SKY NET_KM^3

STRENGTH IS IN THE STRUCTURE

SKY NET

DIPLOMARBEIT

ZUR ERLANGUNG DES AKADEMISCHEN GRADES EINER DIPLOM-INGENIEURIN

STUDIENRICHTUNG: ARCHITEKTUR

IVANA MILOSEVIC

INSTITUT FÜR GEBÄUDE UND ENERGIE, TECHNISCHE UNIVERSITÄT GRAZ
ERZHERZOG-JOHANN-UNIVERSITÄT
FAKULTÄT FÜR ARCHITEKTUR

BETREUER: BRIAN CODY
INSTITUT: GEBÄUDE UND ENERGIE

ACKNOWLEDGEMENTS

2014

I WOULD LIKE TO EXPRESS MY APPRECIATION TO MANY PEOPLE FOR THEIR SELFLESS SUPPORT AND ENCOURAGEMENT, WHICH GAVE ME MENTAL STRENGTH AND MOTIVATION TO SUCCESSFULLY COMPLETE THIS WORK.
AT FIRST, I WANT TO THANK PROF. BRIAN CODY BSC (HONS) CENG MCIBSE, FOR HIS TIME, PATIENCE, AND UNDERSTANDING. HE SUPPORTED ME DURING MY THESIS AND GAVE ME THE UNIQUE OPPORTUNITY TO REALISE MY IDEAS.
I AM DEEPLY GRATEFUL TO HERR STADLER MICHAEL, DIPL.-ING. DIPL.-ING. DR.TECHN. WHO GENEROUSLY PROVIDED ASSISTANCE AND HELPED ME IN USING SIMULATION PROGRAMS.
I ALSO WANT TO THANK MAG. ARCH. DANIEL PODMIRSEG, WHO HAD MANY VALUABLE IDEAS AND SUGGESTIONS AND DORIS DAMM, WHO HAD ALWAYS RESPONSED ON MY REQUESTS.
I ALSO WANT TO EXPRESS MY THANKS TO ALL MY FRIENDS AND WORKING COLLEAGUES, WHO ALWAYS TOOK TIME FOR ENCOURAGING WORDS AND PROVIDED HELP WHEN IT WAS NEEDED.
LAST BUT BY NO MEANS LEAST, I LIKE TO THANK MY FAMILY, MUM AND SISTER FOR GENERAL EDUCATION, ONGOING SUPPORT AND THE OPPORTUNITY TO START AND PURSUE A CAREER IN ARCHITECTURE.
TO MY LOVELY BOYFREND, ARMIN, WHO ALWAYS FOUND A RIGHT WORDS IN A RIGHT TIME, AND DID NOT LET ME TO WEARY.

IT'S NOT THAT I AM SO SMART.
IT'S JUST THAT I STAY WITH PROBLEMS LONGER.
(ALBERT EINSTEIN)

SKYNET

DEDICATION: to my dad...

EIDESSTATLICHE ERKLÄRUNG

ICH ERKLÄRE AN EIDES STATT, DASS ICH DIE VORLIEGENDE ARBEIT SELBSTÄNDIG VERFASST, ANDERE ALS DIE ANGEGEBENEN QUELLEN / HILFSMITTEL NICHT BENUTZT, UND DIE DEN BENUTZTEN QUELLEN WÖRTLICH UND INHALTLICH ENTNOMMEN STELLEN ALS SOLCHE KENNTLICH GEMACHT HABE.

2014

GRAZ, AM

.....

.....

STATUTORY DECLARATION

I DECLARE THAT I HAVE AUTHORED THIS THESIS INDEPENDENTLY, THAT I HAVE NOT USED OTHER THAN THE DECLARED SOURCES / RESOURCES, AND THAT I HAVE EXPLICITLY MARKED ALL MATERIAL WHICH HAS BEEN QUOTED EITHER LITERALLY OR BY CONTENT FROM THE USED SOURCES.

GRAZ, DATE

.....

.....

SKYNET

OVERVIEW / CONTENT

THESIS
(IDEA)

INTENSE STUDY ABOUT ENERGY DESIGN, THAT CREATES A QUESTION ABOUT NEW ARCHITECTURE; A MEGA STRUCTURES THAT ARE SOLVING PROBLEMS AT THE SCALE OF MEGA REGION; CREATING INTERACTION IN BETWEEN.
NATURE AND FUTURE WORK TOGETHER

ANALYSIS

2014

ENERGY

SOLAR ENERGY

WIND ENERGY

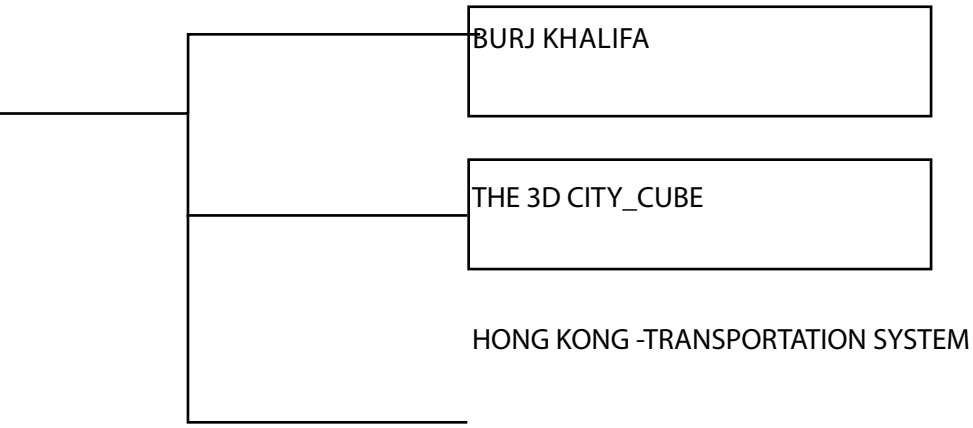
BIOMASS

PROJECT

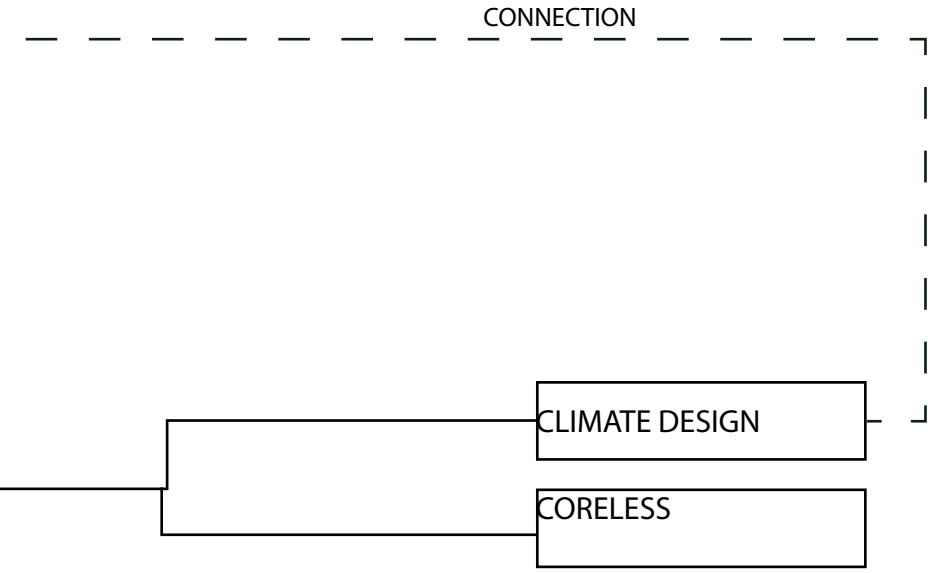
ARCHITECTURE

EXPERIMENTS

BUILDING DATA


BURJ KHALIFA
THE 3D CITY_CUBE
HONG KONG -TRANSPORTATION SYSTEM

SKY NET

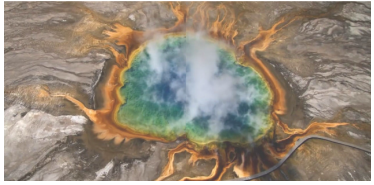

CONNECTION
CLIMATE DESIGN
CORELESS

2014

SKY NET

„MANKIND NEEDS TO DRASTICALLY IMPROVE THE ENERGY EFFICIENCY OF THE MAN-MADE SYSTEMS ON PLANET EARTH; NOT ONLY ON ACCOUNT OF GLOBAL WARMING, RAPIDLY DEPLETING ENERGY RESOURCES, AND EXPONENTIAL POPULATION GROWTH BUT ALSO DUE TO THE GEOPOLITICAL INSTABILITIES THAT ARISE FROM THE INSECURITY RELATING TO FUTURE ENERGY SUPPLY SOURCES. BUILDINGS ARE DIRECTLY RESPONSIBLE FOR ROUGHLY 50% OF THE WORLD'S PRIMARY ENERGY CONSUMPTION. TRANSPORT IS RESPONSIBLE FOR A FURTHER 25%. THE POTENTIAL CONTRIBUTION FOR SOLVING THE ENERGY PROBLEM TO BE FOUND IN ARCHITECTURE AND URBAN DESIGN IS THEREFORE ENORMOUS. THE CHALLENGES AND OPPORTUNITIES FOR BUILDING DESIGN PROFESSIONALS THAT THIS SITUATION OFFERS ARE UNPRECEDENTED. THE EMBRACEMENT OF ISSUES RELATING TO SUSTAINABILITY AND ENERGY EFFICIENCY IN ***ARCHITECTURE AND URBAN DESIGN*** *MUST BE SEEN AS A CHALLENGE, WHICH CAN LEAD TO NEW DESIGN QUALITIES. THE STARTING POINT FOR ENERGY EFFICIENCY IS IN URBAN DESIGN AND NOT IN A SOLITARY BUILDING. THE MOST ENERGY EFFICIENT BUILDING IN THE WORLD IS ABSOLUTELY INEFFECTIVE IF NOT INTEGRATED INTO AN ENERGY EFFICIENT URBAN STRUCTURE. OPTIMISING URBAN DENSITY MUST BE A KEY COMPONENT OF ANY FUTURE STRATEGY TO MAXIMISE ENERGY EFFICIENCY. THIS HAS ONLY PARTLY TO DO WITH THE REDUCTION OF TRANSPORT ENERGY. THE PRESENT USE OF LAND ITSELF IS NOT SUSTAINABLE. APART FROM THE ISSUE OF FOOD PRODUCTION, WE NEED TO REALISE THAT THE QUALITY OF A CITY OFTEN DEPENDS TO A LARGE EXTEND ON THE QUALITY OF THE SURROUNDING COUNTRYSIDE AND SO CITIES NEED TO BE CONCETRATED COMPACT PLACES OFFERING THE QUALITIES OF URBAN LIFE BUT WITH A CLEAR BOUNDARY BETWEEN URBAN SPACE AND SURROUNDING INTACT OPEN SPACE. SPACES WHICH ARE NEITHER CITY NOR COUNTRYSIDE - COMMONLY REFERRED TO AS SUBURBS - SHOULD BE KEPT TO A MINIMUM. „*

BRIAN CODY

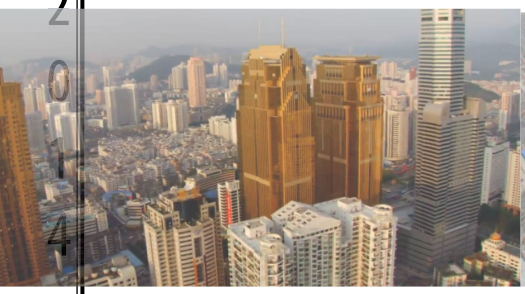



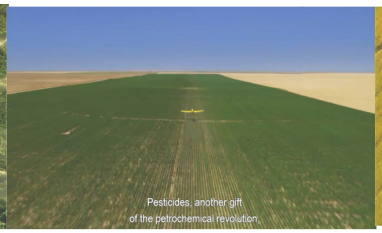


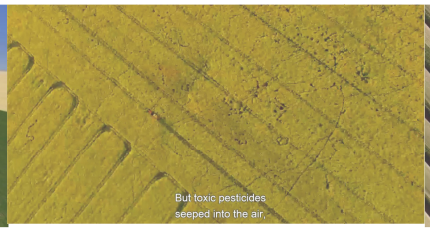






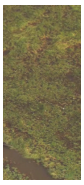



2014

INSPIRATION..

"WE ARE LIVING IN EXCEPTIONAL TIMES. SCIENTISTS TELL US THAT WE HAVE 10 YEARS TO CHANGE THE WAY WE LIVE, AVERT THE DEPLETION OF NATURAL RESOURCES AND THE CATASTROPHIC EVOLUTION OF THE EARTH'S CLIMATE.
HOME HAS BEEN MADE FOR YOU SHARE IT! AND ACT FOR THE PLANET"
HOME (2009 FILM) BY YANN ARTHUS-BERTRAND



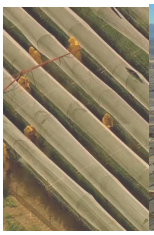














I FOUND INSPIRATION IN A DOCUMENTARY FILM, SHOWING THE IMPACT OF HUMANKIND, AS THE DOMINANT ALPHA SPECIES ON OUR EARTH AND HOW THEIR ACTIONS THREATENING THE ECOLOGICAL BALANCE OF THE PLANET THROUGHOUT OUR HISTORY.
I REALIZED THAT ALL WE NEED IS SPACE AND SOLUTIONS TO CONQUER AND OVERCOME THE DIFFERENCES BETWEEN OUR NEEDS AND ABILITIES OF THE WHOLE POPULATION

SKY NET

ABSTRACT

2014

THE PROJECT IS A HYPER DENSE VERTICAL NETWORK OF INDIVIDUAL TOWERS, EACH WITH DIVERSE PURPOSE, INTERCONNECTING AT DIFFERENT HEIGHTS IN A SERIES OF NODES CHARACTERIZED BY SPECIAL PUBLIC AND SEMI-PUBLIC PROGRAMS. THE BASELINE STRUCTURE IS OPEN AND ANTI-HIERARCHICAL. THE VERTICAL URBANISM OPERATES SIMULTANEOUSLY AT DIFFERENT LEVELS, ALLOWING MULTIPLE COMMUNICATIONS BETWEEN PARTS AND CROSSBREEDING OF FUNCTIONS AND ACTIVITIES. I DESIGNED A HYPOTHETICAL VERTICAL DENSE CITY, ACCESSING THE IDEA OF UTOPIA AND LOOKING AT IT IN A NEW SCALE AND NEW DIMENSIONS. I WAS LOOKING FOR A COMPREHENSIVE STRATEGY WHICH INCLUDES CLIMATE CHARACTERISTICS ON URBAN PLANNING AND DESIGNING. IN ADDITION A VERTICAL CITY IS RESTING UPON ARCHITECTURE AND DESIGN, BUT ALSO URBAN PLANNING SHOULD BE FUNDAMENTALLY TAKEN INTO ACCOUNT. IN MY THESIS BUILDINGS ARE MAJOR STRUCTURAL ELEMENTS SHAPING THE WHOLE CITY AREA AND ENCOURAGE DIRECT INTERACTIONS BETWEEN AND WITHIN THE BUILDING AND THE RESIDUAL CITY SYSTEM:
MY ARCHITECTURAL IDEOLOGY IS TO CREATE A SUSTAINABLE PLACE WHERE WE CAN FIND EVERYTHING WHAT COVERS OUR BELONGINGS, WHERE WE GATHER AND COLLECT ALL AVAILABLE RESOURCES IN ORDER TO CREATE AN ENERGY INDEPENDENT CITY. THIS OVERLAP OF VERTICAL ARCHITECTURE AND URBAN DESIGN CREATED A SYSTEM AS A NEW KIND OF SPATIAL AND FUNCTIONAL RELATIONSHIPS BETWEEN TALL, HABITABLE BUILDINGS AND THE VOIDS BETWEEN THEM. THIS RESULTS IN HIGH QUALITY LIVING, WORKING AND RECREATION SPACE. THIS PROJECT IS ALL ABOUT THE CITY FOR THE FUTURE, AND HOW WE WILL LIVE IN OUR UPCOMING REALITY.

KEYWORDS

OVERALL**SUSTAINABILITY**

IMPLEMENTATION

CREATIVITY

GROUNDBREAKING

GREEN**ENERGY**

SKY NET

HYPOTHESE:

OUR **CITIES** *CAN* BE ***ENERGY*** INDEPENDENT

CITIES GONNA ***CONQUER*** THE **WORLD**

RESEARCH

ANALYSES OF YET PUBLISHED CONCEPTS SHOWED THAT FUTURE CONCEPTS MUST PREDICT THE ESTIMATED POPULATION OF THE CITY, AND HOW MUCH SPACE WILL BE NEEDED;
IT SHOULD BE ALSO TAKEN INTO ACCOUNT THAT THE CITY IN TOTAL OR PARTIALLY CAN GROW AND SPREAD. SMART SOLUTIONS AND ACCESS MODULES OVERCOME THIS PERSPECTIVES.
ANOTHER IMPORTANT CHALLENGE IN CITY PLANNING IS THE DEVELOPMENT OF AN EFFICIENT TRANSPORT NETWORK. SUSTAINABLE PUBLIC TRANSPORT SYSTEMS NEED TO BE CONVENIENT, EASY ACCESSIBLE WITH A HIGH COVERAGE.

SITE SELECTION

2014

I WAS DOING EXTENSIVE REASEARCH ABOUT THE GLOBAL SITUATION ON OUR PLANET EARTH. REDUNDANT FACTS SHOWED TRENDS THAT THOSE CITIES WHOSE POPULATION LIVES IN POVERTY AND SQUALOR, ARE EXPECTED TO BECOME A MULTI-MILLION CITIES WITHIN COUPLE OF YEARS.
THIS FACT WAS FOR ME FIRST CRITERION FOR SHORTLISTING SITES (LOCATIONS) ON THE PLANET EARTH.

THE SECOND CRITERION WAS THE AVAILABILITY AND POSSIBLE UTILIZATION OF NATURAL ENERGY RESOURCES .
THE TROPICAL CLIMATE ZONE IN PARTICULAR ARE MORE THAN AVERAGE THREATENED BY GLOBAL WARMING BUT ALSO HAVE A HIGH POTENTIAL TO UTILIZE SOLAR ENERGY:

DESIGN SOLUTIONS

IN ARCHITECTURE UNNEEDED SPACE IS ALWAYS A PROBLEM.
THE BUILDINGS ARE SUPPORTING STRUCTURES FOR THE CITY. THE TRANSPORTATION NETWORK CONTRIBUTES TO A OVERALL INCREASED STABILITY. THIS INTERCONNECTIONS OF BOTH BASIC STRUCTURES, CREATES FREE SPACES AND MODULES FOR INSTALLMENTS OF SYSTEMS, WHICH CAN COLLECT AND UTILIZE NATURAL RESOURCES FOR ENERGY PRODUCTION,. HERE I WANT TO CREATE NEW PERSPECTIVES TO USE FREE SPACE WITH A HIGH DEGREE OF FLEXIBILITY.

FACTS

PROBLEMS THAT ACCOMPANY MODERN CITIES / SOCIETY

CLIMATE **CHANGE**

TOTAL*ENERGY* ***CONSUMPTION***

POPULATION **GROWTH**

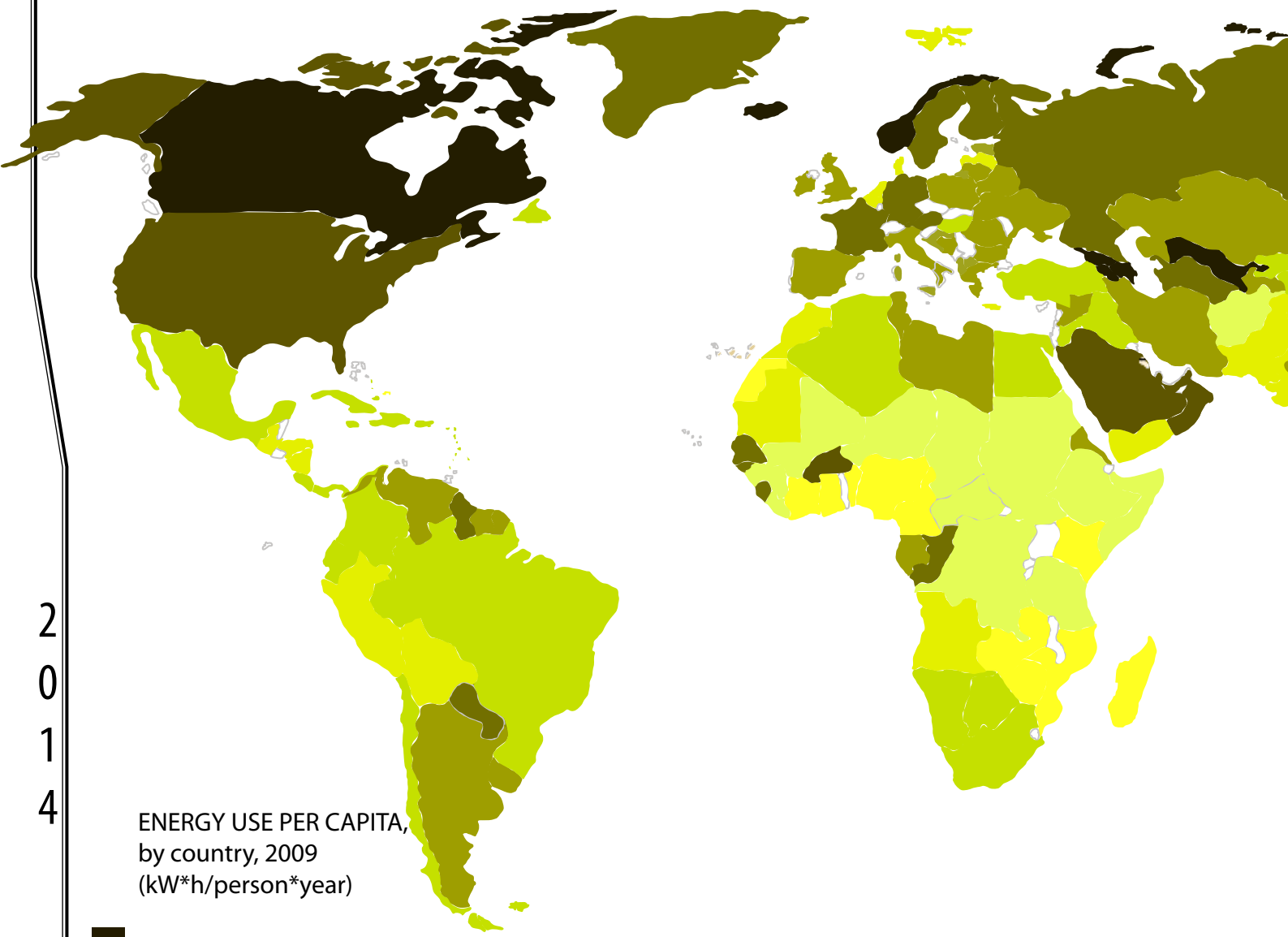
URBAN POPULATION

SLUMS

SKY

NET

2014



ENERGY USE PER CAPITA,
by country, 2009
(kW*h/person*year)

- more than 117 200
- 73 270 - 116 900
- 43 960 - 72 970
- 21 980 - 43 670
- 7 327 - 21 690
- 2 931 - 7 034
- 1 465 - 2 638
- less than 1 465

TOTAL ENERGY CONSUMPTION

THE WORLD ENERGY CONSUMPTION COMPRISES THE TOTAL AMOUNT OF ENERGY.SPENT BY HUMAN CIVILIZATION. *HTTP://EN.WIKIPEDIA.ORG/WIKI/WORLD_ENERGY_CONSUMPTION 10.10.2012*

EVERY YEAR, 10,962,318,212.9 CUBIC METERS OF OUR TOTAL ENERGY CONSUMPTION COME FROM EXHAUSTIBLE RESOURCES. THAT is 88%, MEANING ONLY 12% COMES FROM RENEWABLE RESOURCES, (1)
OF ALL THAT ENERGY 48, 7% IS CONSUMED BY THE BUILDING SECTOR, AND THE OTHER 2 QUARTERS ARE USED BY INDUSTRY (23.2%) AND TRANSPORTATION (28.1%) (2)
IF WE (HUMANITY) CONTINUE AT OUR CURRENT ENERGY DEMAND GROWTH RATE OF 2.6%, WE WILL NEED ANOTHER1, 125,409,094,100 CUBIC Meters OIL IN TOTAL ENERGY BY 2050(1)

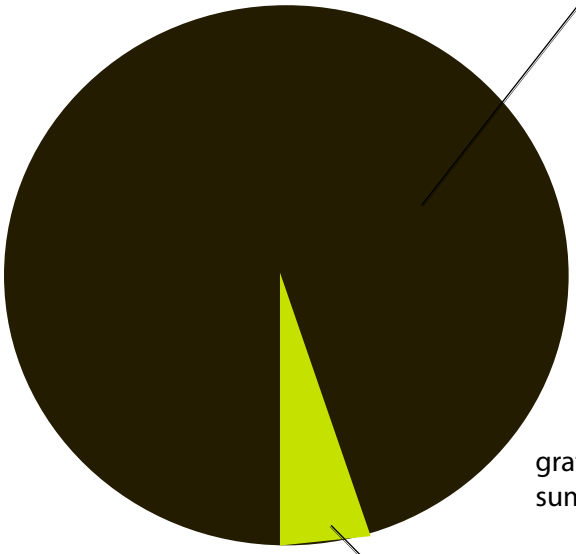
THE U.S. ENERGY INFORMATION ADMINISTRATION (EIA) NOW REPORTS THAT, IN COMING YEARS, BUILDING SECTOR ENERGY CONSUMPTION WILL GROW FASTER THAN THAT OF INDUSTRY AND TRANSPORTATION

SHOULD WE CONTINUE WITH OUR PROFILGATE HABITS OR SHOULD WE START CHANGING?!

HTTP://WWW.ENERGYANDCAPITAL.COM/ARTICLES/FUTURE-SOURCES-ENERGY/787 (1)

HTTP://ARCHITECTURE2030.ORG/THE_PROBLEM/PROBLEM_ENERGY (2)

SKYNET

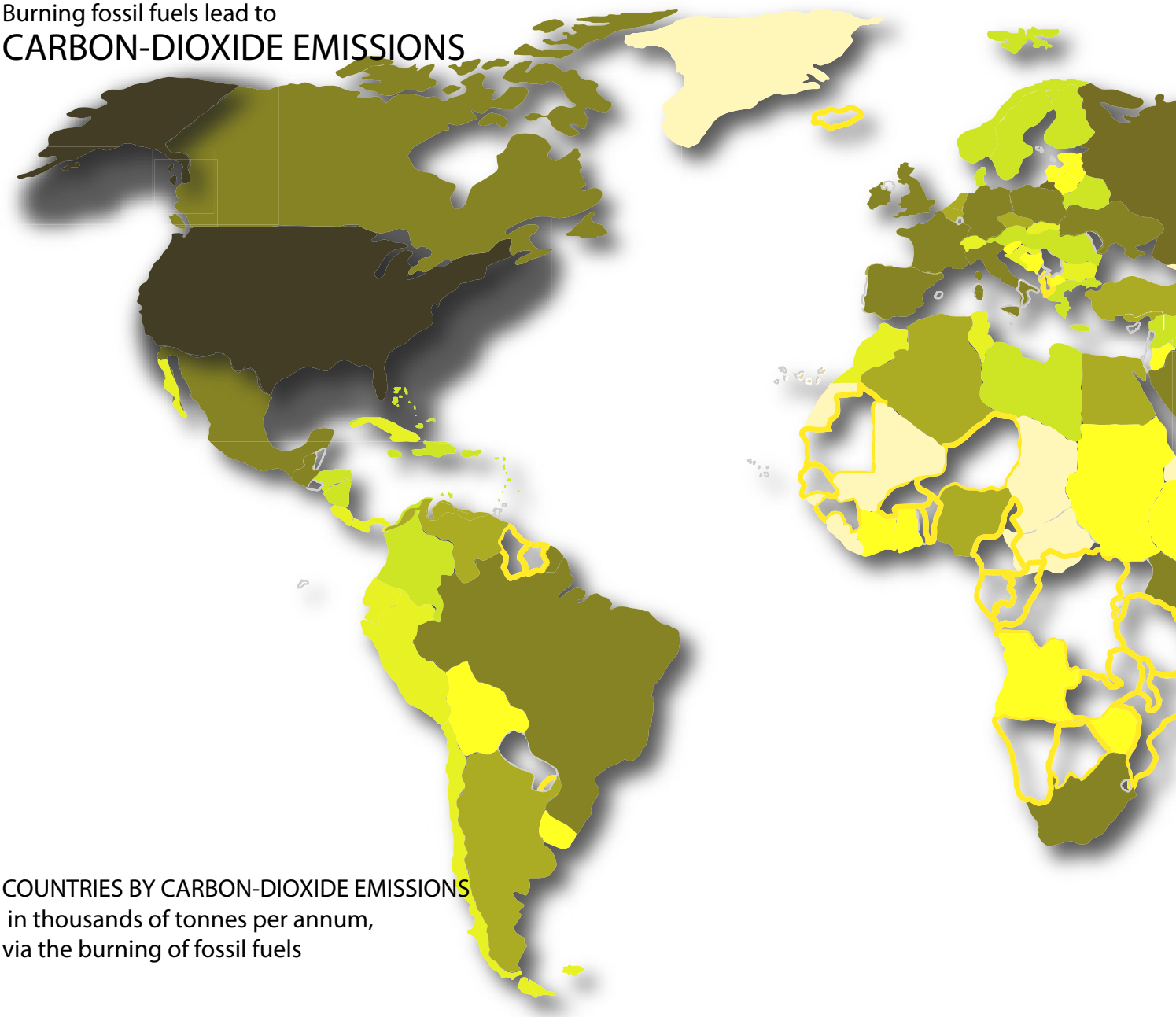


grafic shows that every year 88% of our total energy consumption comes from exhaustible resources.

Burning fossil fuels lead to

CARBON-DIOXIDE EMISSIONS

2014

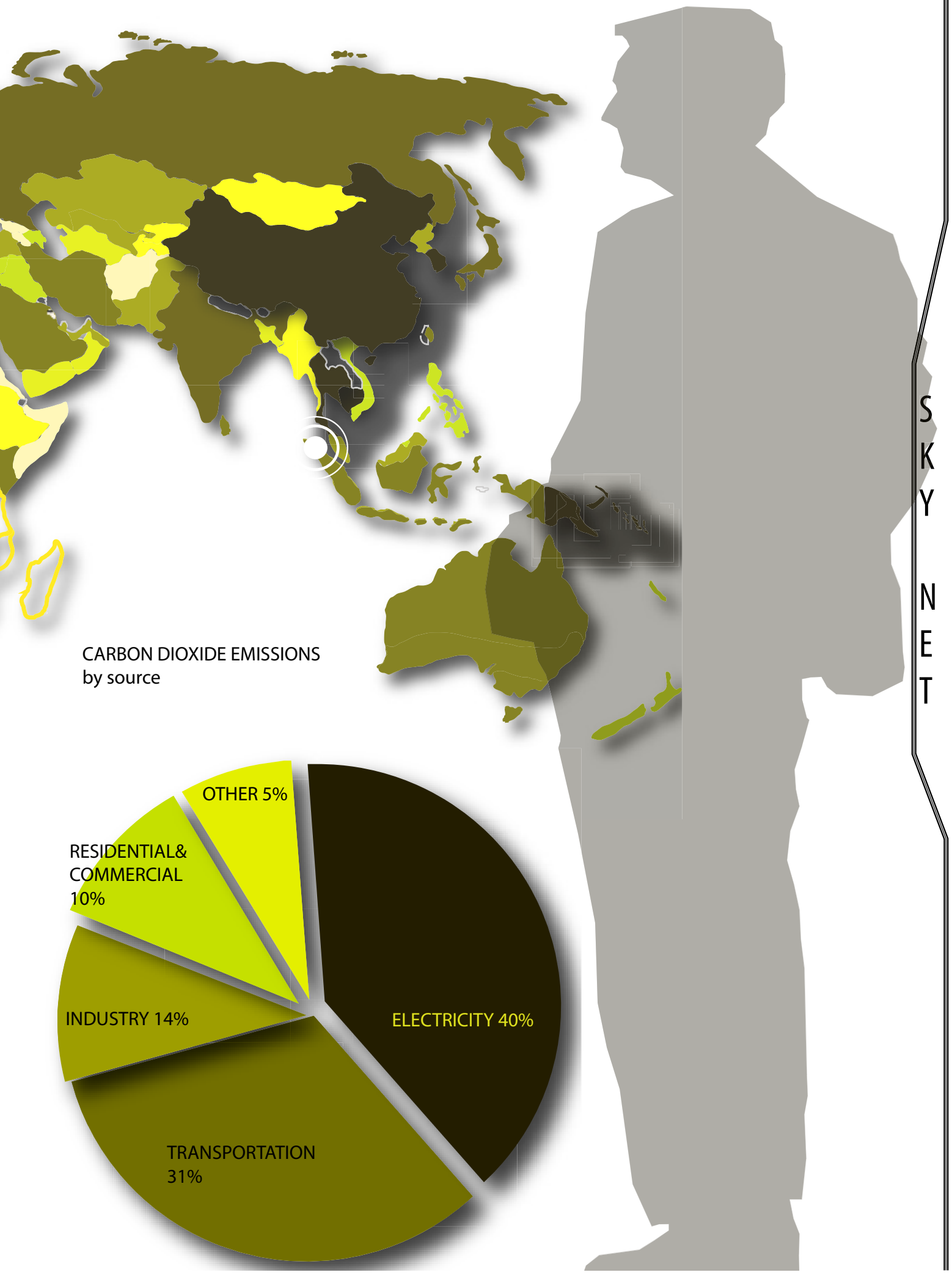


COUNTRIES BY CARBON-DIOXIDE EMISSIONS
in thousands of tonnes per annum,
via the burning of fossil fuels

- 5 000 000+
- 1 000 000 - 5 000 000
- 300 000 - 1 000 000
- 100 000 - 300 000
- 50 000 - 100 000
- 20 000 - 50 000
- 5 000 - 20 000
- 1000 - 5000
- 0 -1 000

THE BURNING OF FOSSIL FUELS TO GENERATE ENERGY RESULTS IN THE PRODUCTION OF CARBON DIOXIDE AND OTHER GREENHOUSE GASES THAT ARE NOW FUELING DANGEROUS CLIMATE CHANGE. THE EXTENSIVE EMISSION OF GREENHOUSE GASES BECAME A MAJOR THREAT TO HUMANITY. THE IMPACT OF CARBON-DIOXIDE EMISSION ON OUR EARTH WAS DISCOVERED IN THE 19TH CENTURY:
IN 1824 JOSEPH FOURIER DESCRIBED IN 1824 ALREADY THE PHENOMEN; THE CARBON DIOXIDE GASES IN THE ATMOSPHERE ABSORB PARTICULAR FRAGMENTS OF SUNLIGHT ENERGY AND, IN DOING SO, HEAT THE PLANET. WITH OTHER WORDS, BURNING FOSSIL FUELS LEADS TO OZONE DEPLETION AND INCREASE THE WORLD AVERAGE TEMPERATURE RAPIDLY.

HTTP://GREEN.BLOGS.NYTIMES.COM/2012/10/23/FOOD-AND-CLIMATE-A-NEW-WARNING/#MORE-149927



CARBON DIOXIDE EMISSIONS
by source

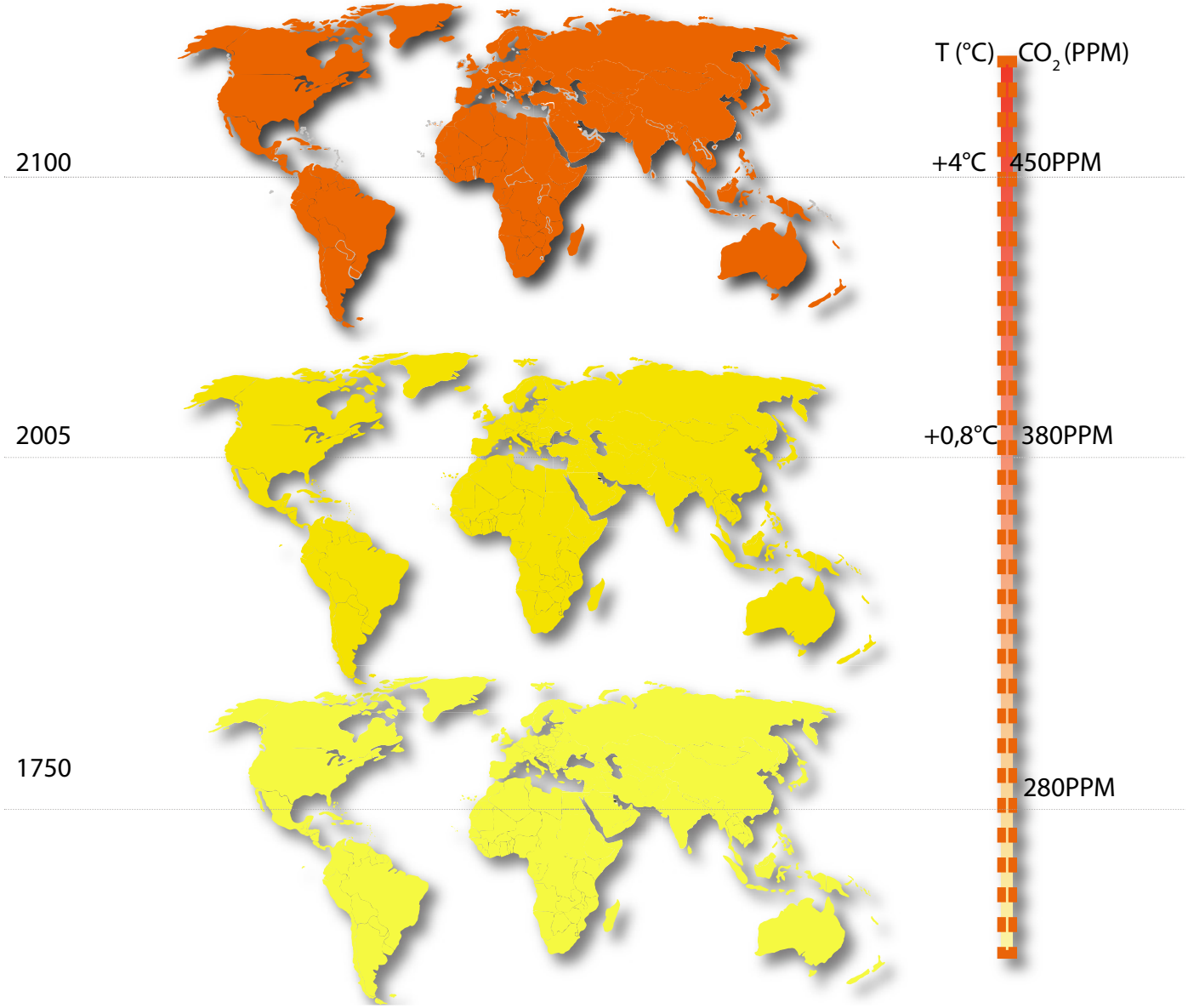
SKYNET

Carbon Dioxid emission leads to

GLOBAL WORMING

"…STRONG SUMMER THUNDERSTORMS THAT PUMP WATER HIGH INTO THE UPPER ATMOSPHERE POSE A THREAT TO THE PROTECTIVE OZONE LAYER OVER THE UNITED STATES, RESEARCHERS SAID ON THURSDAY, DRAWING ONE OF THE FIRST LINKS BETWEEN CLIMATE CHANGE AND OZONE LOSS OVER POPULATED AREAS"

HTTP://WWW.NYTIMES.COM/2012/07/27/SCIENCE/EARTH/STRONG-STORMS-THREATEN-OZONE-LAYER-OVER-US-STUDY-SAYS.HTML?_R=2&NL=TODAYSHEADLINES&EMC=EDIT_TH_20120727



2014

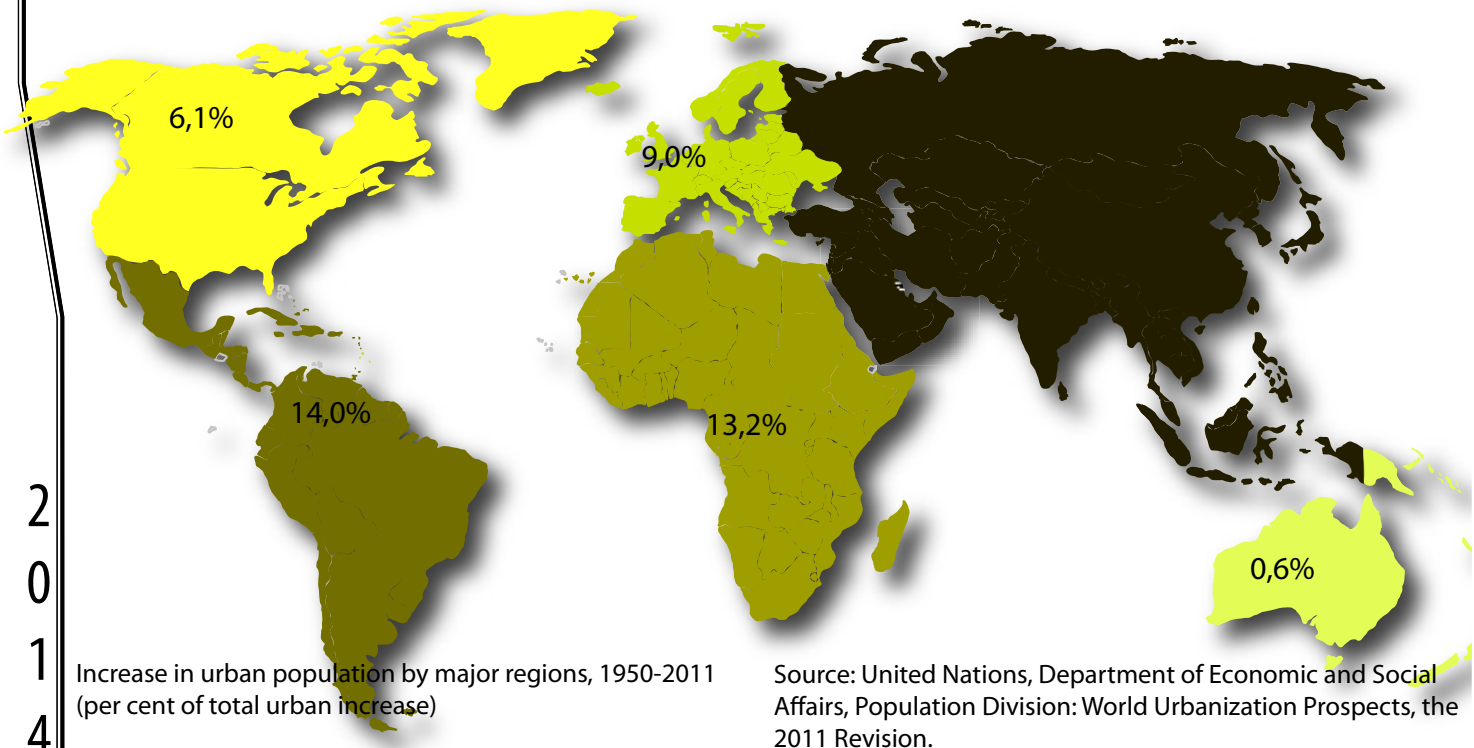
THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC) PUBLISHES DETAILED REPORTS TO DISSEMINATE GREATER KNOWLEDGE ABOUT MAN-MADE CLIMATE CHANGE AND FREQUENTLY RISE PERSPECTIVES AND ADVICE HOW TO COUNTERACT. IPCC HAVE ALREADY BEEN AWARDED FOR THEIR EFFORTS WITH THE NOBEL PEACE PRIZE IN 2007.
IPCC PROJECTIONS AND MODELS EMPHASIZE THAT IN THE FUTURE GREENHOUSE EFFECT CAN REACH A LEVEL THAT WILL SERIOUSLY AFFECT OUR CLIMATE, IF HUMANITY DOES NOT CHANGE THE WAY OF FUNCTIONING AND LIFESTYLE.
THROUGHOUT HISTORY, VARIOUS HUMAN ACTIVITIES, MAINLY THOSE RELATED TO THE DEVELOPMENT AND PROGRESS, (INDUSTRY, INTENSIVE AGRICULTURE, TRANSPORTATION, HEATING, ETC) HAVE COMPREHENSIVLY CONTRIBUTED TO THE SO CALLED GREENHOUSE EFFECT.

GREENHOUSE GASES ARE: WATER VAPOUR (H2O), CARBON DIOXIDE (CO2), METHANE (CH4), NITROUS OXIDE (N2O), OZONE (O3),
IT IS LIKELY THAT DROUGHTS WILL CONTINUE TO GET WORSE AND NATURAL CATASTROPHES WILL OCCUR MORE FREQUENT AS THE PLANET HEATS UP. ALL THE CARBON-DIOXIDE AND SOME OTHER EXHAUSTIVE GASES WE ARE EMIT INTO THE AIR CONTRIBUTES TO THAT PROCESS. AS THE IPCC REPORT NOTES, IF WE KEEP HEATING THE PLANET DROUGHTS WILL GET MORE INTENSE AND FREQUENT.
HTTP://WWW.WASHINGTONPOST.COM/BLOGS/EZRA-KLEIN/WP/2012/07/24/WHAT-WE-KNOW-ABOUT-CLIMATE-CHANGE-AND-DROUGHT/ 25.11.2012
THE STATISTICS ARE WELL-KNOWN. WORLDWIDE, HUMAN ACTIVITY PRODUCES 6.5 GT (BILLION TONNES) OF CARBON AND 23 GT OF CO2
HTTP://WWW.WASHINGTONPOST.COM/BLOGS/EZRA-KLEIN/WP/2012/07/24/WHAT-WE-KNOW-ABOUT-CLIMATE-CHANGE-AND-DROUGHT/ 25.11.2012

And if we do not change our lifestyle and find sustainable solutions for our energy demand, it will be worse, because of

POPULATION GROWTH

1950-2011



Increase in urban population by major regions, 1950-2011 (per cent of total urban increase)

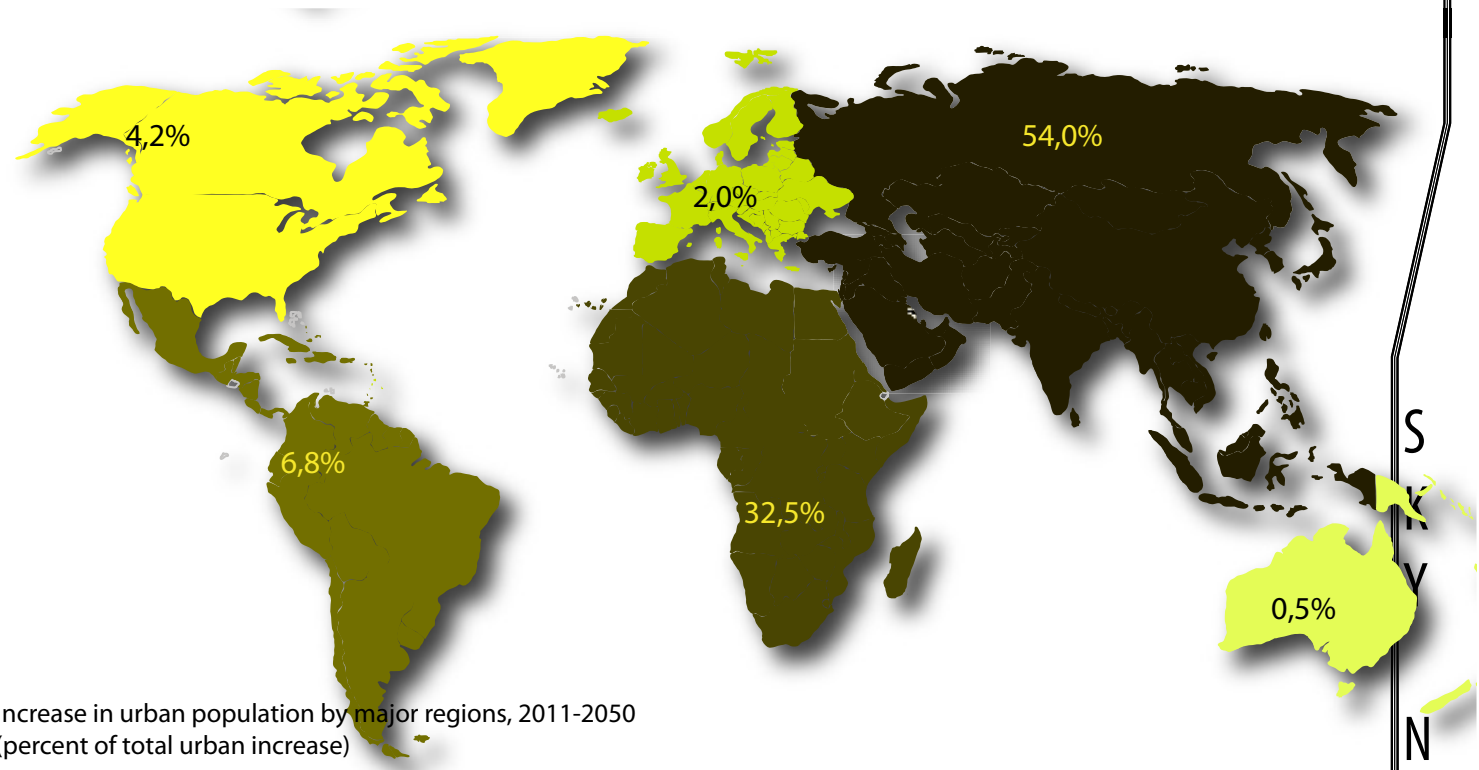
Source: United Nations, Department of Economic and Social Affairs, Population Division: World Urbanization Prospects, the 2011 Revision.
New York, 2012
http://esa.un.org/unup/Analytical-Figures/Fig_5.htm

2014

WORLD POPULATION (UN).

YEAR	2000	2005	2010	2015	2020
	6,115	6,512	6,909	7,302	7,675
WORLD	3,698 (60.5%)	3,937 (60.5%)	4,167 (60.3%)	4,391 (60.1%)	4,596 (59
ASIA	819 (13.4%)	921 (14.1%)	1,033 (15.0%)	1,153 (15.8%)	1,276 (16
AFRICA	727 (11.9%)	729 (11.2%)	733 (10.6%)	734 (10.1%)	733 (9
EUROPE	521 (8.5%)	557 (8.6%)	589 (8.5%)	618 (8.5%)	646 (8.4
LATIN AMERICA	319 (5.2%)	335 (5.1%)	352 (5.1%)	368 (5.0%)	383 (5
NORTHERN AMERICA	31 (0.5%)	34 (0.5%)	36 (0.5%)	38 (0.5%)	40 (0
OCEANIA					

2011-2050



Increase in urban population by major regions, 2011-2050
(percent of total urban increase)

OVERPOPULATION, AN INCREASE IN THE WORLDS POPULATION, AN INCREASE OF INDIVIDUALS. THE BIGGEST JUMP IN POPULATION GROWTH WAS RECORDED IN 1960, WHEN THE GROWTH RATE WAS 2.2% PER YEAR. SINCE THEN THE GROWTH RATE DECLINES TO 2009 AMOUNTED TO 1.1%. BUT TAKING INTO ACCOUNT THE NUMBER OF PEOPLE IN TODAY'S WORLD, 6.8 BILLION, 1.1% IS STILL A LARGE NUMBER. POPULATION GROWTH AND LIMITED NATURAL RESOURCES ARE PROBLEMS OF OVERPOPULATION. NOT ONLY IN TERMS OF THE SETTLEMENT OF PEOPLE, BUT ALSO IN TERMS OR LIMITATIONS AND CONVERSTION OF RESOURCES INTO HAZARDOUS OR TOXIC WASTE. THERE IS A DANGER THAT THE POPULATION EXCEED THE CAPACITY IN-BUILT SENSE OF SPACE, RESOURCES AND ENERGY.

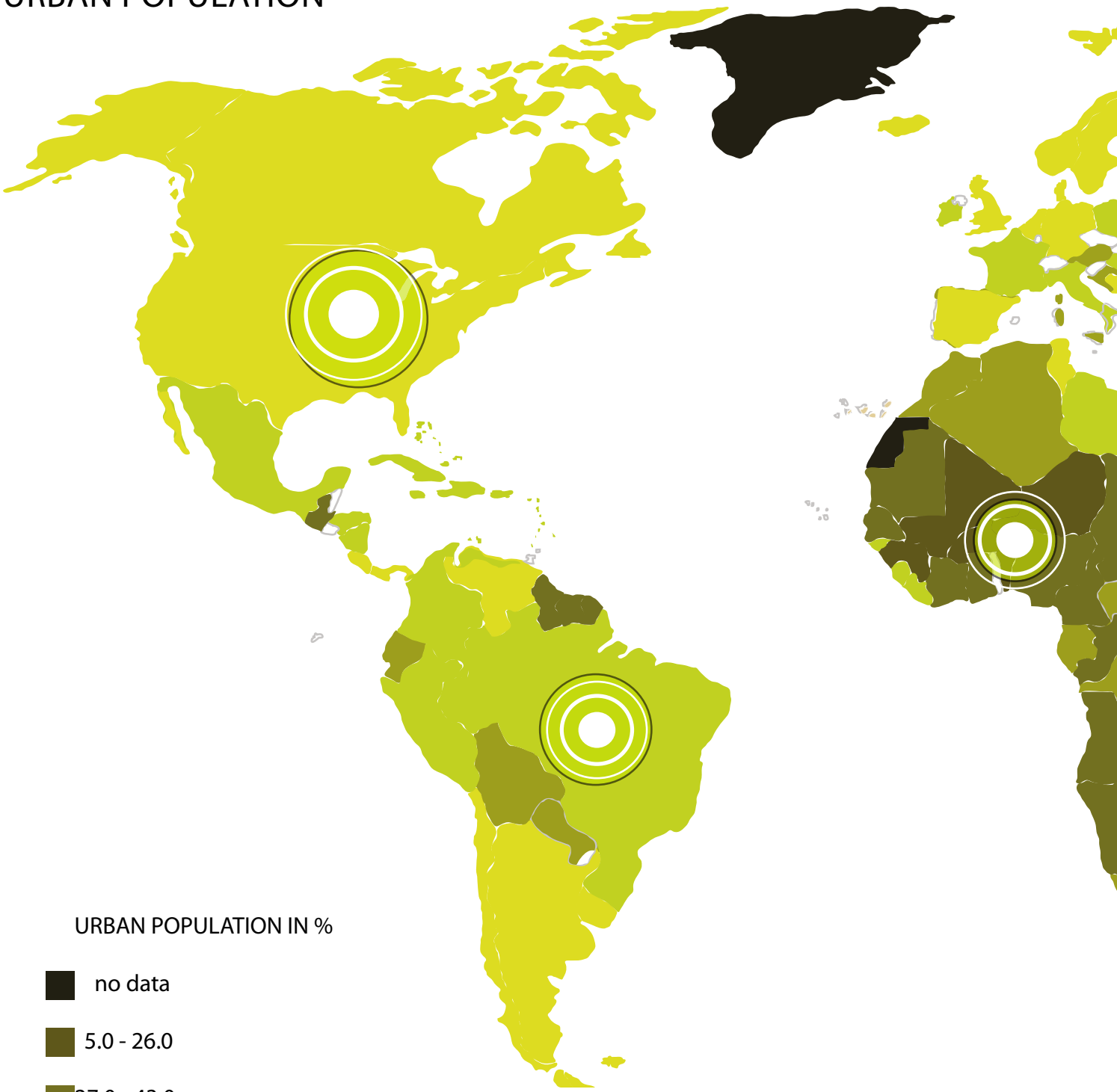
S K Y N E T

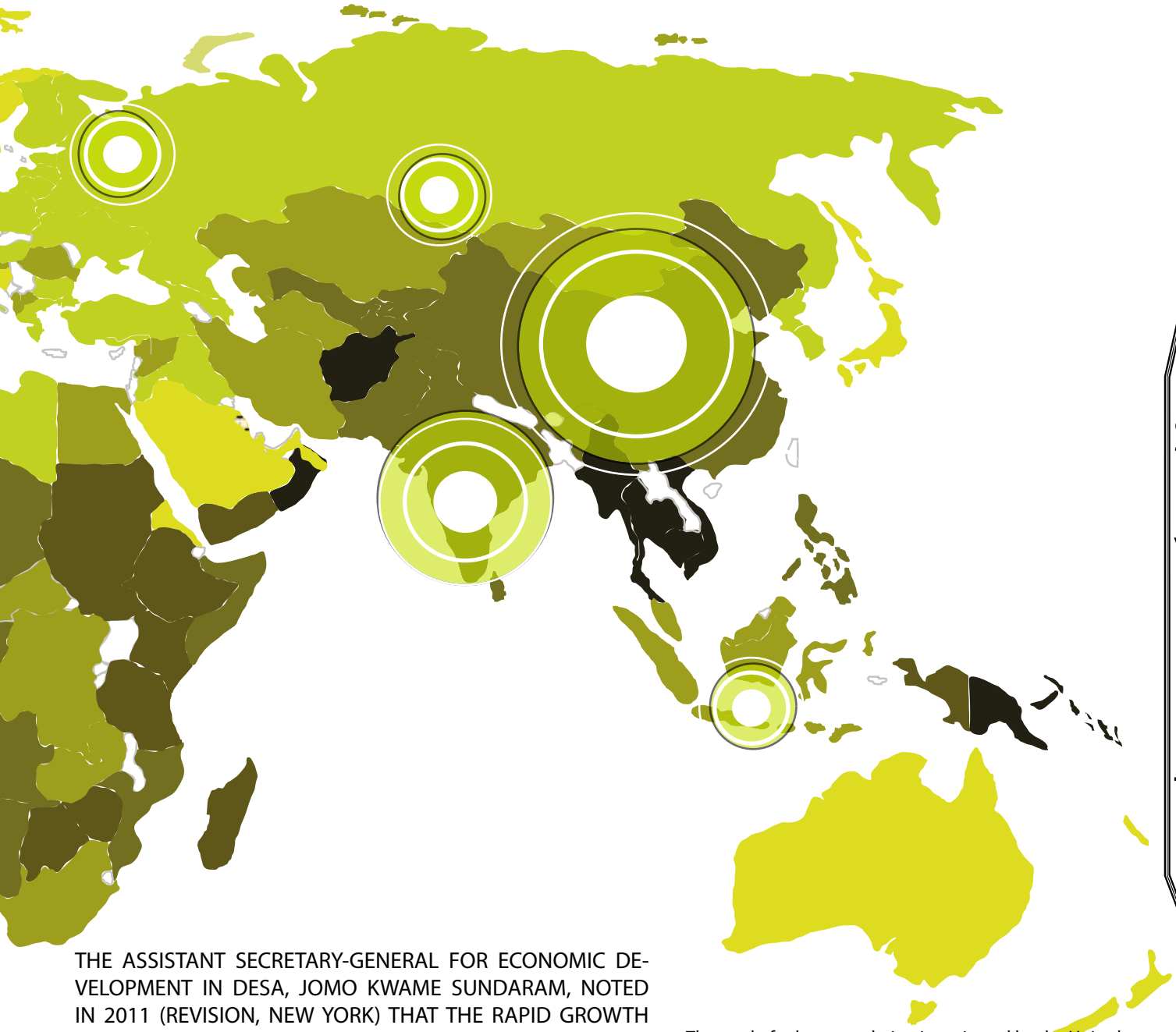
	2025	2030	2035	2040	2045	2050
	8,012	8,309	8,571	8,801	8,996	9,150
.9%)	4,773 (59.6%)	4,917 (59.2%)	5,032 (58.7%)	5,125 (58.2%)	5,193 (57.7%)	5,231 (57.2%)
.6%)	1,400 (17.5%)	1,524 (18.3%)	1,647 (19.2%)	1,770 (20.1%)	1,887 (21.0%)	1,998 (21.8%)
.6%)	729 (9.1%)	723 (8.7%)	716 (8.4%)	708 (8.0%)	700 (7.8%)	691 (7.6%)
4%)	670 (8.4%)	690 (8.3%)	706 (8.2%)	718 (8.2%)	726 (8.1%)	729 (8.0%)
.0%)	398 (5.0%)	410 (4.9%)	421 (4.9%)	431 (4.9%)	440 (4.9%)	448 (4.9%)
.5%)	43 (0.5%)	45 (0.5%)	46 (0.5%)	48 (0.5%)	50 (0.6%)	51 (0.6%)

70 % from all that population will be

URBAN POPULATION

2014





The total of urban population is projected by the United nations according to total population of medium projection.
Sources:Unated Nations Population Division, New York, 1999, 2003, www.earthtrends.org

THE ASSISTANT SECRETARY-GENERAL FOR ECONOMIC DEVELOPMENT IN DESA, JOMO KWAME SUNDARAM, NOTED IN 2011 (REVISION, NEW YORK) THAT THE RAPID GROWTH OF MEGALOPOLIS IS AN OBVIOUS FACT. IN 1970 ONLY 39 MILLION PEOPLE LIVED IN SO-CALLED MEGALOPOLIS, WHICH IS LESS THAN THREE PERCENT OF THE WORLD'S POPULATION AT THAT TIME, WHILE BY 2011 359 MILLION PEOPLE LIVED IN THE MEGALOPOLIS, WHICH IS EQUIVALENT TO 9.9 PERCENT OF THE POPULATION. IN 2025, ESTIMATED 630 MILLION WILL LIVE IN MEGACITIES - THAT IS 13, 6 PERCENT OF THE URBAN POPULATION IN THE WORLD BY THEN. BASED ON SUCH PREDICTIONS, I WANT TO GIVE A GRAPHICAL REPRESENTATION IN ORDER TO COMPARE THE URBAN POPULATION SIZE WITH TERRITORY THAT THEY WILL OCCUPY IN 2050
HTTP://WWW.UN.ORG/EN/DEVELOPMENT/DESA/PUBLICATIONS/WORLD-URBANIZATION-PROSPECTS-THE-2011-REVISION.HTML 20121205

SKY NET

and moste of them will live in

MEGACITIES 2025

A MEGACITY IS USUALLY DEFINED AS A METROPOLITAN AREA WITH A TOTAL POPULATION IN EXCESS OF TEN MILLION PEOPLE[1]. A MEGACITY CAN BE BASED ON A SINGLE METROPOLITAN AREA OR TWO OR MORE METROPOLITAN AREAS THAT CONVERGE. THE TERMS CONURBATION, METROPOLIS AND METROPLEX ARE ALSO APPLIED TO THE LATTER.

	Population (millions)		Average annual rate of change (percentage)
	2011	2025	2011-2025
Lagos	11.2	18.9	3.71
Dhaka	1.4	6.6	2.84
Shenzhen	10.6	15.5	2.71
Karachi	13.9	20.2	2.68
Delhi	22.7	32.9	2.6
Beijing	15.6	22.6	2.66
Guangzhou	10.8	15.5	2.54
Shanghai	20.2	28.4	2.43
Manila	11.9	16.3	2.26
Mumbai	19.7	26.6	2.12
Istanbul	11.3	14.9	2.00
Cairo	11.2	14.7	1.98
Calcutta	14.4	18.7	1.87
Mexico City	20.4	24.6	1.32
Los Angeles	13.4	15.7	1.13
São Paulo	19.9	23.2	1.08
New York	20.4	23.6	1.05
Buenos Aires	13.5	15.5	0.98
Paris	10.6	12.2	0.97
Rio de Janeiro	12.0	13.6	0.93
Moscow	11.6	12.6	0.56
Osaka-Kobe	11.5	12.0	0.33
Tokyo	37.2	38.7	0.27

Source: World Urbanization Prospects
The 2011 Revision, United Nations
New York

2014

ACCORDING TO THE DATA RETRIEVED FROM THE UN POPULATION DIVISION OF THE DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS (DESA), THE LARGEST INCREASES IN URBAN POPULATION ARE EXPECTED IN THE COUNTRIES INDIA, CHINA, NIGERIA, THE UNITED STATES AND INDONESIA. AFRICA'S URBAN POPULATION WILL GROW FROM 414 MILLION TO OVER 1.2 BILLION BY 2050, WHILE ASIA IS EXPECTED TO JUMP FROM 1.9 BILLION TO 3.3 BILLION, WHICH MEANS THAT THEY, TOGETHER, WILL ACCOUNT FOR 86% OF THE TOTAL POPULATION INCREASE OVER THE NEXT FOUR DECADES.

INDIA WILL BE ENRICHED BY A FURTHER 497 MILLION URBAN POPULATION, CHINA BY 341 MILLION, NIGERIA BY 200 MILLION, USA BY 103 MILLION AND INDONESIA BY 92 MILLION

SKY NET

Proportional to mega cities rising is

MEGA-SLUMS WARNING

2014

SLUMS ARE OVERPOPULATED INFORMAL URBAN SETTLEMENTS AND TYPICALLY ACCOMPANIED BY SUBSTANDARD HOUSING AND HIGH POVERTY, SQUALOR. THIS RESULTS OFTEN IN HIGH CRIME LEVEL, POOR LIVING STANDARDS AND SEVERAL LACKS OF MANY BASIC SERVICES, SUCH AS SUPPLY WITH CLEAN DRINKWATER OR RELIABLE ELECTRICITY

IN TERMS OF DEVELOPMENT, POVERTY IS DIRECTLY LINKED TO THE EMERGENCE OF „SLUM"'S, FAILED SETTLEMENTS CHARACTERIZED BY BELOW-TO CONVENTIONAL DWELLINGS, NO HYGIENE AND SAFETY. FROM 1990 TO 2005, THE NUMBER OF PEOPLE LIVING IN THESE SETTLEMENTS (IN COUNTRIES THAT ARE IN DEVELOPMENT), DECREASED FROM 47% TO 37%, BUT AT THIS POINT AGAIN ON THE RISE. NOW 1.7 BILLION PEOPLE LIVING IN SLUMS, AND THAT NUMBER WILL DOUBLE BY 2030

SLUM DWELLERS OFTEN HAVE MINIMAL OR NO ACCESS TO EDUCATION, HEALTHCARE, OR THE URBAN ECONOMY

HTTP://EN.WIKIPEDIA.ORG/WIKI/MEGACITY

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E N E
GO ALONGE WITH NATURE...


R G Y

ENERGY ZONES

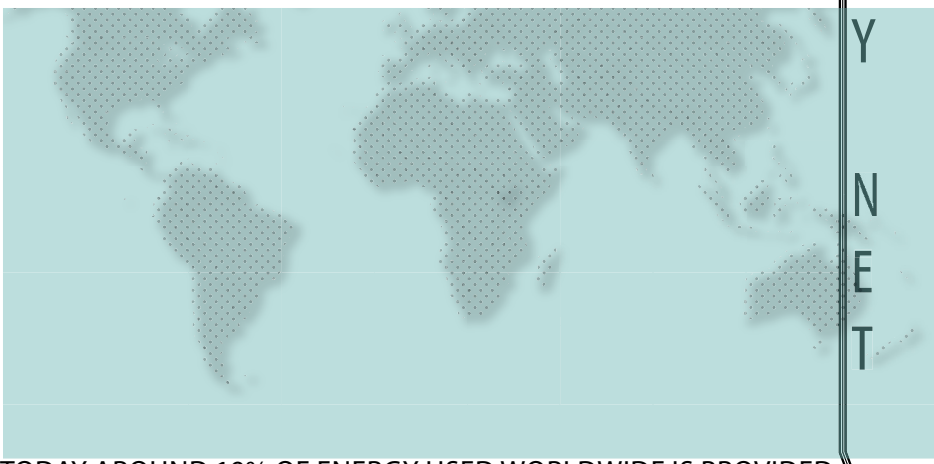
A TECHNOLOGICALLY ADVANCED SOCIETY HEAVILY DEPENT ON MULTIPLE SOURCES OF ENERGY FOR TRANSPORT, PRODUCTION OF GOODS AND PROVISION OF VARIOUS ENERGY SERVICES. ENERGY ALSO PROVIDES A SECURE LIFE FOR PEOPLE WHO INHABIT ALSO UNFAVORABLE CLIMATIC REGIONS OR DIFFERENT SEASONS, WITH RADIATION, VENTILATION AND COOLING.

2014

WIND POWER OR WIND ENERGY DESCRIBES THE PROCESS BY WHICH THE WIND IS USED TO GENERATE MECHANICAL POWER OR ELECTRICITY. WIND TURBINES CONVERT THE KINETIC ENERGY IN THE WIND INTO MECHANICAL POWER. THIS MECHANICAL POWER CAN BE USED FOR SPECIFIC TASKS (SUCH AS GRINDING GRAIN OR PUMPING WATER), OR CAN BE CONVERTED INTO ELECTRICITY BY A GENERATOR. *http://www.windpoweringamerica.gov/what_is_wind.asp 27.10.2012*

GREAT POTENTIAL FOR WIND ENERGY IS ON THE SHORES OF THE OCEAN, WHERE THE WIND SPEEDS ARE 1 M/S HIGHER AND MUCH MORE CONSISTENT.

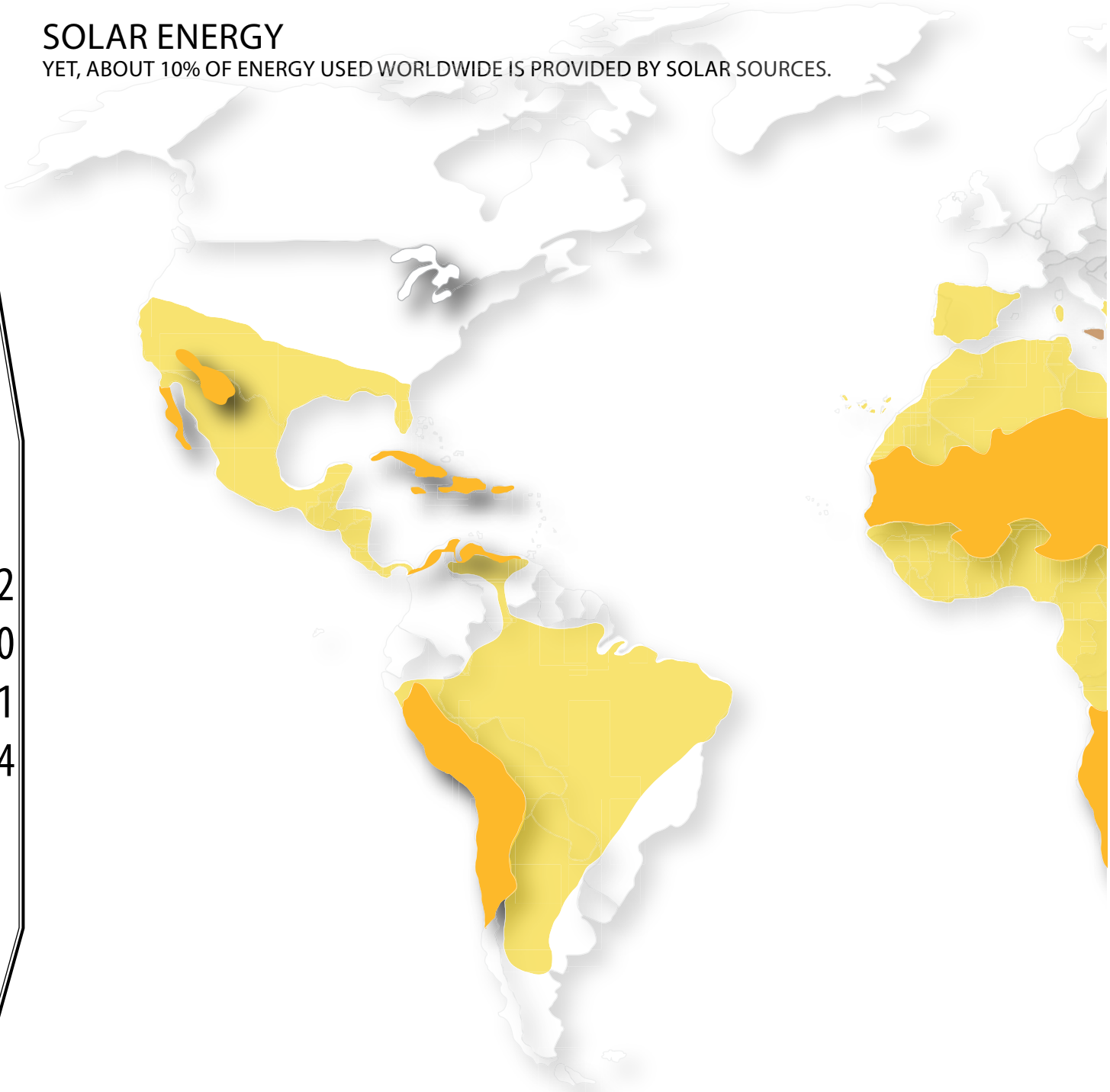
THE POTENTIAL OF GEOTHERMAL ENERGY OF THE EARTH IS HUGE. AROUND 42 MILLION THERMAL MEGAWATTS REACH THE SURFACE CONTINUALLY. ALTHOUGH GEOTHERMAL HEAT PUMPS CAN BE USED ALMOST ANYWHERE



TODAY AROUND 19% OF ENERGY USED WORLDWIDE IS PROVIDED BY HYDROPOWER. FURTHER DEVELOPMENT OF THIS TECHNIQUES, IN THE NEAR FUTURE, WILL INCREASE THE EFFICIENCY AND TURNOVER RATE OF WATER POWER, AND SUBSEQUENT THE ENERGY PRODUCTION, WHICH, AS EXPERTS SAY, WILL MEET THE NEEDS OF THE POPULATION.

SOLAR ENERGY

YET, ABOUT 10% OF ENERGY USED WORLDWIDE IS PROVIDED BY SOLAR SOURCES.



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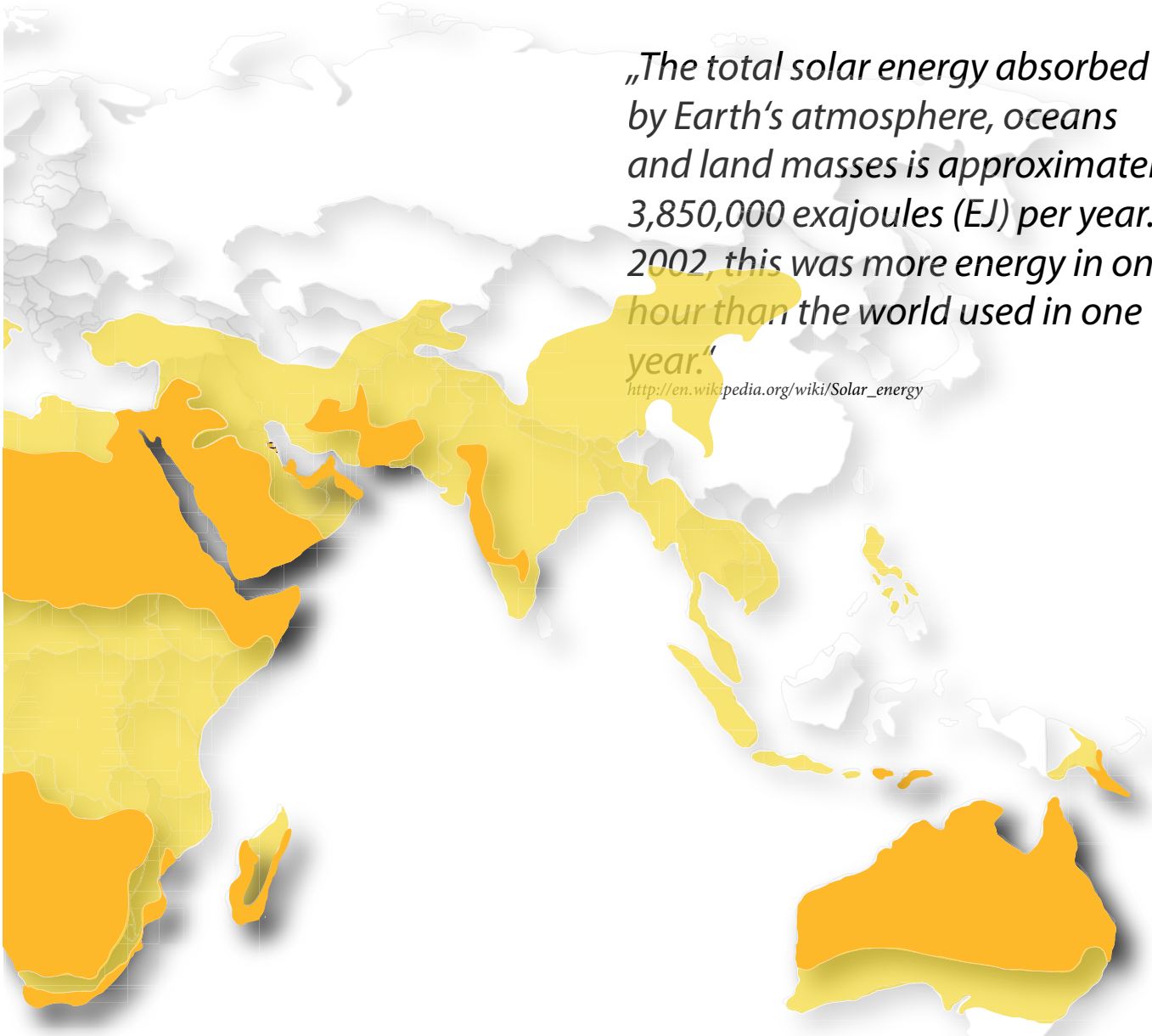
BEST IRRADIATED AREAS (BETWEEN 225-325 KWH/M^2) IN THE WORLD HAS 880842 KM^2

THE SECOND BEST POTENTIAL REGIONS FOR SOLAR ENERGY PRODUCTION ACCOUNT FOR 58 092 046 KM^2 OF LAND



„The total solar energy absorbed by Earth's atmosphere, oceans and land masses is approximately 3,850,000 exajoules (EJ) per year.In 2002, this was more energy in one hour than the world used in one year."

http://en.wikipedia.org/wiki/Solar_energy

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THE CLIMATE AT THE EQUATOR IS KNOWN AS THE EQUATORIAL OR TROPICAL ZONE. MOST REGIONS ALONG THE EQUATOR HAVE TYPICAL VERY HOT AND HUMID CLIMATES, WHILE RAINFALL CAN BE EXCESSIVE. THE ANNUAL RAINFALL IS NORMALLY IN EXCESS OF 2000MM WITH HEAVY SHOWERS ON MOST AFTERNOONS. THIS PATTERN OF RAINFALL IS DUE TO WIND PATTERNS, WHICH CREATES IDEAL CONDITIONS (WARM, MOIST, UNSTABLE AIR) FOR THE FORMATION OF STORM CLOUDS. THE TEMPERATURE INTERVAL IS QUITE STABLE, RANGES LITTLE FROM ABOUT 26ºC - 28ºC. DURING DRY SEASONS TEMPERATURES CAN REACH 33 ºC. AT NIGHT THE CLOUD COVER CAN ACT AS A BLANKET KEEPING TEMPERATURES TO APPROXIMATELY 22ºC. THE EQUATORIAL/TROPICAL ZONE INCLUDES THE AMAZON BASIN IN BRAZIL AND ITS FAMOUS RAINFOREST, WEST AFRICA'S CONGO BASIN AND INDONESIA.

BIOMASS FROM CULTIVATION OF ALGAE

WITH CONTINOUSLY ELEVATING DEMANDS FOR ENERGY SOURCES, ACCOMPANIED BY, PREDICTED FOSSIL FUELS SHORTAGE IN THE NEAR FUTURE, AND ENVIRONMENTAL CONCERNS DUE TO THE VAST RELEASE OF THE GREENHOUSE GAS CARBON DIOXIDE ON THEIR COMBUSTION, HAVE MOTIVATED THE SEARCH FOR ALTERNATIVES. AMONG MANY TRADITIONAL RESOURCES FOR THIS, MICROALGAE HAVE BEEN FOUND TO BE MOST PROMISING DUE TO THEIR HIGH PRODUCTION CAPACITY OF USEFULL LIPIDS. SUCH ORGANISMS POSSESS A HIGH GROWTH RATE, NEED ABUNDANTLY AVAILABLE SOLAR LIGHT TOGETHER WITH CO2, AND THUS ARE MORE PHOTOSYNTHETICALLY EFFICIENT THAN OIL CROPS. ALSO, THEY TOLERATE HIGH CONCENTRATION OF SALTS ALLOWING THE USE OF ANY TYPE OF WATER FOR THE CULTIVATION. ADDITIONALLY THEY ALLOW PRODUCTION USING INNOVATIVE COMPACT PHOTOBIOREACTORS. MOREOVER, MICROALGAE ARE A POTENTIAL SOURCE OF BIOMASS,WHICH CAN BE SHAPED BY BIODIVERSITY AND ASSOCIATED VARIABILITY IN THEIR BIOCHEMICAL COMPOSITION.

ALGE_ http://onlinelibrary.wiley.com/doi/10.1002/er.1695/abstract

2014

CONTINUOUS PRODUCTION SYSTEM FOR THE GENERATION OF HYDROGEN AND BIOMASS FROM ALGAE
ON ONE HAND ALGAE ABSORB CARBON FROM THE ATMOSPHERE AND RELEASE OXYGEN ON THE OTHER HAND, TO IMPROVE AIR AND OCEAN QUALITY. WOULD BE COVERED IN PHOTOSYNTHETIC ALGAE TO PRODUCE BIOFUELS.
ALGAE INITIALLY RELEASE CLEAN OXYGEN AS THEY GROW IN SIZE AND NUMBER.
ONCE SULPHUR IS DEPLETED ALGAE PRODUCE HYDROGEN INSTEAD OF OXYGEN.
FOLLOWED BY HYDROGEN PRODUCTION THE ALGAE ARE
FED MORE SULPHUR TO ENCOURAGE LIPID AND BIOMASS GROWTH.

COOL CLIMATE

ALGAE STRAIN USED;
CHLAMYDOMONAS F-9
MARINE (SALTWATER) TOLERANT
100 DWELLINGS PER HECTARE
= APPROX. 300,000 KWH PER ANNUM PER HECTARE

HOT, ARID CLIMATE

ALGAE STRAIN USED;
SCENEDESMUS OBLIQUUS
TOLERANT OF HOT, ARID CONDITIONS
25 DWELLINGS PER HECTARE
= APPROX. 65,000 KWH PER ANNUM PER HECTARE

MODERATE CLIMATE

ALGAE STRAIN USED;
CHLAMYDOMONAS REINHARDTII
FAVOUR MODERATE CONDITIONS
6 DWELLINGS PER HECTARE
= APPROX. 24,600 KWH PER ANNUM PER HECTARE

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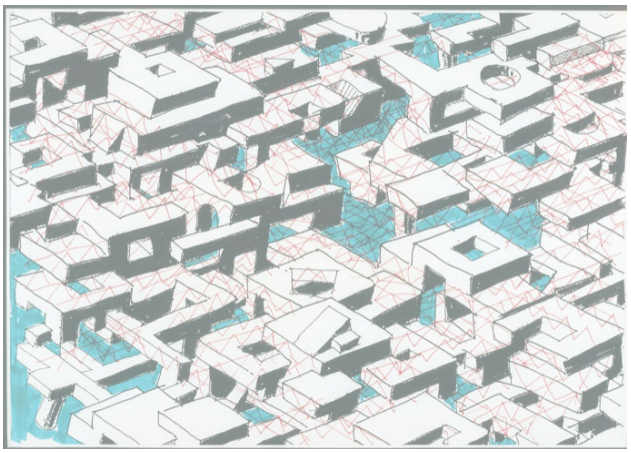

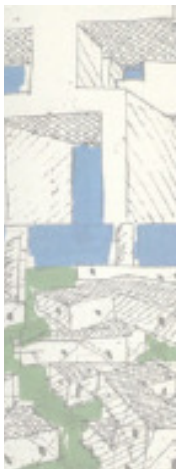

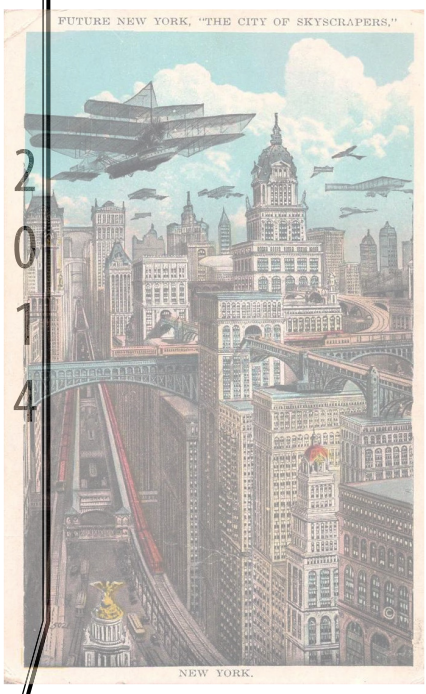

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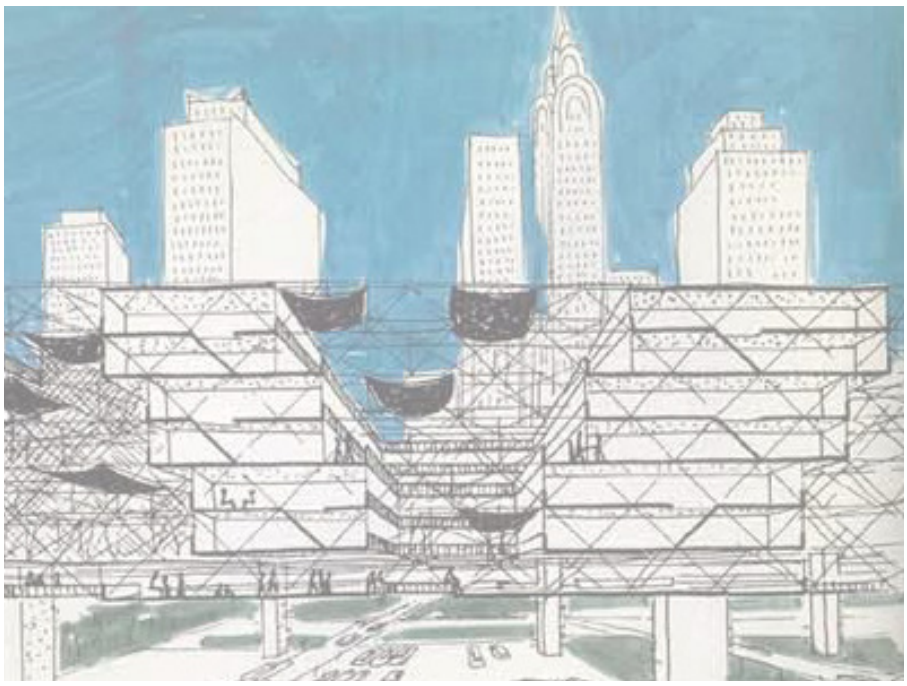
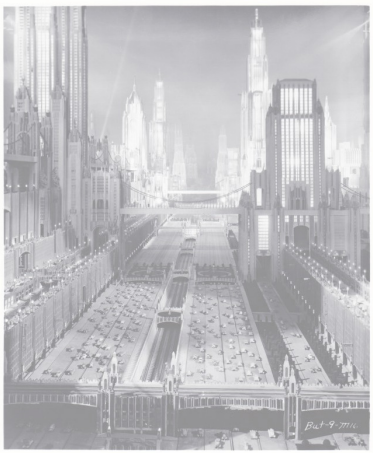
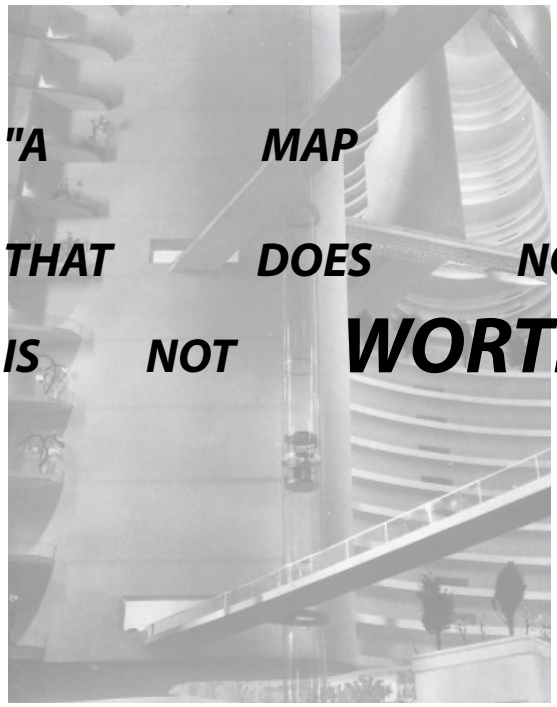


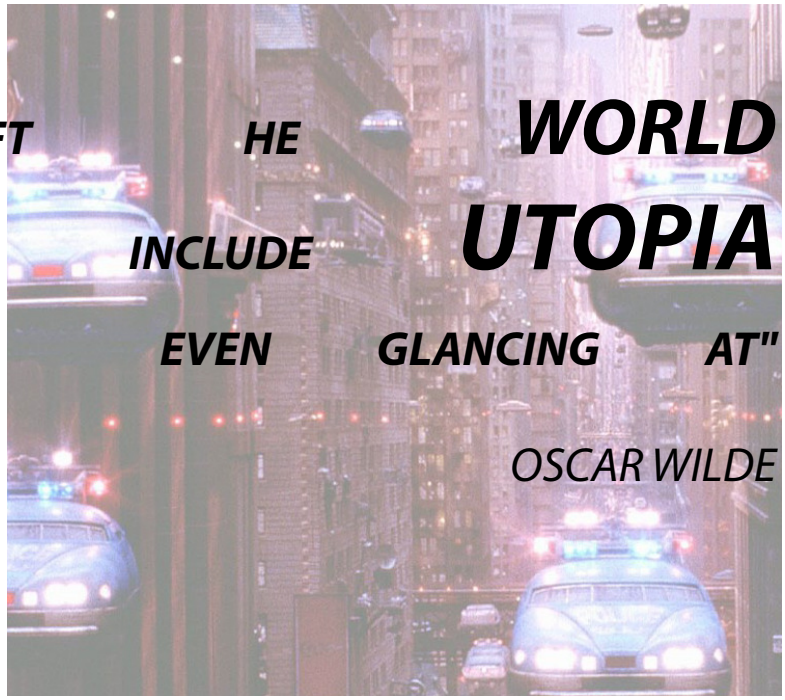


FANTASY
ILLUSION?
VISION



"A MAP OFT HE WORLD
THAT DOES NOT INCLUDE UTOPIA
IS NOT WORTH EVEN GLANCING AT"

OSCAR WILDE



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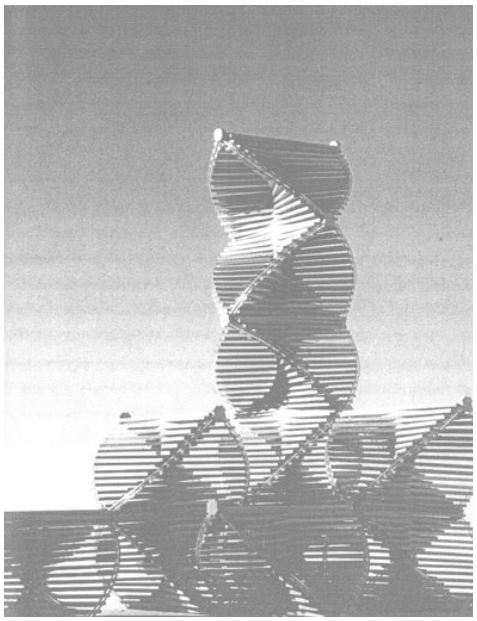
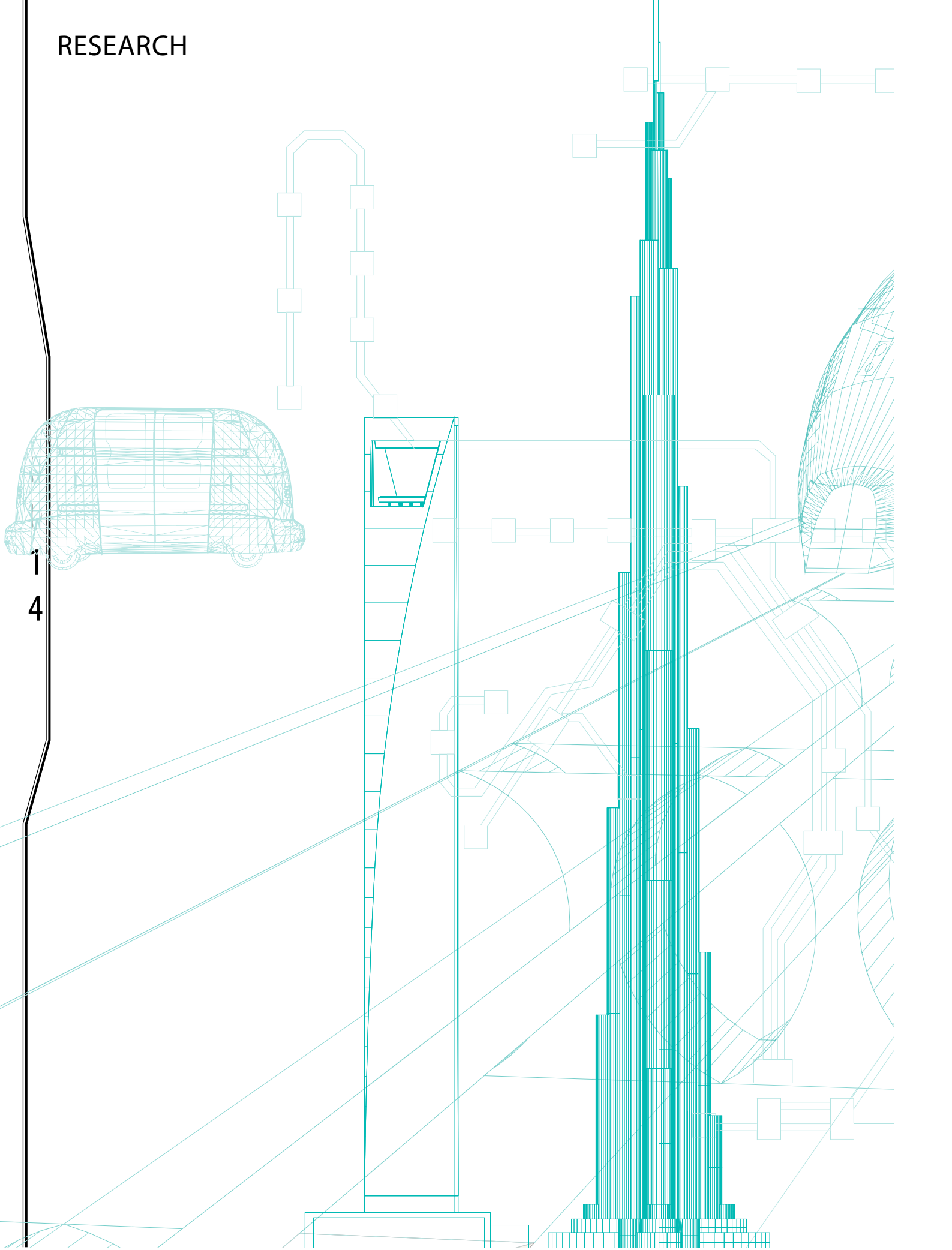
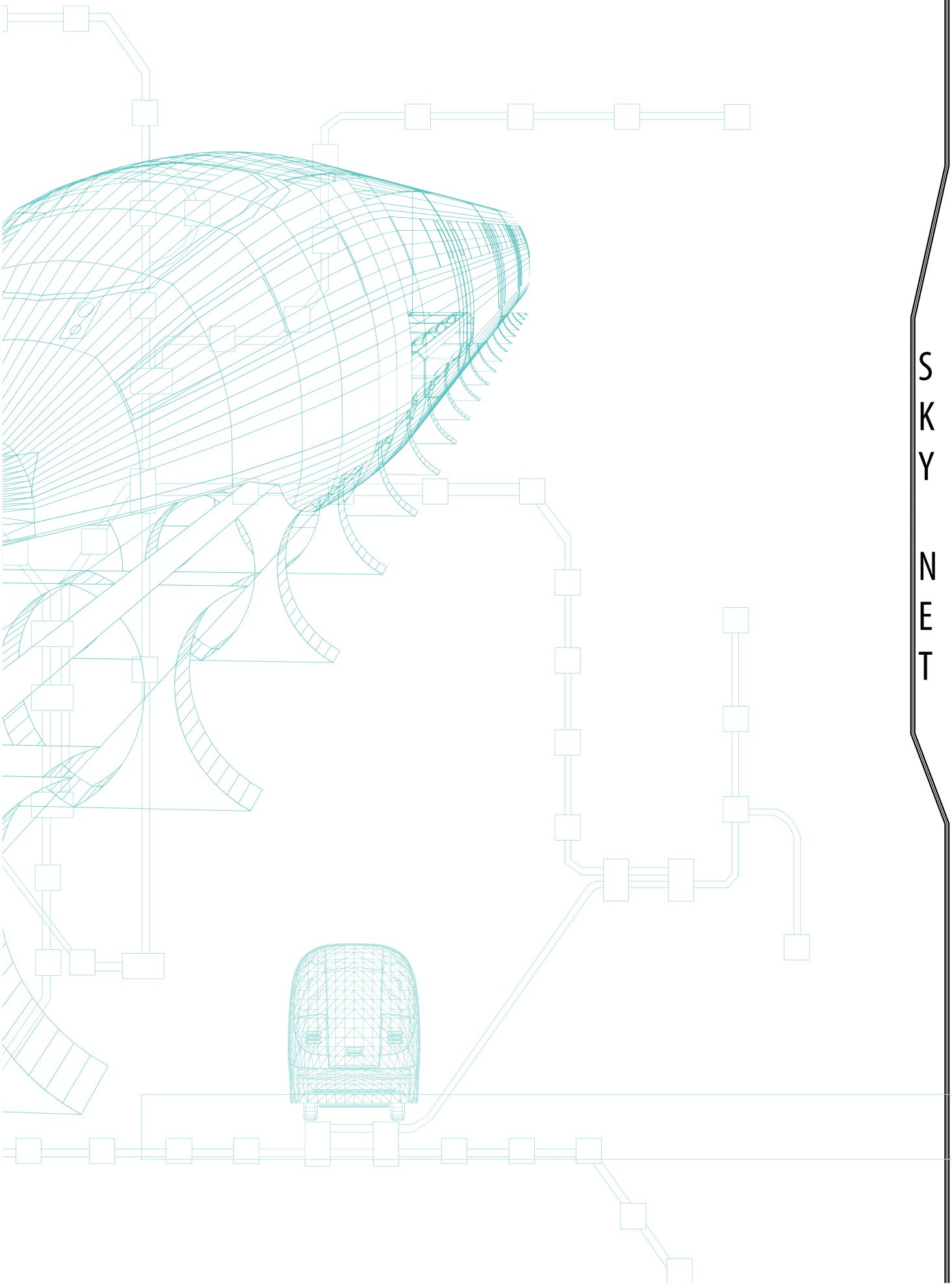






SKYNET

2014

ANALYSE

BURJ KALIFA
KM^3
HONG KONG - TRANSPORTATION SYSTEM

INOVATION IN CORE STRUCTURE

HYBRID TUBE

FUNCTION AREA

EFFICIENT TRANSPORT SYSTEM

CITY PROBLEMS

FIRST STEP IN THE DIRECTION TO SKY NET

SKY NET

AS I STARTED TO THINK ABOUT NEW STRATEGIES AND CONCEPTS FOR PLANNING MY SKY NET CITY I OCCUPIED MYSELF WITH MAIN PROBLEMS WHICH APPEAR OVER AND OVER IN CITIES BY TODAY'S STANDARDS:
TRANSPORTATION SYSTEMS AND INFRASTRUCTURE.
THEREFORE I SEARCHED FOR DIFFERENT INNOVATIONS WHICH HAVE BEEN SUCCESSFULLY ESTABLIS-

THE BEST TRANSIT SYSTEM IN THE WORLD

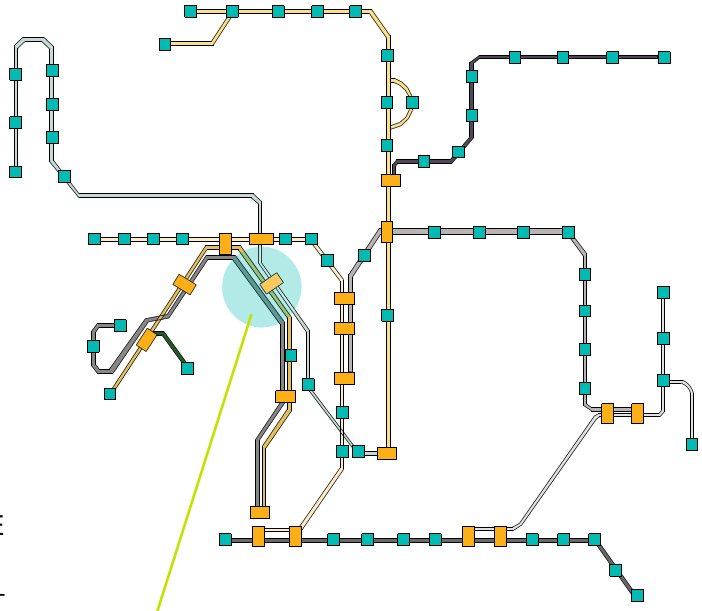
ONE OF THE BEST WAYS AROUND LEAVING A GIANT CARBON FOOTPRINT, OR PAYING AN ARM AND A LEG, IS TO TAKE THE BUS, THE TRAIN. OR A SUBWAY.

AFTER ALL, WHY TAKE A CAR? CNN FILMED PEOPLE PAYING FOR GAS YESTERDAY LIKE IT WAS NEWS!

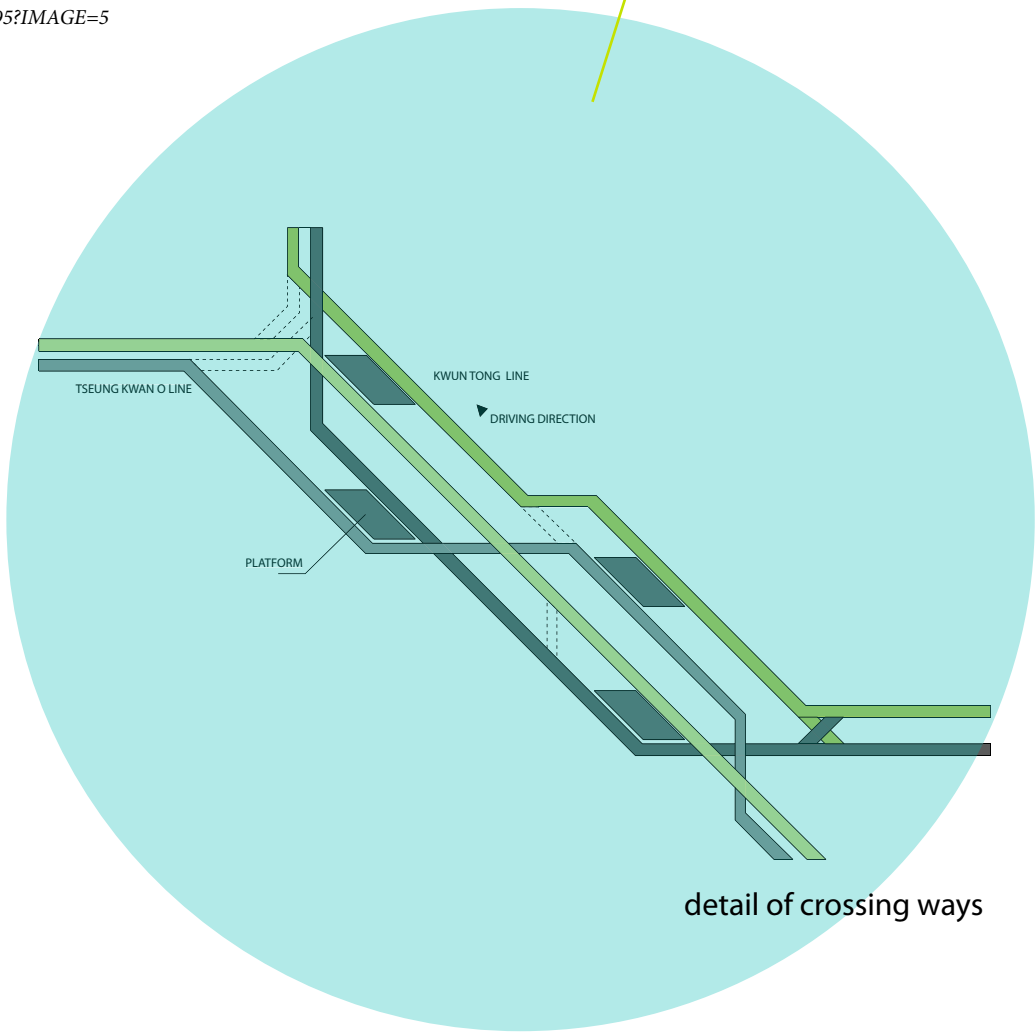
HTTP://WWW.ENVIRONMENTALGRAFFITI.COM/GREEN-LIVING/FREE-RIDE-THE-FIVE-BEST-MASS-TRANSIT-SYSTEMS-WORLDWIDE/1095?IMAGE=5

HONG KONG IS THE MOST EFFECTIVE SYSTEM IN THE WORLD FOR A SHEER VOLUME OF PUBLIC TRANSPORTATION, : 90% OF ALL TRAVELING IS DONE BY MASS TRANSIT. THE 7 MILLION DAILY RIDERS HAVE ACCESS TO SOMETHING KNOWN AS AN „OCTOPUS CARD" WHICH IS ACCEPTED AS CURRENCY NOT JUST TO MOVE THEM AROUND THE CITY, BUT ALSO AT PARKING METERS, CONVENIENCE STORES, AND FAST-FOOD RESTAURANTS. LOOKING TOWARDS THE FUTURE, SHOULDN'T ALL CITIES BE COPYING THIS SYSTEM?

HTTP://WWW.ENVIRONMENTALGRAFFITI.COM/GREEN-LIVING/FREE-RIDE-THE-FIVE-BEST-MASS-TRANSIT-SYSTEMS-WORLDWIDE/1095?IMAGE=5



plan of hong kong transit system



detail of crossing ways

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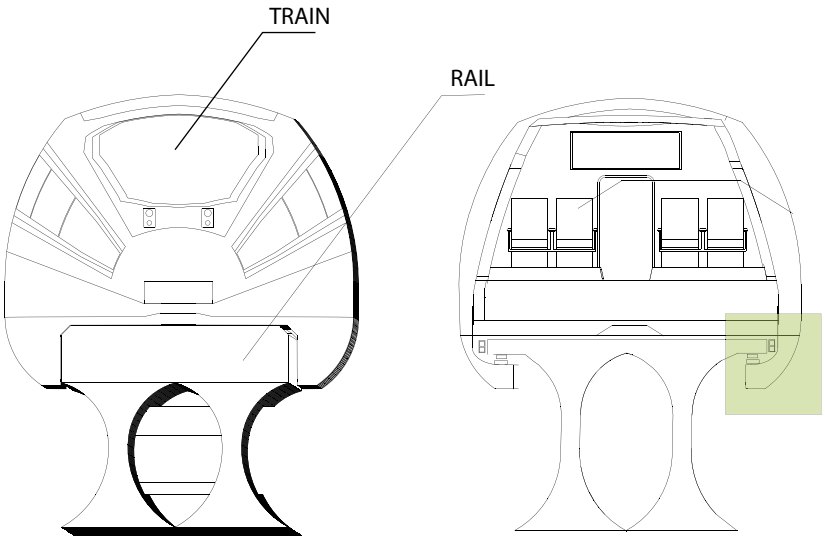
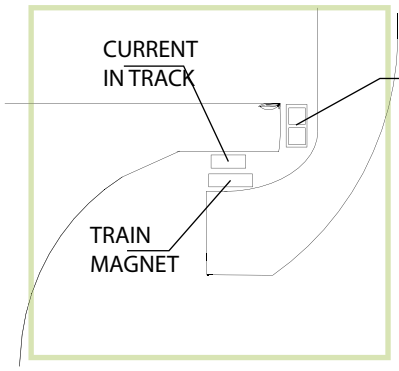
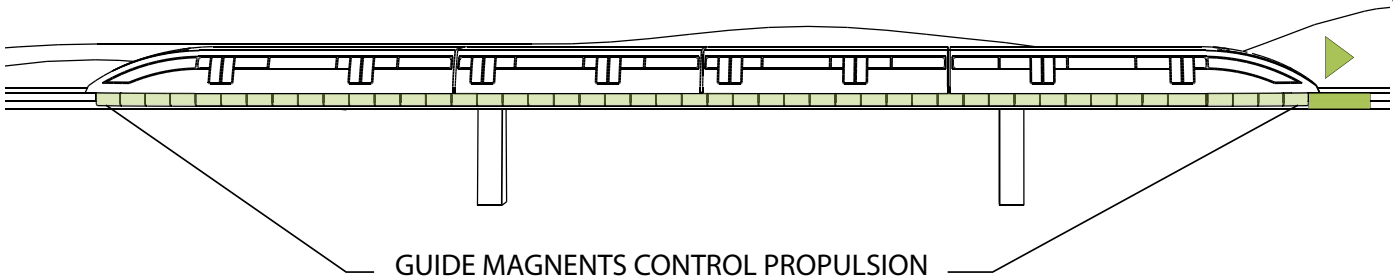
MAGLEV TRAIN



DETAIL

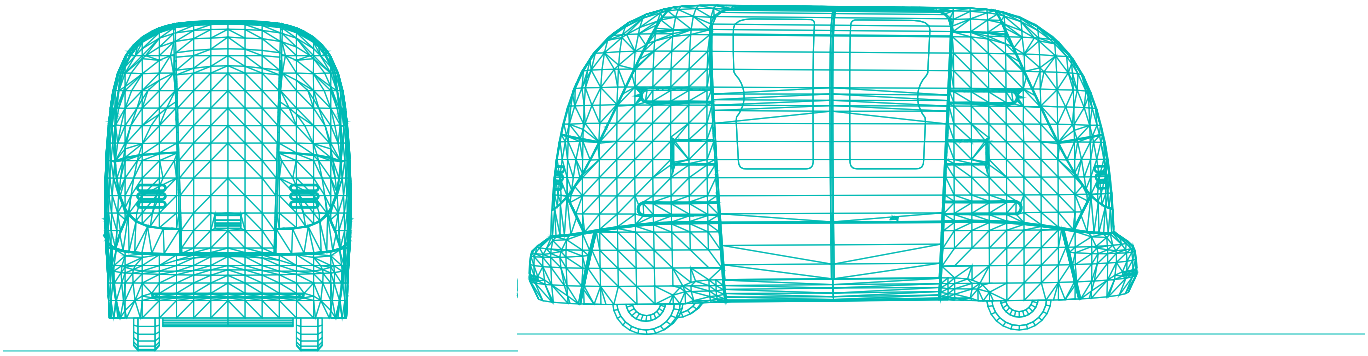




MAGLEV TRAIN
A NOTEABLE SECOND INOVATION IN TRANSIT SYSTEM ARE MAGLEV TRAINS.
MAGLEV TRAINS ARE TRAINS AT VERY HIGH SPEEDS.
THEY USE MAGNETIC FORCE TO BE SUSPENDED AND TO CREATE BOTH, LIFT AND THRUST, WITH STABILITY.

SKY NET

PERSONAL RAPID TRANSIT



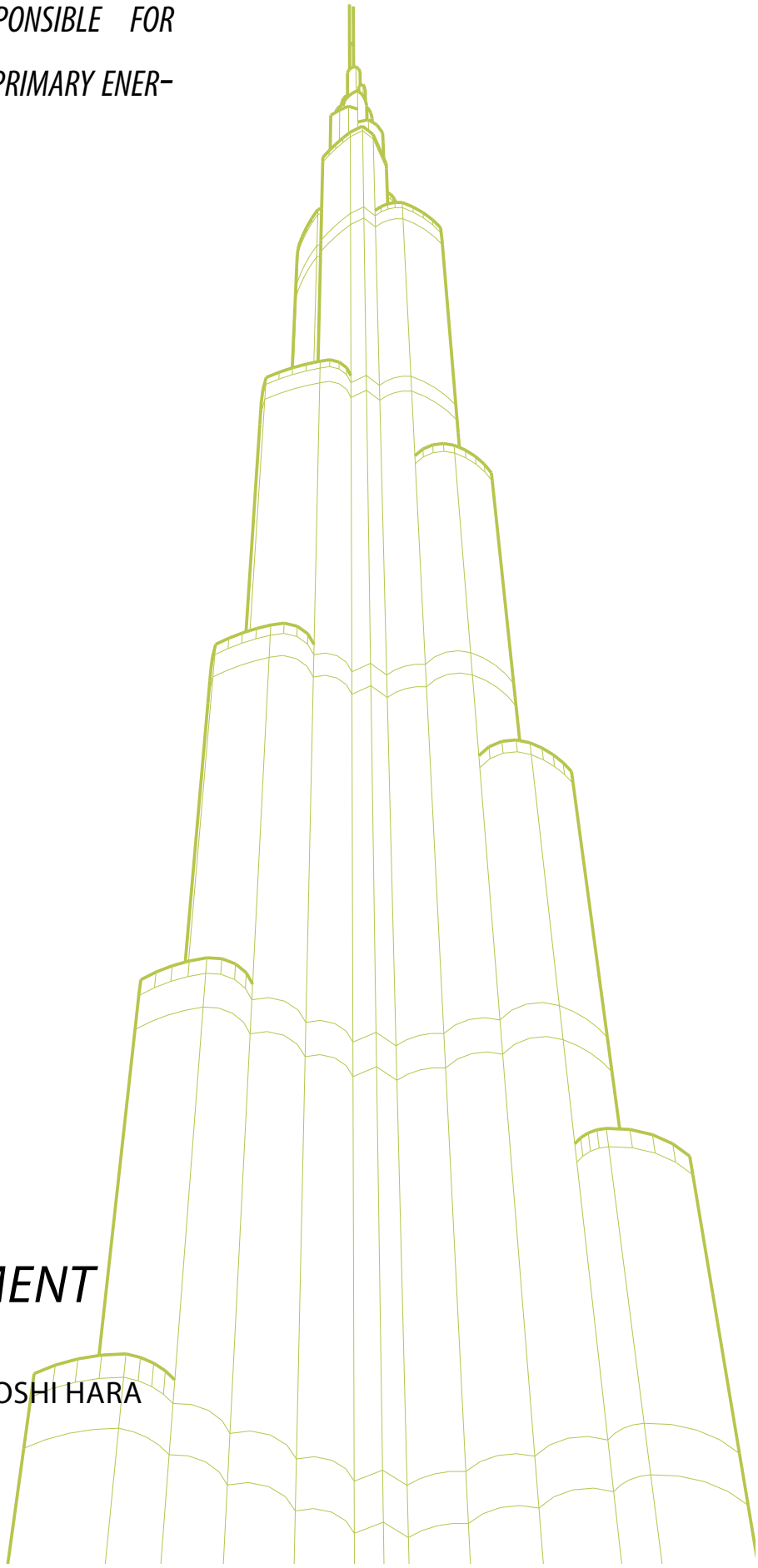
2014

PRT VEHICLES ARE SIZED FOR INDIVIDUAL OR SMALL GROUP TRAVEL, TYPICALLY CARRYING NO MORE THAN 3 TO 6 PASSENGERS PER VEHICLE. THEY CAN BE COMPARED TO ELEVATORS WHICH DRIVE HORIZONTALLY

SKY NET

BUILDINGS ARE DIRECTLY RESPONSIBLE FOR ROUGHLY 50% OF THE WORLD'S PRIMARY ENERGY CONSUMPTION

2014

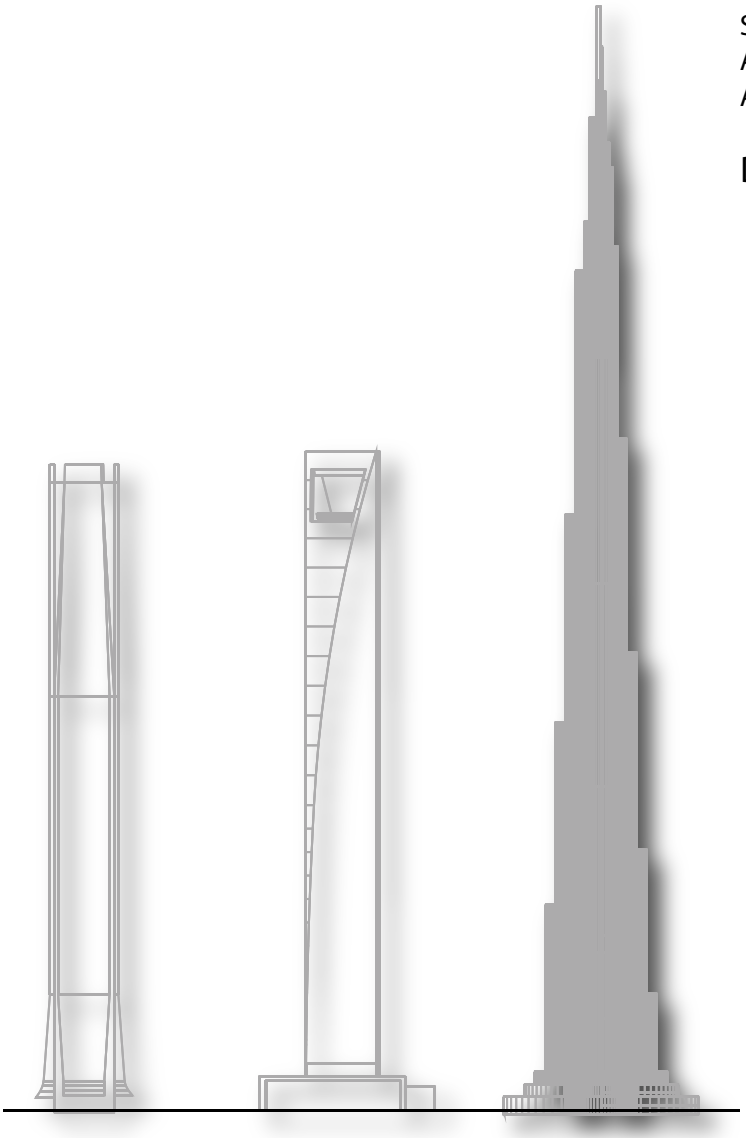


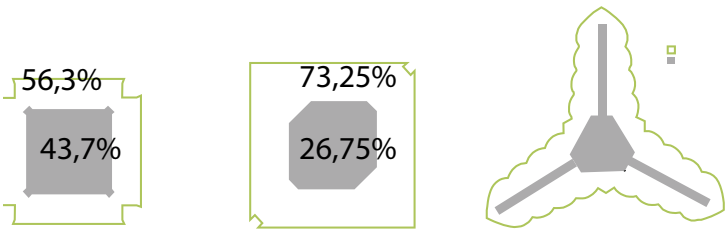
„VERTICAL MOVEMENT IS MUCH EASIER“

HIROSHI HARA

LIFTS WERE ALWAYS SEEN AS ENEMIES THAT OCCUPY SKYSCRAPERS
THEY EAT PRECIOUS SPACE THAT COULD OTHERWISE BE RENTED
ALTHOUGH THE ELEVATORS BECOME FASTER AND SMALLER, ENGINES AND OTHER COMPONENTS USUALLY OCCUPY THE WHOLE FLOOR,-WHICH LEADS TO A LARGE LOSS OF SPACE.

DO WE NEED CORE AT ALL?





SFWC

BURJ KHALIFA

USABLE SPACE

UNUSABLE SPACE

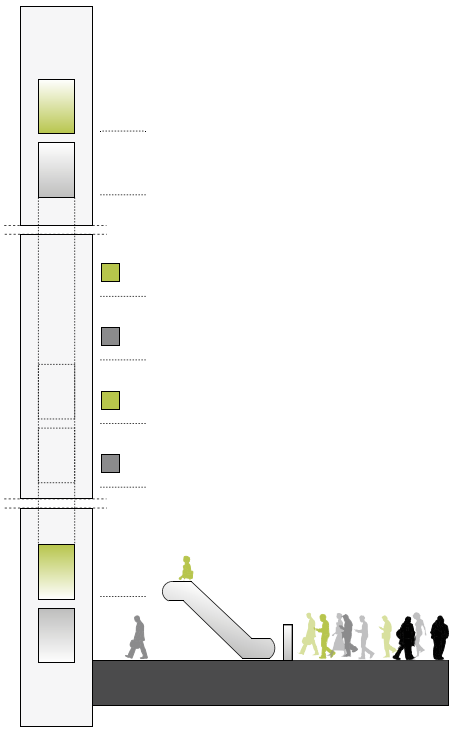
SKY NET

SCHINDLER ELEVATORS, ESCALATORS AND MOVING WALKS

IN TERMS OF INDUSTRIAL PRODUCTION OF ELEVATORS, SCHINDLER MADE A BIG STEP FORWARD, REPLACING BUTTONS IN ELEVATORS WITH SIMPLE KEY- CARDS. PASSENGERS WHO WANTED TO GO IN THE SAME DIRECTION (FLOOR) ARE SENT TO THE APPROPRIATE ELLEVATOR TO IMPROVE TRAFFIC FLOW. THIS MODEL CAN SAVE TIME UP TO 40 PERCENT.
THE NEW TYPE OF ELIVATOR SYSTEMS IS DESIGNED TO BE MORE ENERGY EFFICIENT AND FASTER THAN CONVENTIONAL SYSTEMS.
OTHER INNOVATIONS FROM THE MENTIONED COMPANY INCLUDE LOW STANDBY ENERGY CONSUMPTION AND MORE ENVIRONMENTALLY FRIENDLY MANUFACTURING METHODS.
THE COMPANY IS ALSO MAKING INROADS INTO POWER-SAVING TECHNOLOGY, INCLUDING THE USE OF GEARLESS MACHINES WITH CONVERTERS THAT FEED REGENERATIVE POWER BACK TO THE MAIN POWER LINE.

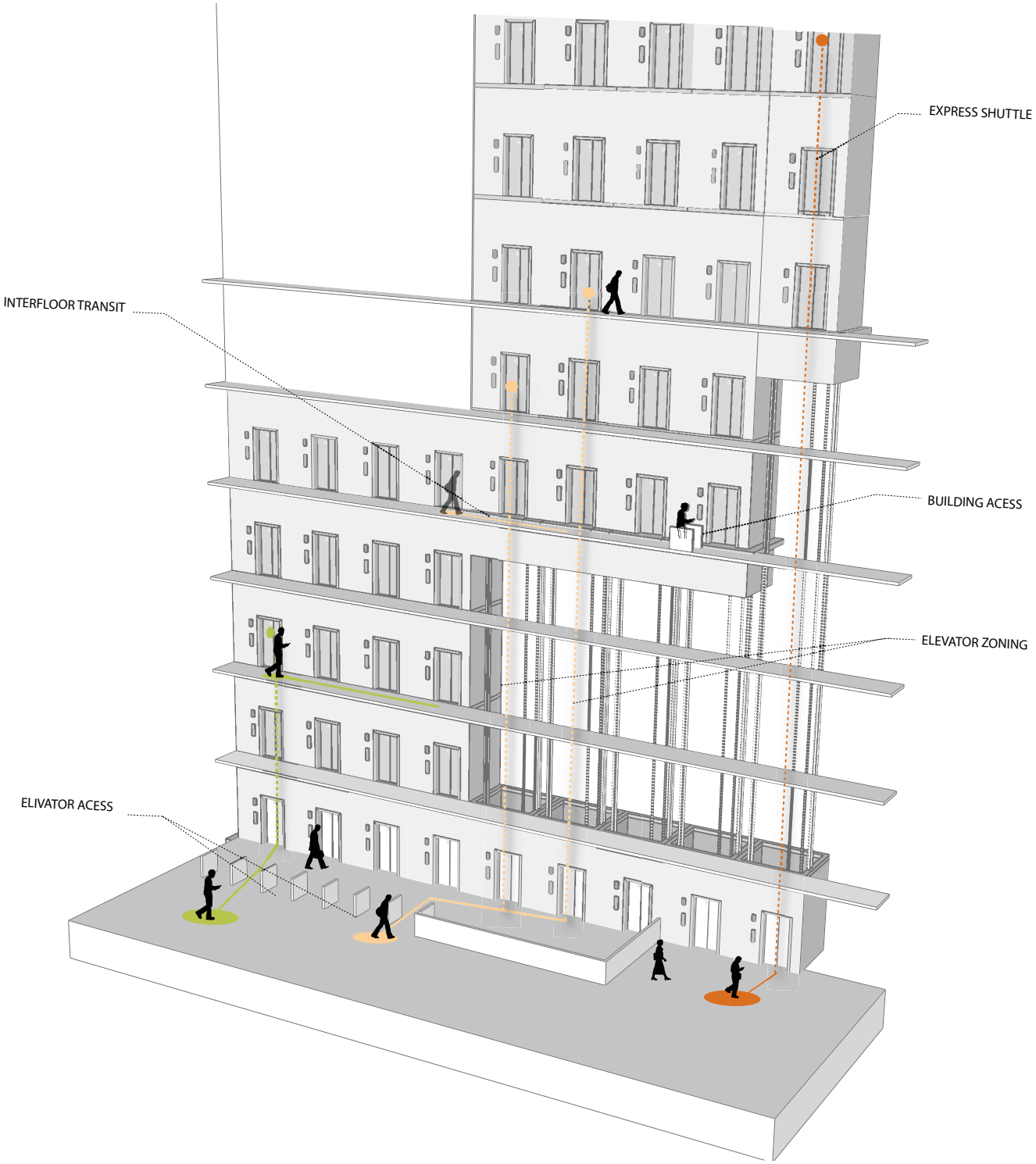
2014

„We transport guests with double-decker elevators. Lift served two floors at the same time and quickly returned to the hall for new passenger (s)
once the construction of such a system is completed, the passenger towards an intelligent transport system of high-speed on charge



ANOTHER EXAMPLE OF A NOTEWORTHY INNOVATION ARE DOUBLE-DECKER LIFTS. ENGINEERS WERE INSPIRED BY DOUBLE DECKER BUSES.
SUCH A CONCEPT ALLOWS FOR AN INCREASE IN PASSENGER NUMBERS, WITHOUT THE DISADVANTAGE OF TAKING ADDITIONAL SPACE.

(http://www.skyscrapercity.com/showthread.php?t=542321)



SKY NET

ANOTHER CONCEPT OF PUBLIC MASS TRANSPORTATION INSPIRED ENGINEERS TO DESIGN LIFTS AS HIGH SPEED TRAINS. IT IS COMMON THAT THE ELEVATOR STOPS AT EVERY FLOOR DESIRED, BUT THIS LEADS TO A SERIES OF REPEATED STOPS AND SUBSEQUENT LOSS OF TIME. WITH THE NEW STRATEGY, THE PASSENGERS WHO EXPRESS A DESIRE TO WANT TO GO UPSTAIRS ARE PRIORIZED, AND A BUDGETING SYSTEM CALCULATES WHICH ELEVATOR WILL ARRIVE FASTEST TO THE DESIRED FLOOR. IN THIS WAY, THEY ARRIVE MUCH FASTER ON TARGET. SUCH SYSTEM WAS USED BY ENGINEERS IN BURJ KHALIFA.

BURJ KHALIFA VERTICAL TRANSPORTATION ANALYSIS

+828

+693

HEIGHT: 828M
FLOORS: 162
CONSTRUCTION START DATE: 21. SEPTEMBER 2004
COMPLETION DATE: 4. JANUARY 2010
DEVELOPER: EMAAR PROPERTIES
DESIGNED BY: SKIDMORE, OWINGS, & MERRILL
TYPE: SKYSCRAPER
LOCATION: NO. 1, BURJ DUBAI BOULEVARD, DUBAI, UNITED ARAB EMIRATES

OBSERVATION DECK

+554

2014

FUNCTIONS

TECHNIC

HOTEL

+416

LUXURY RESIDENTIAL

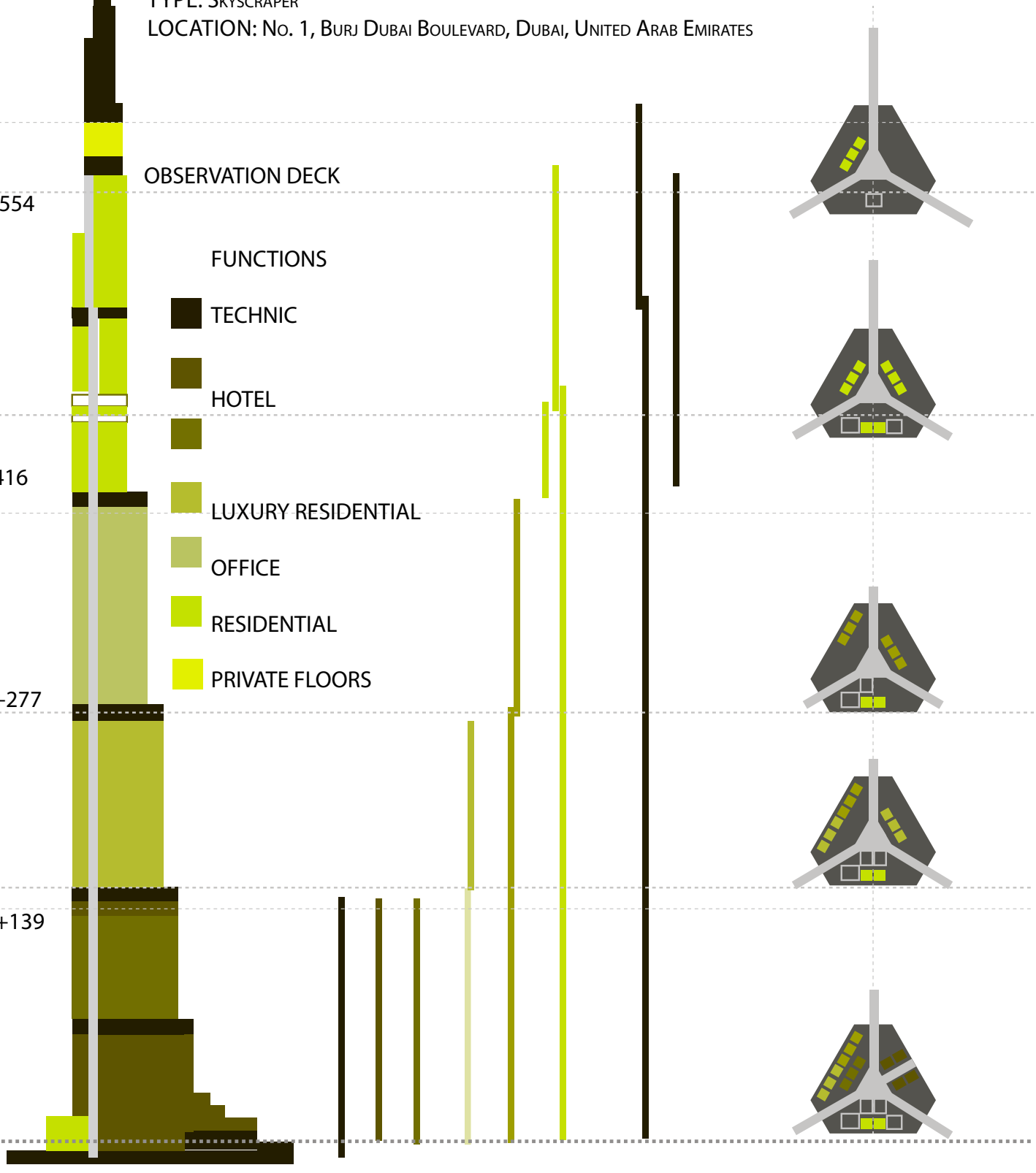
OFFICE

RESIDENTIAL

PRIVATE FLOORS

+277

+139



THE TOWER IS COMPOSED OF THREE ELEMENTS ARRANGED AROUND A CENTRAL CORE. AS THE TOWER RISES FROM THE FLAT DESERT BASE, SETBACKS OCCUR AT EACH ELEMENT IN AN UPWARD SPIRALLING PATTERN, DECREASING THE CROSS SECTION OF THE TOWER AS IT REACHES TOWARD THE SKY. THERE ARE 27 TERRACES IN BURJ KHALIFA. AT THE TOP, THE CENTRAL CORE EMERGES AND IS SCULPTED TO FORM A FINISHING SPIRE. A Y-SHAPED FLOOR PLAN MAXIMIZES VIEWS OF THE PERSIAN GULF. VIEWED FROM ABOVE OR FROM THE BASE, THE FORM ALSO EVOKES THE ONION DOMES OF ISLAMIC ARCHITECTURE. DURING THE DESIGN PROCESS, ENGINEERS ROTATED THE BUILDING 120 DEGREES FROM ITS ORIGINAL LAYOUT TO REDUCE STRESS FROM PREVAILING WINDS. AT ITS TALLEST POINT, THE TOWER SWAYS A TOTAL OF 1.5 M.

THE SPIRE OF BURJ KHALIFA IS COMPOSED OF MORE THAN 4,000 TONNES OF STRUCTURAL STEEL. THE CENTRAL PINNACLE PIPE WEIGHING 350 TONNES WAS CONSTRUCTED FROM INSIDE THE BUILDING AND JACKED TO ITS FULL HEIGHT OF OVER 200 M USING A STRAND JACK SYSTEM. THE SPIRE ALSO HOUSES COMMUNICATIONS EQUIPMENT.

Burj Kalifa\Design Burj Khalifa.mht

SKY NET

57 ELEVATORS IN TOTAL

33 HIGH-RISE ELEVATORS INCLUDING 2 DOUBLE-DECKS

24 ENERGY-EFFICIENT GEN2 ELEVATORS

8 ESCALATORS

138 FLOORS SERVED BY MAIN SERVICE ELEVATOR

504 METERS - MAIN SERVICE ELEVATOR RISE, THE WORLD'S HIGHEST

10 METRES PER SECOND - SPEED OF OBSERVATION DECK ELEVATOR

60 SECONDS - APPROXIMATE TIME FROM GROUND TO LEVEL 124

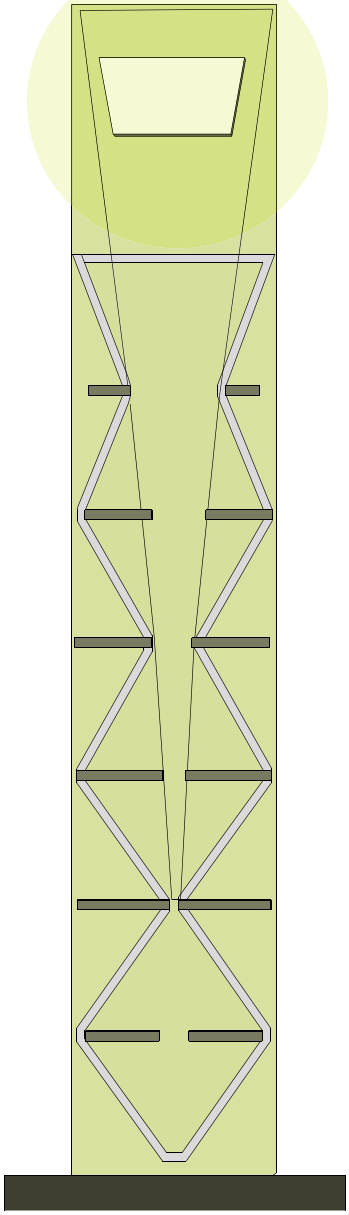
10 000 KILOGRAMS - WEIGHT OF HOIST ROPES

SWFC SYSTEM AGAINST DISASTERS.

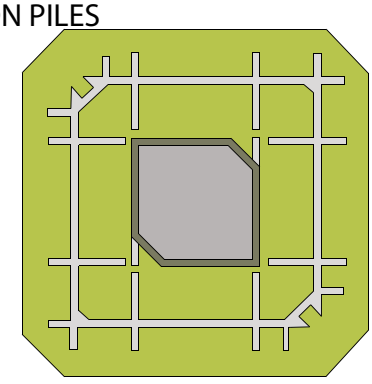
WITH A HEIGHT OF 492M AND 101 FLOORS, THE SWFC IS THE TALLEST BUILDING IN THE REPUBLIC OF CHINA AND THE THIRD-HIGHEST IN THE WORLD. IT WAS DESIGNED BY KOHN PEDERSEN FOX AND DEVELOPED BY THE JAPANESE MORI BUILDING COMPANY.PLANNING OF THE BUILDING TOOK NEARLY A DECADE. IT WAS FINALLY COMPLETED IN 2008.
INNOVATIVE DESIGN WITH ITS SPACIOUS FACILITIES, LEASED IDEA ON HOW ONE BUILDING IN SKY NET CITY MIGHT LOOK LIKE.
ONE OF THE STRATEGIES THAT ENGINEERS USE TO MAKE BUILDING STABLE.IS
THE MOST PROMINENT PART OF THE DESIGN OF THE BUILDING - A „HOLE“ ON ITS TOP, WHICH IS THERE TO REDUCE THE STRAIN OF THE PRESSURE WHICH IS CAUSED BY THE WIND. BRILLIANT IDEA!
BUT THE MOST IMPORTANT CONCEPT AGAINST FORCES FROM TYPHOON WINDS AND EARTHQUAKES IS THE MEGA-STRUCTURE CONCEPT. IT CONSIST OF THREE PARALLEL STRUCTURAL SYSTEMS WHICH ARE INTERACTING IN-BETWEEN.
-THE MEGA-STRUCTURE, CONSISTING OF THE MAJOR STRUCTURAL COLUMNS, THE MAJOR DIAGONALS, AND THE BELT TRUSSES.
- THE CONCRETE WALLS OF THE SERVICES CORE.
- THE INTERACTION BETWEEN THE CONCRETE WALLS OF THE SERVICES CORE AND THE MEGA-COLUMNS, AS CREATED BY THE OUTRIGGER TRUSSES.
THIS NEW CONCEPT FOR THE STRUCTURAL SYSTEM ENABLES FASTER CONSTRUCTION, AT THE SAME TIME IT REDUCES THE COST OF THE WHOLE SYSTEM.IT IS OF GREAT IMPORTANCETHAT THE NEW STRUCTURAL SYSTEM DECREASES THE PERIMETER FRAMING FROM SEVENTEEN WIDE COLUMNS TO JUST THREE NARROW COLUMNS, WHAT CREATES A SENSE OF OPENNESS AND IMPROVES BETTER QUALITY FOR USING SPACE. THE WHOLE SYSTEM CAN BE OPTIMIZED BY CHANGING THE THICKNESS OF WALLS, OR OPTIMIZING DESIGN OF THE OUTRIGGER TRUSSES, WHAT MAKES POSSIBLE TO CONTROL THE WEIGHT OF THE CORE.
(HTTP://WWW.STRUCTUREMAG.ORG/ARTICLE.ASPX?ARTICLEID=393)

2014

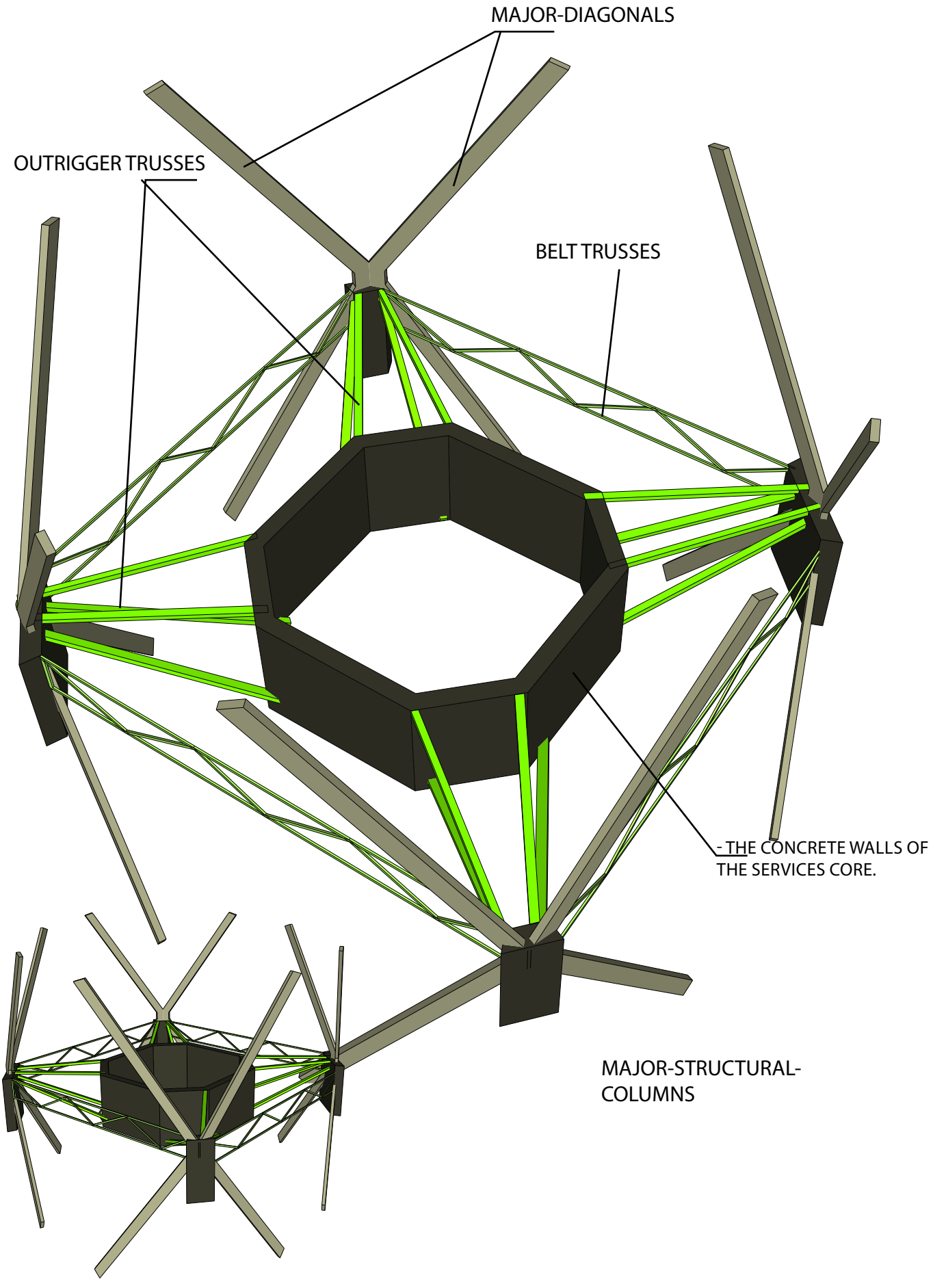
„HOLE“ in the building



FOUNDATION PILES



BASEMENT WALL


MAJOR-DIAGONALS
OUTRIGGER TRUSSES
BELT TRUSSES
- THE CONCRETE WALLS OF THE SERVICES CORE.
MAJOR-STRUCTURAL-COLUMNS

SKY NET

POPULATION DISTRIBUTION IN 1 KM^3; 1000000 PEOPLE

LABOR 44,00%

4,00% PRIMARY EMPLOYMENT
22,00% SECONDARY EMPLOYMENT
74,00% TERTIARY EMPLOYMENT

OFFICE 32,56%

325600,00 UNITS (9,5m^2 PER UNIT)

HOUSING 100,00%

EDUCATION 19,86%

49,24% PRIMARY 452 UNITS (5895,00m^2)
27,91% SECONDARY 42 UNITS (28873,00m^2)
9,63% VOCATIONAL SEC. 5 UNITS (78161,00m^2)
8,59% VOCATIONAL 4 UNITS (82504,00m^2)
4,63% UNIVERSITY 1 UNITS (282692,00m^2)

HEALT CARE 184,31%

0,11% GENERAL 9 UNITS (2457,56m^2)
0,21% PSYCHIATRIC 5 UNITS (111,50m^2)
0,10% MENTAL HEALT 9 UNITS (1501,61m^2)
0,05% NURSING 21 UNITS (2441,75m^2)
1,33% INSTITUT FOR SENSORY DISABLED 1 UNITS (65,10m^2)
0,01% ELDERLY PERSONS HOME 87 UNITS (4925,25m^2)
0,02% CHILDREN'S HOSPIOTAL 50 UNITS (5039,23m^2)

AGRYCULTURE 5,00%

1,00% ARABLE HOLDING FARMS	876 UNITS (350000,00m^2)	1141,55 PEOPLE
1,00% HORTICULTURE	195 UNITS (49000,00m^2)	5128,51 PEOPLE
1,00% PERMANENT CROP	338 UNITS (69000m^2)	2958,58 PEOPLE
1,00% FACTORY FARMS	567 UNITS (56000m^2)	1763,67 PEOPLE
1,00% IMIXED CROP	147 UNITS (270000m^2)	6802,72 PEOPLE

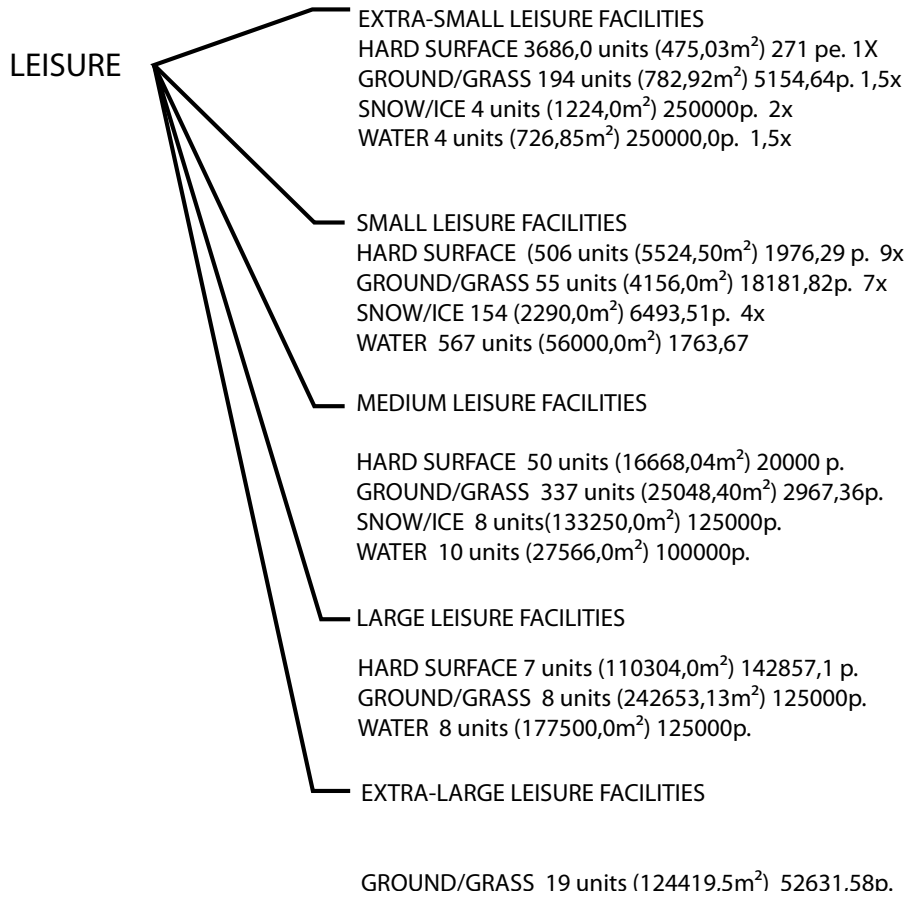
INDUSTRY 4,00%

1,0% SMALL ENTEPISES 287 UNITS (1091,0m^2) 3482,76 P 2x
1,0% MEDIUM 69 UNITS (2651,2m^2) 14492,75P 4,2x
1,0% LARGE 466 UNITS (8507,30m^2) 2145,92P 13x
1,0% EXTRA LARGE 34 UNITS (33214,00m^2) 29411 P 27x

SHOPING

FOOD&BEVERAGE 1822 UNITS (148,00m^2) 548,85 P/U 0,24x
PERSONAL CARE 230 UNITS (219,00m^2) 4347,83 P/U 0,35x
CLOTHING&ACCESSORIE 1361 UNITS (1336,00m^2) 734,75 P/U 2,13x
HOME STORES 1005 UNITS (260,00m^2) 995,02 P/U 0,40x
ELECTRONIC 262 UNITS (231,00m^2) 3816,79 P/U 0,36x
OFFICE&EDUCATION 159 UNITS (201,00m^2) 6289,91 P/U 0,37x
LEISURE 460 UNITS (234,00m^2) 2173,91 P/U 0,37x
LUXURY GOODS 120 UNITS (98,00m^2) 8333,3 P/U 0,17x

2014



TO GET A FEELING ABOUT SPACE AND ALSO ABOUT USABLE SPACE, WHICH PEOPLE NEED, I USED DETAILED ANALYSES OF THE PROJECT FOR MVRDV AND OBTAINED THE TOTAL VOLUME IN KM^3. THEY MADE A CITY WHICH HAS A TOTAL VOLUME OF 5 KM^3, SUITABLE FOR ONE MILLION PEOPLE. THIS GAVE ME THE IDEA, OR RATHER LED ME TO WONDER, HOW I WOULD HAVE ORGANIZED SUCH SPACE,5 IN 1 KM^3?

ONE MORE STEP TOWARDS SKY NET..

EXCURSIONS ON CAPACITIES KM3 MVRDV - CUBE STUDY ON THE COMPACT CITY/ BERLANGE INSTITUTE/ WIELAND & GOUWENS, 2000-2005. ACTAR ISBN-10: 8495951851

2014

SKY NET

2014

WHY LAGOS?

LAGOS, SO DISTANT, SO ALIEN,
SEEMS TO ME LIKE ALMOST DISCONNECTED FROM THE GLOBAL SYSTEM

REM KOOLHAAS

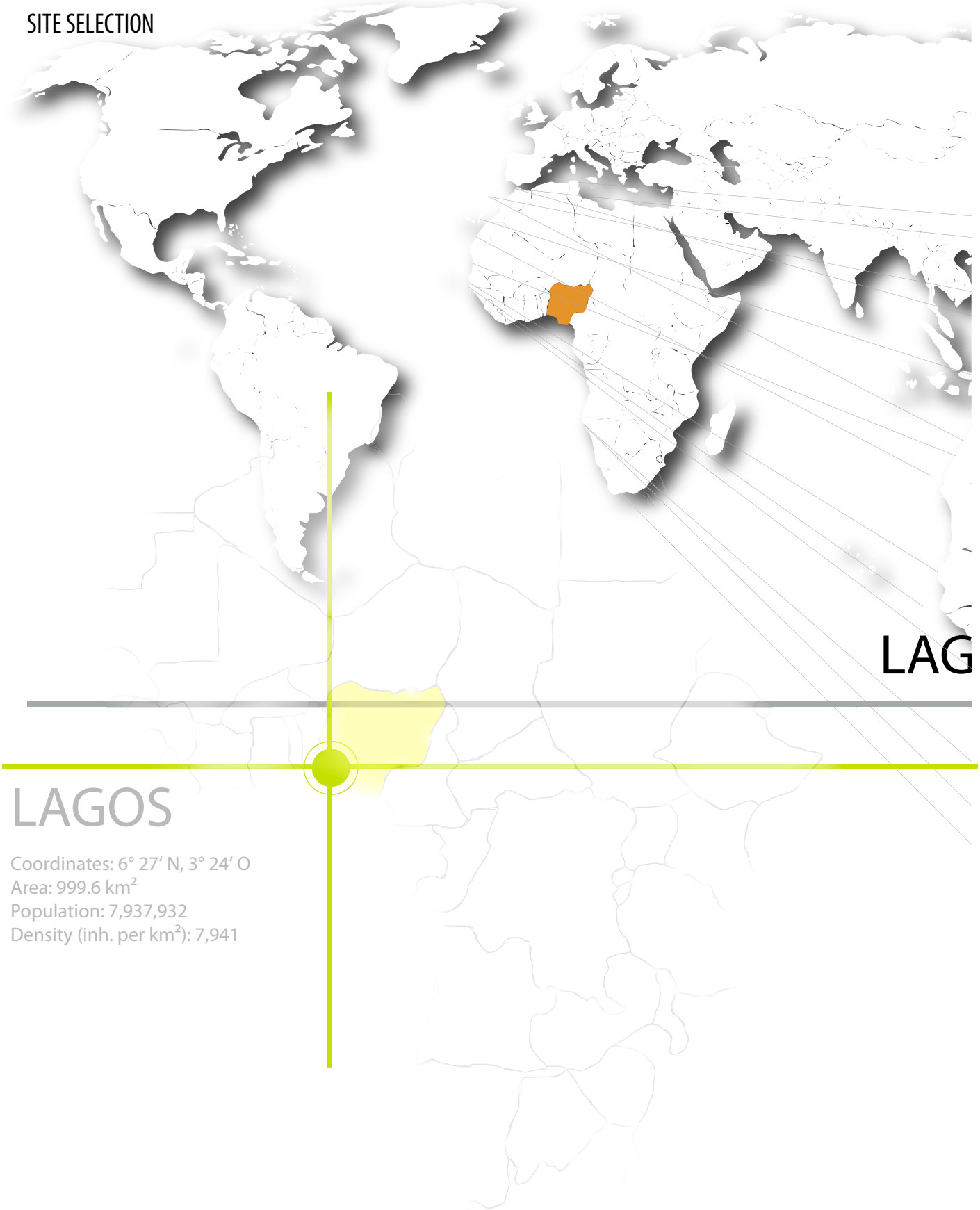
LAGOS IS QUITE LARGE, AND IT IS A CITY OF CONTRAST. IT'S CENTER OF BOUTH, POOREST AND FASTES-GROWING THE GOVERNOR OF LAGOS STATE TOLD REPORTERS LAST YEAR THAT "ABOUT TWO THIRDS OF THE STATE'S TOTAL LAND MASS OF 3,577 SQUARE KILOMETRES COULD BE CLASSIFIED AS SHANTIES OR SLUMS." [37] INDEED, WRITES A UN CORRESPONDENT,
LAGOS, MOREOVER, IS SIMPLY THE BIGGEST NODE IN THE SHANTYTOWN CORRIDOR OF 70 MILLION PEOPLE THAT STRETCHES FROM ABIDJAN TO IBADAN: PROBABLY THE BIGGEST CONTINUOUS FOOTPRINT OF URBAN POVERTY ON EARTH. [39] HTTP://WWW.BLACKCOMMENTATOR.COM/88/88_REPRINT_PLANET_SLUMS.HTML

THE REPORT SAID PROVIDING FOOD AND WATER FOR THE BILLION EXTRA PEOPLE ON THE CONTINENT BY 2050 WILL BE A HUGE PROBLEM, ESPECIALLY BECAUSE AFRICA EXPECTS TO BE HIT HARD BY CLIMATE CHANGE.
, WHICH CONTRIBUTE TO AFRICA'S FOOD AND WATER SECURITY."
"AS THE FASTEST URBANISING CONTINENT IN THE WORLD, AFRICA IS NOT ONLY CONFRONTED WITH THE CHALLENGE OF IMPROVING THE LIVES OF SLUM DWELLERS BUT ALSO THE CHALLENGE OF PREVENTING THE FORMATION OF NEW SLUMS," SAID JOAN
TO STRATEGIC URBAN PLANNING SO THAT THE NEEDS OF THE POOR WILL BE MET."
THE POPULATION OF LAGOS HAS INCREASED THIRTY TIMES OVER SINCE 1950. IN A CITY MARKED BY GREAT INEQUALITY, THE RICH LIVE IN AREAS SEPARATED FROM THE REST OF THE POPULATION. THE VAST MAJORITY BARELY SCRAPES A LIVING BY WORKING SEVERAL DIFFERENT JOBS. MANY COUNTRY PEOPLE HAVE COME TO LAGOS HOPING TO FIND WORK AND MAKE THEIR FORTUNE. BUYING A FEW PLANKS AND RECYCLING OTHER MATERIALS ENABLES THEM TO BUILD A HOME, SO THE CITY HAS MUSHROOMED AS SLUMS SPREAD RAPIDLY IN THE ABSENCE OF URBAN PLANNING. THESE SETTLEMENTS HAVE NO ELECTRICITY OR RUNNING WATER AND CAN DISAPPEAR AS QUICKLY AS THEY ARE BUILT WHEN BULLDOZERS CUT SWATHES THROUGH THE SLUMS TO CLEAR LAND FOR BUILDINGS. (PIC. HOMEMAPPLET.COM)
HTTP://LURGNETWORK.WORDPRESS.COM/CATEGORY/SITES-CONDITIONS/

AJU NGELE 8KM^2 - 1,5 MILLIONS PEOPLE. HOW MANY PEOPLLE CAN INHABITATE 8KM^3

"
IT IS THE SINGULAR TRUTH AWAITING THE SIX HUNDRED THOUSAND PEOPLE
"
WHO POUR INTO LAGOS FROM WEST AFRICA EVERY YEAR.

SITE SELECTION

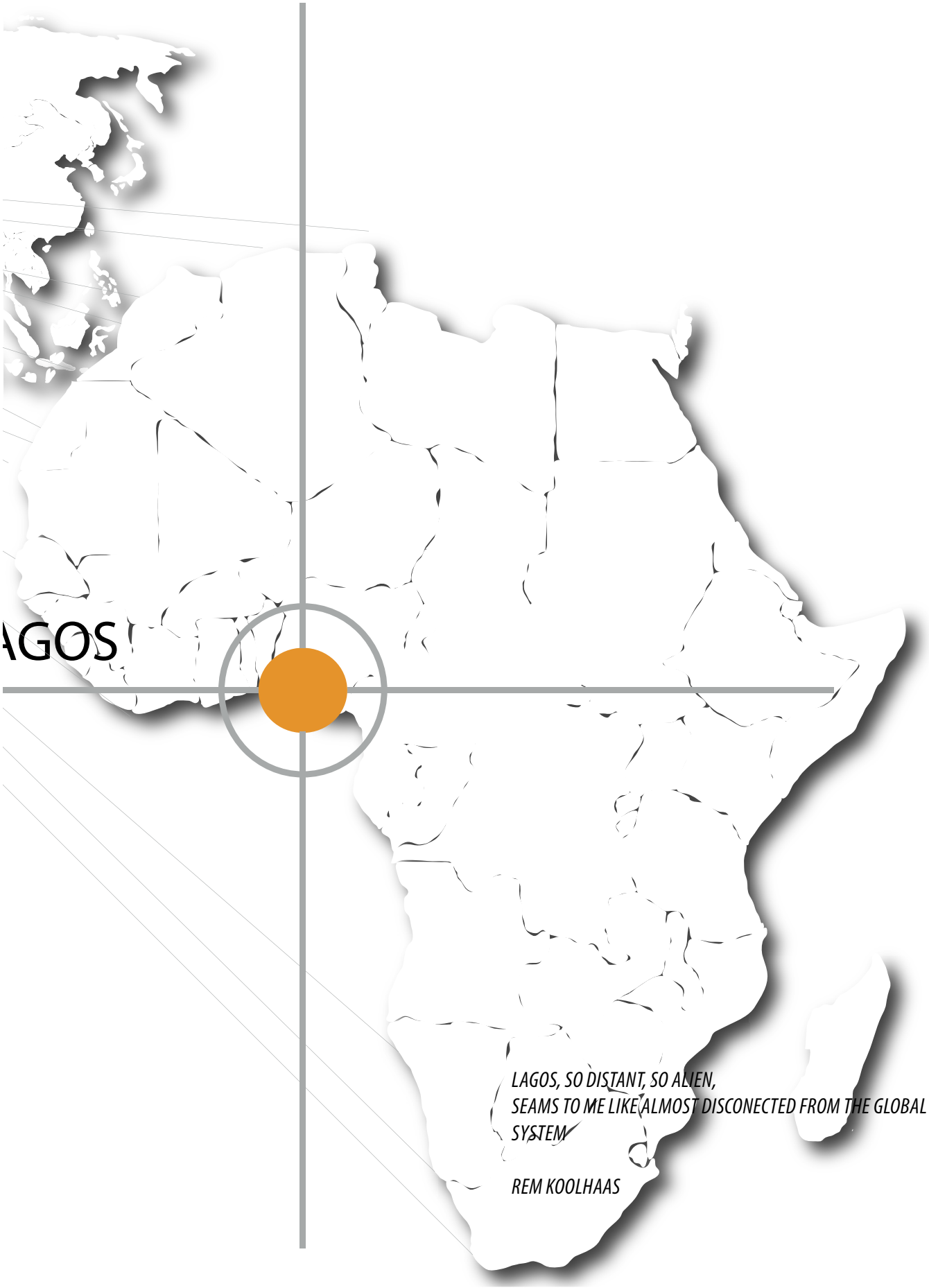


2014

LAG

LAGOS

Coordinates: 6° 27' N, 3° 24' O
Area: 999.6 km^2
Population: 7,937,932
Density (inh. per km^2): 7,941



LAGOS, SO DISTANT, SO ALIEN,
SEAMS TO ME LIKE ALMOST DISCONECTED FROM THE GLOBAL SYSTEM

REM KOOLHAAS

SKY NET

SITE SELECTION

• LAGOS STATE IS LOCATED ON A NARROW COASTAL PLAIN OF THE BIGHT OF BENIN. IT LIES APPROXIMATELY ON LONGITUDE 2.42'E AND 3.22'E RESPECTIVELY AND BETWEEN LATITUDE 6.22'N AND 6.20'N.

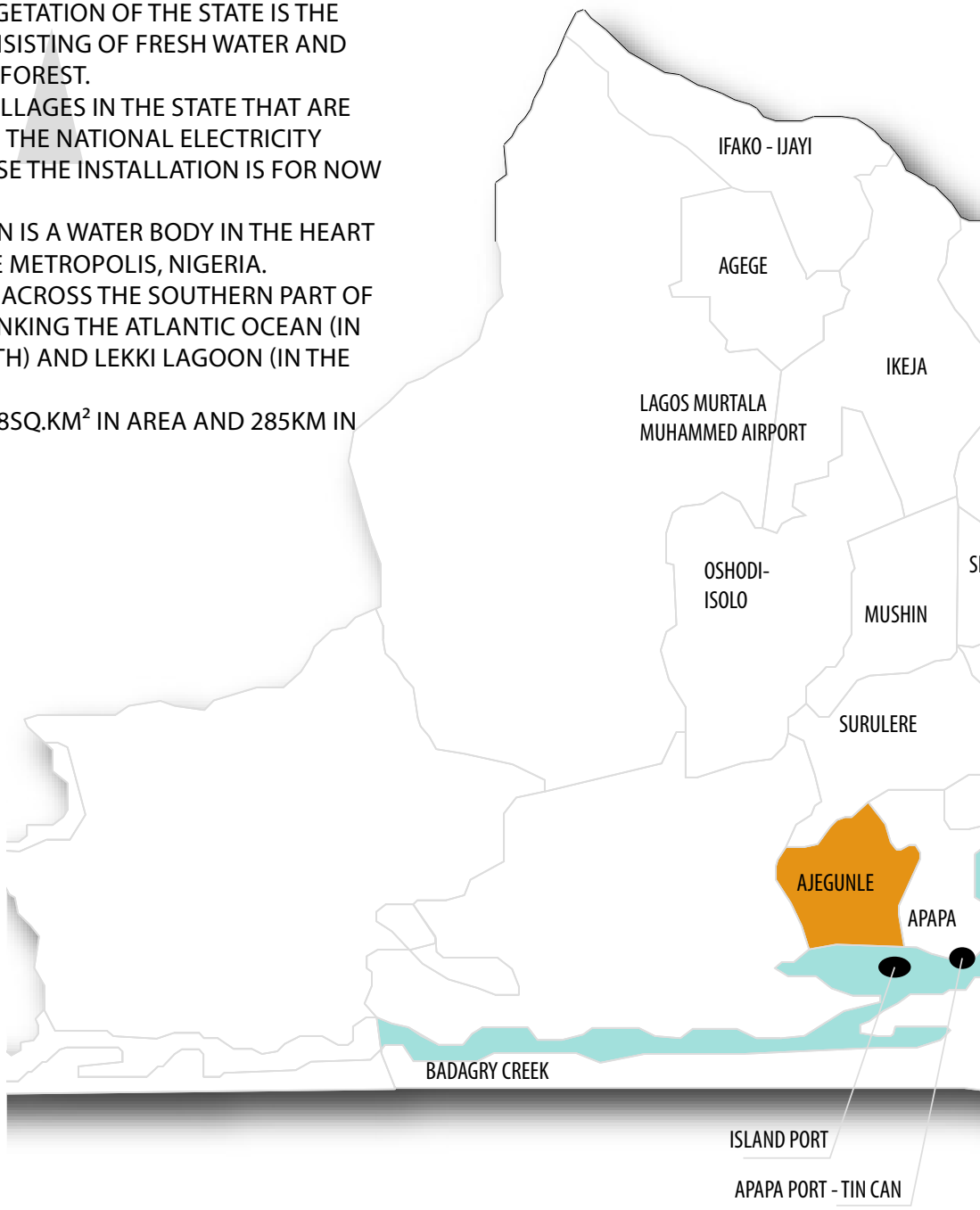
• THE DOMINANT VEGETATION OF THE STATE IS THE SWAMP FOREST CONSISTING OF FRESH WATER AND MANGROVE SWAMP FOREST.

• THERE ARE SOME VILLAGES IN THE STATE THAT ARE NOT CONNECTED TO THE NATIONAL ELECTRICITY POWER GRID BECAUSE THE INSTALLATION IS FOR NOW TOO EXPENSIVE.

• THE LAGOS LAGOON IS A WATER BODY IN THE HEART OF THE LAGOS STATE METROPOLIS, NIGERIA.

• THE LAGOON CUTS ACROSS THE SOUTHERN PART OF THE METROPOLIS, LINKING THE ATLANTIC OCEAN (IN THE WEST AND SOUTH) AND LEKKI LAGOON (IN THE EAST).

IT IS ABOUT 6354.708SQ.KM^2 IN AREA AND 285KM IN PERIMETER.



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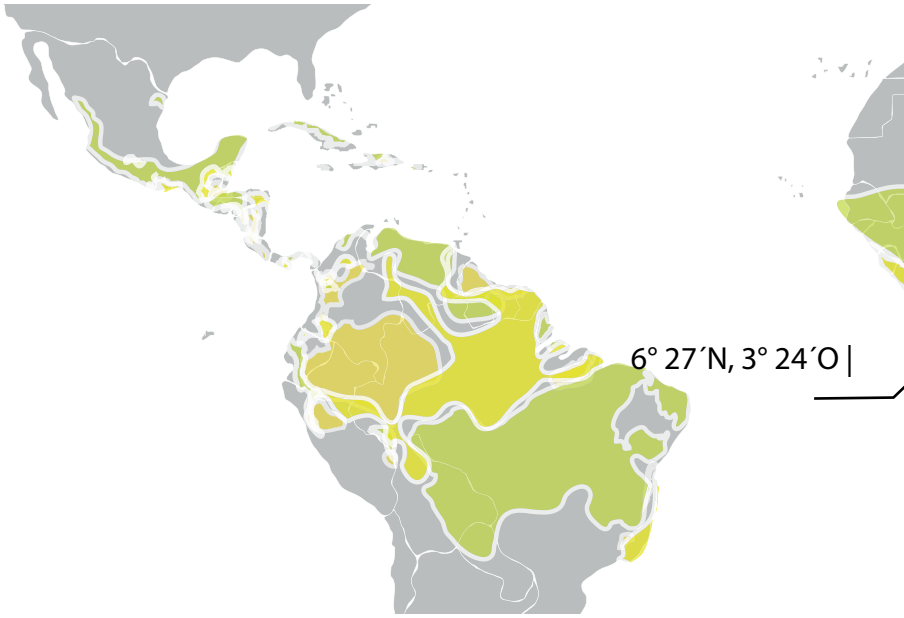
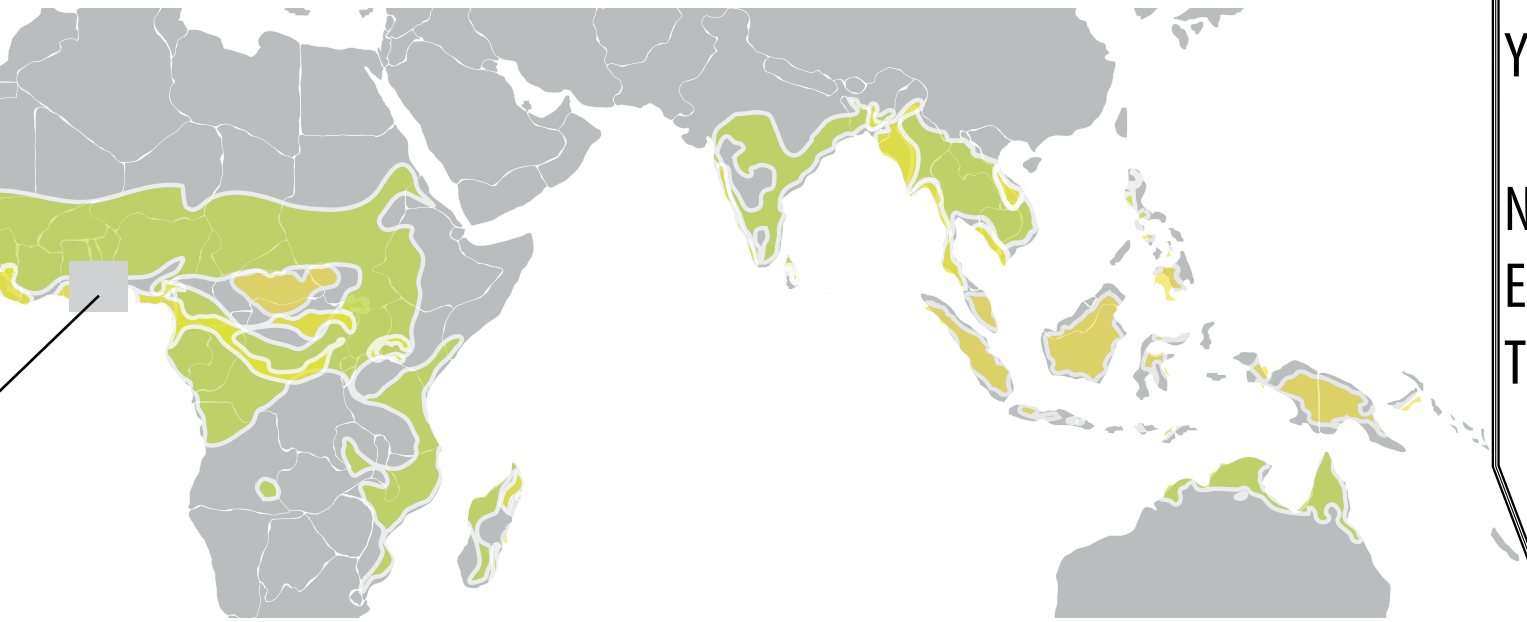
SKY NET

DOING RESEARCH ABOUT WHICH CITIES AND HOW CITIES ARE CHANGING, U.N. PROJECTIONS TO 2025 SUGGEST THAT THE FUTURE LIST OF MEGACITIES WILL BE DOMINATED BY LOWER-INCOME CITIES, WITH GROWTH PRIMARILY IN PLACES LIKE AFRICA AND CENTRAL ASIA. LAGOS CAME UP LIKE 3TH CITY IN THE WORLD WICH WILL HAVE OVER 15 MILLION PEOPLE, AFTER BEIJING, CHINA 22.6 AND KARACHI, PAKISTAN 20.2.

2014



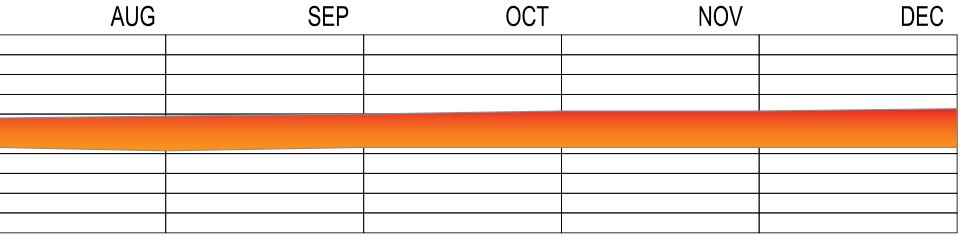
6° 27´N, 3° 24´O |



WORLD MAP SHOWING REGIONS WITH TROPICAL CLIMATE, WHICH ARE THE MOST VULNERABLE FROM CLIMATE CHAINGE.
THIS AREAS SHARE THE SAME HOT AND HUMID -ARID CONDITIONS PARTLY OR ALL OVER THE YEAR, AS THIS PROJECTS LOCATION

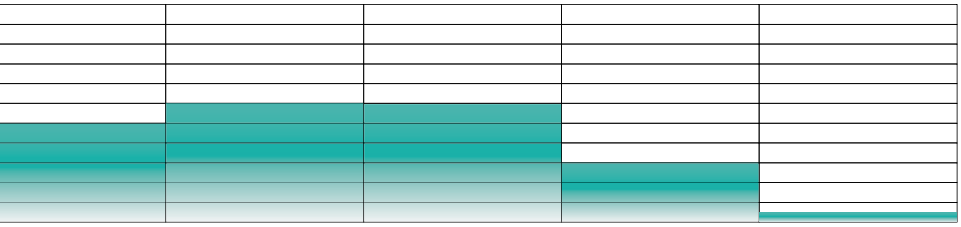
CLIMATE DATA _LAGOS

2014

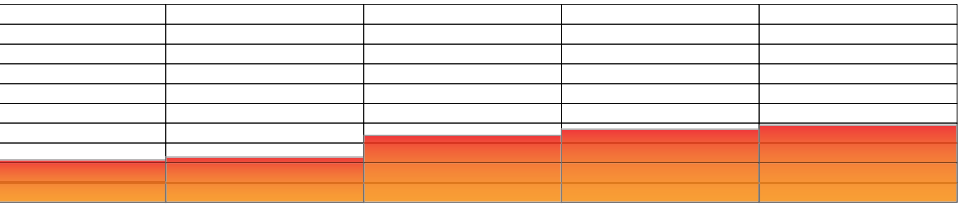


TEMPERATURE °C

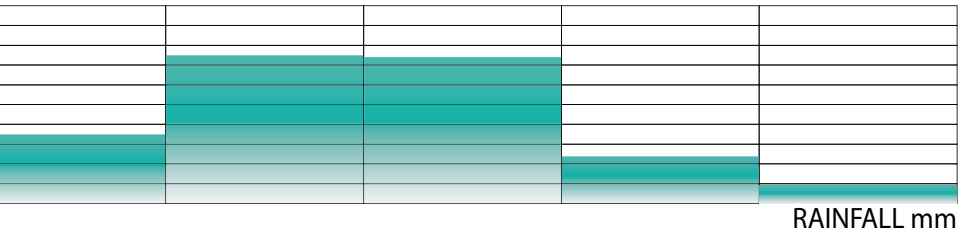
HUMIDITY %



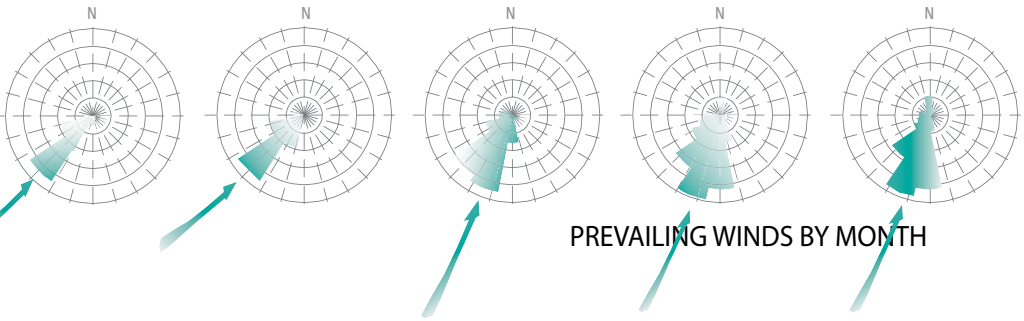
AVG.PRECIPITATION DAYS



SUNSHINE HOURS



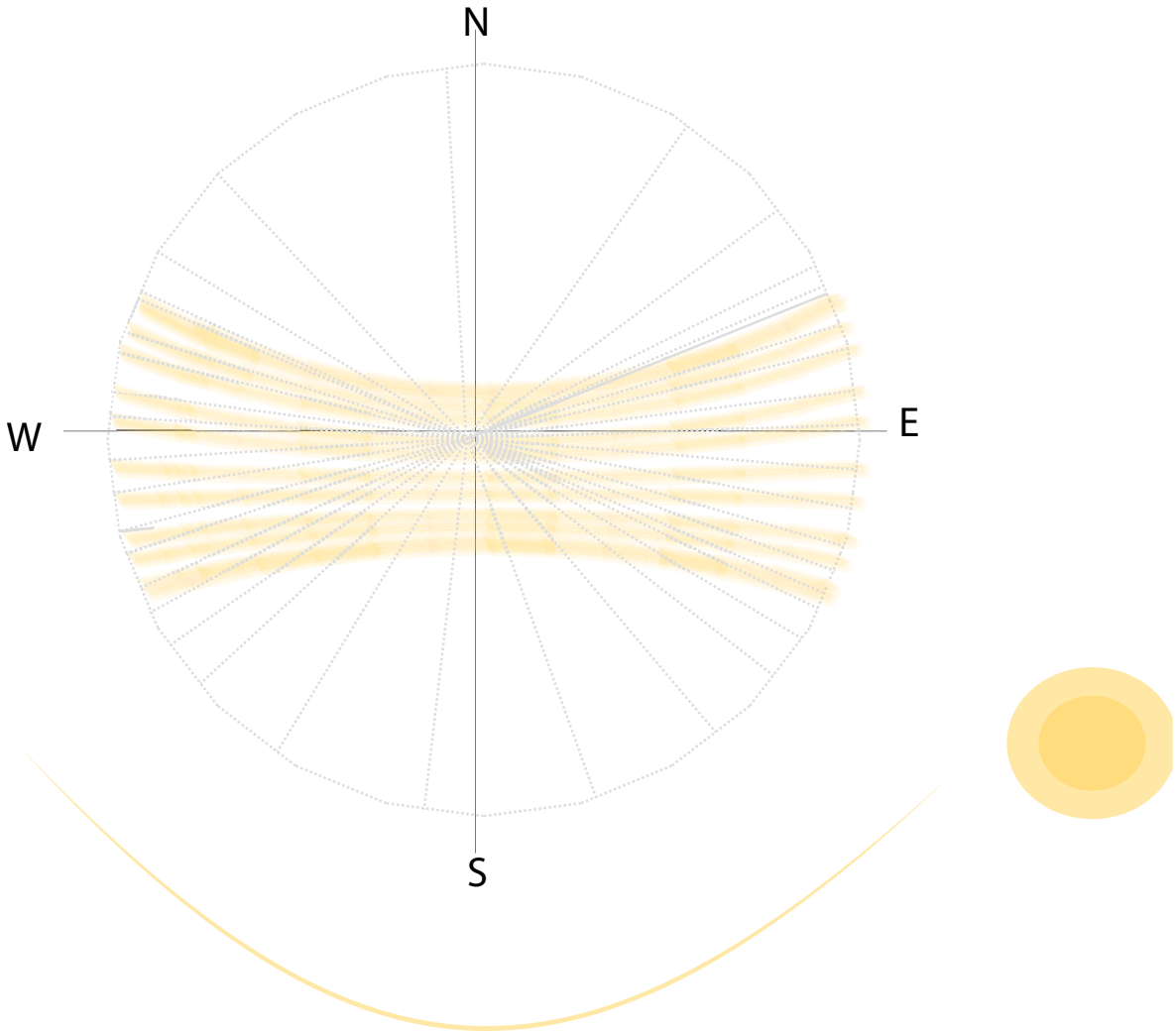
RAINFALL mm



PREVAILING WINDS BY MONTH

LAGOS IS INFLUENCED BY THE TROPICAL CLIMATE ZONE, **HOT AND HUMID CLIMATE CAN BE EXPECTED THROUGHOUT MOST OF THE YEAR** AND A FERTILE RAINY SEASON. THE HUMIDITY IS HIGH THROUGHOUT THE YEAR FROM 70 PERCENT IN THE DRY SEASON (NOVEMBER TO MARCH) AND TO 85 PERCENT IN THE WET SEASON (APRIL TO OCTOBER). THE MEAN ANNUAL AVERAGE TEMPERATURE IS 26.8 DEGREES CELSIUS. AT NIGHT IT COOLS MOSTLY FROM VERY LITTLE. THE ANNUAL RAINFALL IS ABOUT 1600 MILLIMETERS ON AVERAGE. THE AVERAGE MAXIMUM TEMPERATURES THROUGHOUT THE YEAR 28-33 DEGREES CELSIUS, MINIMUM TEMPERATURES 21 TO 24 DEGREES CELSIUS ON AVERAGE. MOST PRECIPITATION FALLS IN JUNE WITH MORE THAN 300 MILLIMETERS, THE FEWEST IN JANUARY WITH A GOOD 20 MILLIMETERS ON AVERAGE.

SKY NET



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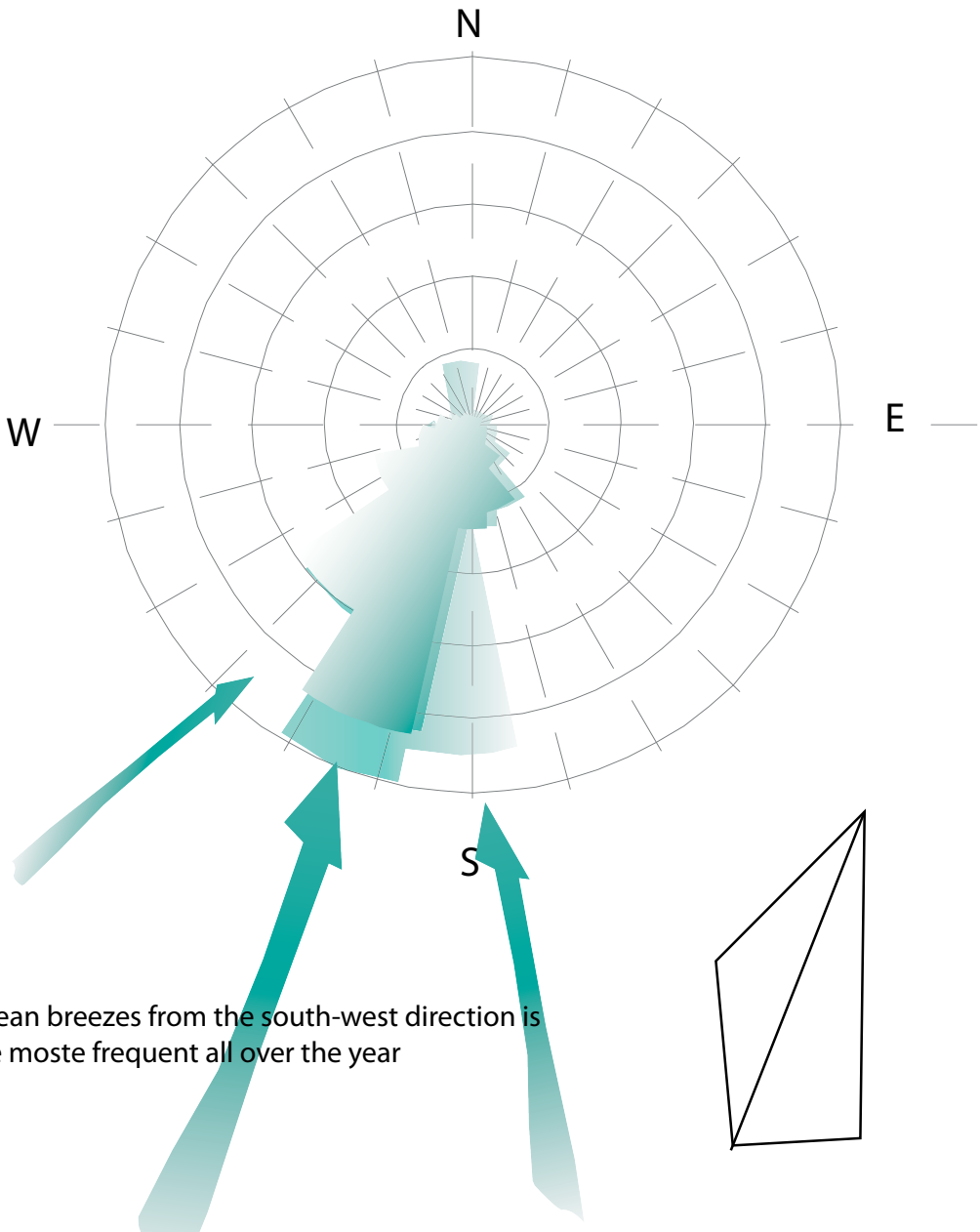
• NIGERIA LIES IN THE TROPICS AND RECEIVES ABUNDANT SOLAR RADIATION.

• LAGOS STATE HAS TWO CLIMATIC SEASONS, NAMELY DRY
SEASON (NOVEMBER-MARCH) AND WET SEASON (APRIL–OCTOBER). THE ANNUAL AVERAGE OF MEASURED DAILY GLOBAL IRRADIATION ON A HORIZONTAL SURFACE IN LAGOS IS 4323WH/M2/DAY.

• THE MONTHLY AVERAGE VARIES FROM A MAXIMUM OF 5861WH/M2/DAY IN FEBRUARY TO A MINIMUM OF 3231WH/M2/DAY IN JULY.
• THE AVERAGE ANNUAL RAINFALL IS 111ML PER ANNUM,
AVERAGE RELATIVE HUMIDITY IS 82%, AND THE MEAN

• THE AVERAGE ANNUAL RAINFALL IS 111ML PER ANNUM, AVERAGE RELATIVE HUMIDITY IS 82%, AND THE MEAN AVERAGE TEMPERATURE IS 26.7OC.

• THE MEAN DAILY SUNSHINE DURATION IS 4.9 HOURS PER DAY.



Ocean breezes from the south-west direction is the moste frequent all over the year

OCEAN BREEZES FROM THE SOUTH-WEST ARE THE MOST FREQUENT CASE ALL OVER THE YEAR

SKY NET

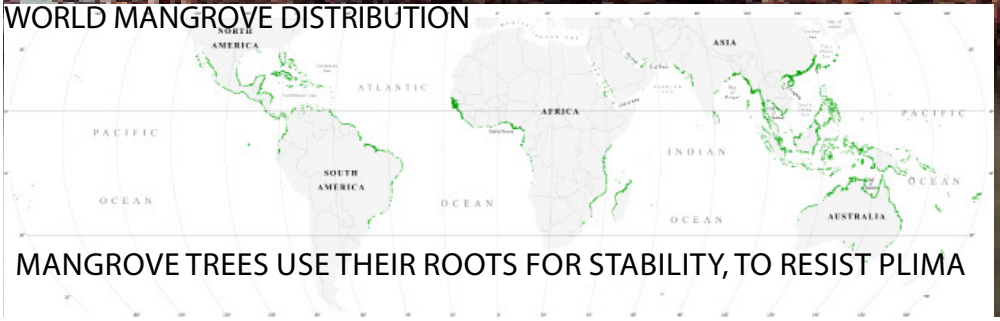
MICROCLIMATE_MANGROVE FOREST

NIGERIA HAS AFRICA'S LARGEST MANGROVE CONCENTRATION, SPANNING 36,000 KM2. OIL SPILLS AND LEAKS HAVE DESTROYED SIGNIFICANT PARTS IN THE LAST 50 YEARS, DAMAGING THE LOCAL FISHING ECONOMY AND WATER QUALITY.

FOR A PLANT TO SURVIVE IN THIS ENVIRONMENT, IT MUST TOLERATE BROAD RANGES OF SALINITY, TEMPERATURE, AND MOISTURE, AS WELL AS A NUMBER OF OTHER KEY ENVIRONMENTAL FACTORS-THUS ONLY A SELECTION OF FEW SPECIES MAKE UP THE MANGROVE TREE COMMUNITY.

2014

WORLD MANGROVE DISTRIBUTION

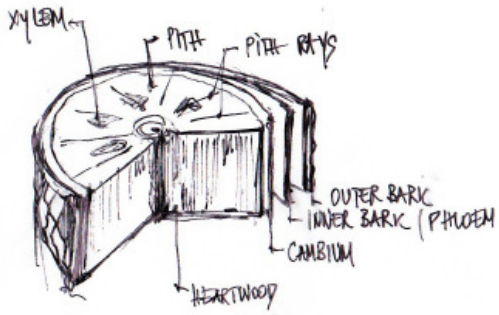


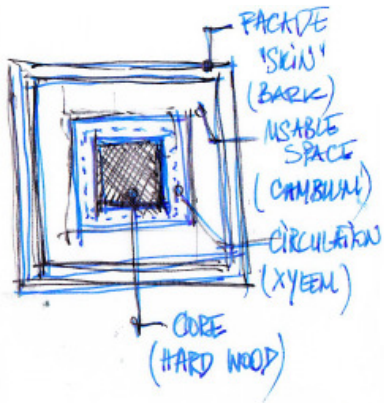
MANGROVE TREES USE THEIR ROOTS FOR STABILITY, TO RESIST PLIMA

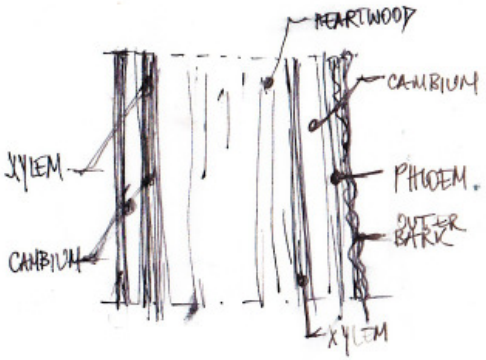
BUILDING TYPOLOGY
THREE STRUCTURE - MANGROVE

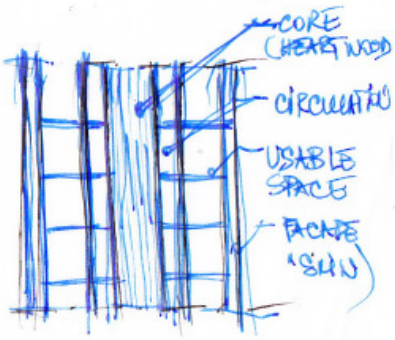
SKY NET

TREE STRUCTURE INVESTIGATION



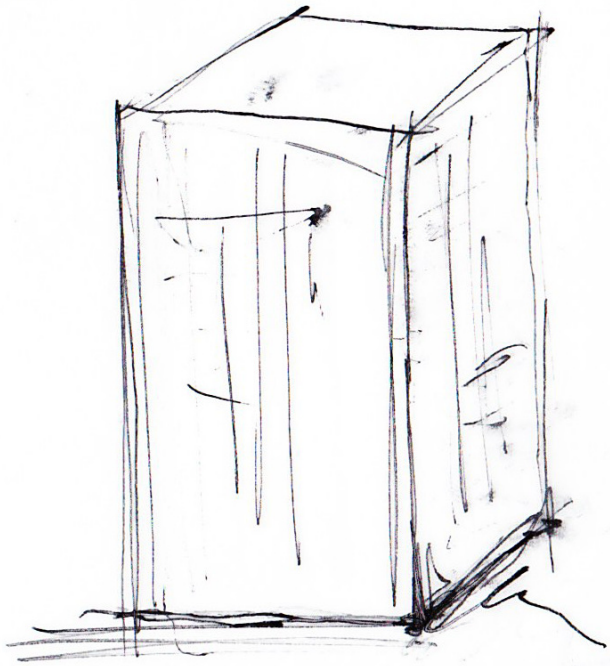






2014

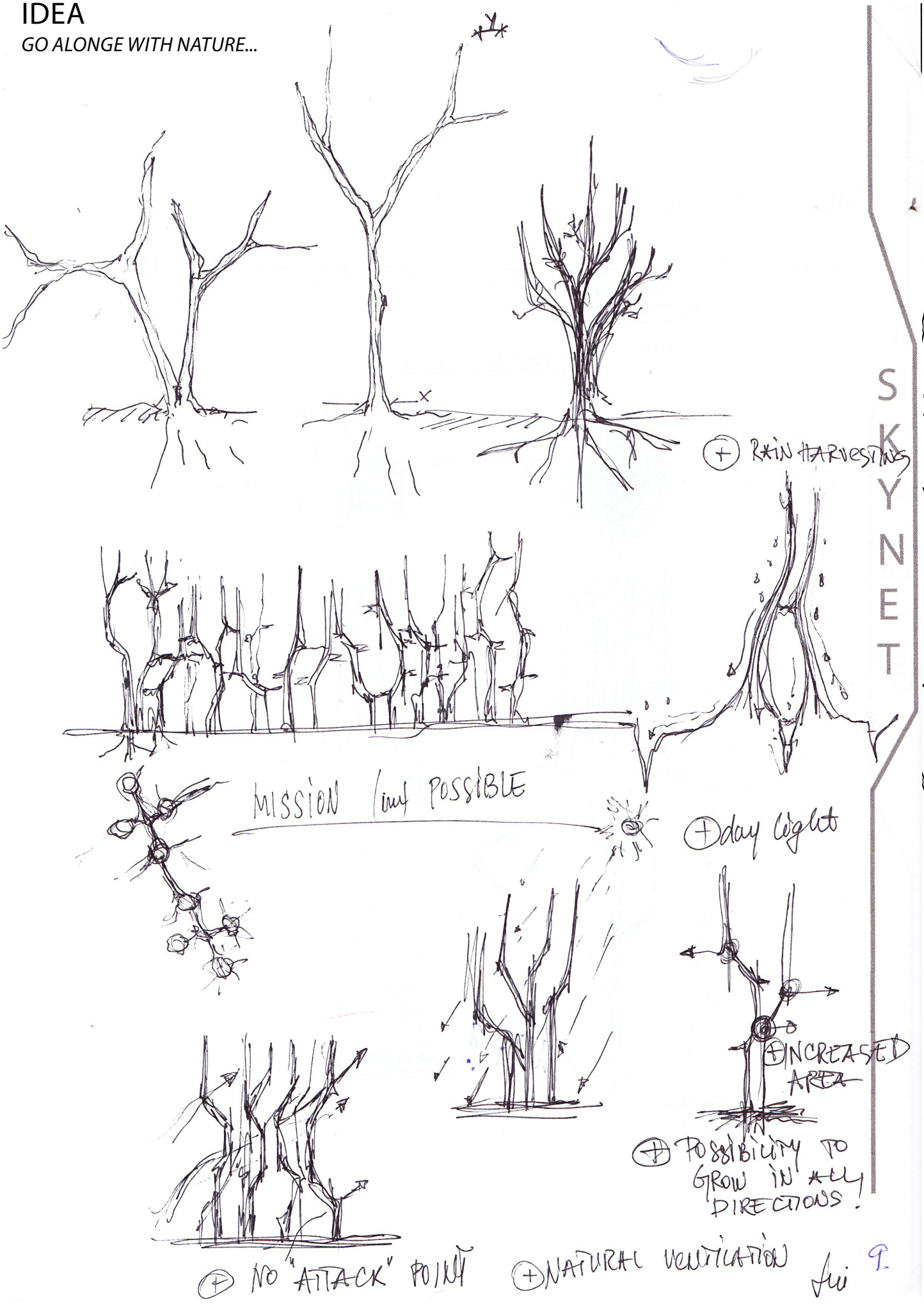
ZOOM OUT



WTF?!!

IDEA

GO ALONGE WITH NATURE...



SKYNET

SKYNET

WHY TREE STRUCTURE?
ADVANTAGES

NATURAL LIGHT

CONNECTIONS

ADAPTATION

POROSITY

STRATEGY:
optimization of function using design strategy
PASSIVE-ACTIVE

2014

BUILDING DEVELOPMENT - FORM FINDING

BUILDING DESIGN

IN THIS PROCESS I TOOK IN CONSIDERATION TO SOLVE PROBLEMS LIKE STABILITY AND CORE AREA, AND ON THE OTHER SIDE, FORM OF THE BUILDING IS ADAPTED TO THE CLIMATIC CONDITIONS

FOR DESIGNING MY SKY NET HABITABLE VERTICAL STRUCTURE I WAS USING TWO METHODS:

-EFFICIENT DISTANCE, FIRST PARAMETER TO REDUCE TRAWELING/WALLKING TIME, AND TO DEENCOURAGE ELIVATOR DEPENDECY
- MAIN WIND DIRECTION (HORISONTAL PARAMETER), TO MAKE POSSIBLE NATURAL VENTILATION, MAKING VOIDS OR (USED FOR MAKING MASTER PLAN)
-SUN ANGELS (VERTICAL PARAMETER), IN SEEN TO MODULATE BUILDING MOVEMENT AND BRANCHING DIRECTION, FOR SHADING

THESE BUILDING MUST MEET THE SAME PROBLEM AS THEIR ROLE MODELS.

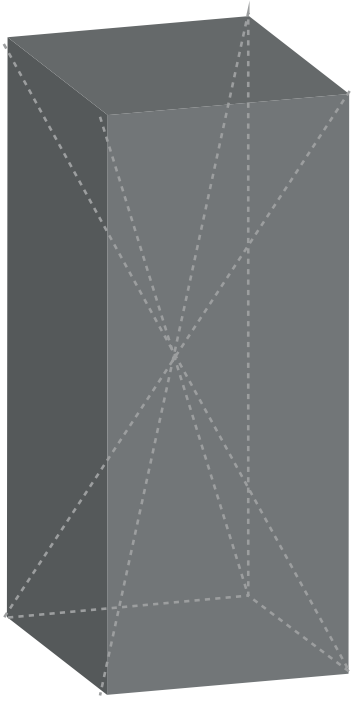
TEHNICAL PRIORITIES:

PROBLEM NR.1 - **STABILITY**
PROBLEM NR.2 - **REDUCTION OF CORE AREA**

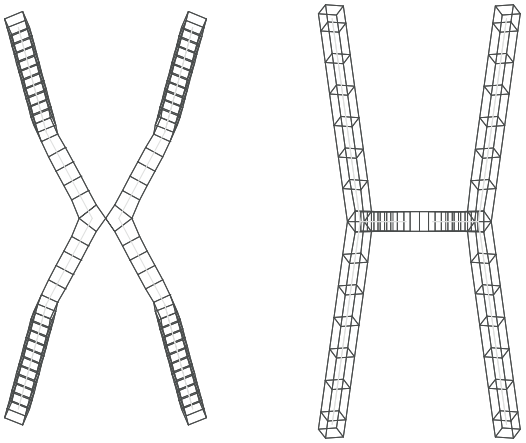
FORM FINDING

PRIORITY I - SHAIDING
PRIORITY II - NATURAL VENTILATION

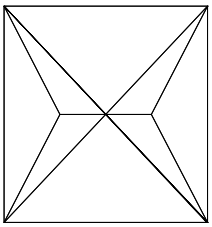
STABILITY - FORM FIDING

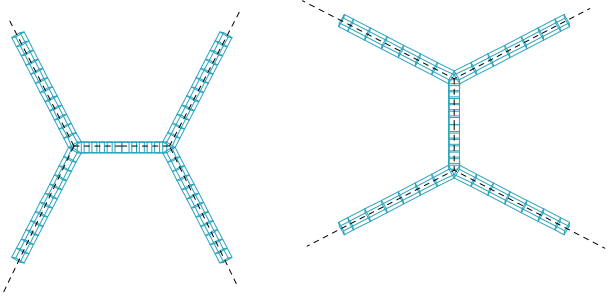


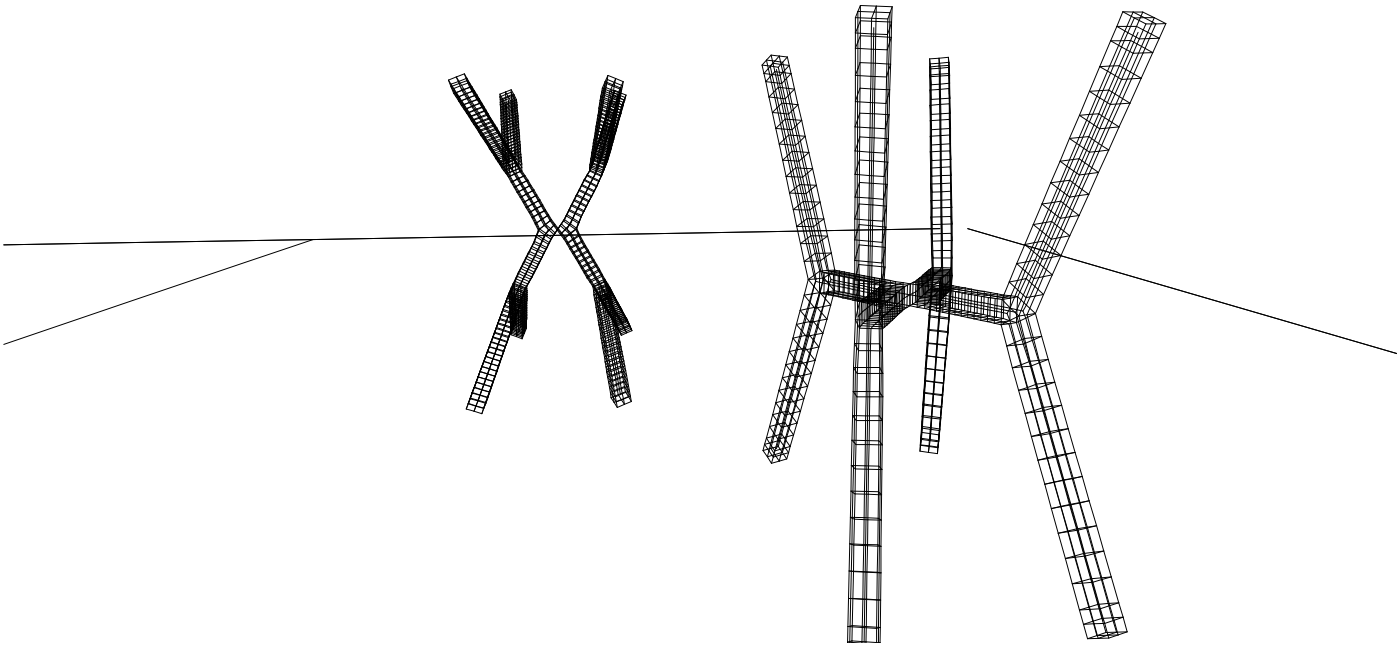
X STRUCTURE



THE GIGANTIC STRUCTURE MAY CRUSH THE PLACE, THAT IS WHY MUST BE INSERTED AS HARMONIOUS AS POSSIBLE IN SPACE.
THE RECTANGULAR BUILDING WOULD CAST A HUGE SHADOW ON THE SURROUNDING AND BUILDING IN THE AREA.
4-LEG DESIGN ARE AMONG THE MOST STABLE AND YET MOST DISCREET ARCHITECTURAL FORM
AN X-SHAPED BUILDING WILL CLAIMED RELATIVELY LITTLE STANDING AREA NEVERTHELESS COULD PENETRATE MORE LIGHT TO THE GROUND AND GET MORE VISIBILITY REMAIN SCARP SHAPE INCREASES STABILITY, BUT THE HEIGHT OF THE SKYSCRAPER WOULD BE THE PROBLEM, BECAUSE OF STRONGER IMPACT OF WIND THAN IN THE NORMAL SIZE OF SKYSCRAPERS.





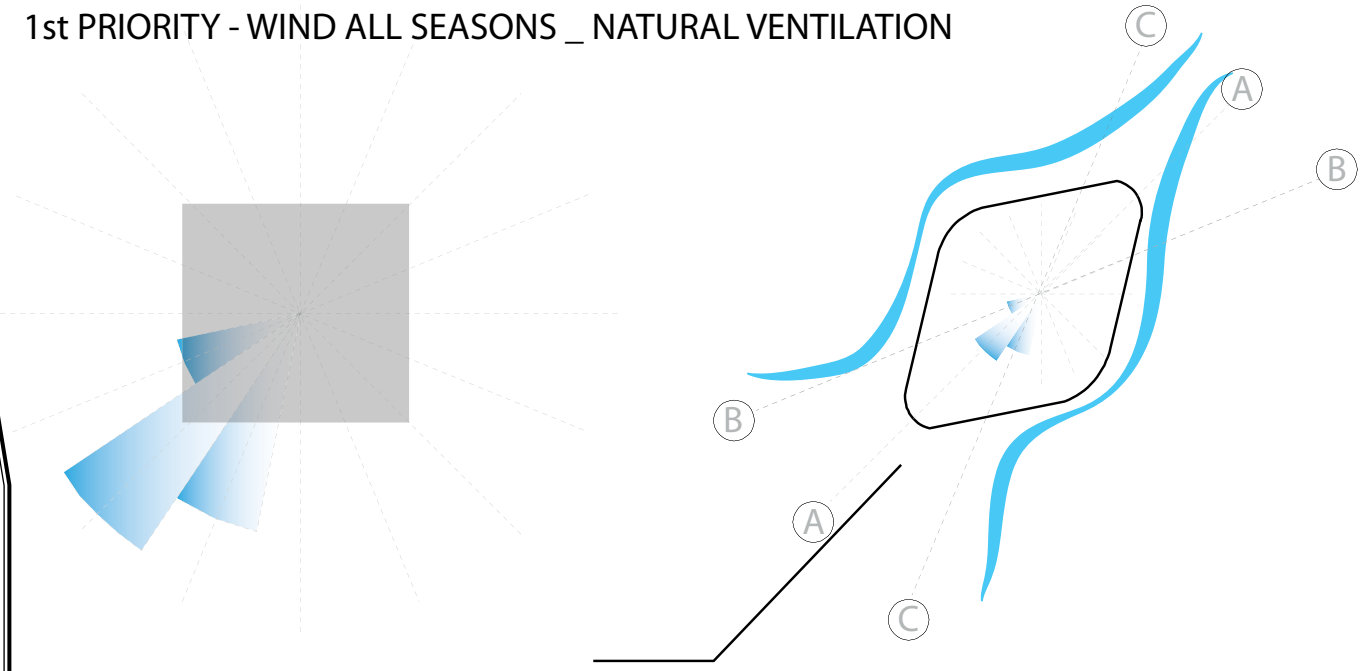


SKY NET

THE PART OF THE DESIGN TO REDUCE THE STRAIN OF THE PRESSURE WHICH CAUSES THE WIND, IS TO MAKE VOIDS THRU THE BUILDING „HOLE“ IS ONE OF THE STRATEGIES THAT I WILL USE TO MAKE BUILDING STABILE.

RESPONCE TO CLIMATE CONDITIONS

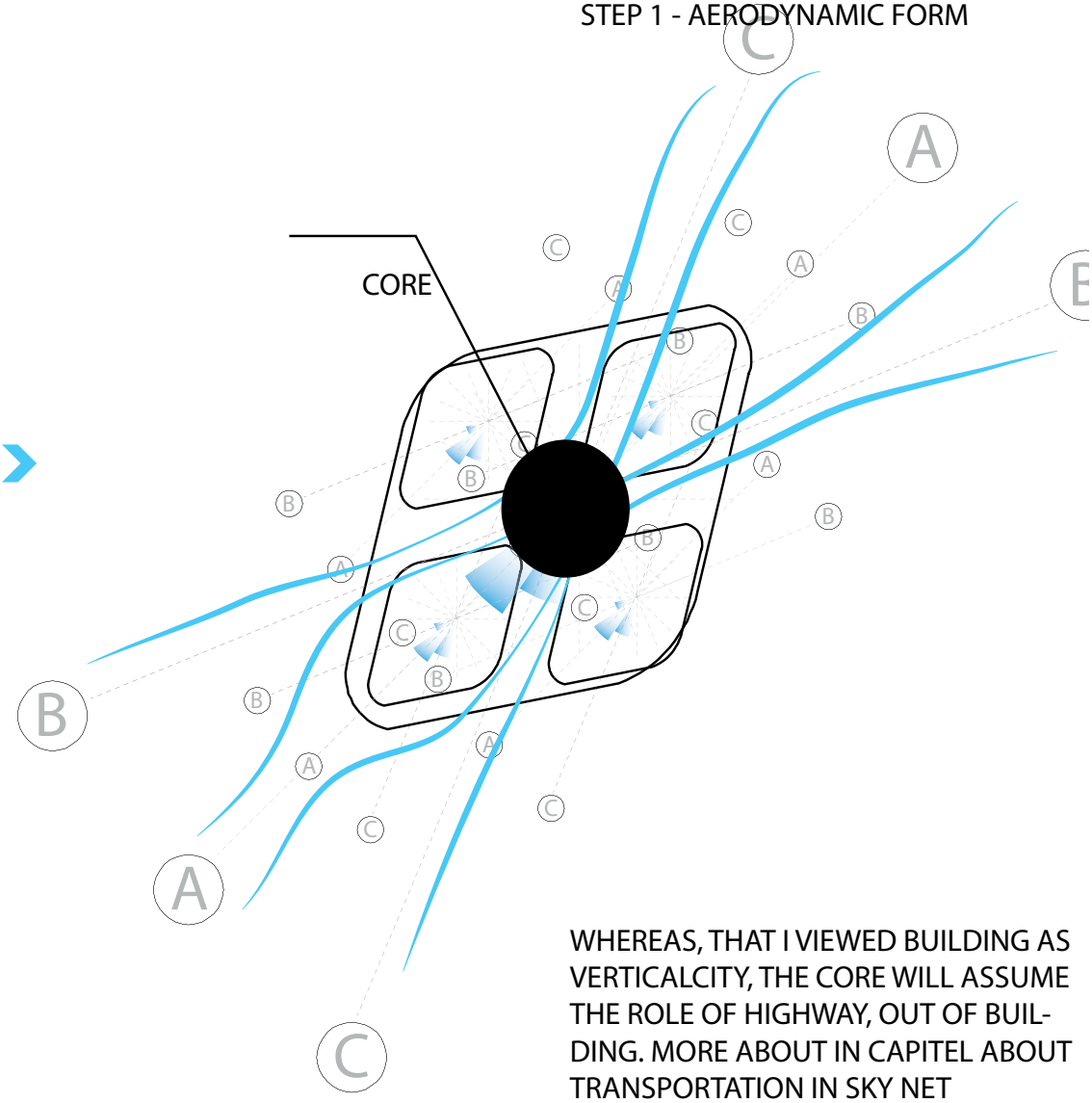
1st PRIORITY - WIND ALL SEASONS _ NATURAL VENTILATION



MAIN WIND DIRECTION S-W

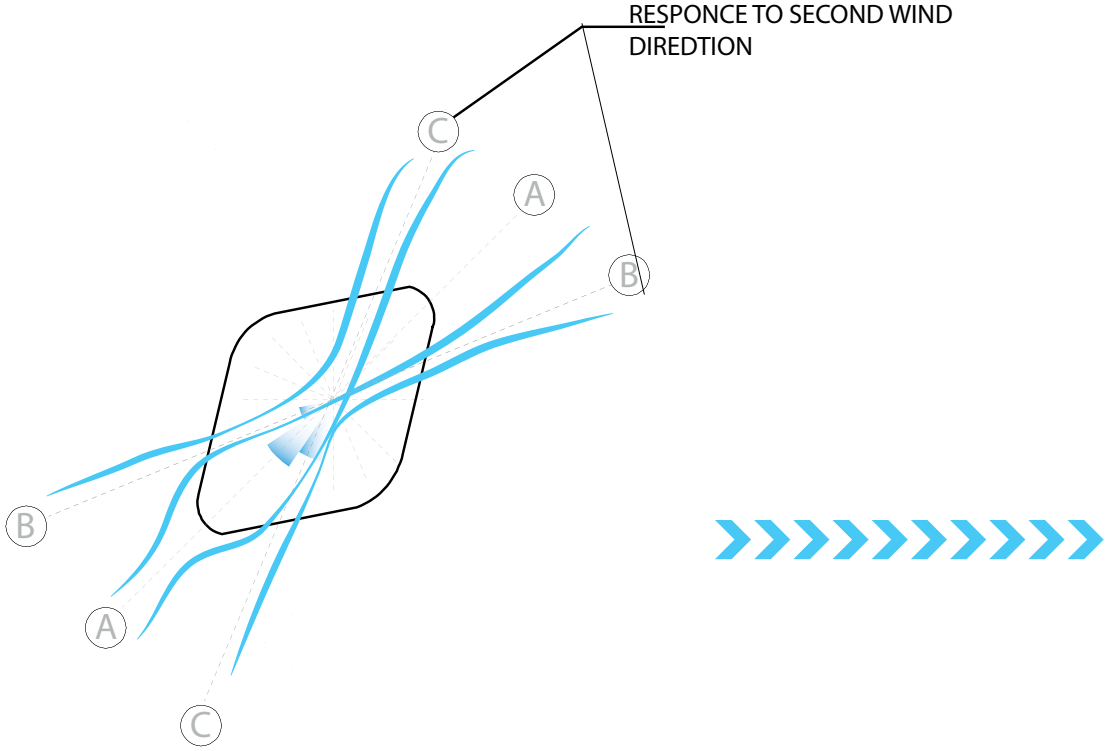
2014

STEP 1 - AERODYNAMIC FORM

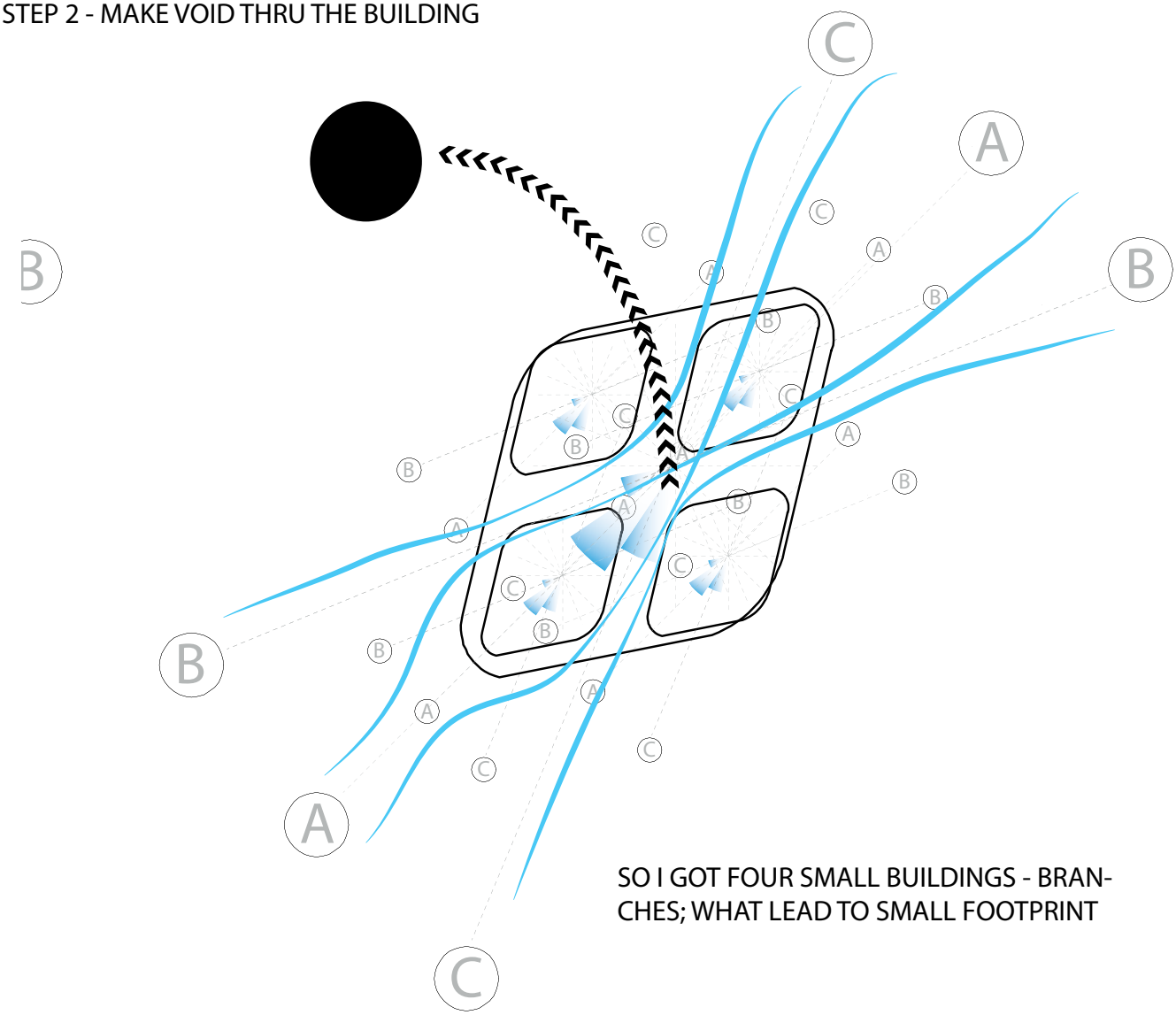


WHEREAS, THAT I VIEWED BUILDING AS VERTICALCITY, THE CORE WILL ASSUME THE ROLE OF HIGHWAY, OUT OF BUILDING. MORE ABOUT IN CAPITEL ABOUT TRANSPORTATION IN SKY NET

RESPONCE TO SECOND WIND DIREDTION



STEP 2 - MAKE VOID THRU THE BUILDING



SO I GOT FOUR SMALL BUILDINGS - BRANCHES; WHAT LEAD TO SMALL FOOTPRINT

SKY NET

Tabulated Daily Solar Data

Latitude: 6.6°
Longitude: 3.4°
Timezone: 15.0° [+1.0hrs]
Orientation: 0.0°

Date: 21st March
Julian Date: 80
Sunrise: 06:53
Sunset: 18:53

Local Correction: -53.6 mins
Equation of Time: -7.2 mins
Declination: -0.3°

Local	(Solar)	Aziumuth	Altitude	HSA	VSA	Shading
07:00	(06:06)	90.4°	1.6°	90.4°	105.7°	[Behind]
07:30	(06:36)	91.3°	9.0°	91.3°	98.2°	[Behind]
08:00	(07:06)	92.2°	16.5°	92.2°	97.5°	[Behind]
08:30	(07:36)	93.2°	23.9°	93.2°	97.2°	[Behind]
09:00	(08:06)	94.3°	31.3°	94.3°	97.1°	[Behind]
09:30	(08:36)	95.7°	38.8°	95.7°	97.0°	[Behind]
10:00	(09:06)	97.3°	46.2°	97.3°	97.0°	[Behind]
10:30	(09:36)	99.4°	53.5°	99.4°	96.9°	[Behind]
11:00	(10:06)	102.5°	60.8°	102.5°	96.9°	[Behind]
11:30	(10:36)	107.4°	68.0°	107.4°	96.9°	[Behind]
12:00	(11:06)	116.6°	75.0°	116.6°	96.9°	[Behind]
12:30	(11:36)	139.1°	81.0°	139.1°	96.9°	[Behind]
13:00	(12:06)	-166.8°	83.0°	-166.8°	96.9°	[Behind]
13:30	(12:36)	-126.7°	78.6°	-126.7°	96.9°	[Behind]
14:00	(13:06)	-111.9°	72.1°	-111.9°	96.9°	[Behind]
14:30	(13:36)	-105.0°	65.0°	-105.0°	96.9°	[Behind]
15:00	(14:06)	-101.0°	57.7°	-101.0°	96.9°	[Behind]
15:30	(14:36)	-98.4°	50.4°	-98.4°	96.9°	[Behind]
16:00	(15:06)	-96.5°	43.0°	-96.5°	97.0°	[Behind]
16:30	(15:36)	-95.1°	35.6°	-95.1°	97.0°	[Behind]
17:00	(16:06)	-93.8°	28.2°	-93.8°	97.1°	[Behind]
17:30	(16:36)	-92.8°	20.7°	-92.8°	97.3°	[Behind]
18:00	(17:06)	-91.8°	13.3°	-91.8°	97.7°	[Behind]
18:30	(17:36)	-90.9°	5.8°	-90.9°	99.1°	[Behind]

Tabulated Daily Solar Data

Latitude: 6.6°
Longitude: 3.4°
Timezone: 15.0° [+1.0hrs]
Orientation: 0.0°

Date: 22nd June
Julian Date: 173
Sunrise: 06:36
Sunset: 18:59

Local Correction: -48.2 mins
Equation of Time: -1.8 mins
Declination: 23.4°

Local	(Solar)	Aziumuth	Altitude	HSA	VSA	Shading
07:00	(06:11)	67.0°	5.3°	67.0°	13.4°	6%
07:30	(06:41)	67.4°	12.2°	67.4°	29.3°	15%
08:00	(07:11)	67.4°	19.1°	67.4°	42.0°	29%
08:30	(07:41)	67.1°	25.9°	67.1°	51.3°	52%
09:00	(08:11)	66.3°	32.8°	66.3°	58.0°	63%
09:30	(08:41)	64.9°	39.6°	64.9°	62.8°	72%
10:00	(09:11)	62.7°	46.3°	62.7°	66.3°	81%
10:30	(09:41)	59.4°	52.8°	59.4°	68.8°	86%
11:00	(10:11)	54.2°	59.0°	54.2°	70.6°	92%
11:30	(10:41)	46.1°	64.8°	46.1°	71.9°	95%
12:00	(11:11)	33.3°	69.6°	33.3°	72.7°	99%
12:30	(11:41)	14.1°	72.6°	14.1°	73.1°	100%
13:00	(12:11)	-9.3°	72.9°	-9.3°	73.1°	100%
13:30	(12:41)	-29.7°	70.4°	-29.7°	72.8°	100%
14:00	(13:11)	-43.8°	65.9°	-43.8°	72.1°	99%
14:30	(13:41)	-52.7°	60.3°	-52.7°	71.0°	96%
15:00	(14:11)	-58.4°	54.1°	-58.4°	69.3°	87%
15:30	(14:41)	-62.1°	47.7°	-62.1°	66.9°	83%
16:00	(15:11)	-64.5°	41.0°	-64.5°	63.7°	77%
16:30	(15:41)	-66.1°	34.2°	-66.1°	59.2°	62%
17:00	(16:11)	-67.0°	27.4°	-67.0°	53.0°	50%
17:30	(16:41)	-67.4°	20.5°	-67.4°	44.3°	40%
18:00	(17:11)	-67.4°	13.6°	-67.4°	32.3°	16%
18:30	(17:41)	-67.1°	6.8°	-67.1°	17.0°	8%

2014

Tabulated Daily Solar Data

Latitude: 6.6°
Longitude: 3.4°
Timezone: 15.0° [+1.0hrs]
Orientation: 0.0°

Date: 23rd September
Julian Date: 266
Sunrise: 06:38
Sunset: 18:38

Local Correction: -38.8 mins
Equation of Time: 7.6 mins
Declination: 0.2°

Local	(Solar)	Aziumuth	Altitude	HSA	VSA	Shading
07:00	(06:21)	90.4°	5.3°	90.4°	94.4°	[Behind]
07:30	(06:51)	91.3°	12.7°	91.3°	95.7°	[Behind]
08:00	(07:21)	92.2°	20.2°	92.2°	96.0°	[Behind]
08:30	(07:51)	93.2°	27.6°	93.2°	96.2°	[Behind]
09:00	(08:21)	94.4°	35.1°	94.4°	96.2°	[Behind]
09:30	(08:51)	95.8°	42.5°	95.8°	96.3°	[Behind]
10:00	(09:21)	97.6°	49.9°	97.6°	96.3°	[Behind]
10:30	(09:51)	100.0°	57.3°	100.0°	96.4°	[Behind]
11:00	(10:21)	103.6°	64.6°	103.6°	96.4°	[Behind]
11:30	(10:51)	109.8°	71.7°	109.8°	96.4°	[Behind]
12:00	(11:21)	123.1°	78.4°	123.1°	96.4°	[Behind]
12:30	(11:51)	161.0°	83.2°	161.0°	96.4°	[Behind]
13:00	(12:21)	-140.2°	81.7°	-140.2°	96.4°	[Behind]
13:30	(12:51)	-116.1°	75.7°	-116.1°	96.4°	[Behind]
14:00	(13:21)	-106.7°	68.8°	-106.7°	96.4°	[Behind]
14:30	(13:51)	-101.9°	61.5°	-101.9°	96.4°	[Behind]
15:00	(14:21)	-98.9°	54.2°	-98.9°	96.3°	[Behind]
15:30	(14:51)	-96.8°	46.8°	-96.8°	96.3°	[Behind]
16:00	(15:21)	-95.2°	39.4°	-95.2°	96.3°	[Behind]
16:30	(15:51)	-93.9°	32.0°	-93.9°	96.2°	[Behind]
17:00	(16:21)	-92.8°	24.5°	-92.8°	96.1°	[Behind]
17:30	(16:51)	-91.8°	17.1°	-91.8°	95.9°	[Behind]
18:00	(17:21)	-90.9°	9.6°	-90.9°	95.4°	[Behind]
18:30	(17:51)	-90.0°	2.2°	-90.0°	88.7°	0%

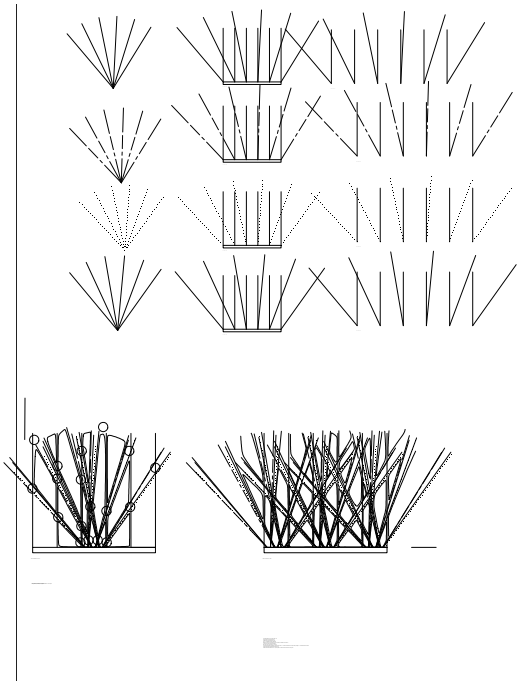
Tabulated Daily Solar Data

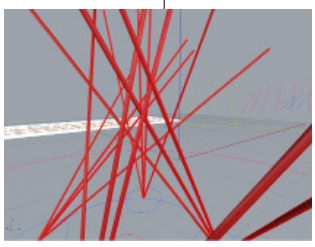
Latitude: 6.6°
Longitude: 3.4°
Timezone: 15.0° [+1.0hrs]
Orientation: 0.0°

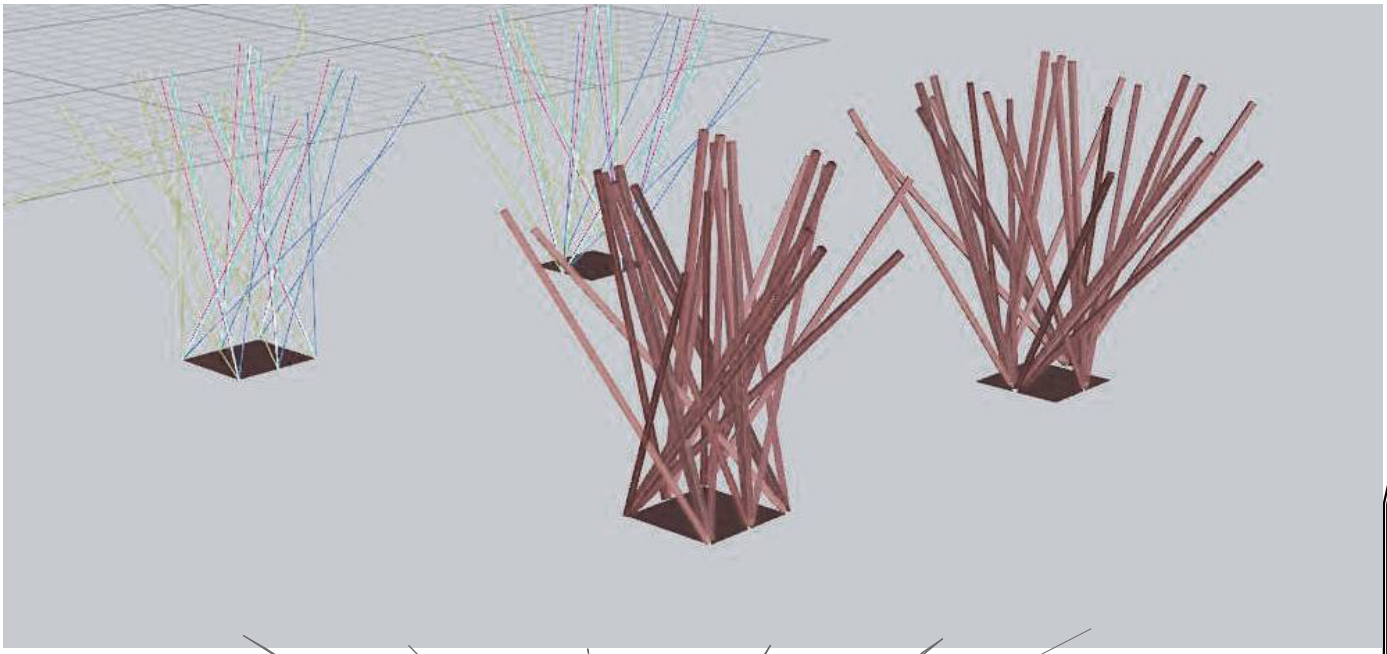
Date: 21st December
Julian Date: 355
Sunrise: 06:55
Sunset: 18:32

Local Correction: -44.3 mins
Equation of Time: 2.1 mins
Declination: -23.5°

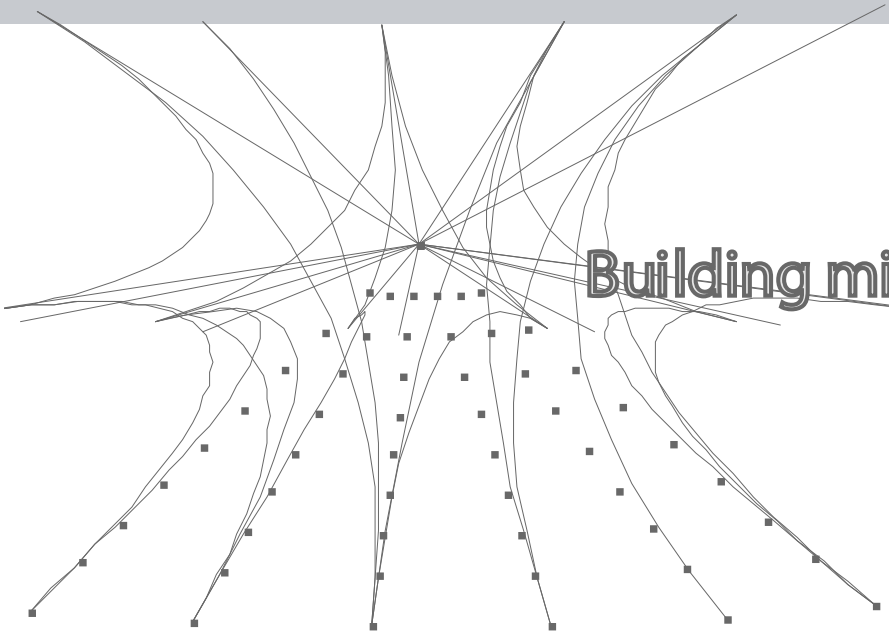
Local	(Solar)	Aziumuth	Altitude	HSA	VSA	Shading
07:00	(06:15)	113.8°	1.0°	113.8°	177.6°	[Behind]
07:30	(06:45)	114.9°	7.7°	114.9°	162.1°	[Behind]
08:00	(07:15)	116.4°	14.5°	116.4°	149.8°	[Behind]
08:30	(07:45)	118.3°	21.1°	118.3°	140.9°	[Behind]
09:00	(08:15)	120.8°	27.6°	120.8°	134.5°	[Behind]
09:30	(08:45)	124.1°	33.9°	124.1°	129.9°	[Behind]
10:00	(09:15)	128.3°	39.9°	128.3°	126.5°	[Behind]
10:30	(09:45)	133.6°	45.5°	133.6°	124.1°	[Behind]
11:00	(10:15)	140.6°	50.6°	140.6°	122.4°	[Behind]
11:30	(10:45)	149.5°	54.9°	149.5°	121.2°	[Behind]
12:00	(11:15)	160.6°	58.0°	160.6°	120.5°	[Behind]
12:30	(11:45)	173.5°	59.7°	173.5°	120.1°	[Behind]
13:00	(12:15)	-172.9°	59.7°	-172.9°	120.1°	[Behind]
13:30	(12:45)	-160.0°	57.9°	-160.0°	120.5°	[Behind]
14:00	(13:15)	-149.0°	54.7°	-149.0°	121.3°	[Behind]
14:30	(13:45)	-140.2°	50.4°	-140.2°	122.5°	[Behind]
15:00	(14:15)	-133.3°	45.3°	-133.3°	124.2°	[Behind]
15:30	(14:45)	-128.0°	39.6°	-128.0°	126.7°	[Behind]
16:00	(15:15)	-123.9°	33.6°	-123.9°	130.1°	[Behind]
16:30	(15:45)	-120.7°	27.3°	-120.7°	134.7°	[Behind]
17:00	(16:15)	-118.2°	20.8°	-118.2°	141.3°	[Behind]
17:30	(16:45)	-116.3°	14.1°	-116.3°	150.3°	[Behind]
18:00	(17:15)	-114.8°	7.4°	-114.8°	162.7°	[Behind]
18:30	(17:45)	-113.7°	0.6°	-113.7°	178.4°	[Behind]



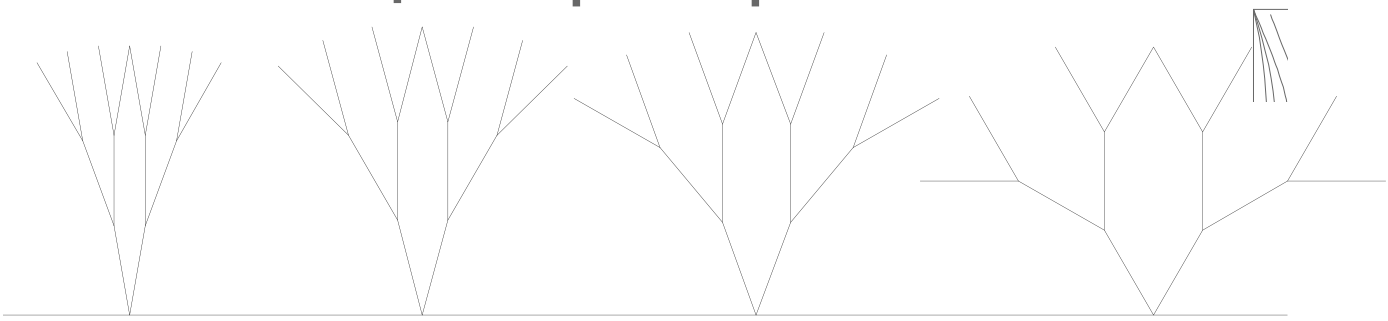




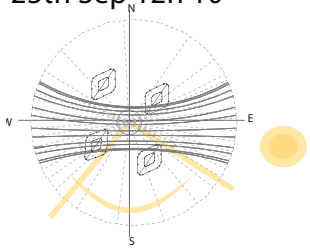
SKY NET



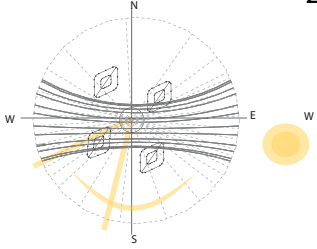
Building minimal f



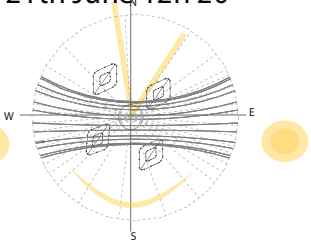
23th Sep 12h 10°



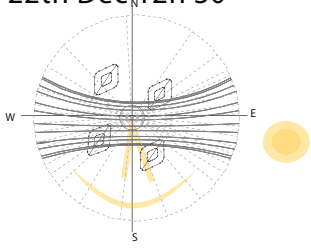
21th March 12h



21th June 12h 20°



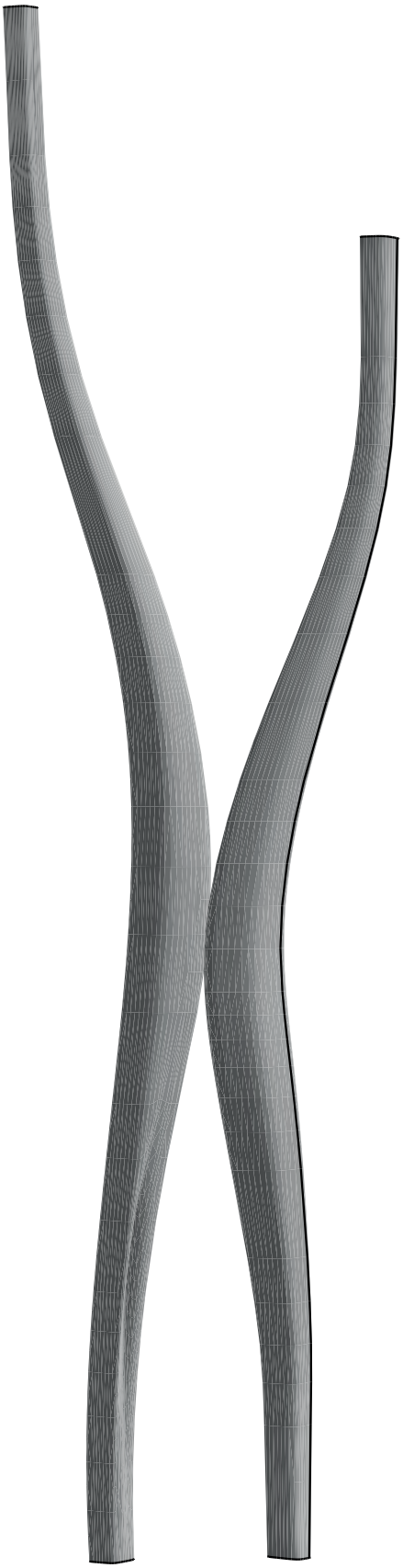
22th Dec 12h 30°



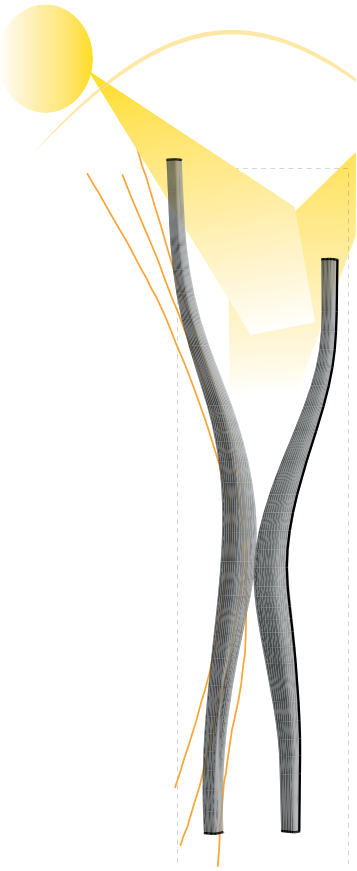
2nd PRIORITY - SHADING

SUN EFFECT SCENARIO

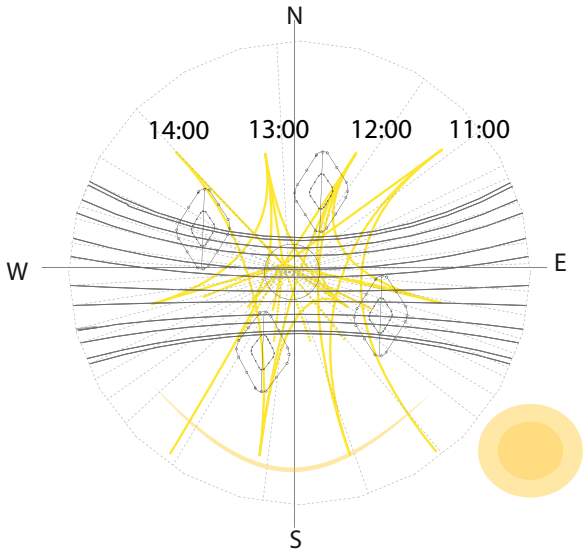
2014

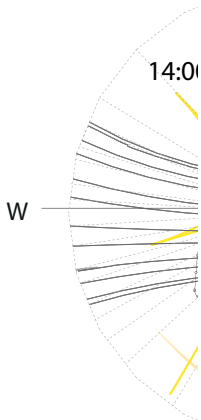


SEAKING FOR SHADE



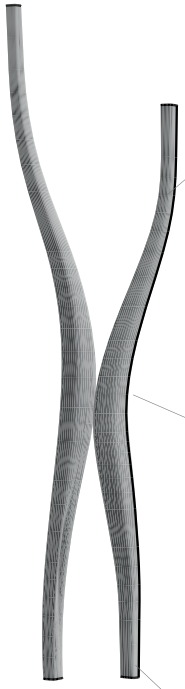
PASIV DESIGN TO A
RADIATION AND W
THERMAL MASS BE
2 PM, when the sur

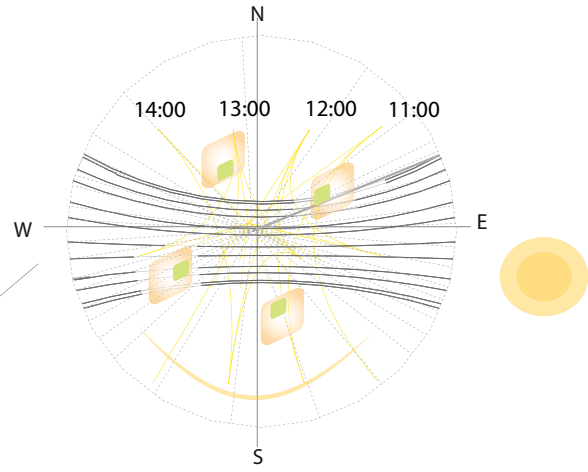


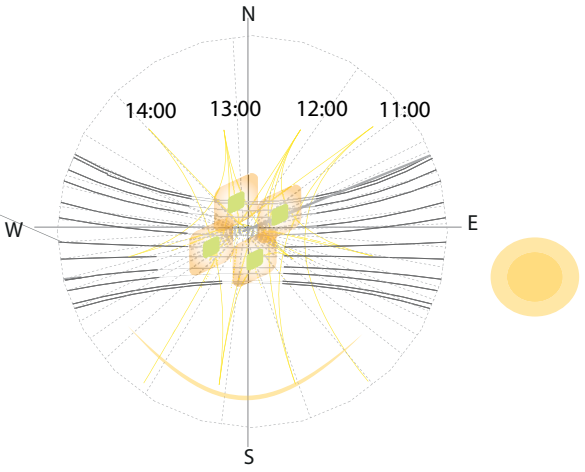


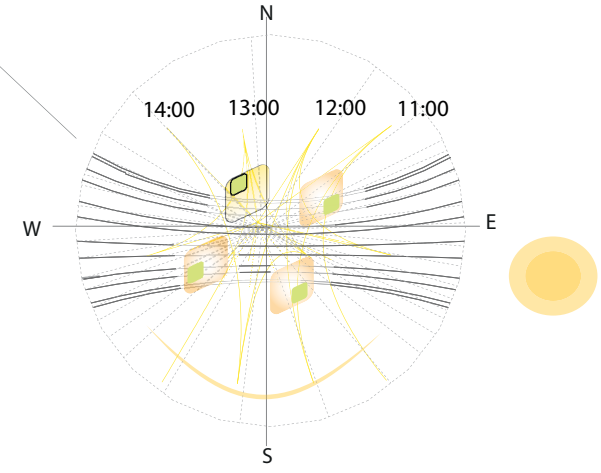
RC

SKY NET



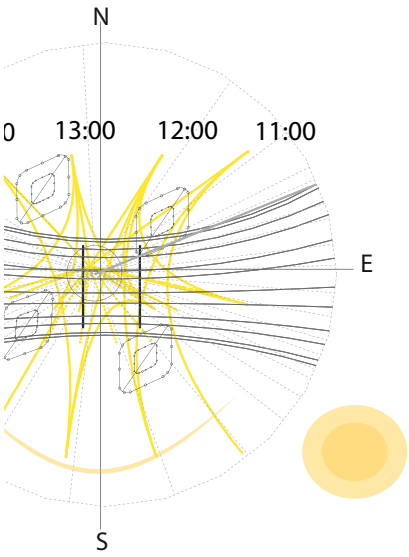






VOIDE SOLAR
ARMING OF
TWEEN 11 AM and

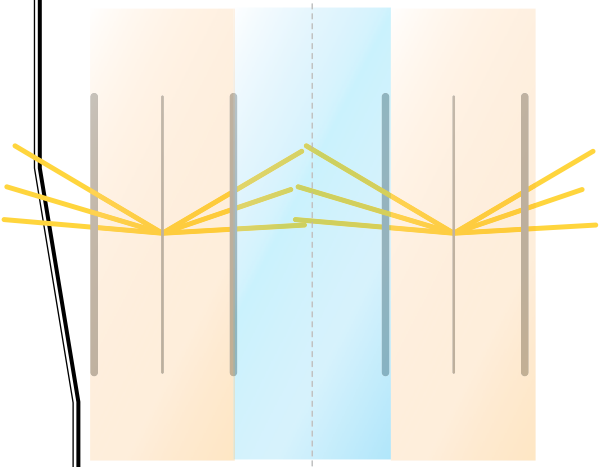
FOR MORNING AND
AFTERNOON SUN AVOID
PLACMENT OF
CORE/ATRIUM WILL HAVE
THE MAIN ROLLE



)TATION FOR 45° is

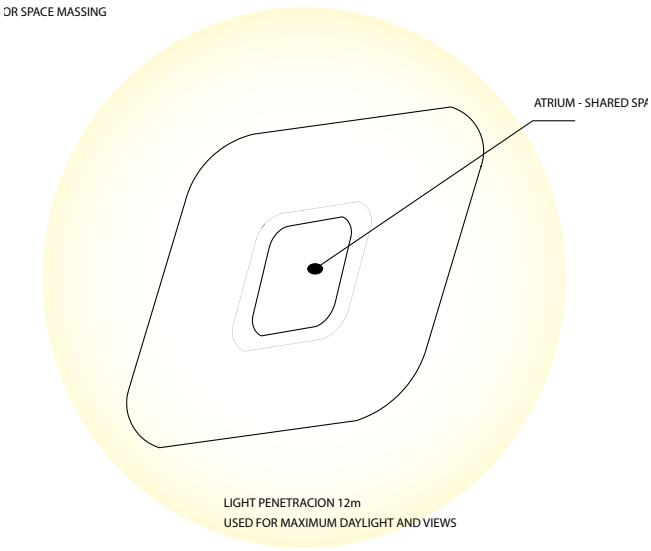
SUN EFFECT ON PLATES SHAPE AND ORIENTATION

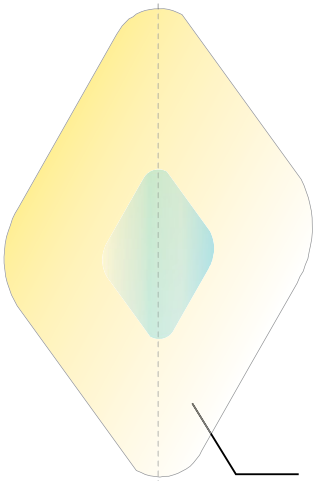
FLOOR AREA DIMENSION



LIGHT PENETRATION 6m

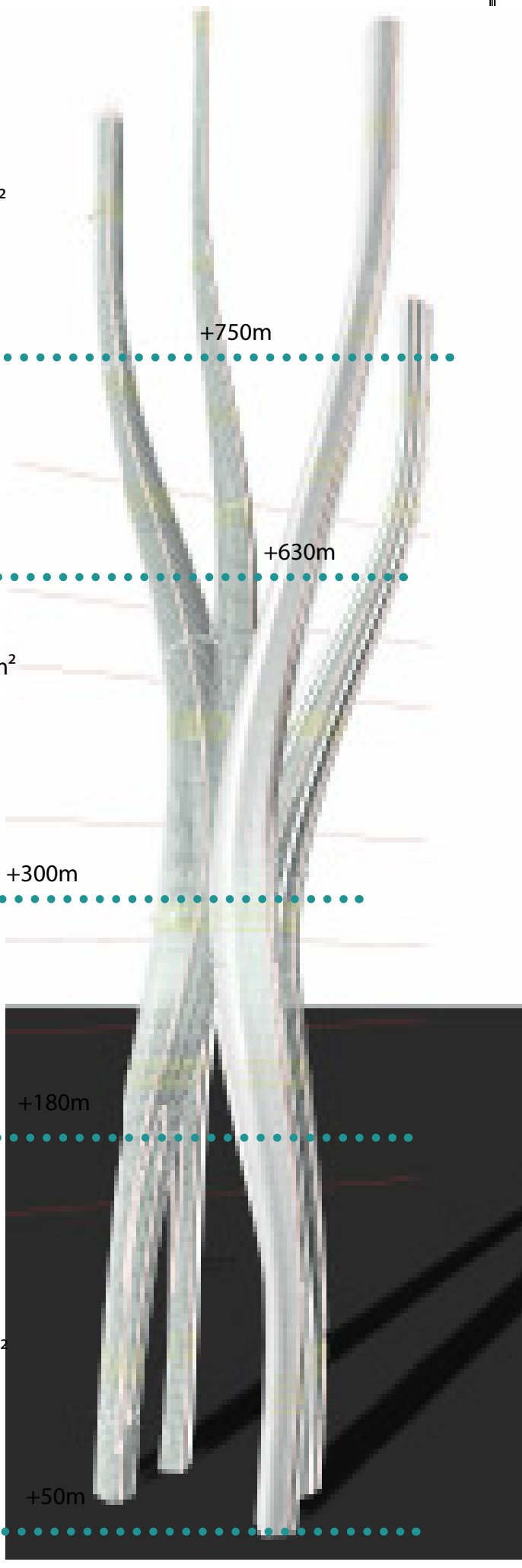
2014



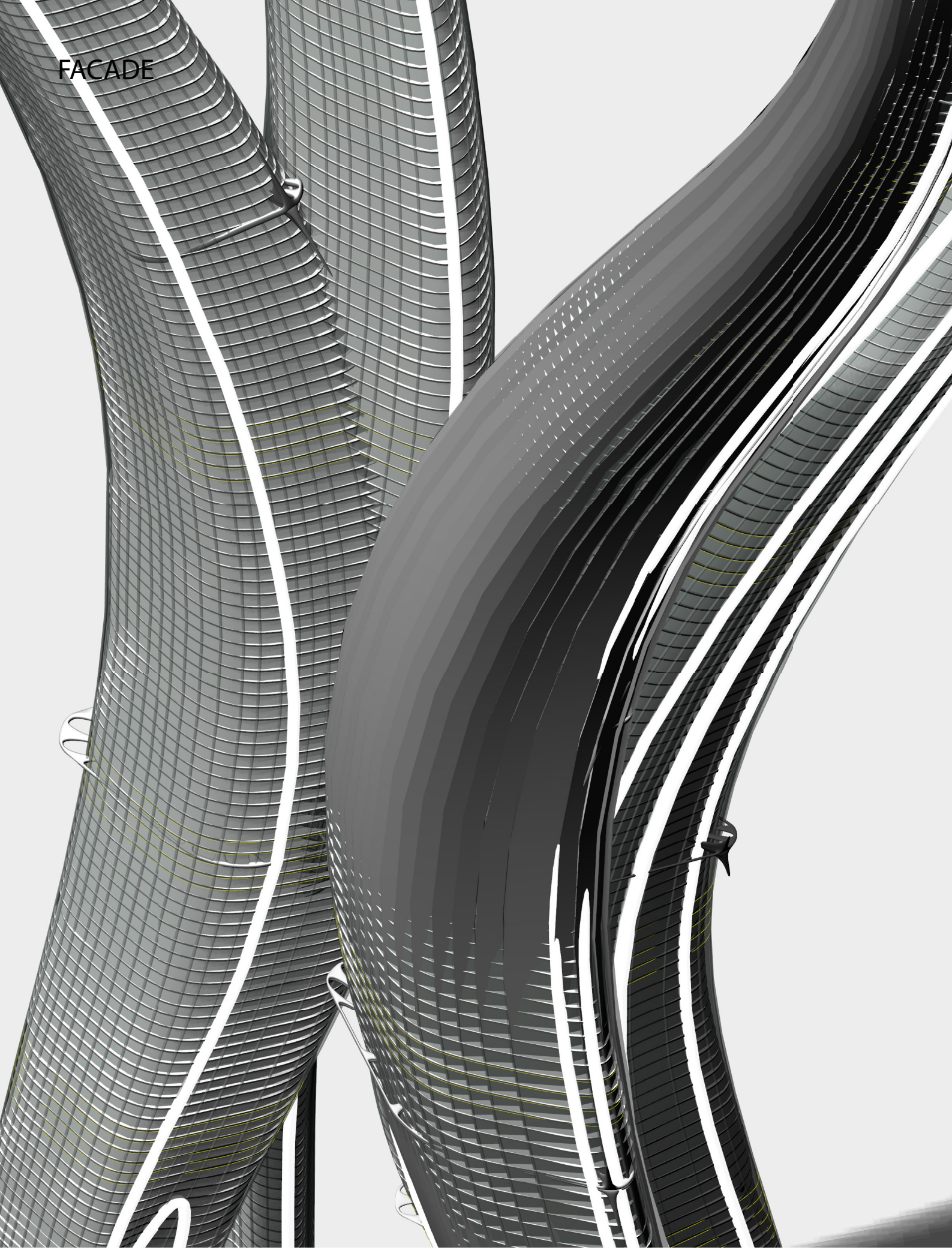


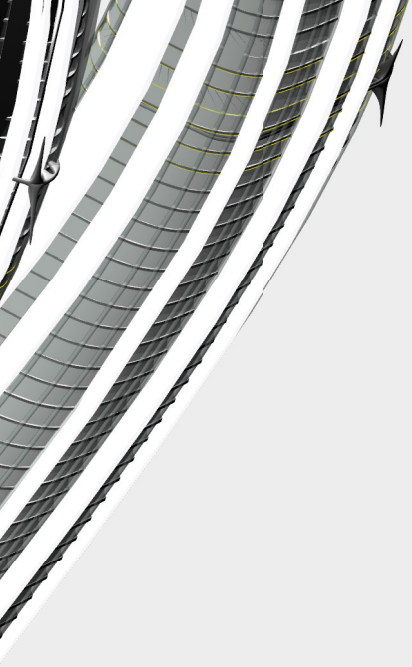
BUILDING MINIMAL FOOTPRINT 24m x 38,8m

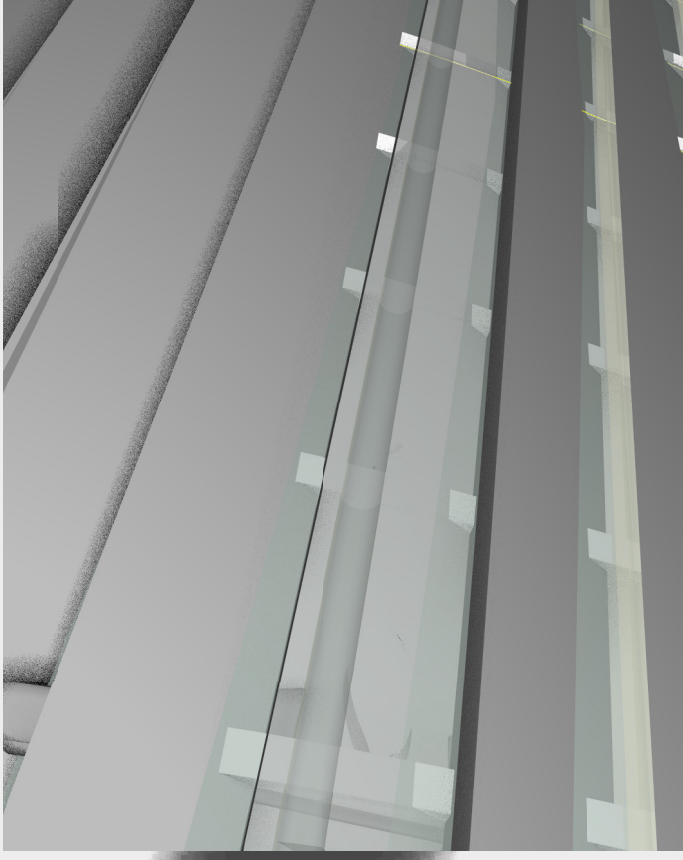
SINCE I GOT INSPIRED BY NATURE, I WILL USE GOLD SECTION
(FI= 1,61803...) FOR PROPORTION OF BUILDING FOOTPRINT


A 280m²
Atrium/Core 10m²
A 300m²
Atrium/Core 15m²
A 470m²
Atrium/Core 20m²
+750m
A 290m²
Atrium/Core 10m²
A 470m²
Atrium/Core35m²
+630m
A 740m²
Atrium/Core70m²
A 570m²
Atrium/Core40m²
A 720m²
Atrium/Core30m²
+300m
A 1645m²
Atrium/Core100m²
A 770m²
Atrium/Core55m²
A 690m²
Atrium/Core60m²
+180m
A 450m²
Atrium/Core30m²
A 450m²
Atrium/Core30m²
A 450m²
Atrium/Core30m²
A 450m²
Atrium/Core30m²
+50m

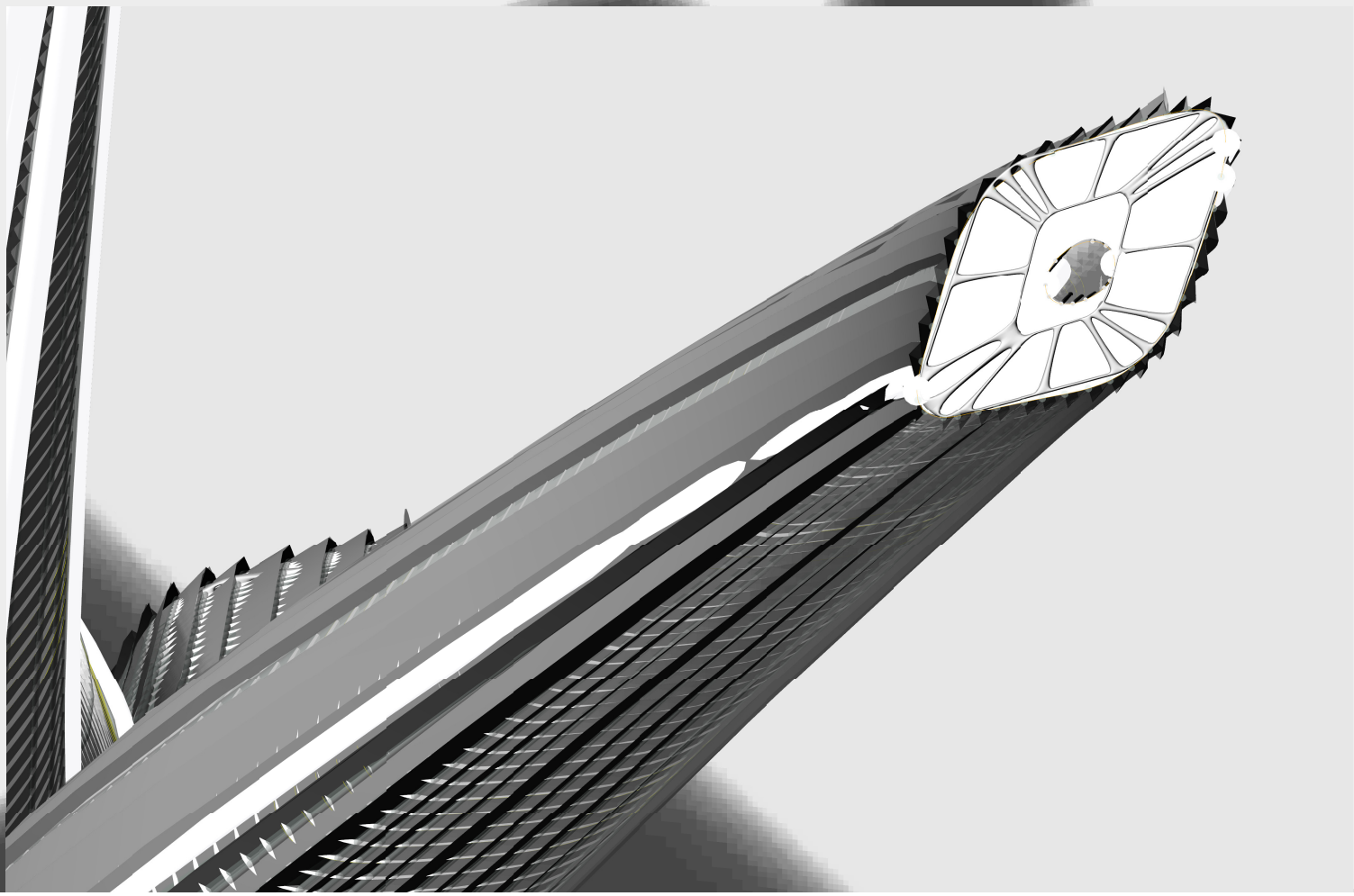
FACADE





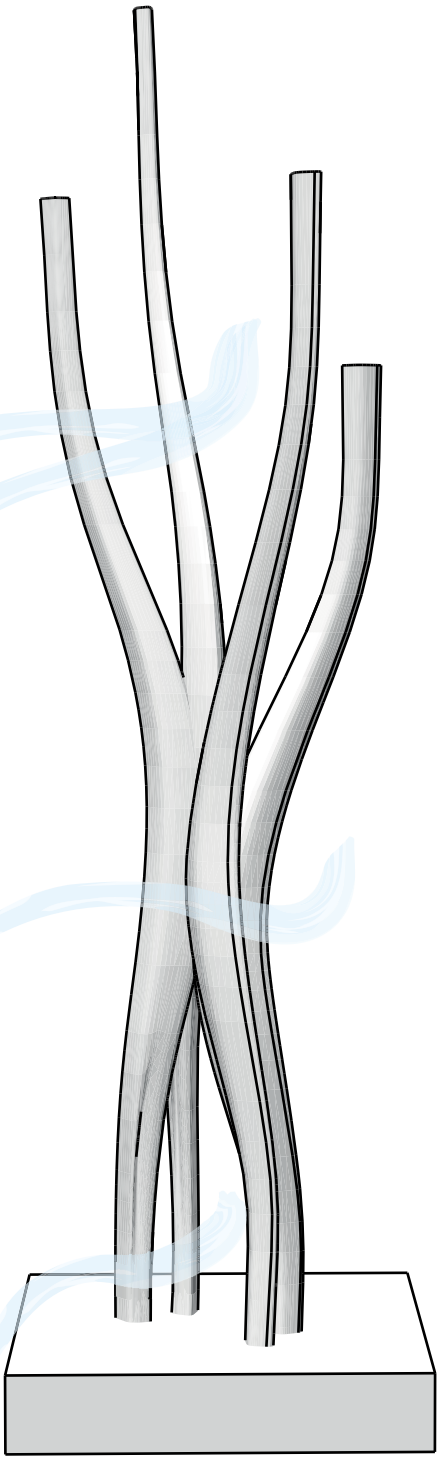


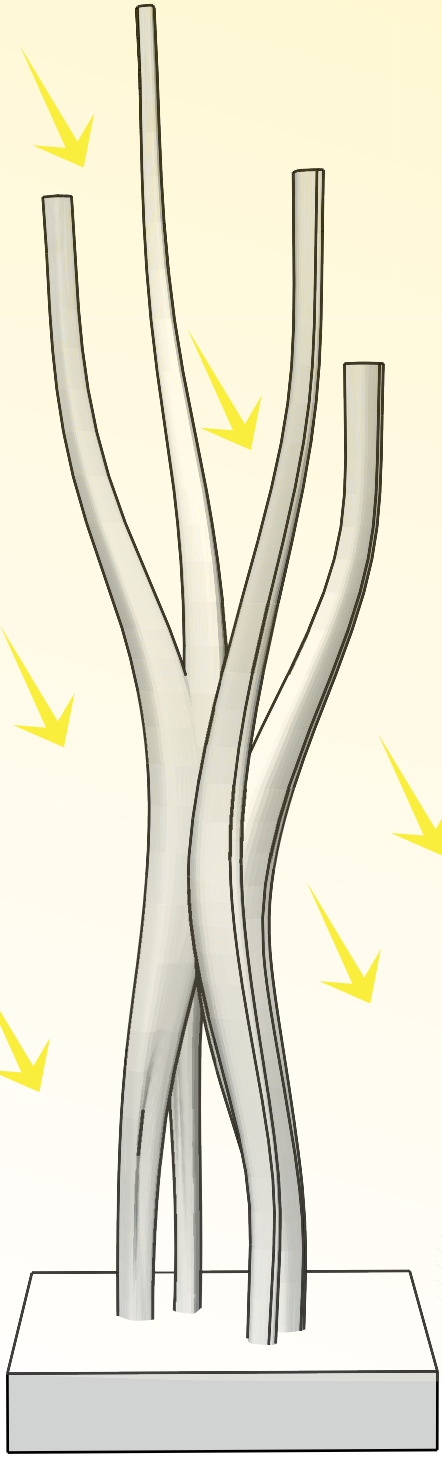
FISH BREATHING SYSTEM
PANELS CAN ROTATE; THEY OPEN IN WIND DIRECTION
AND FORWARD THE FLOW INSIDE THE BUILDING



SUMMARY FORM FINDING ADVANAGES

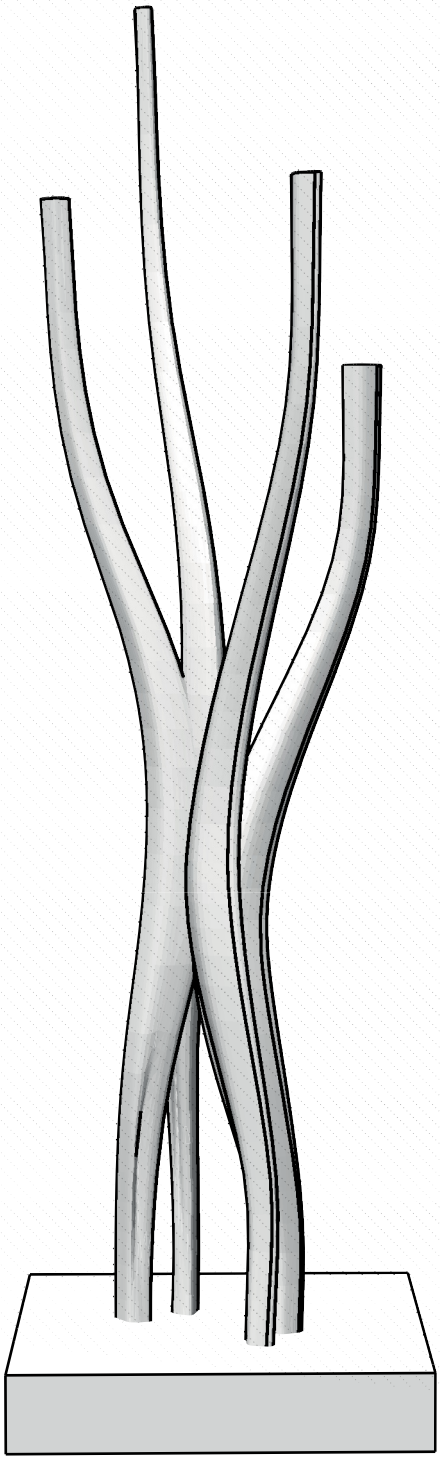
2014



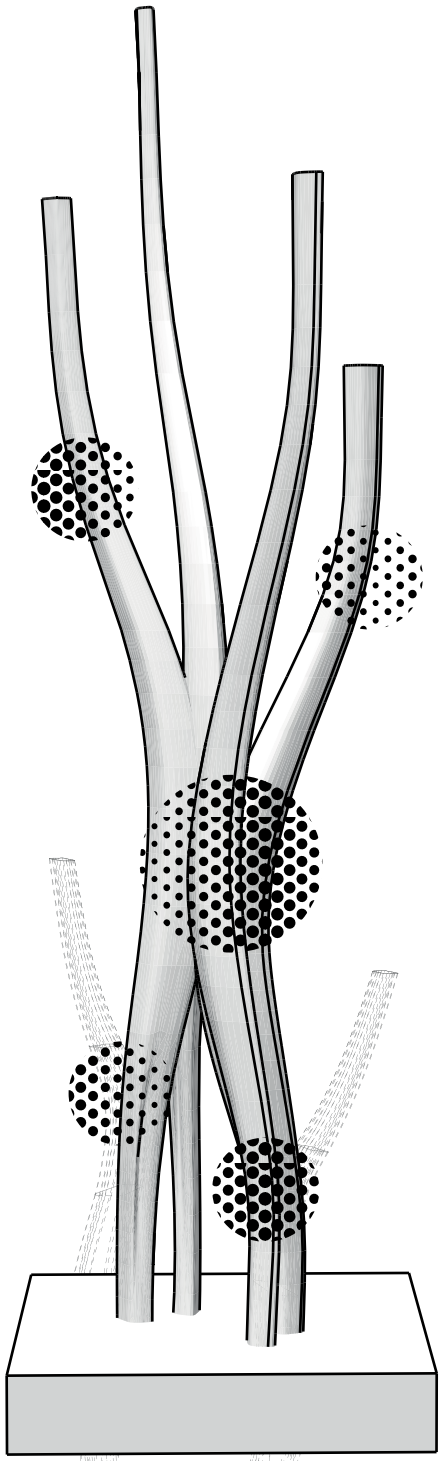


WIND:
AERODYNAMIC FORM MAKE IT POSSIBLE TO BRING FRESH AIR IN TO THE CITY
SLIM BUILDINGS POSSIBLE NATURAL VENTILATION
X-Form MAKE POSSIBLE TO GROW AND CONNECT WITH OTHER BUILDING
MIXTURE OF VOIDS/COMPACT GIVE WIND NON „ATACK "POINT

DAYLIGHT
VOIDS letting day light to the ground
bigger radius on top of building - shadc



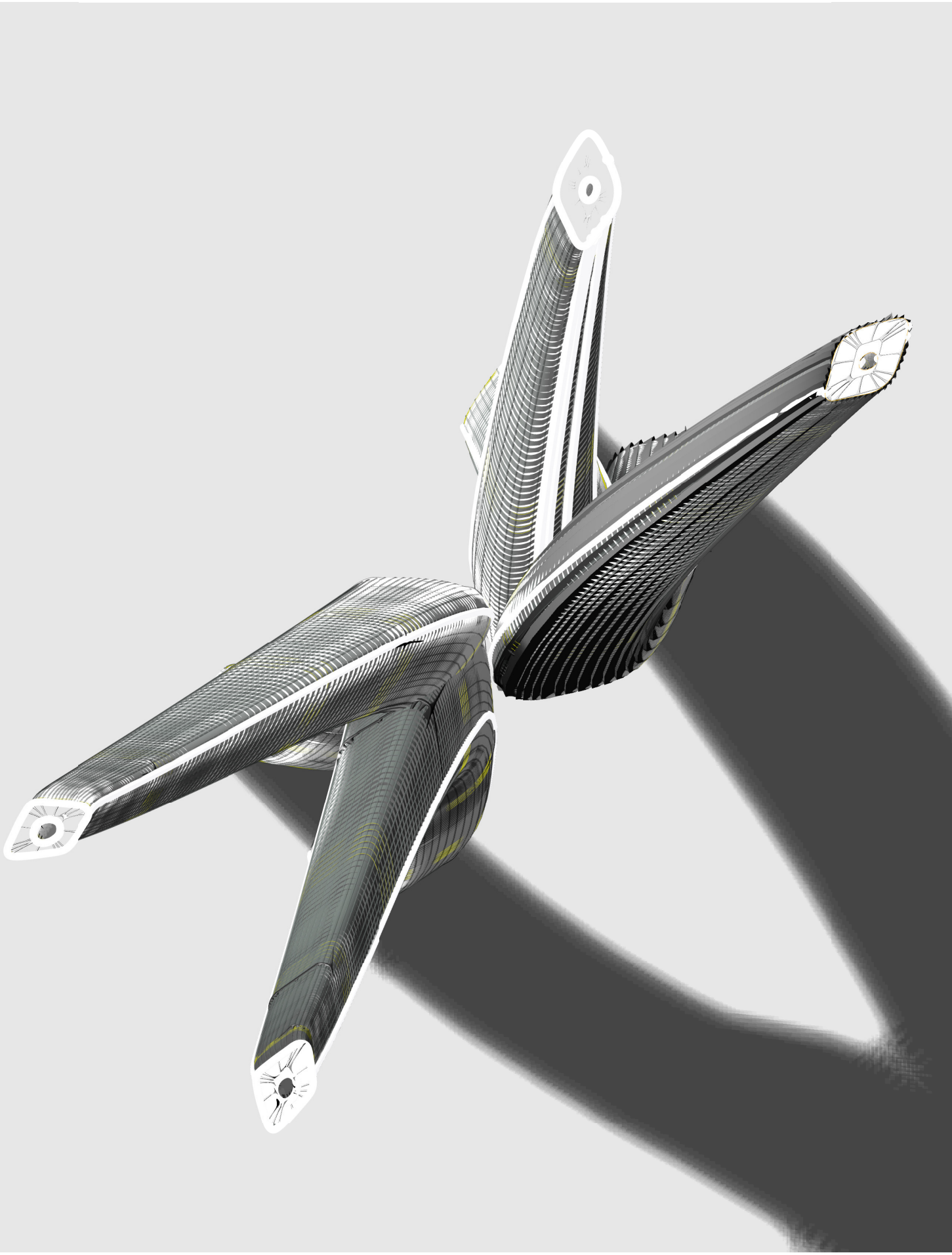
RAINWATER COLLECTION

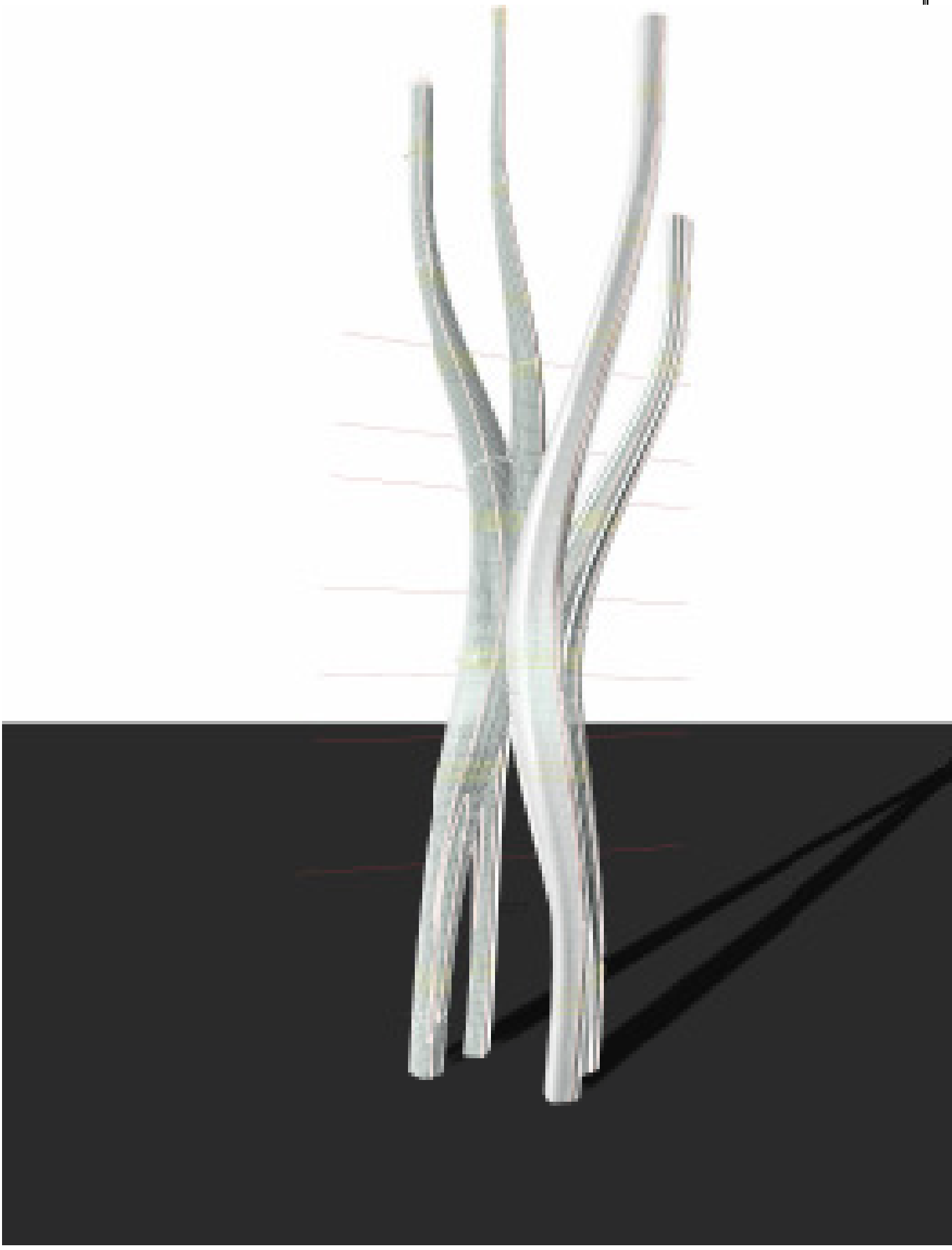


VARIATIONS IN AREA
MORE POSSIBILITES FOR ATRACTION POINTS, AND/OR INCREASING AREA AND CONNECTING WITH OTHER BUILDINGVIA BRANCHING

SKY NET

ows





AN AVERAGE PERSON WALKS AT A SPEED OF 1.4 m/s (5 km / h).

EFFICIENT DISTANCE

in five minutes

In a minute

in ten minutes

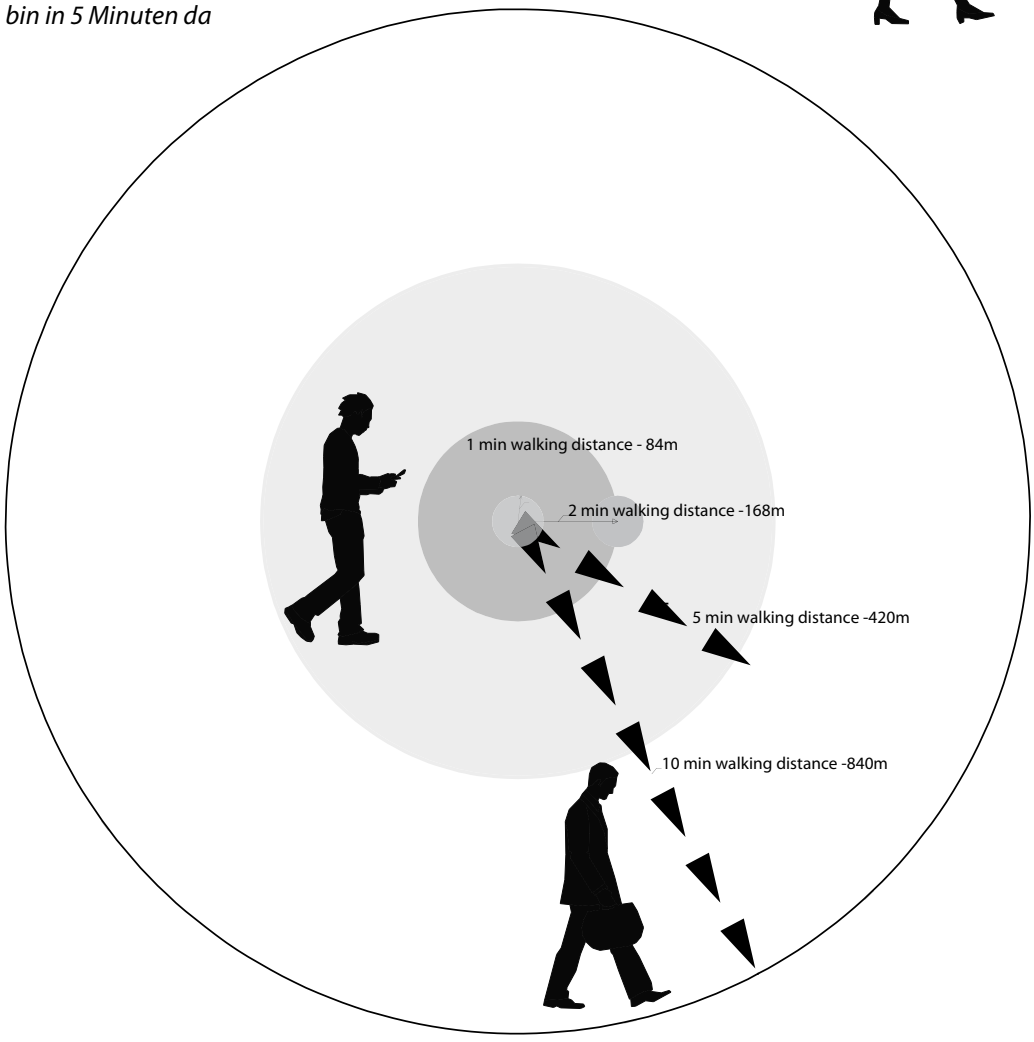
in two minutes

n 2 minuten bin ich da

I'll Be There in a Minute

Dolazim za dva minuta (I'm coming in two minutes) I

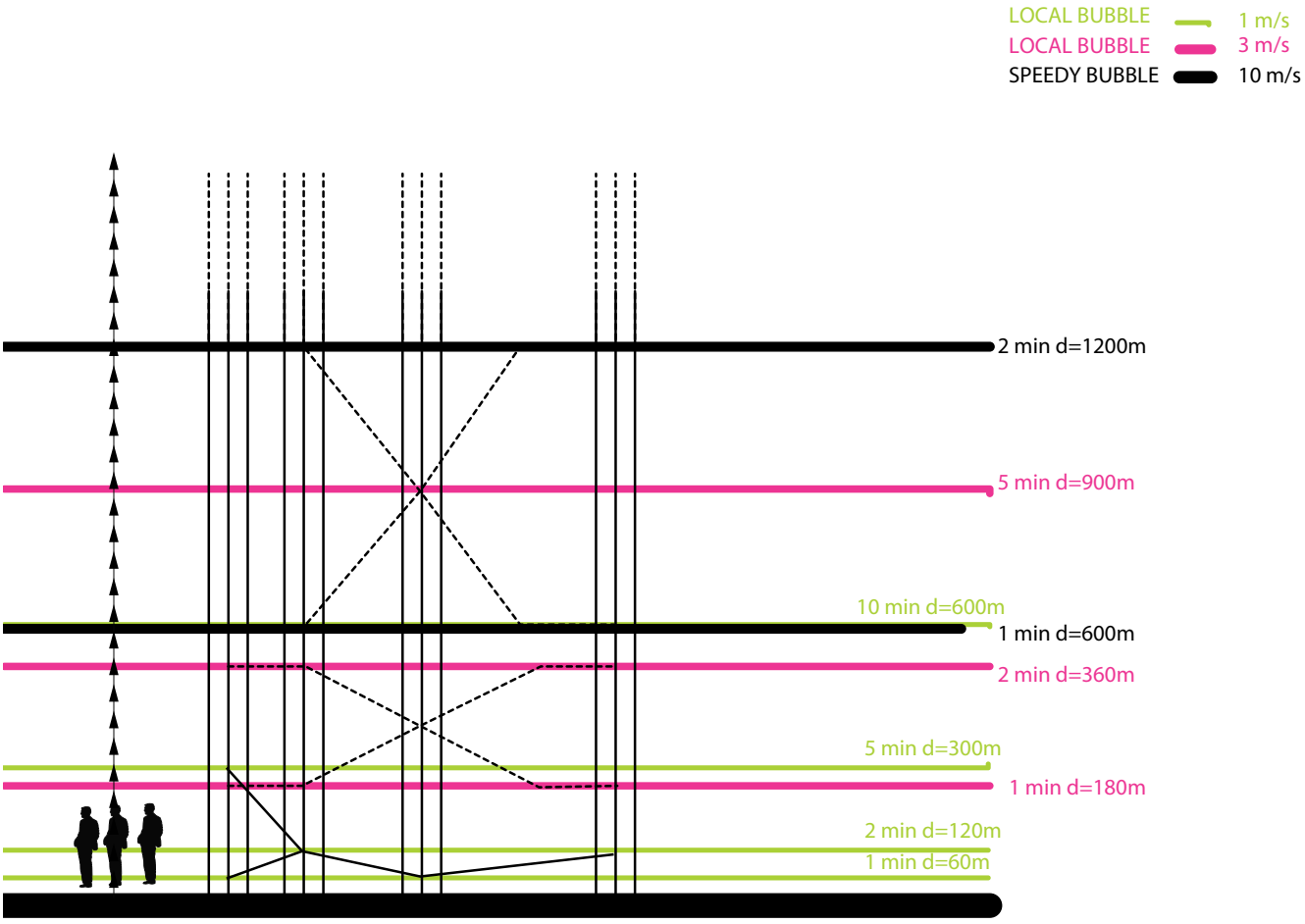
bin in 5 Minuten da



2014

SCHINDLER ELIVATOR DRIVING SPEED 10 m/s

IINDLER ELIVATOR TEHNOLOGY

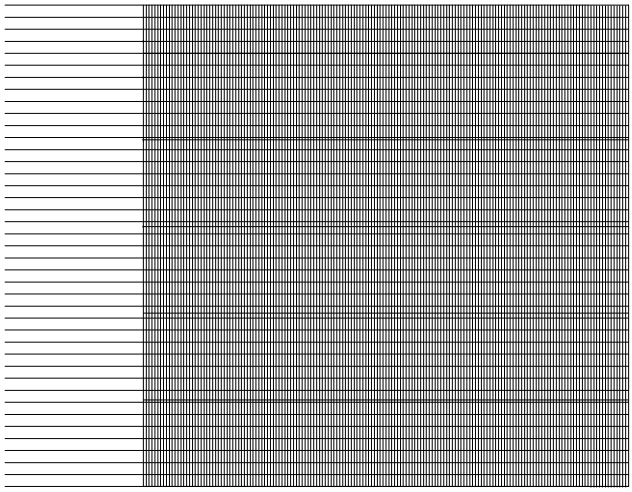


SKY NET

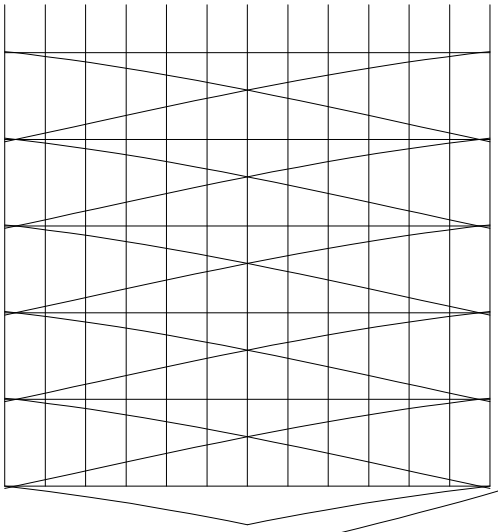
1 MIN DISTANCE NET

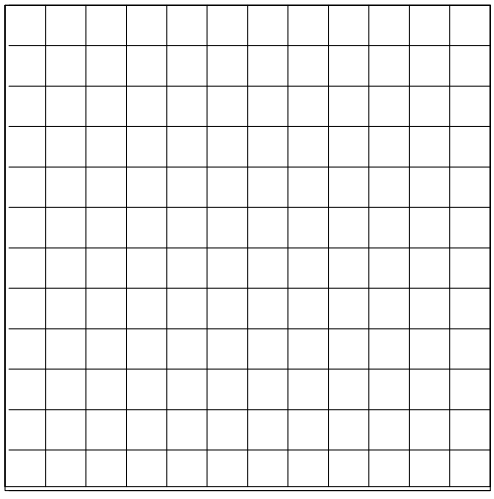
2014

ortogonal grid 6m (light penetration) x 25m (brig between buildings)

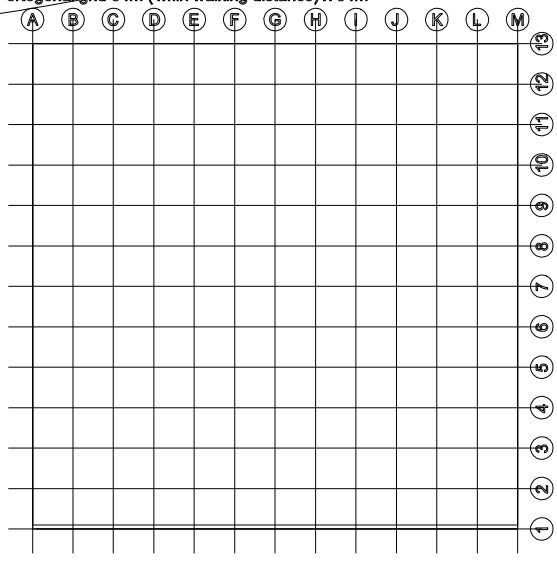


180m (Vertical distance which schindler elivator make in one min)



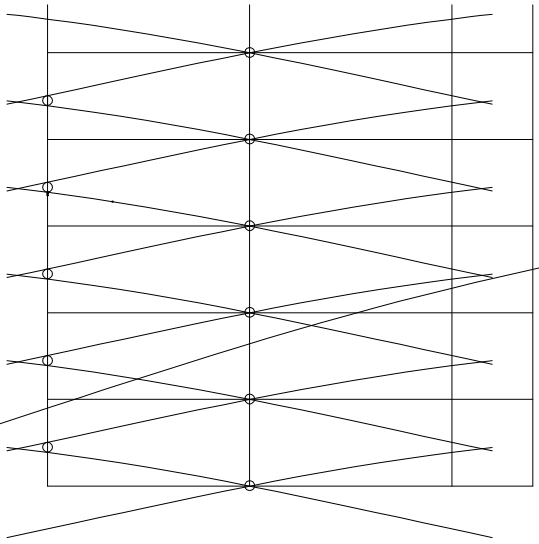


ortogonal grid 84m (1min walking distance) x 84m

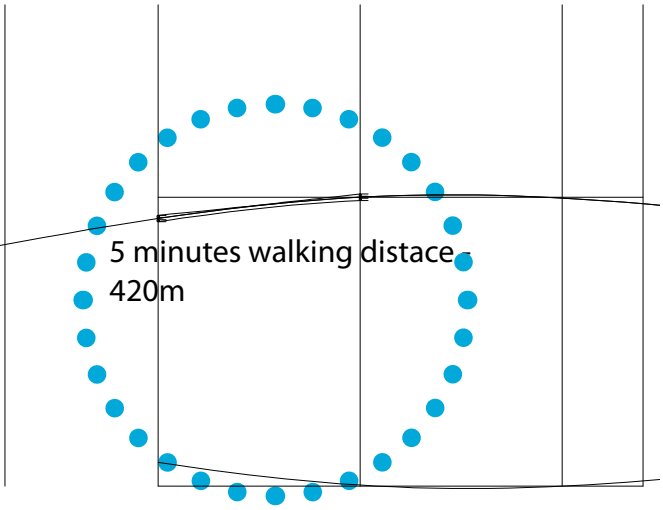


84mx84m ortogonal grid

this grid is connection between hi way (vertical) and middle way (horisontal)

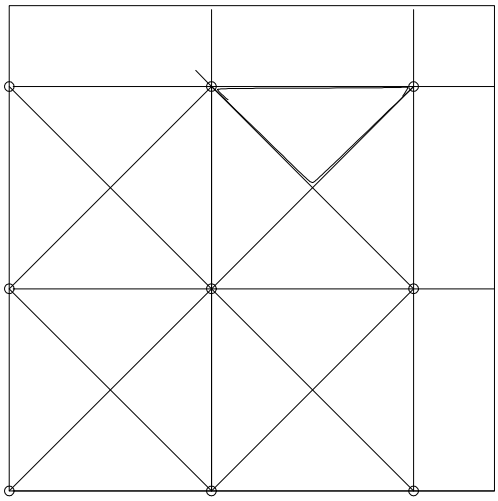


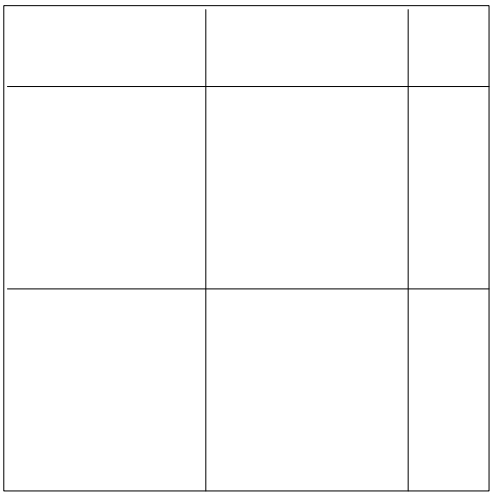
this grid is connection between horisontal and vertical hi ways



5 minutes walking distace -
420m

briging every 180m
84x180



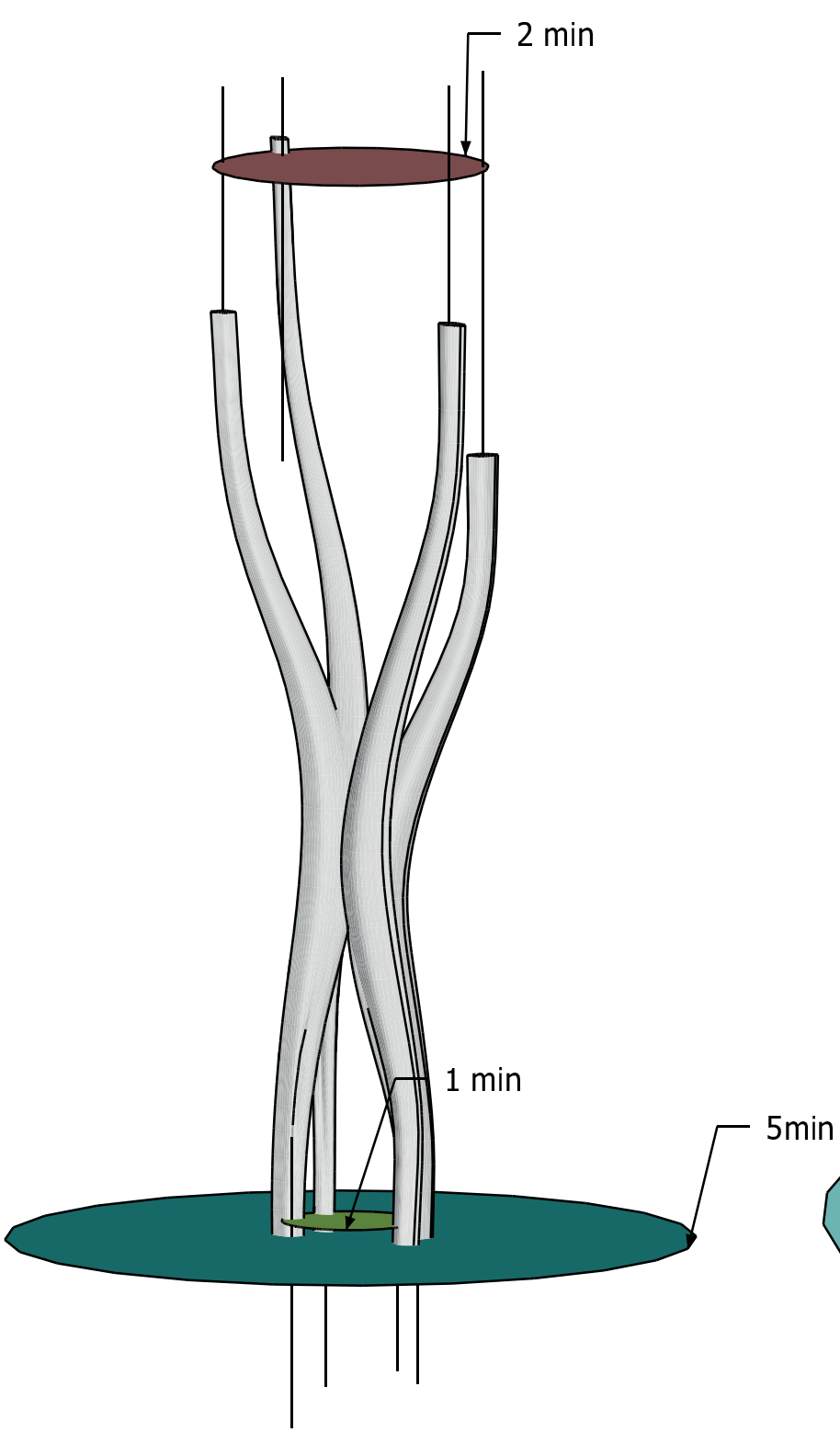


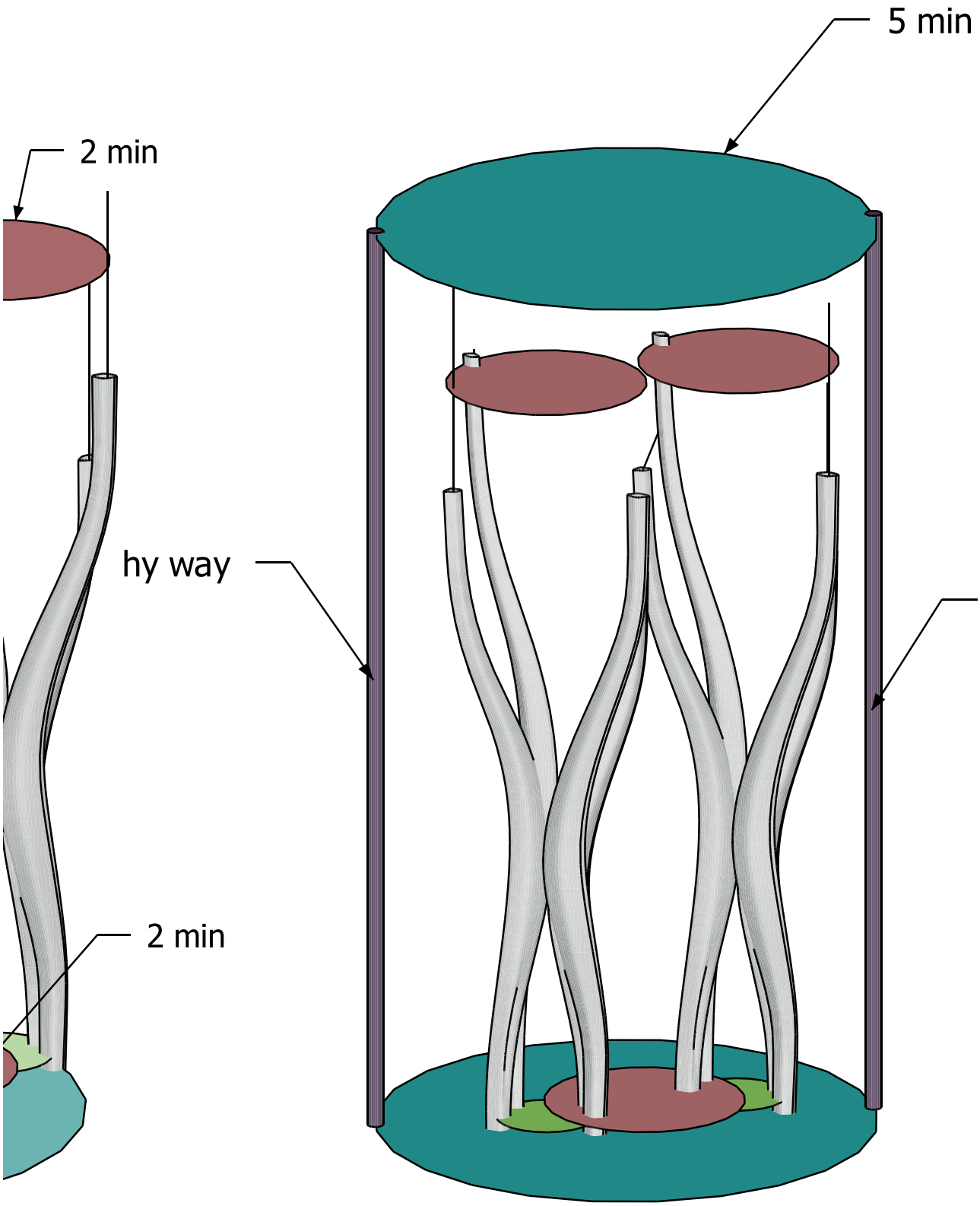
with elivator V 10m/s, we are on 600 m
hight for onre minute

SKY NET

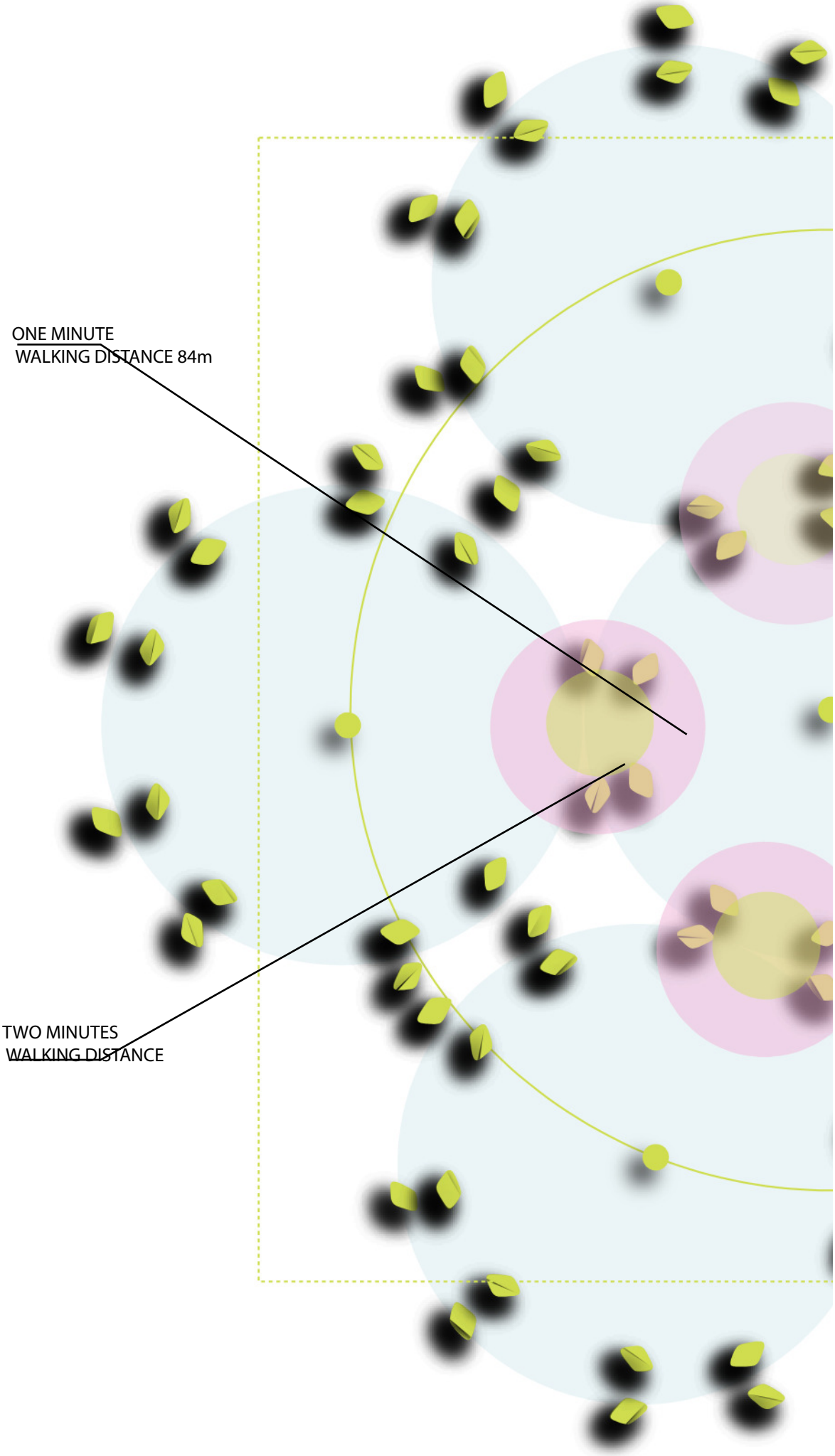
RULE Nr. 1 - WALKING DISTANCE ZONING STRATEGY

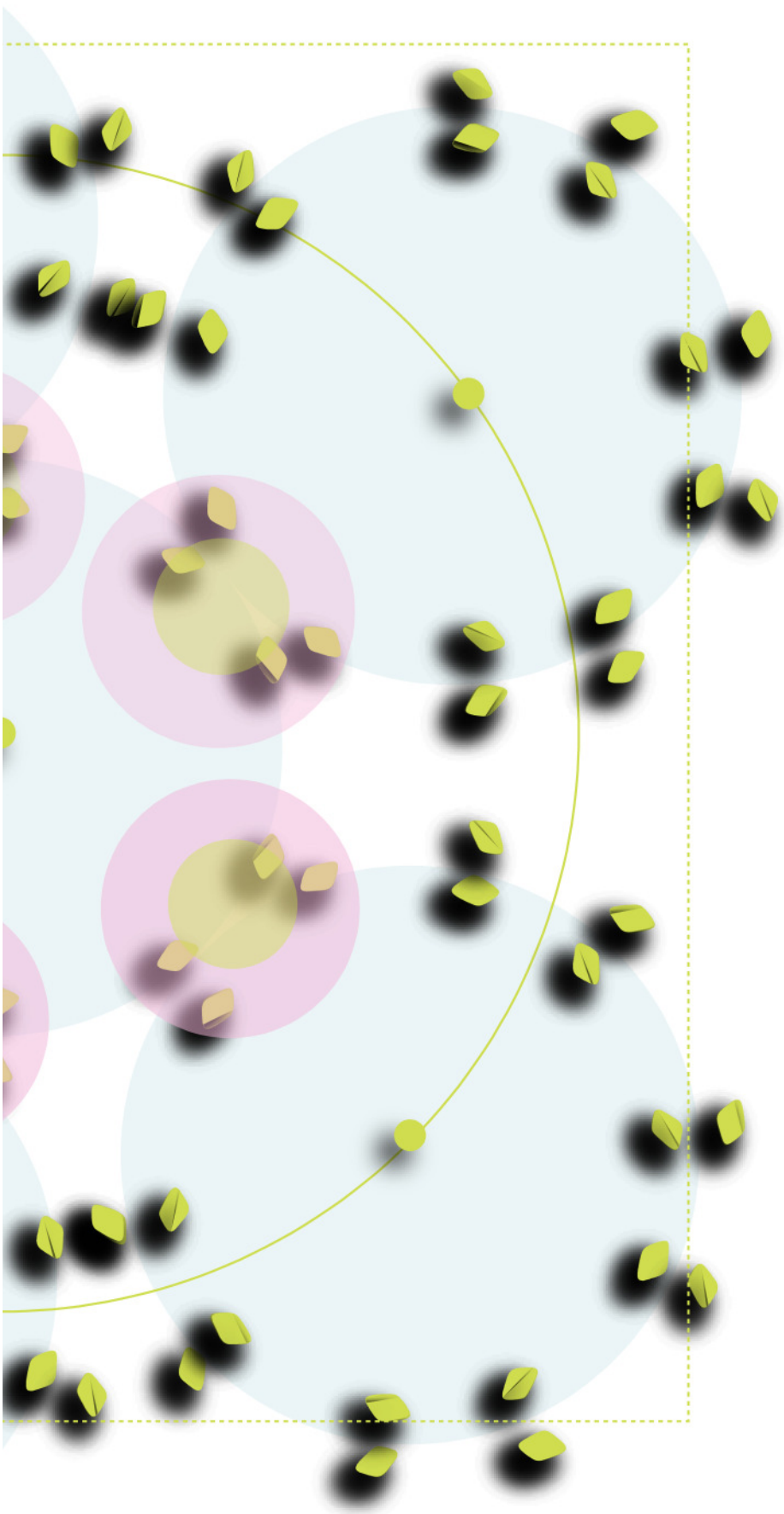
2014




5 min
2 min
hy way
2 min
S
K
Y
E
T

2014


ONE MINUTE
WALKING DISTANCE 84m
TWO MINUTES
WALKING DISTANCE



HYPER DENSE VERTICAL NET-
JSE INDIVIDUAL TOWERS INTER-
)IFFERENT HEIGHTS IN A SERIES
CTERIZED BY SPECIAL PUBLIC
PROGRAMS. OPEN AND ANTI-HI-
VERTICAL URBANISM OPERATES
AT DIFFERENT LEVELS, ALLOWING
JNICATIONS BETWEEN PARTS AND
)F FUNCTIONS AND ACTIVITIES
RSI.COM/PROJECTS/202845-VERTICAL-

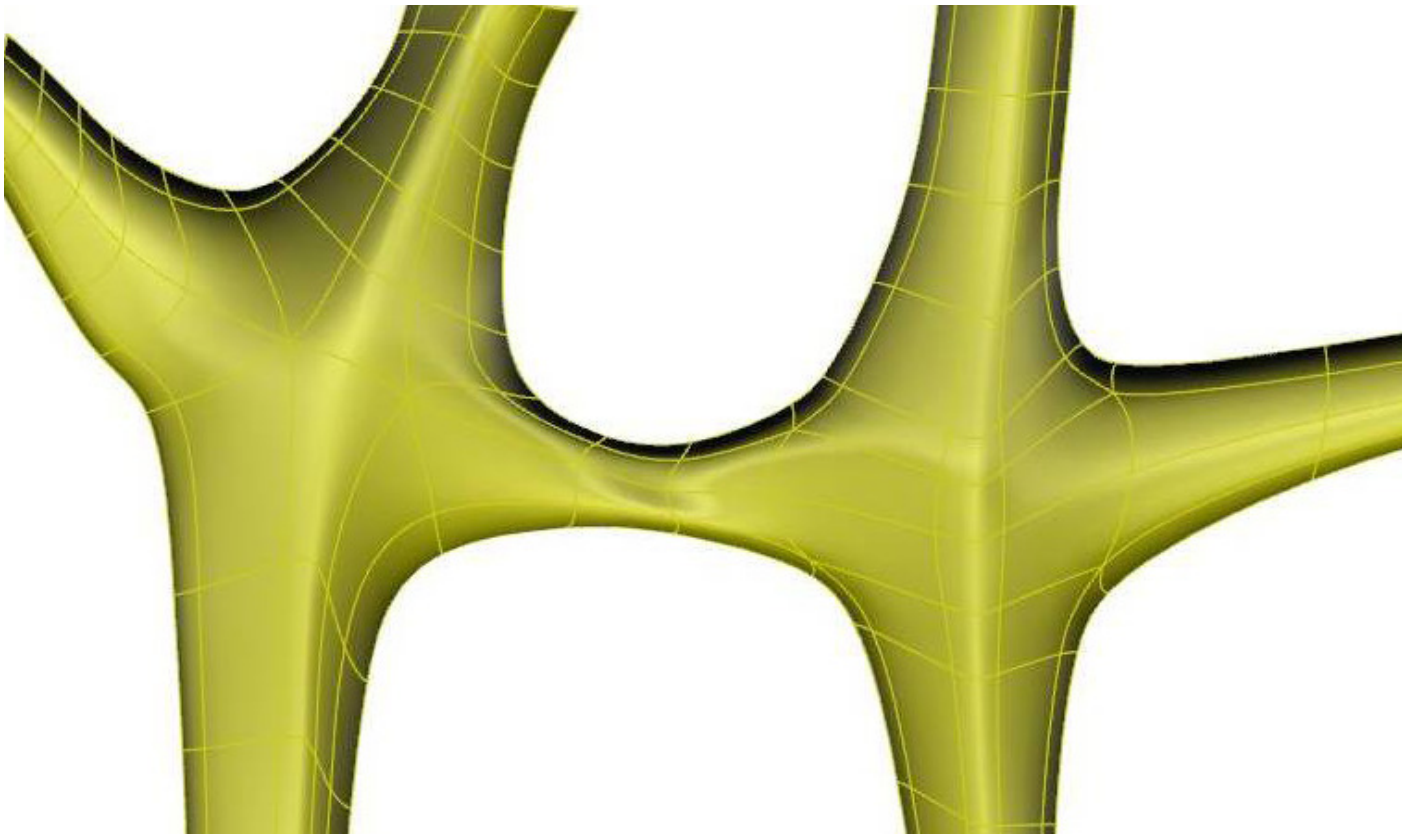
JTES
DISTANCE

SKY NET

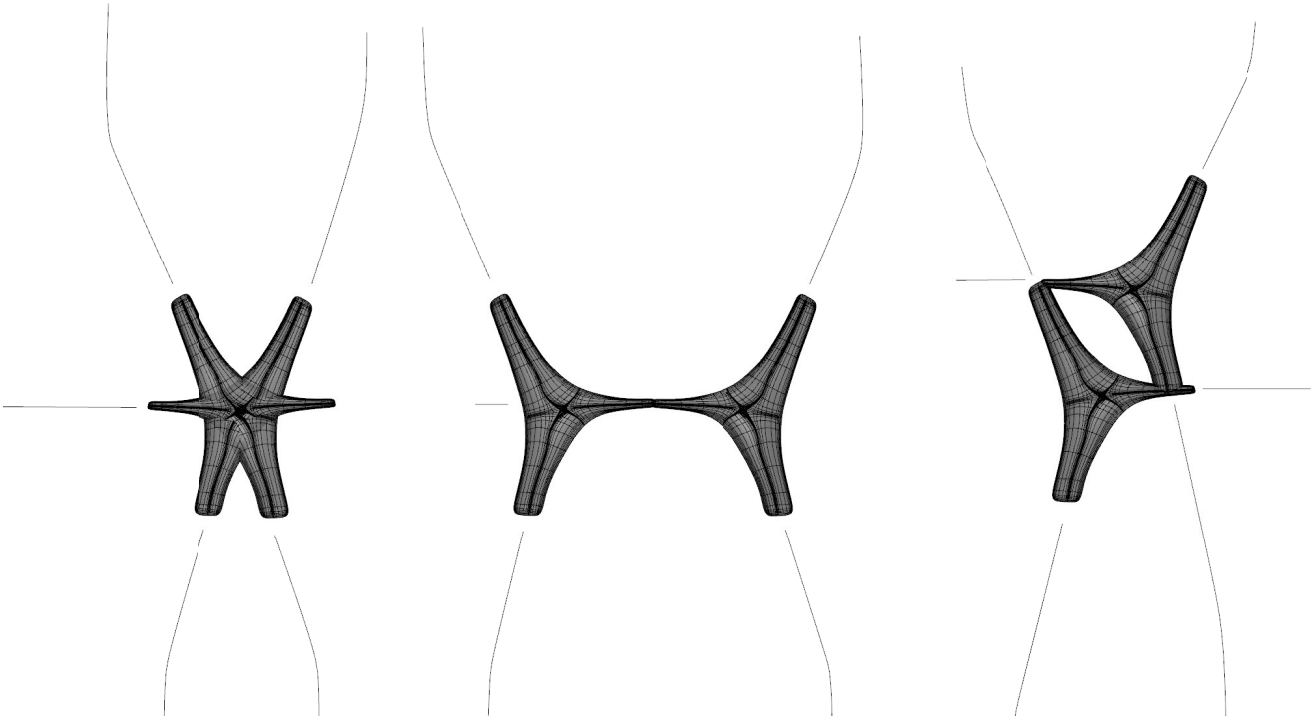
CONNECTIONS

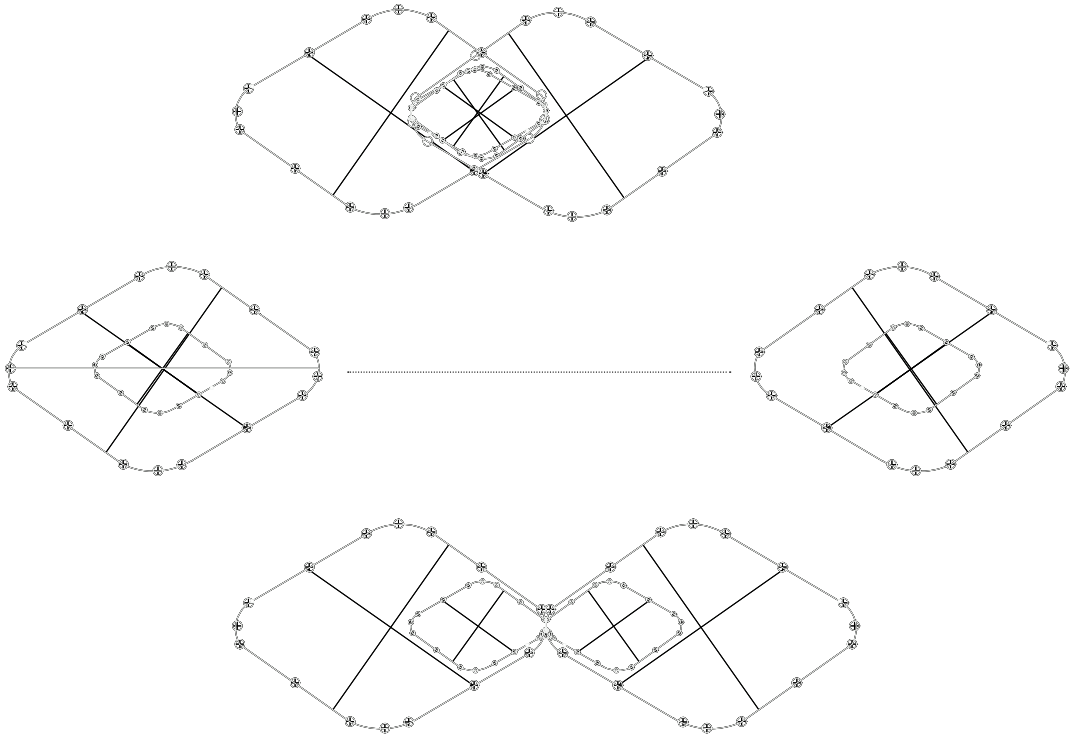
FUNCTION RELATIONSHIP ACROSS THE CITY:

DIFFERENT PROGRAMS COME TOGETHER EXPAN-
DING TNE CONNECTIVITY AND OPEN SPACE -



2014





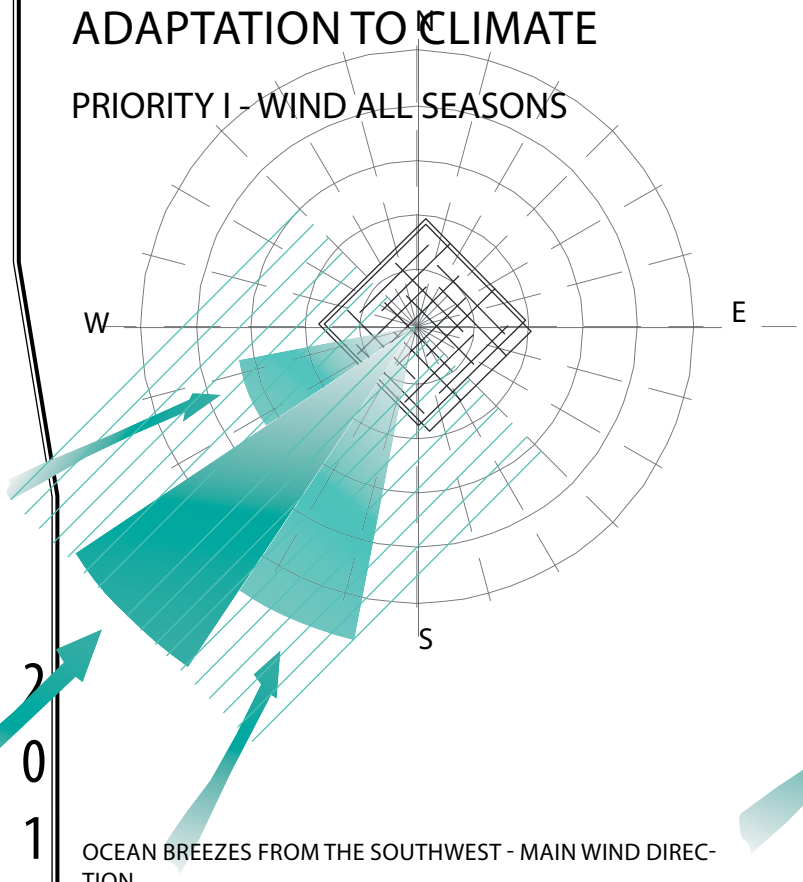
- POSSIBILITY TO GROW
- POSSIBILITY TO CONNECT

POSSIBLE CONNECTIONS BETWEEN TWO BUILDINGS

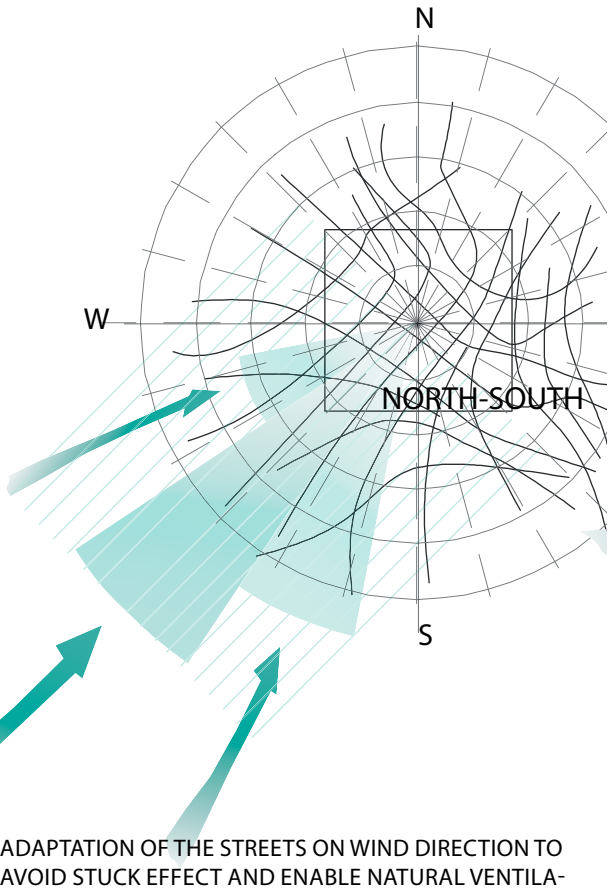
SKY NET

MASTER PLAN - ADAPTATION TO CLIMATE

PRIORITY I - WIND ALL SEASONS

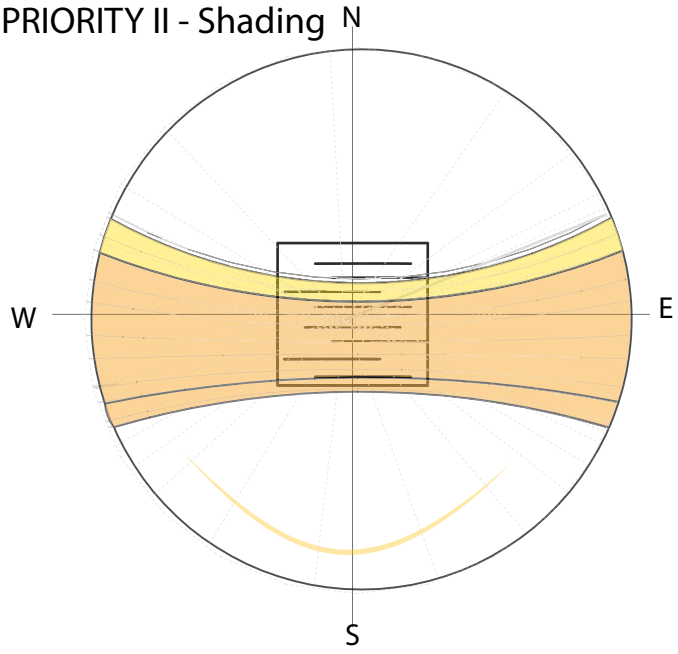


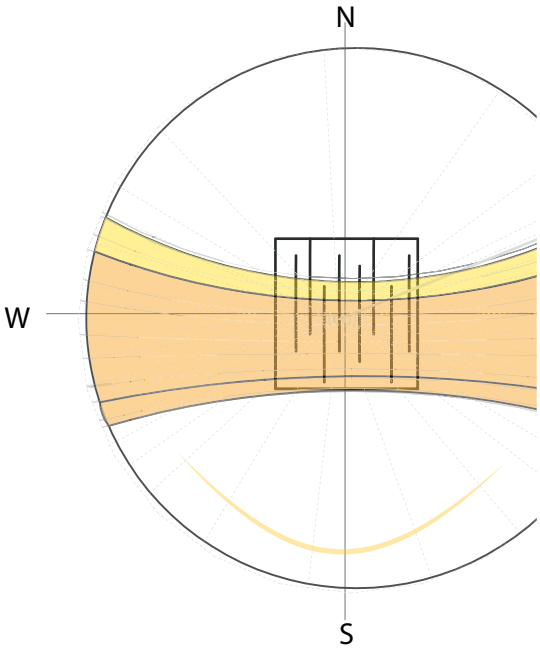
OCEAN BREEZES FROM THE SOUTHWEST - MAIN WIND DIRECTION



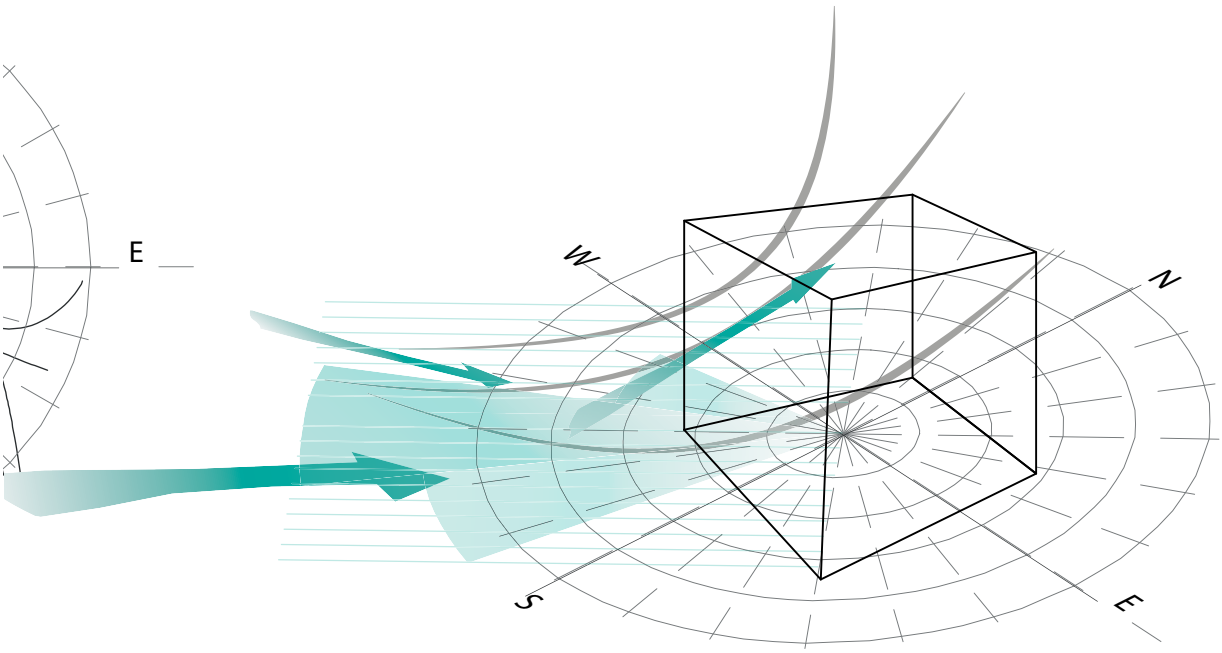
ADAPTATION OF THE STREETS ON WIND DIRECTION TO AVOID STUCK EFFECT AND ENABLE NATURAL VENTILATION. SO I HAVE GOT NET OF STREETS, AND IN-BETWEEN SPACE FOR GREEN ZONES

PRIORITY II - Shading

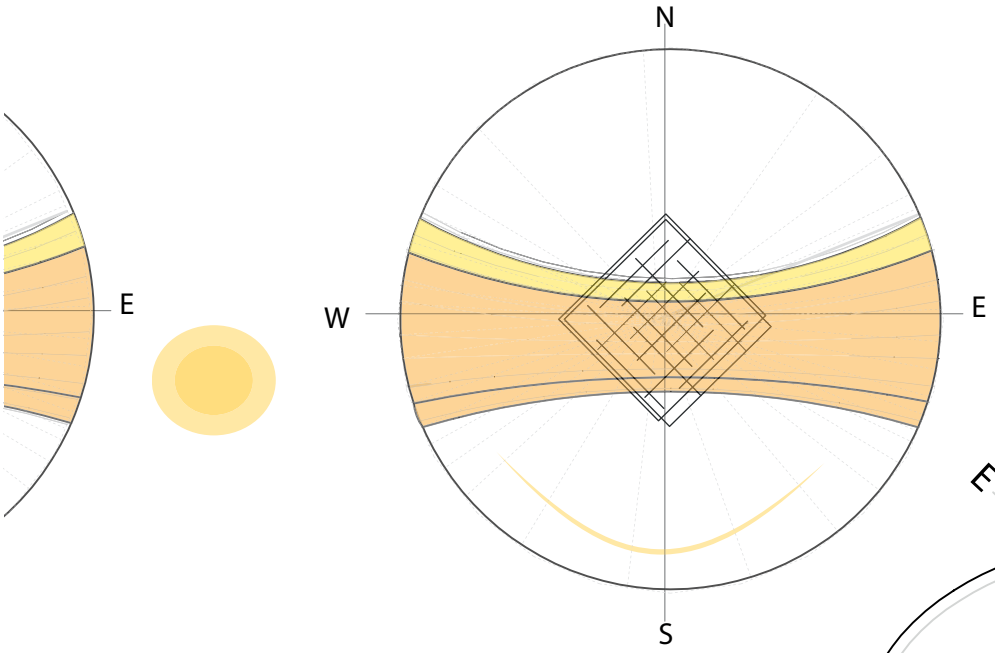


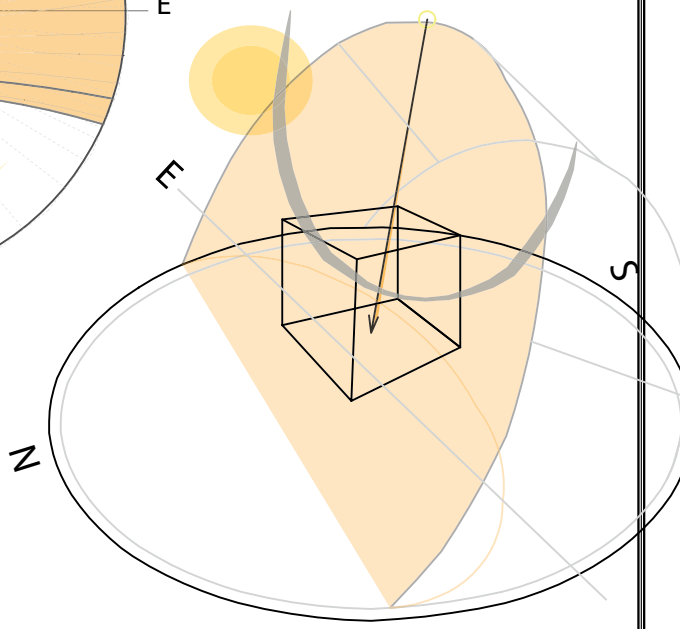


SKY NET IS ORIENTED TO THE NORTHEAST AND SOUTHWEST TO MAINTAIN AN EFFECTIVE BALANCE BETWEEN LIGHT AND SHADE.
COMBINATION OF SOLAR SHADING AND DAYLIGHT OPTIMIZATION IS BEST AT THIS ORIENTATION



CITY WILL GROW IN DIRECTION SOUTHWEST-NORTHEAST, TO ALLOW WIND FORCE TO PRODUCE ENERGY

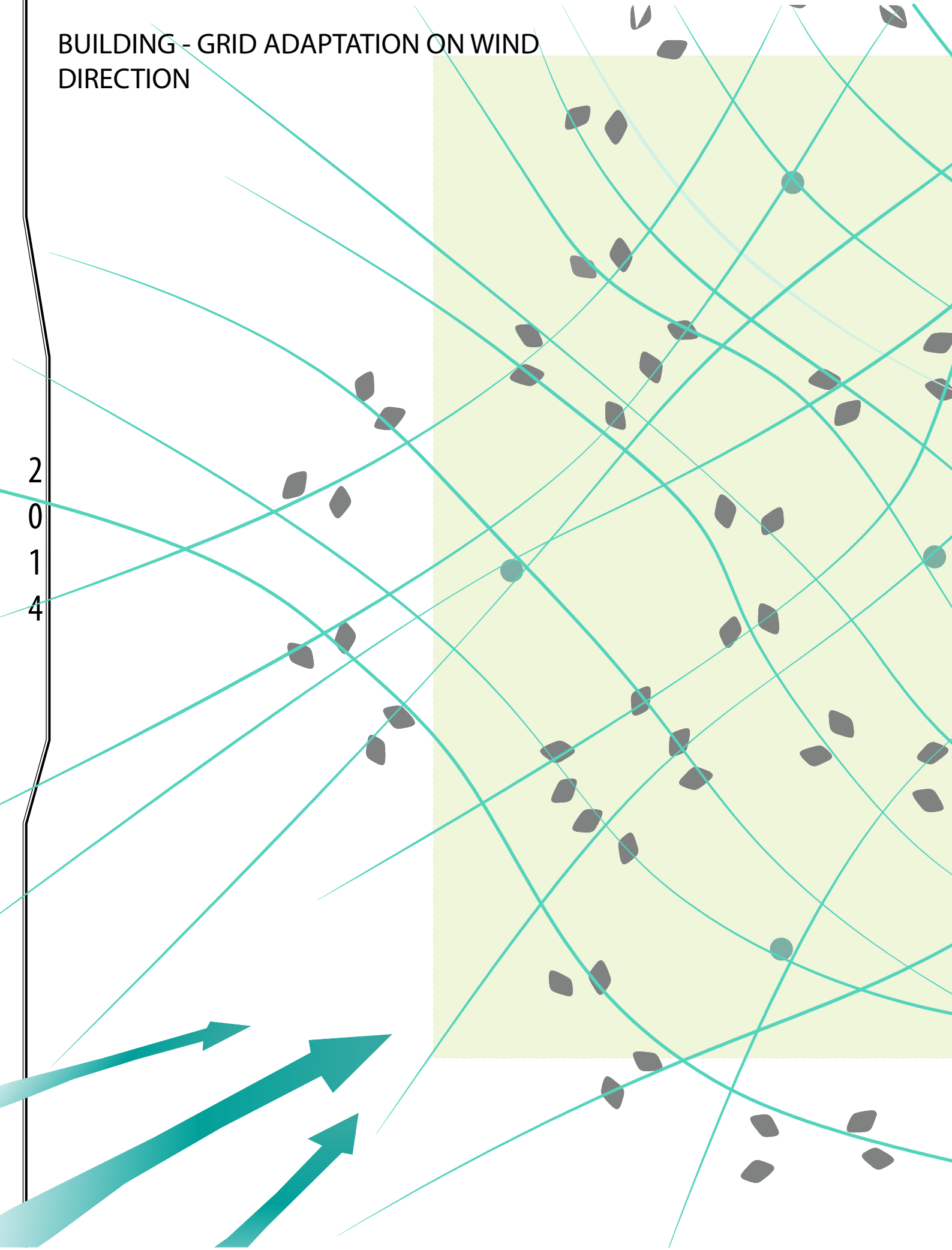


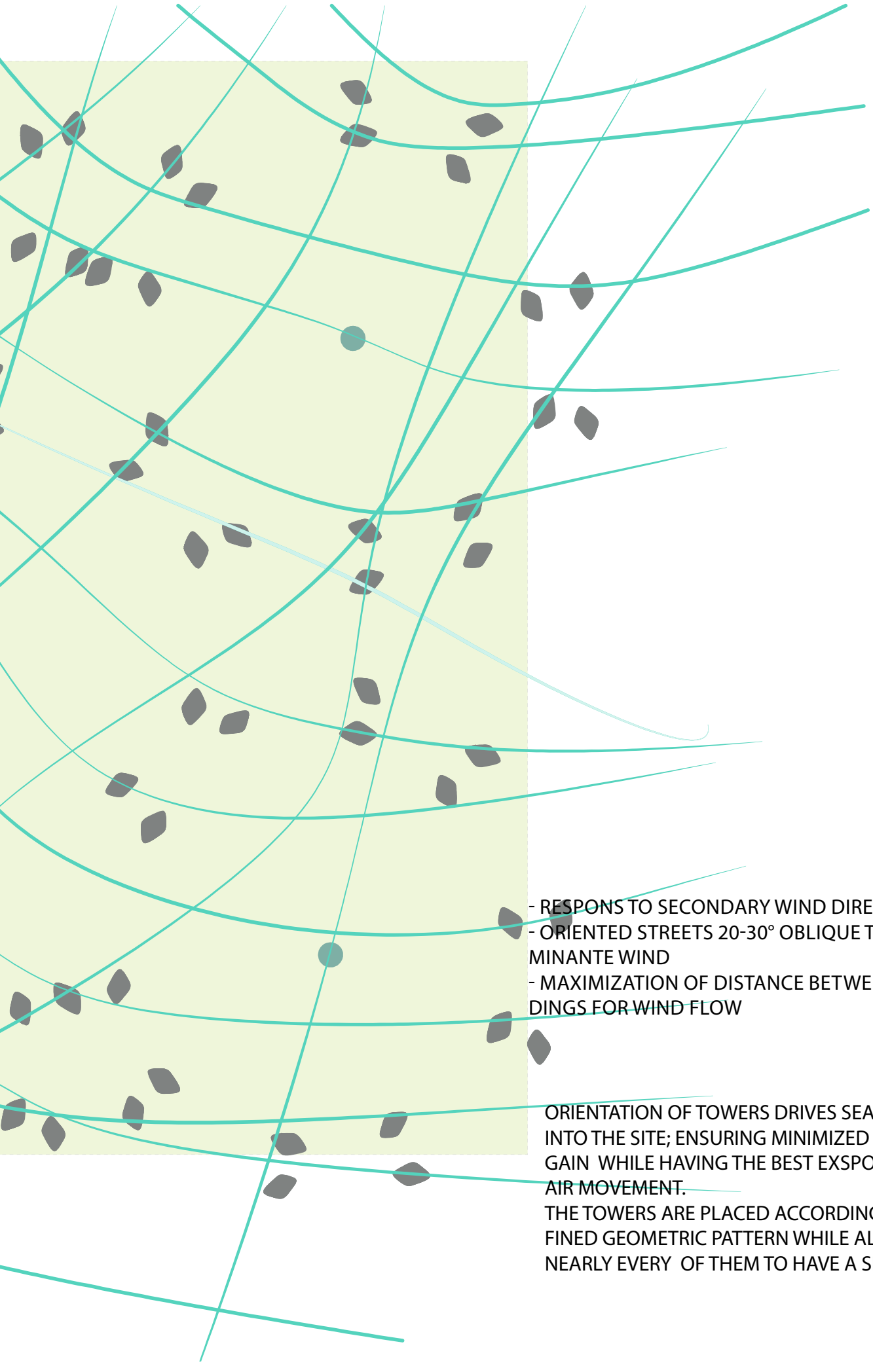


SKY NET

BUILDING - GRID ADAPTATION ON WIND DIRECTION

2014



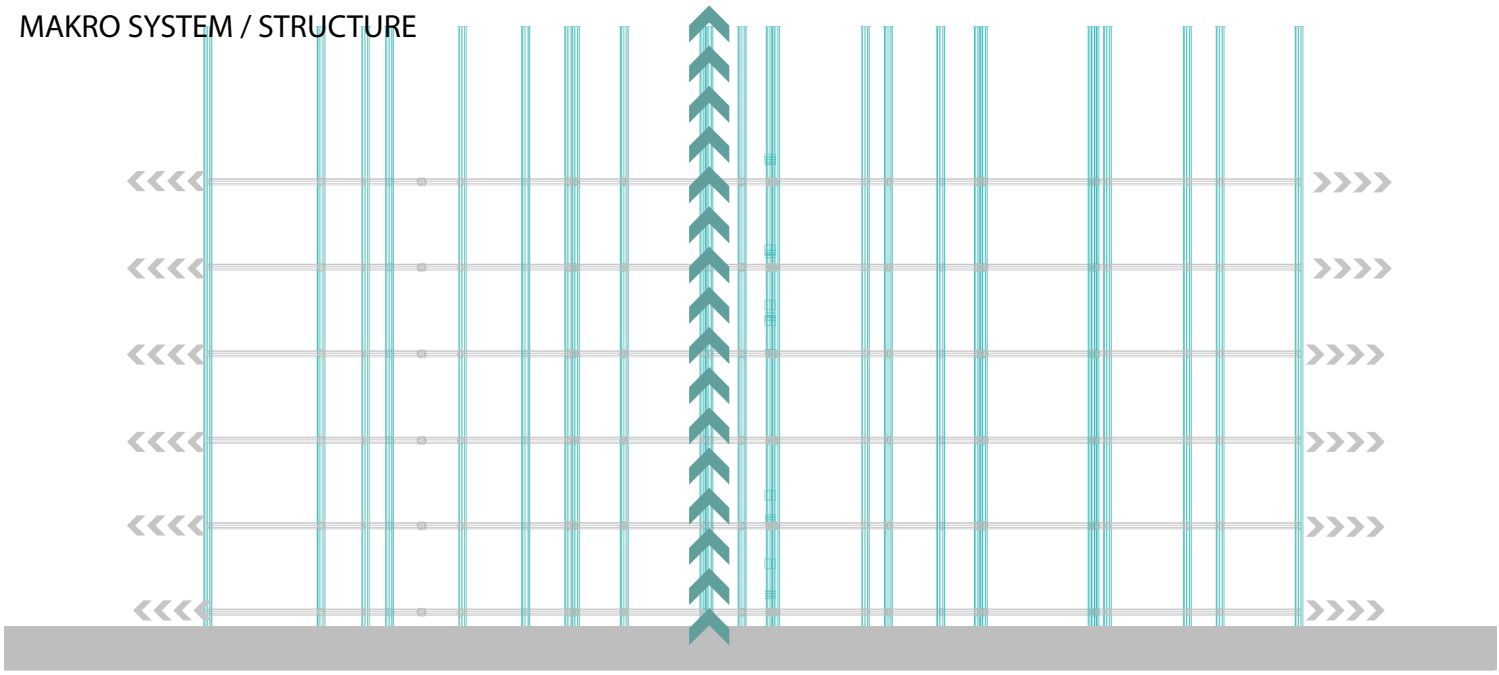


SKY NET

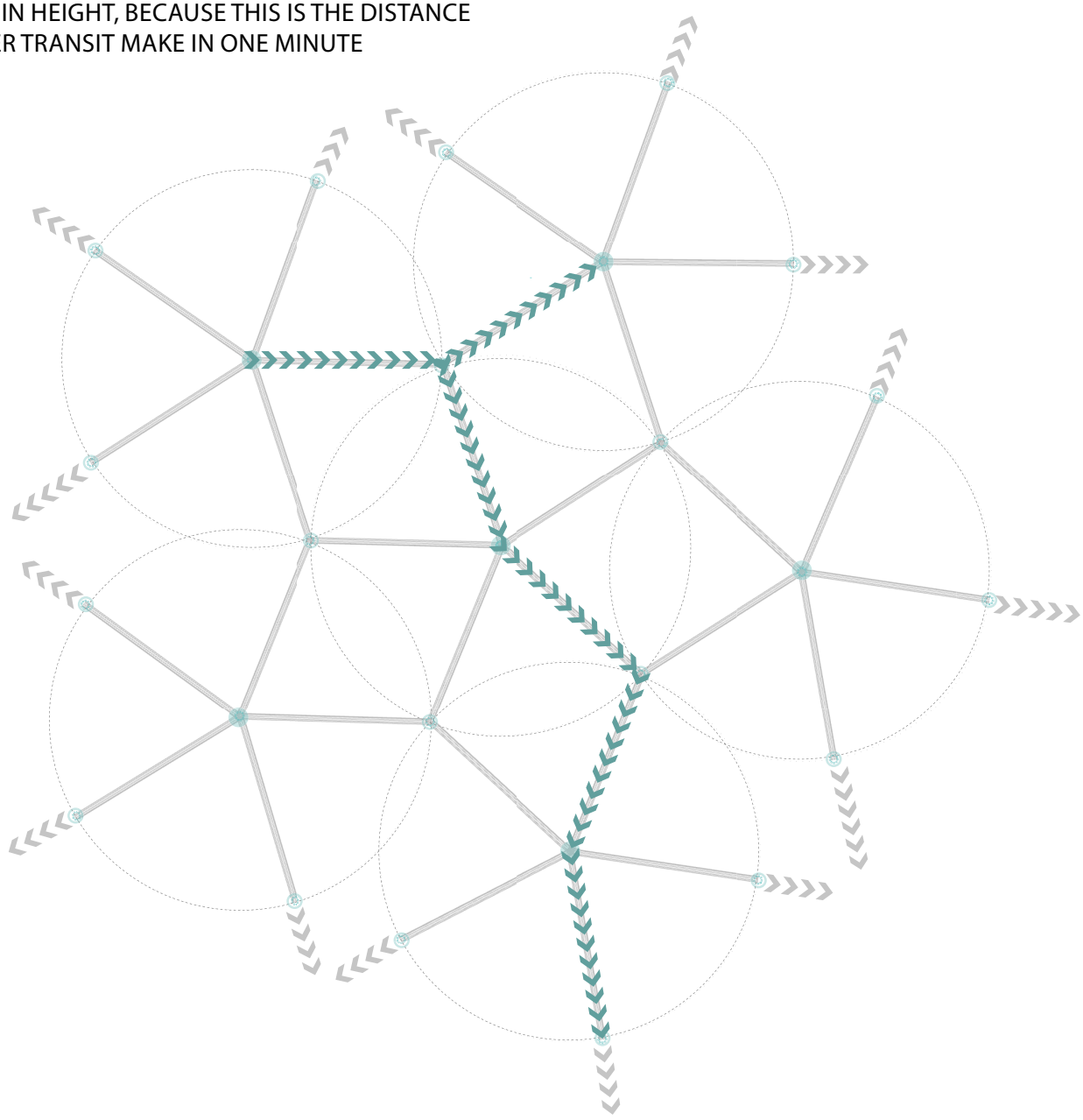
- RESPONS TO SECONDARY WIND DIRECTION
- ORIENTED STREETS 20-30° OBLIQUE TO PREDOMINANTE WIND
- MAXIMIZATION OF DISTANCE BETWEEN BUILDINGS FOR WIND FLOW

ORIENTATION OF TOWERS DRIVES SEA BREEZE INTO THE SITE; ENSURING MINIMIZED HEAT GAIN WHILE HAVING THE BEST EXSPOSURE TO AIR MOVEMENT.
THE TOWERS ARE PLACED ACCORDING TO A DEFINED GEOMETRIC PATTERN WHILE ALLOWING NEARLY EVERY OF THEM TO HAVE A SEA VIEW

MAKRO SYSTEM / STRUCTURE



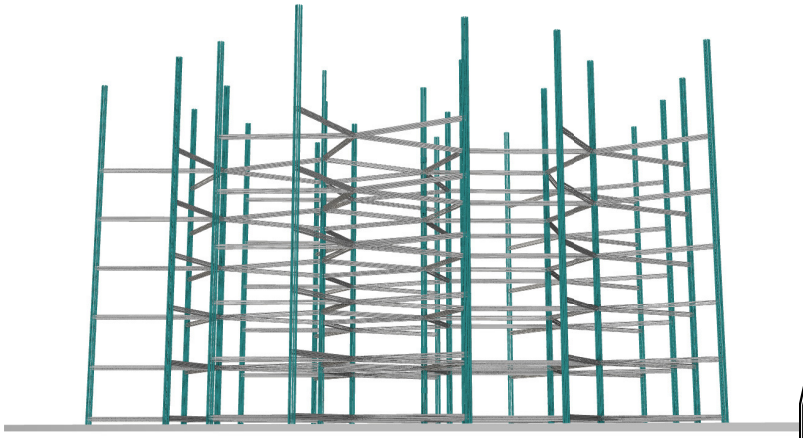
HORIZONTAL EXPRESS STRUCTURE SYSTEM HAPPEN
EVERY 180M IN HEIGHT, BECAUSE THIS IS THE DISTANCE
WHICH SUPER TRANSIT MAKE IN ONE MINUTE

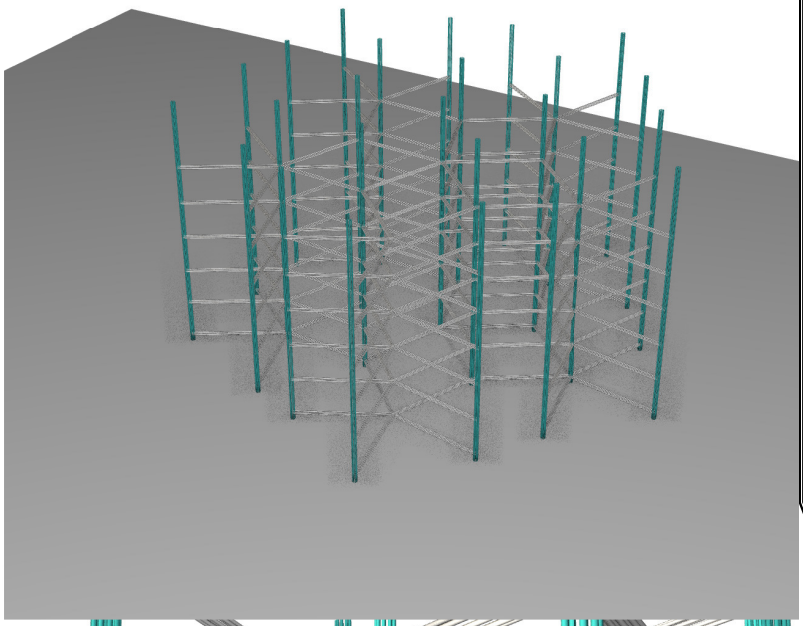


2014

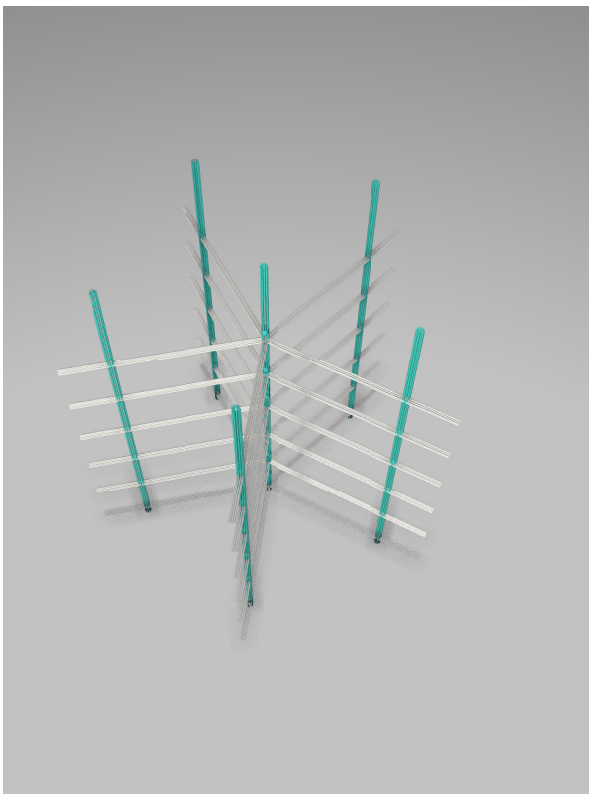
MEGA STRUCTURE IS MADE OF ORTHOGONAL 3D NET WHICH IMPLEMENTS AN EXPRESS TRANSPORTATION SYSTEM

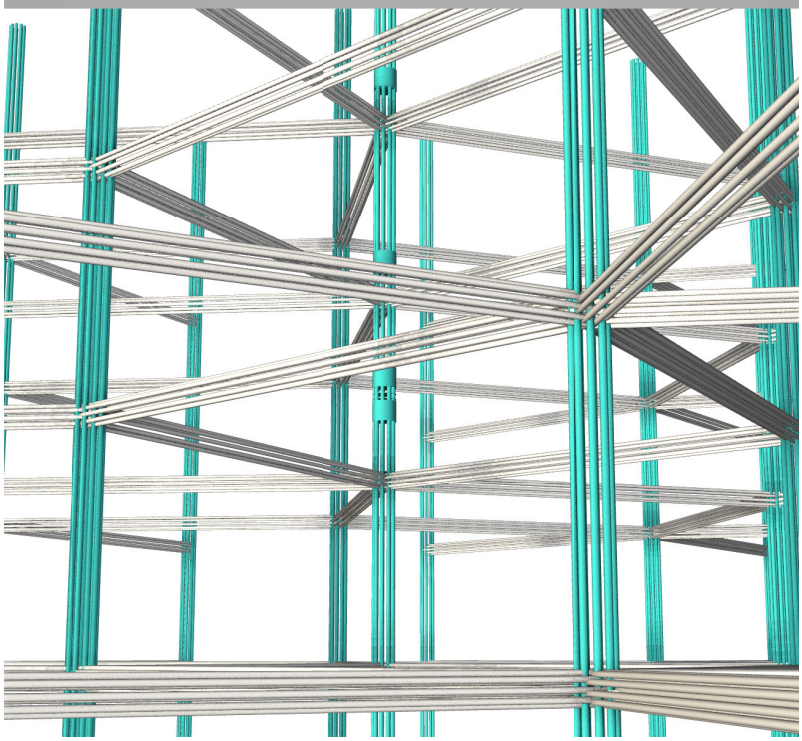
MEGA STRUCTURE IS MADE OF ORTHOGONAL 3D NET WHICH IMPLEMENTS AN EXPRESS TRANSPORTATION SYSTEM, BUT ALSO SEMI-PUBLIC AND PUBLIC SPACES. BRIDGES BETWEEN VERTICAL TUBES OFFERS CAFES, SMALL SHOPPING SPACES, RECREATIONAL AREAS, PARKS... BRIDGES ARE LIKE SMALL CITIES IN THE CITY FOR E.G. SOCIAL LIFE.



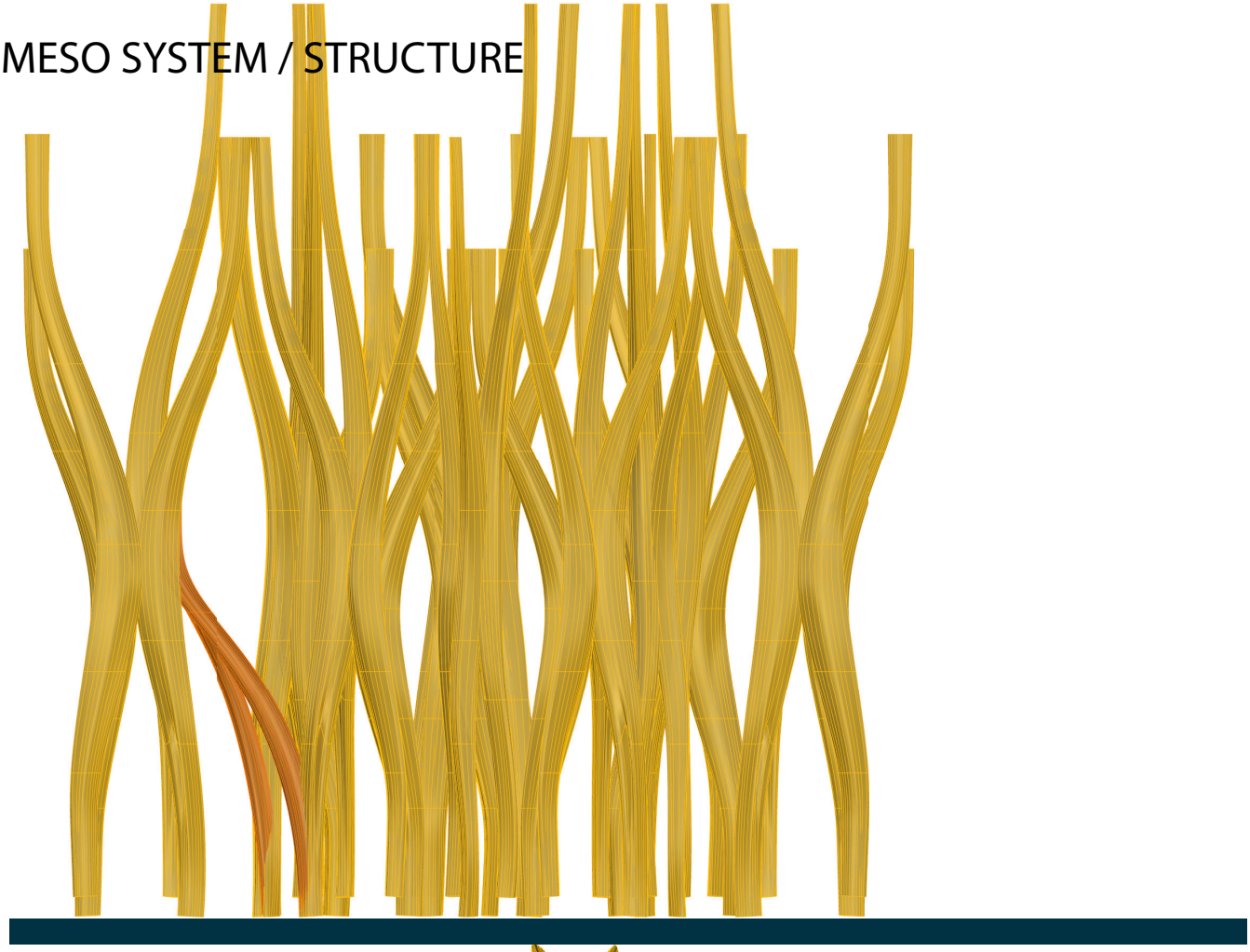


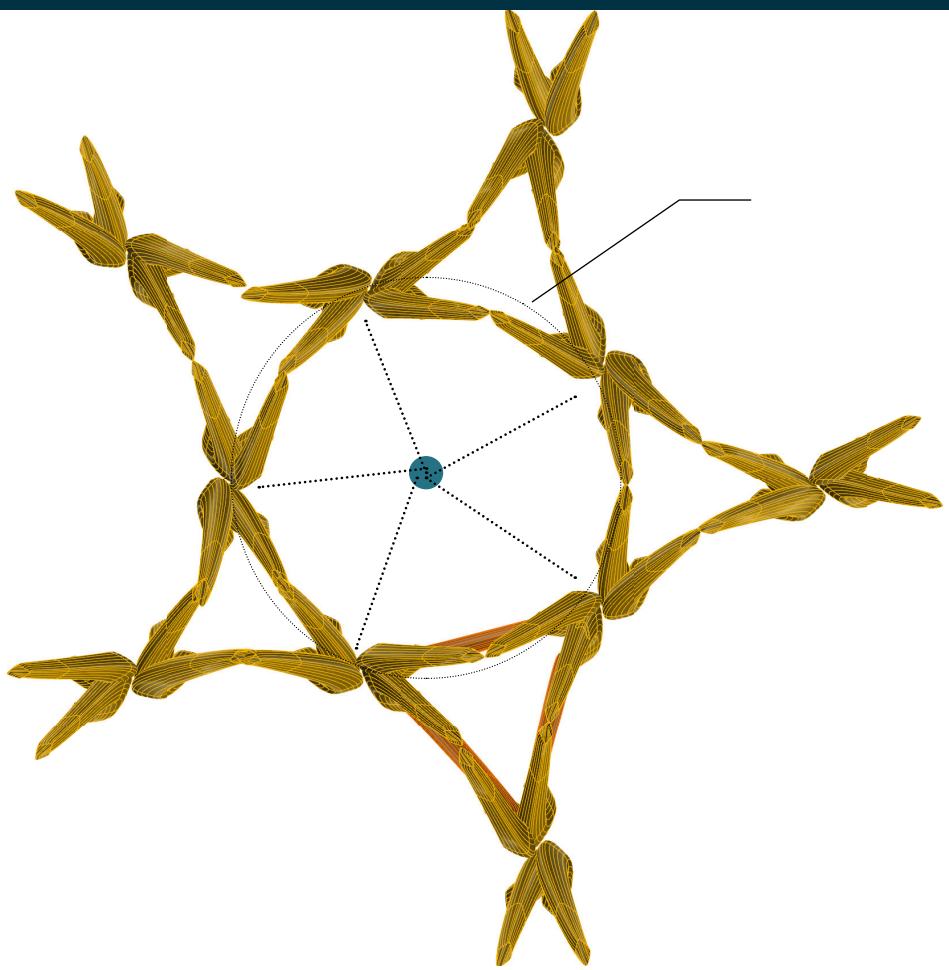
SKY NET





MESO SYSTEM / STRUCTURE





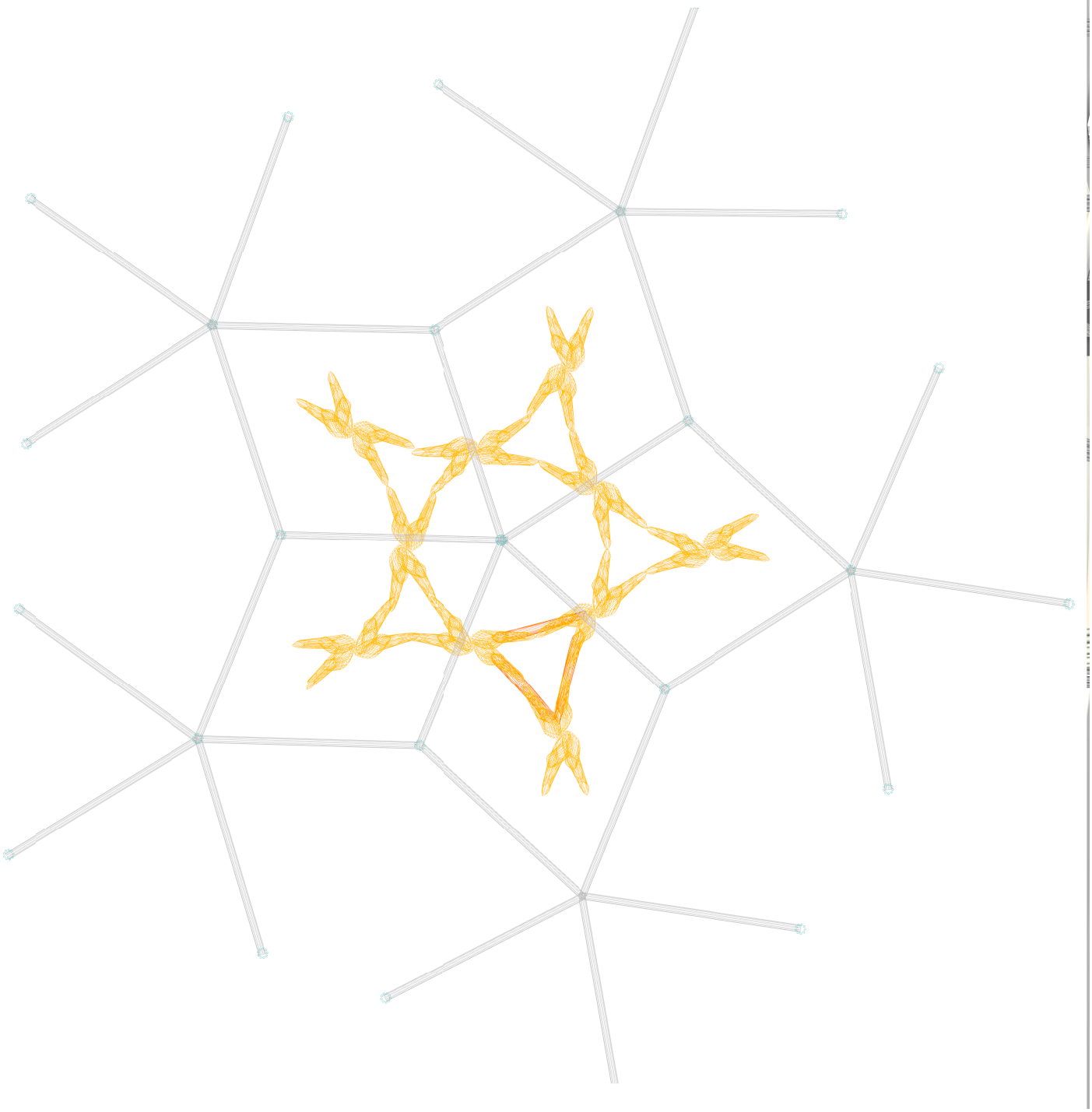
2014

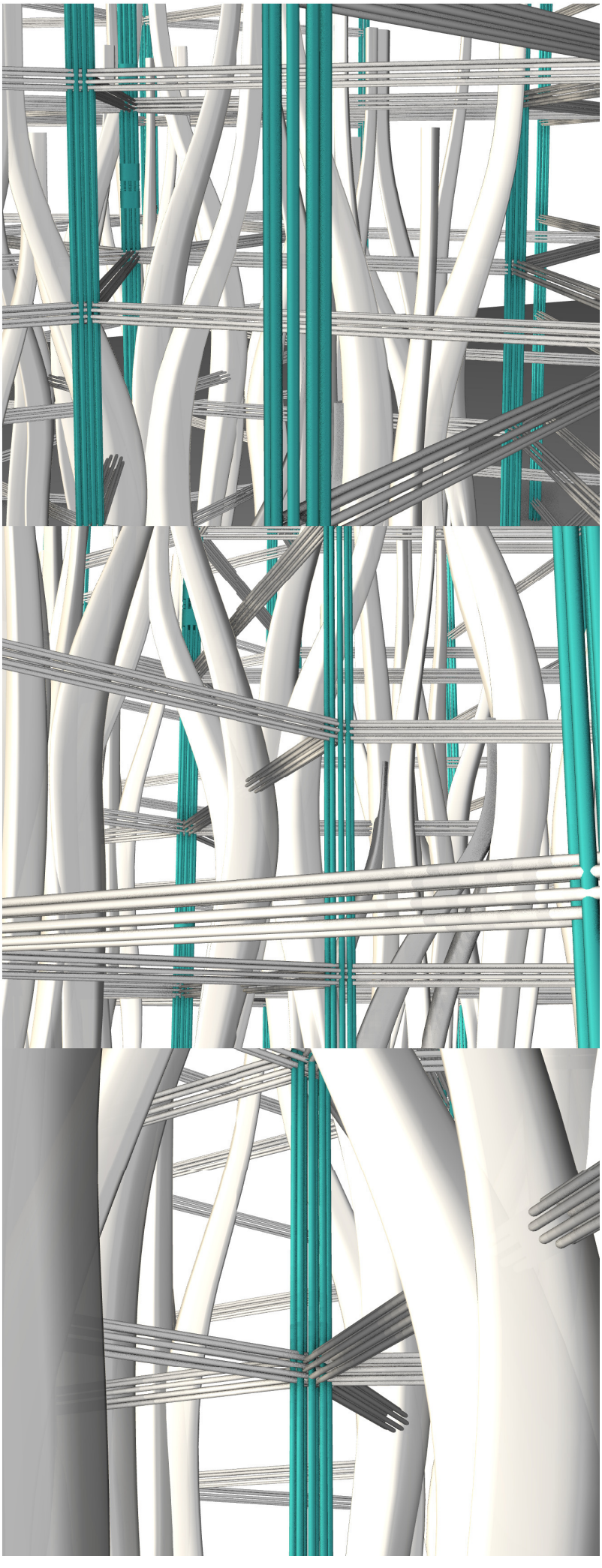
IN-BETWEEN MEGA -TRANSPORTATION STRUCTURE GROWS A SECOND MEGA STRUCTURE, THIS TIME X FORMING. THAT ARE BUILDINGS, HABITABLE SPACES, WHICH CONSIST OF SEMI PUBLIC AND PRIVATE SPACES.

SKY NET

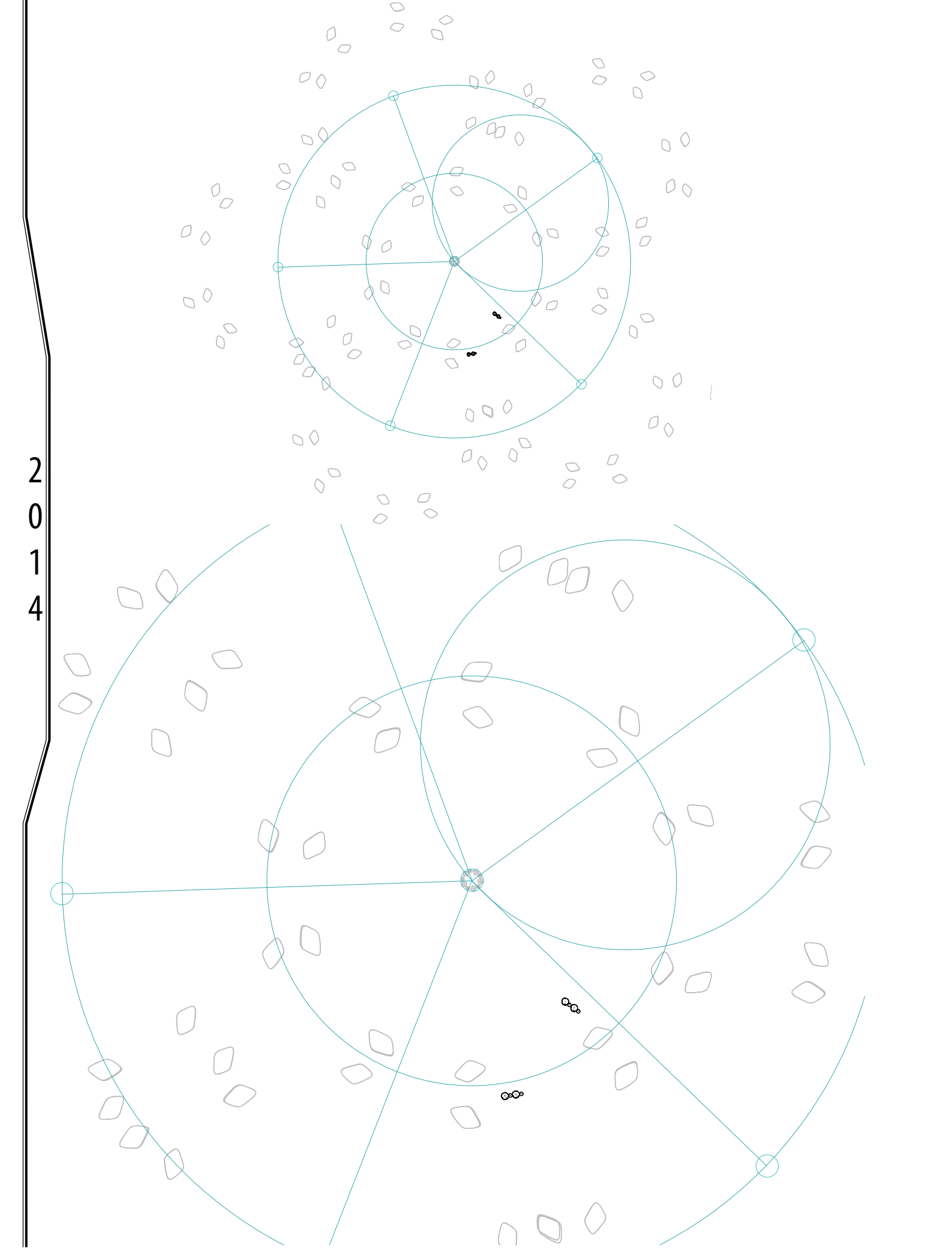
IMPLEMENTATION:
MACRO + MEZZO STRUCTURAL SYSTEM MIX

2014





SKY NET



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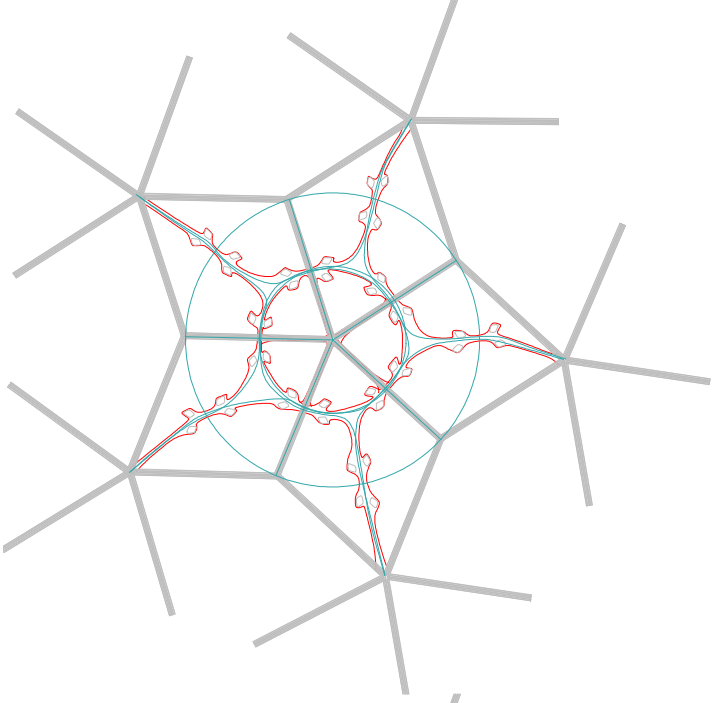
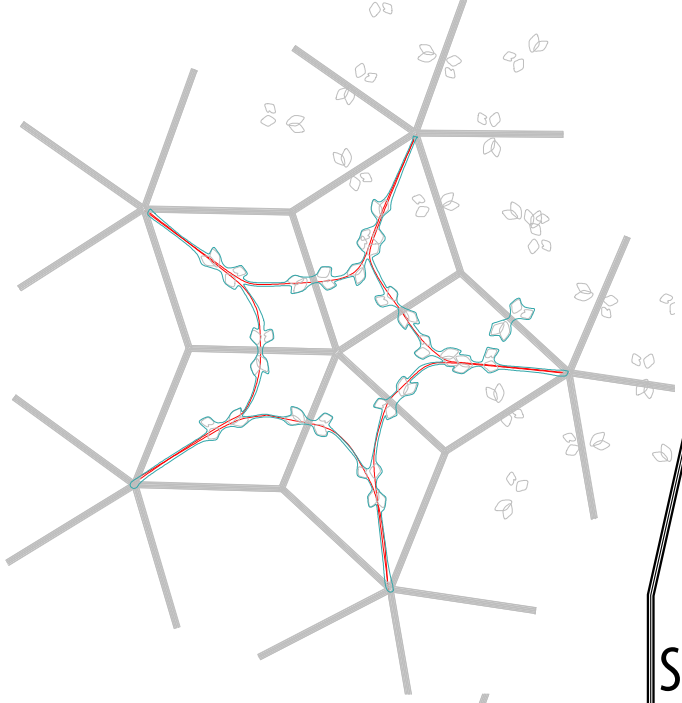
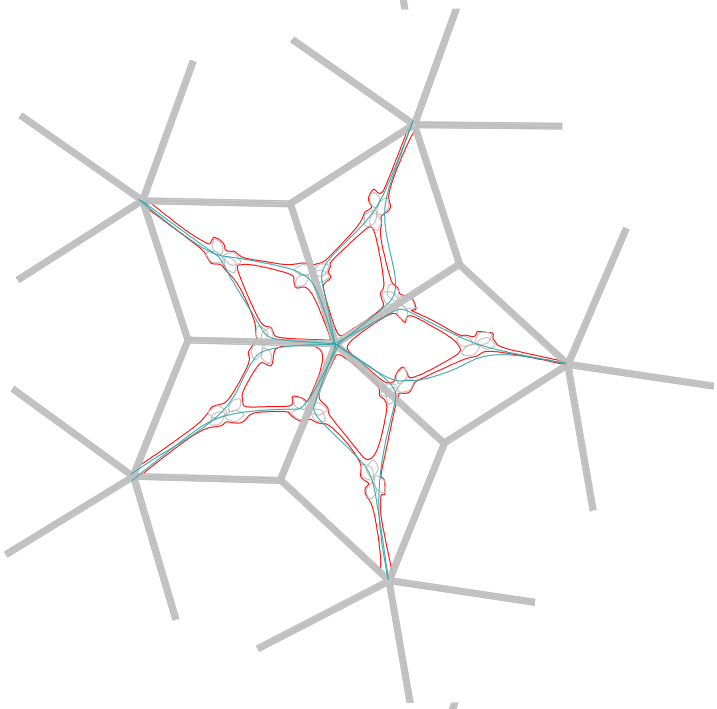
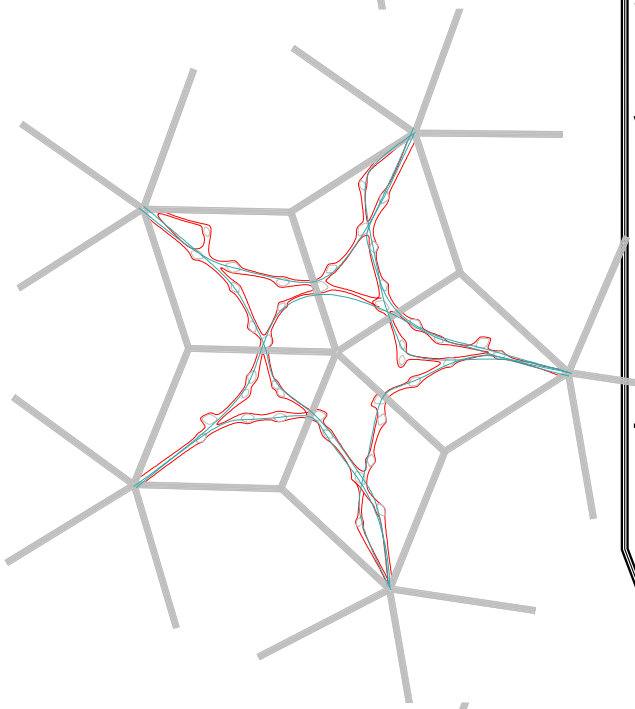
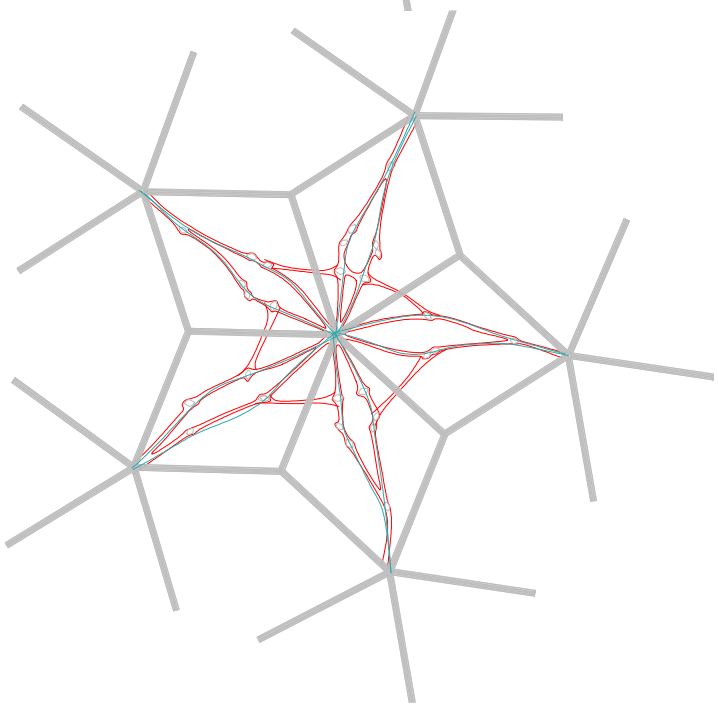
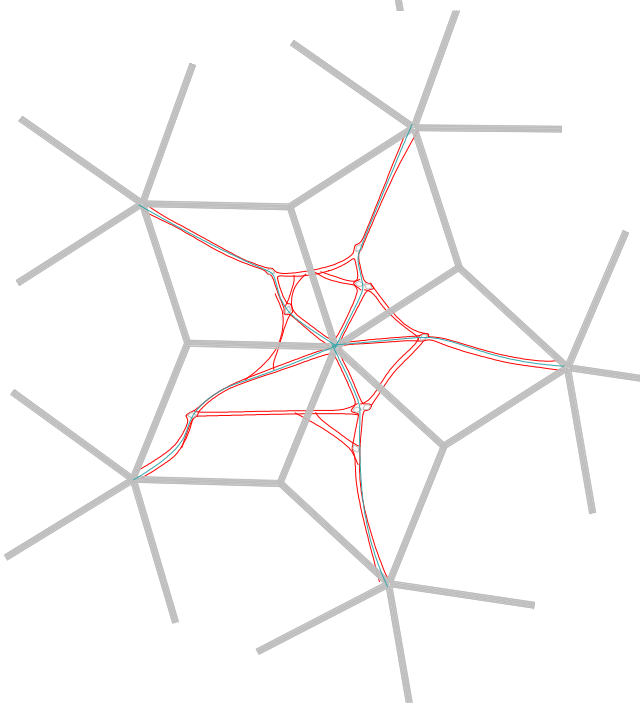








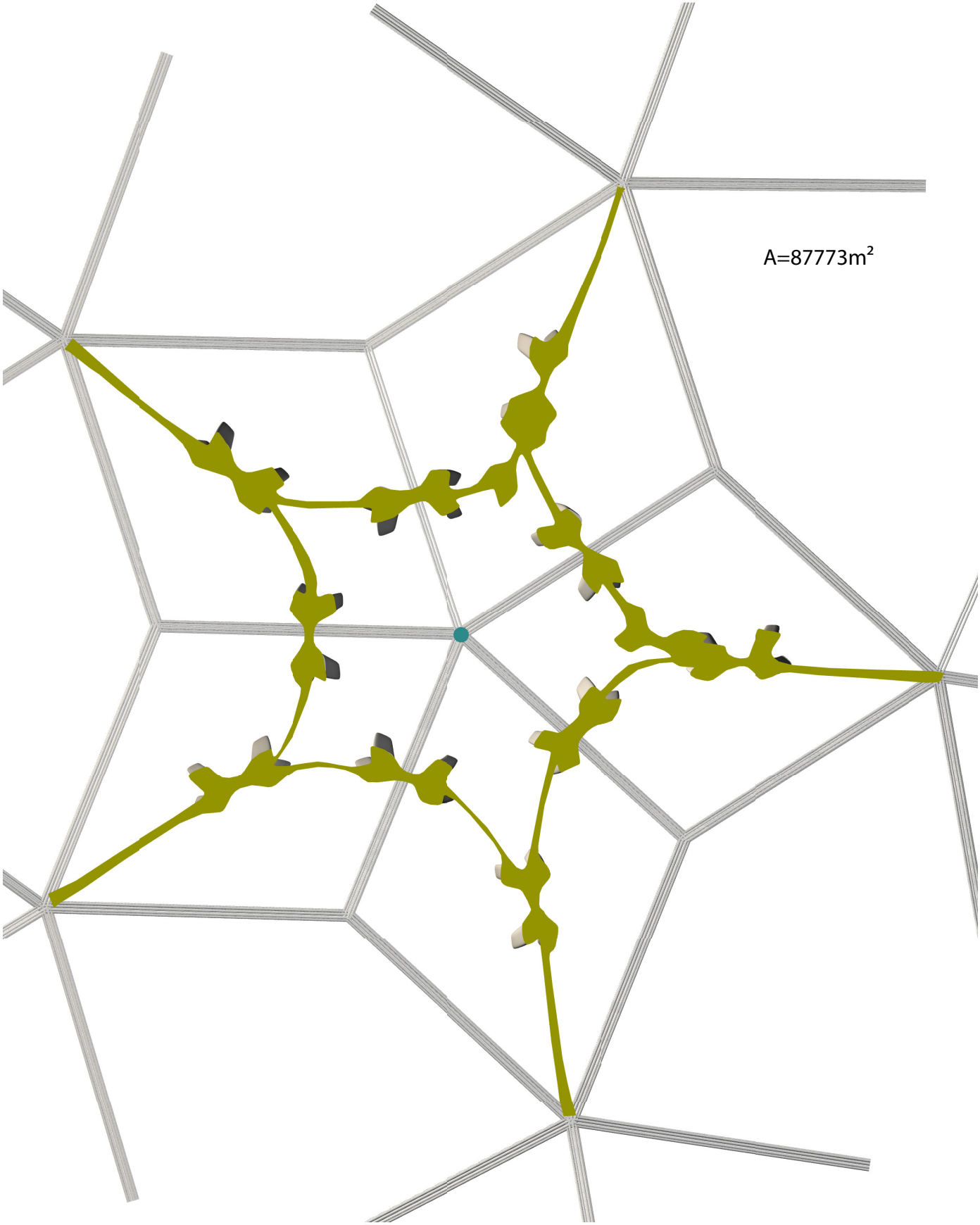




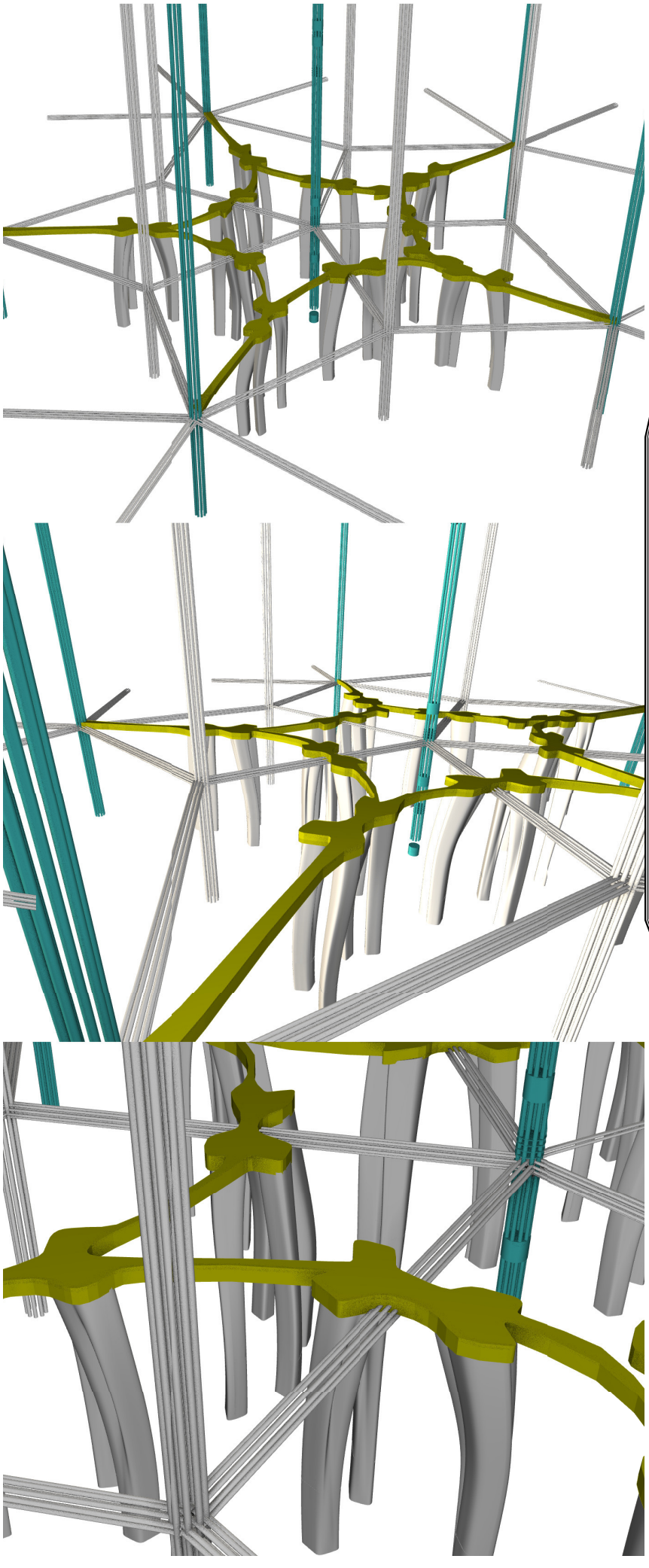
SKY NET

ADAPTATION MACRO SYSTEM ON MEZZO SYSTEM

2014

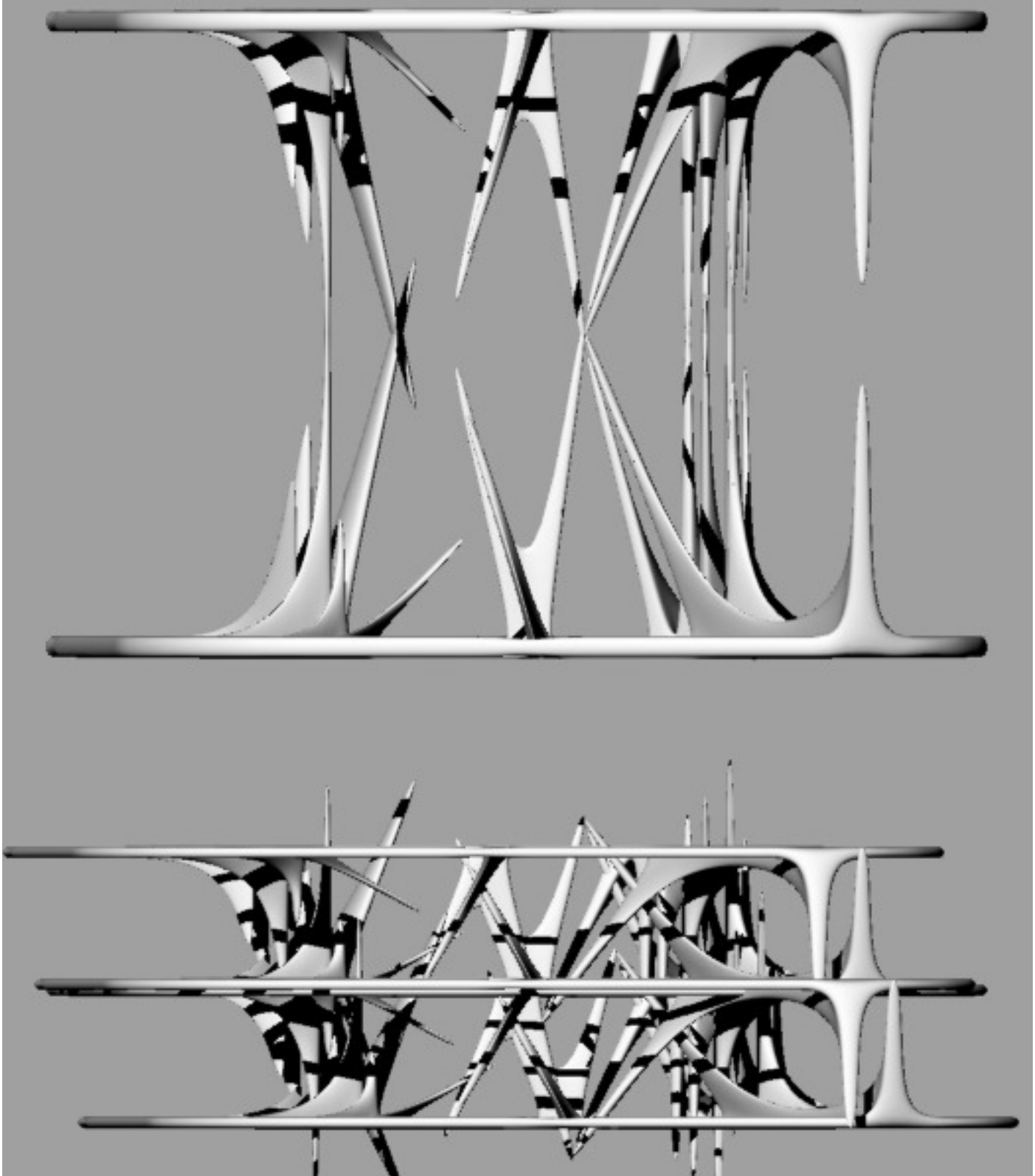


WITH ADAPTATION WE BECOME A NEW LAYER IN SPACE, WHICH IS USED FOR SEMI PUBLIC AND PUBLIC SPACES, LIKE ALSO FOR LOCAL TRANSPORTATION SYSTEM. IT CONNECTIS BUILDINGS AND MAIN STATIONS ON VERTICAL HIGHWAYS



SKY NET

MICRO SYSTEM / STRUCTURE

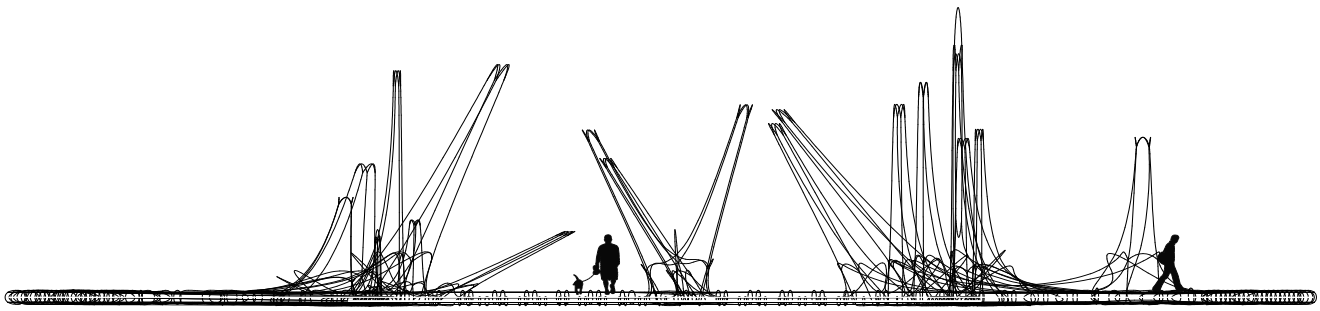


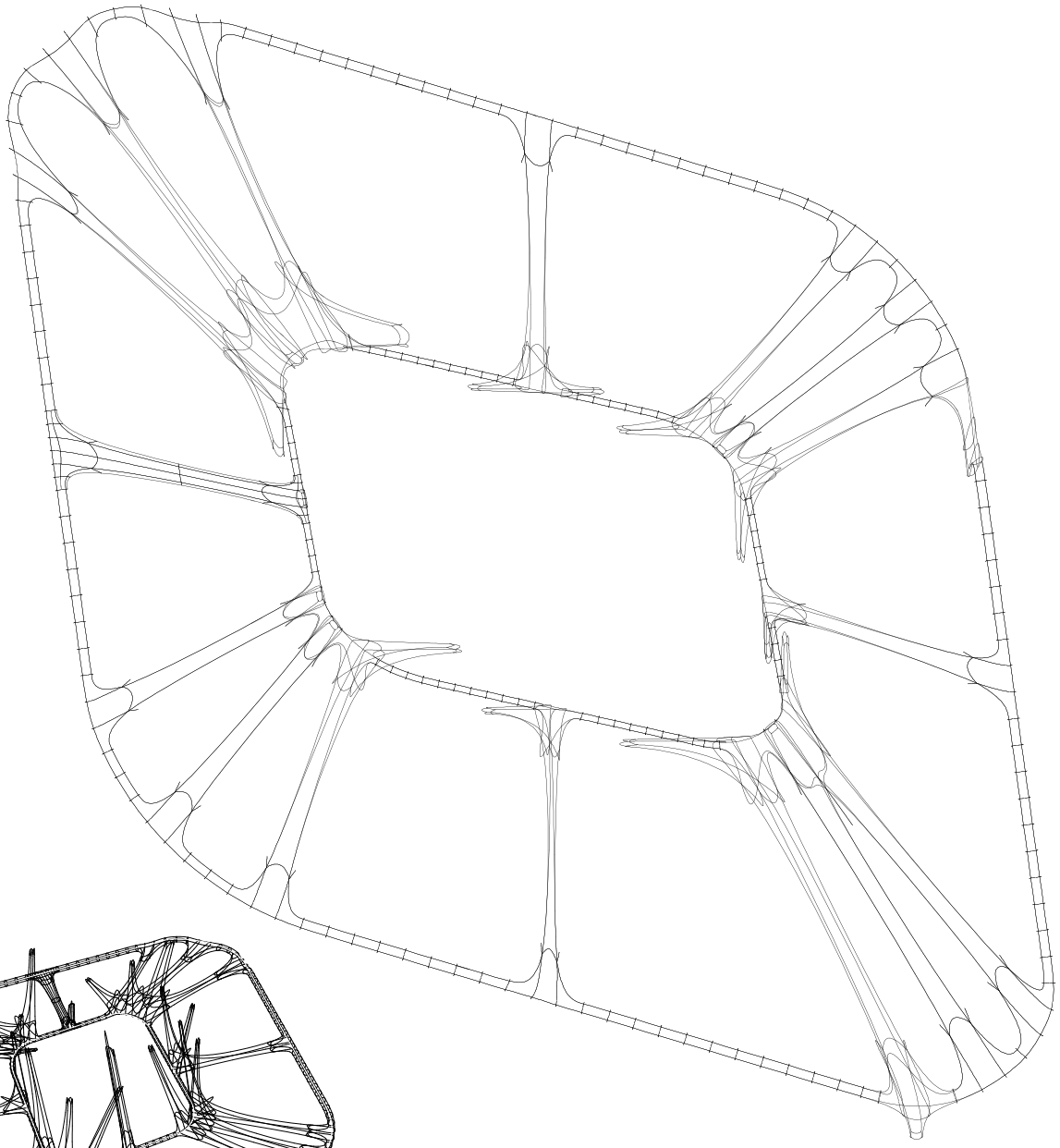
2014

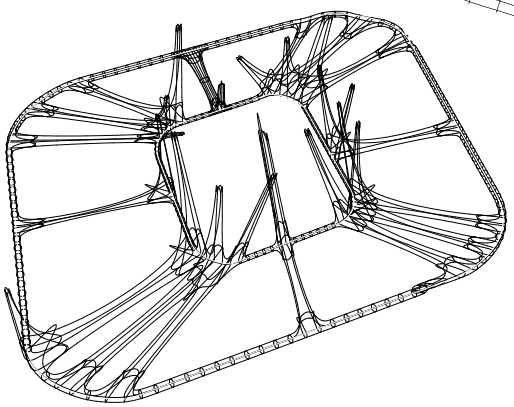
BY IMPLEMENTATION OF MEGA STRUCTURE WITH MESO STRUCTURE, MICRO STRUCTURE IS ONE OF THE KEY PLAYERS. IT HELPS TO CONNECT THIS TO SYSTEMS, MAKE THEM STABLE AND
MICRO STRUCTURE ALSO IMPLEMENT THE WHOLE INFRASTRUCTURE..
IT WORKS ON PRINCIPE COMMUNICATING VESSELS
SO NOTHING IN SKY NET IS MONO-FUNCTIONAL

THE MICRO SYSTEM IS BASICALLY A NET OF TUBES, WHICH FOLLOWS THE SILHOUETTES OF MACRO AND MEZZO STRUCTURES. TUBES OF MACRO SYSTEM ARE USED LIKE WAY FOR HYBRID TRANSPORT SYSTEM, AND TUBES ON MEZZO SCALE ARE USED FOR LOCAL TRANSPORTATION SYSTEM, ALSO LIKE FOR INFRASTRUCTURE
MICRO STRUCTURE IS ALSO BORDER BETWEEN INSIDE AND OUTSIDE

INFRASTRUCTURE IN THE STRUCTURE



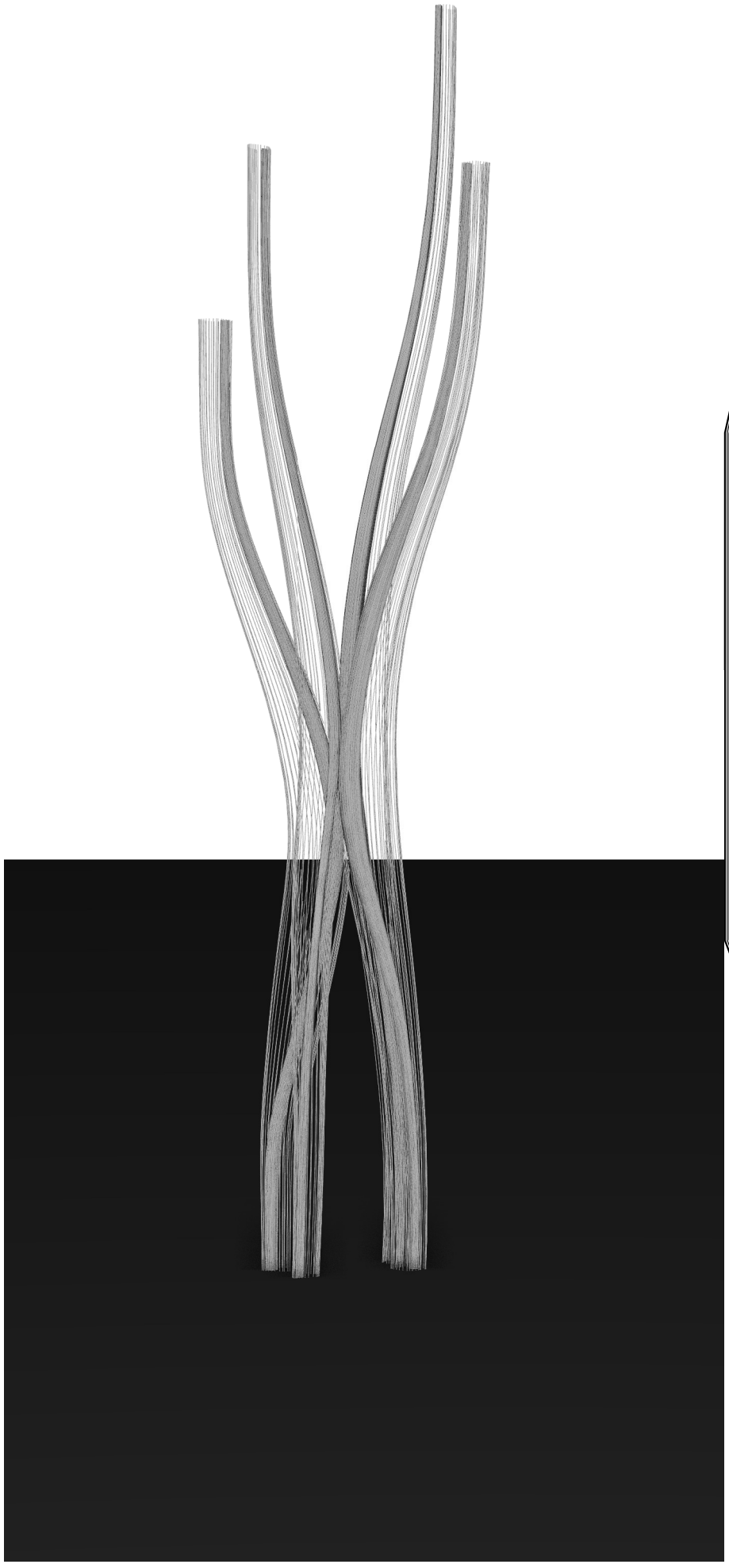




SKY NET

PHYSICAL AND ORGANIZATIONAL STRUCTURES, WHICH ARE NECESSARY FOR THE FUNCTIONING OF SOCIETY OR THE SERVICES AND FACILITIES NECESSARY FOR THE FUNCTIONING OF THE ECONOMY. OFTEN REFER TO THE TECHNICAL STRUCTURES THAT SERVE TO SUPPORT THE SOCIETY. THIS INCLUDES FOR EXAMPLE: ROADS, WATER SUPPLY, SEWERAGE, ELECTRICITY GRIDS, TELECOMMUNICATIONS, ETC. INFRASTRUCTURE PROMOTES THE PRODUCTION OF GOODS AND AVAILABILITY OF SERVICES. IN TERMS OF FUNCTIONALITY, INFRASTRUCTURE SYSTEM CAN NOT KEEP TRACK OF URBAN DEVELOPMENT AND POPULATION GROWTH.TODAY'S NETWORK INFRASTRUCTURE IS SOLID, TWO-DIMENSIONAL AND LIMITED, limited in terms of considerable distances which must be bypassed to reach certain points

2014

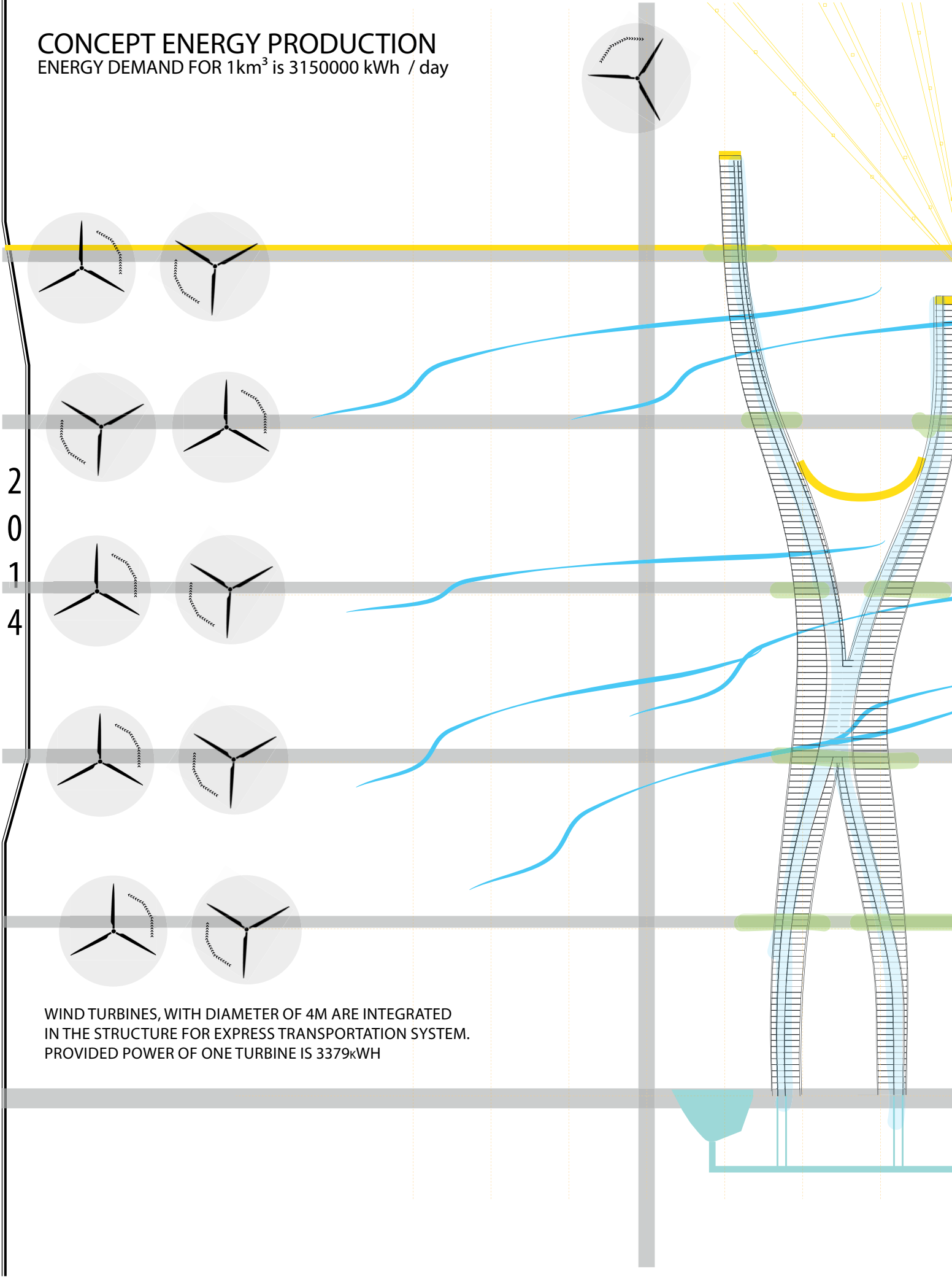


SKY NET

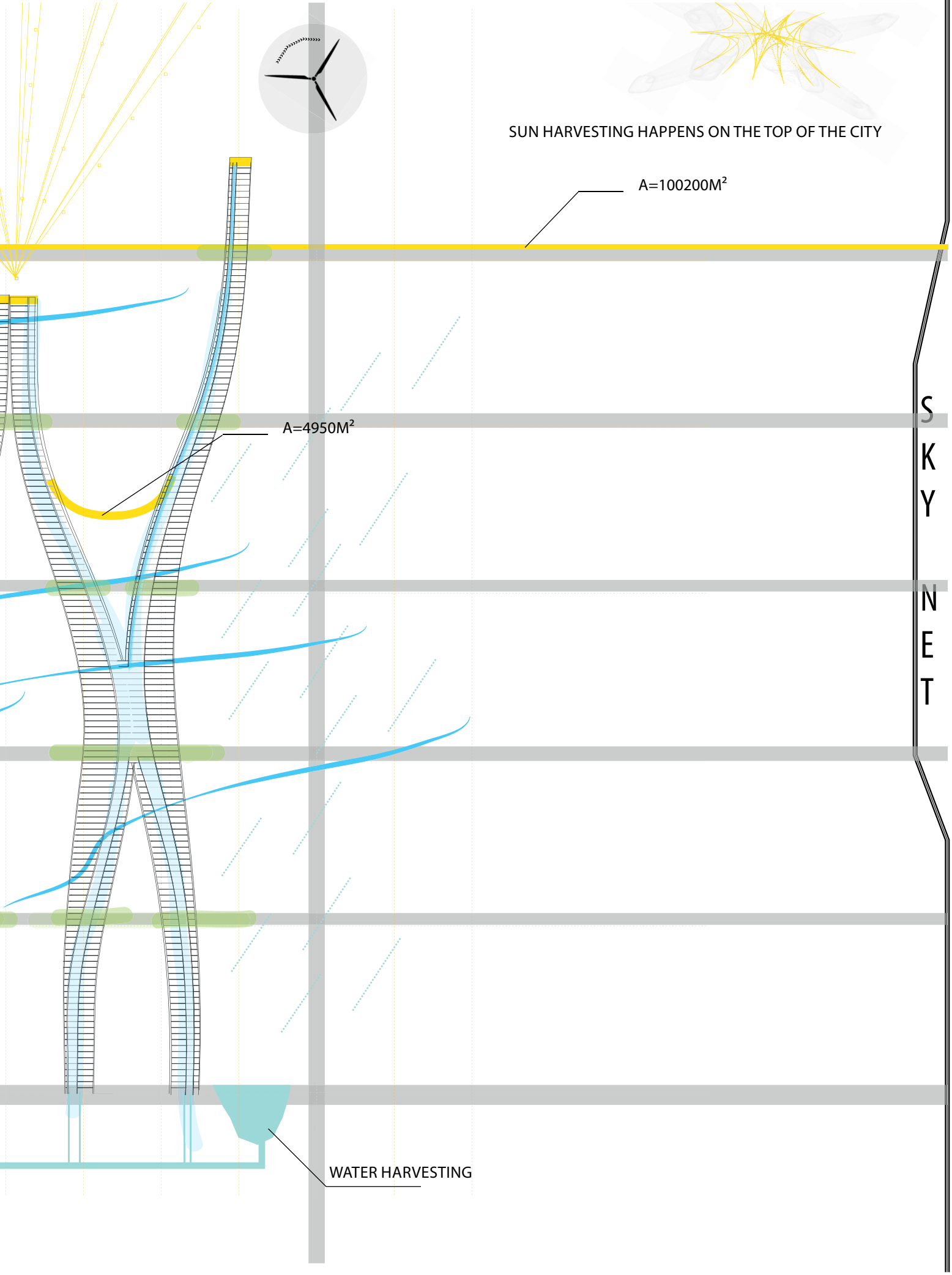
CONCEPT ENERGY PRODUCTION

ENERGY DEMAND FOR 1km^3 is 3150000 kWh / day

2014

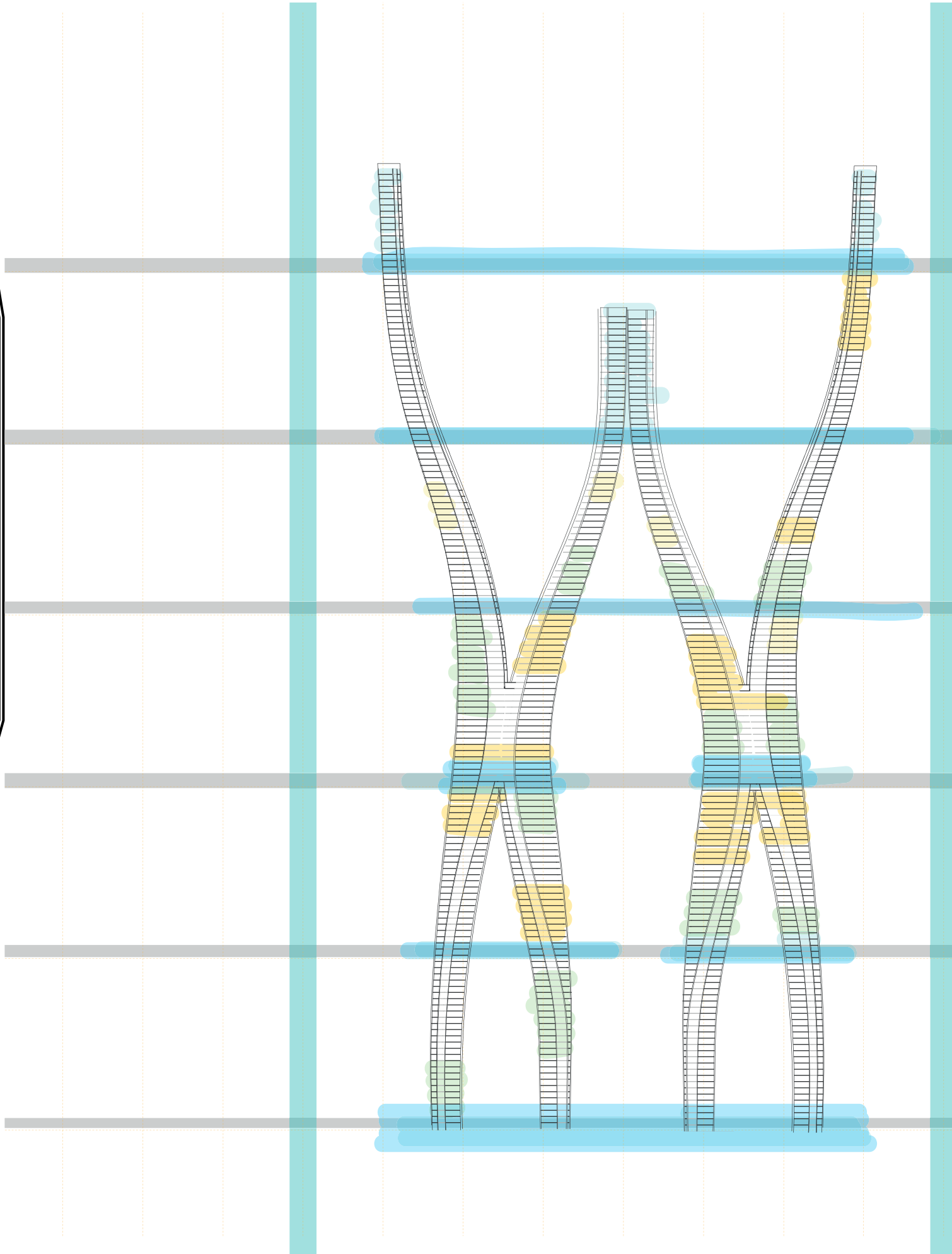


WIND TURBINES, WITH DIAMETER OF 4M ARE INTEGRATED
IN THE STRUCTURE FOR EXPRESS TRANSPORTATION SYSTEM.
PROVIDED POWER OF ONE TURBINE IS 3379KWH


SUN HARVESTING HAPPENS ON THE TOP OF THE CITY
A=100200M²
A=4950M²
SKY NET
WATER HARVESTING

PROGRAM DISTRIBUTION

2014



FAR = 14

1500x

30000x

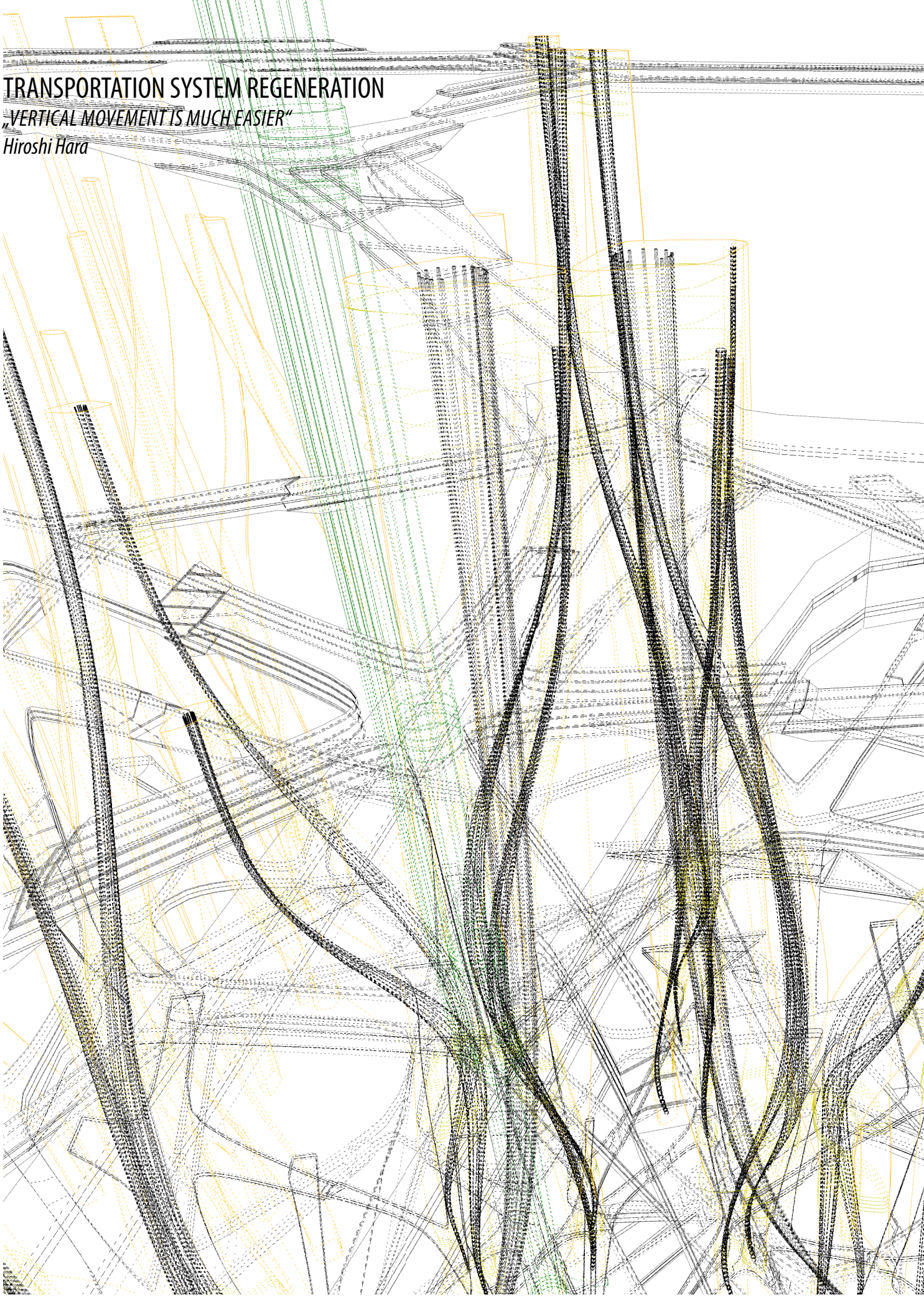
		m^2/P	m^2/BUIDING	m^2/KM^3
HOME		54,11	81165	1623300
OFFICE		3,09	4635	92700
SERVICE		26,89	40335	806700
VERTICAL FARMING		211,97	317955	6359100
IINDUSTRY		4,49	6735	134700
SHOPPING		2,68	4020	80400
LEISURE		14,50	21750	435000
HVAC		144,00	216000	4320000

SKY NET

TRANSPORTATION SYSTEM REGENERATION

„VERTICAL MOVEMENT IS MUCH EASIER“

Hiroshi Hara



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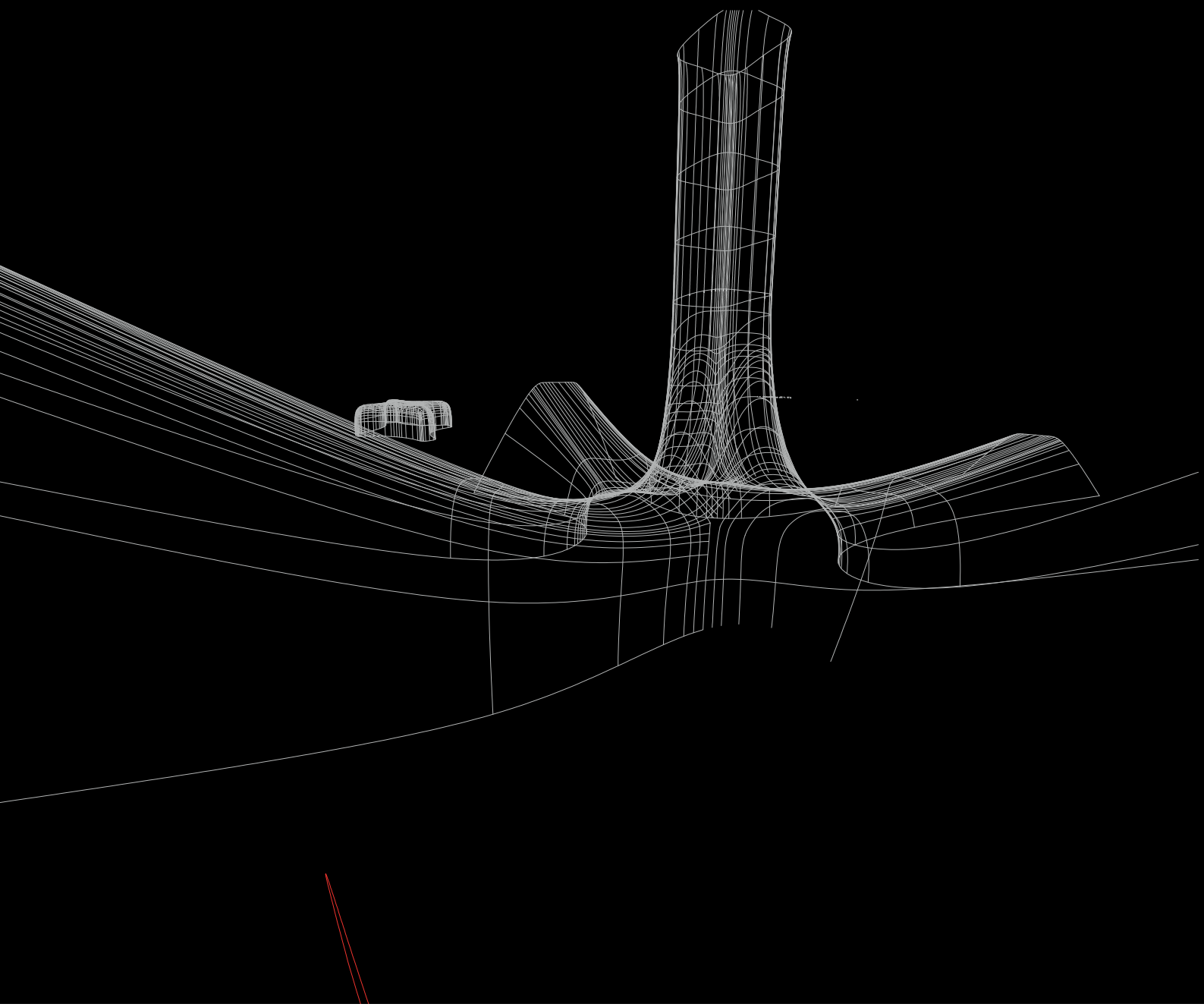
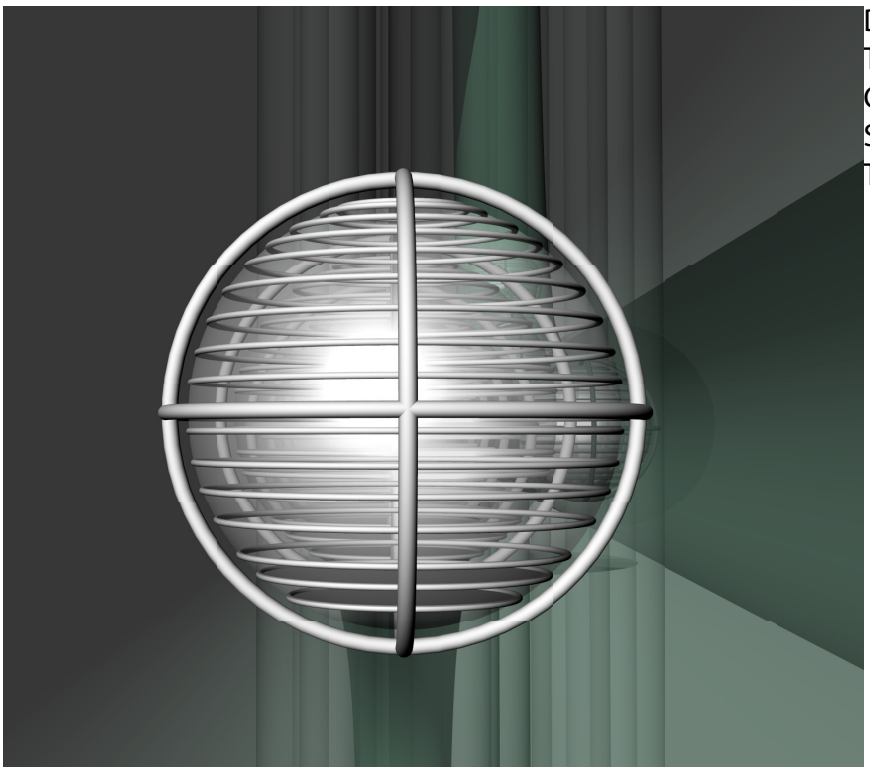


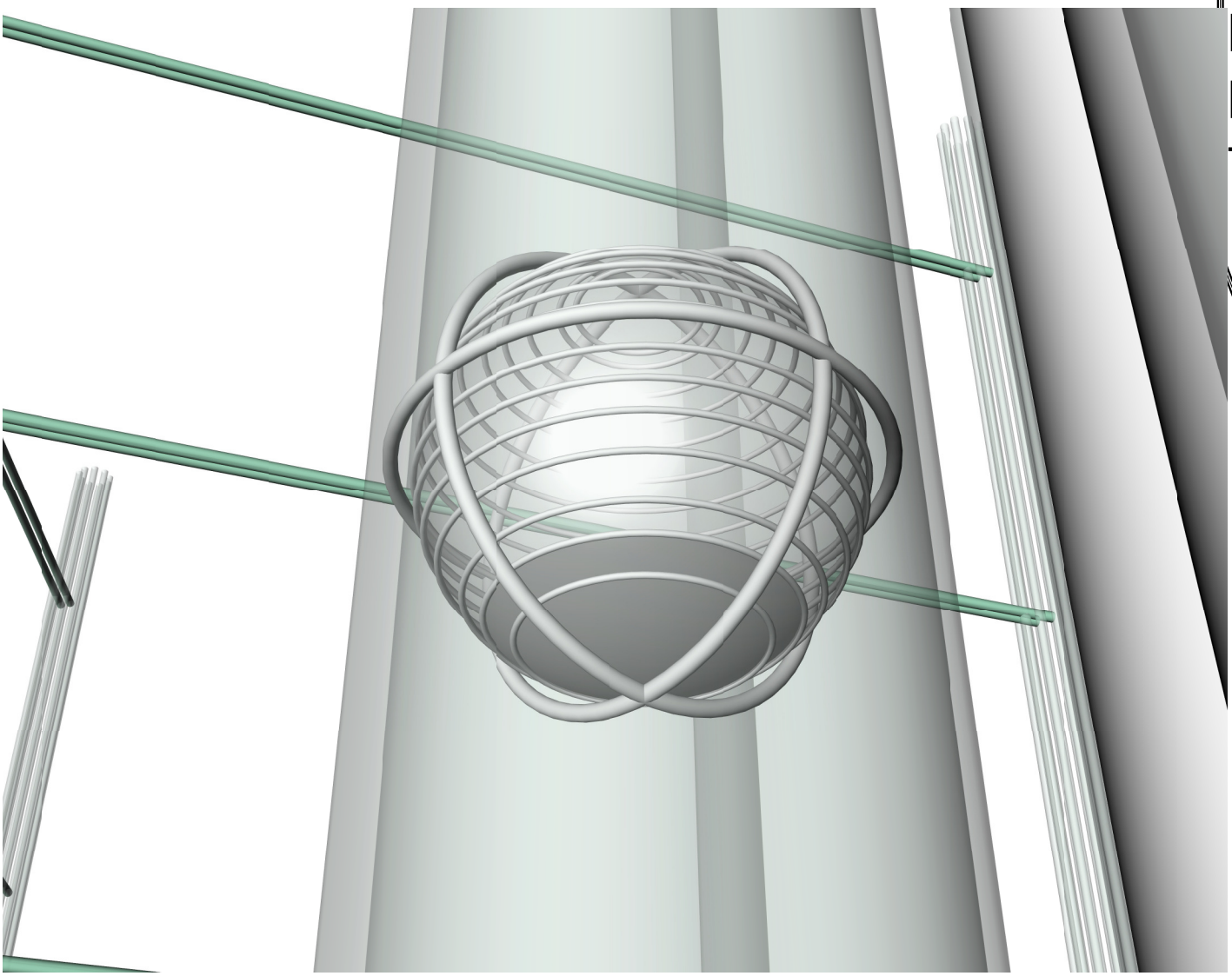
2014

HIGH ALTITUDE IS NOT THE ONLY CHALLENGE IN THE WAY OF PLANNING THE BUILDING, BUT ALSO IN THE ORGANIZATION ACROSS THE SAME, ESPECIALLY TO FACILITATE THE MOVEMENT OF PEOPLE AND NOT TO COME TO THE GREAT LOSS OF USABLE SPACE AND TIME



DRIVING UNIT IN SKY NET TRANSPORTATION SYSTEM IS A HYBRID PRODUCED BY CROSSING FUNCTIONALITY OF SCHINDLER ELEVATOR AND MAGLEV TRAIN

SKY NET



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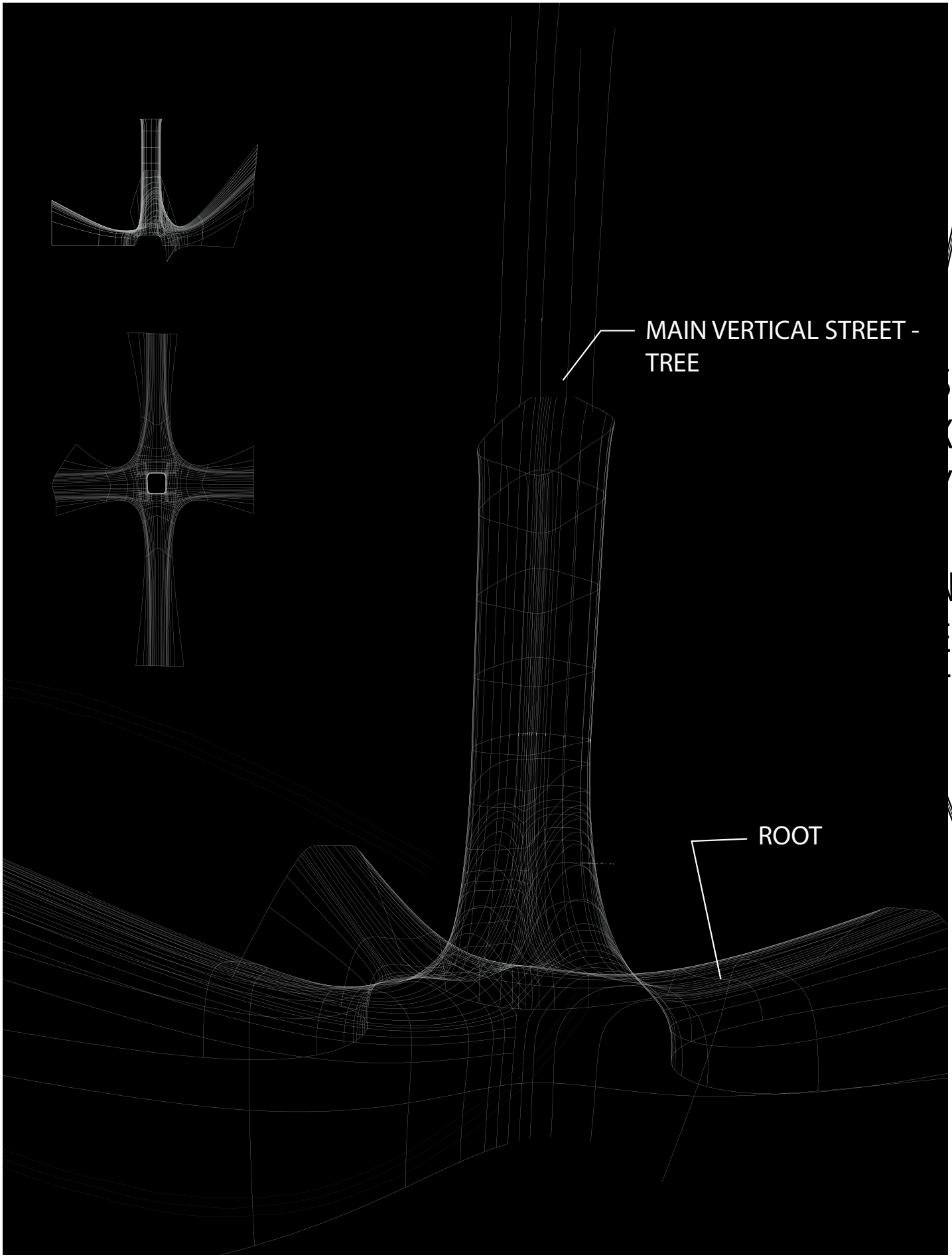
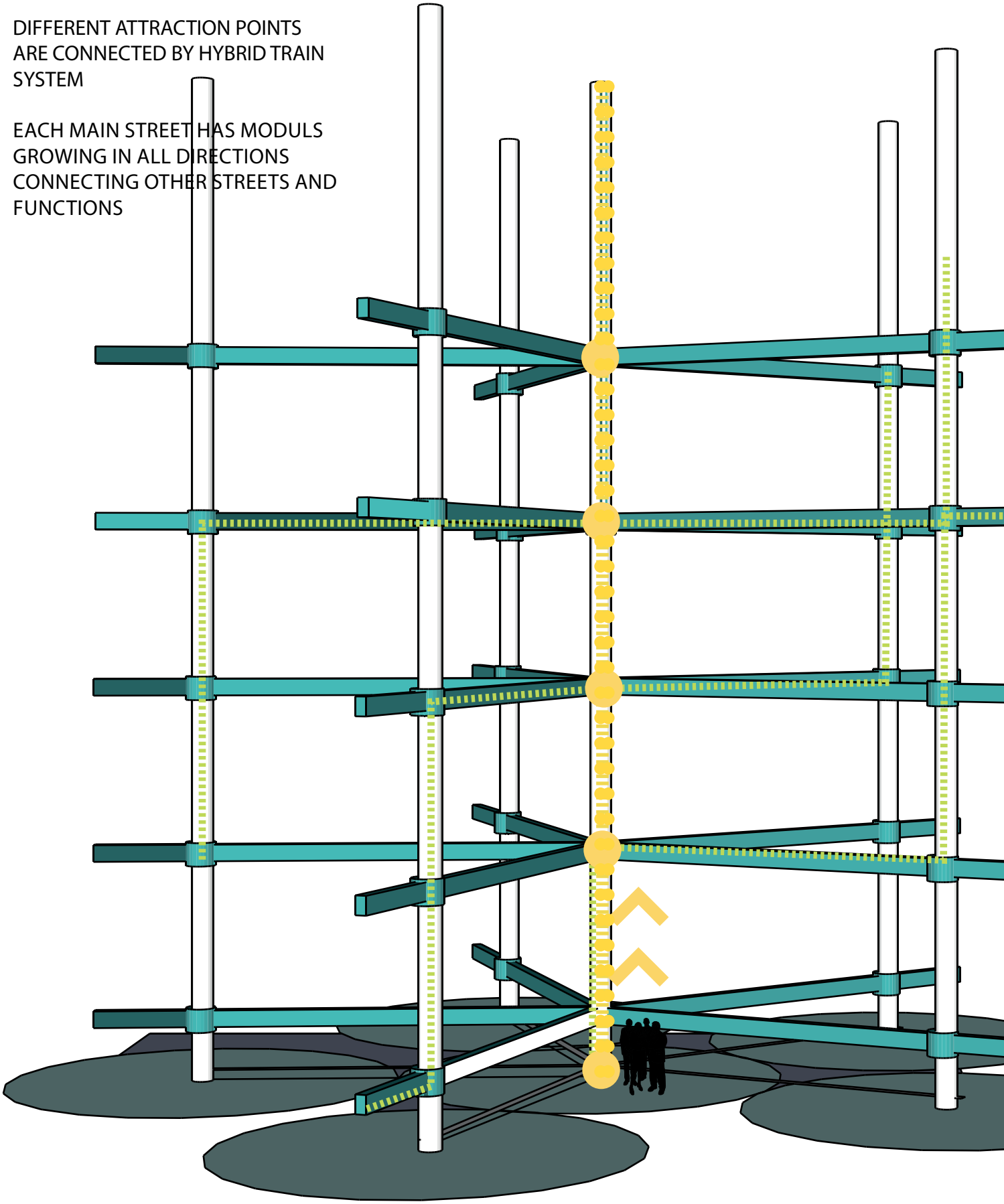

MAIN VERTICAL STREET -
TREE
ROOT

EXPRESS TRANSIT

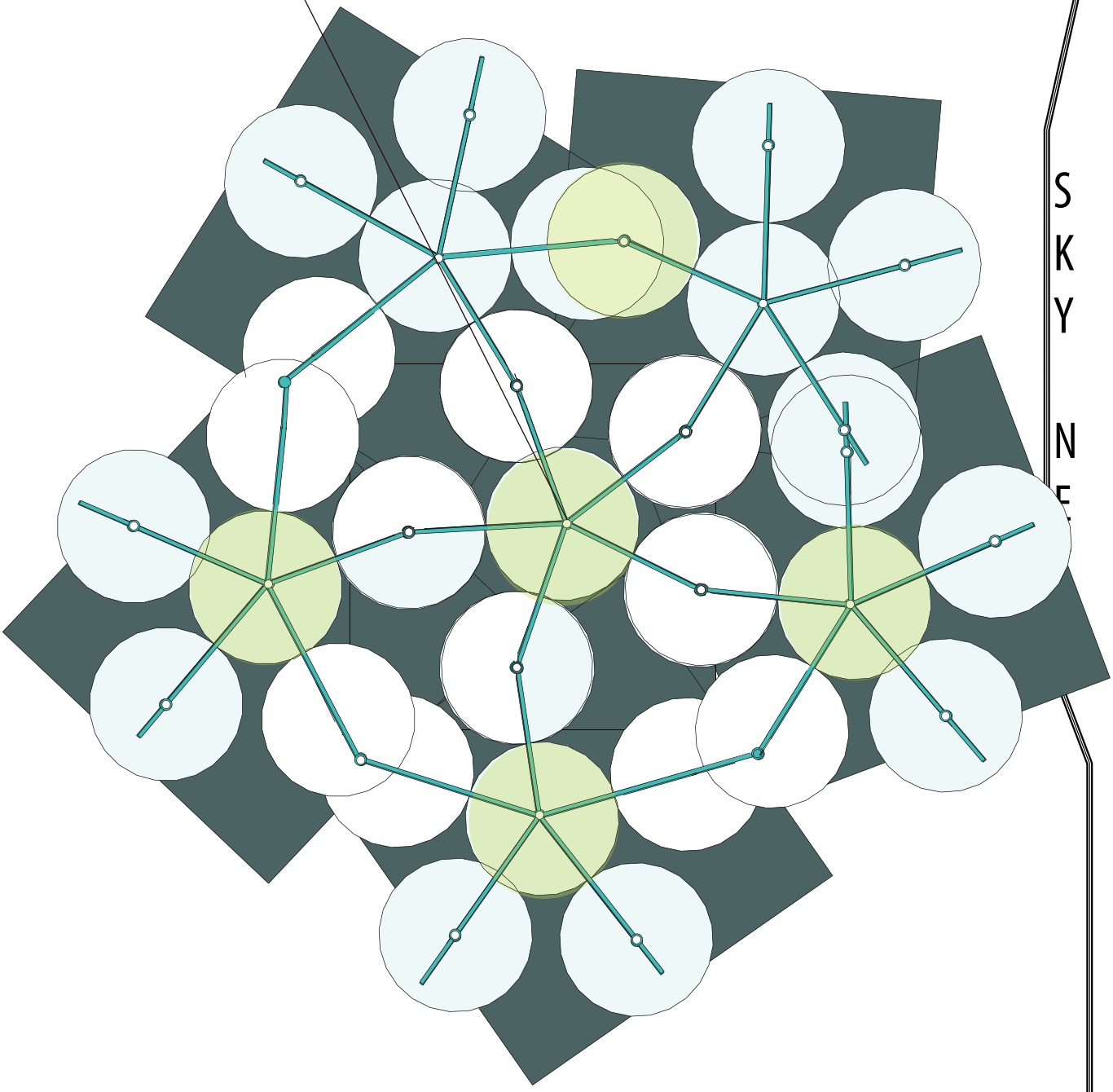
DIFFERENT ATTRACTION POINTS ARE CONNECTED BY HYBRID TRAIN SYSTEM

EACH MAIN STREET HAS MODULS GROWING IN ALL DIRECTIONS CONNECTING OTHER STREETS AND FUNCTIONS

2014



the main vertical hy way has has just
vertical movement



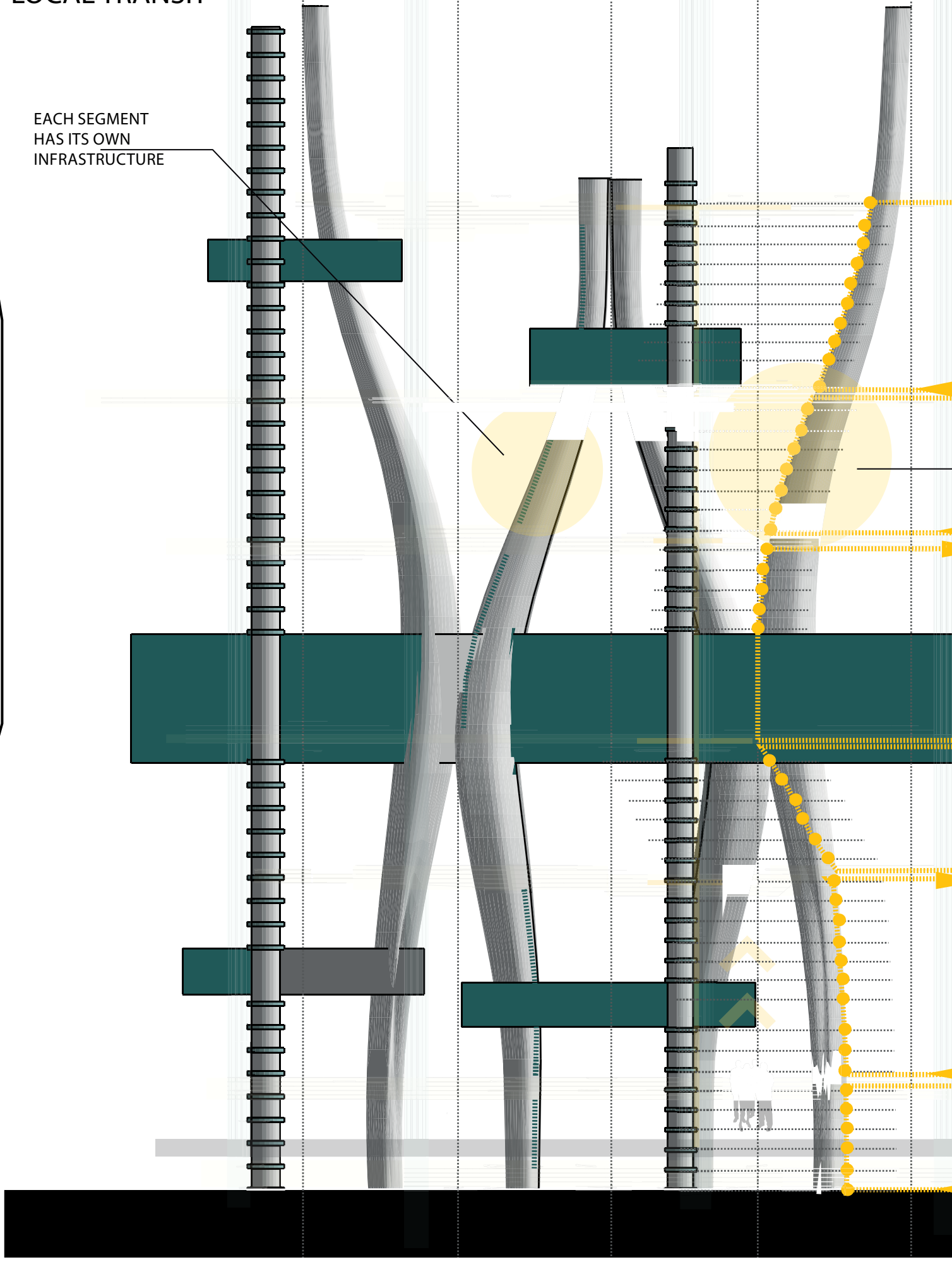
POSSIBILITY TO EXPAND

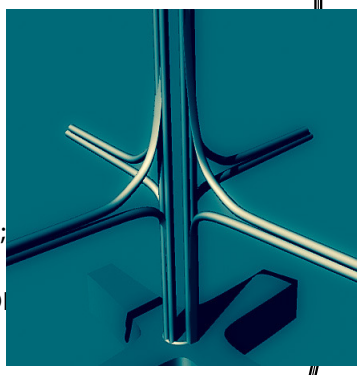
SKY

LOCAL TRANSIT

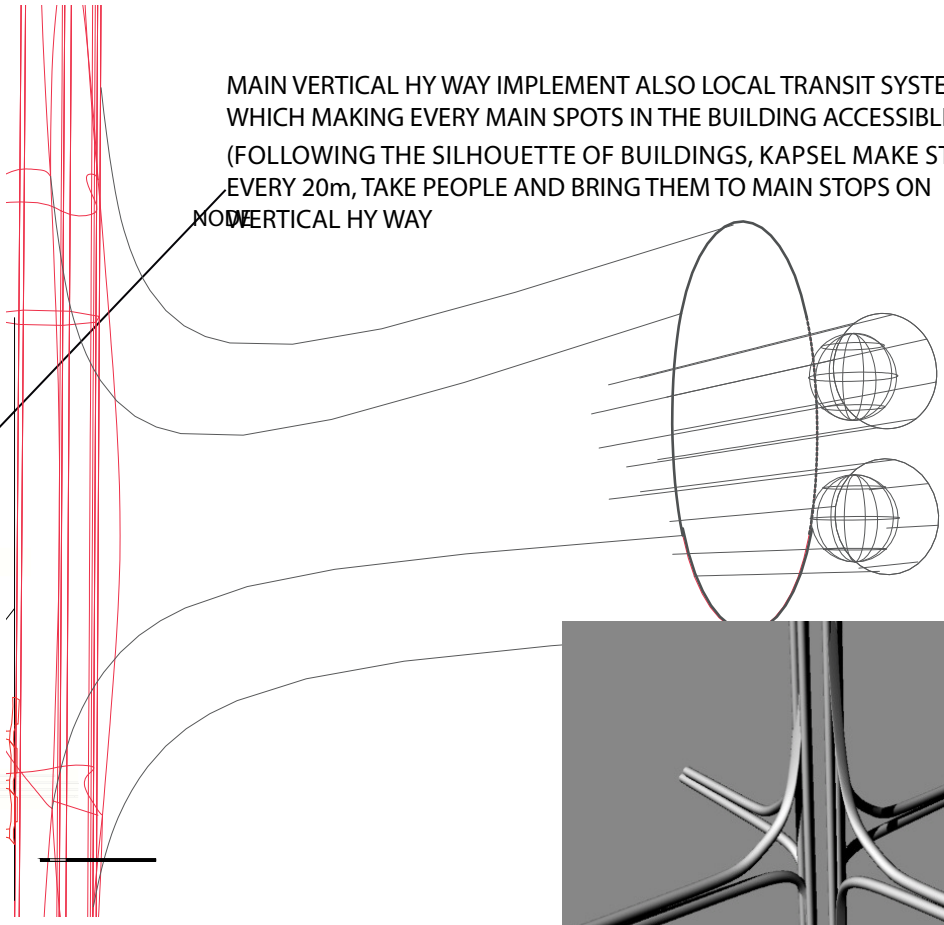
EACH SEGMENT
HAS ITS OWN
INFRASTRUCTURE

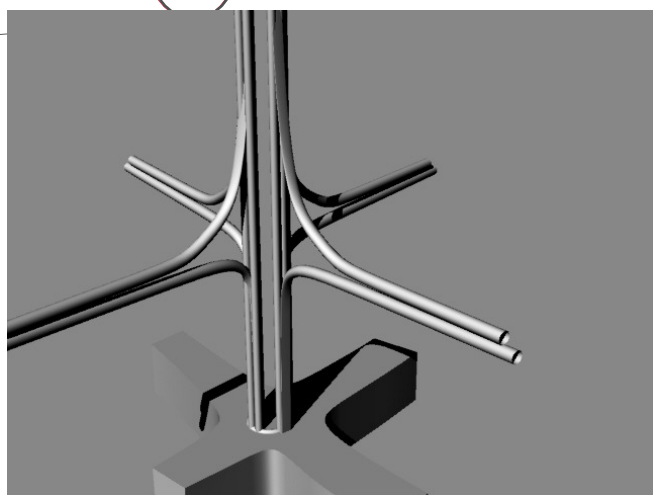
2014



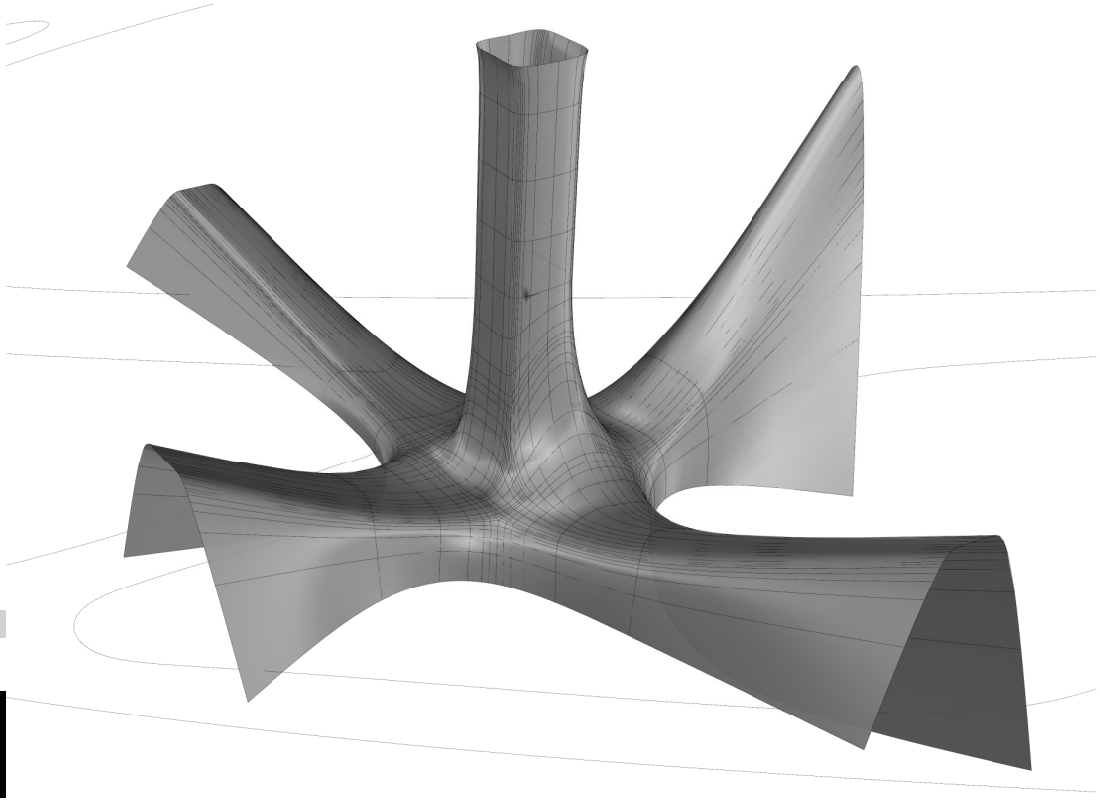


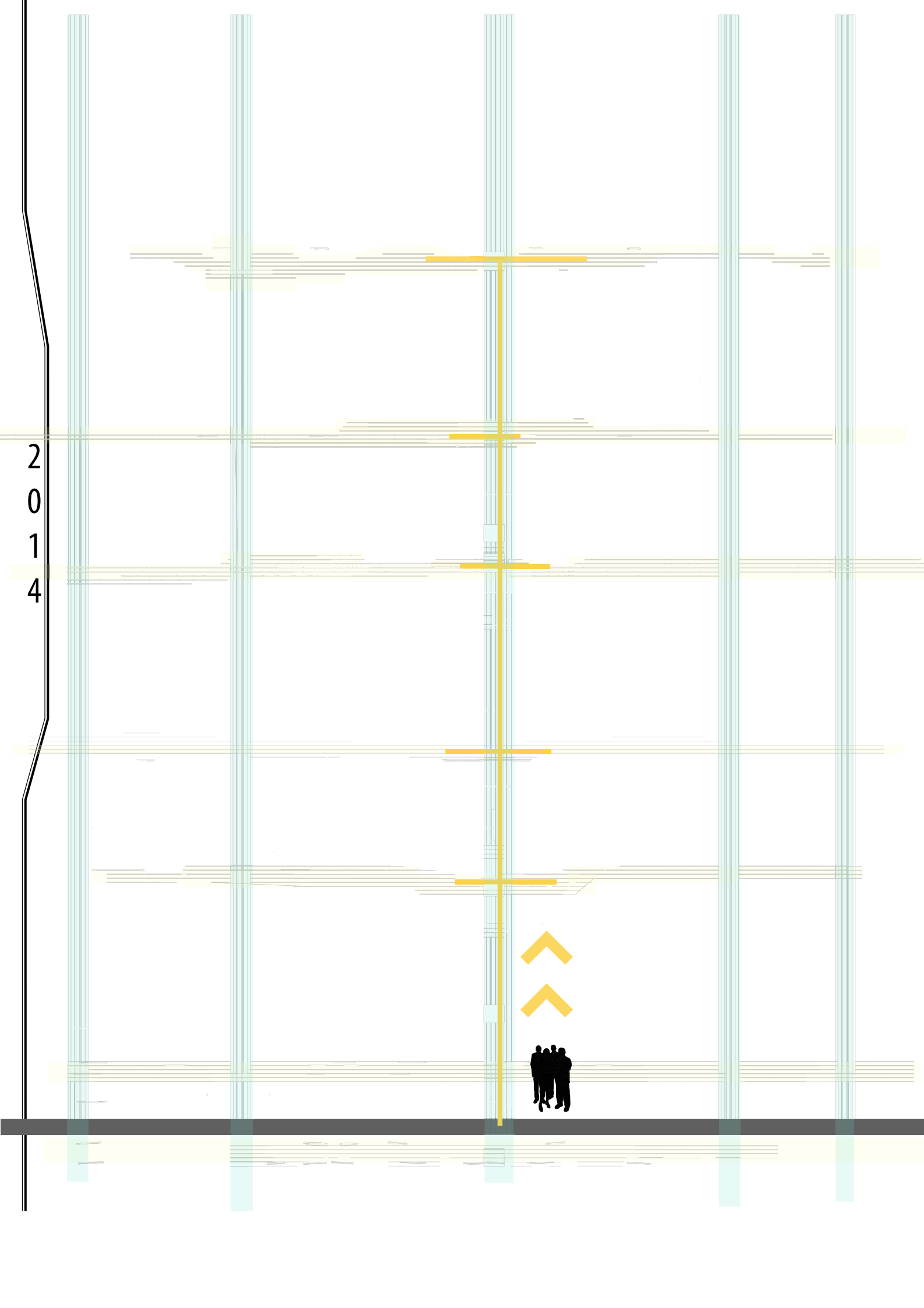
MAIN VERTICAL HY WAY IMPLEMENT ALSO LOCAL TRANSIT SYSTEM;
WHICH MAKING EVERY MAIN SPOTS IN THE BUILDING ACCESSIBLE.
(FOLLOWING THE SILHOUETTE OF BUILDINGS, KAPSEL MAKE STO
EVERY 20m, TAKE PEOPLE AND BRING THEM TO MAIN STOPS ON
NODE VERTICAL HY WAY





SKY NET

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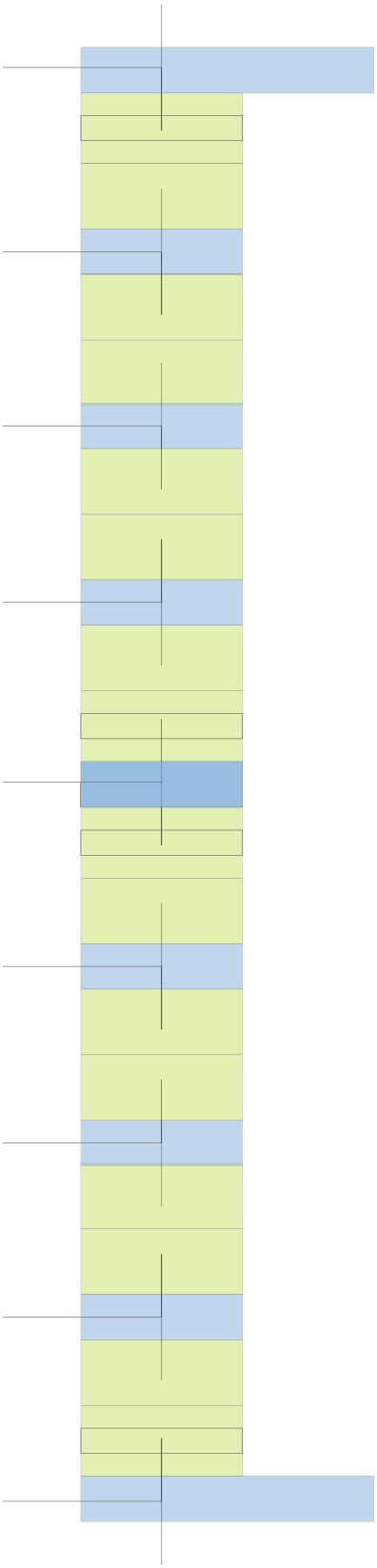
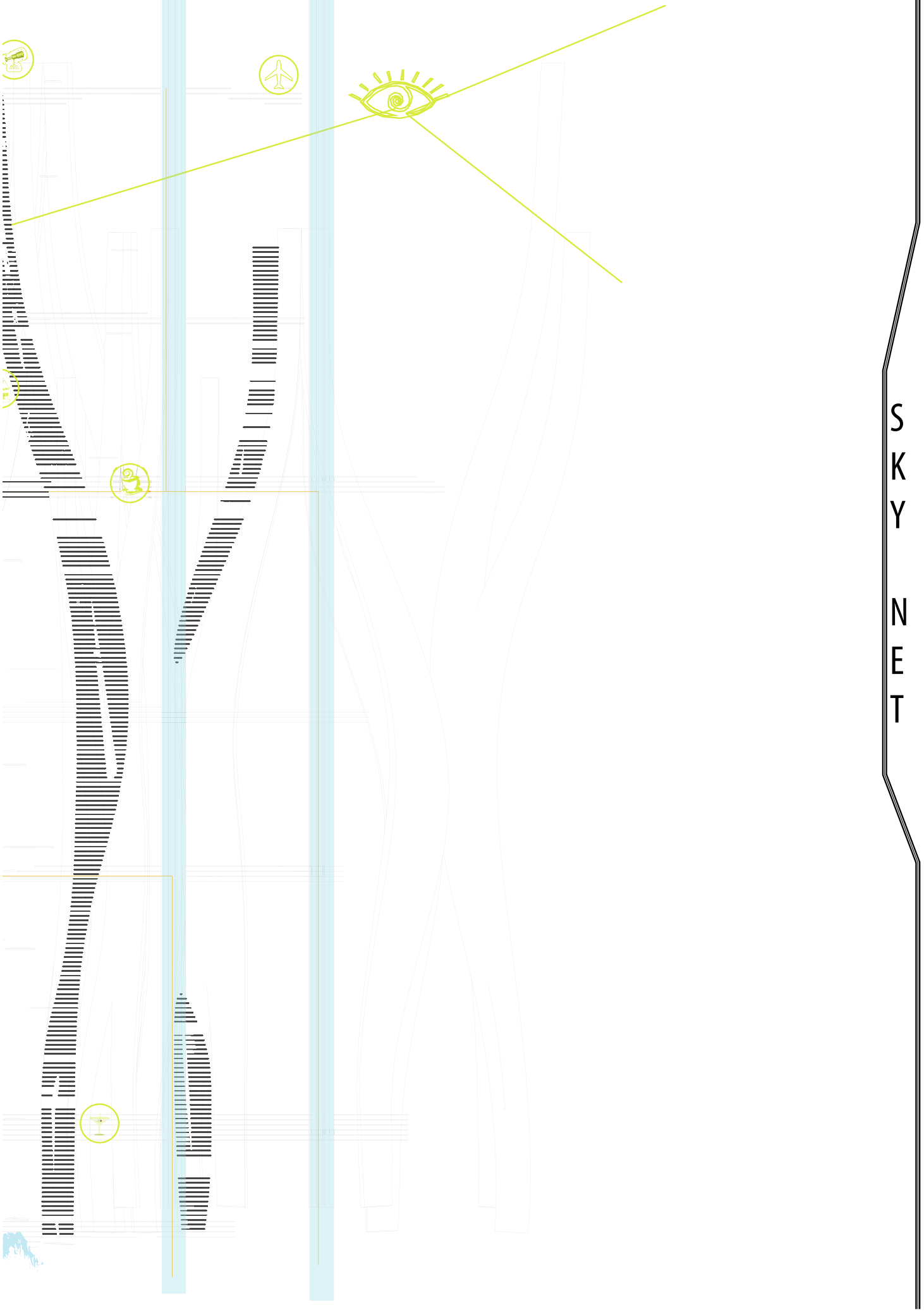
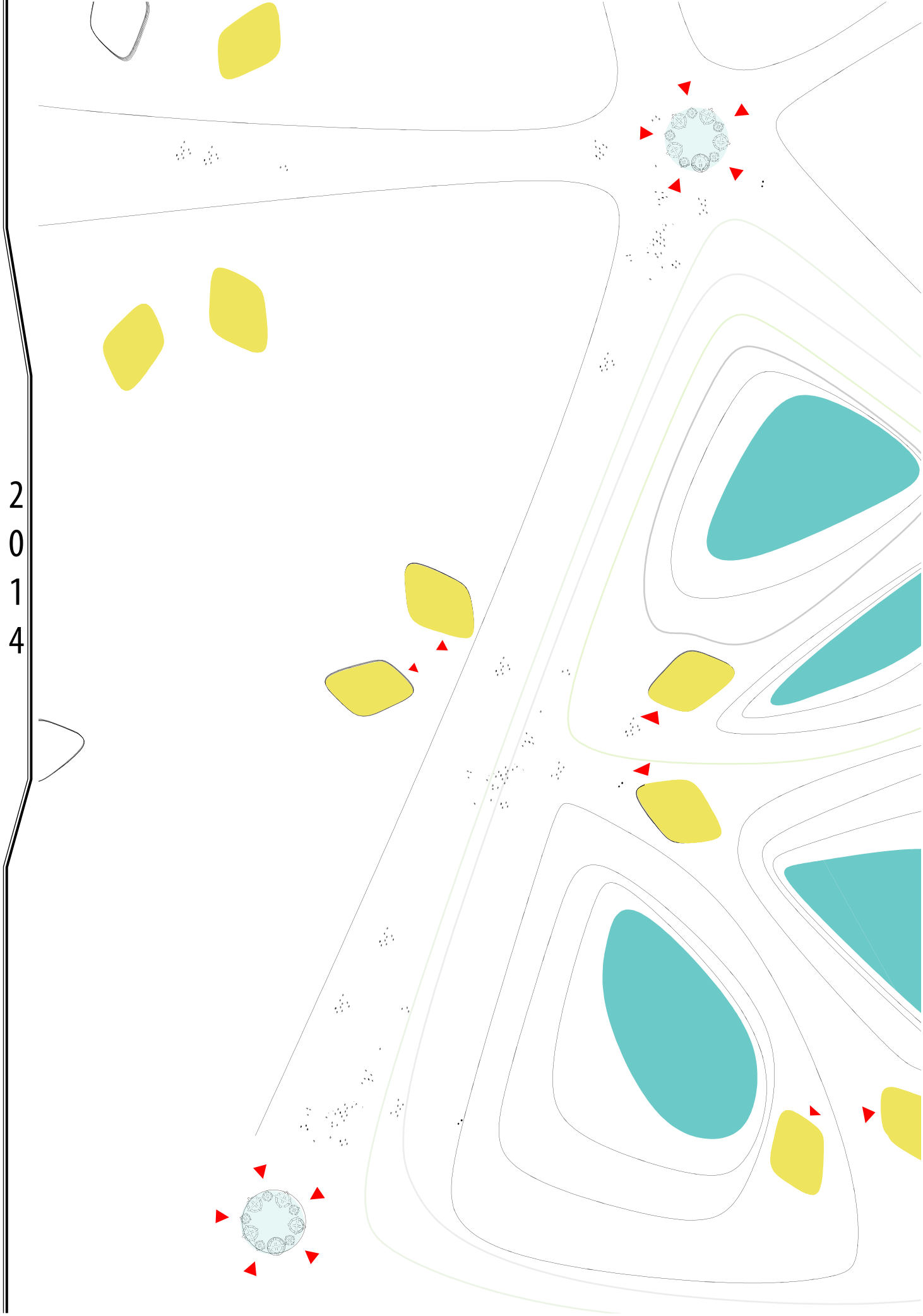


SKY NET

MILKY WAY

2014


SKY
NET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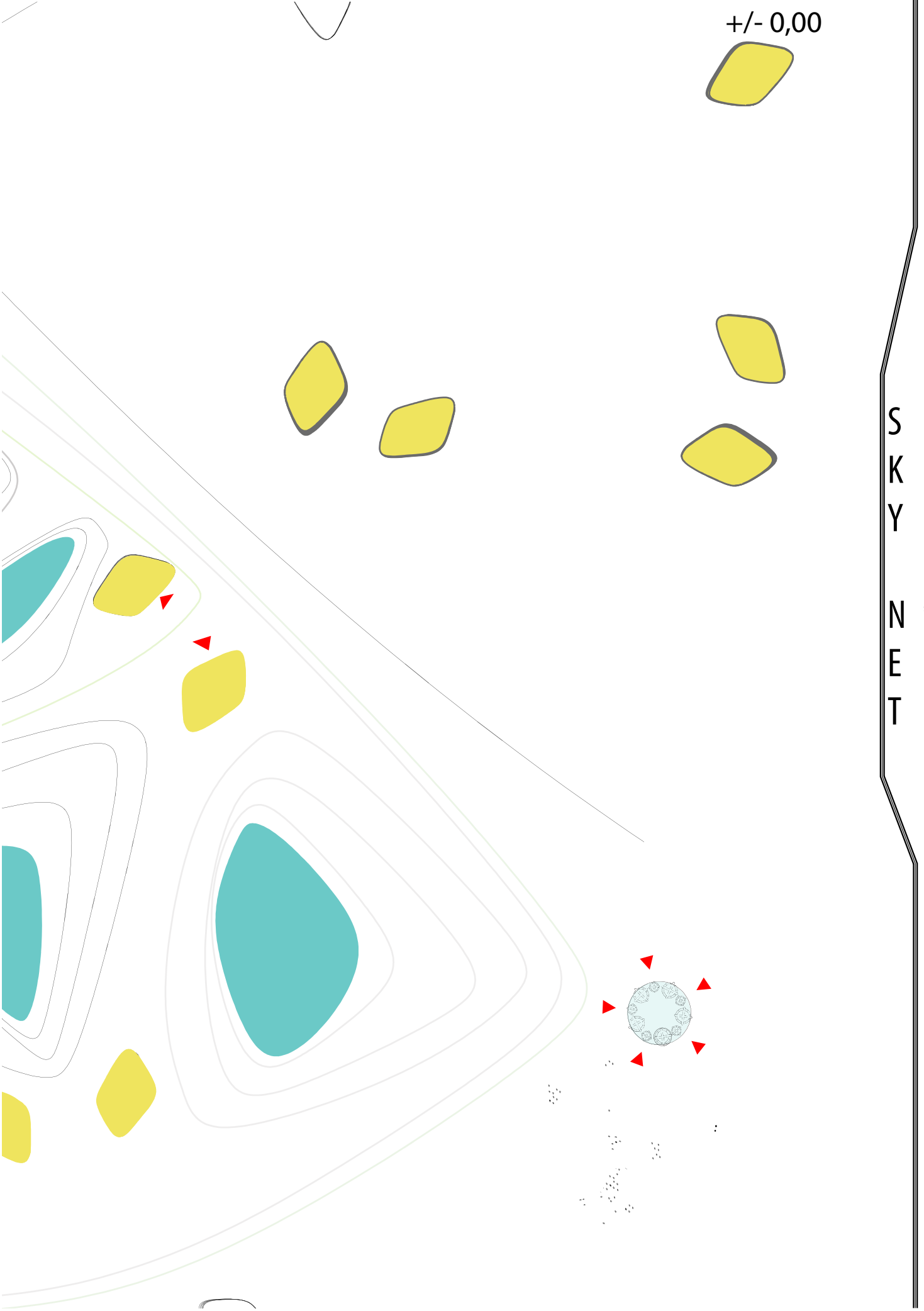
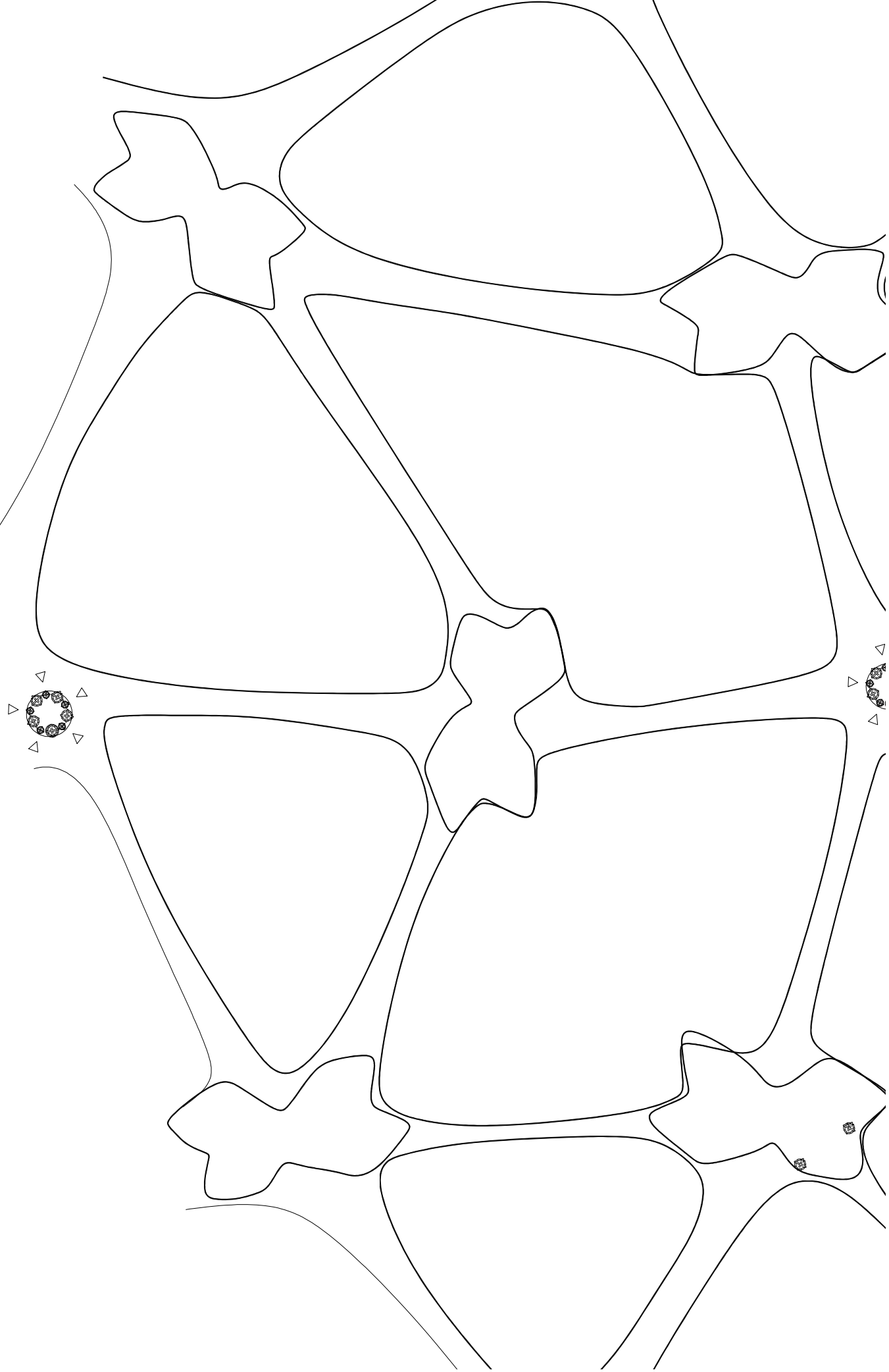
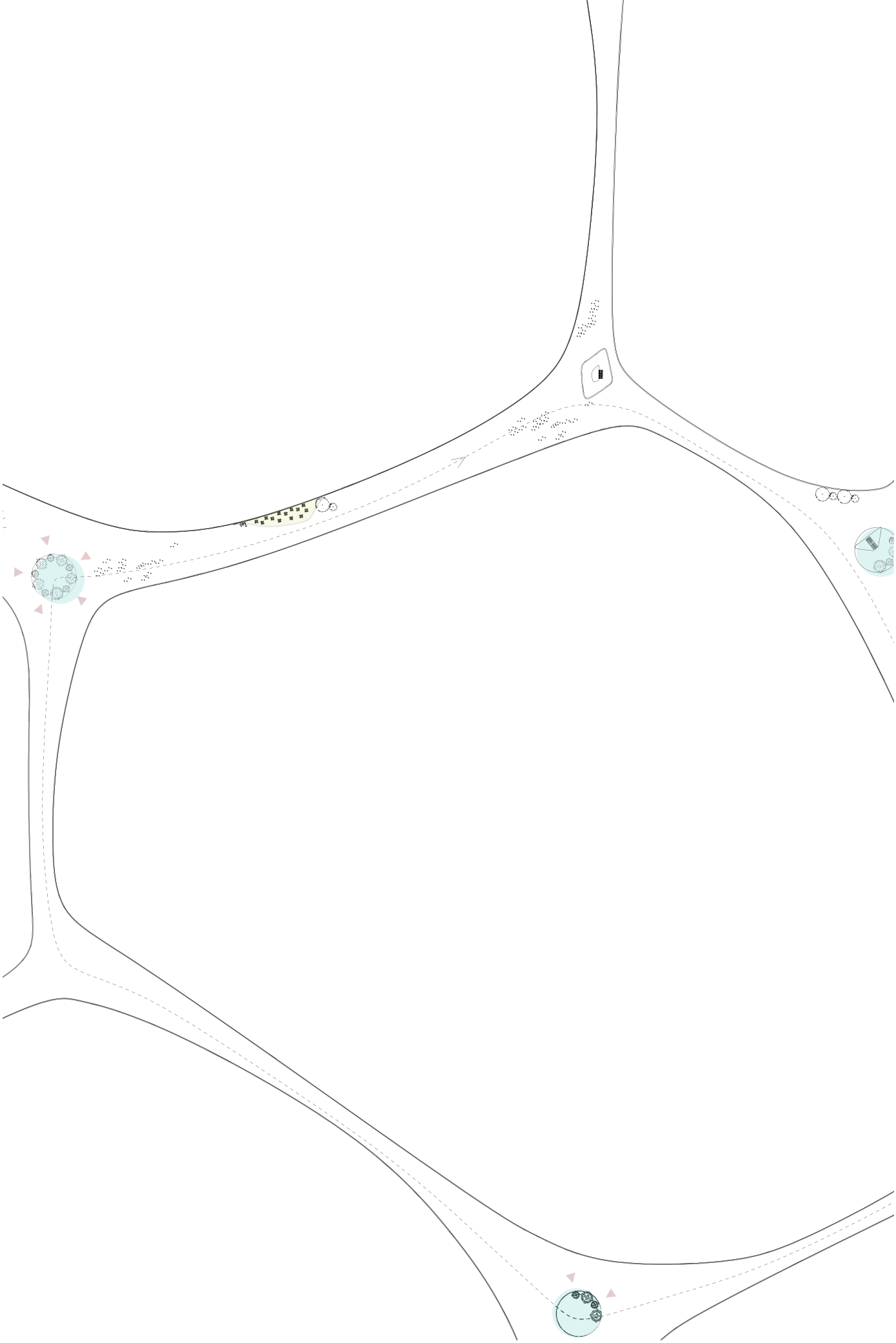

+/- 0,00
SKY NET

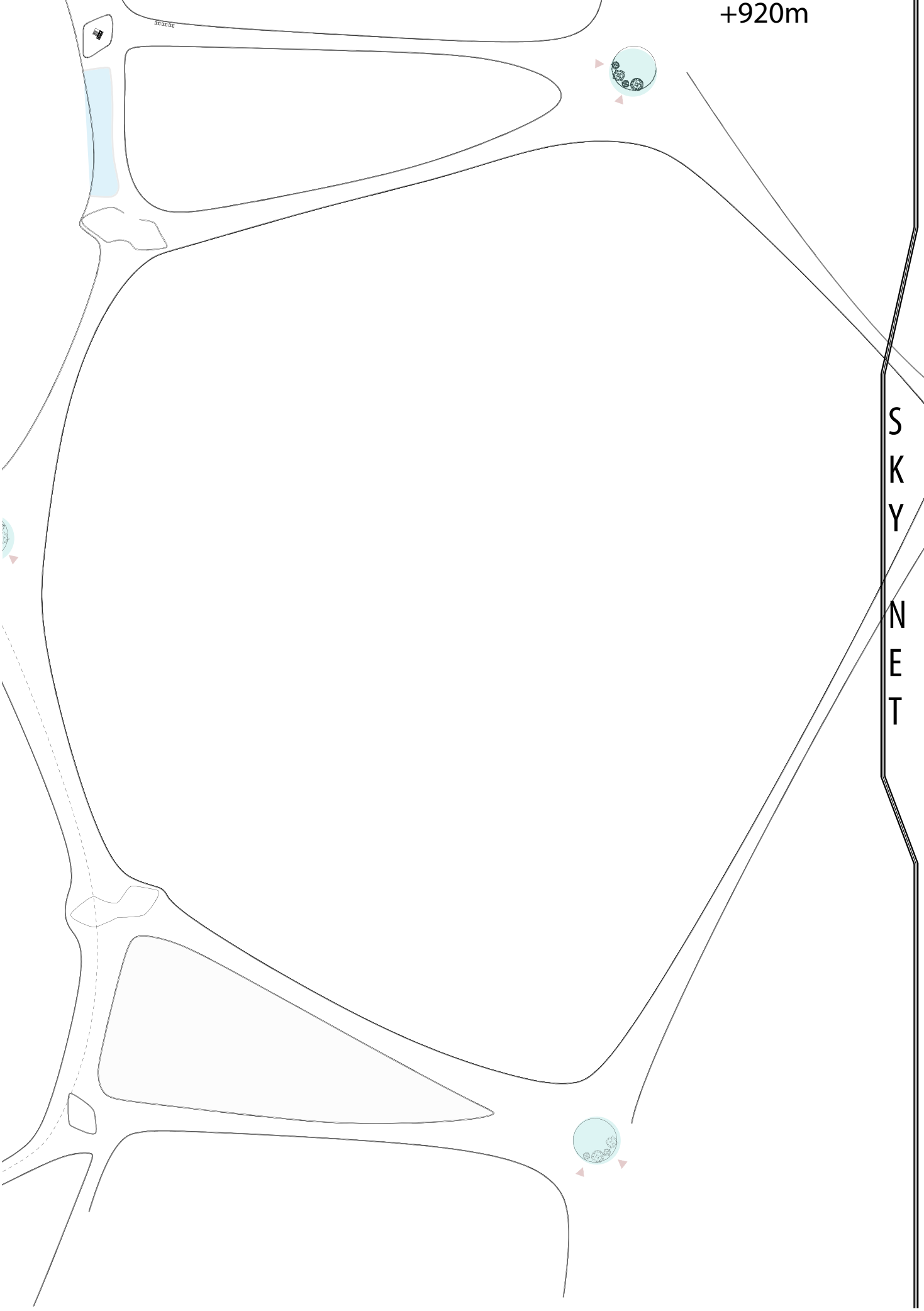
2014

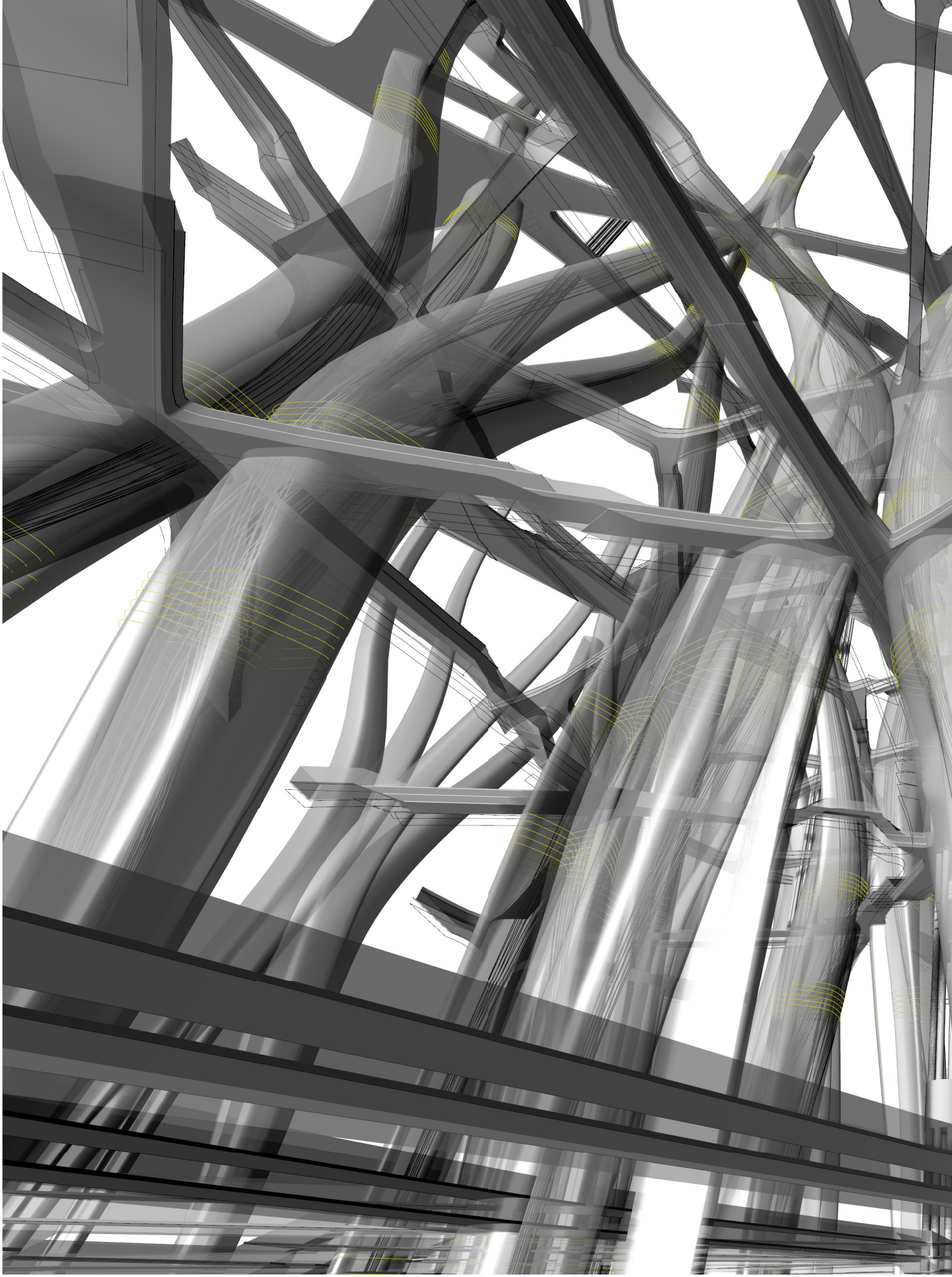


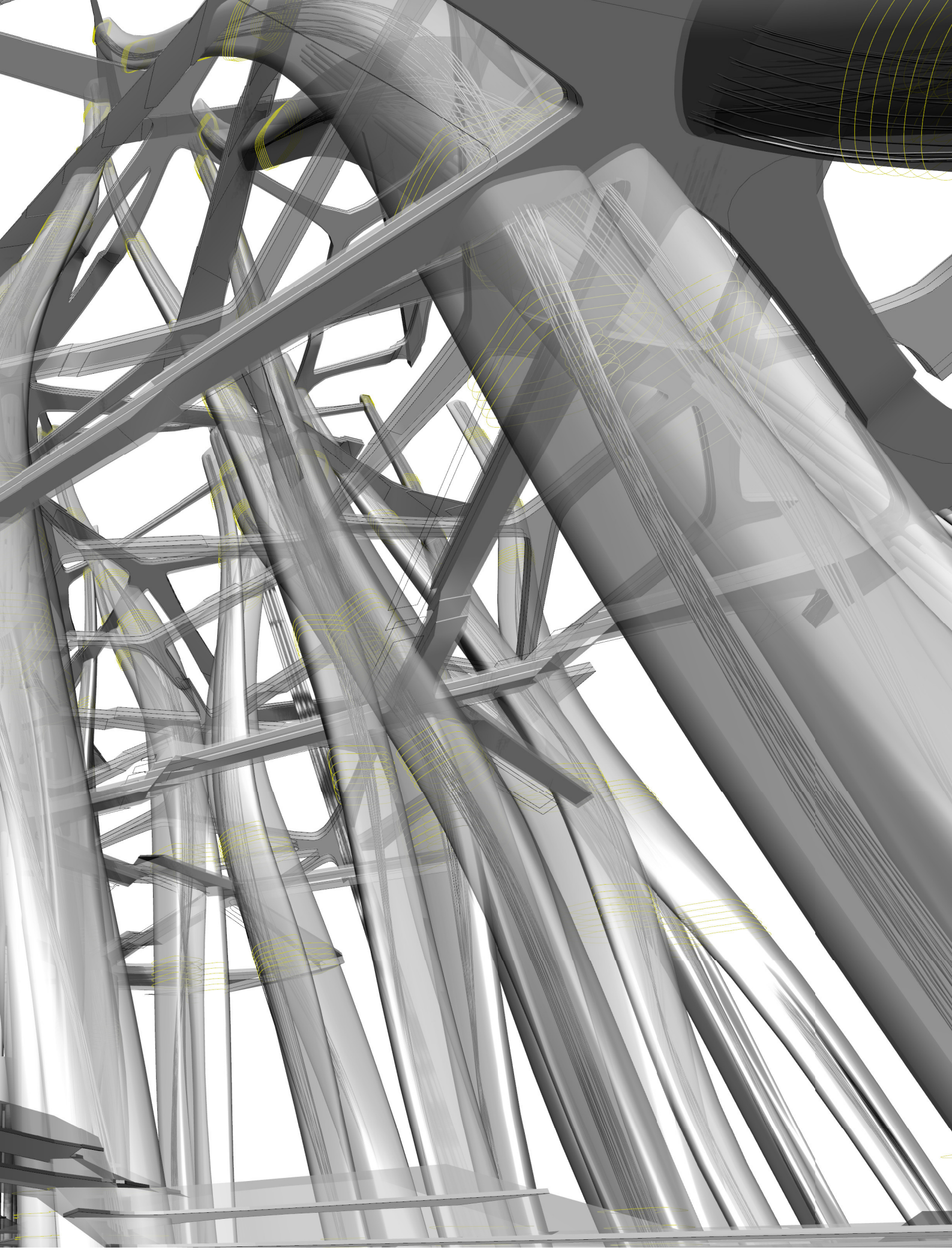

+300m
SKY NET

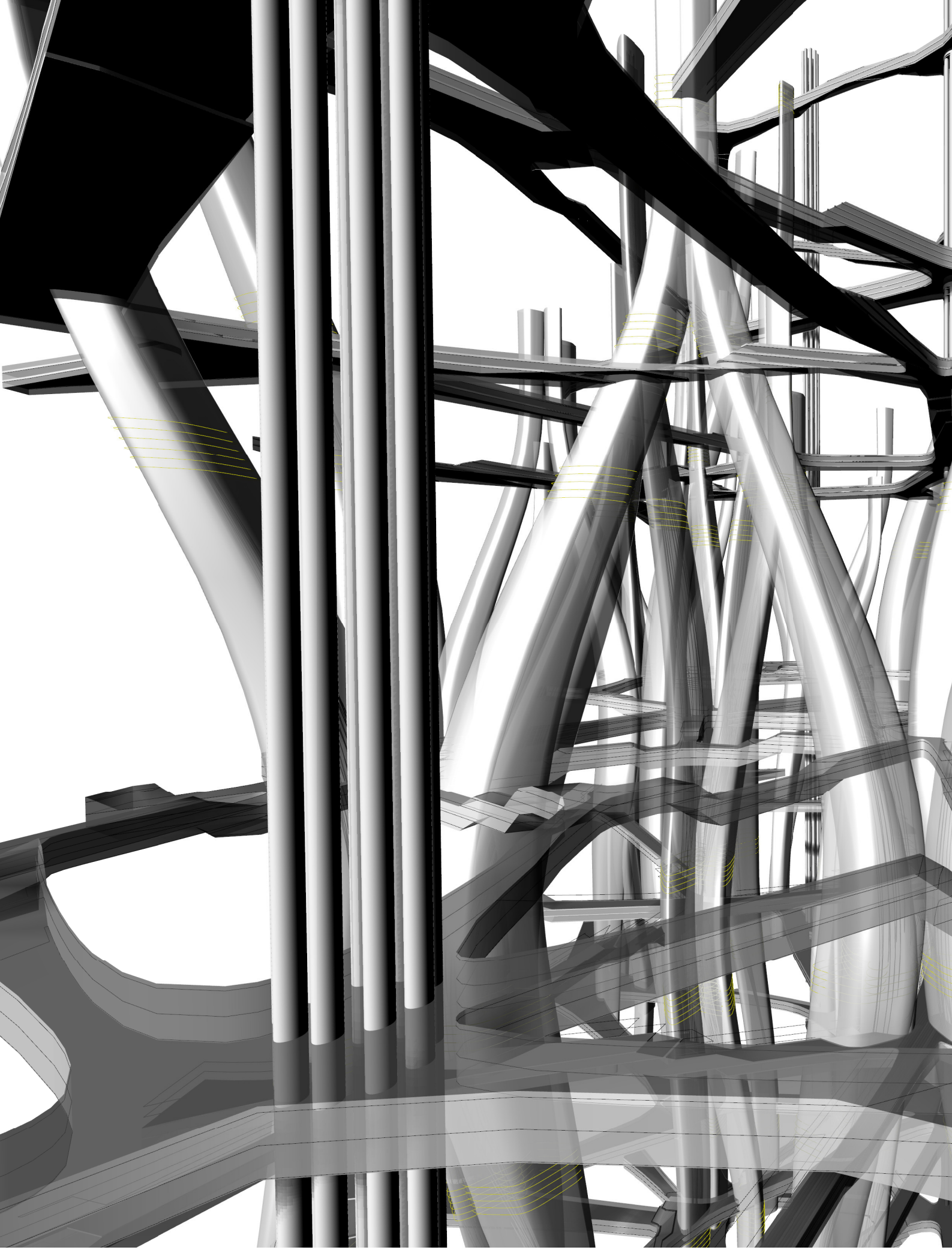
2014

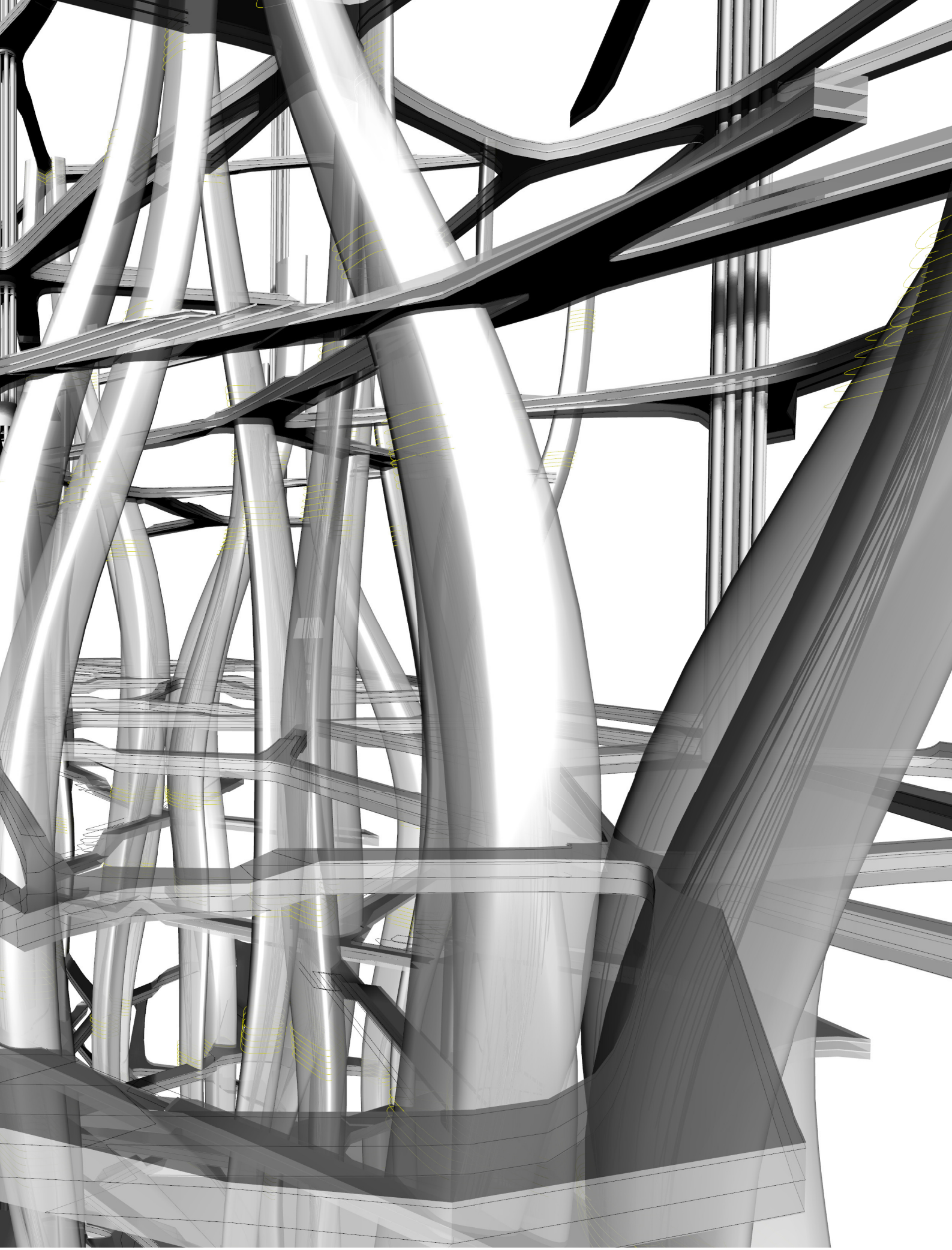


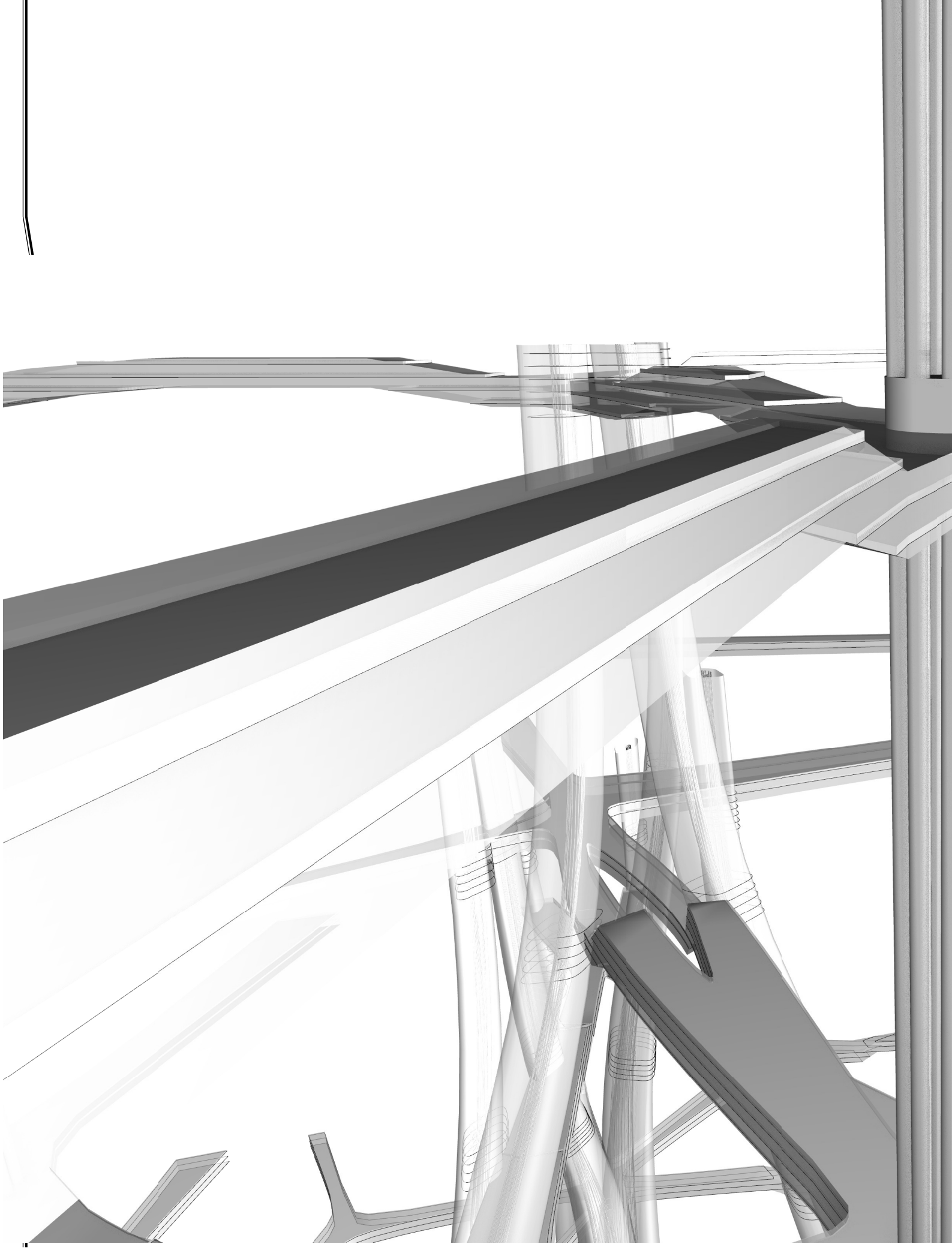

+920m
SKYNET

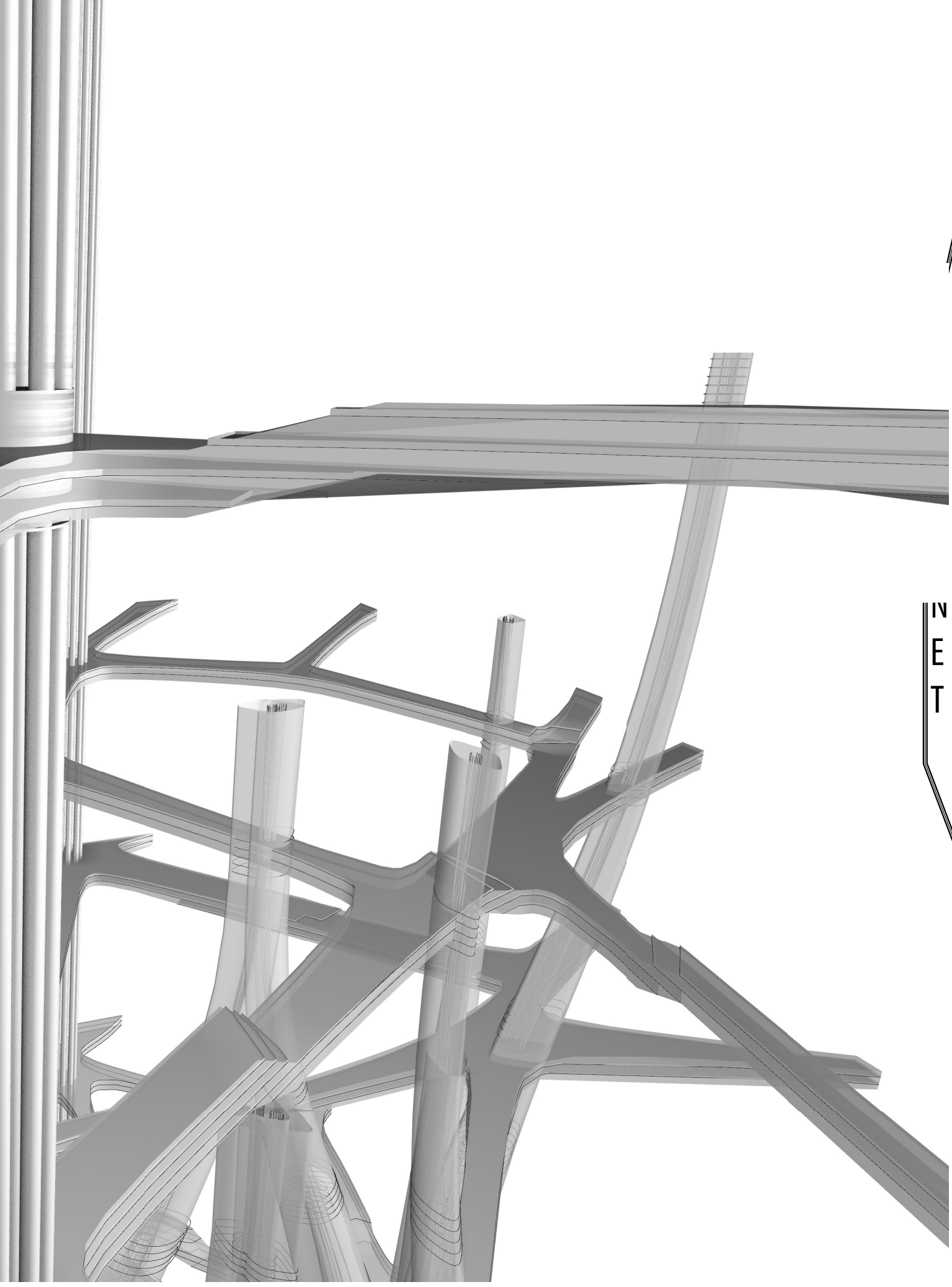


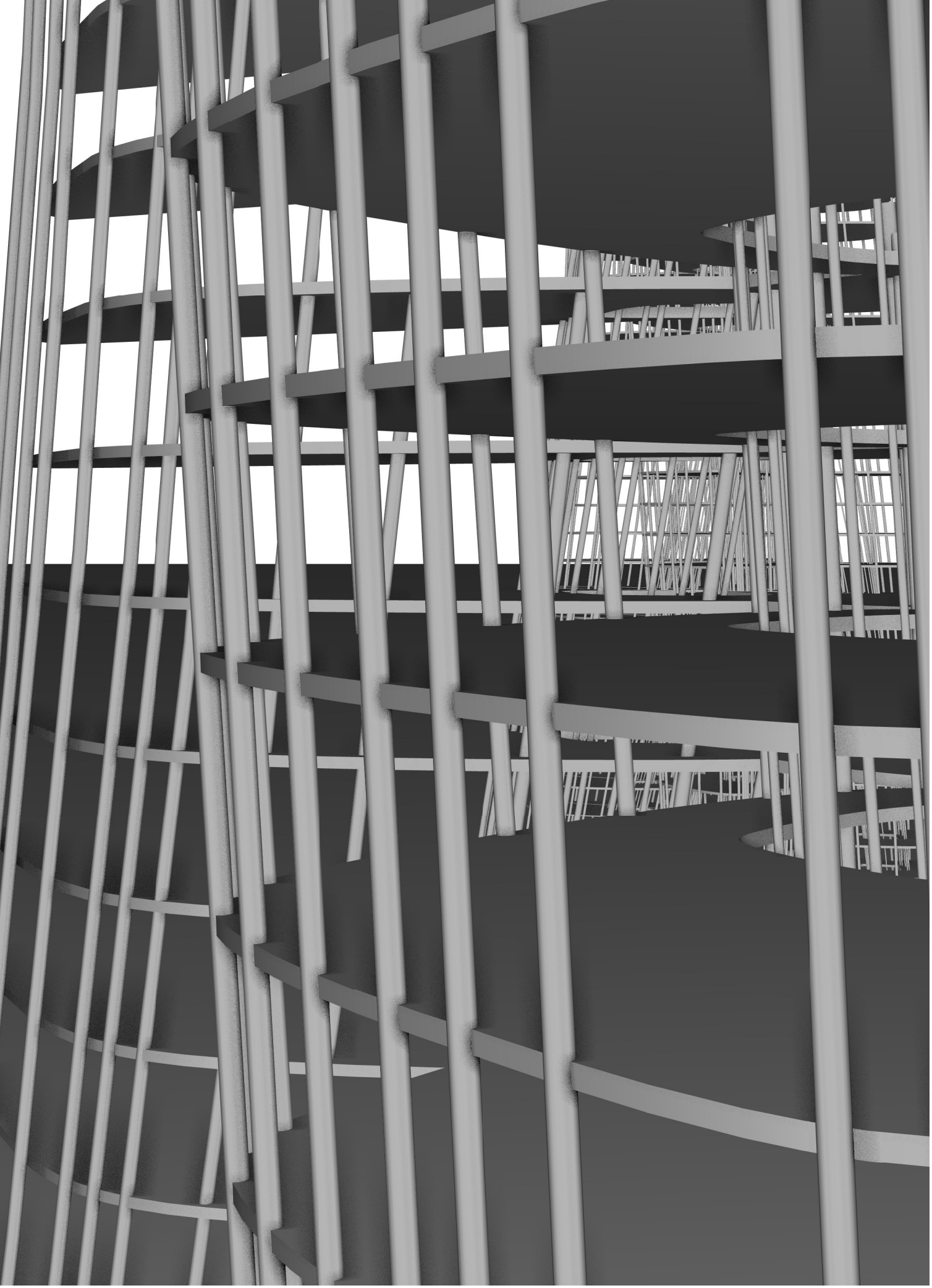


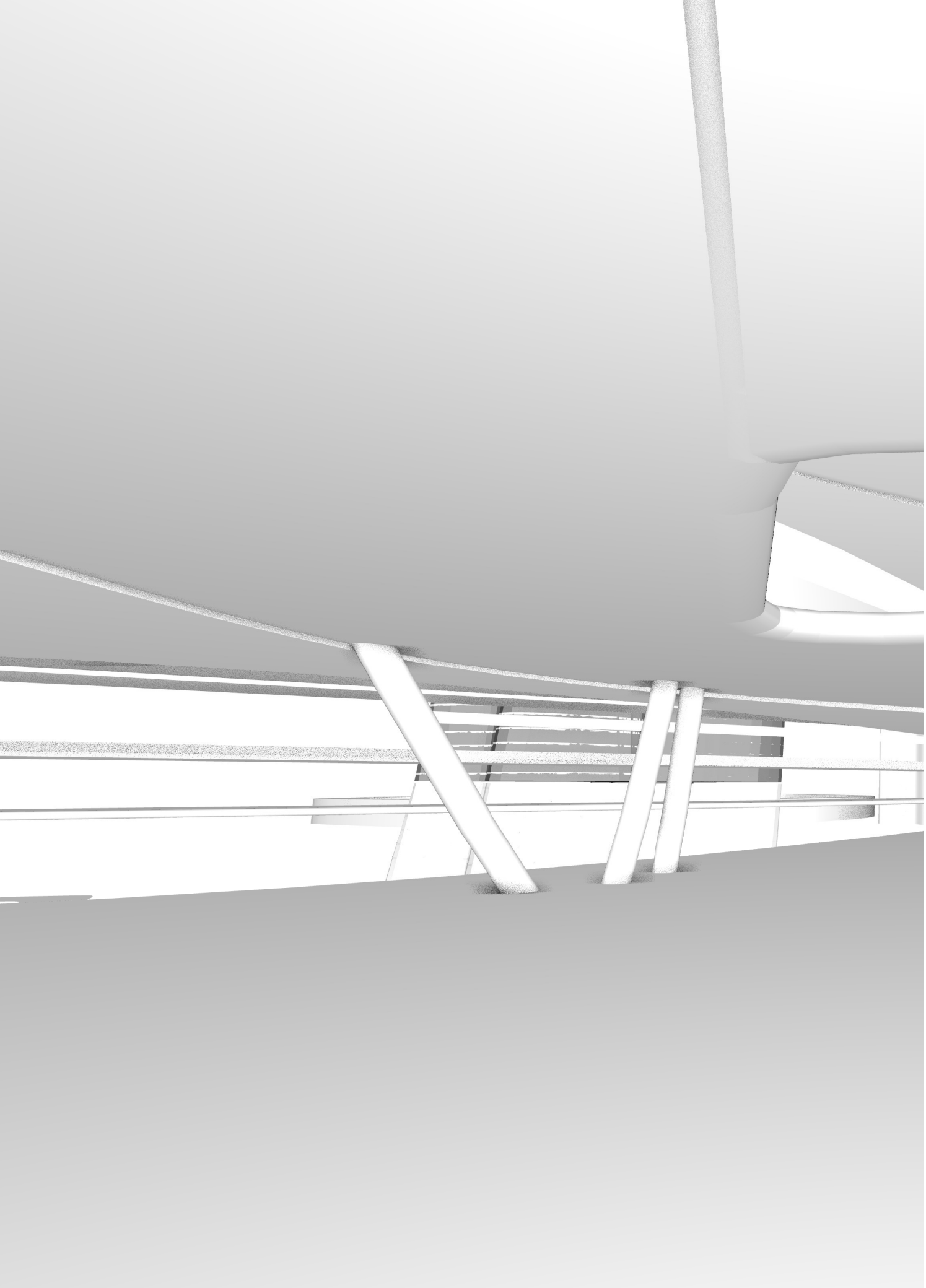


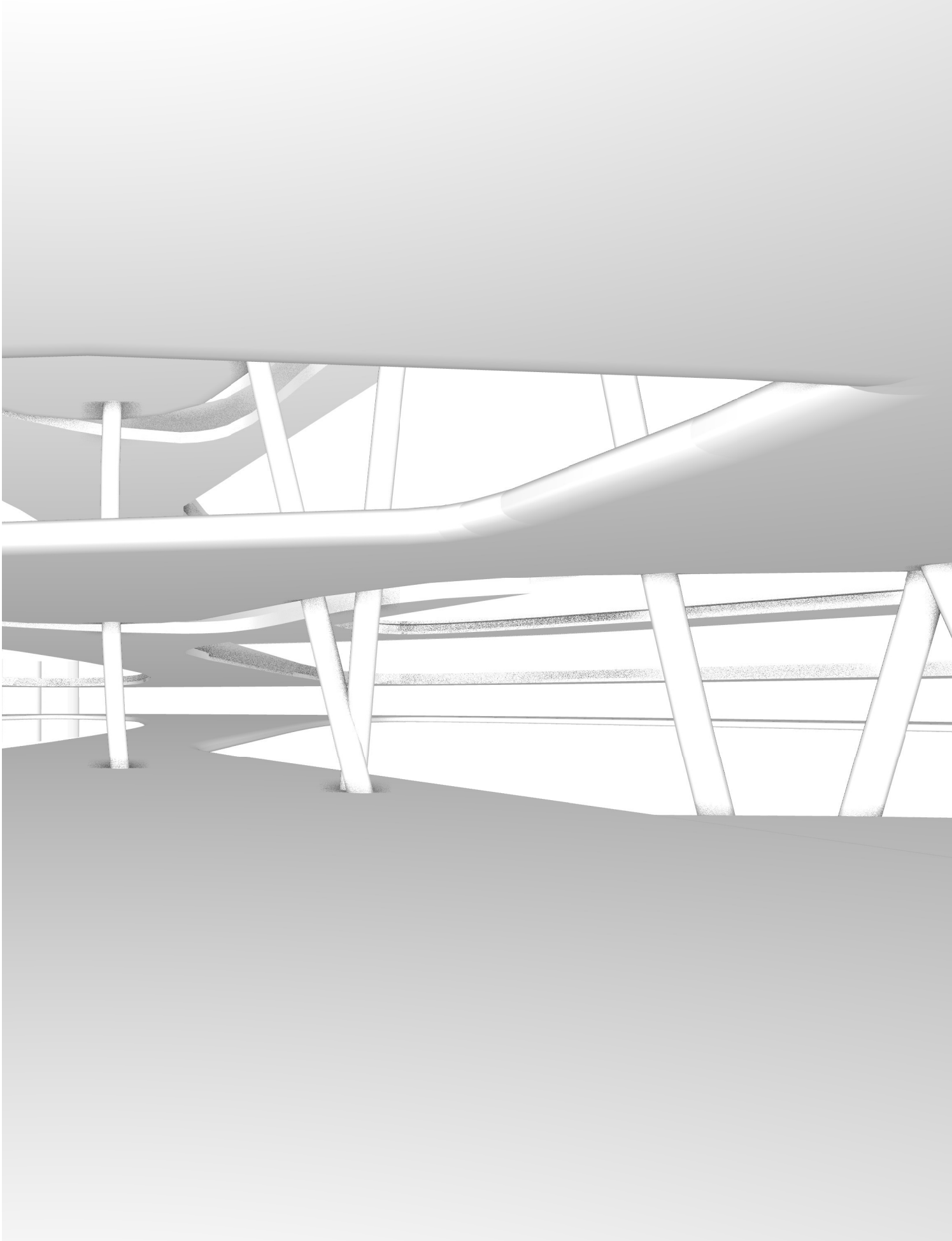


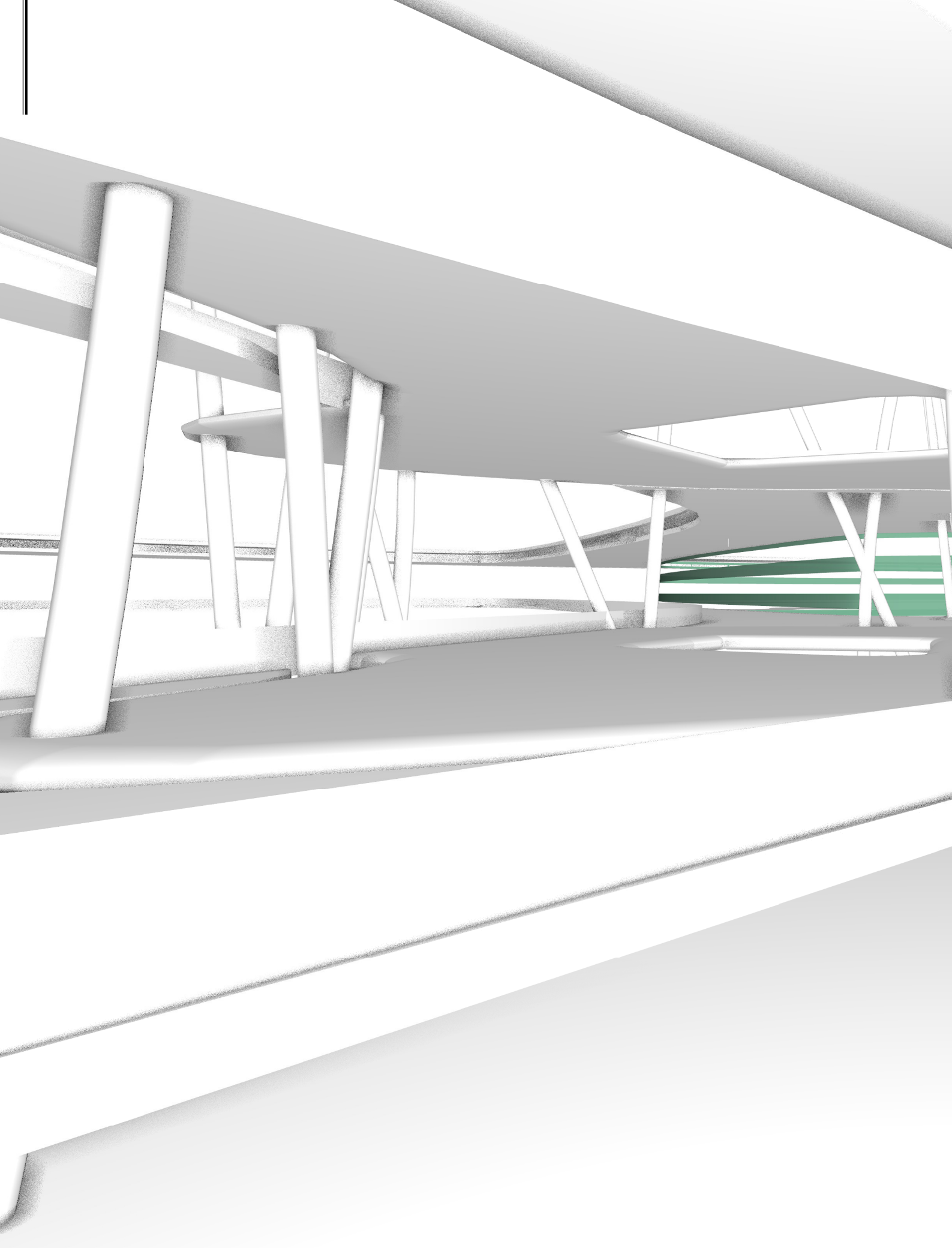


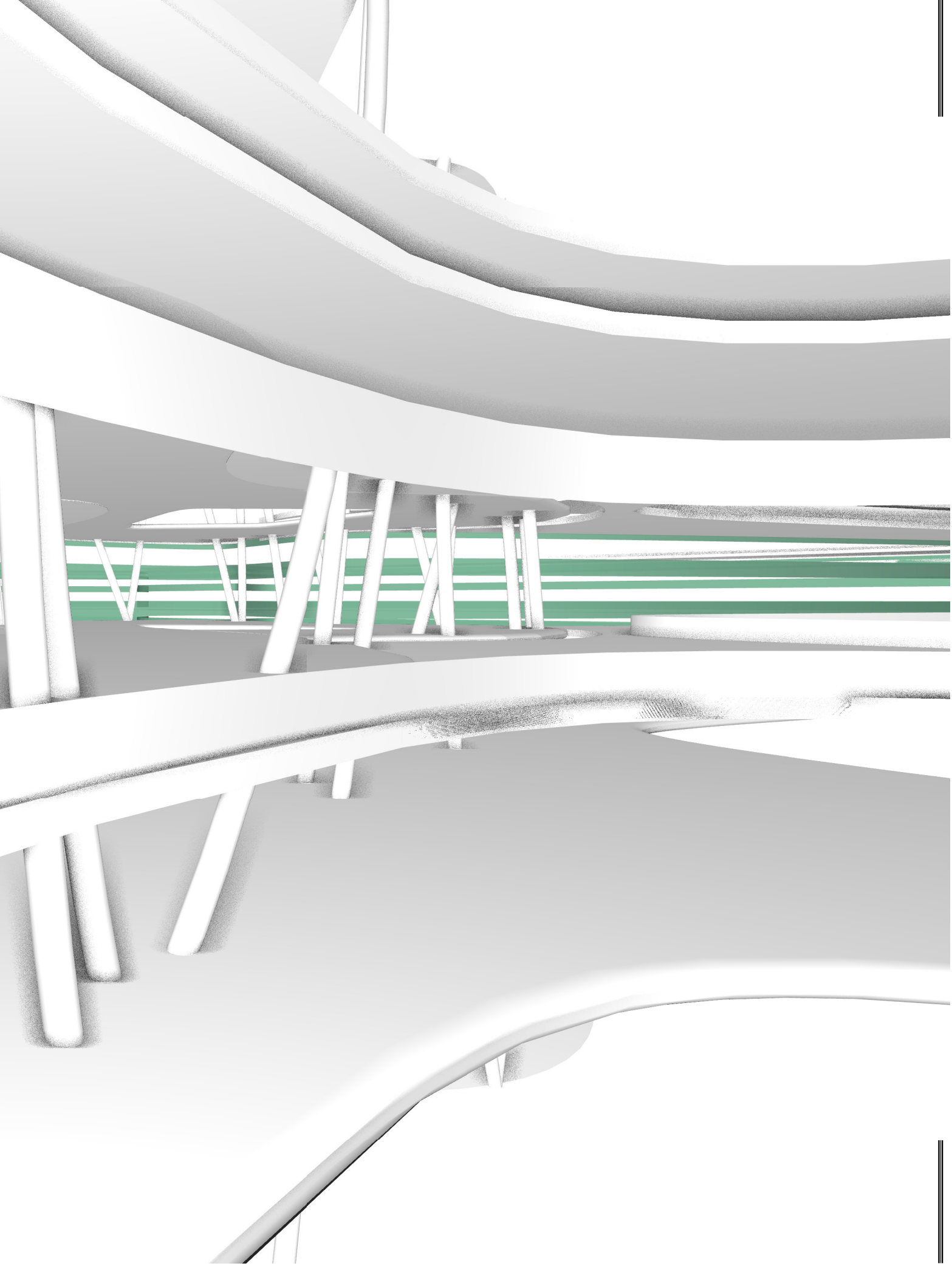


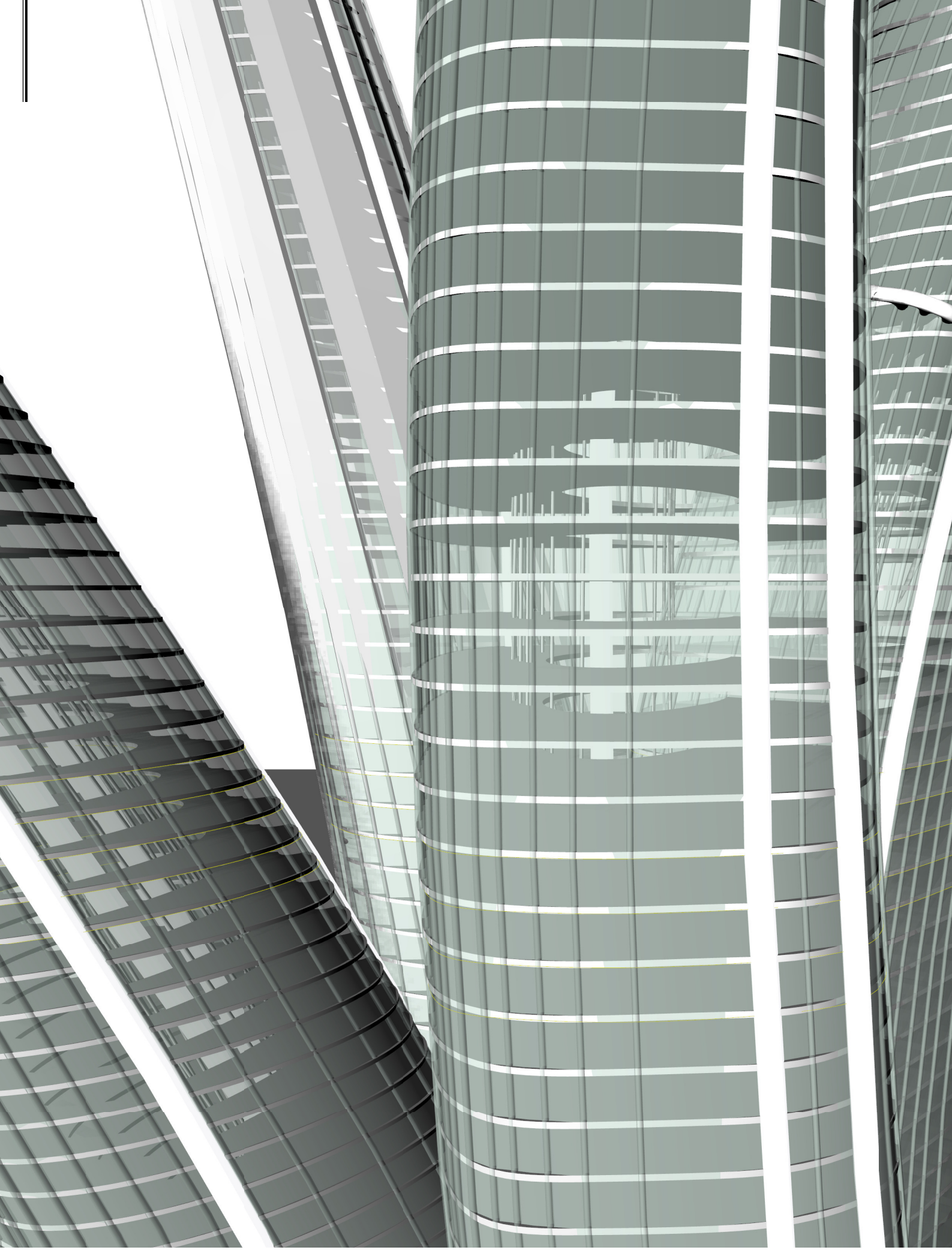












THIS HUGE SCULPTURE IS MADE FROM PERSONAL BUNT, TO SHOW THE WORLD WE CAN DO IT ON OTHER WAY..THAT WE CAN NOT FORGET SOME PLACES...MAKE A CHANGE!

SKY NET

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