SITE LOCATION:

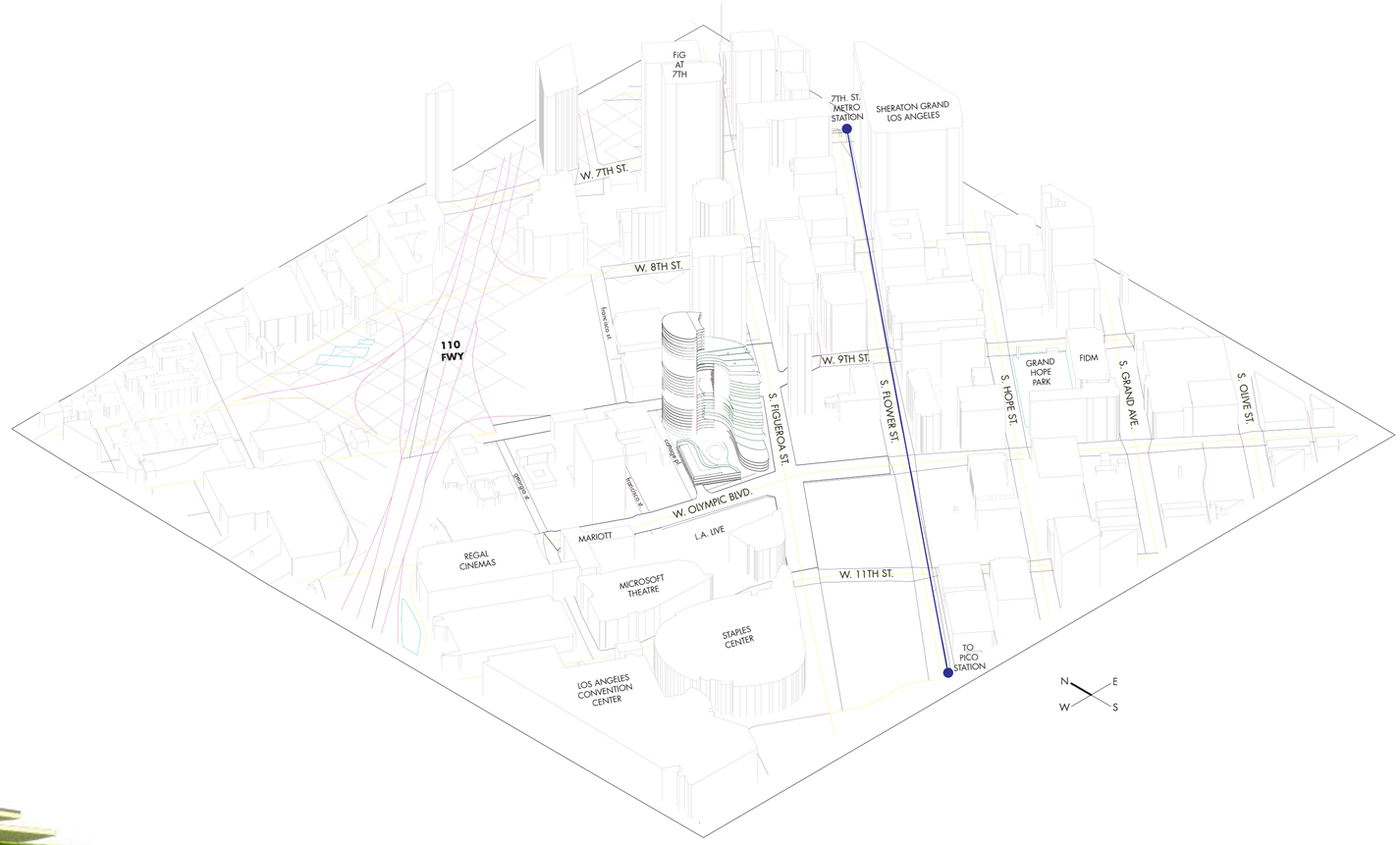
DOWNTOWN LA, SOUTH PARK DISTRICT
S. FIGUEROA ST. + W. OLYMPIC BLVD.

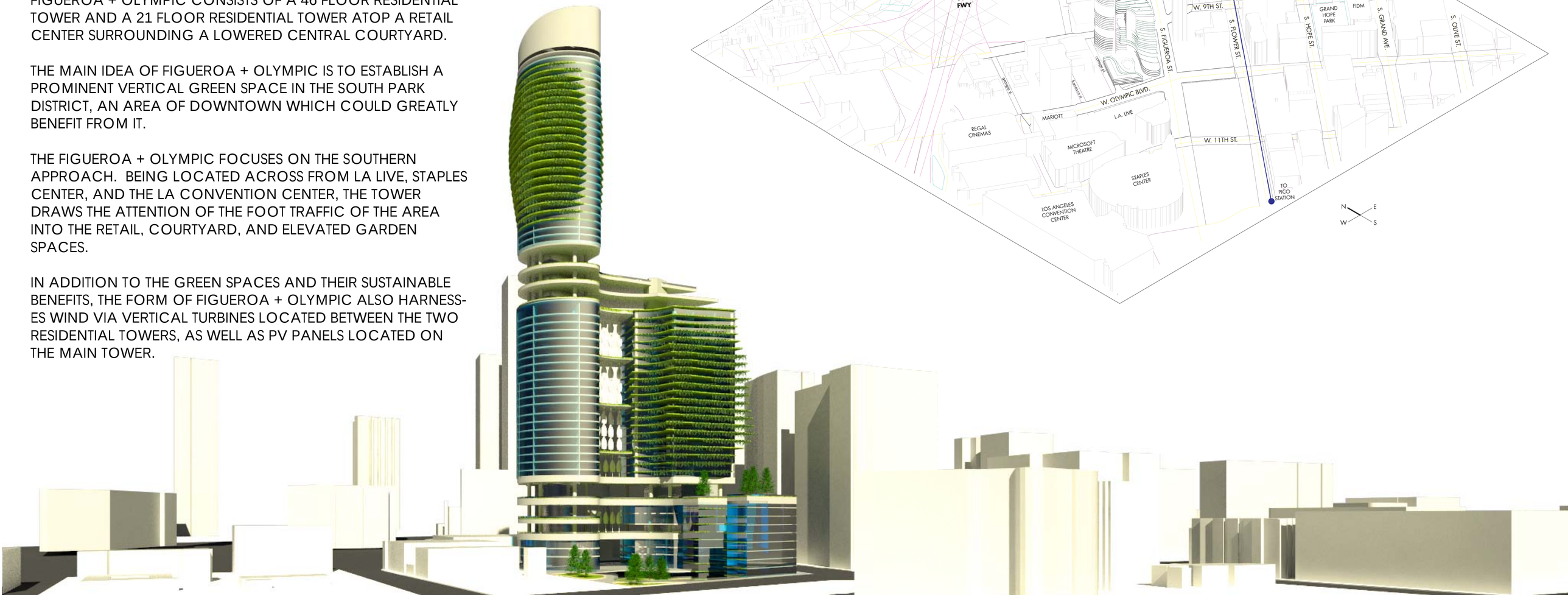
FIGUEROA + OLYMPIC CONSISTS OF A 46 FLOOR RESIDENTIAL TOWER AND A 21 FLOOR RESIDENTIAL TOWER ATOP A RETAIL CENTER SURROUNDING A LOWERED CENTRAL COURTYARD.

THE MAIN IDEA OF FIGUEROA + OLYMPIC IS TO ESTABLISH A PROMINENT VERTICAL GREEN SPACE IN THE SOUTH PARK DISTRICT, AN AREA OF DOWNTOWN WHICH COULD GREATLY BENEFIT FROM IT.

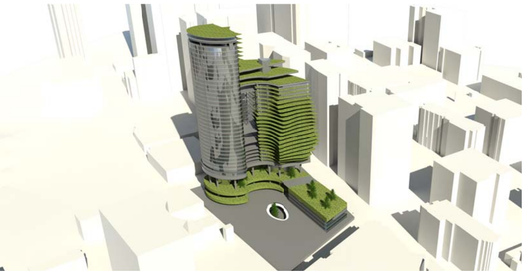
THE FIGUEROA + OLYMPIC FOCUSES ON THE SOUTHERN APPROACH. BEING LOCATED ACROSS FROM LA LIVE, STAPLES CENTER, AND THE LA CONVENTION CENTER, THE TOWER DRAWS THE ATTENTION OF THE FOOT TRAFFIC OF THE AREA INTO THE RETAIL, COURTYARD, AND ELEVATED GARDEN SPACES.

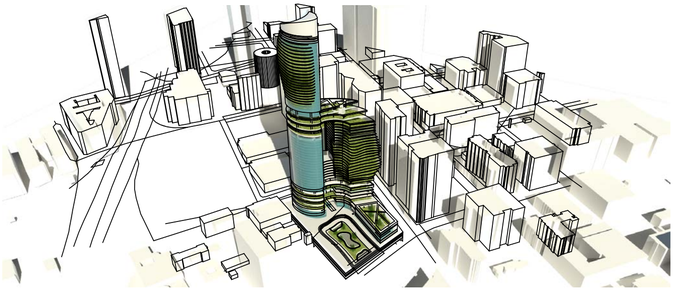
IN ADDITION TO THE GREEN SPACES AND THEIR SUSTAINABLE BENEFITS, THE FORM OF FIGUEROA + OLYMPIC ALSO HARNESSES WIND VIA VERTICAL TURBINES LOCATED BETWEEN THE TWO RESIDENTIAL TOWERS, AS WELL AS PV PANELS LOCATED ON THE MAIN TOWER.

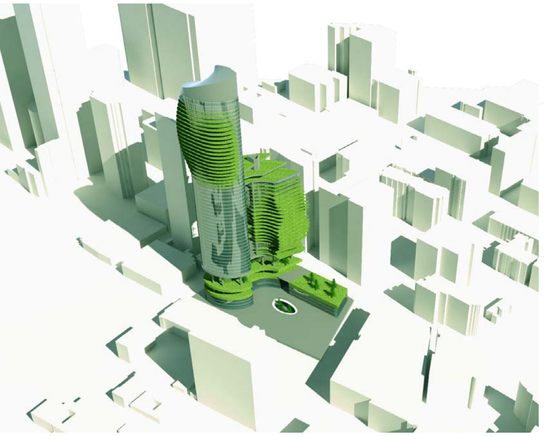


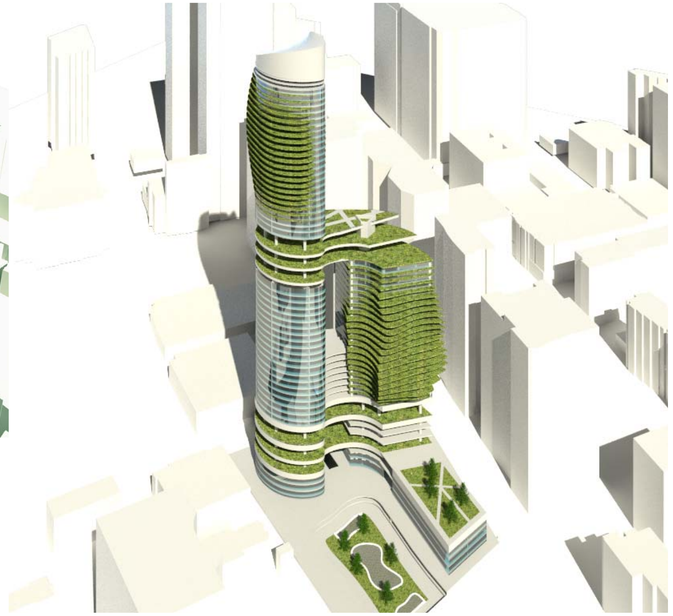


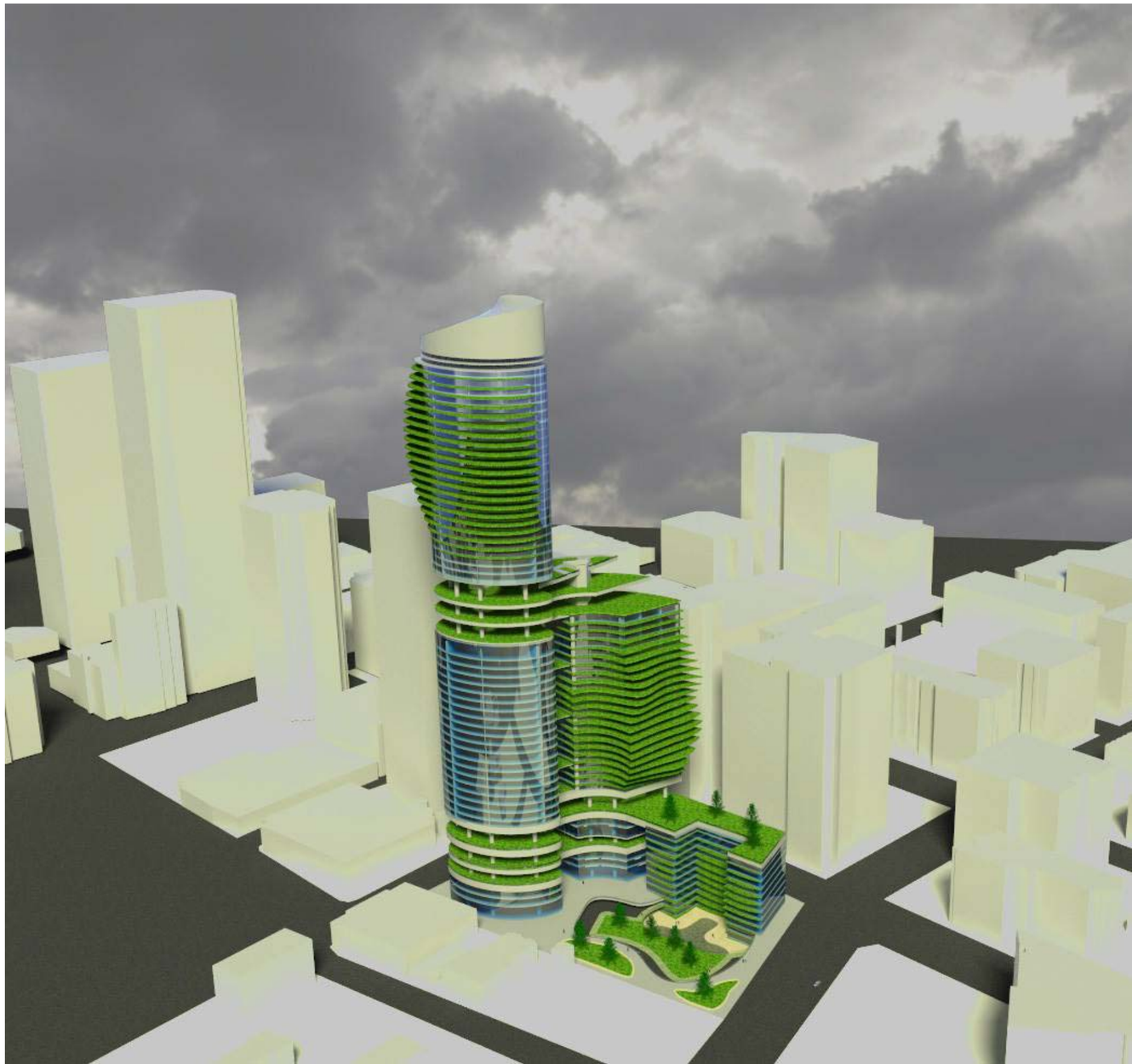
CONCEPT DEVELOPMENT









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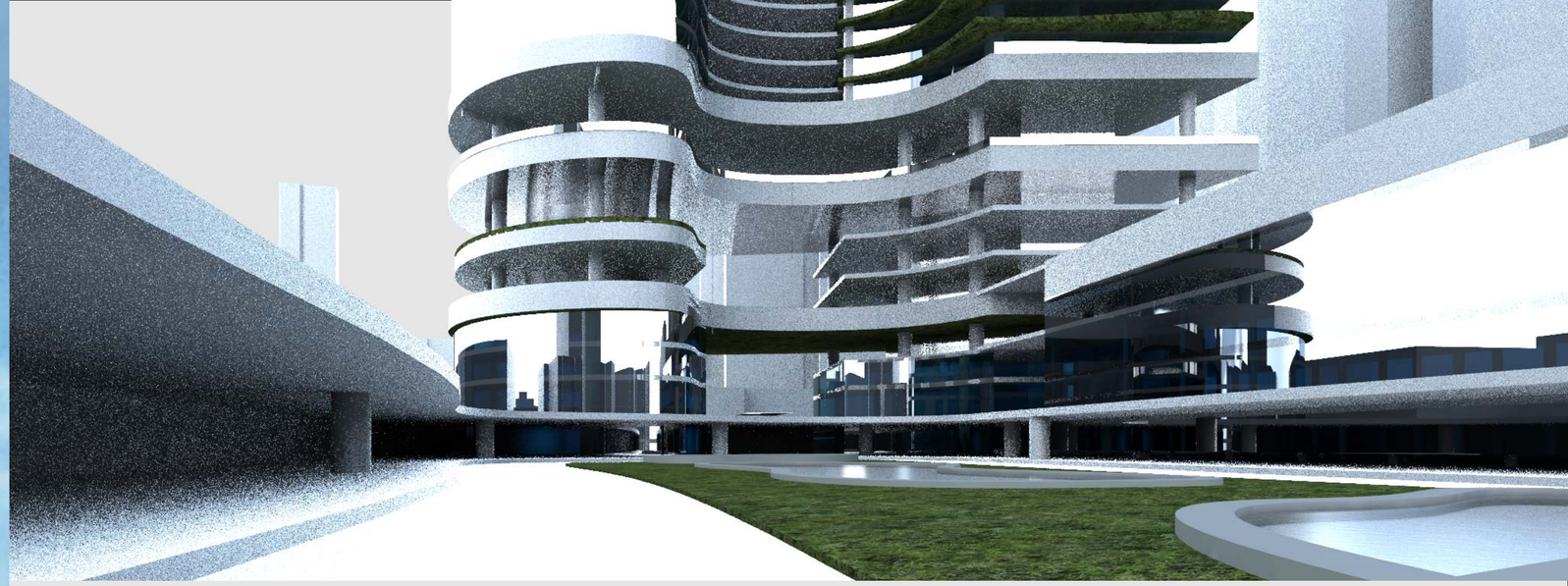
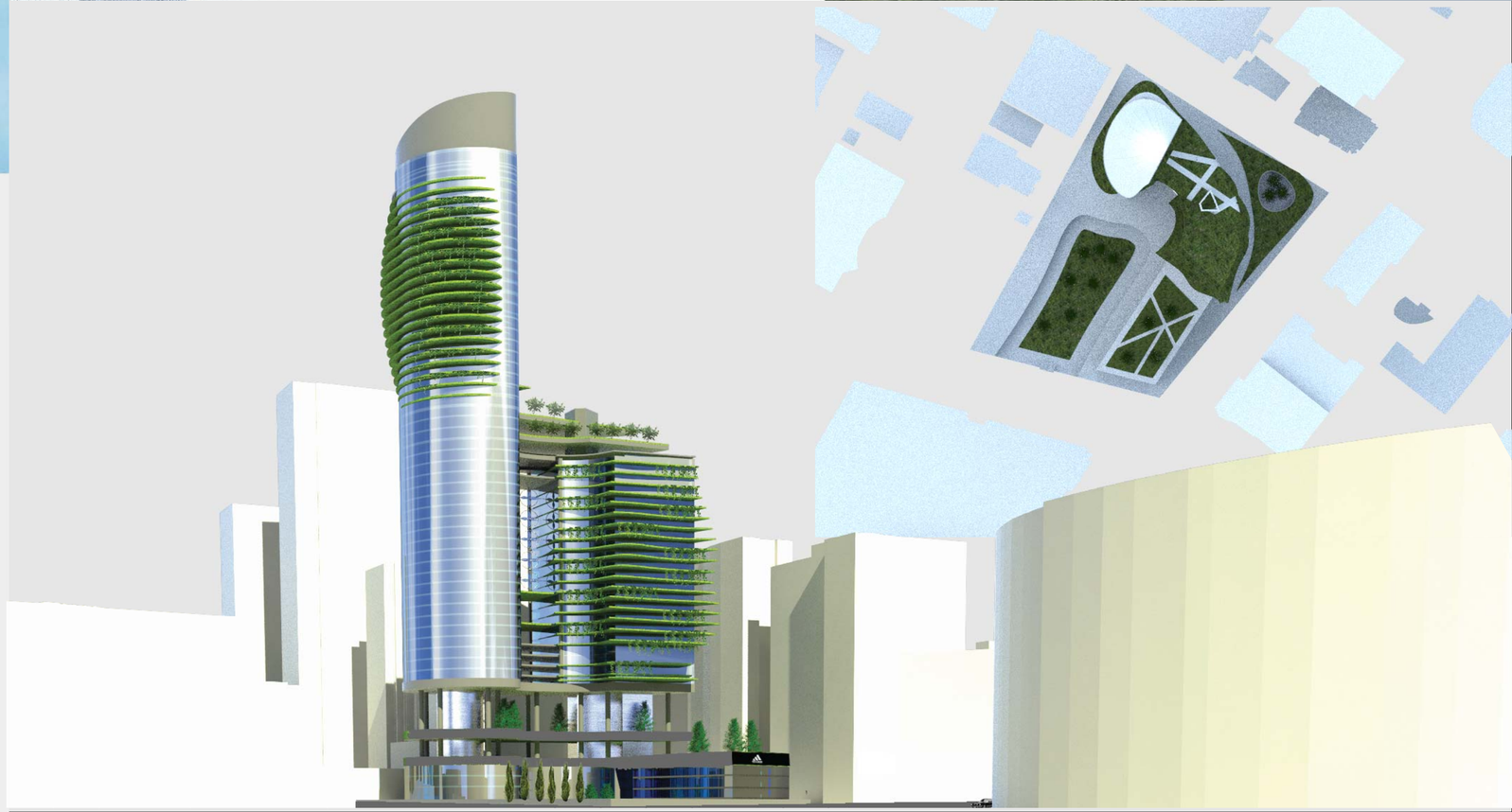




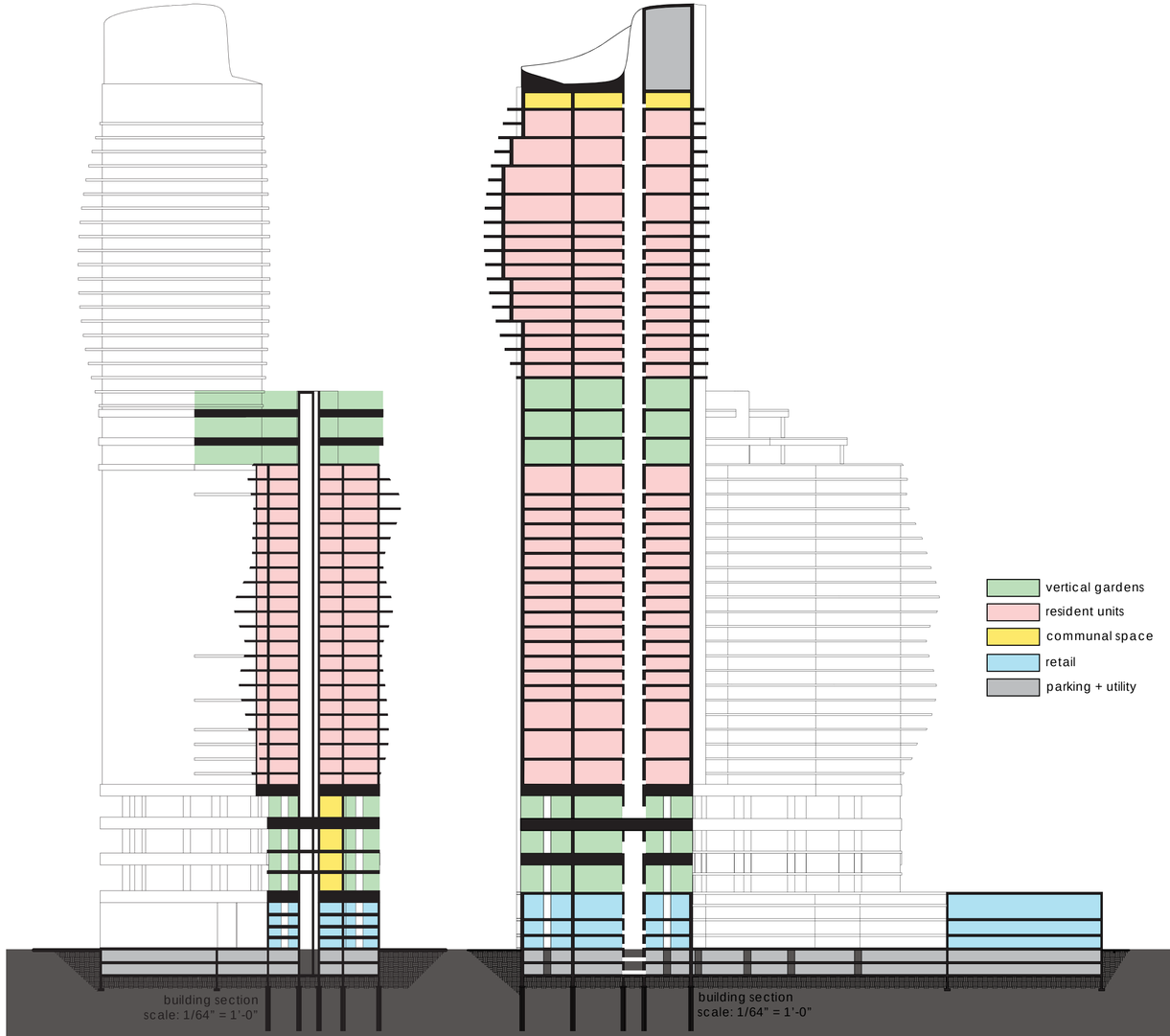
PROGRAMMING

GROUND LEVEL

TYPICAL UNIT LEVEL

NORTH FACING SECTION

EAST FACING SECTION



ELEVATIONS

SOUTHEAST

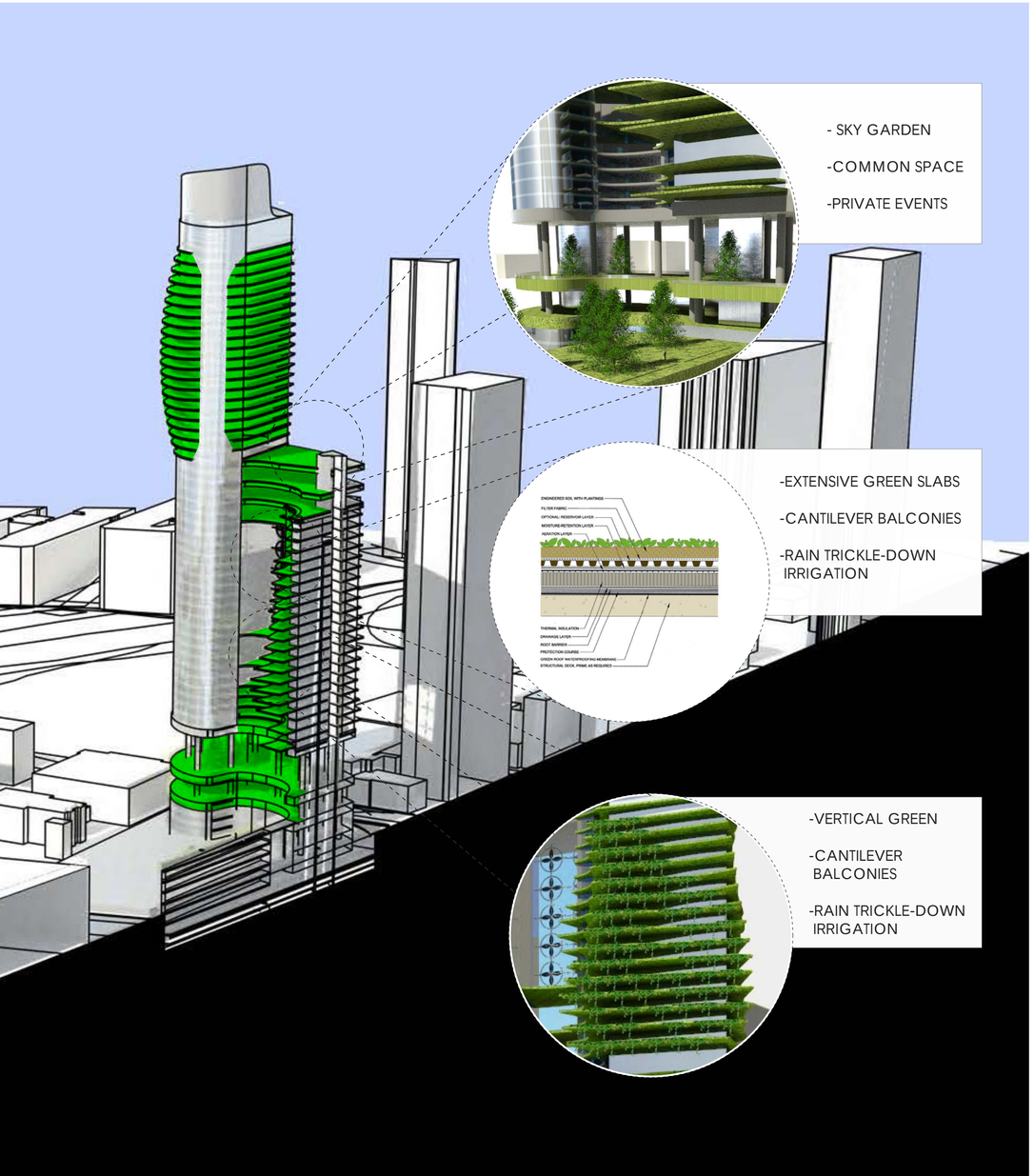
SOUTHWEST

EAST

NORTHEAST

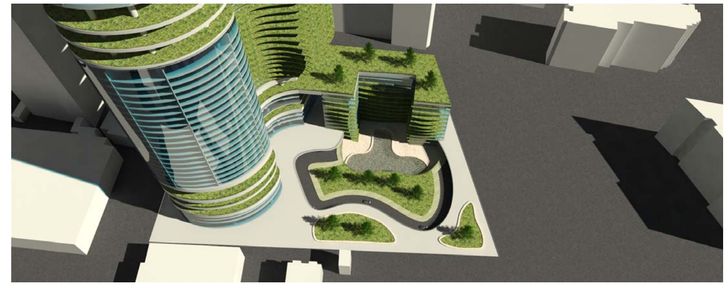
NORTHWEST

SUSTAINABILITY: GREEN

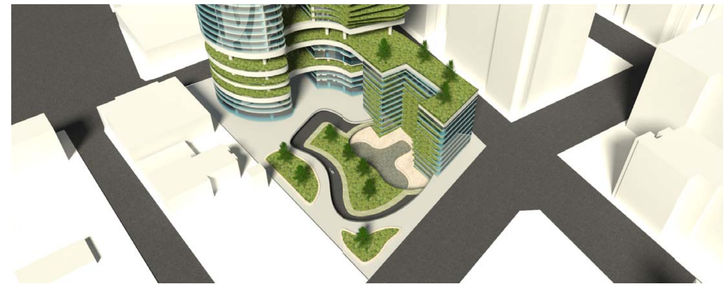


GREEN CONTEXT

UPPER COURTYARD

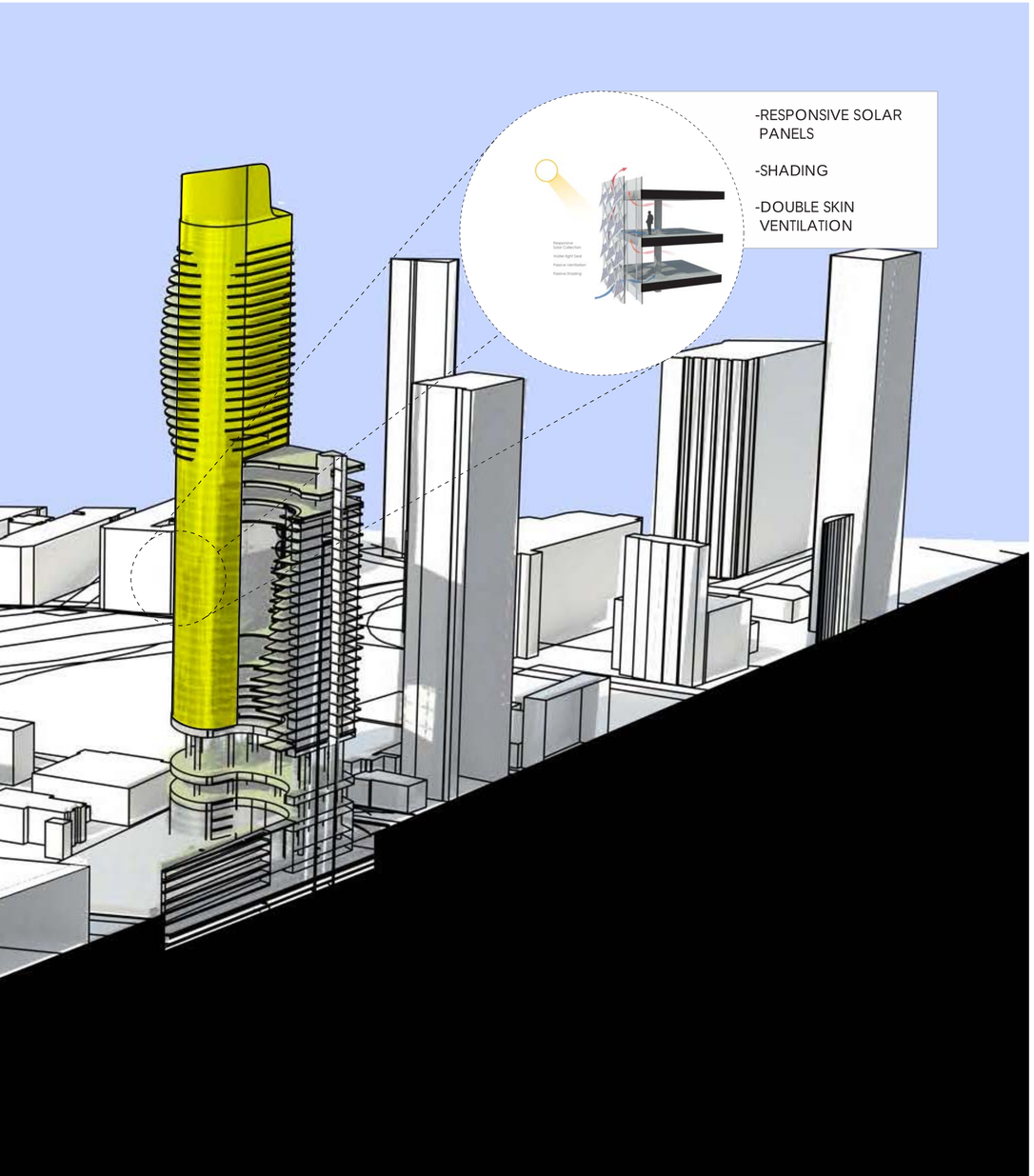


LOWER COURTYARD

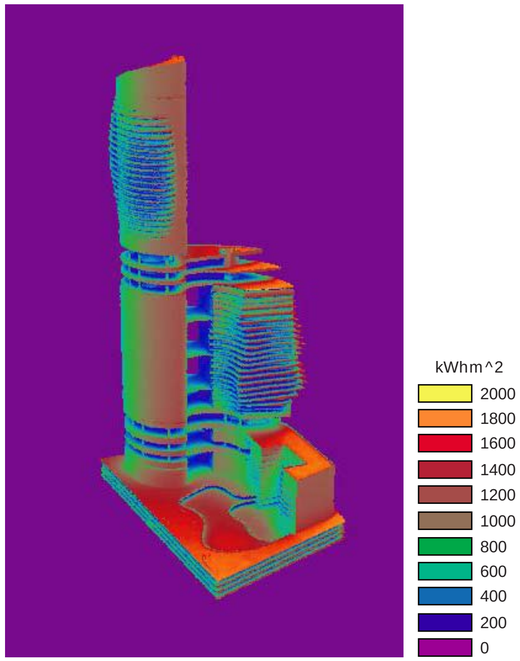


MAIN COURTYARD

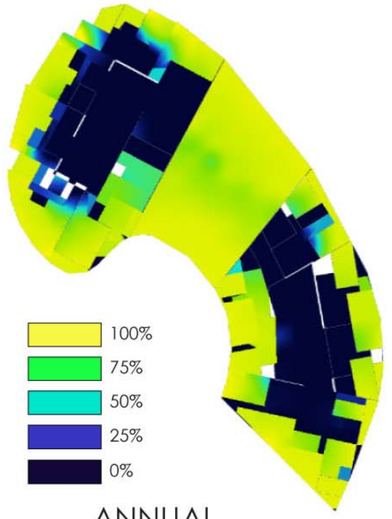
SUSTAINABILITY: SOLAR



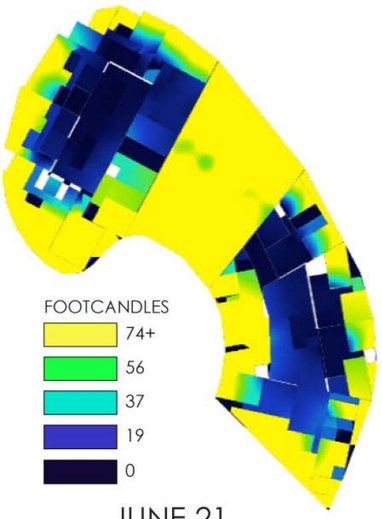
ANNUAL RADIATION MAP



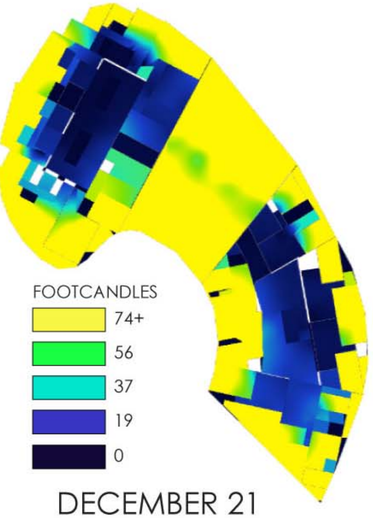
DAYLIGHTING ON TYPICAL RESIDENTIAL LEVELS



ANNUAL DAYLIGHT AUTONOMY

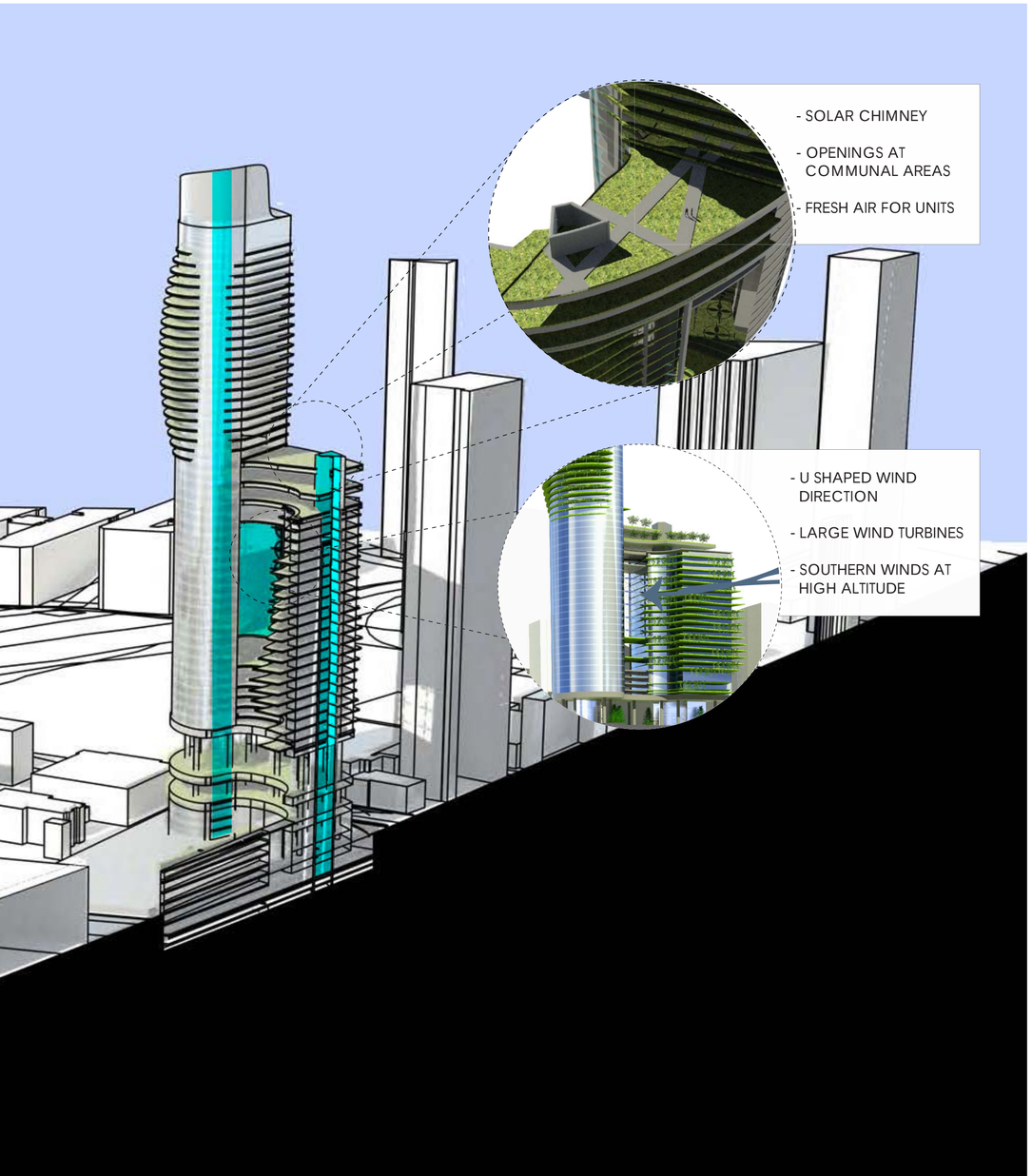


JUNE 21

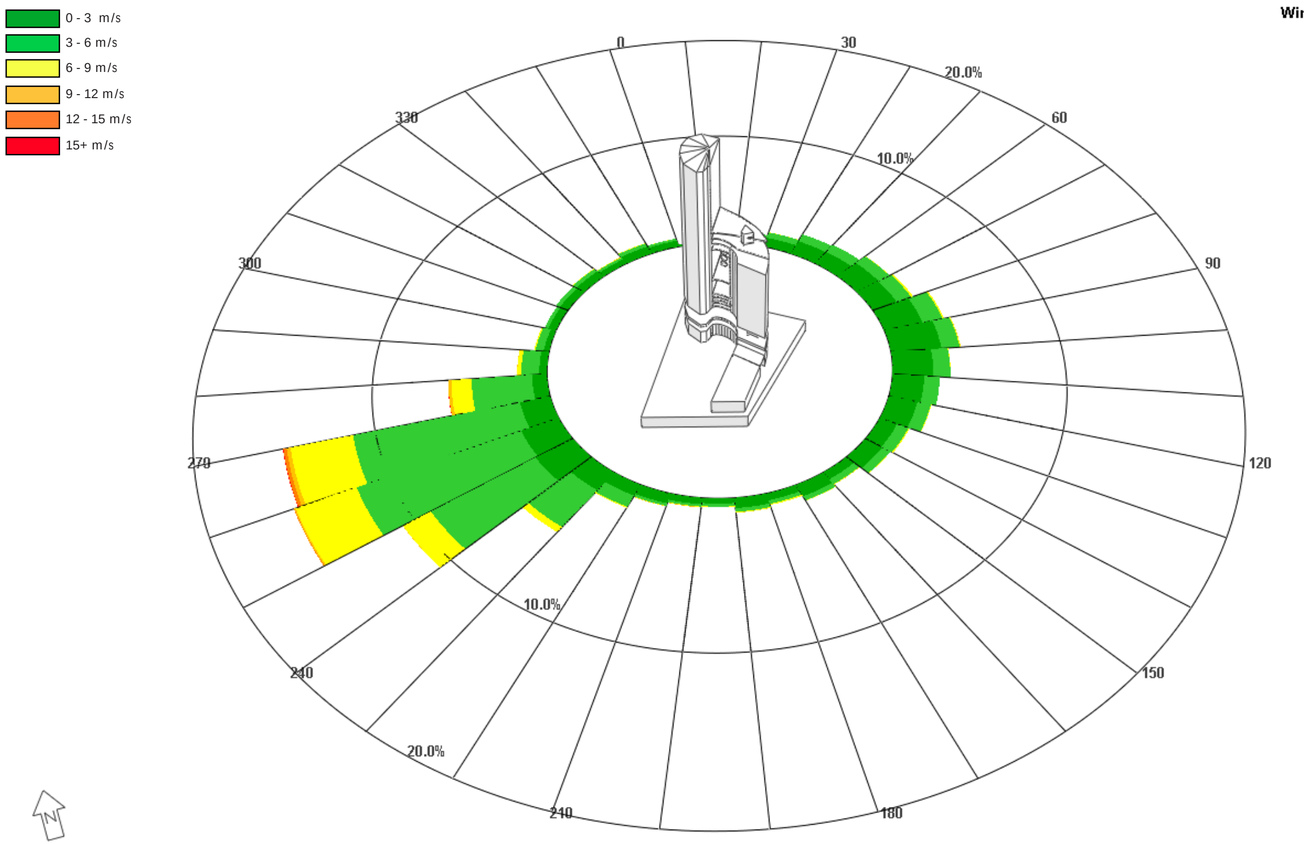


DECEMBER 21

SUSTAINABILITY: WIND



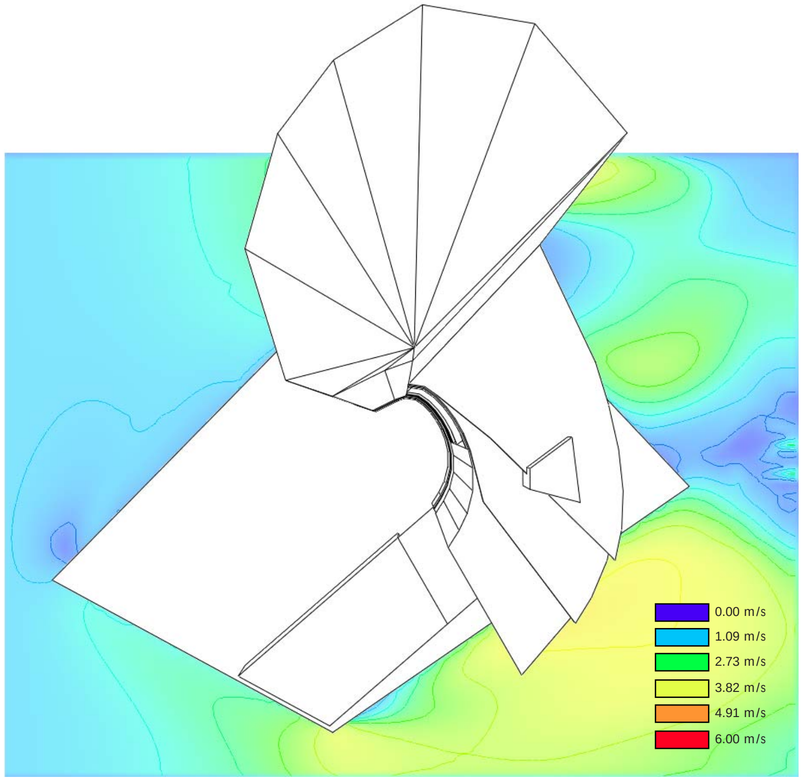
ANNUAL WIND ROSE



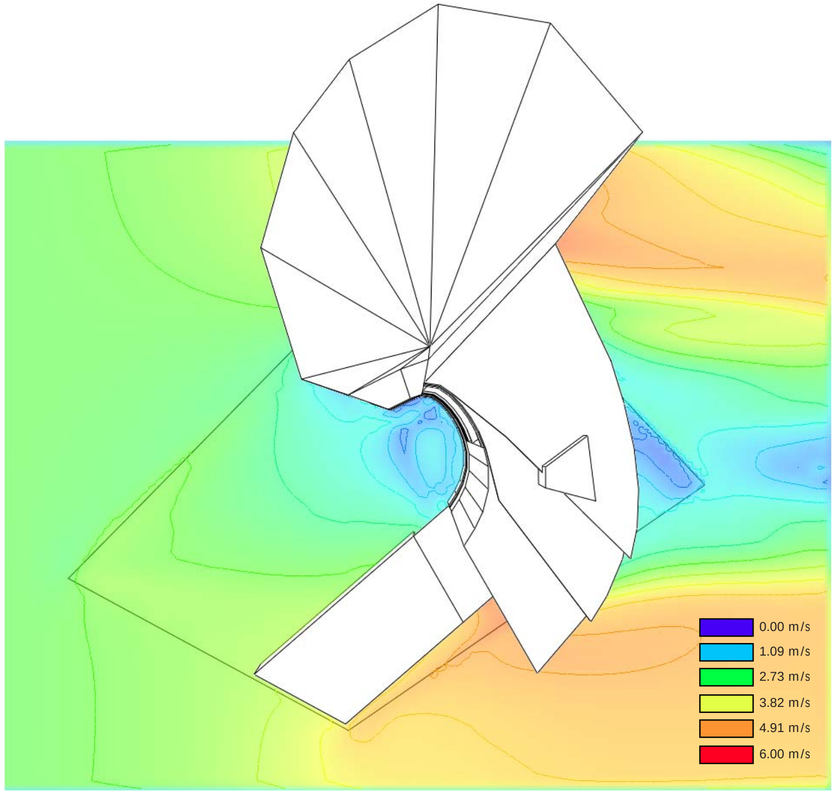
SUSTAINABILITY: WIND

WIND STUDY ANALYSIS

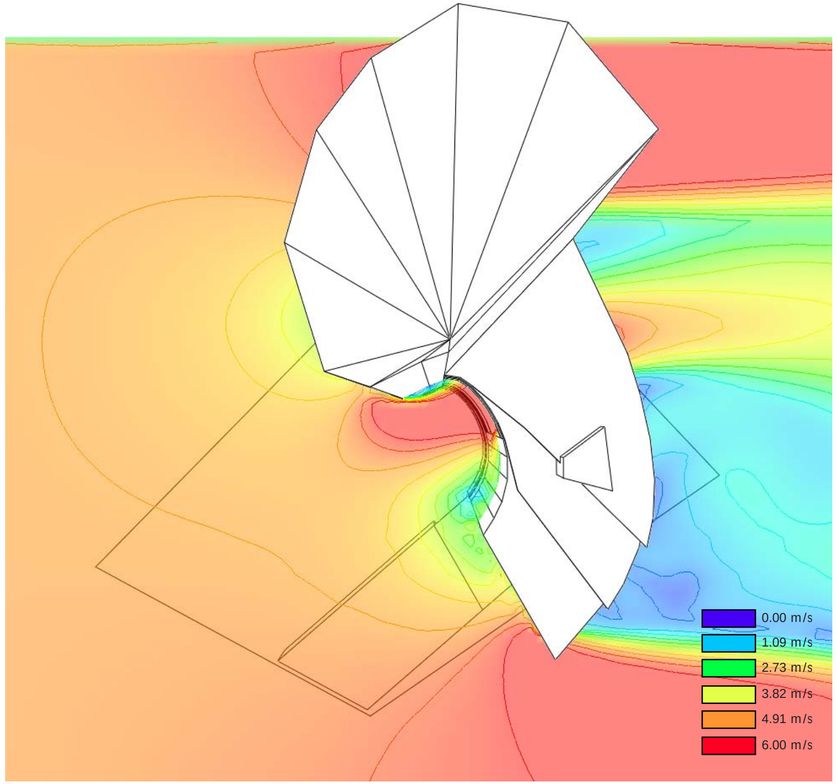
GROUND LEVEL



30 FT ELEVATION



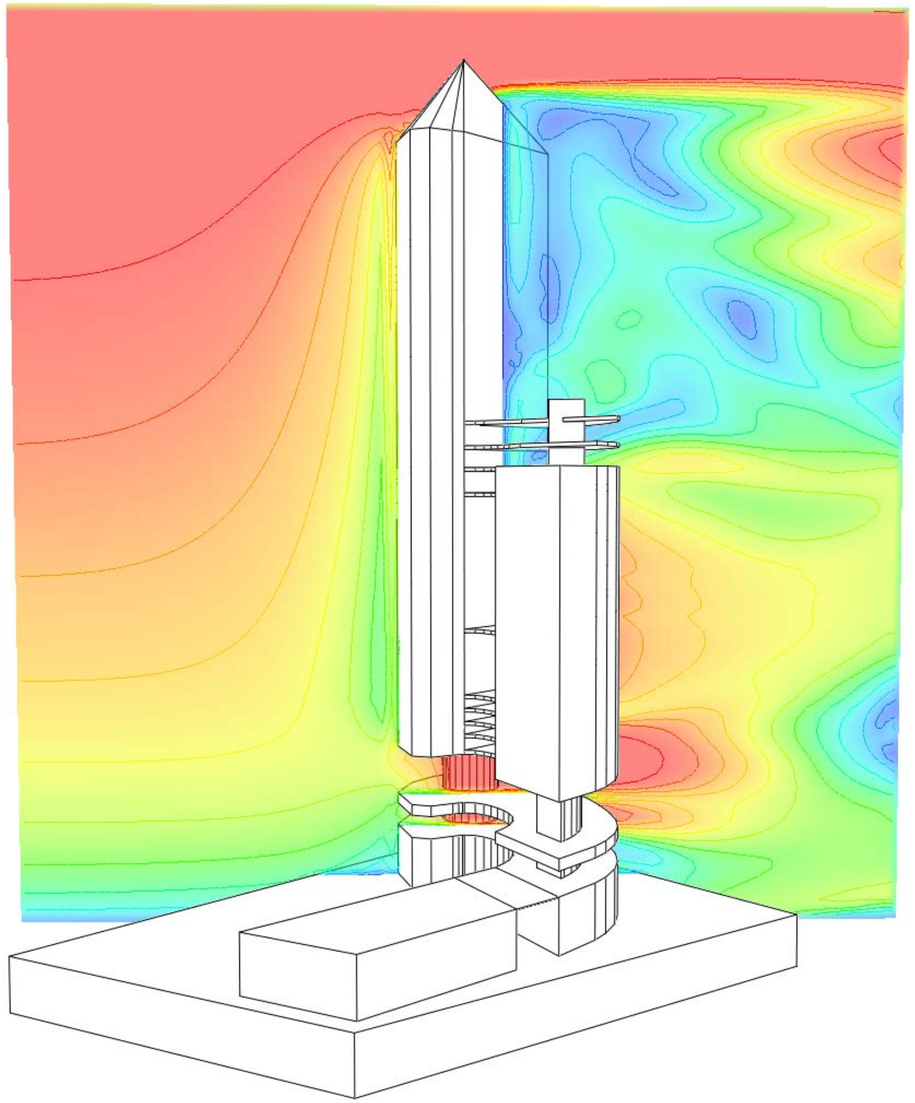
300 FT ELEVATION



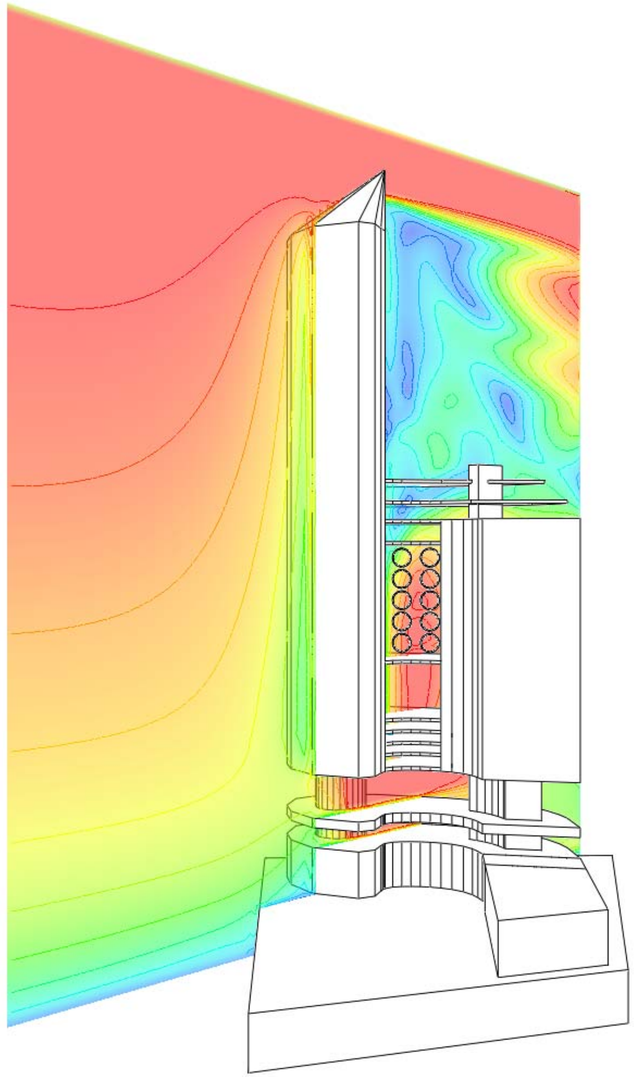
SUSTAINABILITY: WIND

WIND STUDY ANALYSIS

SOUTHERN EXPOSURE



NORTHEASTERN EXPOSURE (TURBINES)



CARBON FOOTPRINT

NET EUI:

21

kBtu/sf yr

NET CUI:

3.8

LBS CO2e/sf yr

Building Area (m2) 128271.0 m2

	Yearly Values		Conversion Factor		lbs CO2e/yr
1. Operational Energy:					
Use the following values from the energy modeling program					
Total Electricity	13,752,653	kWhr per kWhr	0.62	lbs/kWhr	8,526,645
Total Fuel	1,530	kWhr per kWhr	0.083492847	lbs/kWhr	128
EUI	**107**	kWhr/m2 year			
EUI	**34**	kBtus/sq ft year			
				Operational Energy	**8,526,773** lbs CO2e/yr

3,867,017.1 kgs CO2e/yr

Tbe = Oe + Ce + We + Wa – Rs
0 >= Tbe
Where
Tbe total building emissions
Oe operation emissions (energy)
Ce construction emissions
We water emissions
Wa waste emissions
Rs renewable strategies

2. Construction:

Build Carbon Neutral http://buildcarbonneutral.org/ Build Carbon Neutral Provides an Easy way to calculate Embodied Emissions
or Athena Eco Calculator for Assemblies http://www.athenasmi.org/tools/ecoCalculator/index.html

38,364 metric tonnes lbs per metric tonne 2205.0 **Construction** **84,592,620** lbs CO2e **38,364,000.0** kgs CO2e/yr
life expectancy of the building. Default is average in the USA 73.0 **Per Year** **1,158,803** lbs CO2e/yr

3. Water:

C02e factor per Million Gallons: 1,331 lbs of CO2

782,560 gallons of water per gallon of water 0.001331 **Water** **1042** lbs CO2e/yr **472.4** kgs CO2e/yr

4. Waste:

EPA WARM Model or 429,411 **Waste** **429411** lbs CO2e/yr **194,744.2** kgs CO2e/yr
https://www.epa.gov/warm/documentation-chapters-greenhouse-gas-emission-and-energy-factors-used-waste-reduction-model
for a family of five that does not recycle it is 3,458 lbs of CO2e per family
EPA Personal Emissions Calculator http://www.epa.gov/climatechange/emissions/ind_calculator.html
use the carbon footprint calculator to better estimate
https://www3.epa.gov/carbon-footprint-calculator/
Warm Model https://www.epa.gov/warm/versions-waste-reduction-model-warm#WARM Tool V14

total	**10,116,028**	**lbs CO2e / yr**	**4,587,767.9** kgs CO2e/yr
total	**4,588,549**	**kgs CO2e / yr**	**2,080,974.8** kgs CO2e/yr
total	**4,589**	**metric tonnes CO2e / yr**	**2,081.0** kgs CO2e/yr
	36	**kgs CO2e / m2 yr**	
	7.33	**lbs CO2e/sqft-yr**	

Renewable Energy

Total Energy Generated on Site kwhr 5,233,781 kWhr per kWhr 0.62 **3,244,944** **lbs CO2 sequestered on site by renewable system**
Total kWhr/m2/yr: 41 kwhr/m2/yr

ZERO NET CARBON

The numbers below are for 2030 Architecture's definition of Zero Net Carbon

total energy used	13,754,183	kWhr
total renewable energy generated	5,233,781	kWhr
annual energy balance	8,520,402	kWhr
EUI	66	kWhr/m2 year
EUI	**21**	**kBtus/sq ft year**
TOTAL CARBON	5,282,649	**lbs CO2e / yr**
TOTAL CARBON	2,396,172	**kgs CO2e / yr**
CUI: CARBON USE INTENSITY	18.7	**kgs CO2e/m2-yr**
CUI: CARBON USE INTENSITY	3.8	**lbs CO2e /sf yr**

CARBON NEUTRAL

The numbers below are for carbon emissions after renewables and should be zero or better to be carbon neutral

6,871,084	**lbs CO2e-yr**	**3,116,137.9**	kgs CO2e/yr	emissions after renewables
3,116,669	**kgs CO2e-yr**	**1,413,455.2**	kgs CO2e/yr	emissions after renewables
3,117	**metric tonnes CO2e-yr**	**1,413.5**	kgs CO2e/yr	emissions after renewables
53.6	**kgs CO2e/m2-yr**	**24.3**	kgs CO2e/yr	emissions after renewables
11.0	**lbs CO2e /sf yr**			

Useful Information

For Site
Size of the lot sq ft
Area that is covered with vegetation
Number of trees planted

For Construction Material or Descri Area Sq Ft
Foundations and Footings
Columns and Beams
Intermediate Floors
Exterior Walls
Interior Walls
Windows
Roofs

For Energy
Electricity use per year
Gas Use per year
Electricity produced by renewables per year

For Water
Water use per year

For Waste
lbs of trash per year
percentage of trash that is recycled
if we have this by categories it would be even better: aluminum, plastic, glass, paper

Data

median life of a building in the USA is 73 yrs
20.32 lbs of waste = 1 lb of CO2e
california 0.33 kg CO2e per kWh
A mixed hardwood accumulates 0.01 t C (carbon) per year for 20 years

1 kilowatthour = 3,412 Btu

Burning Gas According to the EIA
Per million BTUs of Natural Gas 117 lbs of CO2
https://www.eia.gov/tools/faqs/faq.cfm?id=73&t=11

0	lbs of CO2 per BTU of Gas
0	lbs of CO2 per kBTU of Gas
0	lbs of CO2 per kWhr of Gas

another source

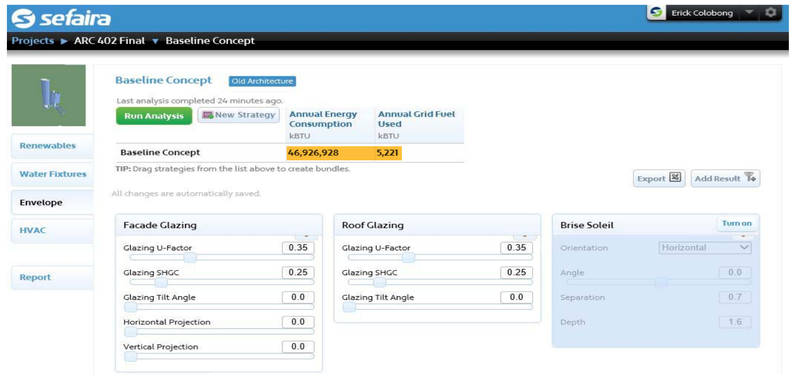
12	lbs per 100000 btus
0	lbs per btu
0	lbs per kbtu

This website provides equivalencies for calculations
https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

116.999 Pounds of CO2 per million Btu

GAS EIA
For gas it is: 0.42 lbs of CO2 per kWh or 11.93 lbs of CO2 per Therm
DEFRA For gas it is: 0.184070 kgCO2 per kWh
0.083492847

SEFAIRA - ANNUAL ENERGY CONSUMPTION



KOHLER - ESTIMATED WATER USAGE

Calculation Results	Your Building	US Average	LEED Baseline
Gallons per person per day:	2.0	6.3	4.7
Gallons per day:	2,144.0	6,700.0	5,038.4
Gallons per month:	65,214.0	203,793.9	153,253.0
Gallons per year:	782,560.0	2,445,500.0	1,839,016.0
% Reduction vs. average:	68.0%		
% Reduction vs. LEED Baseline:	57.4%		

PVWATTS - ESTIMATED GAINS FROM SOLAR

PVWatts® Calculator

NREL

My Location 90015 » Change Location | HELP | FEEDBACK | ALL NREL SOLAR TOOLS

RESOURCE DATA | SYSTEM INFO | RESULTS

Go to system info

RESULTS

Print Results

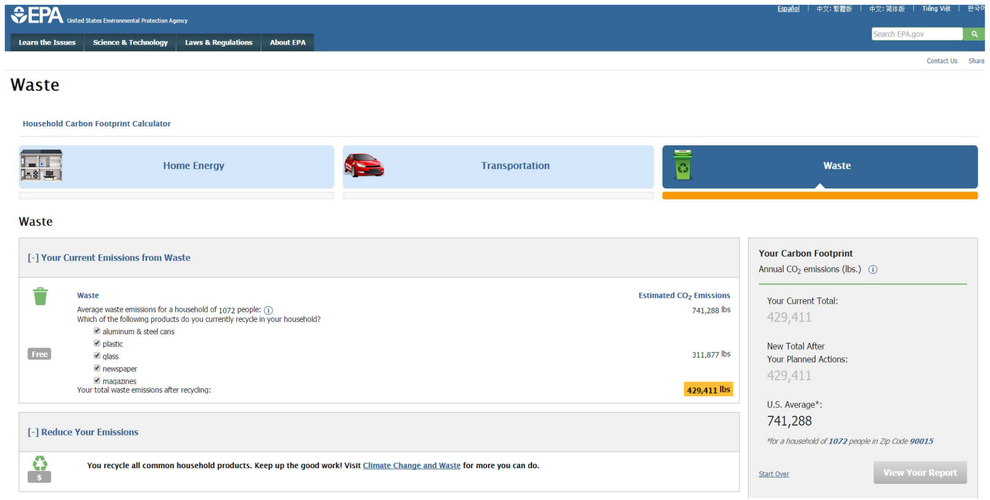
5,233,682 kWh per Year *

System output may range from 4,928,035 to 5,346,729 kWh per year near this location.

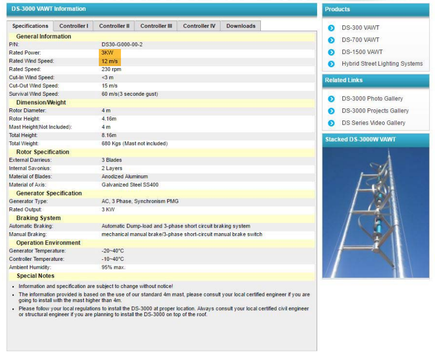
Click HERE for more information.

Month	Solar Radiation (kWh / m² / day)	AC Energy (kWh)	Energy Value ($)
January	5.97	356,328	46,430
February	5.98	325,942	42,470
March	7.11	429,724	55,993
April	9.19	537,886	70,087
May	8.11	490,222	63,876
June	8.74	505,331	65,845
July	9.34	552,518	71,993
August	9.10	537,948	70,095
September	7.35	420,034	54,730
October	5.88	351,573	45,810
November	6.39	364,801	47,534
December	6.07	361,375	47,087
Annual	7.44	5,233,682	$ 681,950

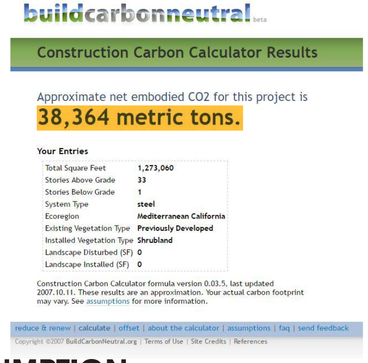
EPA - ESTIMATED CARBON EMISSIONS FROM WASTE



WIND TURBINE SPECS



CONSTRUCTION EMISSIONS



SEFAIRA - MONTHLY ENERGY CONSUMPTION