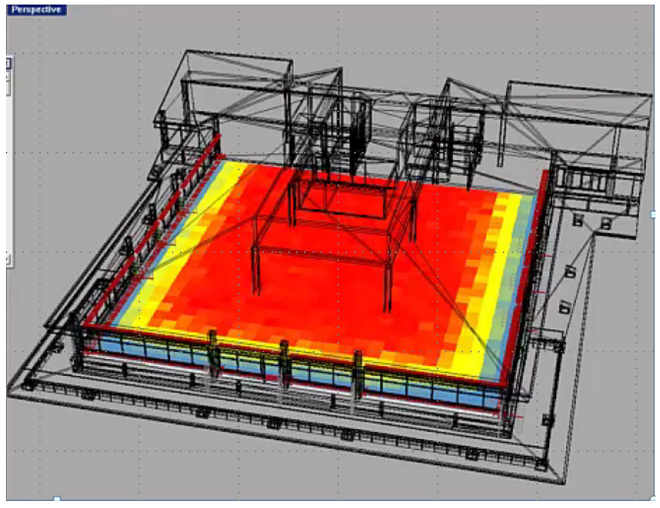


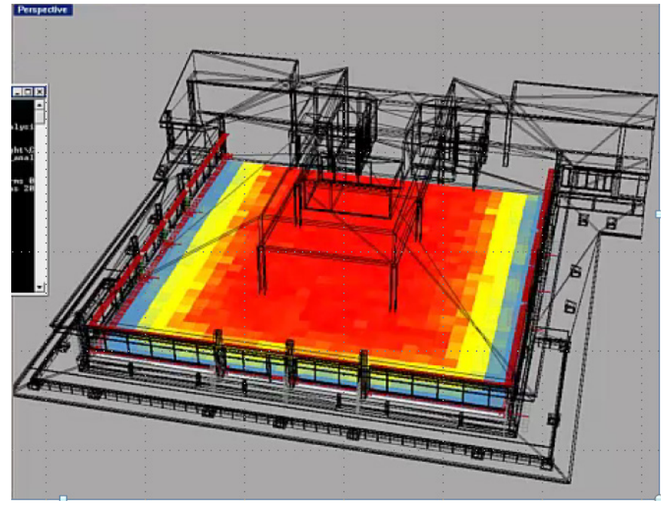


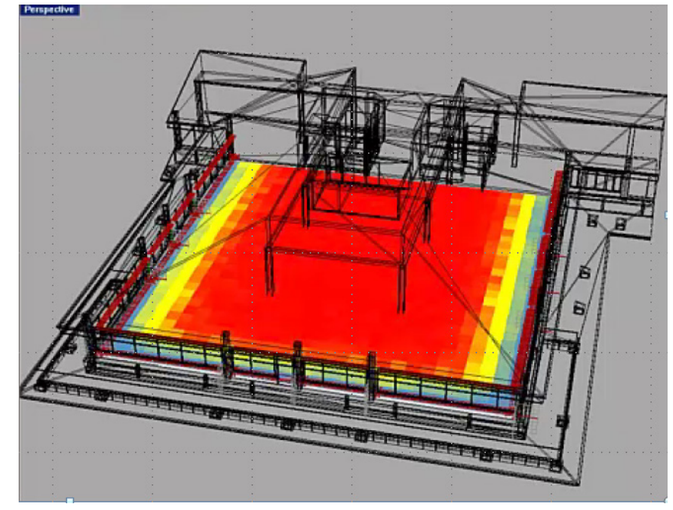


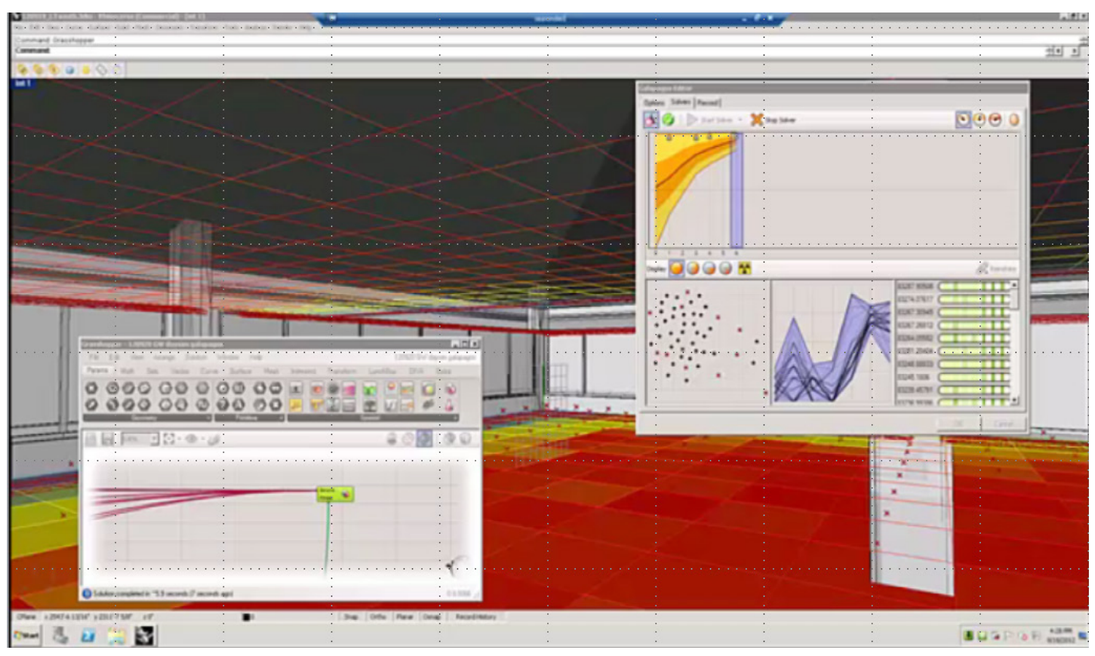


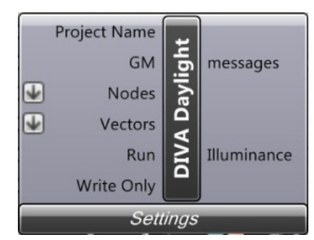
GENETIC OPTIMIZATION











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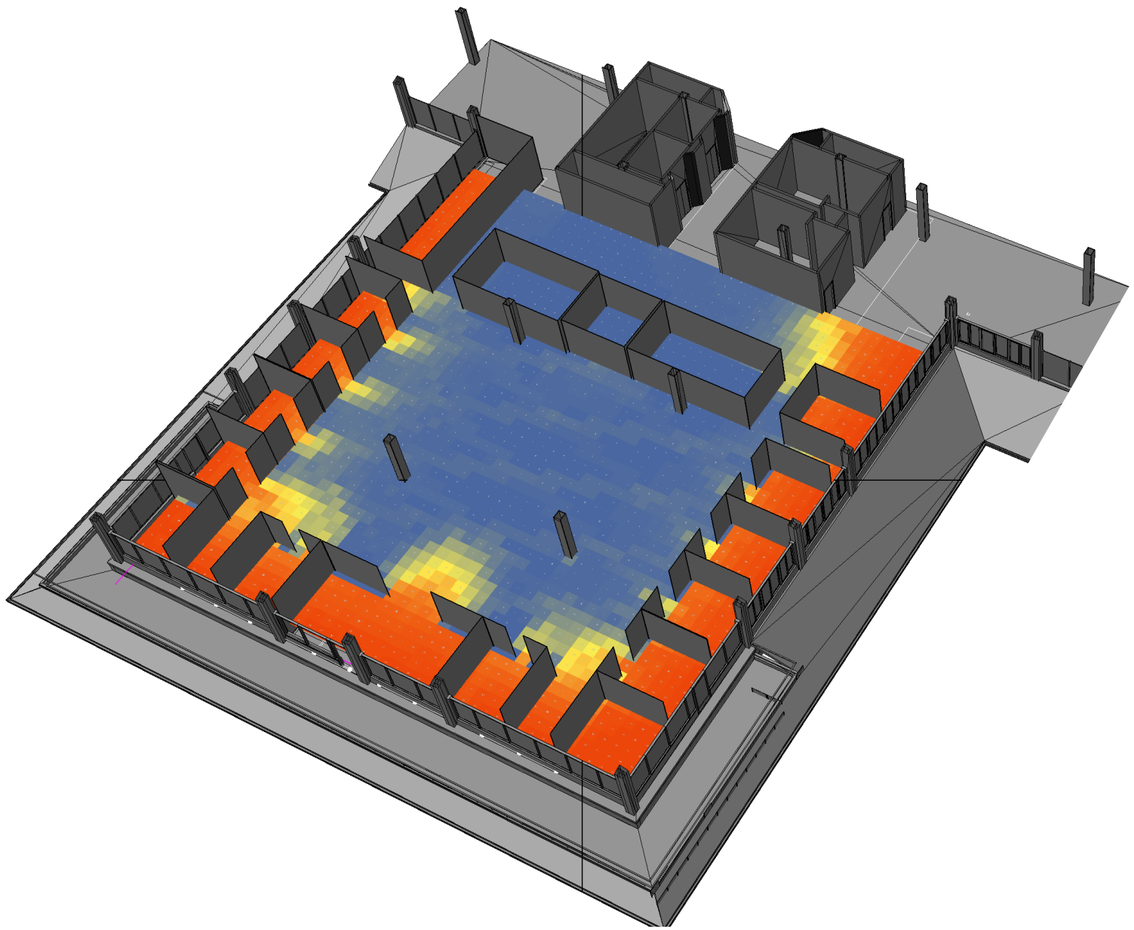
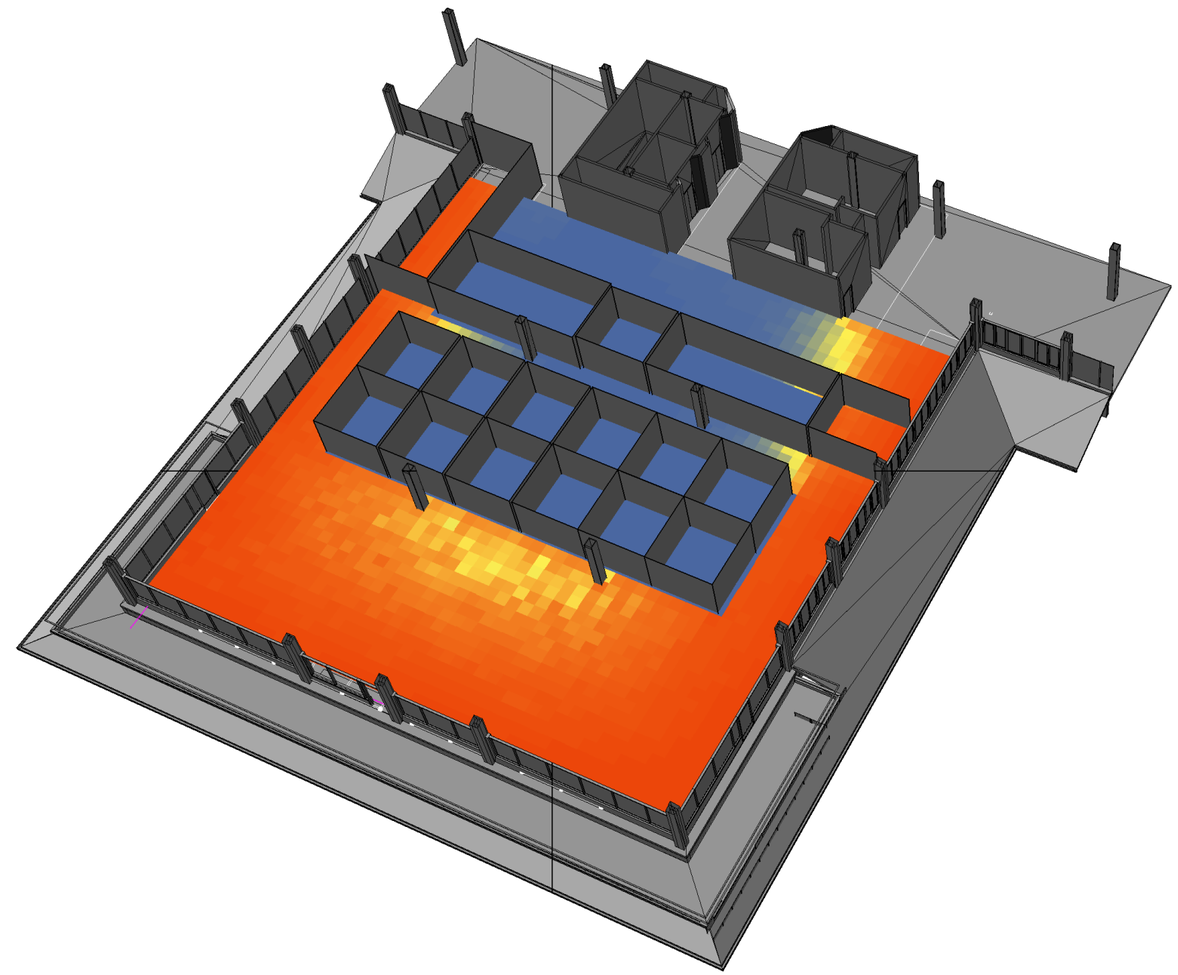
SPACE PLANNING WITH DAYLIGHTING



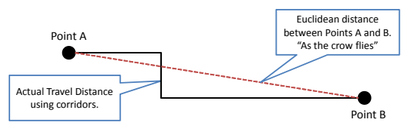


TRAVEL DISTANCE

Travel Distance and Corridor Efficiency Measurement Methodology:

Travel Distance Definitions:

1. **Actual Travel Distance:** The measurement, in meters, using corridors, between Point A and Point B.
2. **Euclidean Distance:** The direct "as the crow flies" distance between Point A and Point B. The Euclidean distance is a measurement that ignores walls and is always a straight line.
3. **Pathway:** A travel path a person would take using corridors, elevators or stairs connecting two rooms.
4. **Patient Pathway:** A travel path a patient would take using corridors and/or elevators connecting two rooms.
5. **Staff Pathway:** A travel path staff would take using corridors, elevators or stairs connecting two rooms.
6. **Corridor:** A travel path within the scope of the project suitable for patient gurney travel.
7. **Elevator:** An elevator suitable for patient gurney transport.
8. **Trauma Elevator:** That elevator identified and intended for Trauma use.
9. **Corridor Efficiency:** Refer to Equation.
10. **Travel Efficiency Distance:** Refer to Equation.
11. **Average:** A simple average.
12. **End Point:** That point on the floor plans where the measurement will terminate or begin.
13. **Center of Door:** The exact center of the door between door opening, regardless of door leaf size. Elevator doors will be the center of the cab opening.



Travel Distance and Corridor Efficiency Measurement Methodology:

Travel Efficiency Distance Calculation Equations

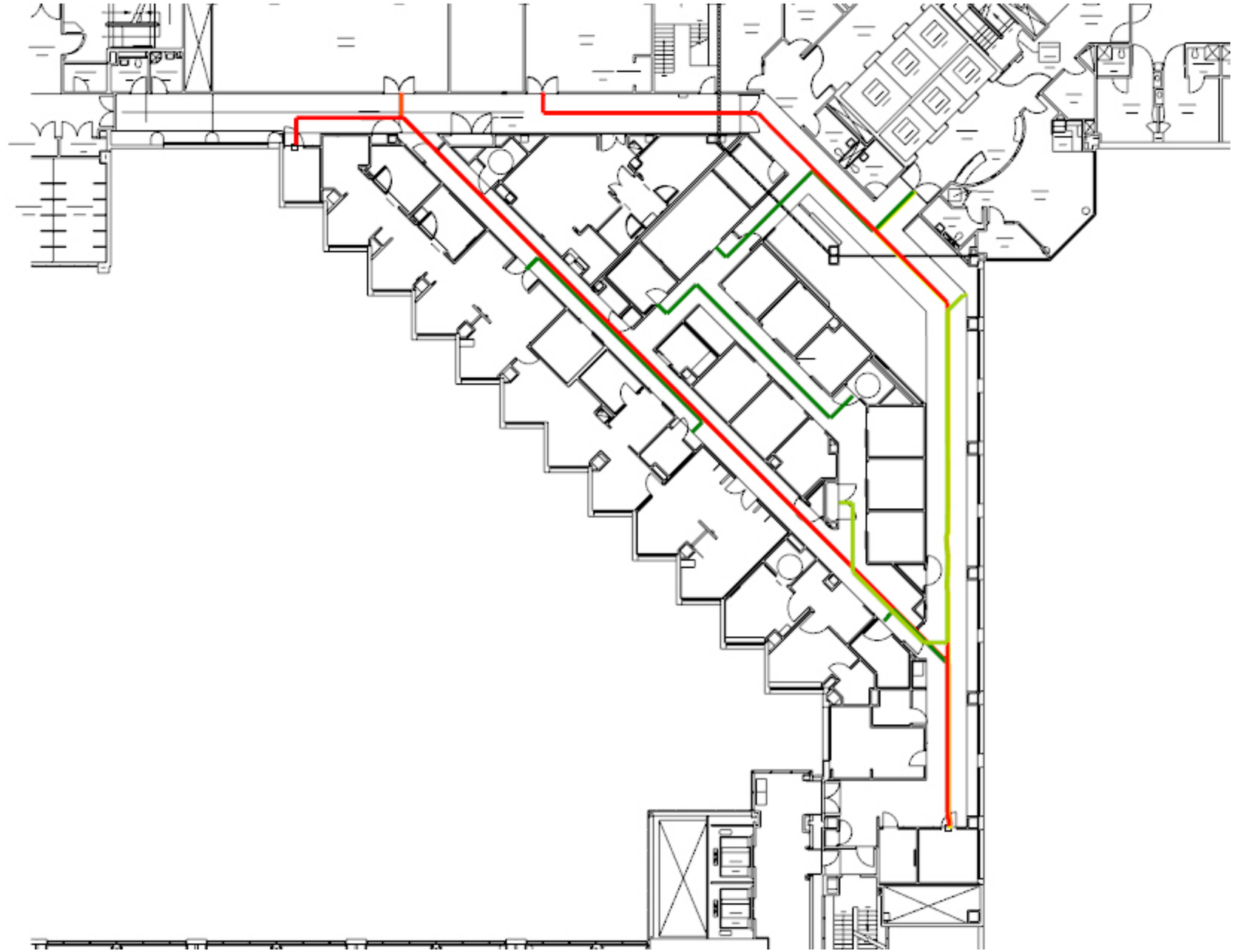
How to Calculate Corridor Efficiency:

$$\text{Corridor Efficiency} = \frac{\text{Euclidian Distance}}{\text{Actual Design A to B distance measurement}} = \text{Relative Percent Corridor Efficient}$$

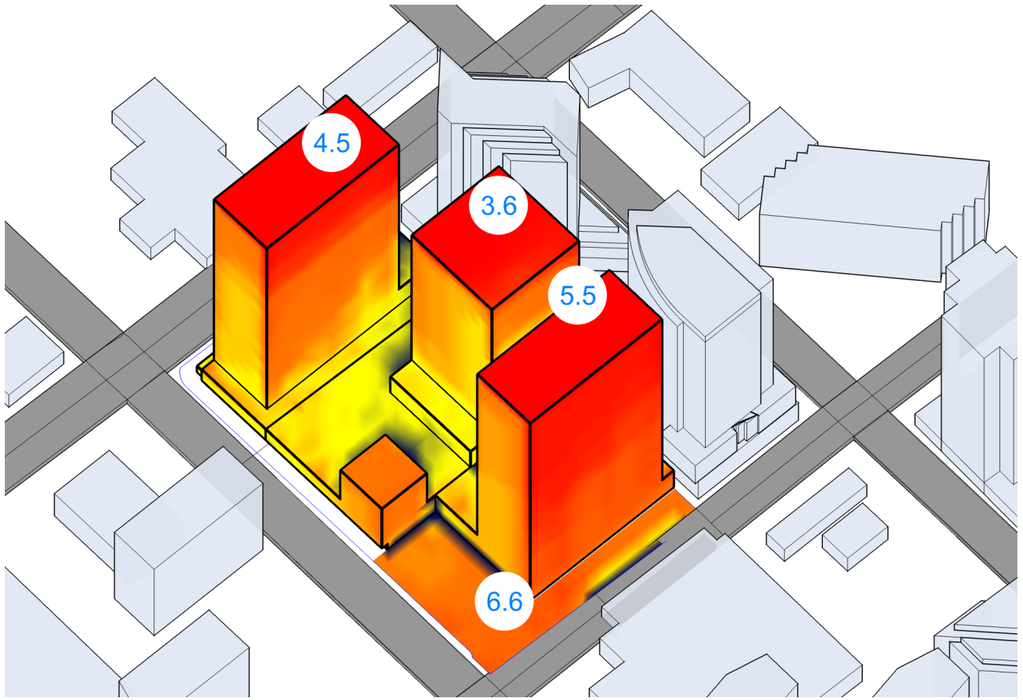
How to Calculate Travel Efficiency Distance:

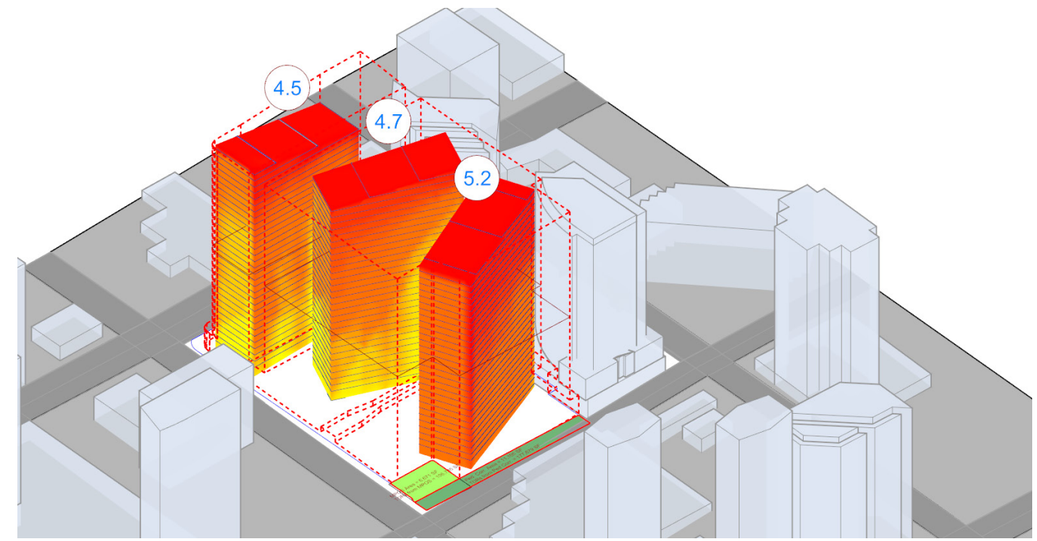
$$\text{Travel Efficiency Distance} = \left\{ \left(1 - \text{Average Corridor Efficiency} \right) \times \text{Average Actual Path of Travel} \right\} + \text{Average Actual Path of Travel} = \text{Travel Efficiency Distance}$$

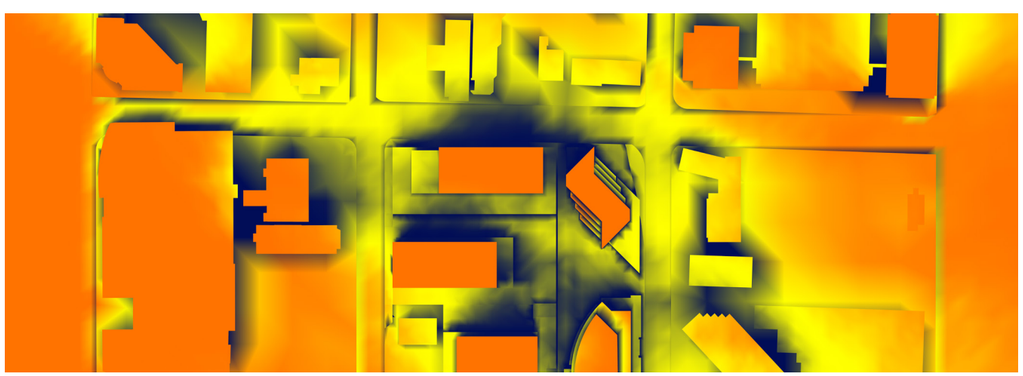
Travel Distance and Corridor Efficiency Measurement Methodology:
Indicative Example: Emergency Patient Rooms to Imaging Modalities
Campbell River
Level 1:



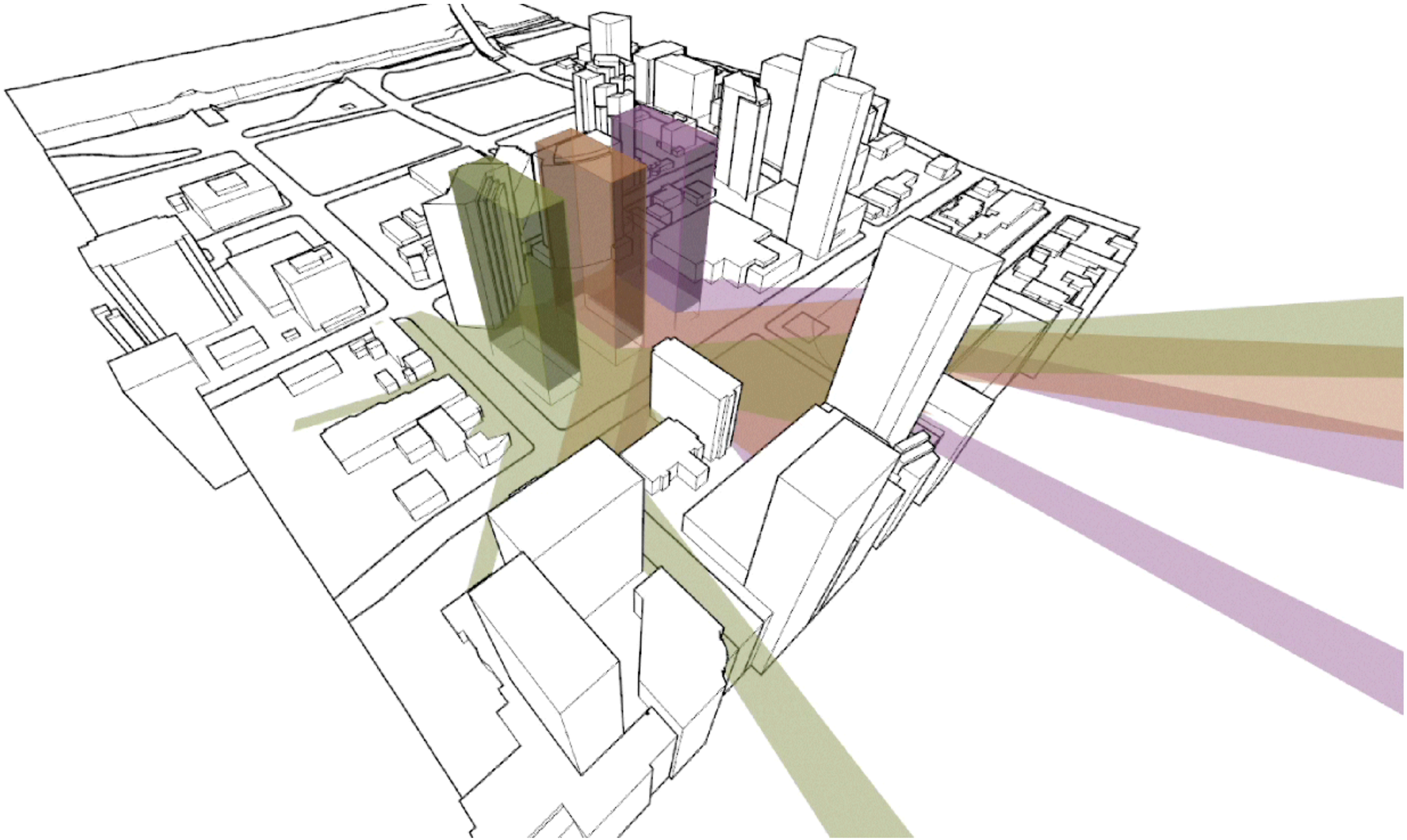
SOLAR ANALYSIS







VIEW ANALYSIS



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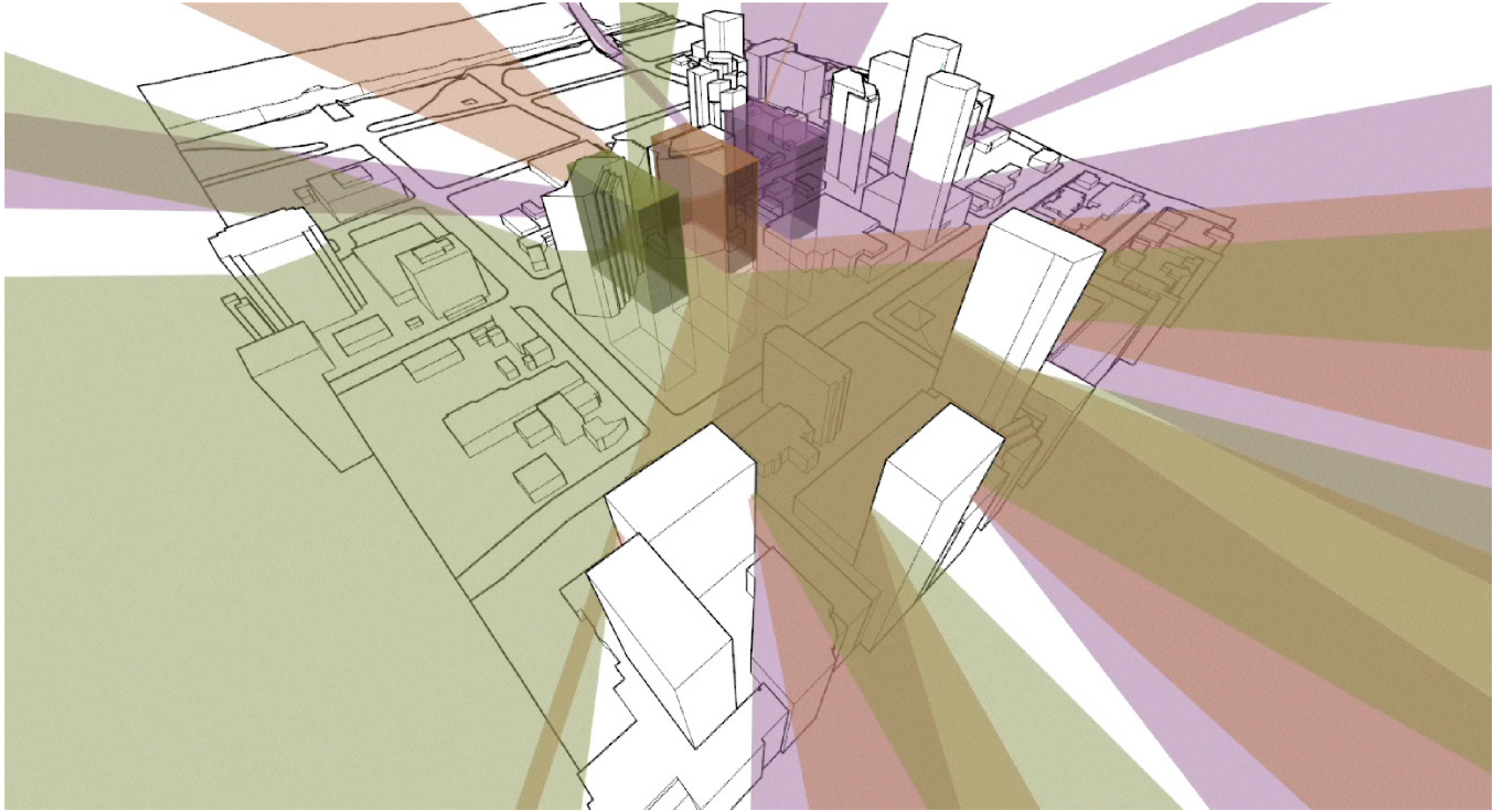
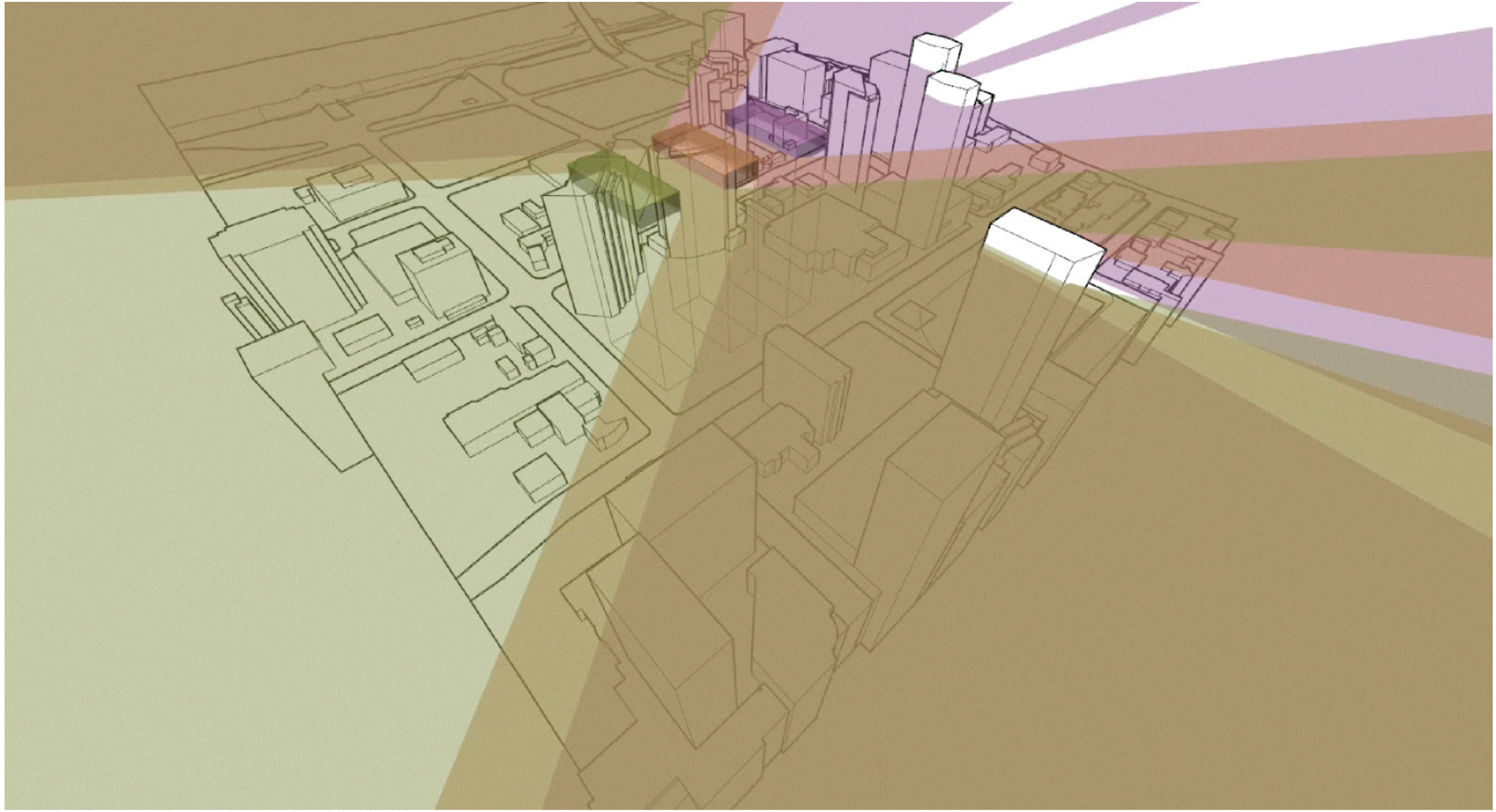
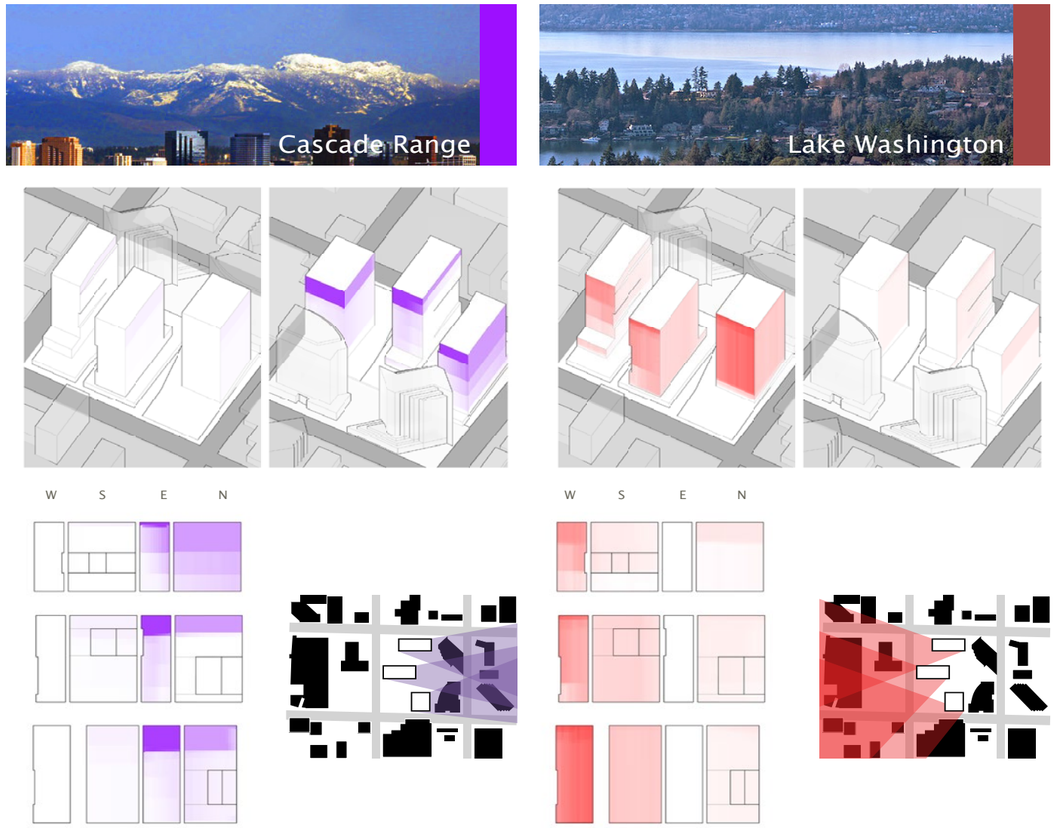
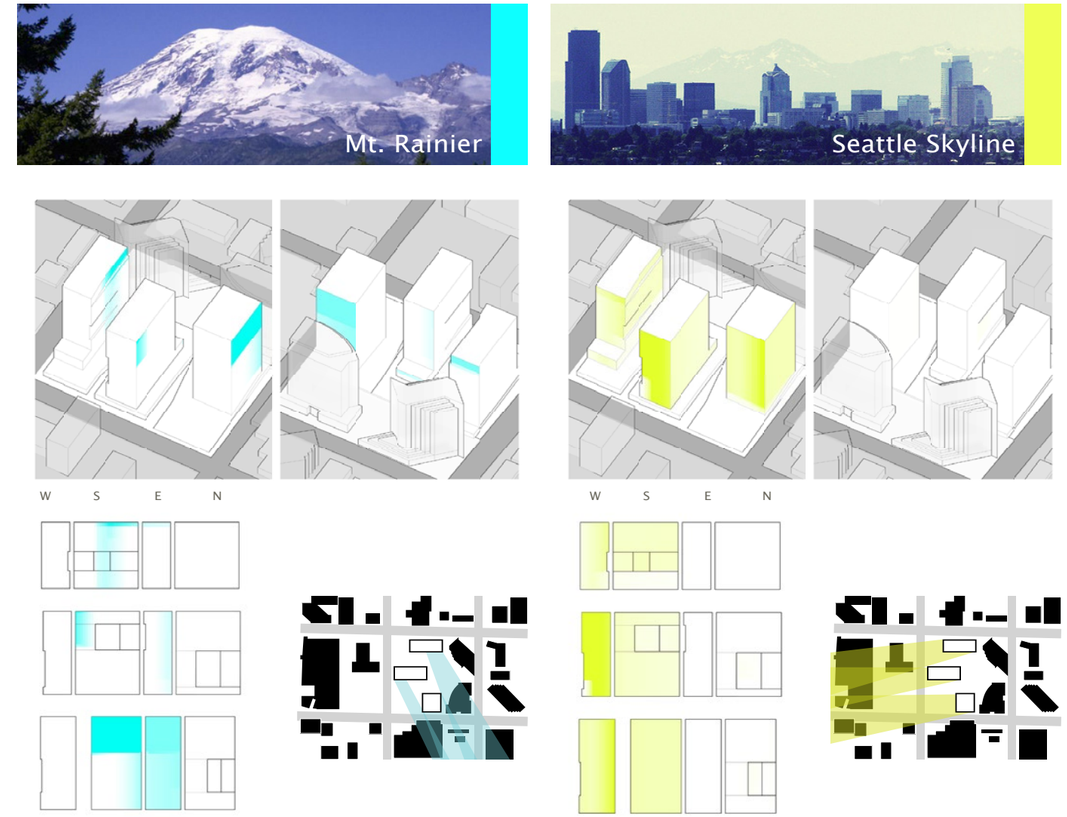


VIEW ANALYSIS



VIEW ANALYSIS

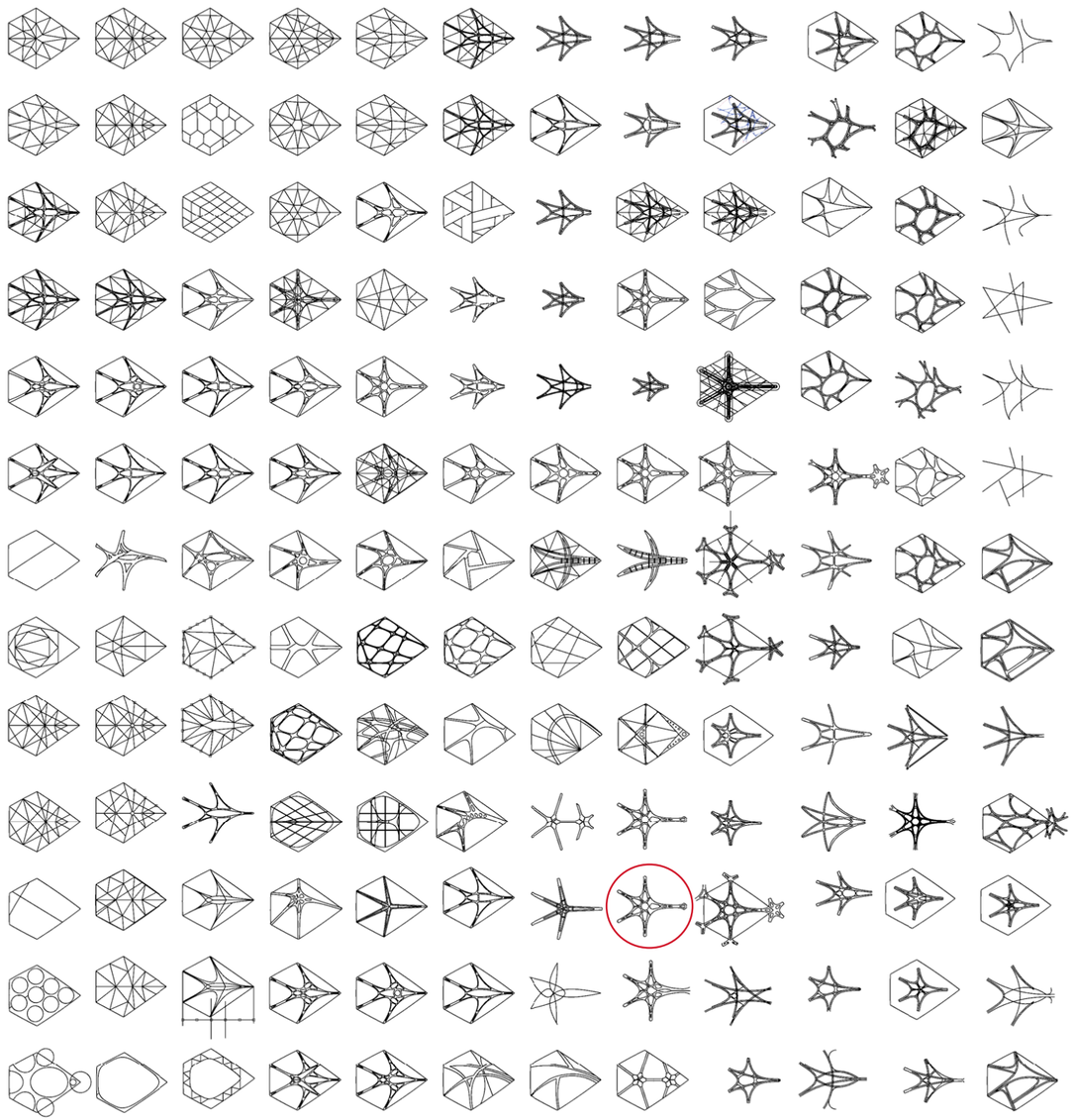




Views are calculated from every point on the facades of the three towers to the specified landmark. Darker colors indicate a better view of the landmark in question.

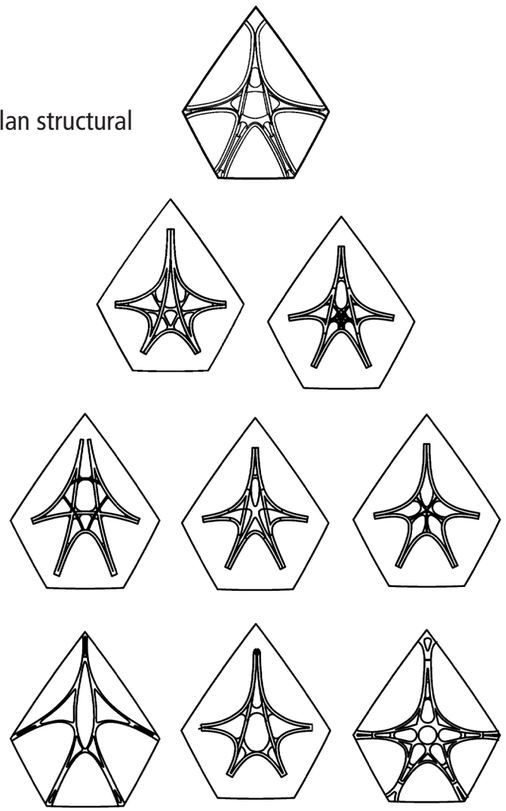
COLLABORATION

Catalan Evolution and Construction

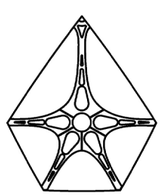


Catalan structural module studies - Earlier generation module shown circled

Proposed catalan structural module

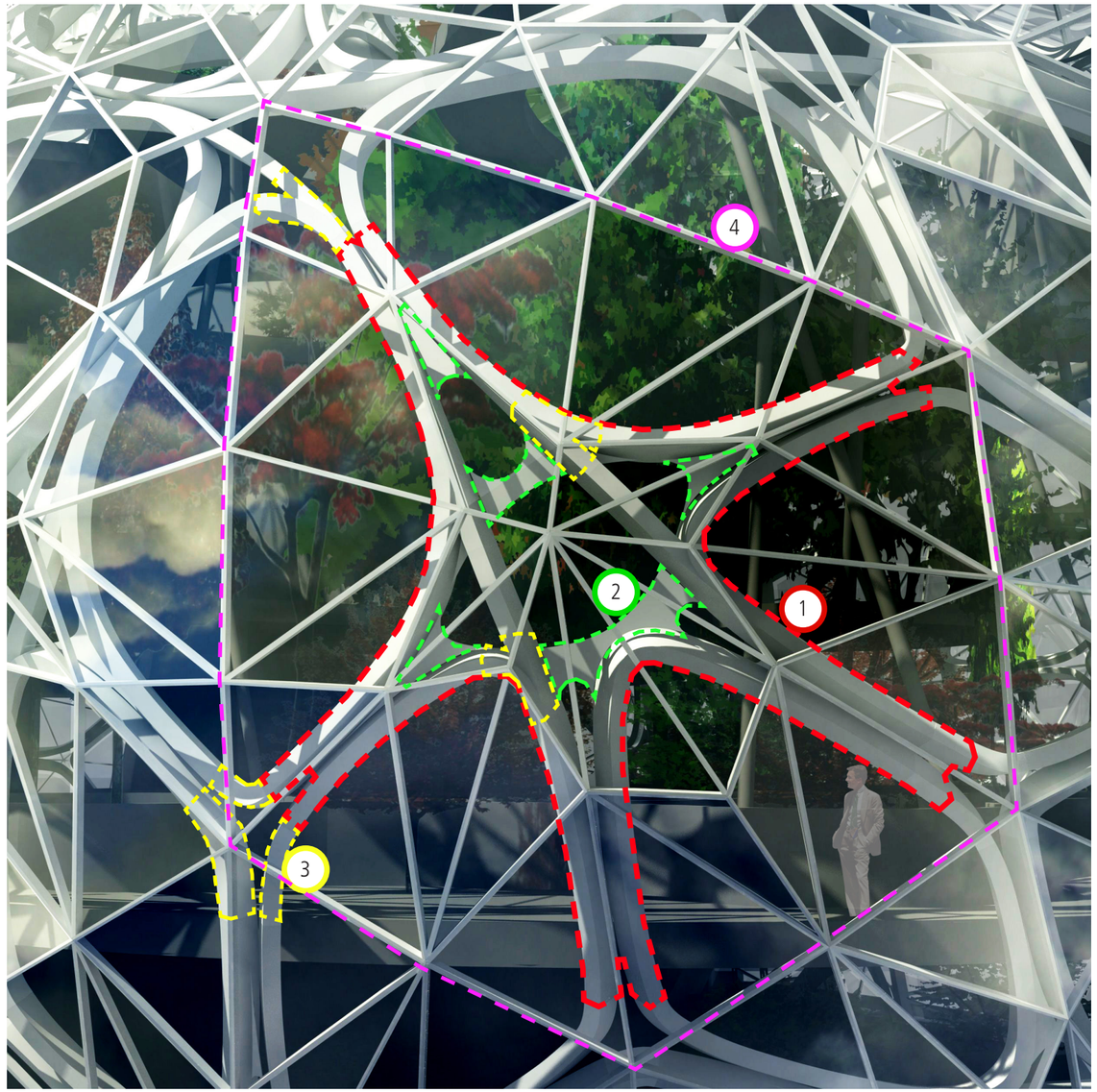


Earlier generation catalan structural module



COLLABORATION

Pattern and Materials

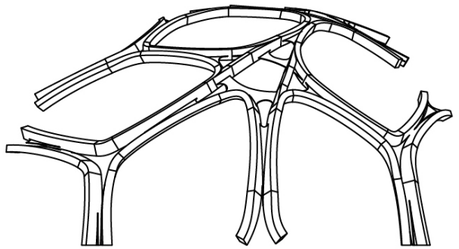


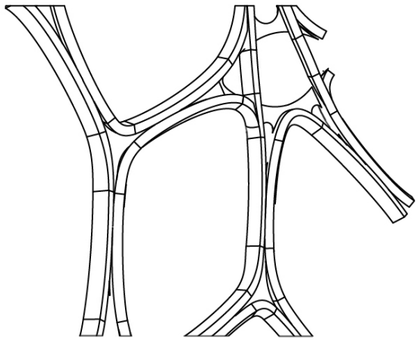
1 Rolled Steel Tube Members

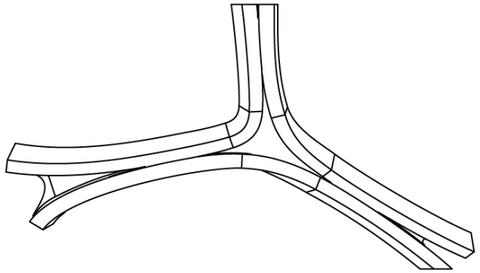
2 Flat Plate Steel Webbing

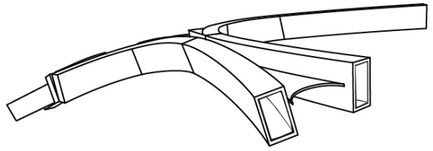
3 Cast Steel Nodes

4 Exterior Mullion & Glazing Overlay

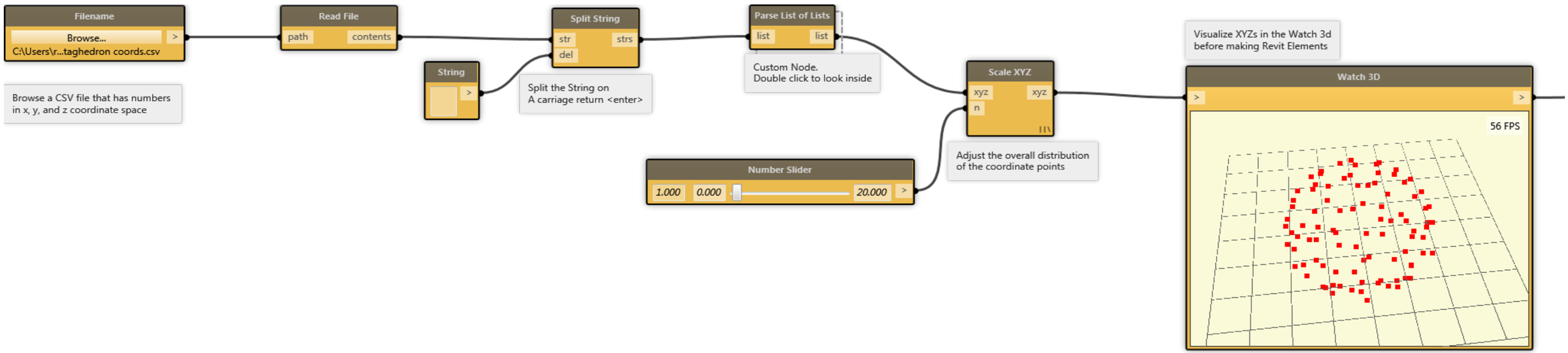


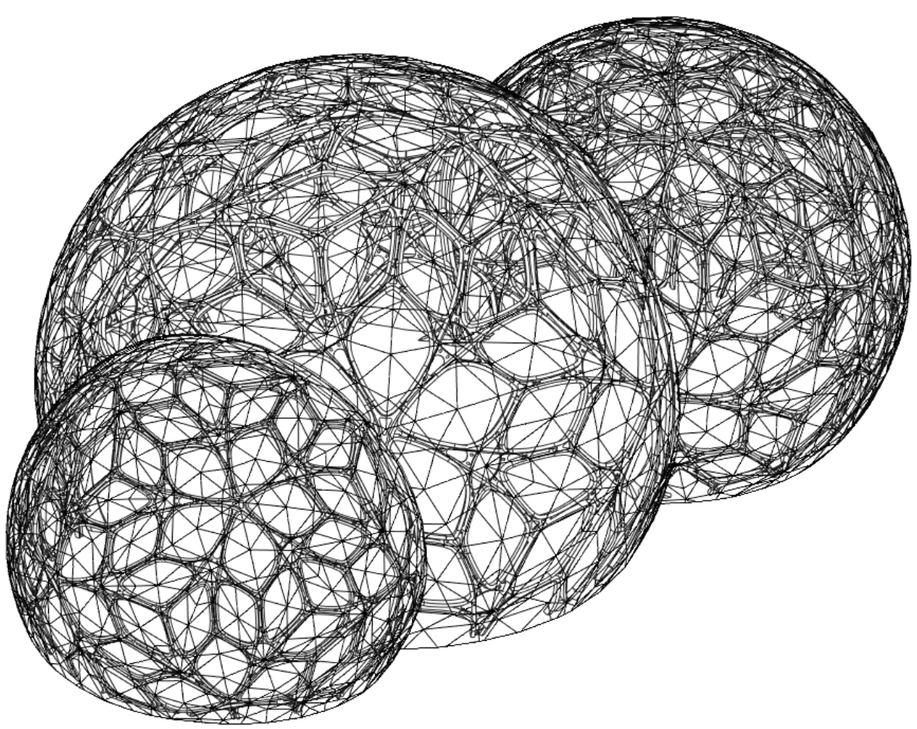


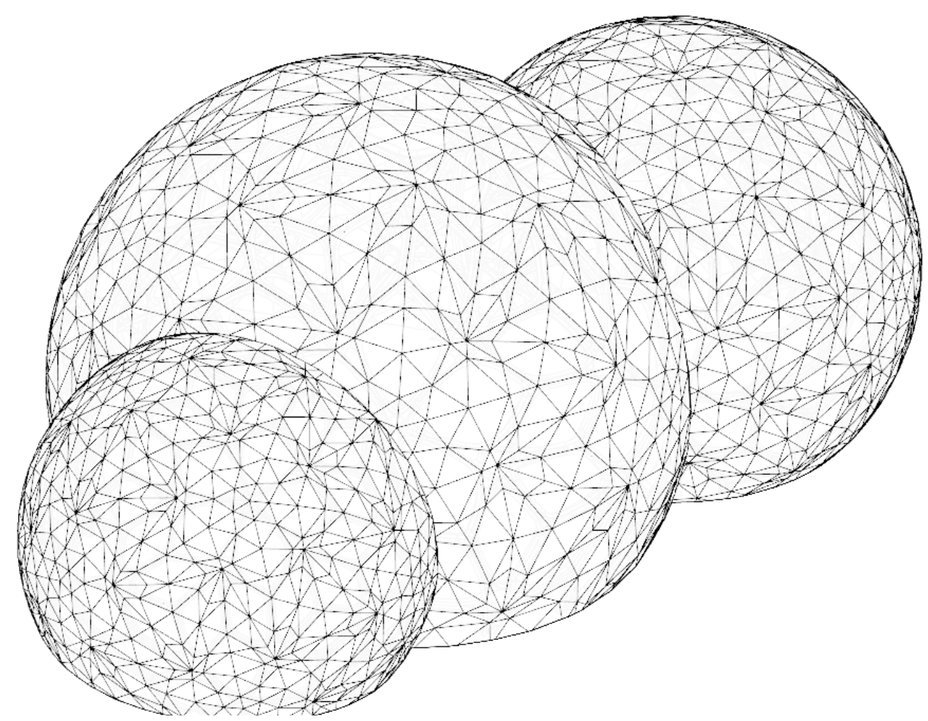




COLLABORATION







COLLABORATION