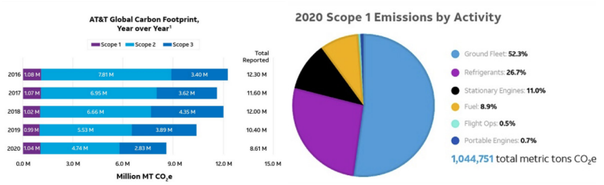
Proposal

AT&T Building functions as a colocation center to house data and equipment. Electricity is consumed continuously to maintain the equipment operation and produce a large amount of carbon dioxide. Therefore, we propose to design a green facade system to achieve carbon naturalization and reduce the heat island effect.

The green facade will be assembled by small panels and attached to the existing facade as a secondary structure for vegetation. Due to the high building density in Manhattan, the facade panels will be operable to maximize the sunlight.

We calculated the value of carbon dioxide emitted from AT&T Building and used the data to generate the proportion of green facade. For the operable panels, solar and wind data are included to determine the angle for operation.Based on the data we collect, we used grasshopper (ladybug, butterfly, honeybee), revit, rhino inside to simulate and build the new facade.

In order to maintain the interior function and the unique panel type of the AT&T Building, a new Truss structure system is add by side.

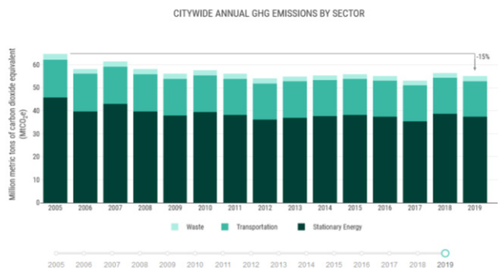


(refrigerants + stationary engines) + electricity consumption

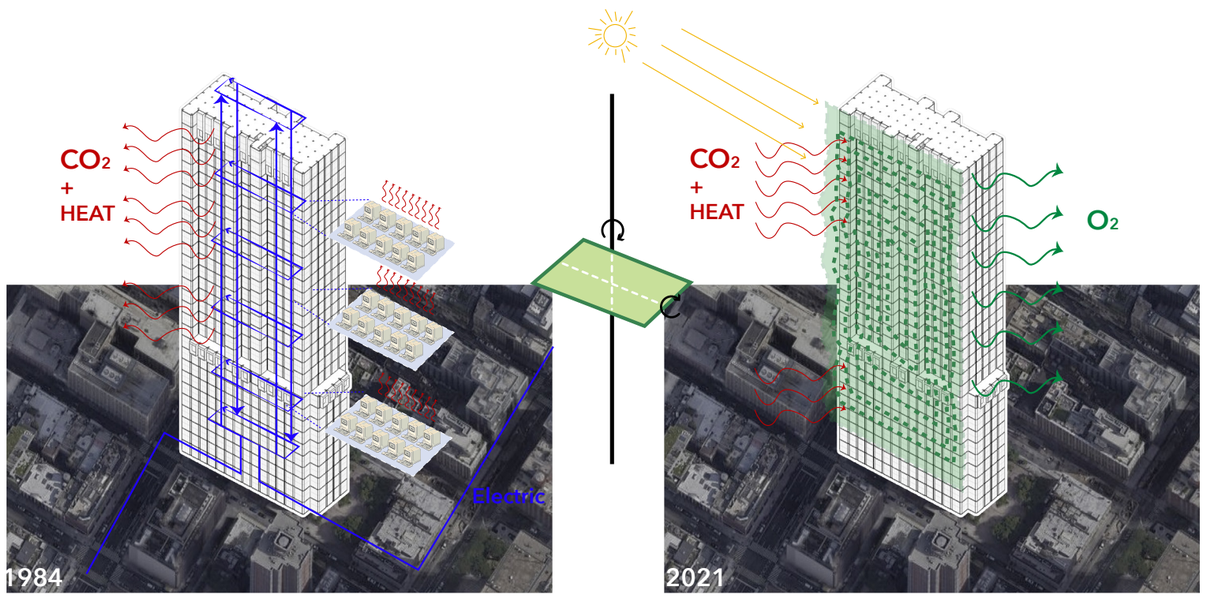
direct emissions indirect emissions

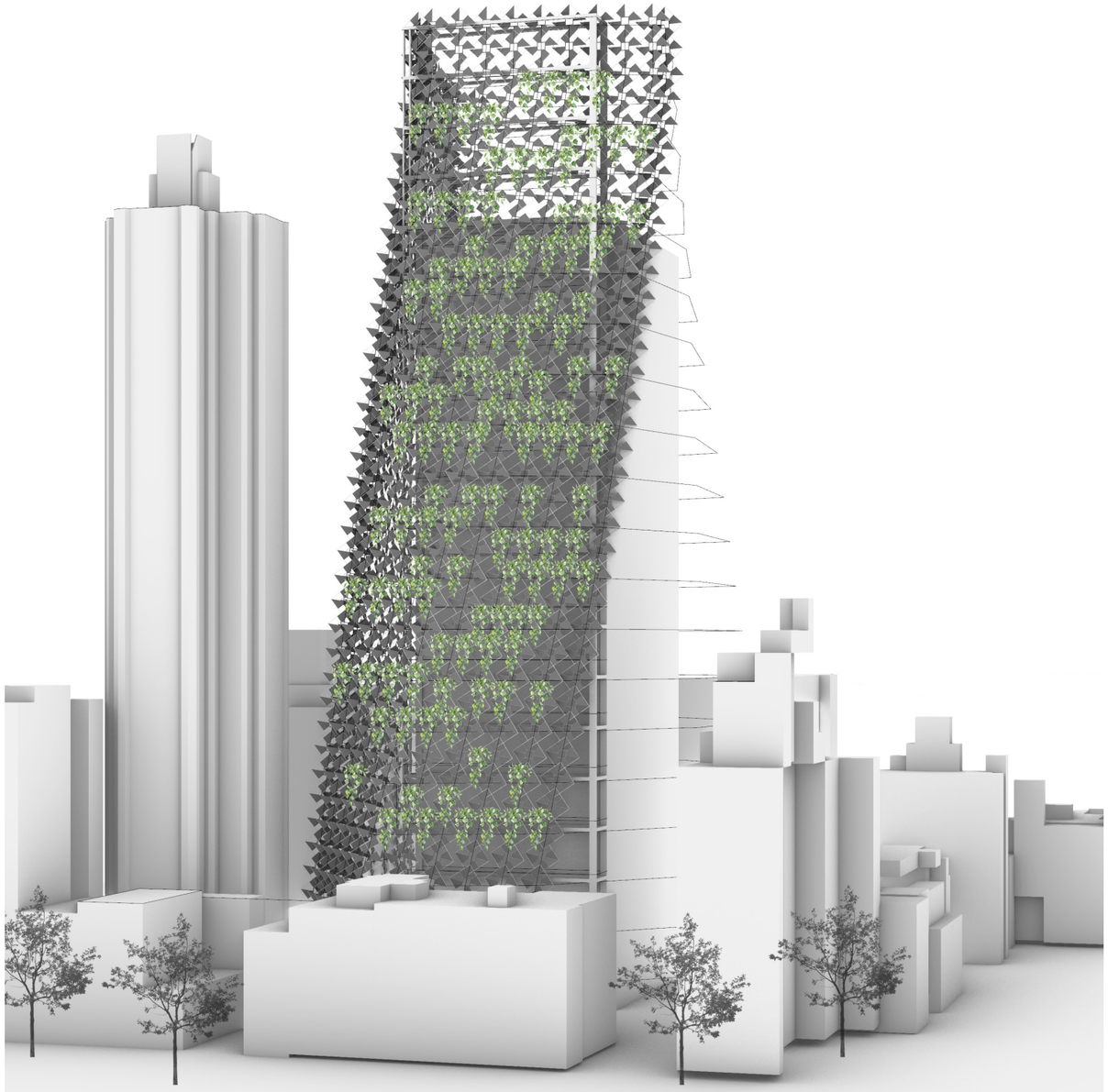
||

5.13 MT CO_2 Emissions



Assumption of CO_2 Emissions = 2.15 MT





Work flow

1. Data Collection

Carbon dioxide (Goal, Chronological change, etc)
Sun (Sun path, Sunlight angle, Sunlight intensity)
Wind (Wind direction, wind intensity)

2.Facade form

Sun & wind Data from ladybug - Form simulation using GALAPAGOS - New facade form in revit

3. Panel pattern

Sun & wind & Carbon dioxide & Heat from the building - Pattern simulation in Grasshopper - Panel form in revit

4. Detail and support elements

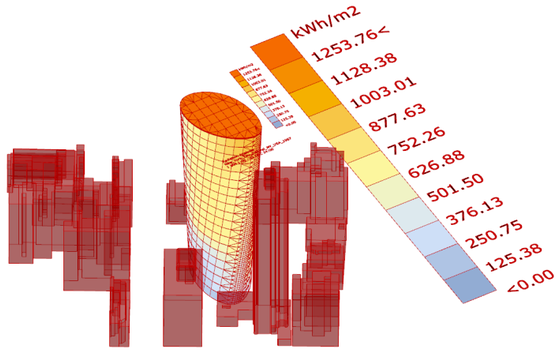
5. Output

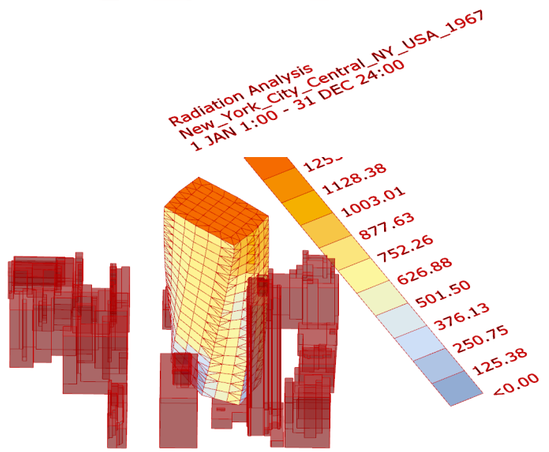
Daily & Seasonal scenario simulation - Panels' daily and seasonal movement - Diagram from Ladybug, honeybee, butterfly showing the improvement and expected output - Animation

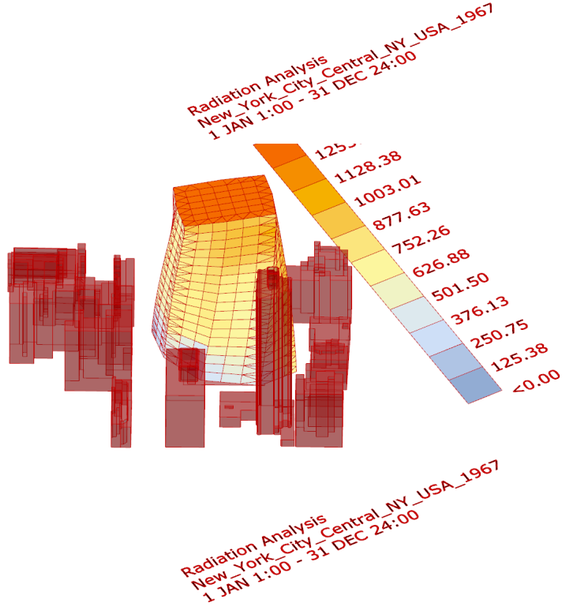
Summer Solstice

Winter Solstice

Form simulation

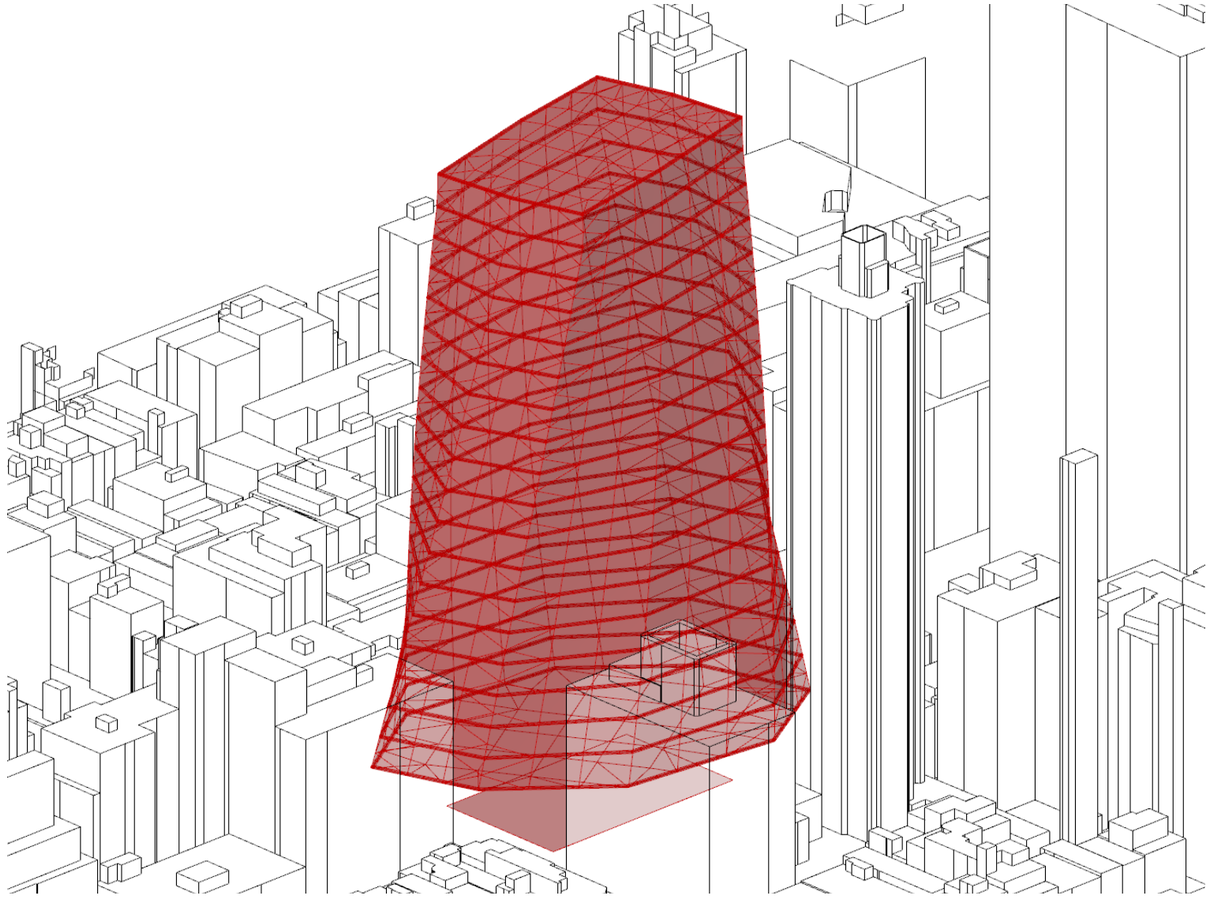


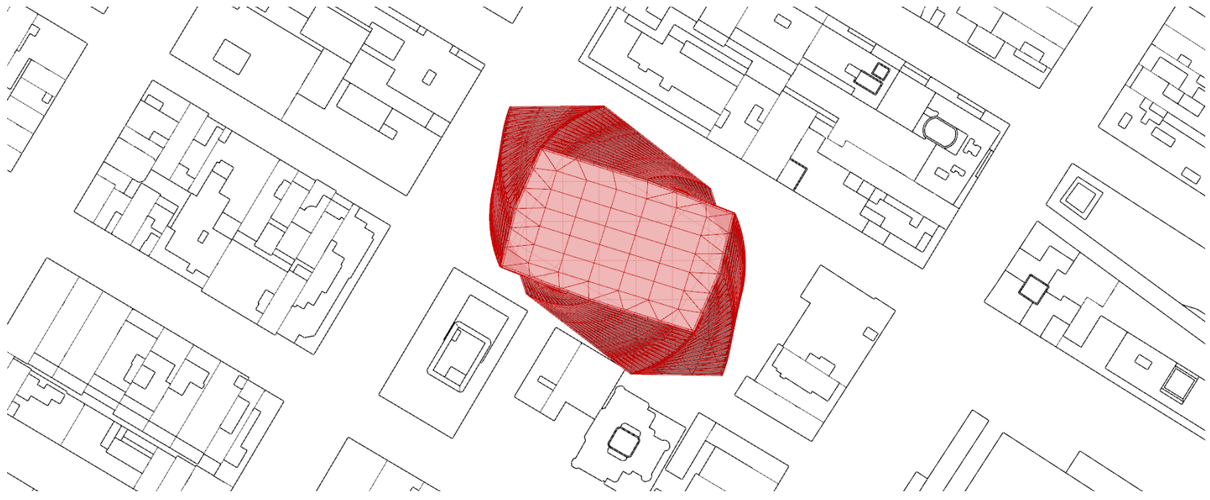




Radiation Analysis
New_York_City_Central_NY_USA_1967
1 JAN 1:00 - 31 DEC 24:00

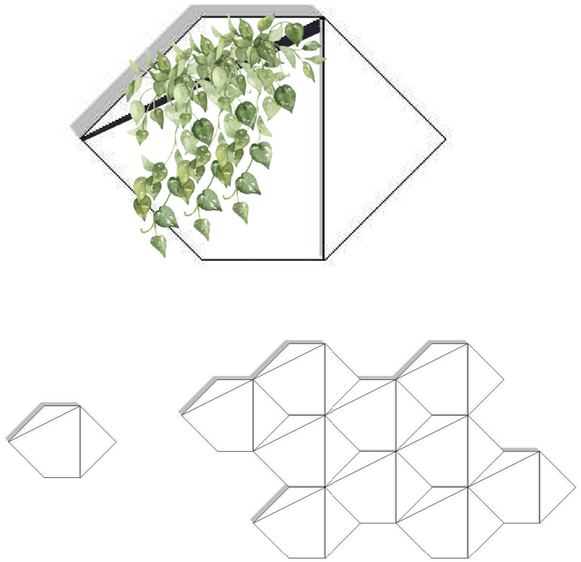
Facade pattern



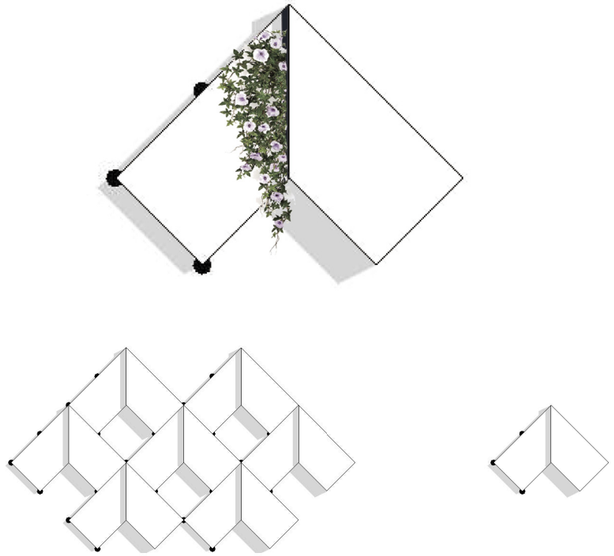


Panel Pattern

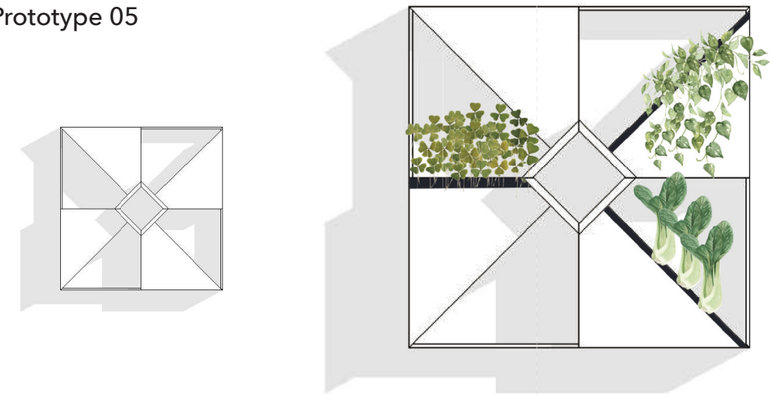
Prototype 01



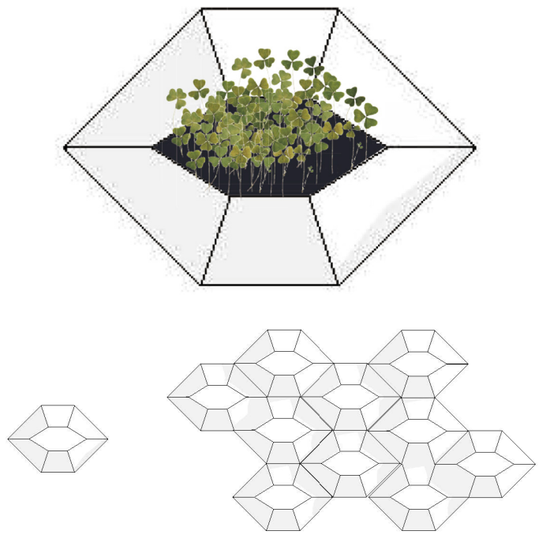
Prototype 02



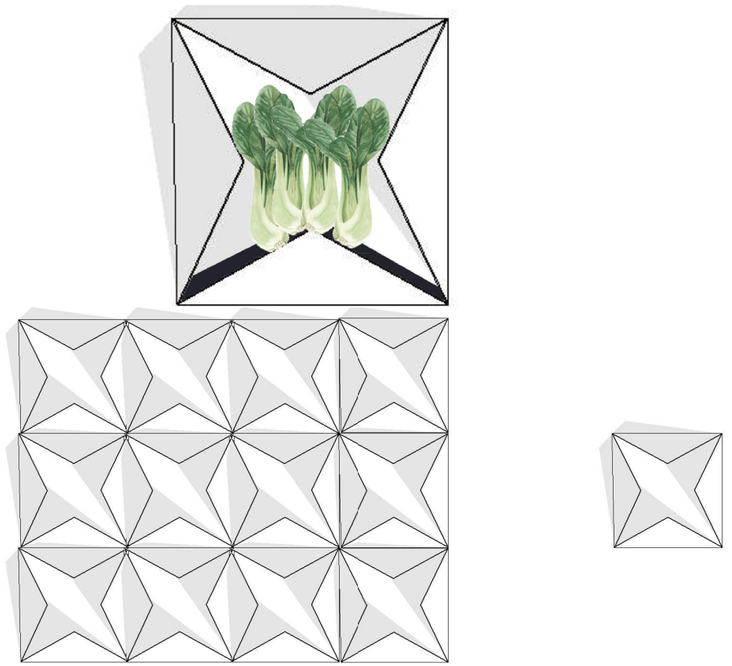
Prototype 05

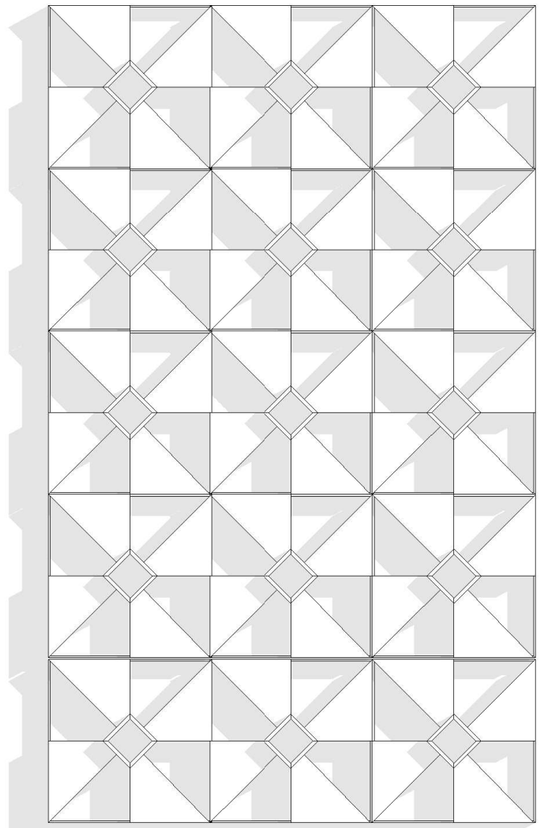


Prototype 03

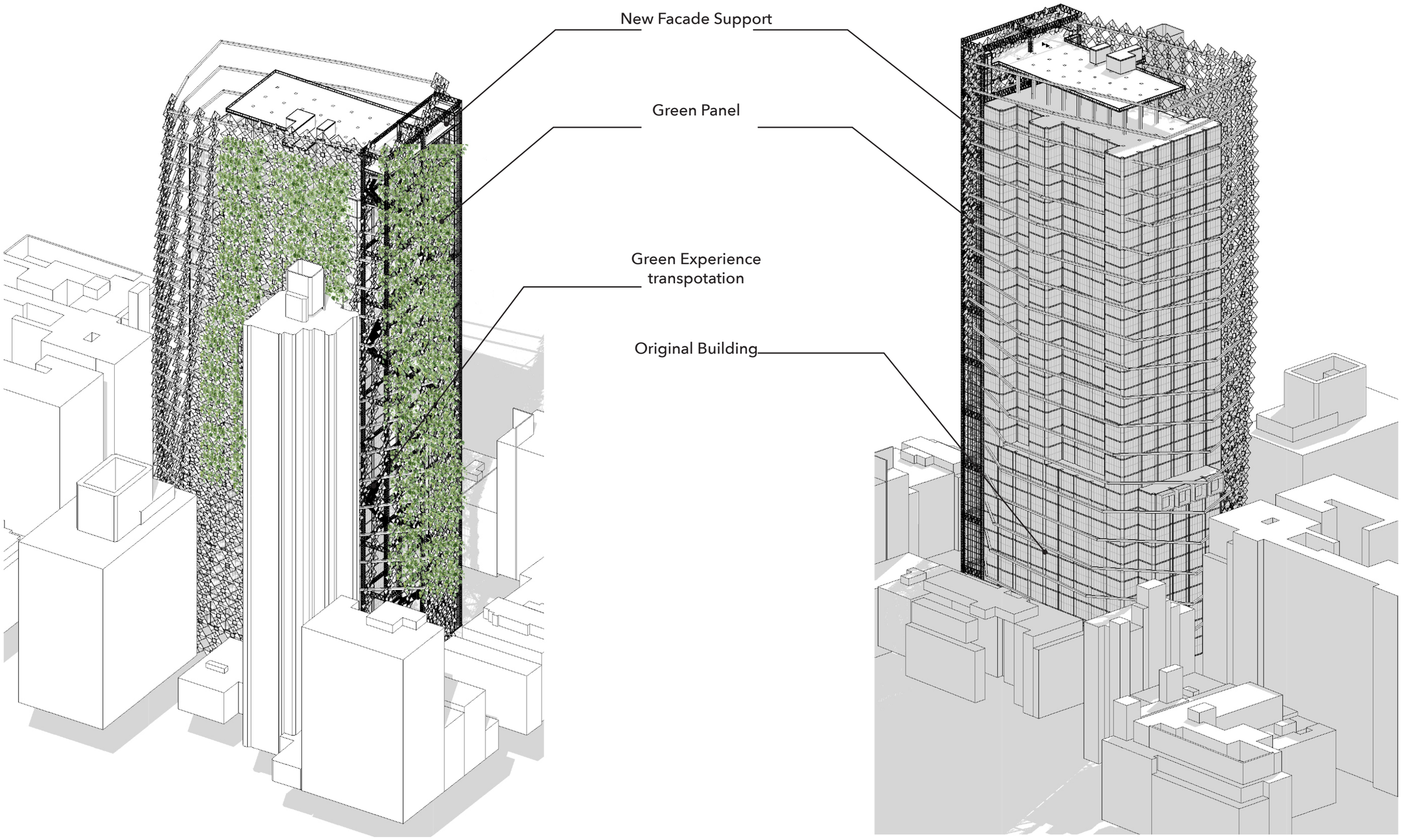


Prototype 04

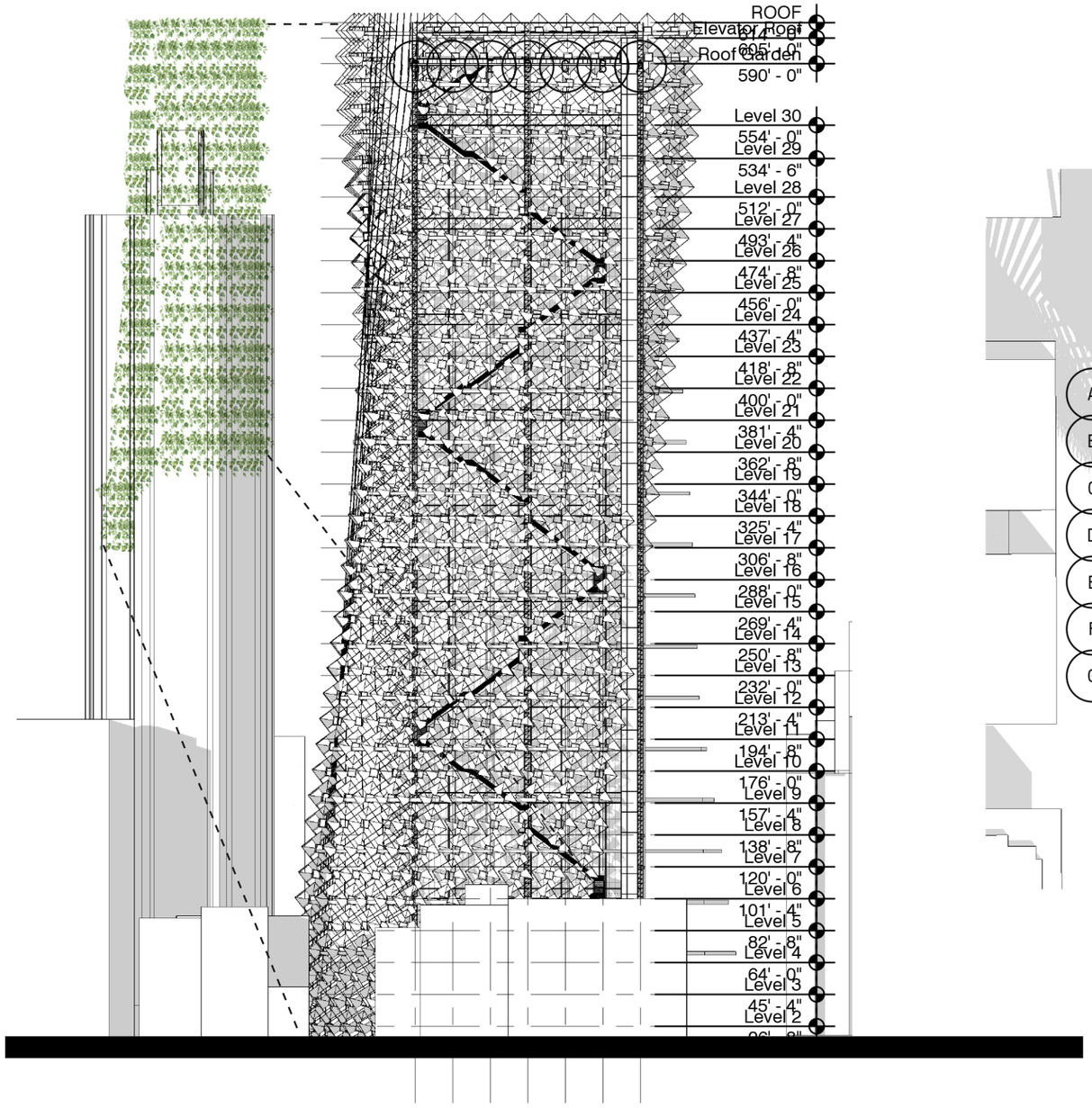




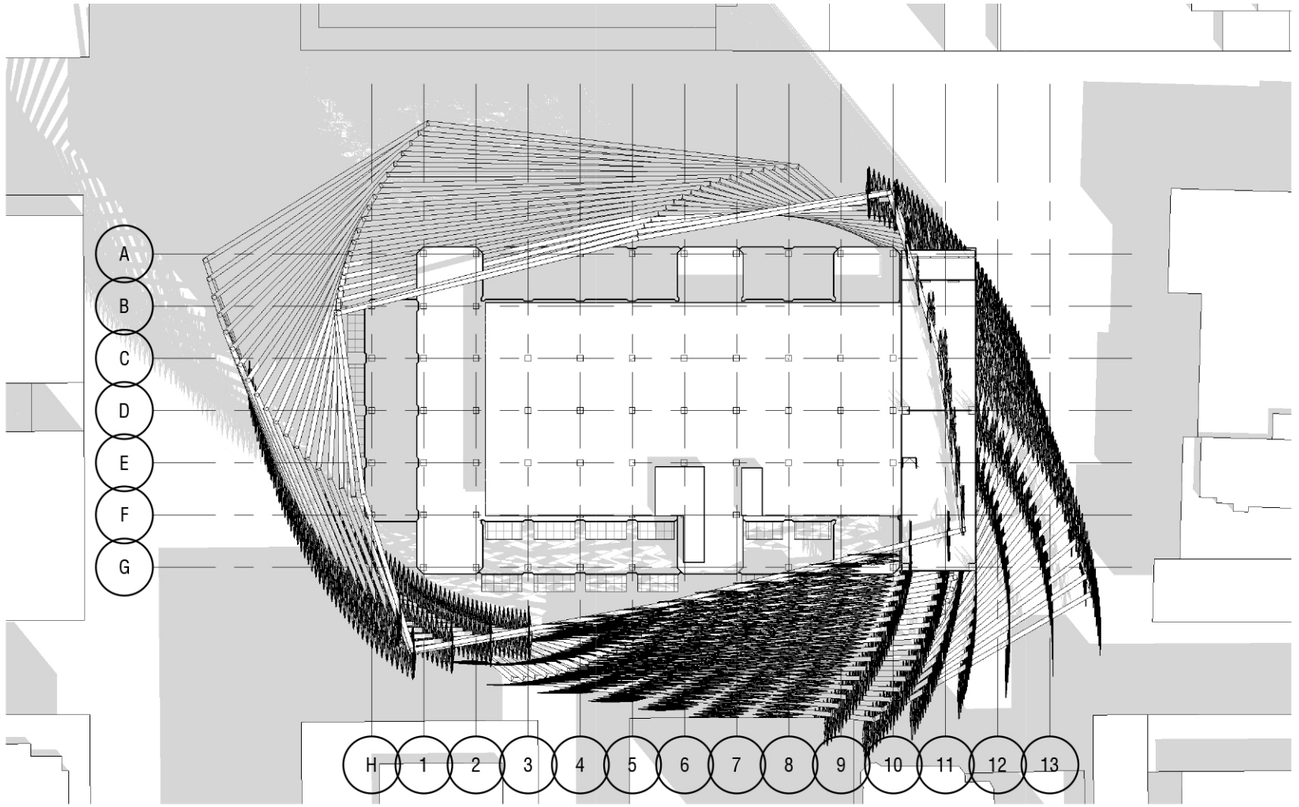
Site View


New Facade Support
Green Panel
Green Experience
transpotation
Original Building

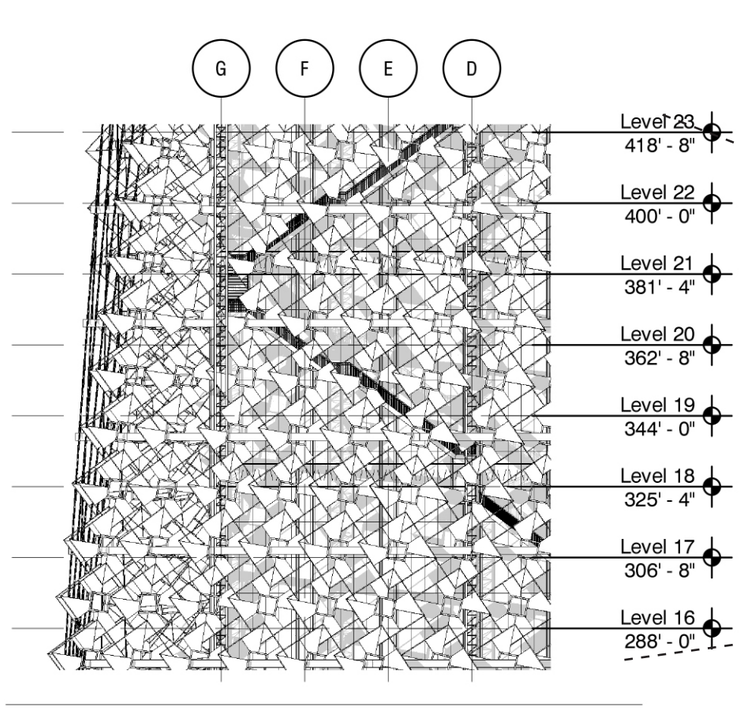
Elevation

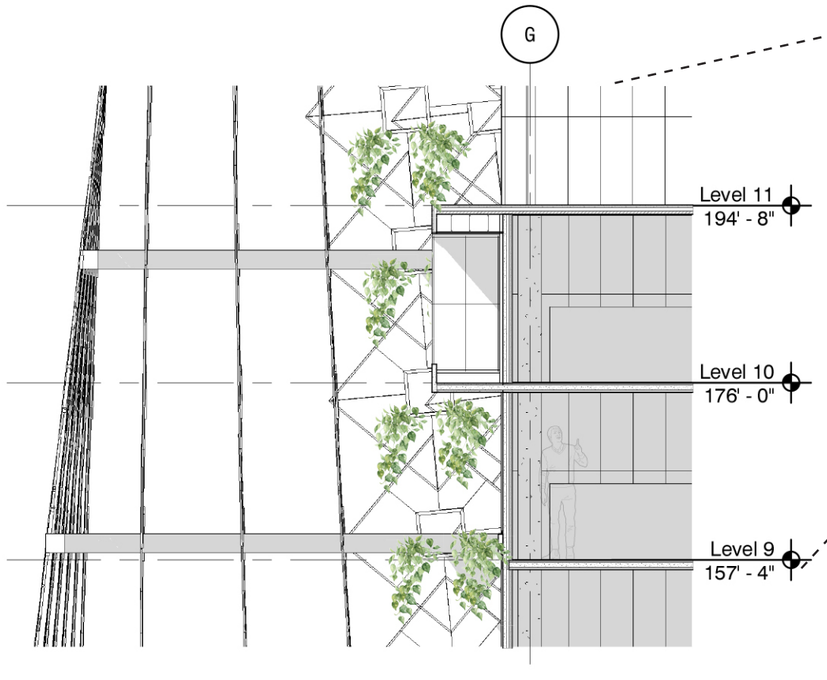


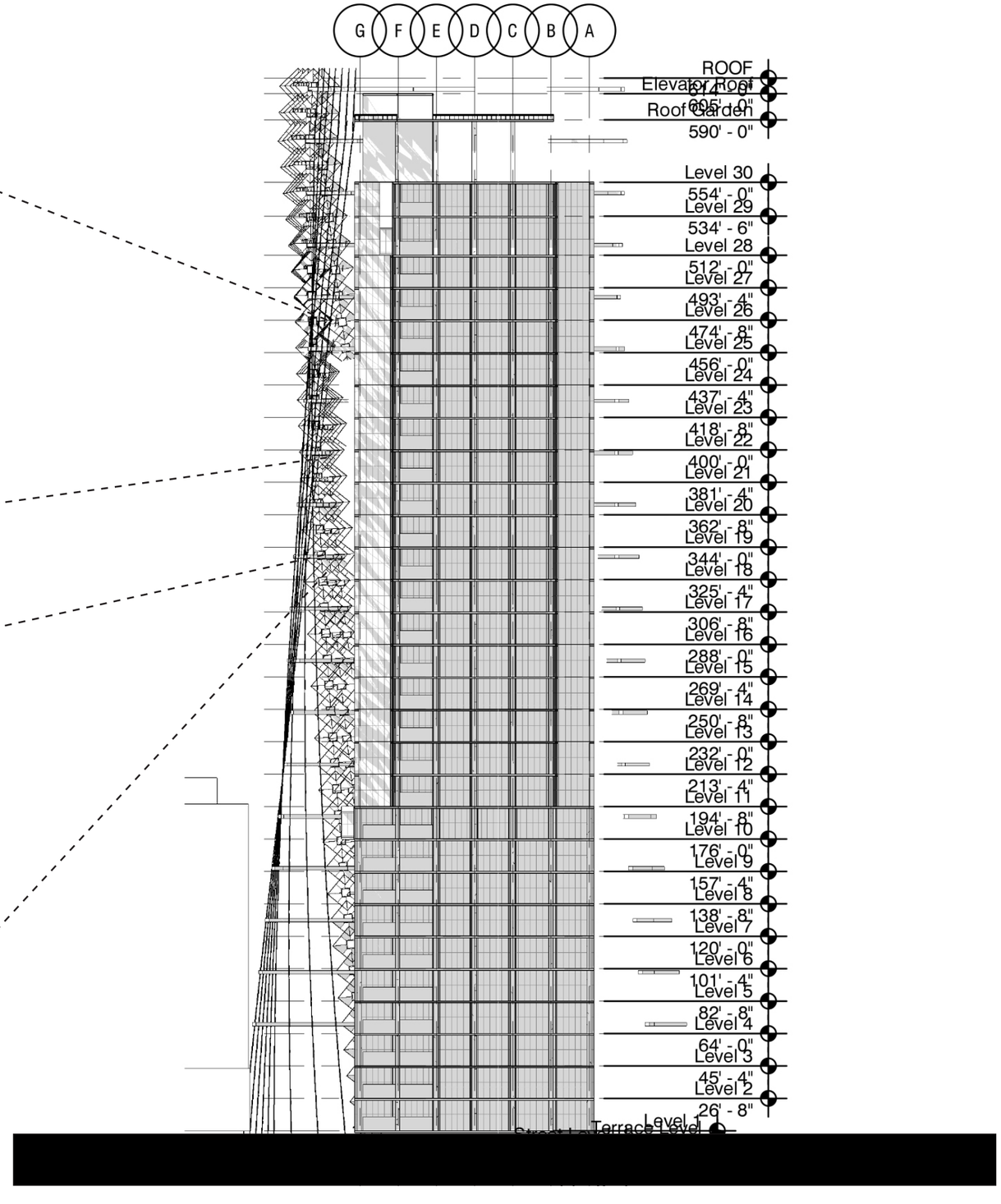
Plan



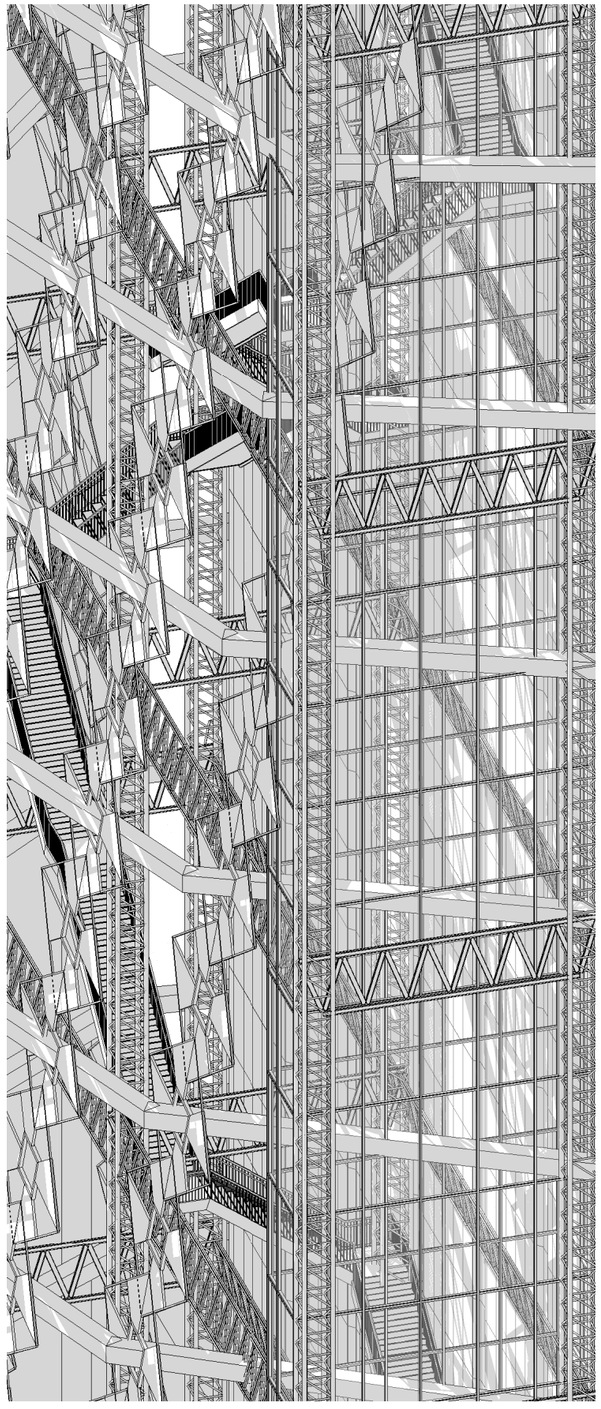
Section

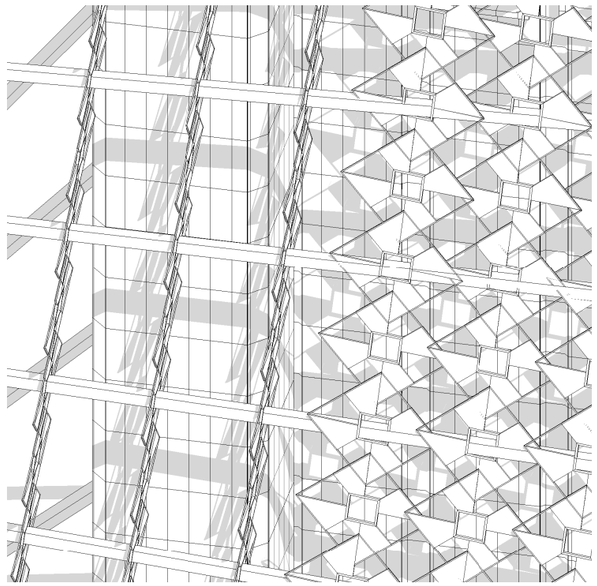

G
F
E
D
Level 23
418' - 8"
Level 22
400' - 0"
Level 21
381' - 4"
Level 20
362' - 8"
Level 19
344' - 0"
Level 18
325' - 4"
Level 17
306' - 8"
Level 16
288' - 0"


G
Level 11
194' - 8"
Level 10
176' - 0"
Level 9
157' - 4"


G
F
E
D
C
B
A
ROOF
Elevator Roof
614' - 0"
605' - 0"
Roof Garden
590' - 0"
Level 30
554' - 0"
Level 29
534' - 6"
Level 28
512' - 0"
Level 27
493' - 4"
Level 26
474' - 8"
Level 25
456' - 0"
Level 24
437' - 4"
Level 23
418' - 8"
Level 22
400' - 0"
Level 21
381' - 4"
Level 20
362' - 8"
Level 19
344' - 0"
Level 18
325' - 4"
Level 17
306' - 8"
Level 16
288' - 0"
Level 15
269' - 4"
Level 14
250' - 8"
Level 13
232' - 0"
Level 12
213' - 4"
Level 11
194' - 8"
Level 10
176' - 0"
Level 9
157' - 4"
Level 8
138' - 8"
Level 7
120' - 0"
Level 6
101' - 4"
Level 5
82' - 8"
Level 4
64' - 0"
Level 3
45' - 4"
Level 2
26' - 8"
Level 1
Terrace Level

Detail Perspective





Section