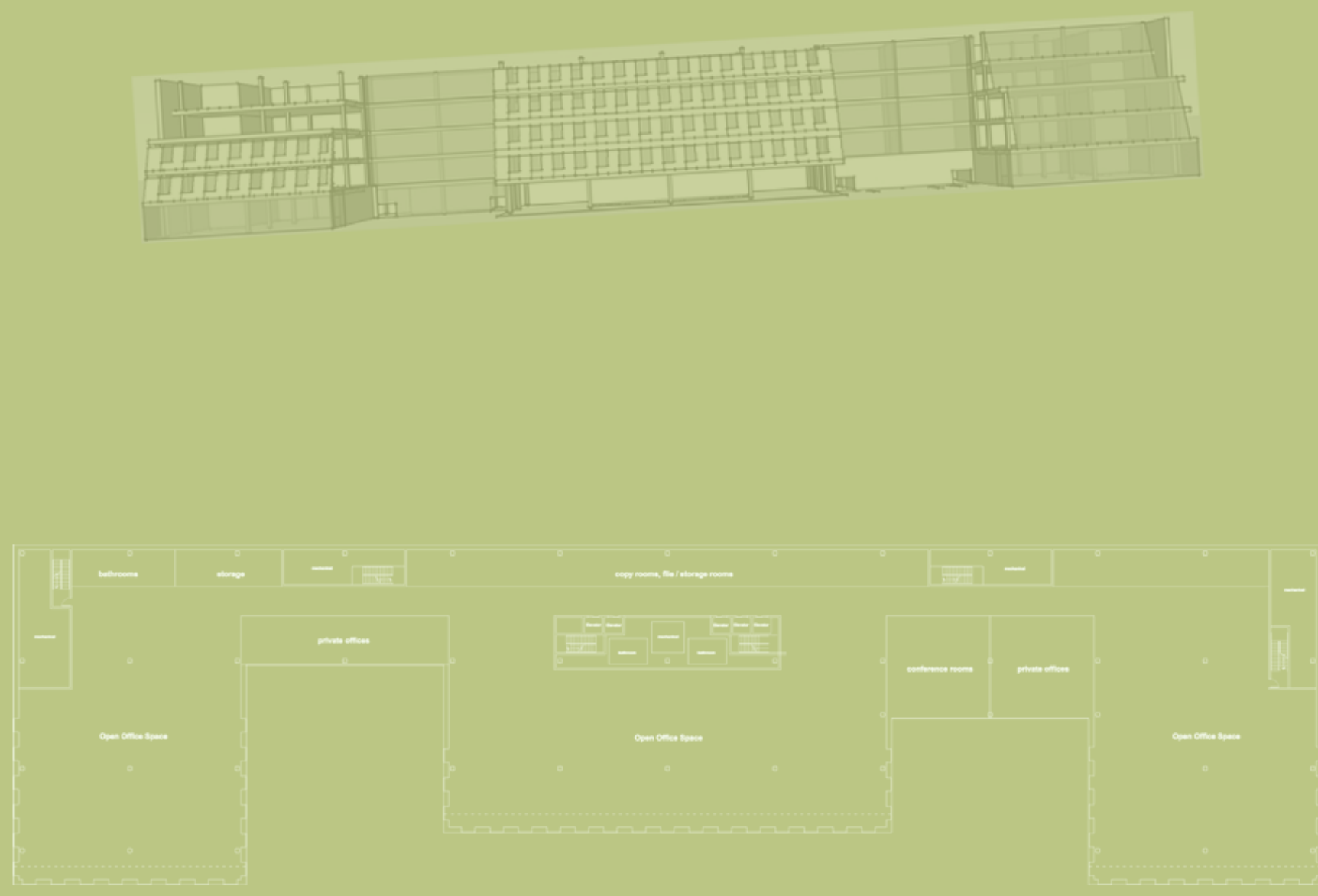
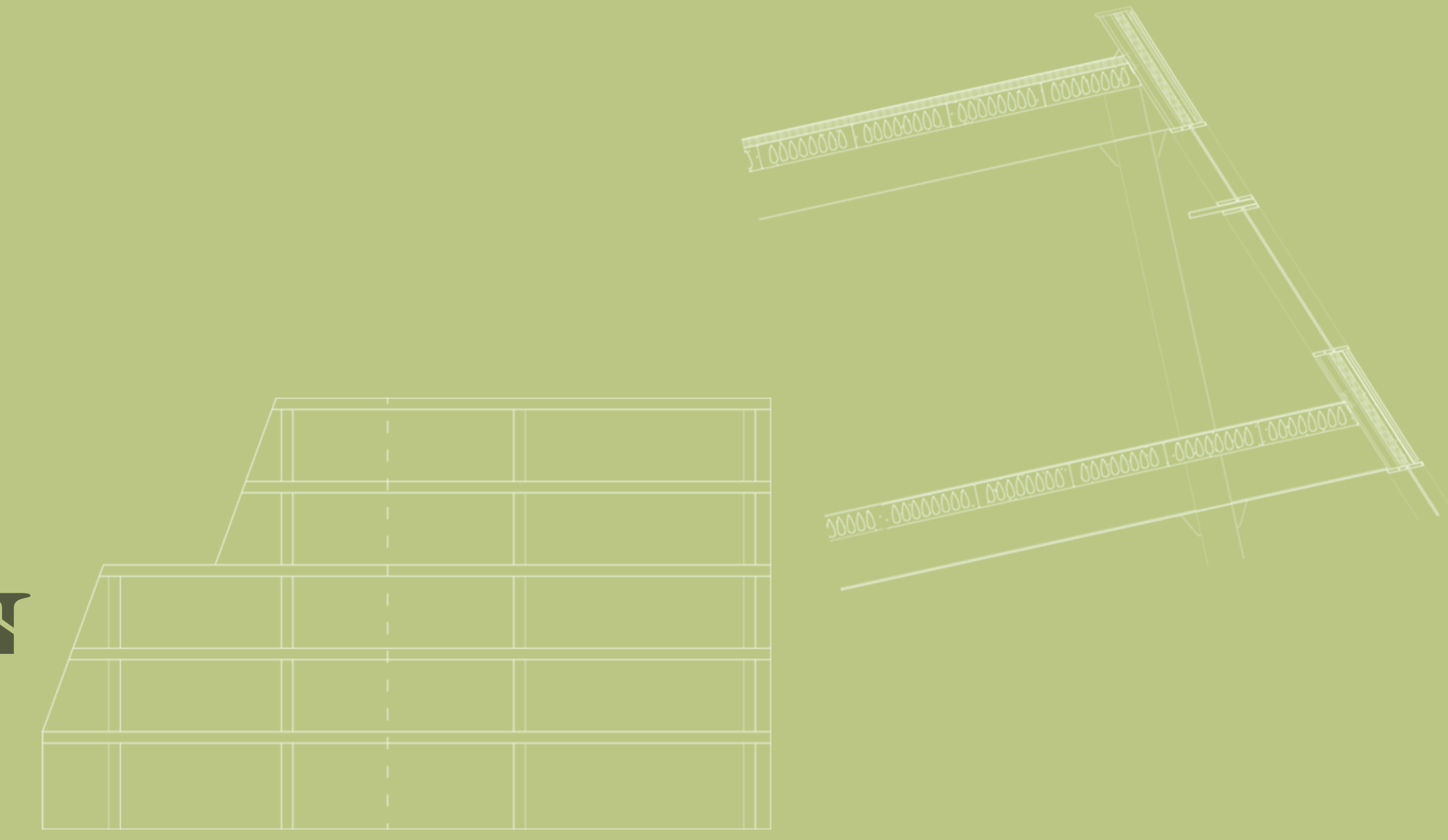




IPRO 335

GREEN BUILDING DESIGN CONCEPTS & INTEGRATION



WIND ENERGY

GOAL: PROVIDE 1/3 OF LIGHTING ENERGY FOR FIRST FLOOR
REQUIRED ENERGY: 42,840 KWH
TYPE: VERTICAL WIND TURBINES

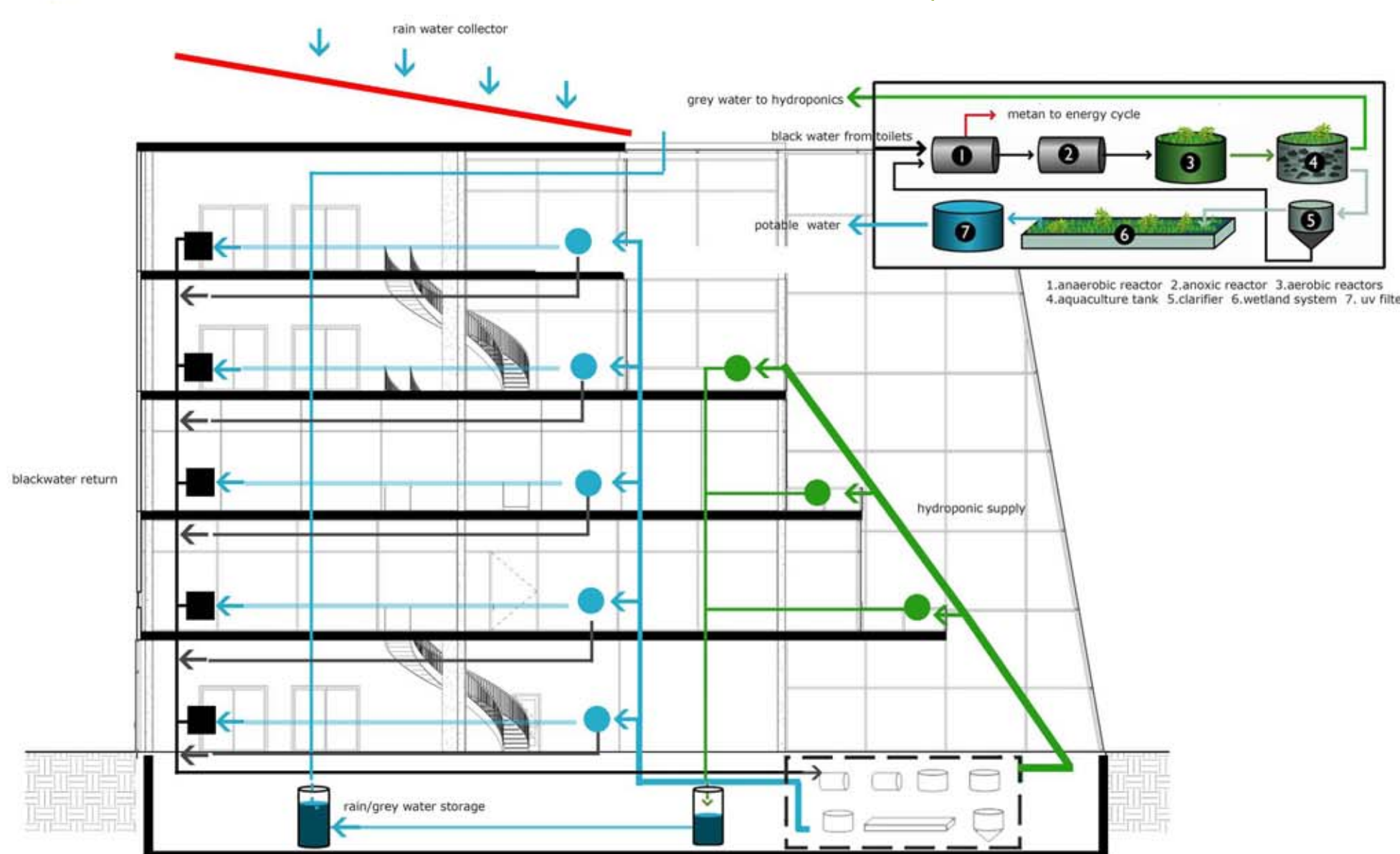
URBAN GREEN ENERGY 4Kw 2ND GENERATION



- COST: \$21,920 each
- ANNUAL PRODUCTION: 4000 kWh
- SIZE: 9' x 11', 700 lbs
- 11 UNITS REQUIRED
- BREAKEVEN POINT: 18 YEARS

RAINWATER HARVESTING

- CHICAGO AVERAGE PRECIPITATION: 38.01 in/year
- ROOF AREA: 37,000 SF
- RAIN WATER HARVESTING AREA: 18,700 SF
- TOTAL AMOUNT OF COLLECTED RAINWATER: 35,900 GAL/MONTH
- SAVING 430,800 GALLONS OF RAINWATER PER YR
- 11 - 3000 GALLON TANKS REQUIRED
- TOTAL CONSTRUCTION COST: \$12,122



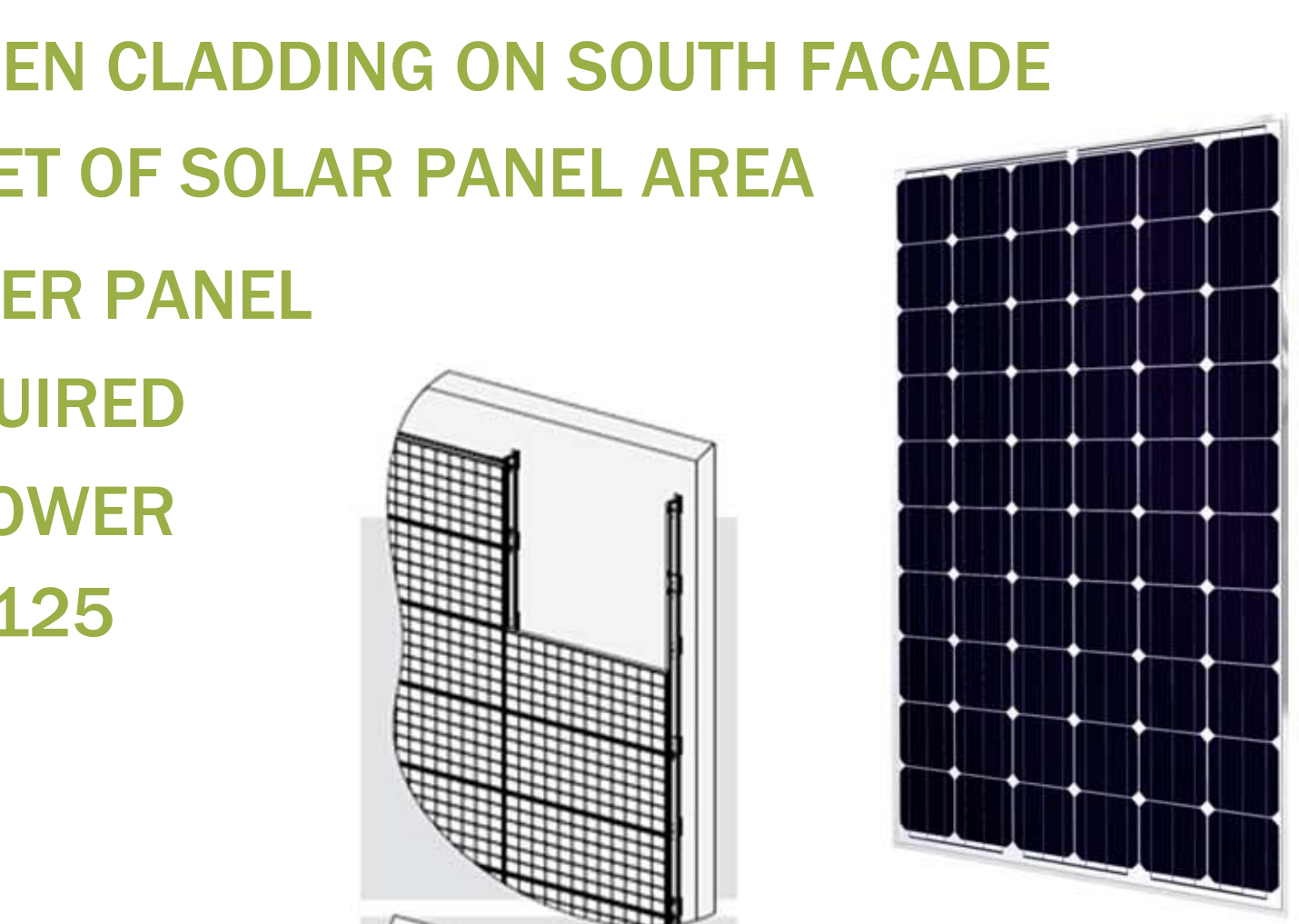
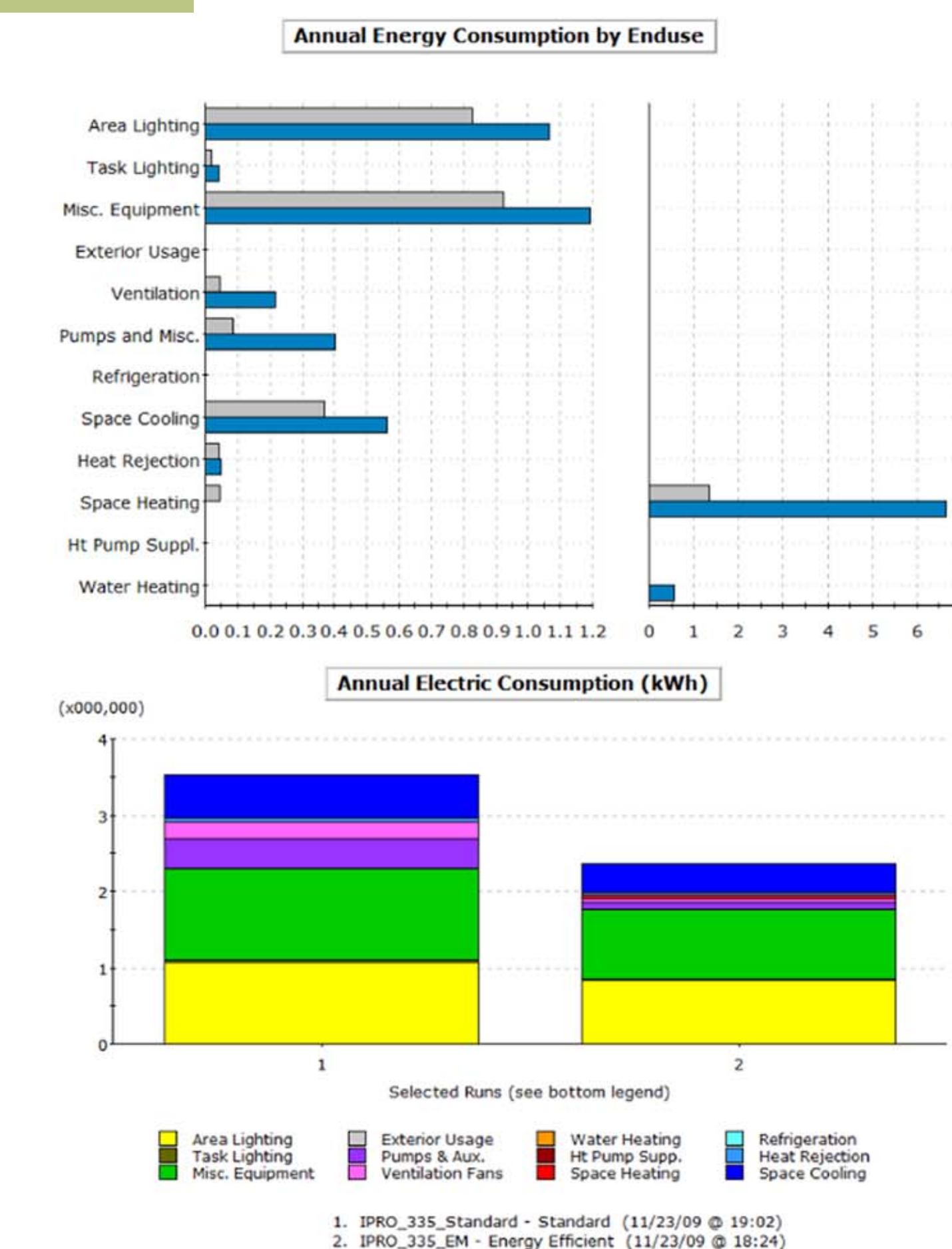
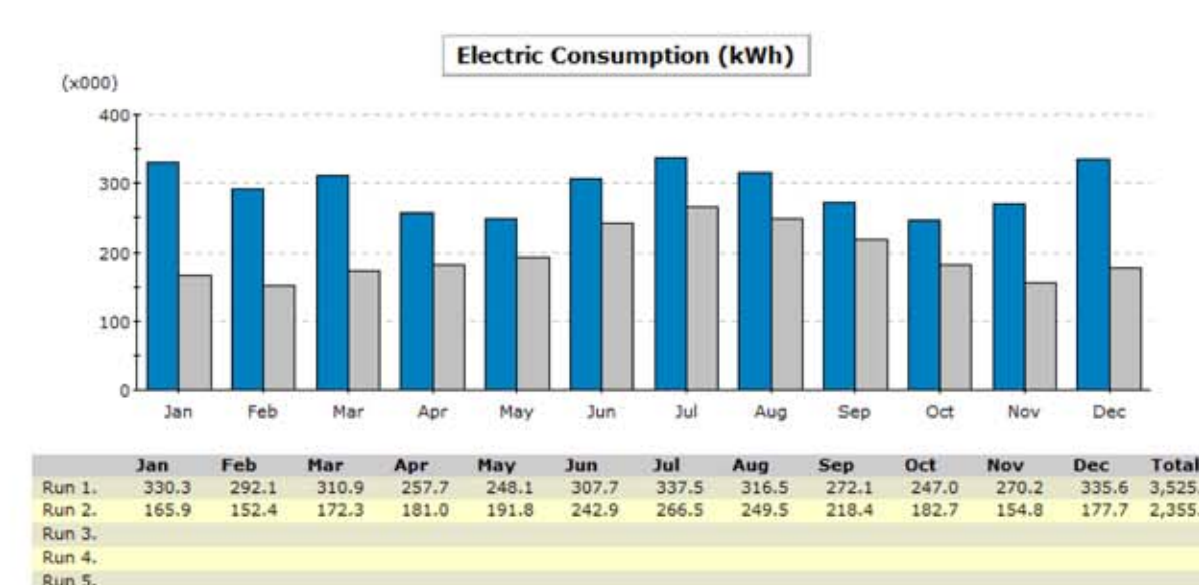
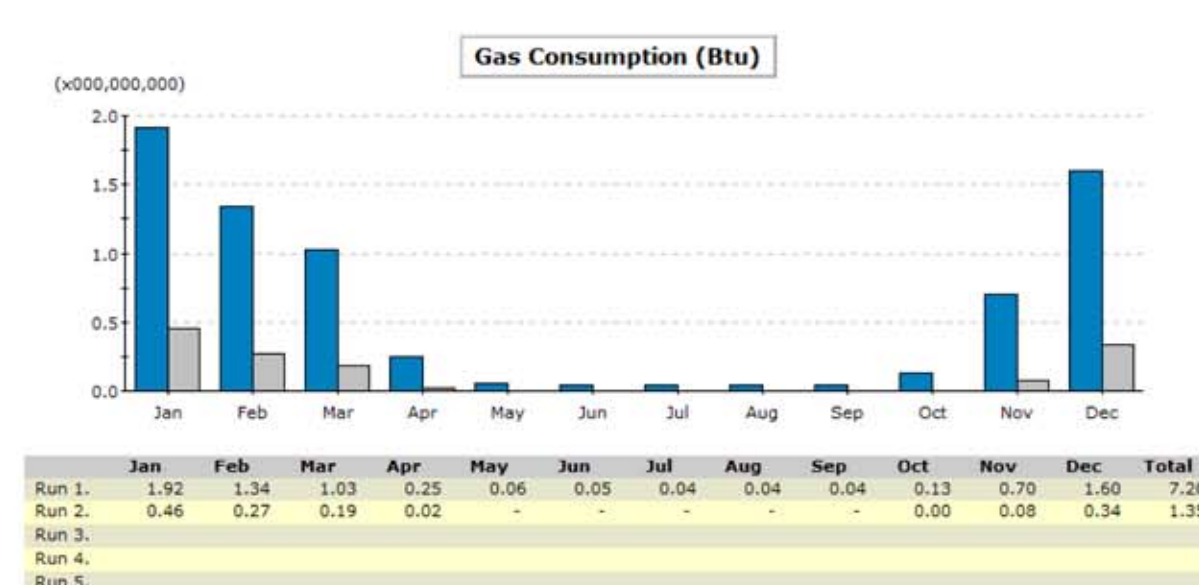
STRUCTURAL INFORMATION

- TRIBUTARY WIDTH= 40FT
- FOR TYPICAL BEAMS FLOORS 2-5, TOTAL SUPERIMPOSED LOAD= 50 + 112.1= 160 PSF
- TOTAL LOADING= 160 PSF* 40 FT = 6400 PLF = 6.4 KLF
- FROM SPANCRETE, SELECT INVERTED SPANCRETE T BEAM, 40" x 36"
- FOR 40' SPAN, MAX LOADING= 8.0 KLF
- FOR TYPICAL SLAB ON FLOORS 2-5, TOTAL SUPERIMPOSED LOAD= 52.1+50 = 102.1 PSF
- FROM SPANCRETE SITE, USE 12" STANDARD FLOOR SLAB, 1.5" STRAND COVER, NO STRUCTURAL TOPPING, SERIES: 1.5D 12712
- ALLOWABLE SUPERIMPOSED LOAD=106PSF
- DEAD LOAD WEIGHT OF SLAB= 86 PSF
- FOR FIRST FLOOR, USE SLAB ON GRADE, POURED ON SITE
- USE 24" X 24" COLUMNS FOR ALL COLUMNS, VARYING REINFORCEMENT.



ENERGY MODEL

- TYPICAL BUILDING ELECTRICAL USE: 3,525,743 kWh
- IPRO 335 BUILDING ELECTRICAL USE: 2,355,839 kWh
- TYPICAL BUILDING FUEL CONSUMPTION: 7,200.1 MBtu
- IPRO 335 BUILDING FUEL CONSUMPTION: 1,347.8 MBtu



GOAL: UTILIZE THE BUILDINGS SOUTH FACADE TO OFFSET ELECTRICAL CONSUMPTION
TYPE: PHOTOVOLTAIC PANELS

SolarWorld SW 230, 230 Watt Monocrystalline Solar Panel

- USED AS RAINSCREEN CLADDING ON SOUTH FACADE
- 20,265 SQUARE FEET OF SOLAR PANEL AREA
- 230 WATTS PEAK PER PANEL
- 1,125 PANELS REQUIRED
- 424,996 kWh OF POWER
- TOTAL COST: \$892,125

GEOTHERMAL ENERGY

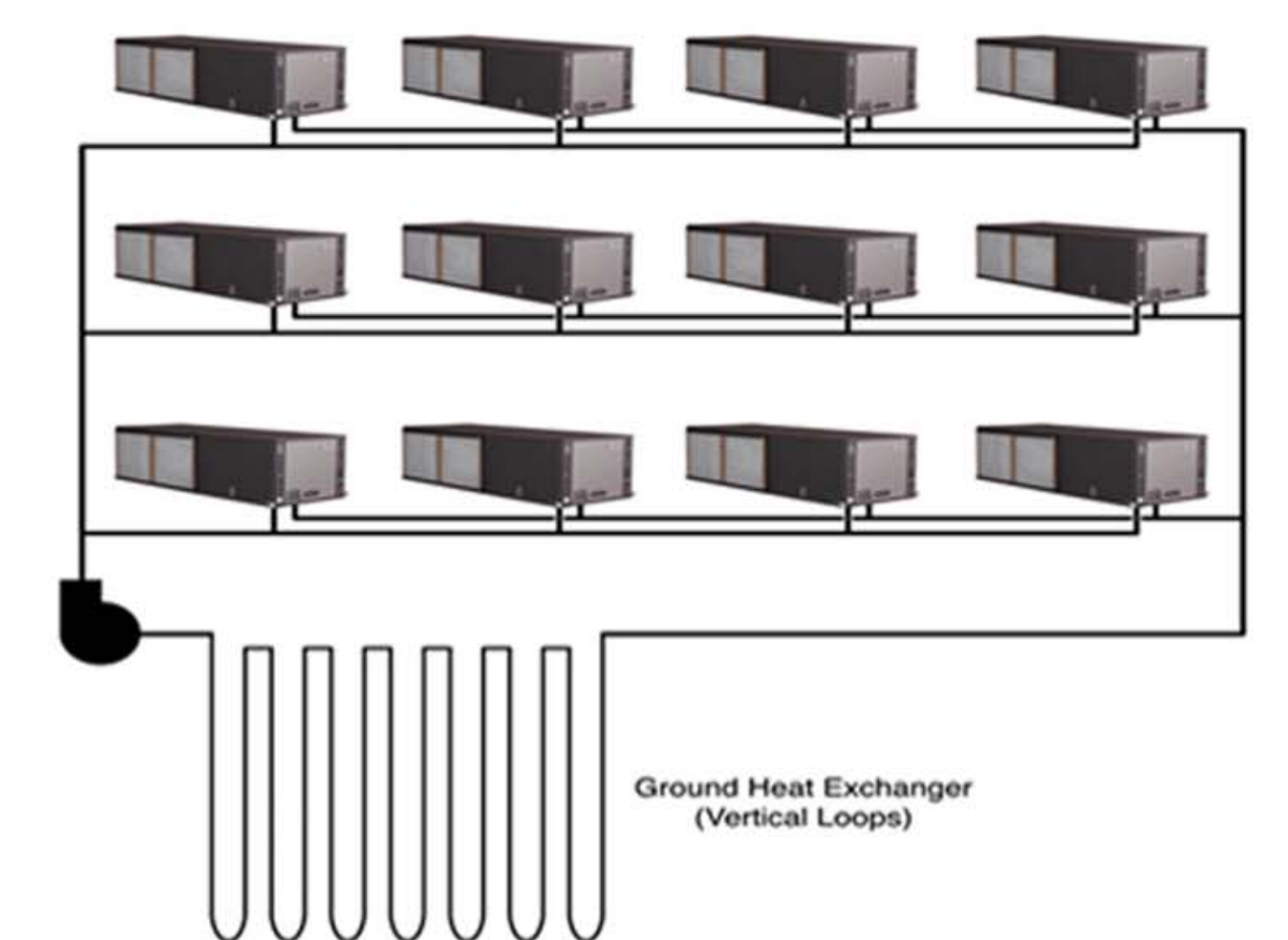
GOAL: UTILIZE EARTH'S ENERGY TO PROVIDE HEATING AND COOLING
TYPE: CLOSED LOOP VERTICAL SYSTEM

FLORDIA HEAT PUMP - ES SERIES R-410 A

- APPROXIMATELY 430 ton CAPACITY
- CENTRAL PUMPING SYSTEM WITH DECENTRALIZED HEAT PUMPS
- 75 UNITS REQUIRED
- 288 VERTICAL BOREHOLES @ 290' DEEP
- 1.25" POLYETHYLENE PIPES



Geothermal Costs (\$)			
Annual Costs (\$)	Geothermal	Air-cooled Chiller / Boiler	Savings
Total Power:	44,530.62	60,903.82	16,373.20
CO2 Emissions:	7,421.77	8,916.63	1,494.86
CO2 (tons):	296.2	356.7	59.8
Water:	0.00	0.00	0.00
Water (Gallons):	0.0	0.0	0.0
Maintenance:	22,500.00	168,750.00	146,250.00
Mechanical Room Lease:	0.00	750.00	-312.50
TOTAL:	75,514.89	239,320.45	163,805.56



LEED

- REQUIRED POINT TOTAL FOR LEED PLATINUM: 80+
- IPRO 335 BUILDING POINT TOTAL: 110
- IPRO 335 BUILDING LEED RATING: PLATINUM

IPRO 335

GREEN BUILDING DESIGN

CONCEPTS & INTEGRATION

PROJECT INFORMATION

BUILDING INFORMATION

- 5 Story Mixed Use Building
- 120' x 500' Building Footprint
- LEED Gold Certification
- Spancrete Stuctural Members
- Site: Corner of W. North Ave. & N. Kostner Chicago, IL 60639

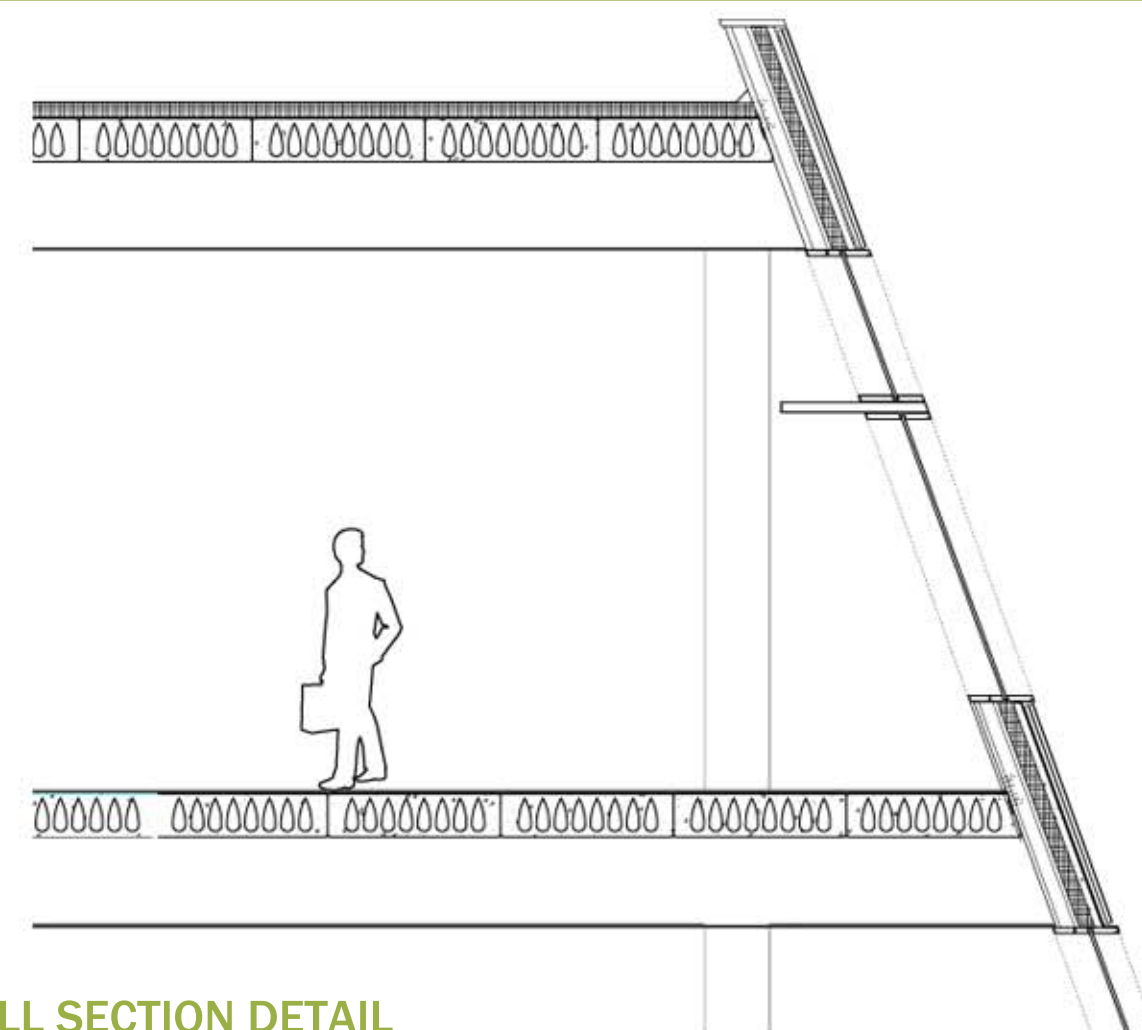
TEAM MEMBERS & ASSIGNMENTS

Team Members	Topic of Research
Ali Razeq & Eric Dexter	Geothermal Systems
Andrew Mey & Adrian Leon	Wind Turbines
Jacqueline Schaefer & Justine Banda	Solar Heat Collection
Kibum Kim & Hye Um	Reusing Rain and Brown Water
Jon Okunaga & Joshua Bergerson	Structural design
Jeffrey Burke and Robert Christo	Building Model (AutoCAD)
Aris Avanesian	Building Energy Model
Andrew Mey & Ali Razeq	LEED Checklist

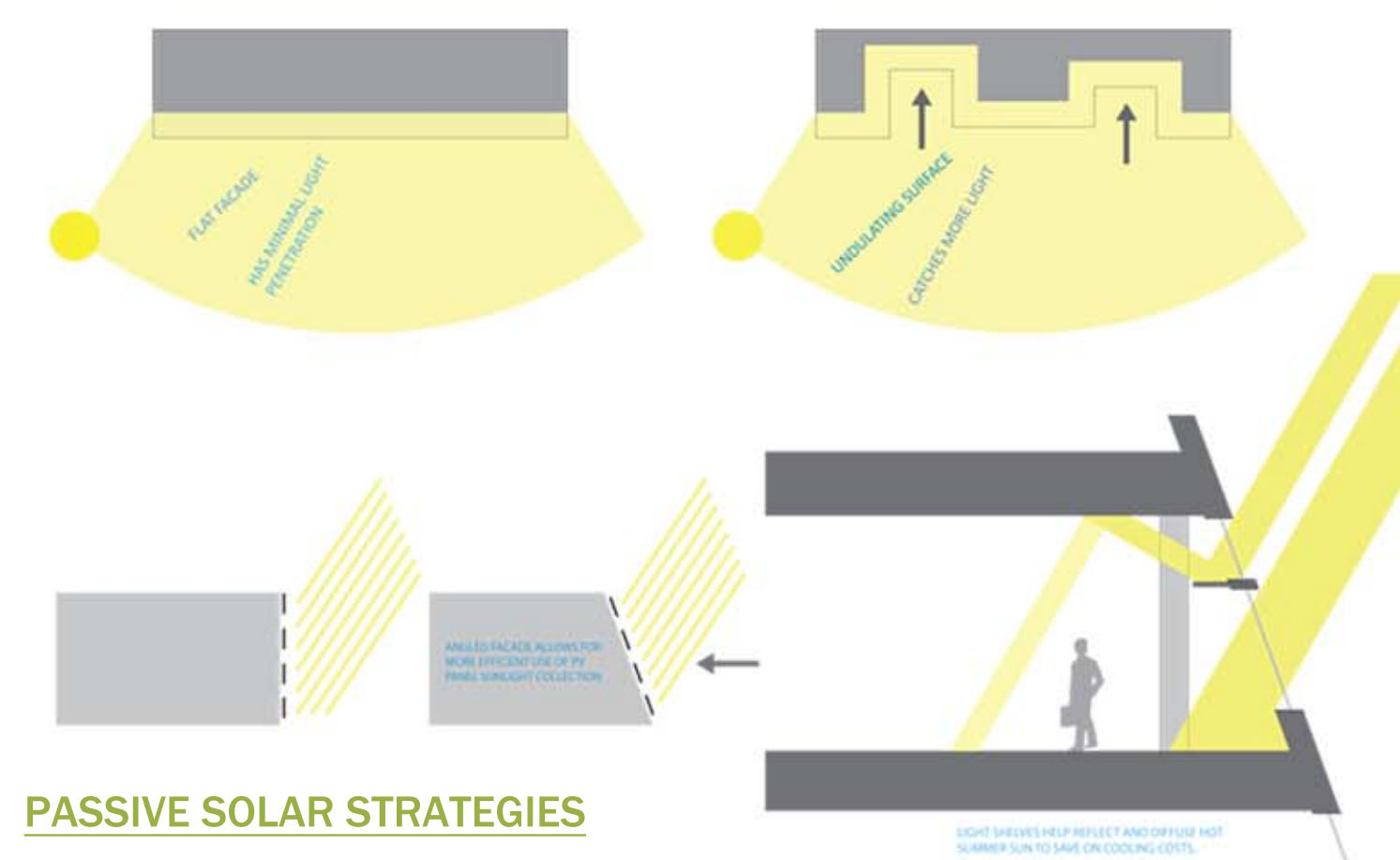
Architects
Eric Dexter
Adrian Thovar Leon
Jacqueline Schaefer (Head Architect)
Justine Banda
Kibum Kim
Hye Um
Jeffrey Burke
Robert Christo

Engineers
Aris Avanesian (Team Leader)
Andrew Mey
Jonathon Okunaga
Ali Razeq (Project Engineer)
Joshua Bergerson

ARCHITECTURAL DETAILS



WALL SECTION DETAIL



PASSIVE SOLAR STRATEGIES

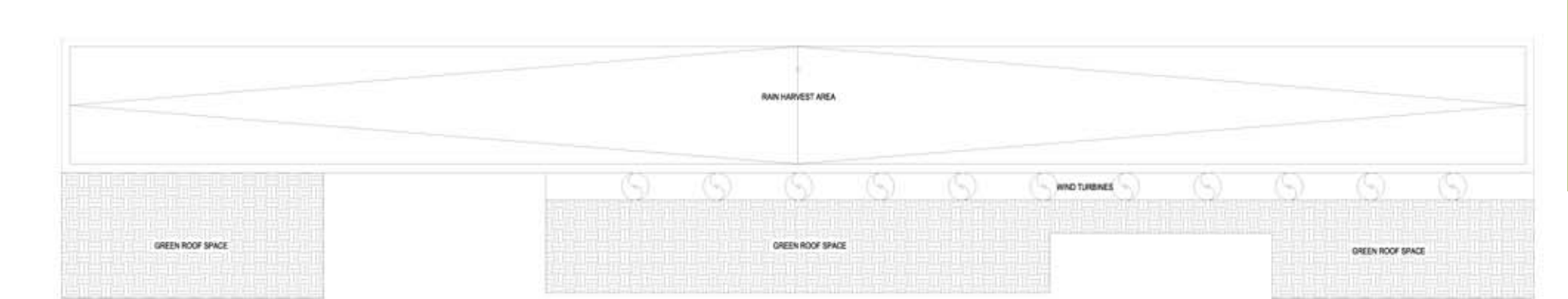
EXTERIOR VIEWS



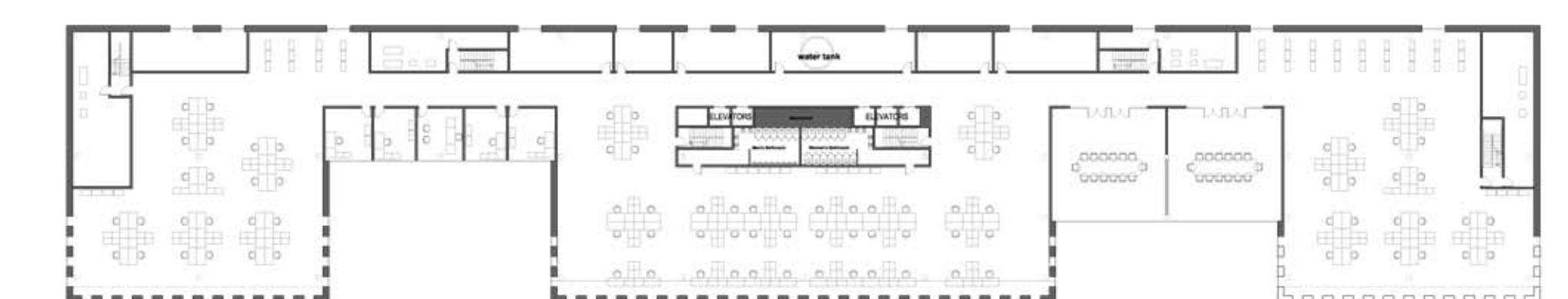
INTERIOR VIEWS



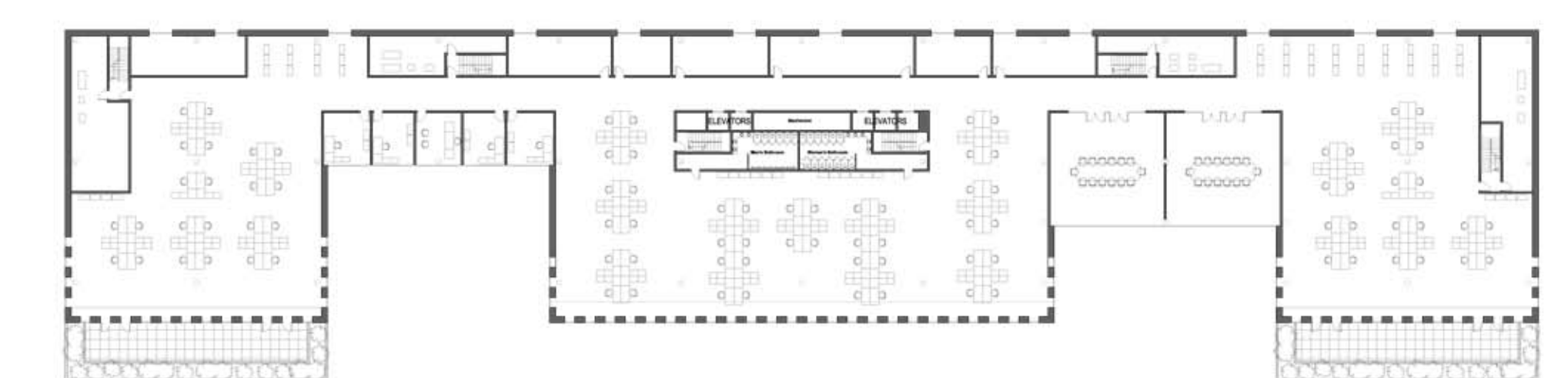
ARCHITECTURAL DRAWINGS



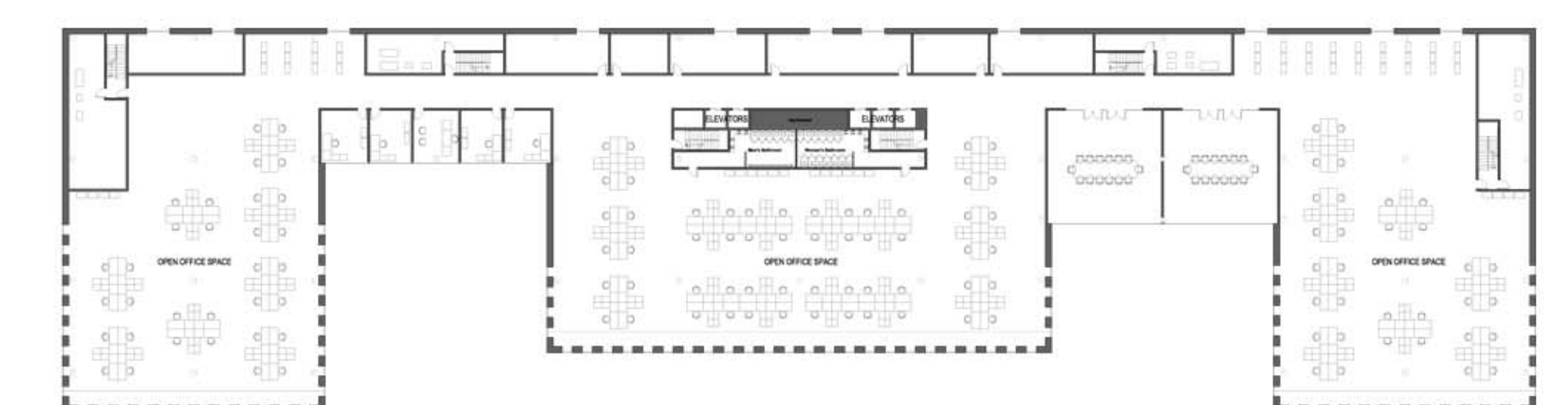
ROOF PLAN



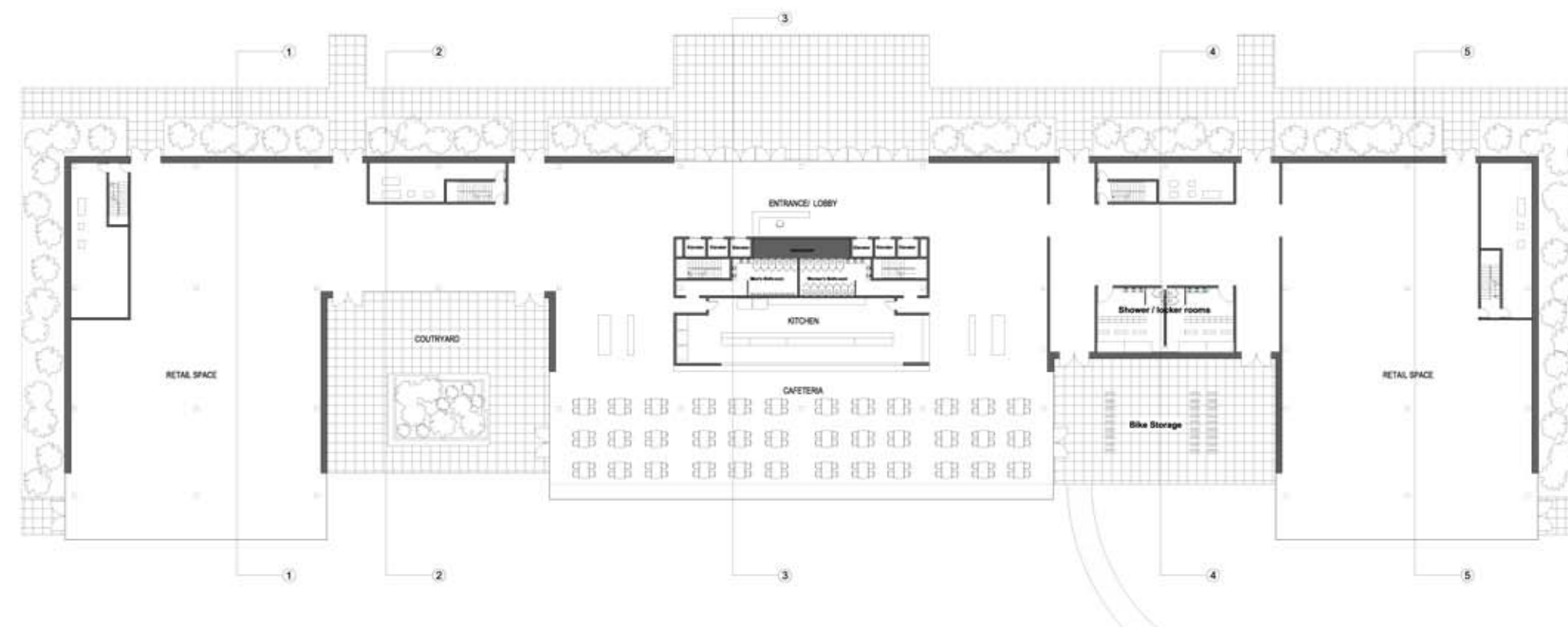
5th FLOOR PLAN



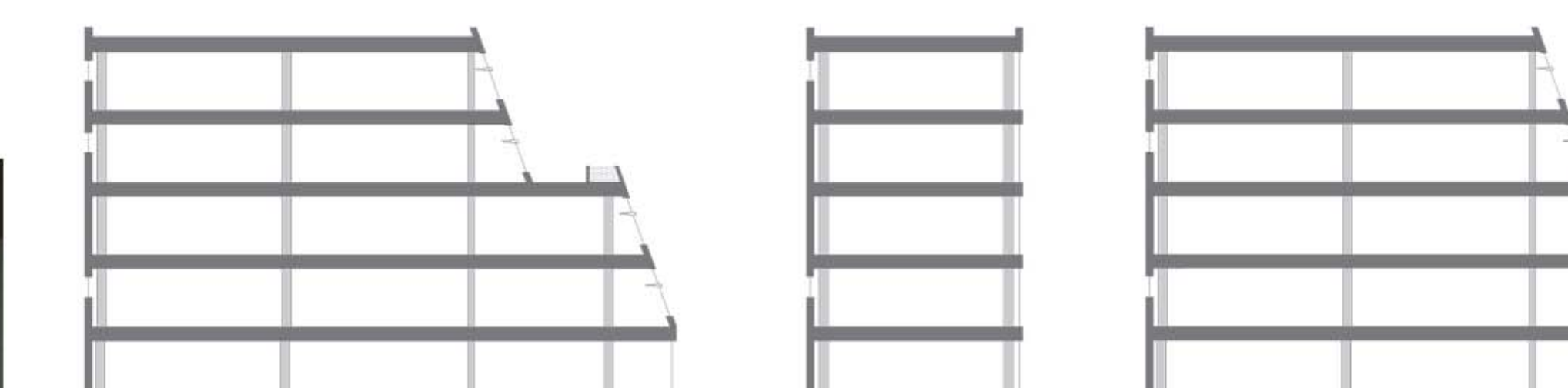
4th FLOOR PLAN



2nd & 3rd FLOOR PLANS



GROUND FLOOR PLAN



SECTION 1

SECTION 2

SECTION 3

SECTION 4

SECTION 5