HEAT ISLAND EFFECT NEW YORK CITY
DEPARTMENT OF BENIGN VIOLATIONS

Welcome, to the Department of Benign Violations (DoBV). Founded in 2011 as an action-committee, the DoBV has now evolved into an integrative city commission, focusing on the wide-ranging impact of the Heat Island Effect. While the long-range trend of climate change is unpredictable, the day-to-day impact of urban micro-climates is something that can be augmented to improve the quality of life today.

The DoBV performs and acts across the legislative boundaries separating a disparate group of bureaucracies, supporting multiple layers of hard and soft infrastructure - from bridges to building codes. We look for actionable opportunities with tangible and observable implications. We design and augment existing environments. We deal with the material. We manage the real.

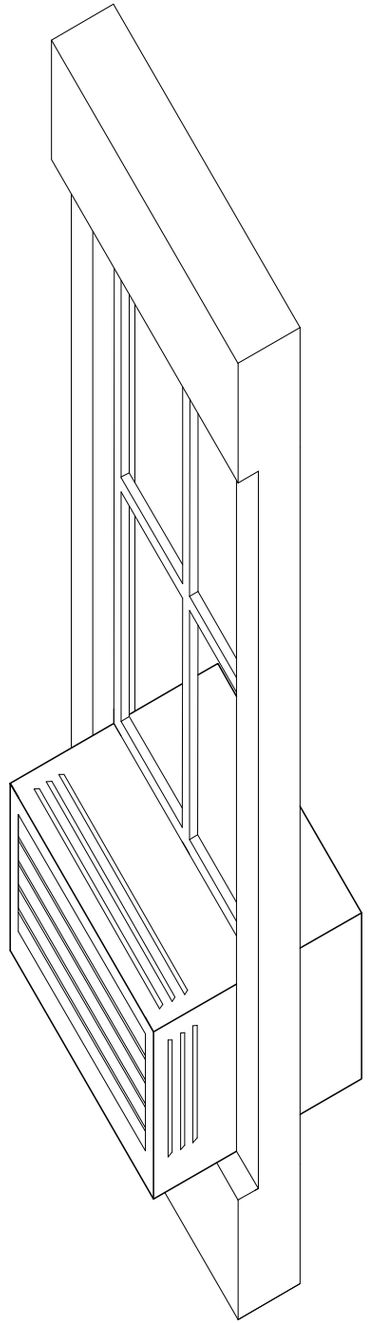
As an integrative commission, the DoBV provides guidance and over-sight for the other City and Regional Depts. Some examples are: the Dept. of Building and Planning, the Zoning Commission, Dept. of Health and Safety, Transportation Authority, Dept. of Water and Power, EPA and various others.

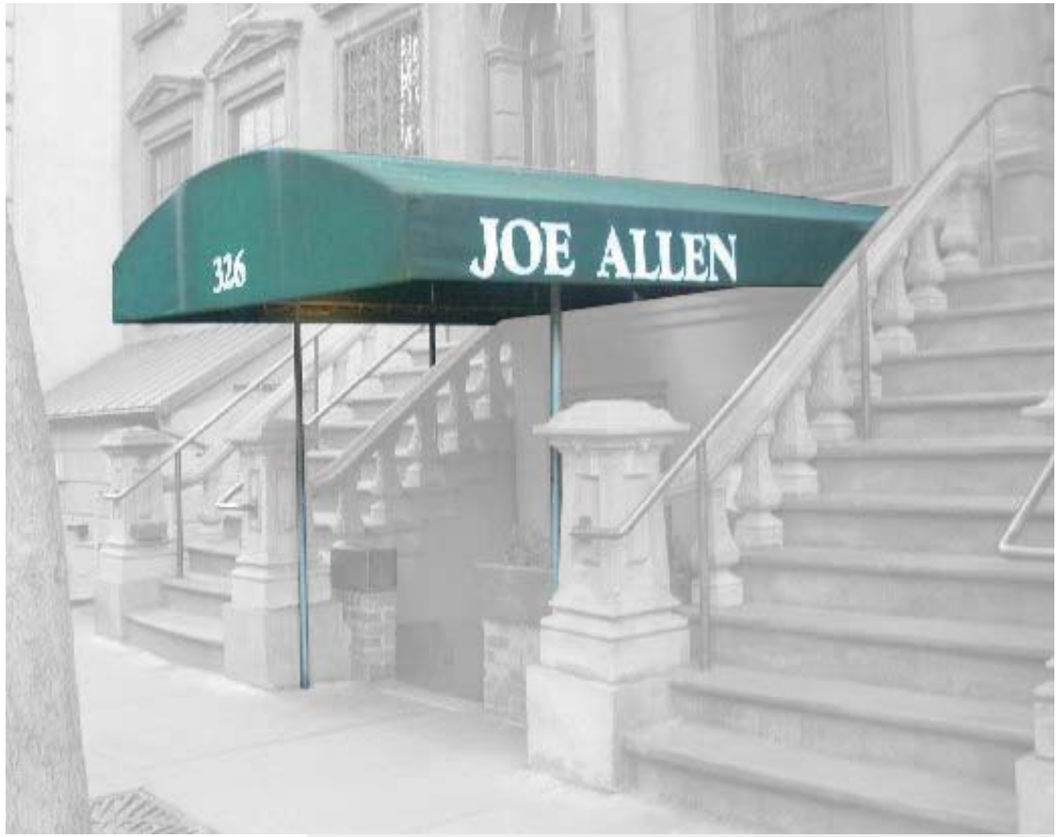
c/ CENSUS BUREAU

Because the DoBV is a new and developing entity, it has formed a Census Bureau (CB)to begin the documentation of architectural objects, components and features of the Urban and built environment, with the goal of identifying new areas of over-sight, regulation and action. While many of these objects have previously fallen under the purview of other ruling bodies, the DoBV recognizes that it is the coordinated and integrative design of these objects en masse that will have the greatest potential for alleviating the Heat Island Effect.

C/01

Name	Function	Site	Size
Air Conditioning Unit	Cooling	Facade	L



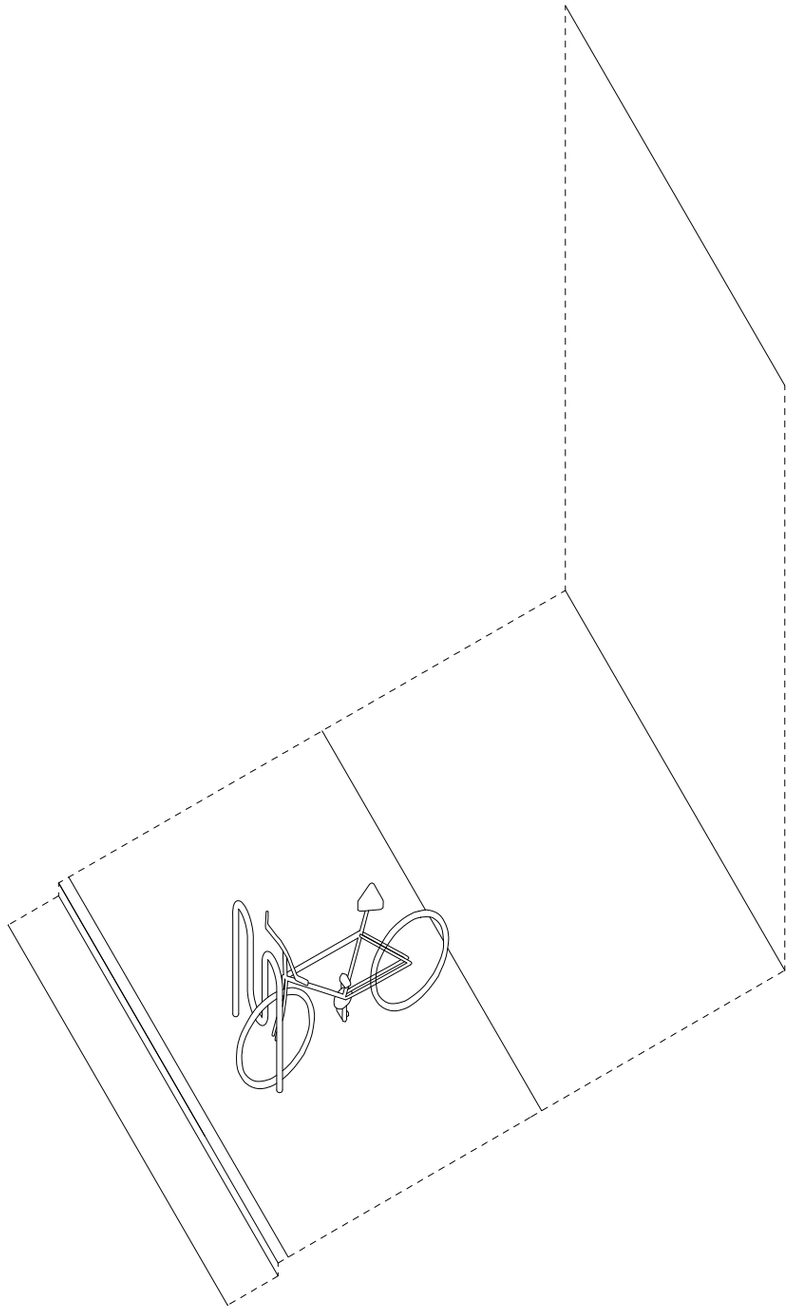


C/02

Name	Function	Site	Size
Awning	Shade	Street	S

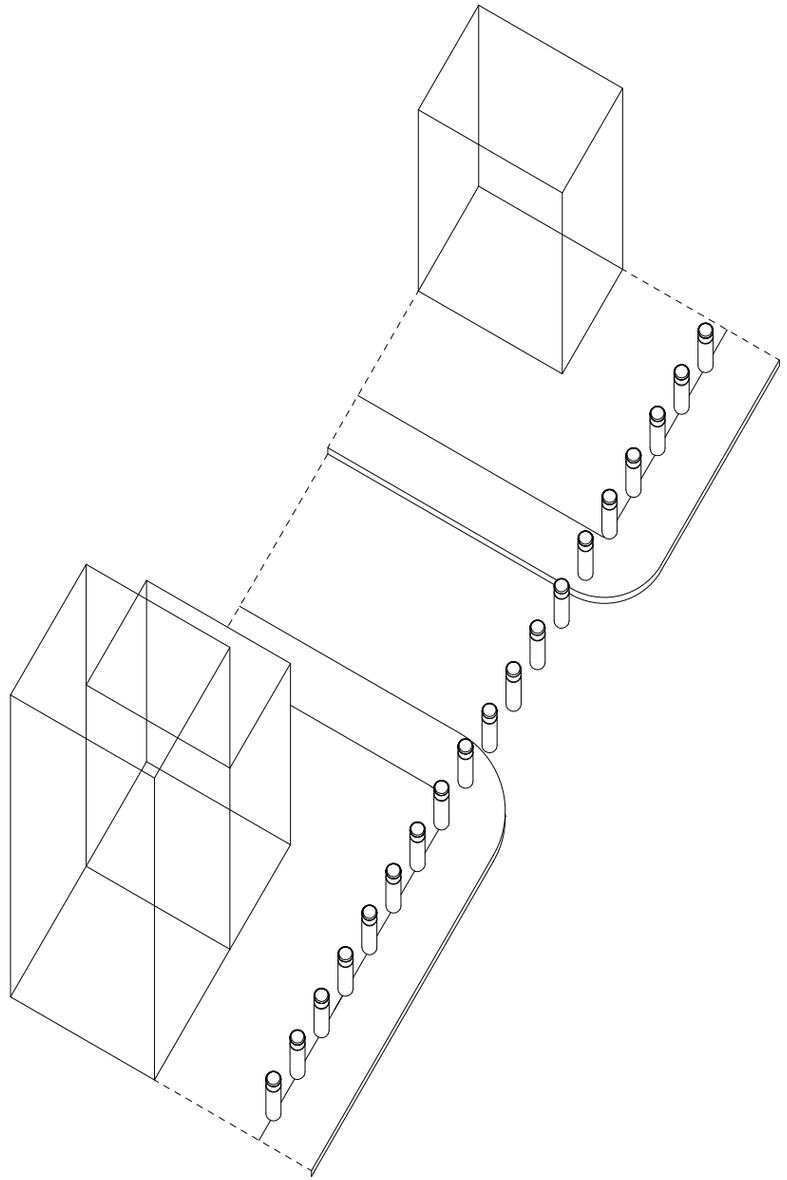
C/03

Name	Function	Site	Size
Bicycle Rack	Cooling	Street	S



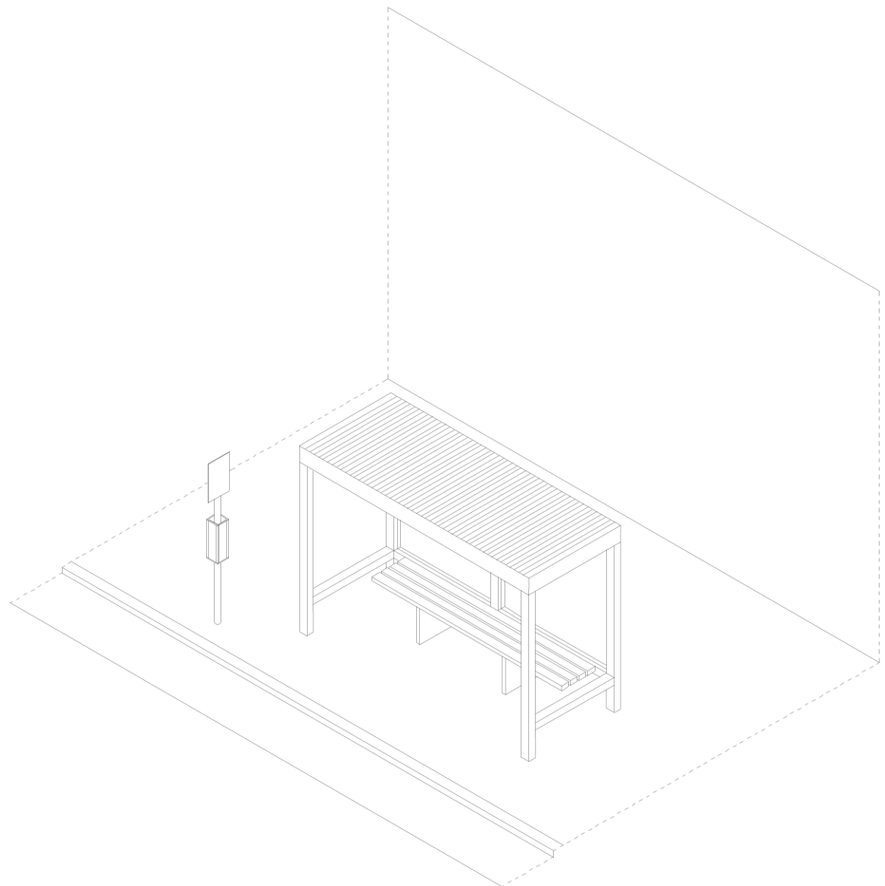
C/04

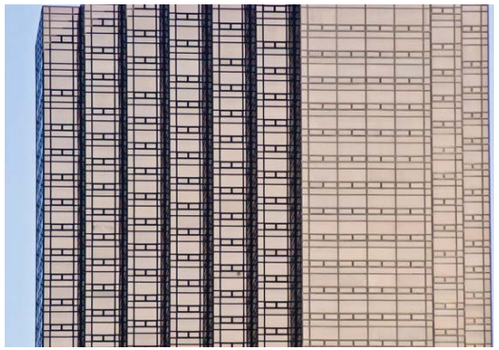
Name	Function	Site	Size
Bollards	Restriction of Access	Street	S

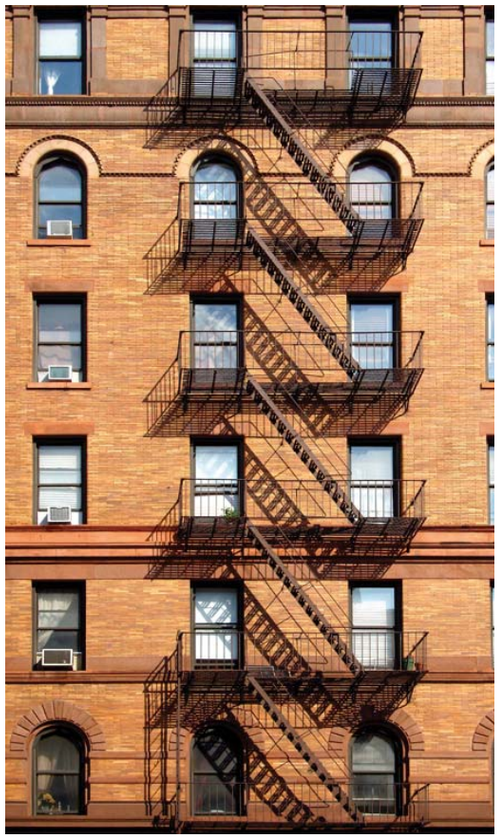


C/05

Name	Function	Site	Size
Bus Stop	Shelter	Street	M





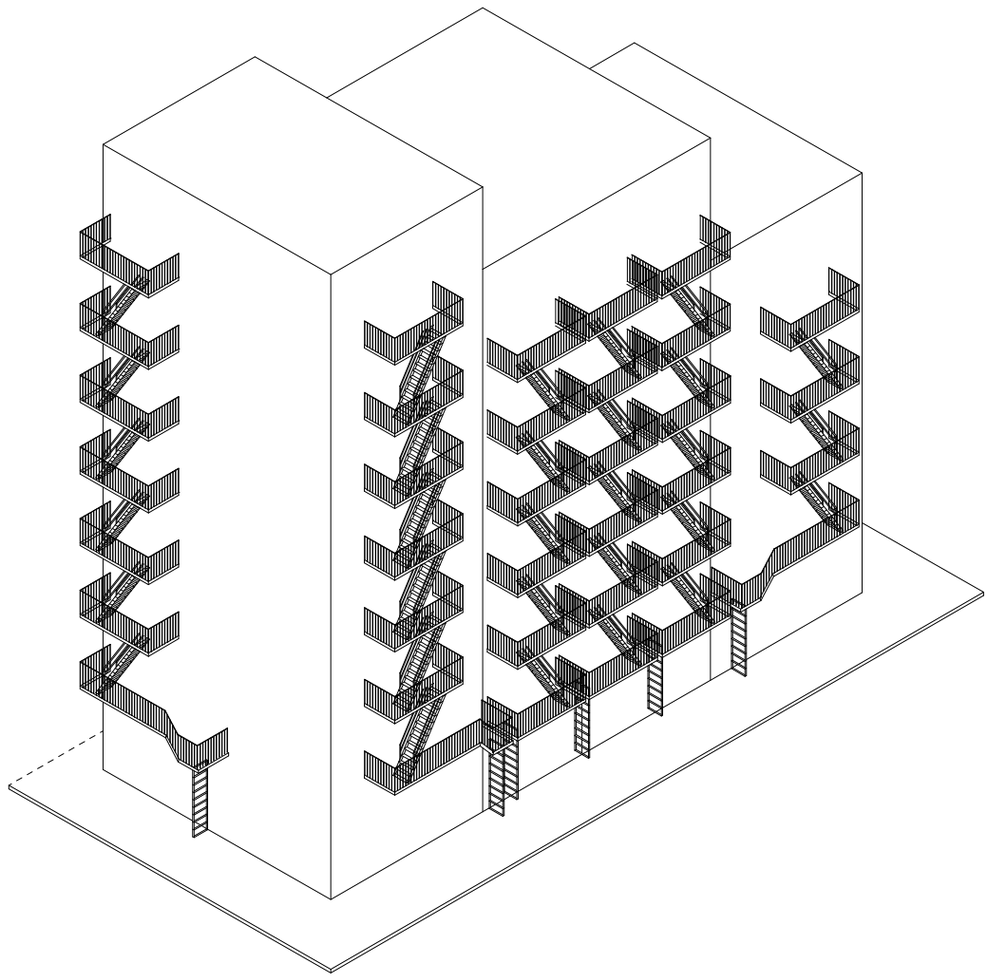


C/06

Name	Function	Site	Size
Facade	Shelter/ Communication	Building	XL

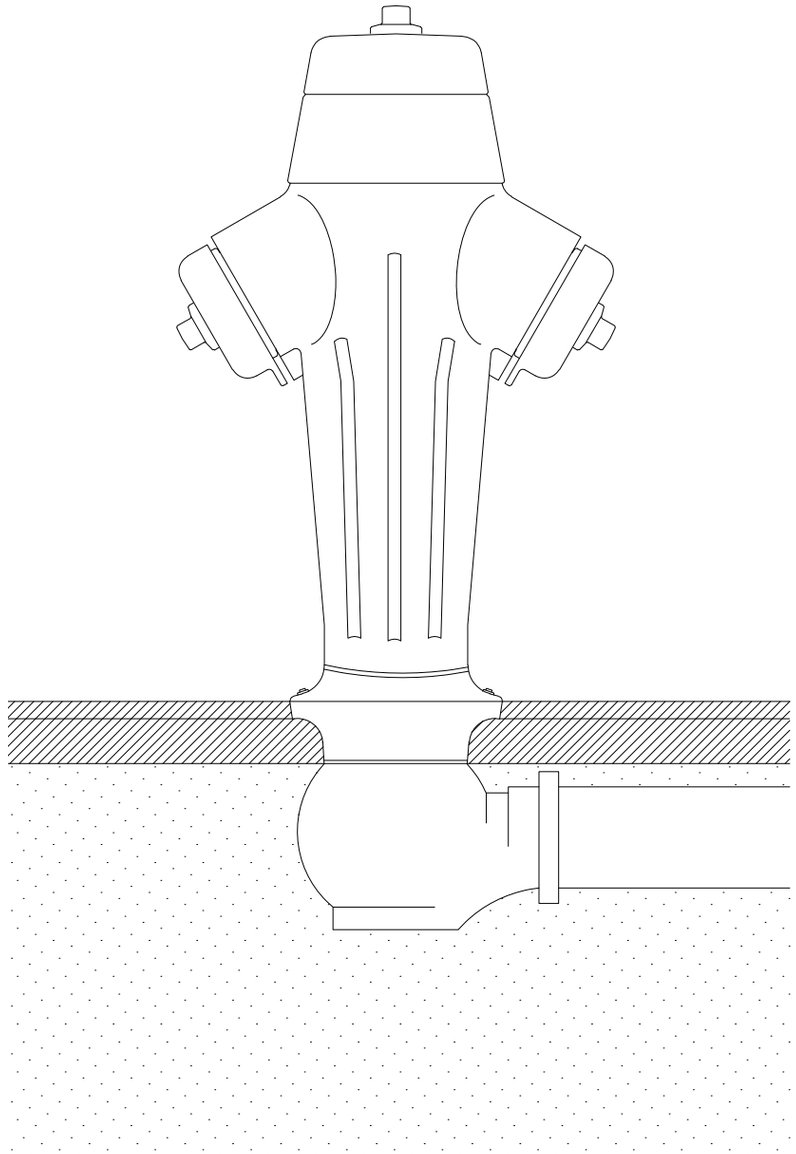
C/07

Name	Function	Site	Size
Fire Escape	Access	Building	L



C/08

Name	Function	Site	Size
Fire Hydrant	Water Supply	Street	S

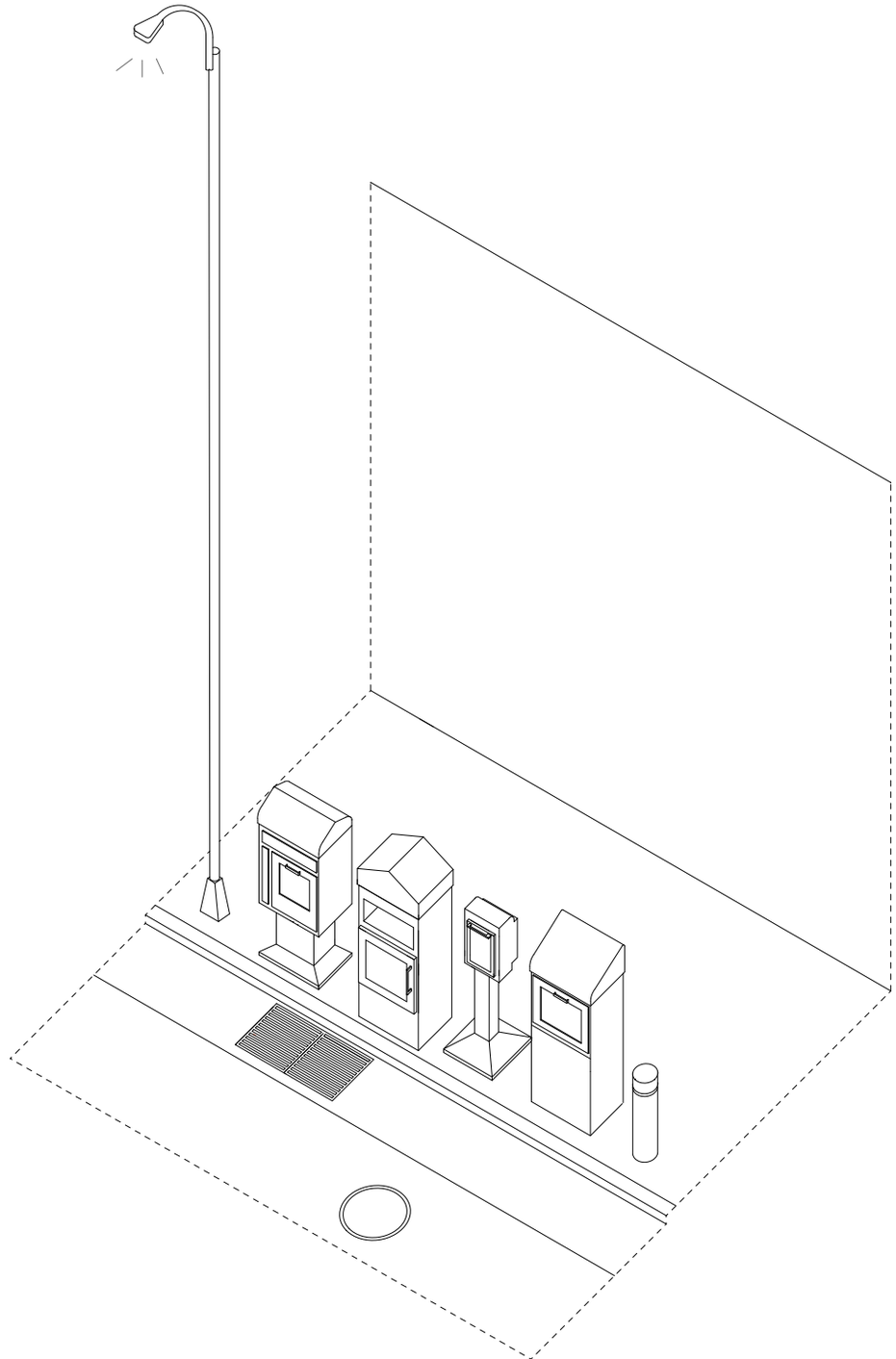


C/09

Name	Function	Site	Size
Loading Dock	Input/Output	Street	L

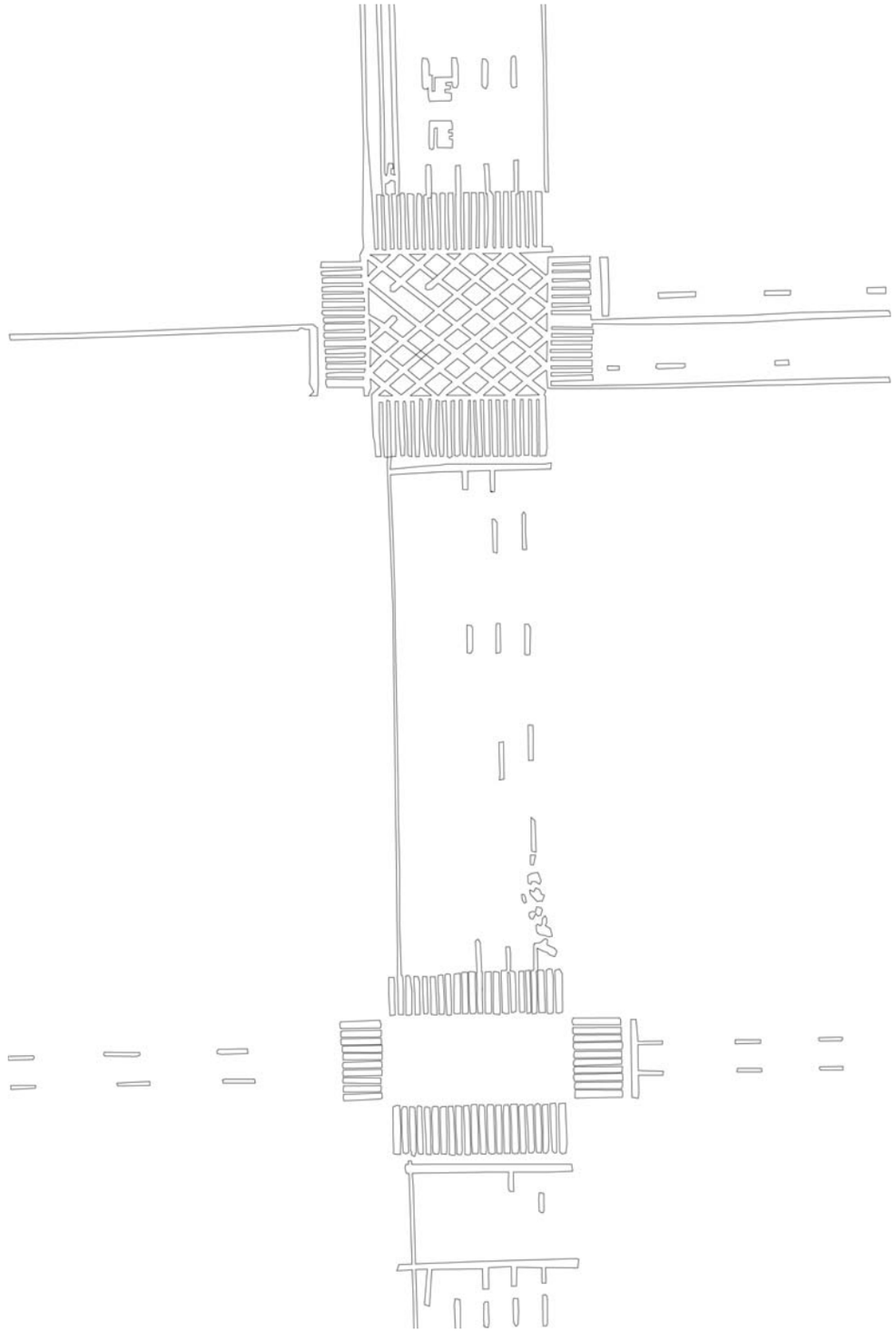
C/10

Name	Function	Site	Size
Newspaper Boxes	Shelter	Street	L



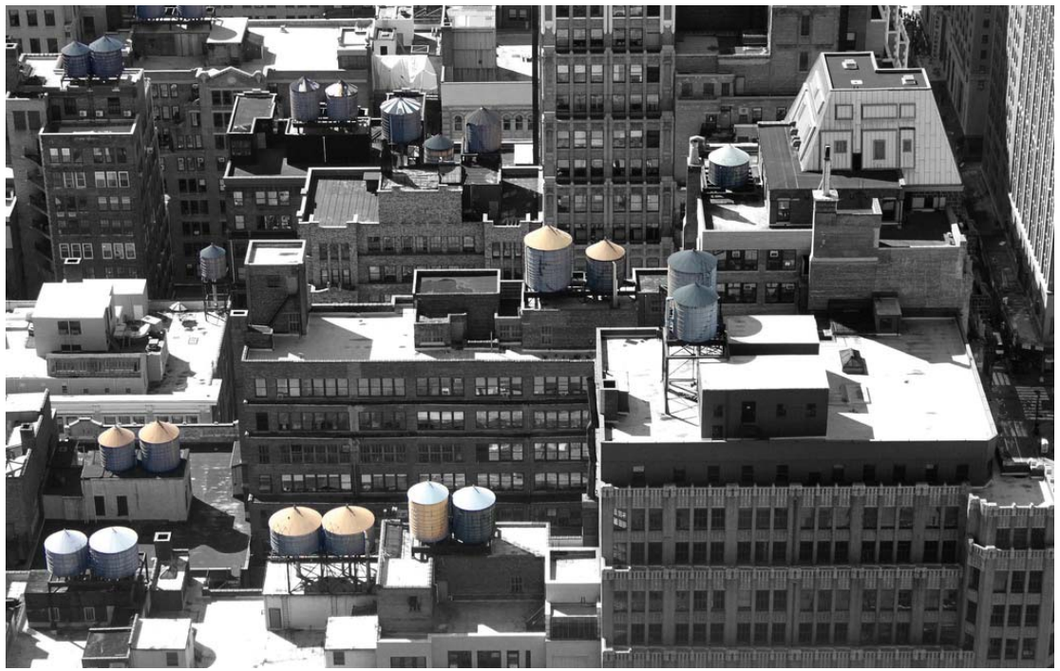
C/11

Name	Function	Site	Size
Road Markings	Order	Street	XL



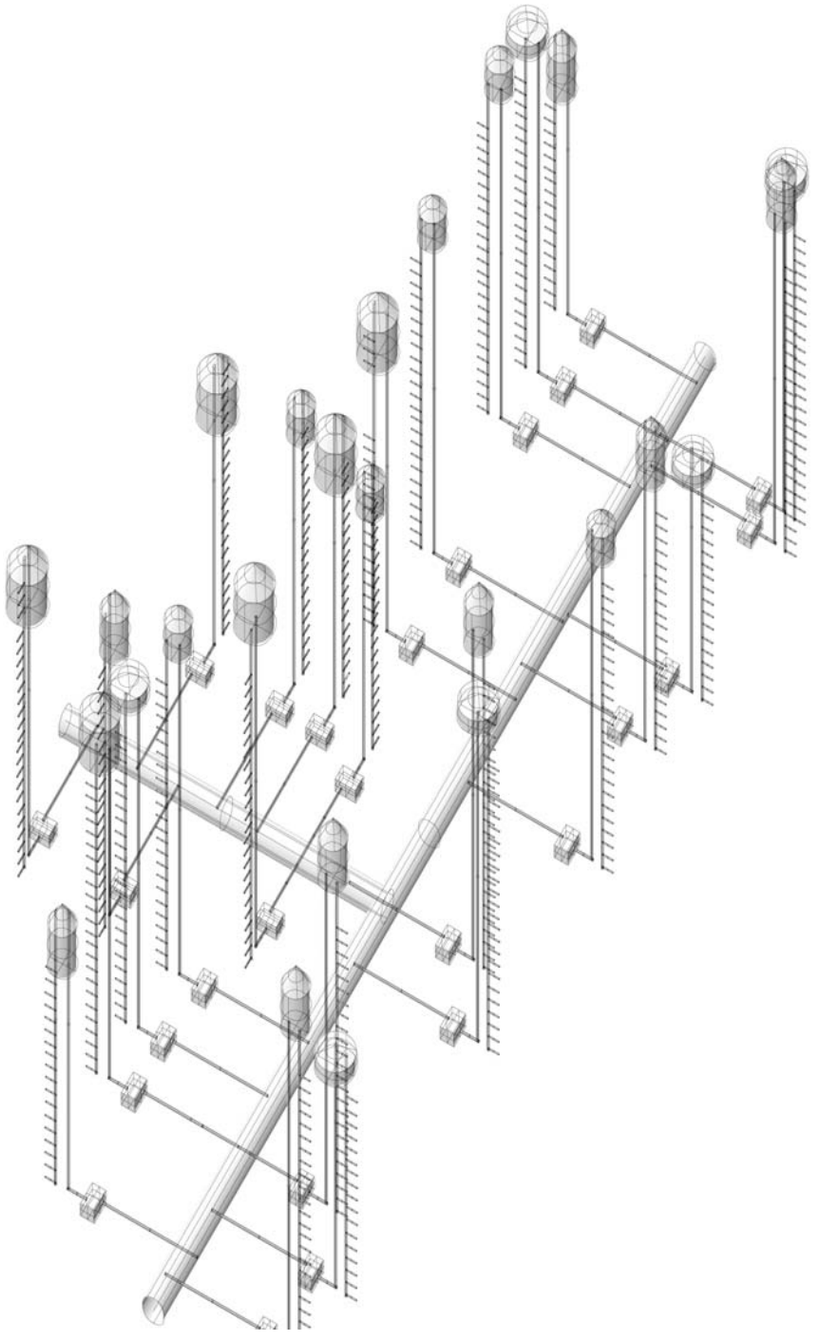
C/12

Name	Function	Site	Size
Roller Door	Security	Street	L



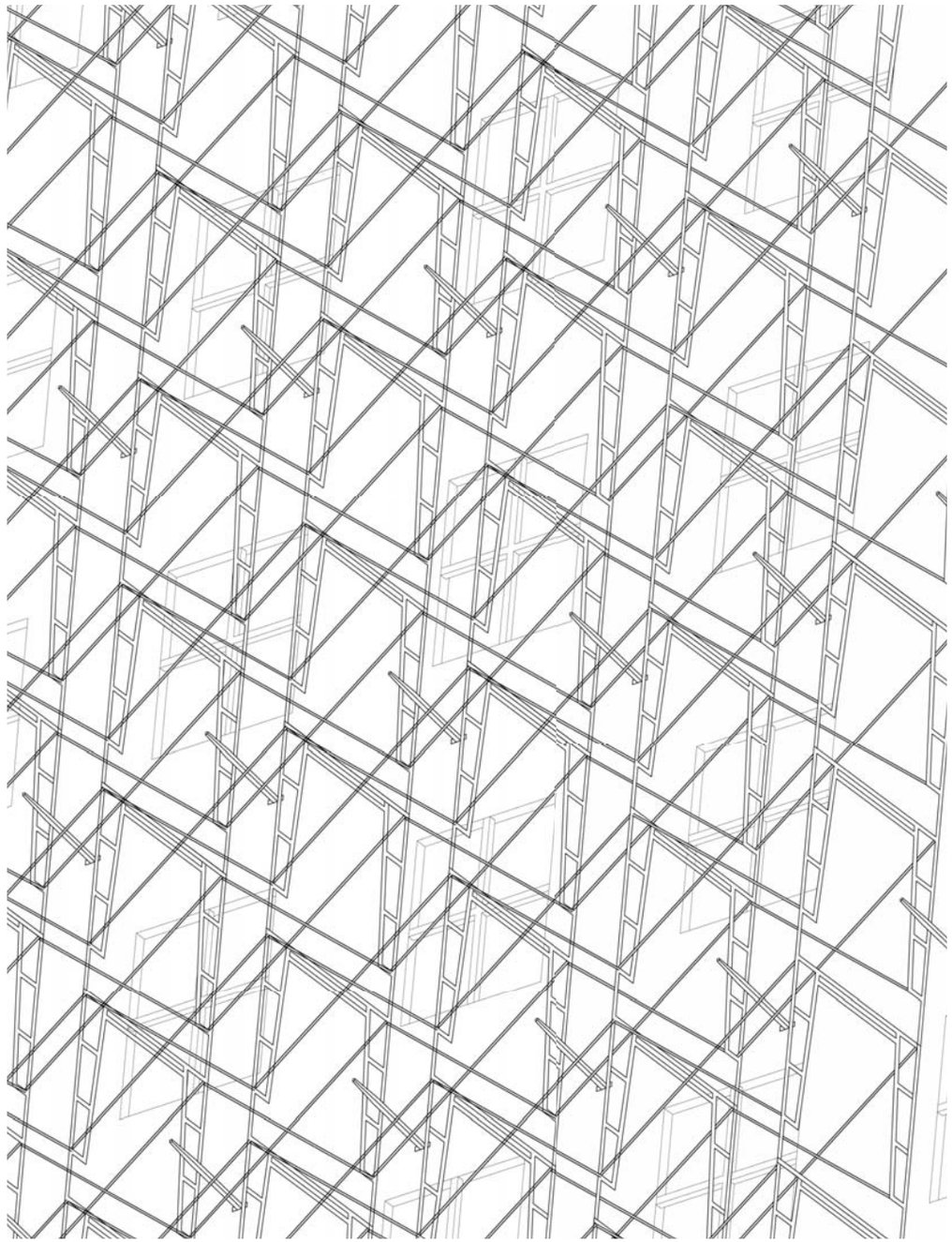
C/13

Name	Function	Site	Size
Water Tower	Storage	Rooftops	L



C/14

Name	Function	Site	Size
Scaffold	Access	Building	XL

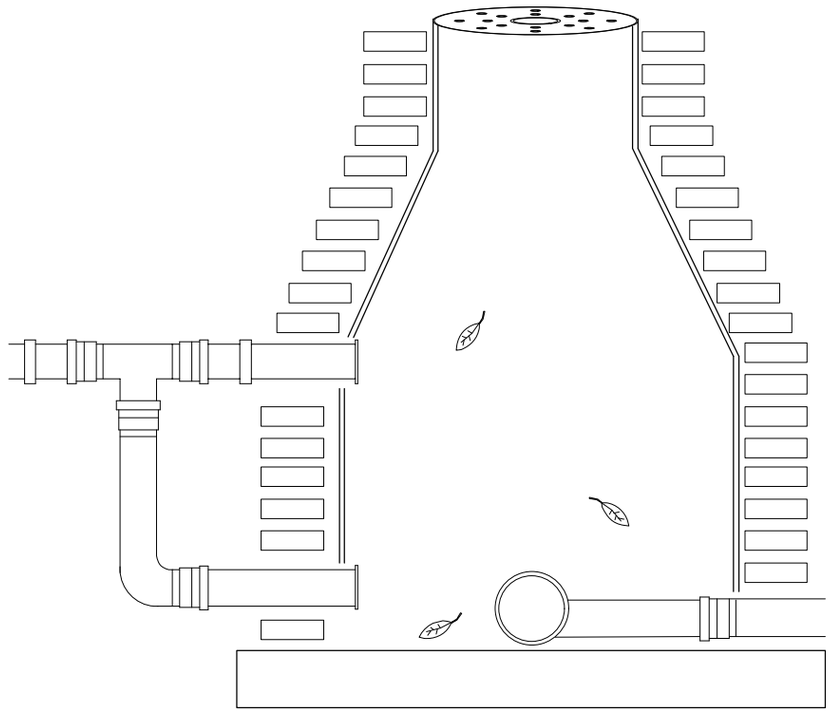


C/15

Name	Function	Site	Size
Billboards	Information	Street	L

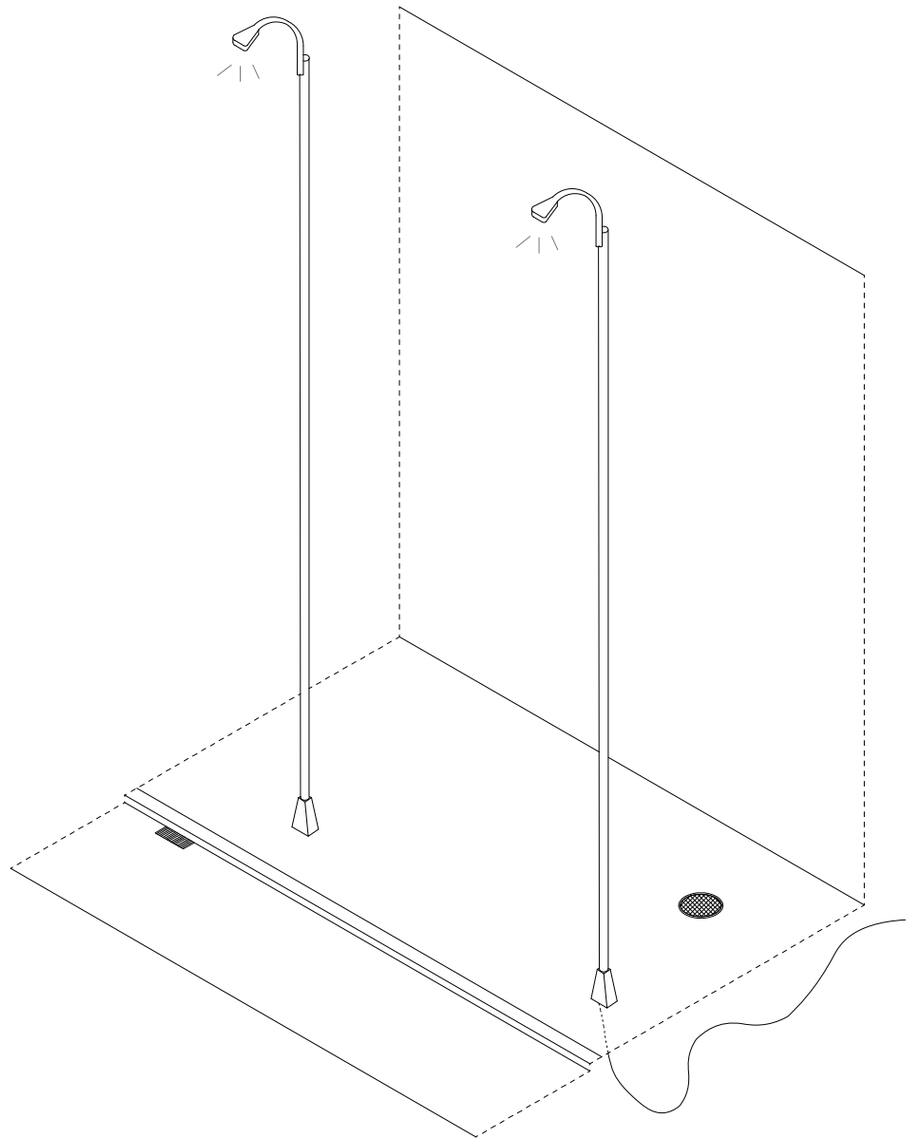
C/16

Name	Function	Site	Size
Manhole	Exhaust and Drainage	Street	S



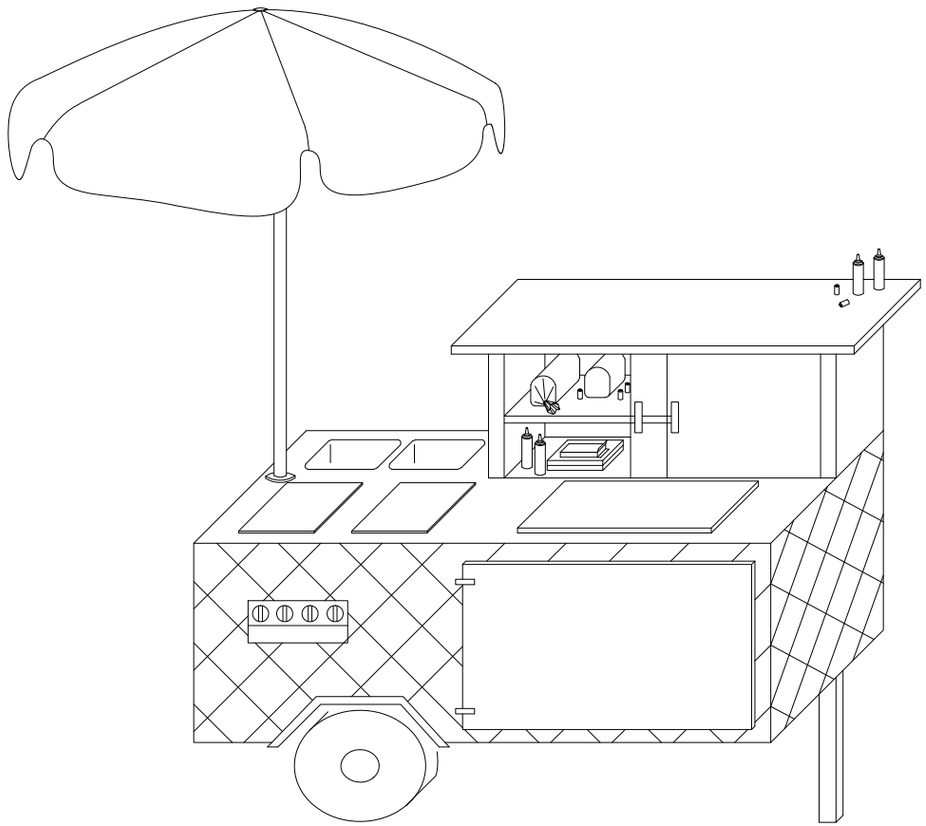
C/17

Name	Function	Site	Size
Street-Lamp	Illumination	Street	L



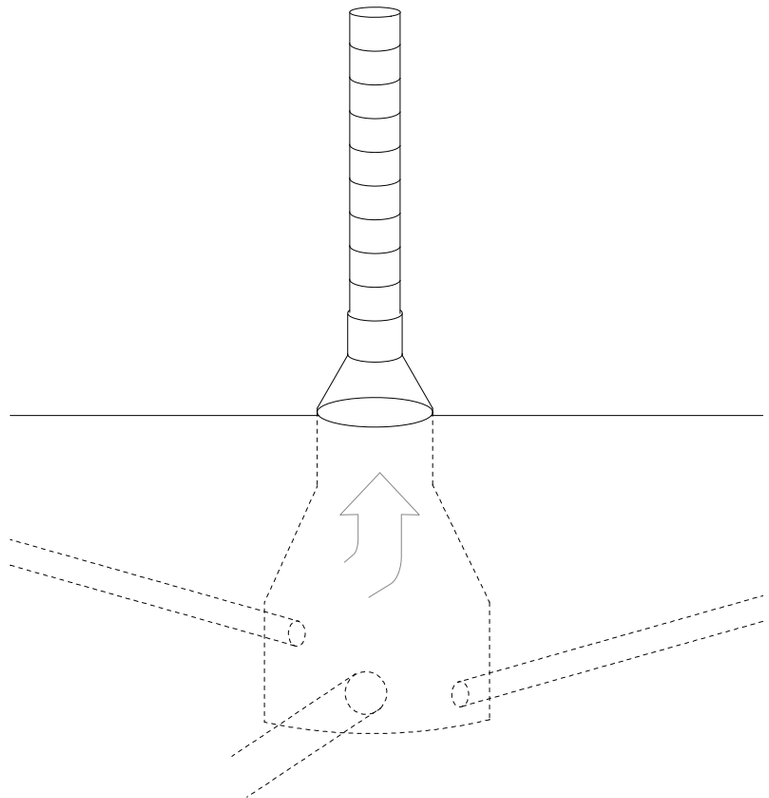
C/18

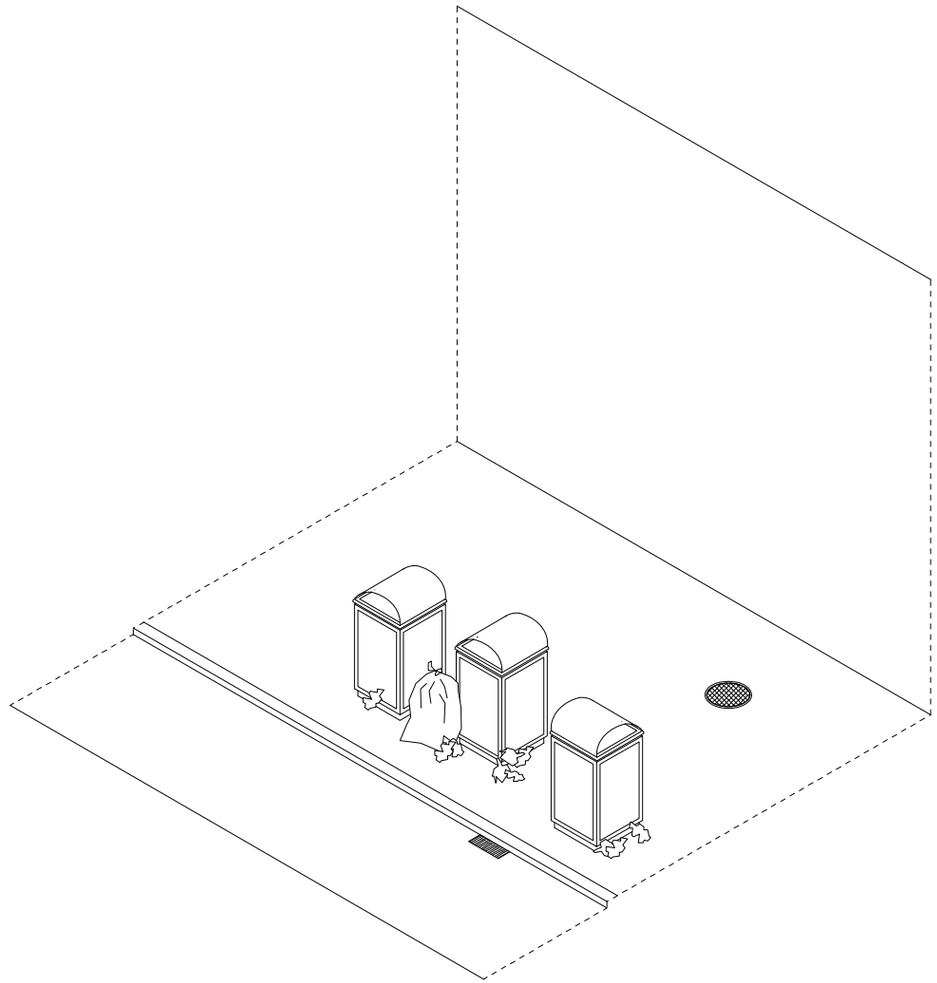
Name	Function	Site	Size
Food Cart	Sustanance	Street	M



C/19

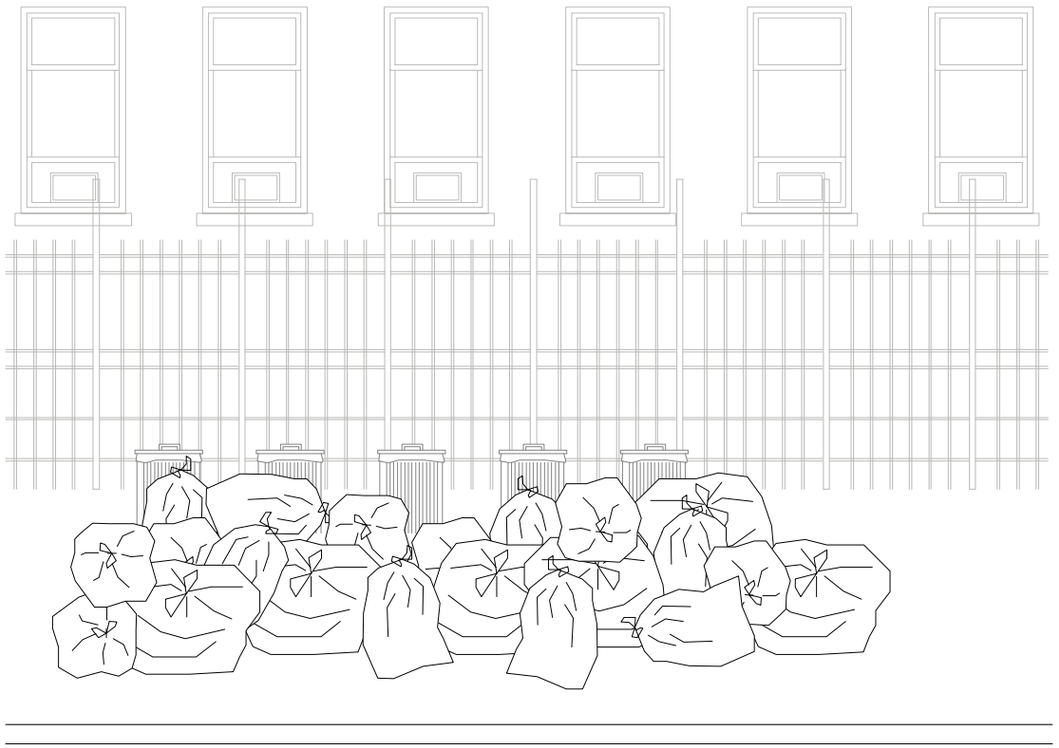
Name	Function	Site	Size
Steam Chimney	Pressure Release	Street	M





C/20

Name	Function	Site	Size
Trash Cans	Refuse Collection	Street	S



C/21

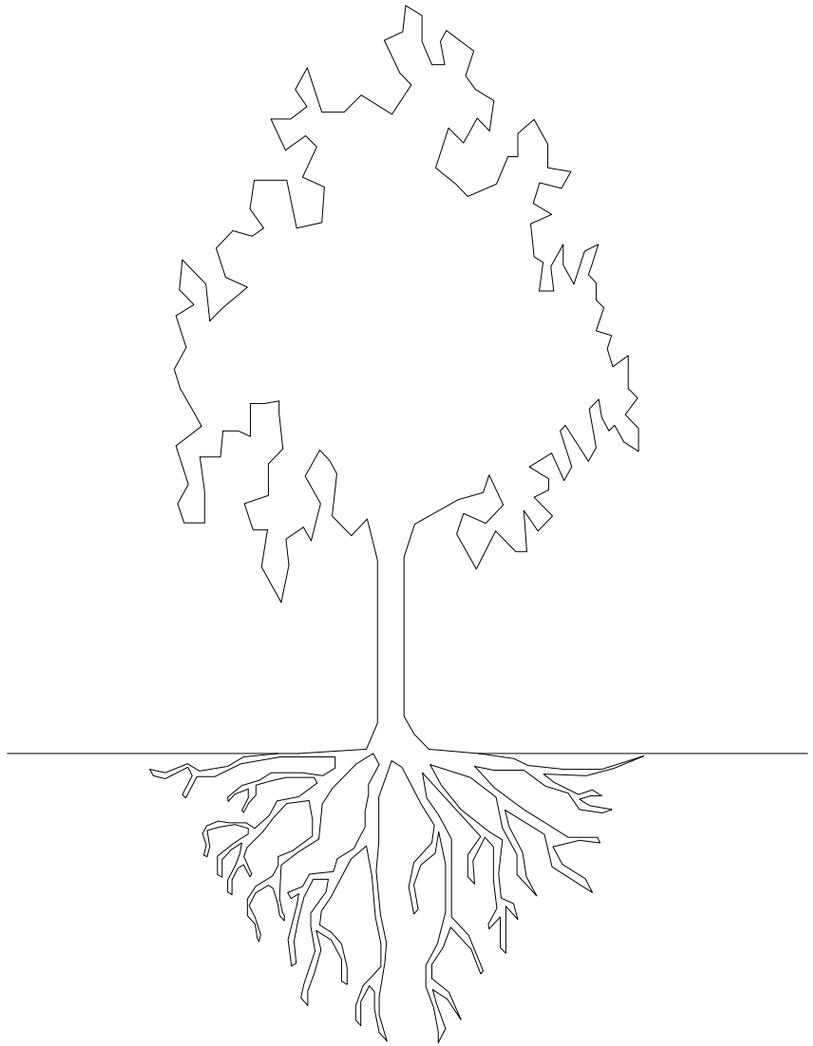
Name	Function	Site	Size
Trash Bags	Refuse Collection	Street	S

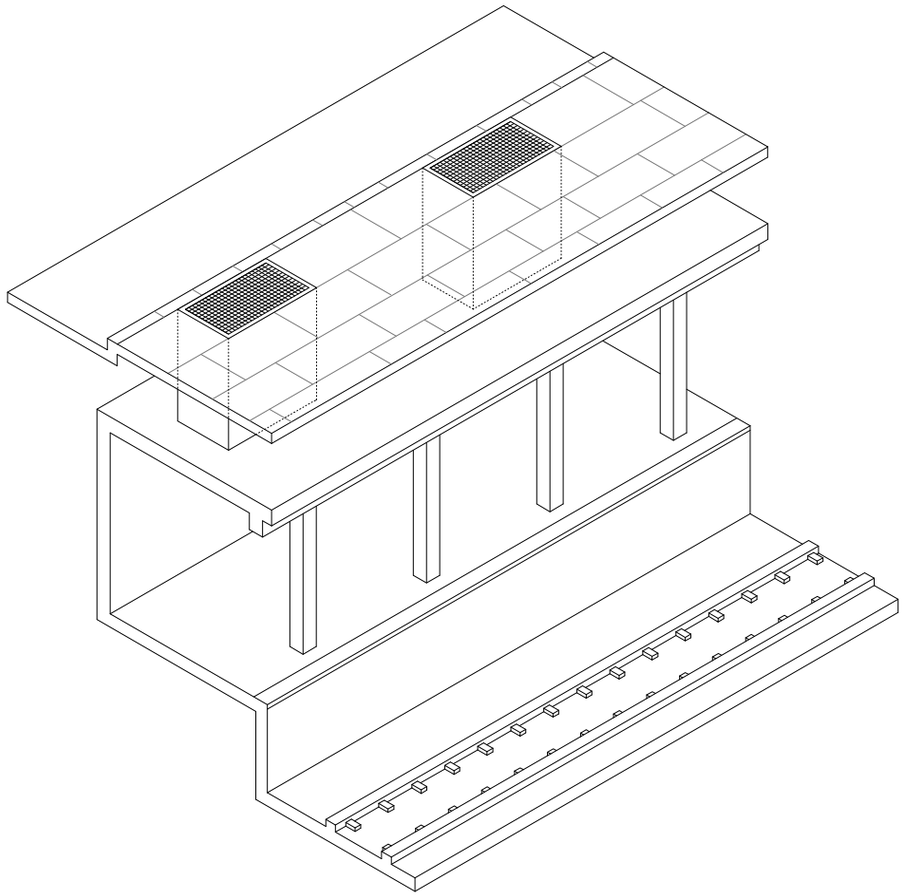
C/22

Name	Function	Site	Size
Construction Furniture	Demarcation	Street	M

C/23

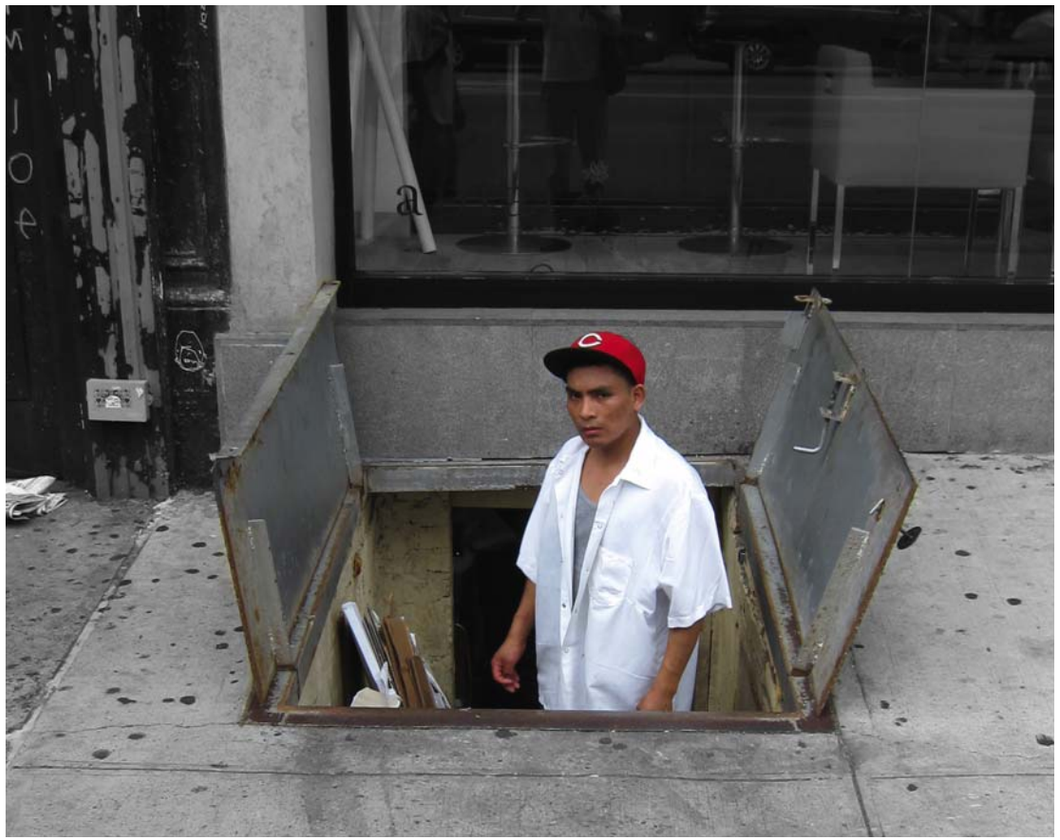
Name	Function	Site	Size
Street Tree	Shade	Street	L

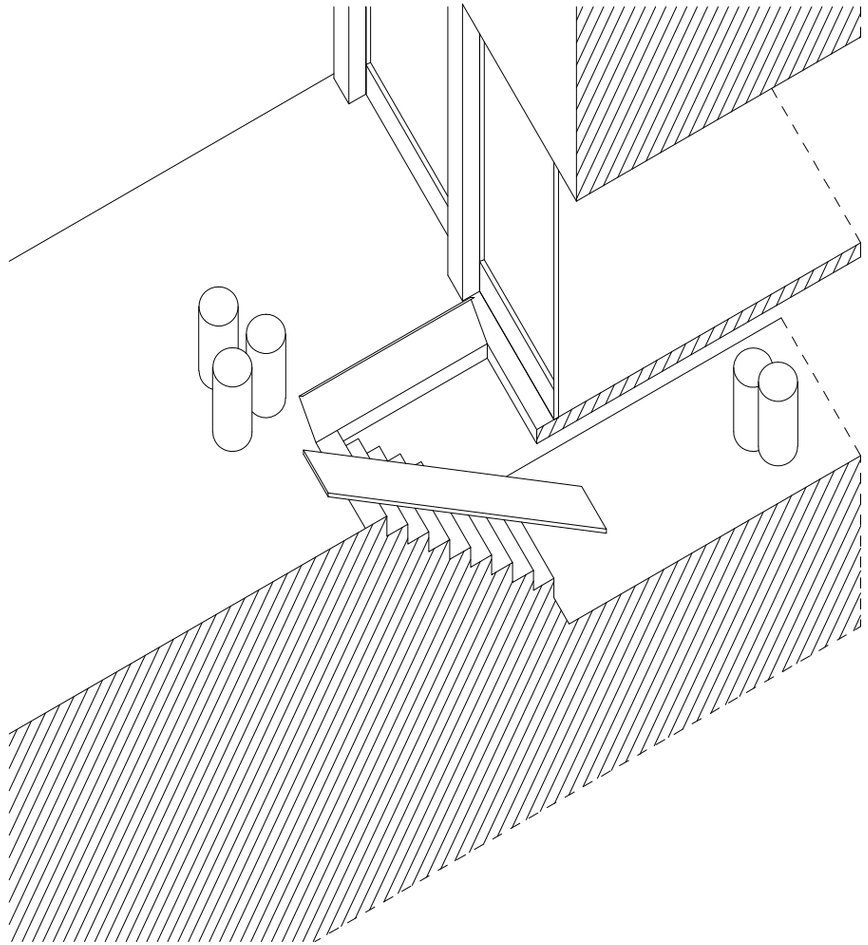




C/24

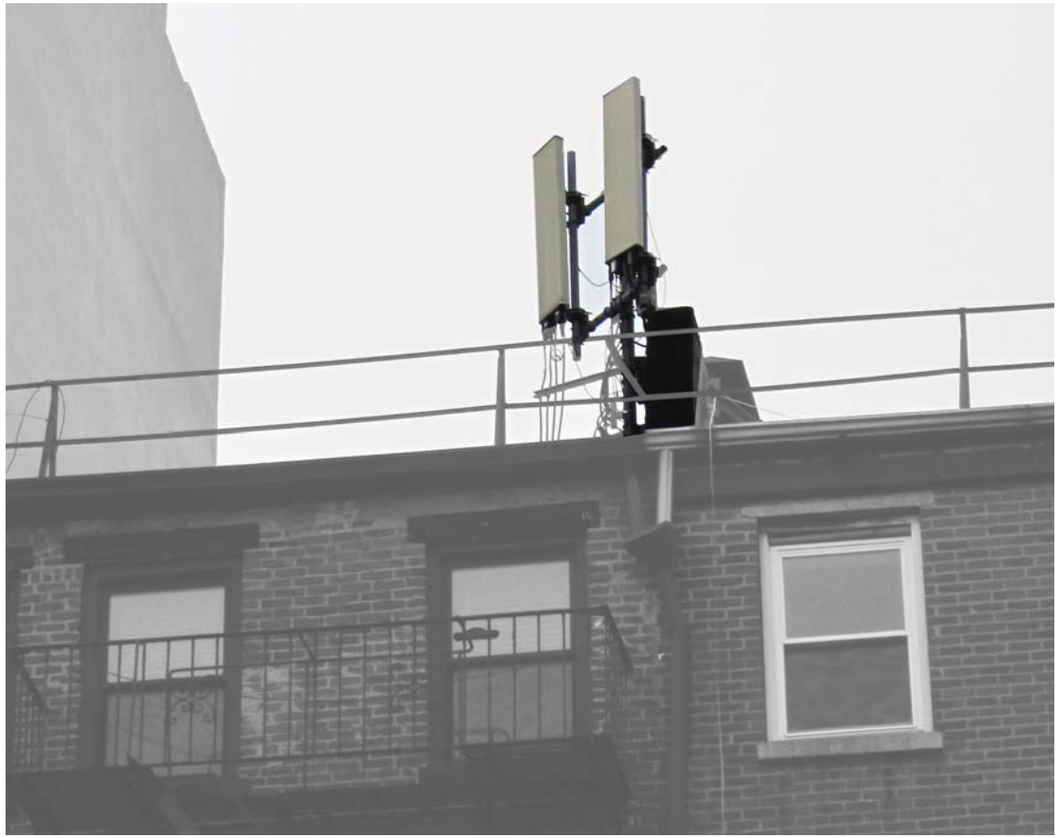
Name	Function	Site	Size
Subway Grates	Pressure Release	Street	M





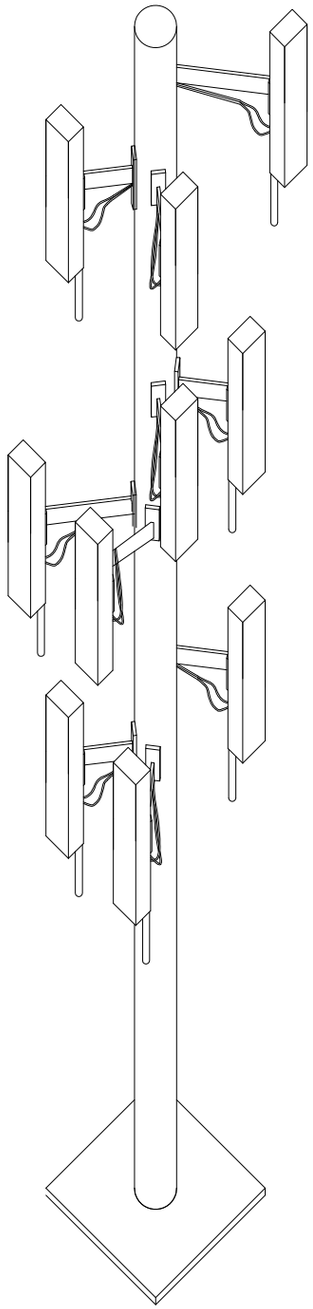
C/25

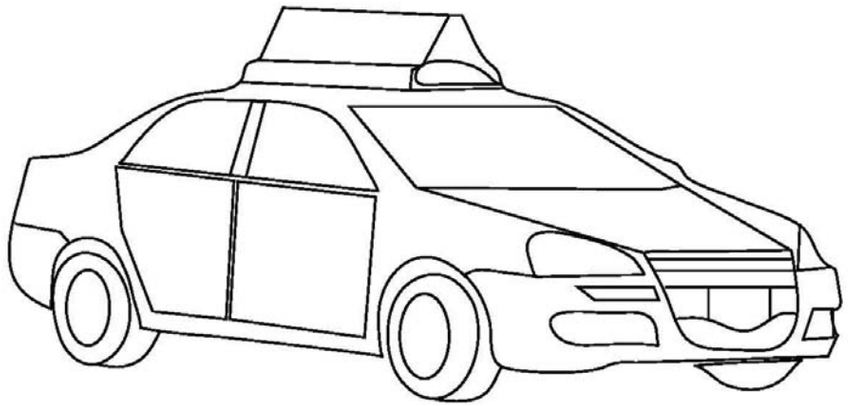
Name	Function	Site	Size
Sidewalk Door	Access	Street	M



C/26

Name	Function	Site	Size
Cell Phone Towers	Signal Reception	Rooftops/Street	L



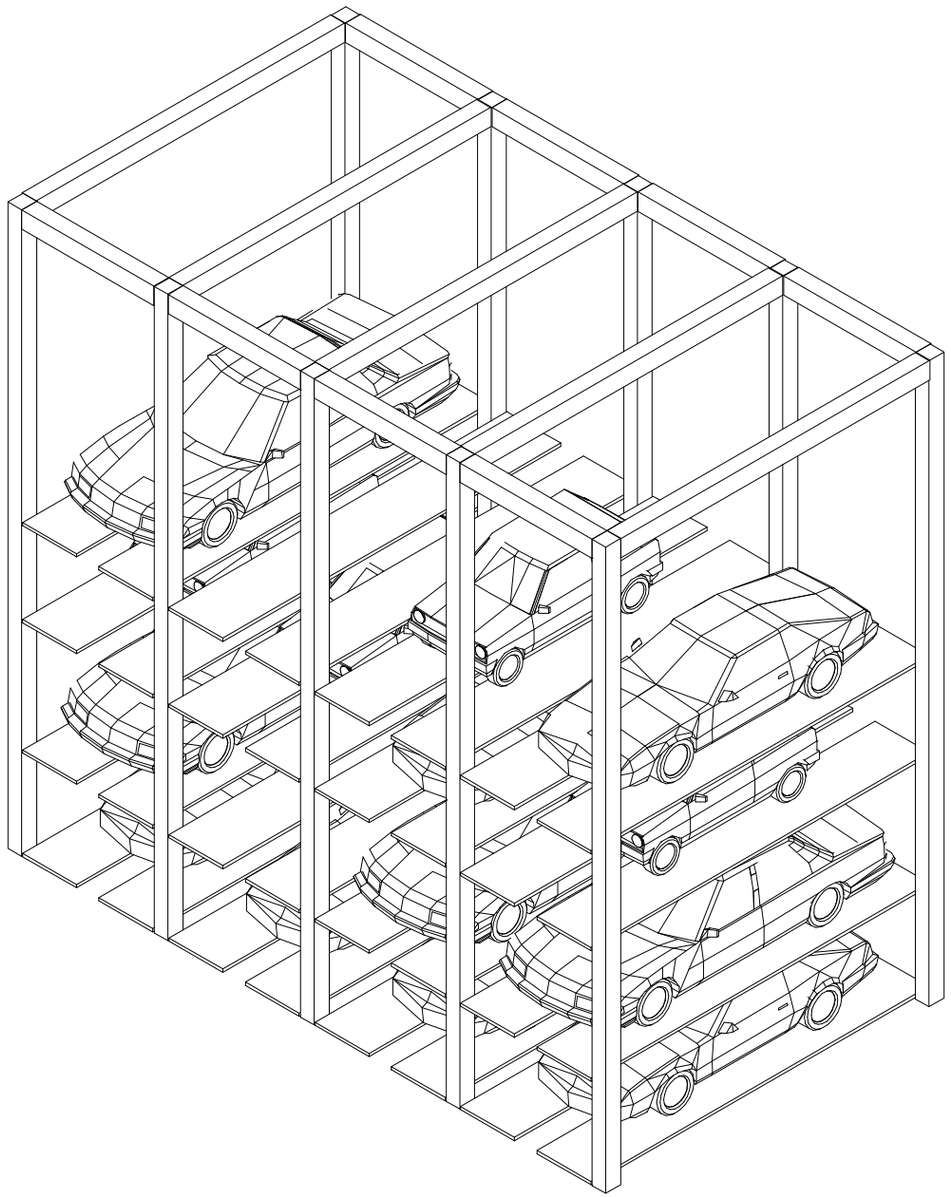


C/25

Name	Function	Site	Size
Taxi	Transportation	Street	L

C/26

Name	Function	Site	Size
Car Stacker	Parking	Carpark	L



R/ RESEARCH COMMISSION

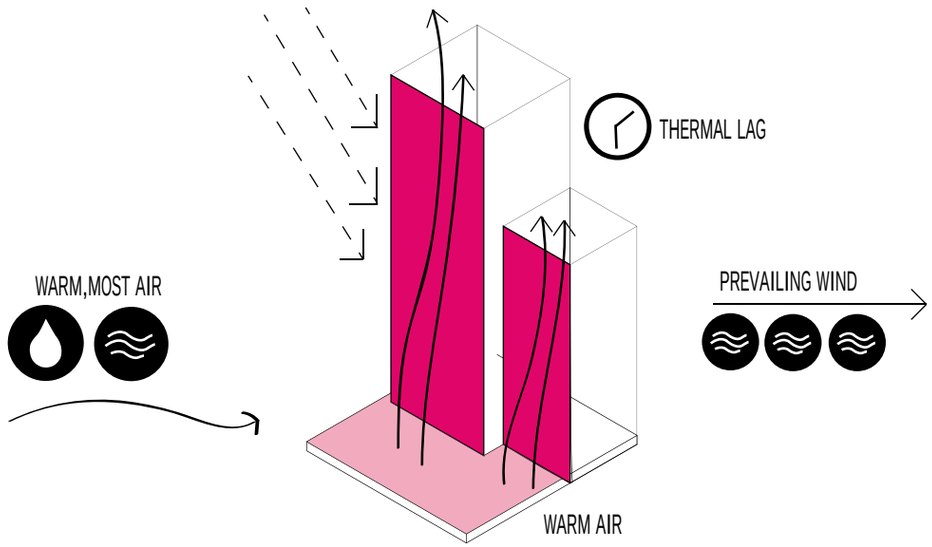
The Research Commission (RC) has been tasked with documenting and evaluating the impact of the Heat Island Effect - its damage to the urban economy, society, health and quality of life. It combines historical data with contemporary projections to shape the larger goals and agenda of the DoBV - its priorities and concerns. In large part, the RC is involved in educating the public and private sectors about the invisible costs of the Heat Island Effect.

The term “heat island” describes built up areas that are hotter than nearby rural areas. The annual mean air temperature of a city with 1 million people or more can be 1.8–5.4°F (1–3°C) warmer than its surroundings. In the evening, the difference can be as high as 22°F (12°C). Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality.

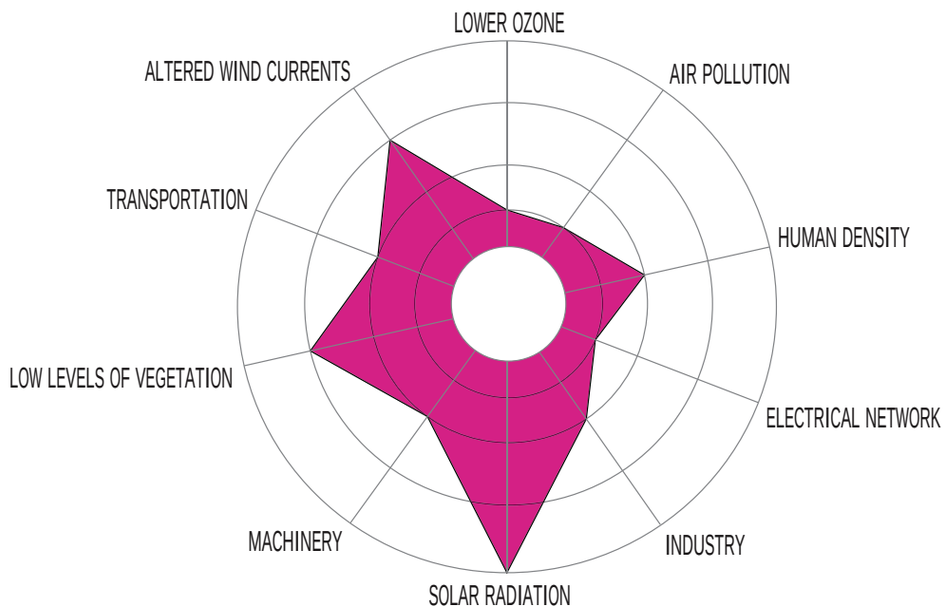
--U.S. EPA

R/01

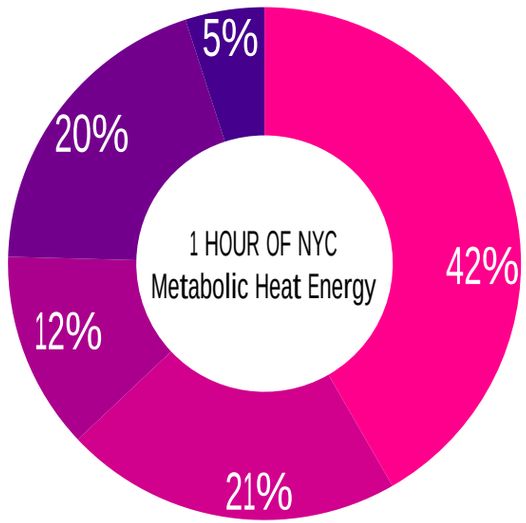
URBAN HEAT ISLAND EFFECT



CONTRIBUTING FACTORS



METABOLIC HEAT GENERATED BY BOROUGH



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594629

LIGHT BULBS FOR AN HOUR

Manhattan Brooklyn Queens The Bronx Staten Island

R/02

HEAT PRODUCED

RESTING

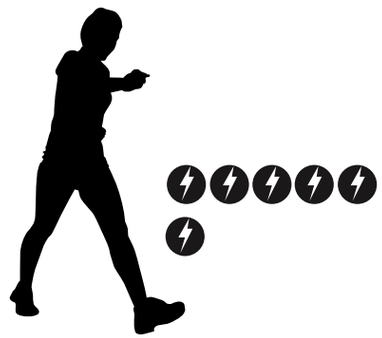
WATTS 100

STANDING

WATTS 140

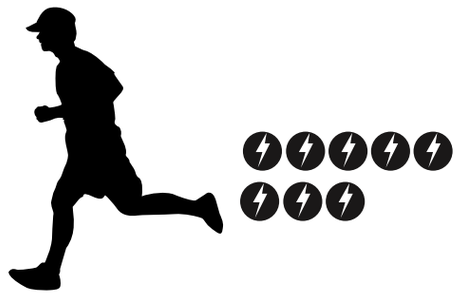
SEATING

WATTS 120



WALKING

WATTS 280

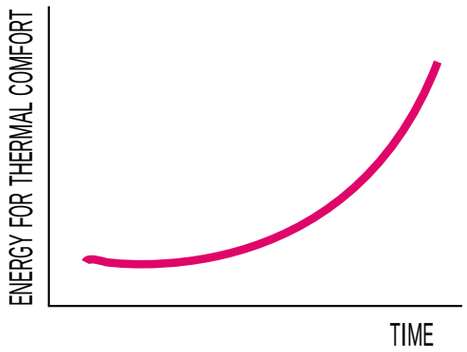


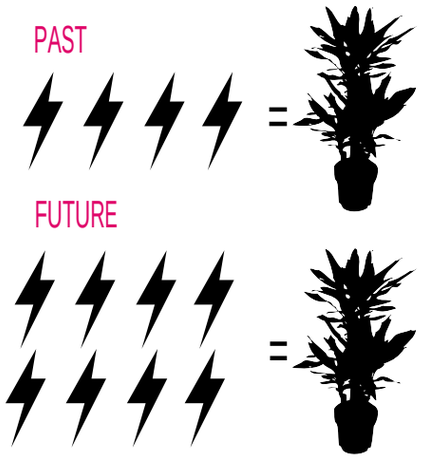
RUNNING

WATTS 430

HOW CAN WE USE THIS HEAT AND ENERGY?

ENERGY CONCERNS

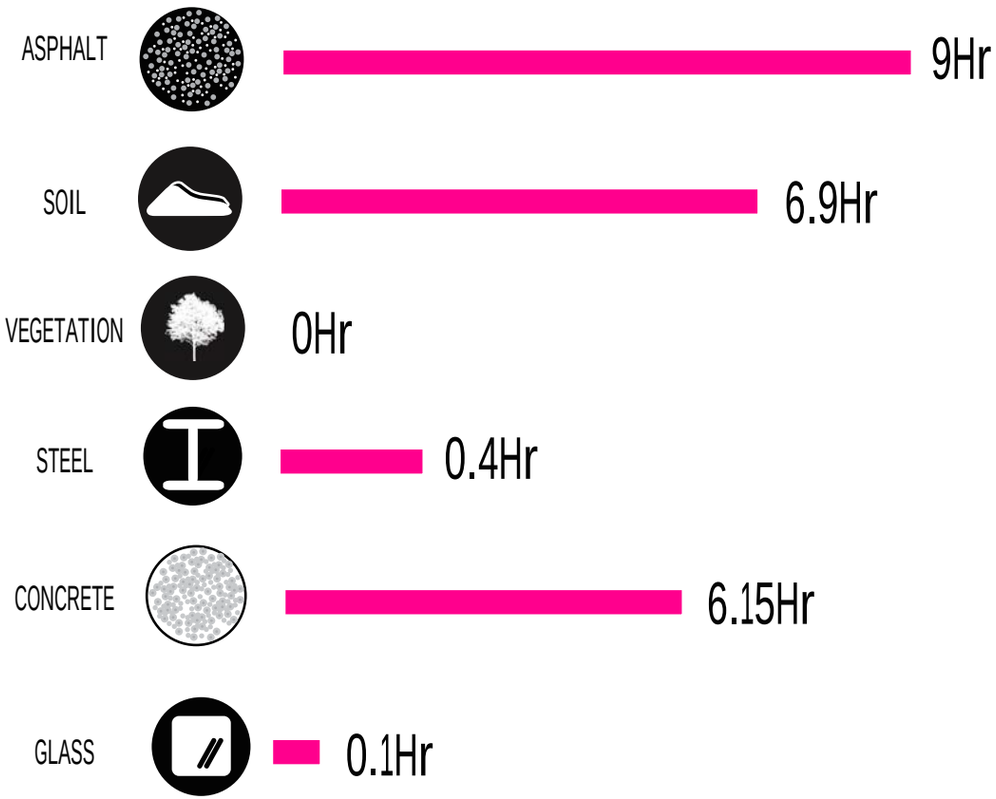




1. CAN THE DEFINITION OF COMFORT BE AUGMENTED?
2. HOW CAN WE HARNESS NEW OR RECYCLED ENERGIES TO PRODUCE GREATER FOOD RESOURCES?

R/03

THERMAL LAG - NYC MATERIALS



1. HOW CAN WE USE NATURAL ENERGY AND RESOURCES TO REDUCE HEAT?
2. HOW CAN WE AUGMENT THE THERMAL LAG OF A MATERIAL?

SUN ⊕
WATER ⊖
WIND ⊖

R/04

Name	Symptom Cat-	Scale of im-	Units
Insert name of object	Insert function of object	Insert site of object	Insert size of object

ESTIMATED SURFACE AREA AVAILABLE FOR STREET TREES

LOWER WEST SIDE MANHATTAN
29.4%

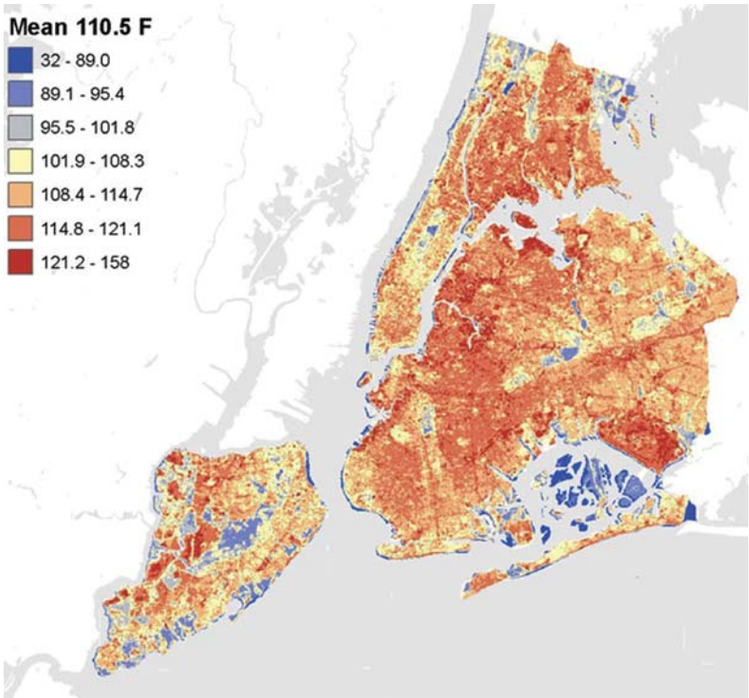
MIDTOWN MANHATTAN
26.1%

BROOKLYN
24.9%

BRONX
21.1%

QUEENS
17.9%

1. CAN STRATEGIC COOL CORRIDORS BE CREATED?
2. DOES THE DISTRIBUTION OF HEAT MATCH THE LOCATION OF STREET TREES?
3. CAN MORE AREAS BE MADE AVAILABLE FOR TREES ON STREET LEVEL?



R/05

% OF HARD AND SOFT SURFACES BY BOROUGH

MID TOWN MANHATTAN
94.3% HARD
5.7% SOFT

LOWER WEST SIDE MANHATTAN
83.6% HARD
16.4% SOFT

BROOKLYN
74.7% HARD
25.3% SOFT

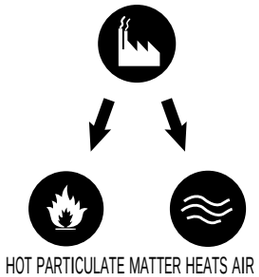
BRONX
68.7% HARD
31.3% SOFT

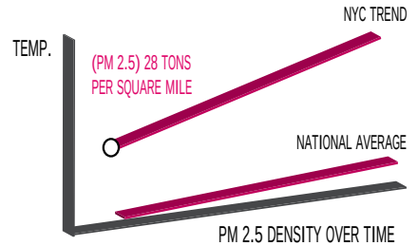
QUEENS
60.2% HARD
39.8% SOFT

1. ARE HEAVILY PAVED AREAS NEW ENERGY STORES?
2. HOW CAN DRAIANGE BE ACHIEVED BY MIXING HARD AND SOFT SURFACES?
3. HOW CAN SOFT SURFACES BE PROJECTED FROM EXCESSIVE HEAT?

R/06

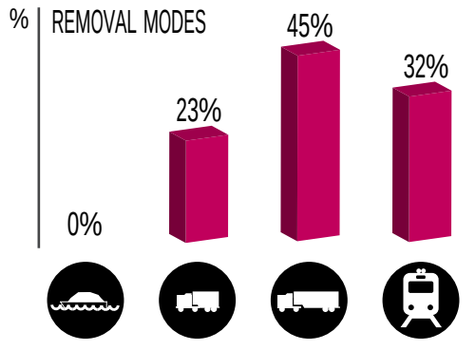
PARTICULATE MATTER (PM2.5)





1. CAN MOVEMENT OF AIR BE CREATED TO DISPERSE PARTICLES AND HEAT?
2. CAN WE HARNESS PARTICLE DENSITY AS A TOOL TO LOCALISE COLLECT WASTE HEAT?

SOLID WASTE & TRANSPORT

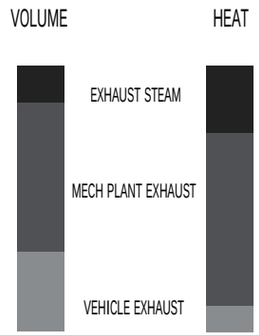


1.66 MILLION METRIC TONS OF GREEN HOUSE GAS IS PRODUCED BY THE SOLID WASTE SYSTEM

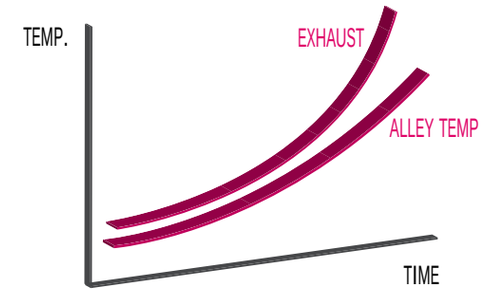
1. WILL EXPORTING WASTE CONTINUE OR CAN THIS BECOME A NEW RESOURCE?
2. CAN LOCATIONS OF WASTE COLLECTION BE NEW CENTRES OF INDUSTRY & WEALTH?
3. CAN LESS ENERGY BE USED IN THE PROCESSING OF SOLID WASTE & ENERGY COLLECTED FROM WASTE?

R/07

EXHAUST HEAT



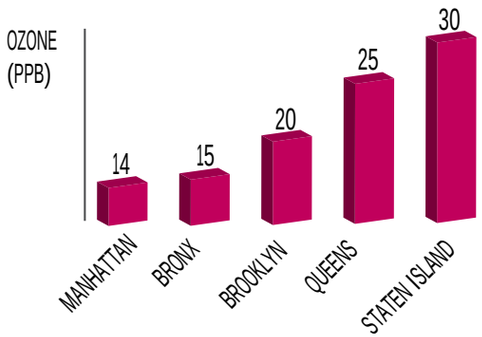
LOCALISED WASTE HEAT IN SMALL STREETS IS SET TO INCREASE AS EXTERIOR TEMPERATURES INCREASE

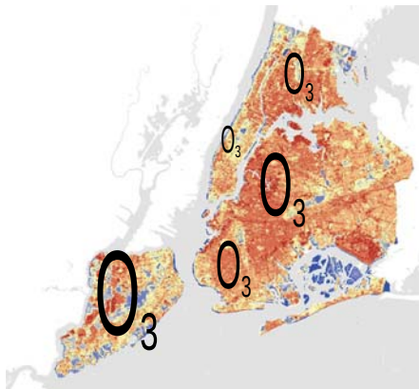


1. WILL NEW AIR CURRENTS BE CREATED BY PASSAGE OF EXHAUST HEAT?
2. CAN EXHAUST HEAT BE HARVESTED & ENERGY RECOVERED?
3. WILL CONTAINABLE EXHAUST HEAT BECOME A DECENTRALISED ENERGY RESOURCE?

OZONE CONCENTRATION

OZONE DEPLETION VARIES OVER THE CITY IN RELATION TO AIR TEMP.





1. WITH GREATER INCOMING ENERGY AND HEAT, IS OZONE GENERATION A DESIRABLE/VIABLE GOAL?

HOW CAN THE HEAT ISLAND FORMULA BE ADAPTED?

WARM HUMID AIR FROM OVER WATER + WARM AIR OVER CITY + PREVAILING WIND = DOWNWIND PRECIPITATION

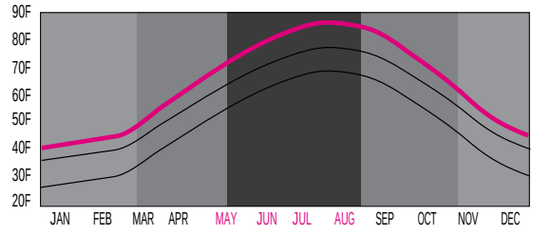
WARM HUMID AIR FROM OVER WATER + WARM AIR OVER CITY + PREVAILING WIND = DOWNWIND TOWN PRECIPITATION

WARM HUMID AIR FROM OVER WATER + WARM HOT AIR OVER CITY + PREVAILING WIND = DOWNWIND TOWN HEAVY PRECIPITATION

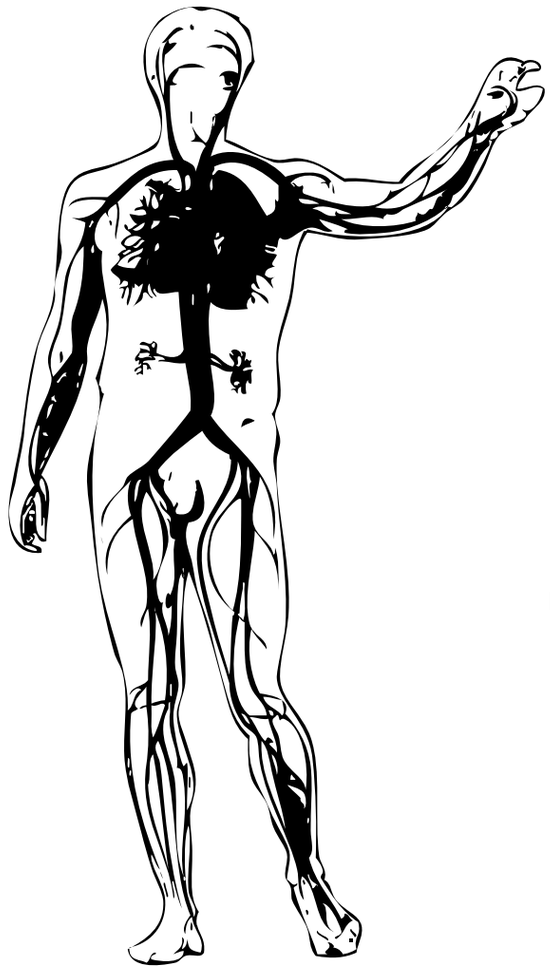
WARM DRY AIR FROM OVER WATER LAND + WARM HOT AIR OVER CITY + PREVAILING WIND = DOWNWIND TOWN DUST STORM

R/08

HEALTH EFFECTS HIGHER TEMPERATURES



HIGHER TEMPERATURES SUMMER



+ NEW TROPICAL DISEASE

+ HIGHER BLOOD PRESSURE

+ HIGHER STROKE RATE

+ MORE HEAT RELATED DEATHS

+ HIGHER HEALTH COSTS

WE NEED NEW SCALES OF QUANTIFYING THE HEAT ISLAND EFFECT

FRESH	WATER RECYCLING REQUIREMENT	FETID
COOL	SUN TAN LOTION DEMAND	SEARING
0%	HOURS OF THE DAY SPENT SQUINTING	100%
0%	HOURS OF THE DAY SPENT SWEATING	100%
SATURATION	DRINKING WATER REQUIREMENT	THIRST
FRESH	CITY ODOR FACTOR	PUNGENT
BOOTS	FLIP FLOP DEMAND	FLIP FLOP
OPEN EYES	SUN HAT DEMAND	CLOSED EYES
BAKING	ICE CREAM DEMAND	BRAIN FREEZE
DRY	EVAPORATIVE COOLING REQUIREMENT	SWEATING

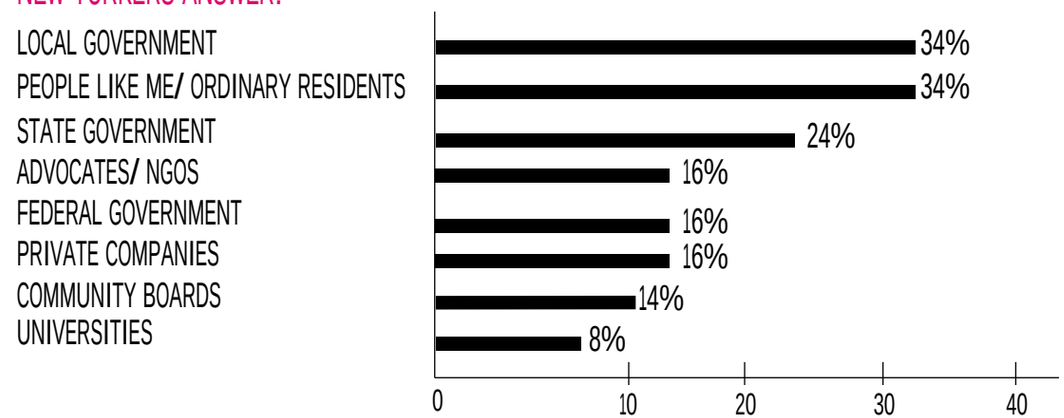
R/09

WHICH OF THE FOLLOWING HAVE THE MOST POTENTIAL TO HELP IMPROVE THE OVERALL QUALITY OF THE ENVIRONMENT IN NEW YORK CITY?

0%

OF PEOPLE SAY ARCHITECTS

NEW YORKERS ANSWER:

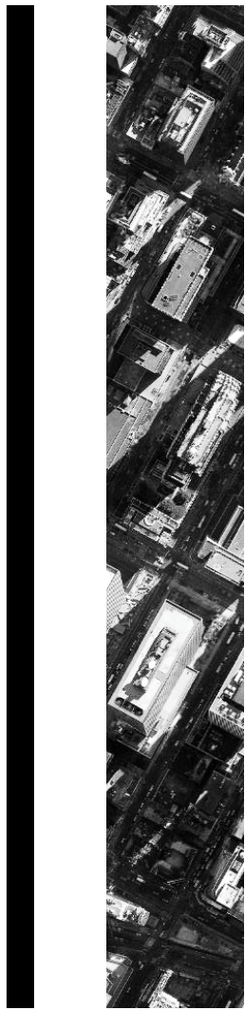


Z/ ZONING COMMISSION

Zoning was introduced into Manhattan in 1915 in response to the construction of the 42-story Equitable Building erected in Lower Manhattan, which rises 538 feet above the ground, without any setbacks, casting a 7 acre shadow on its neighboring buildings. Since that time, zoning has also become heavily influenced by financial and real-estate markets. Every Architect working in NYC, uses, abuses and interprets the zoning and building code in order to find moments of opportunity - lost spaces, extra square footage, etc - anything can become an opportunity. The Zoning Commission of the DoBV is much more far-reaching: micro-climates are not limited to building parcels and their effects are not exclusive to the exterior. In some ways, the Zoning Commission has become the most powerful force shaping the city today and includes all scales of object/space/building/material/infrastructure/resource within its realm of influence.

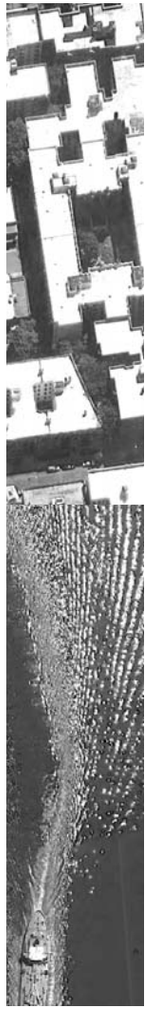
Z/01

POPULATION



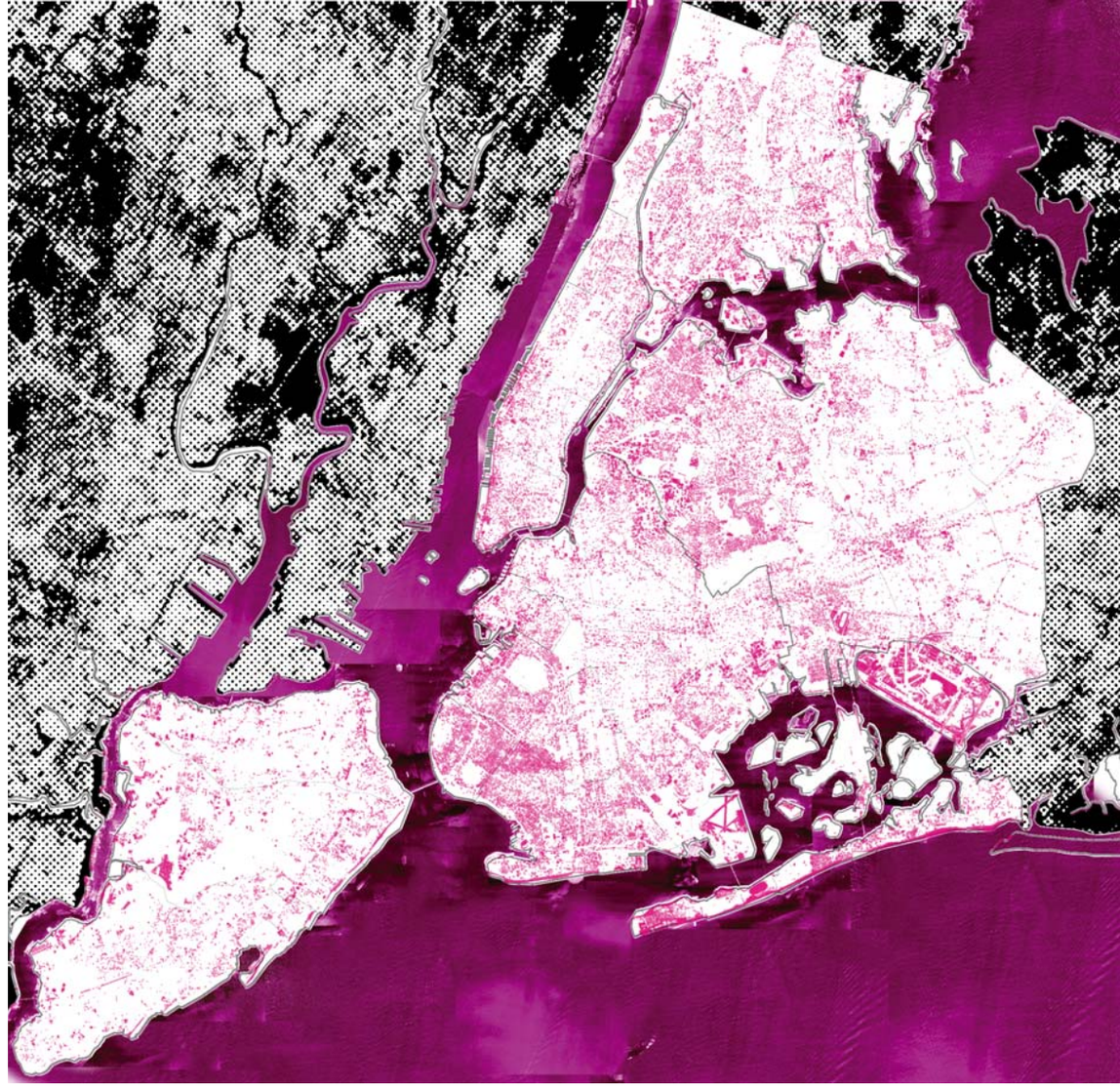
Z/02

SHADOW



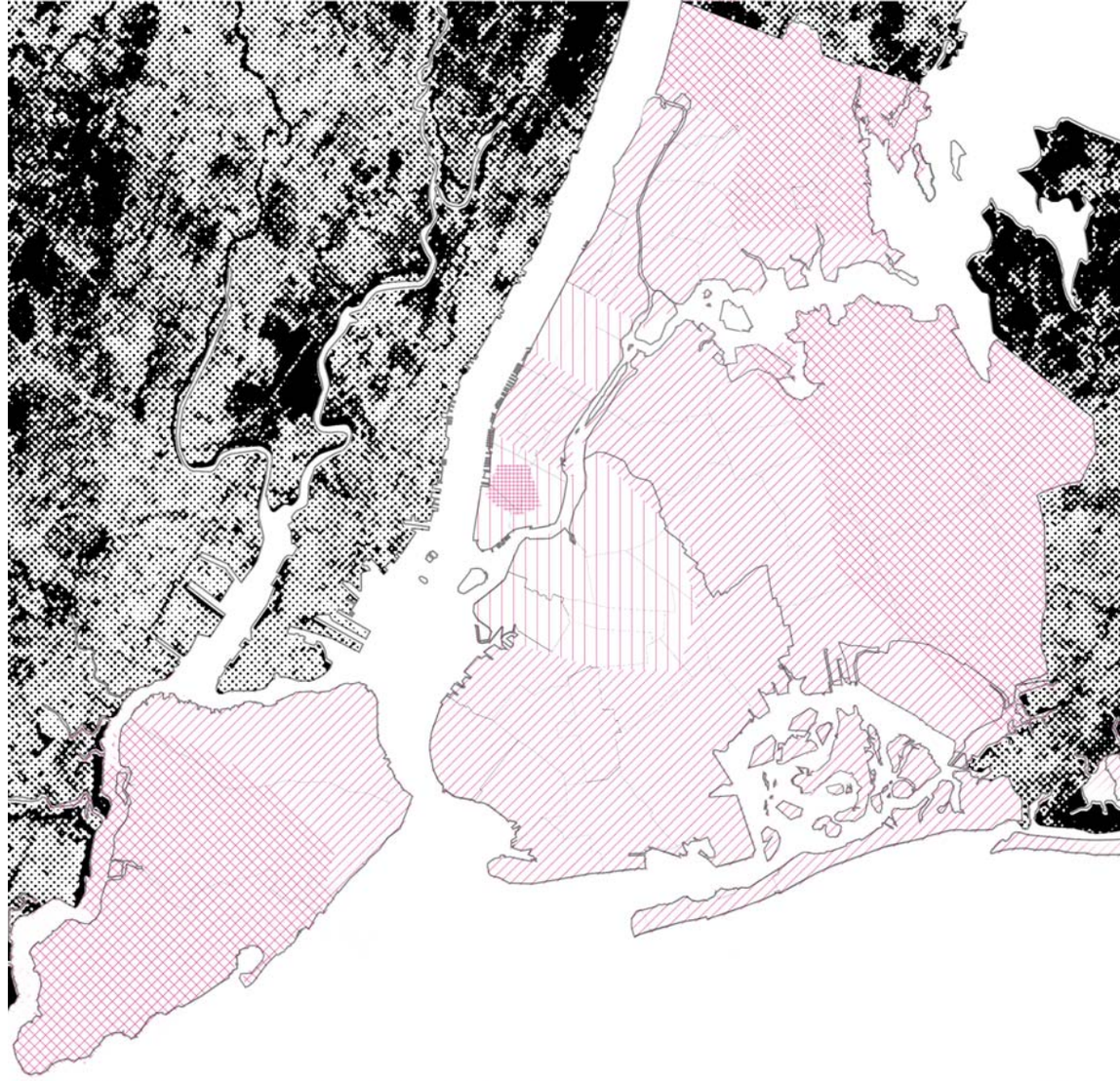
Z/03

REFLECTIVITY



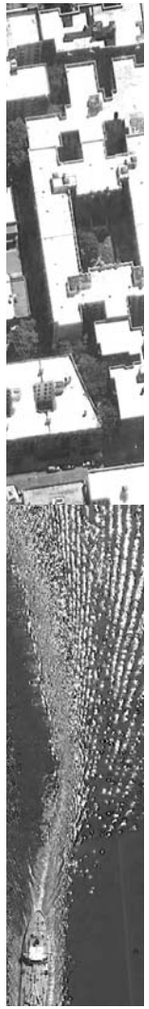
Z/04

MATERIALITY



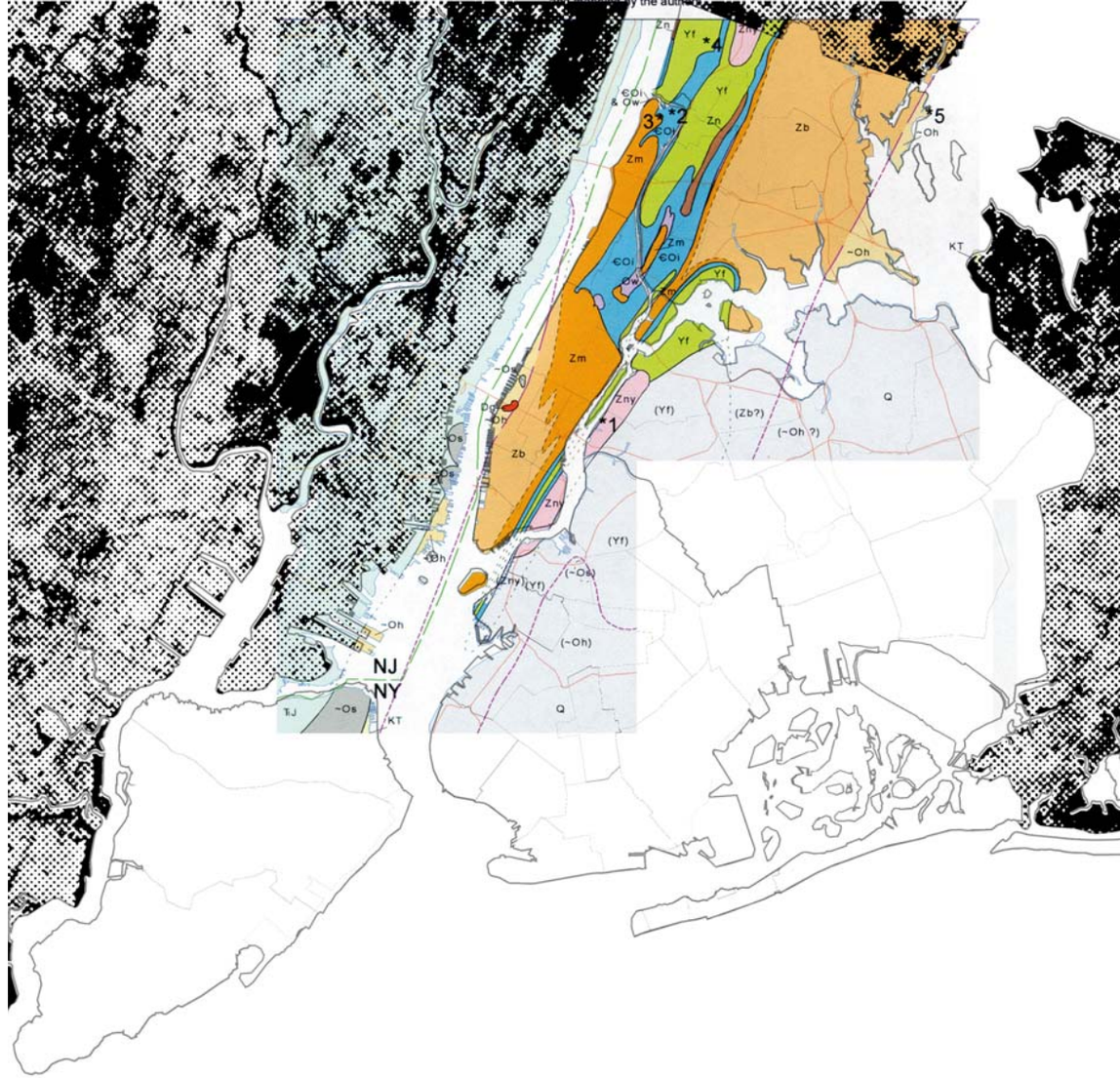
Z/05

VEGETATION



Z/06

GEOLOGY

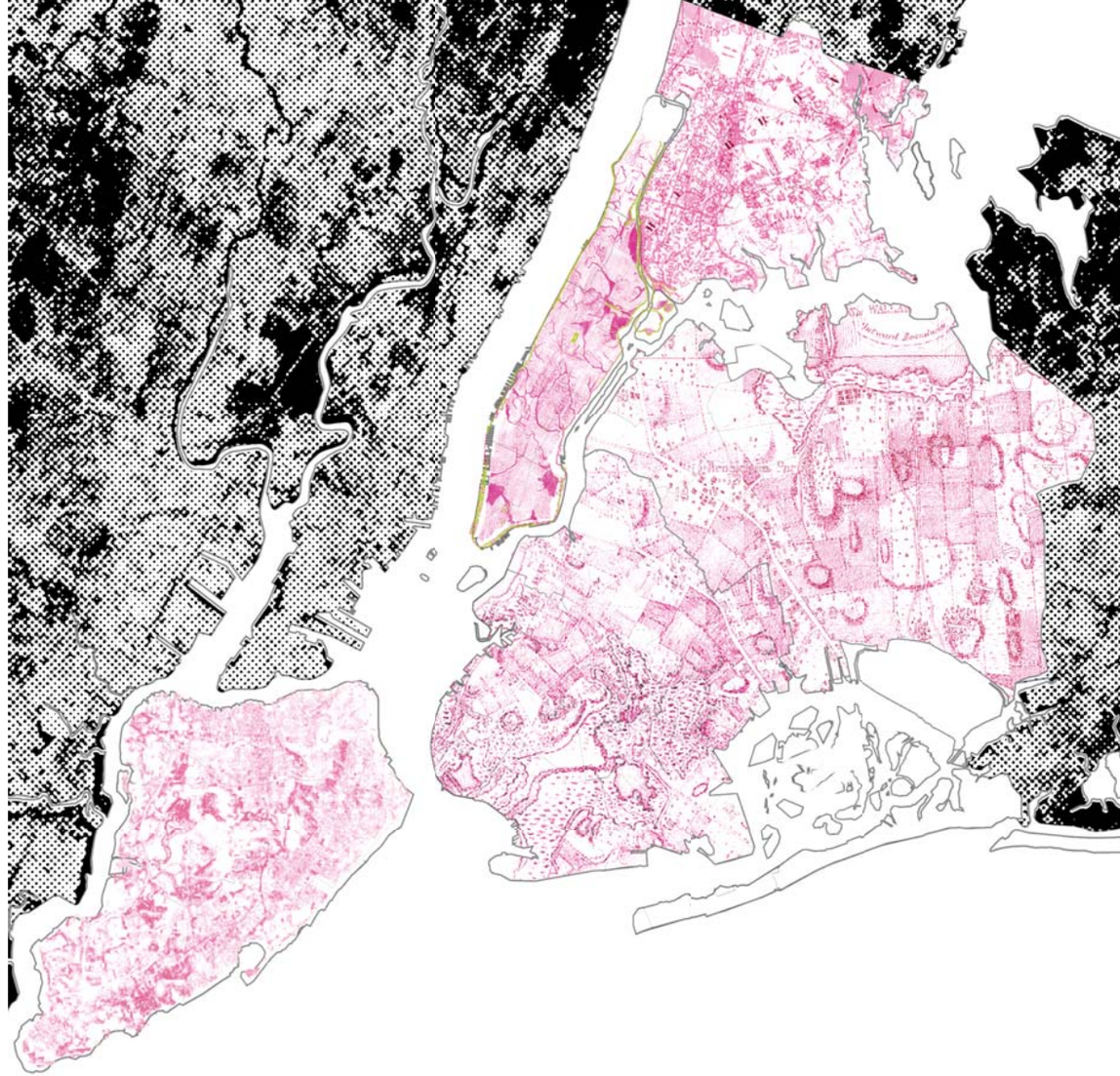


Z/07

ETHNIC DIVERSITY

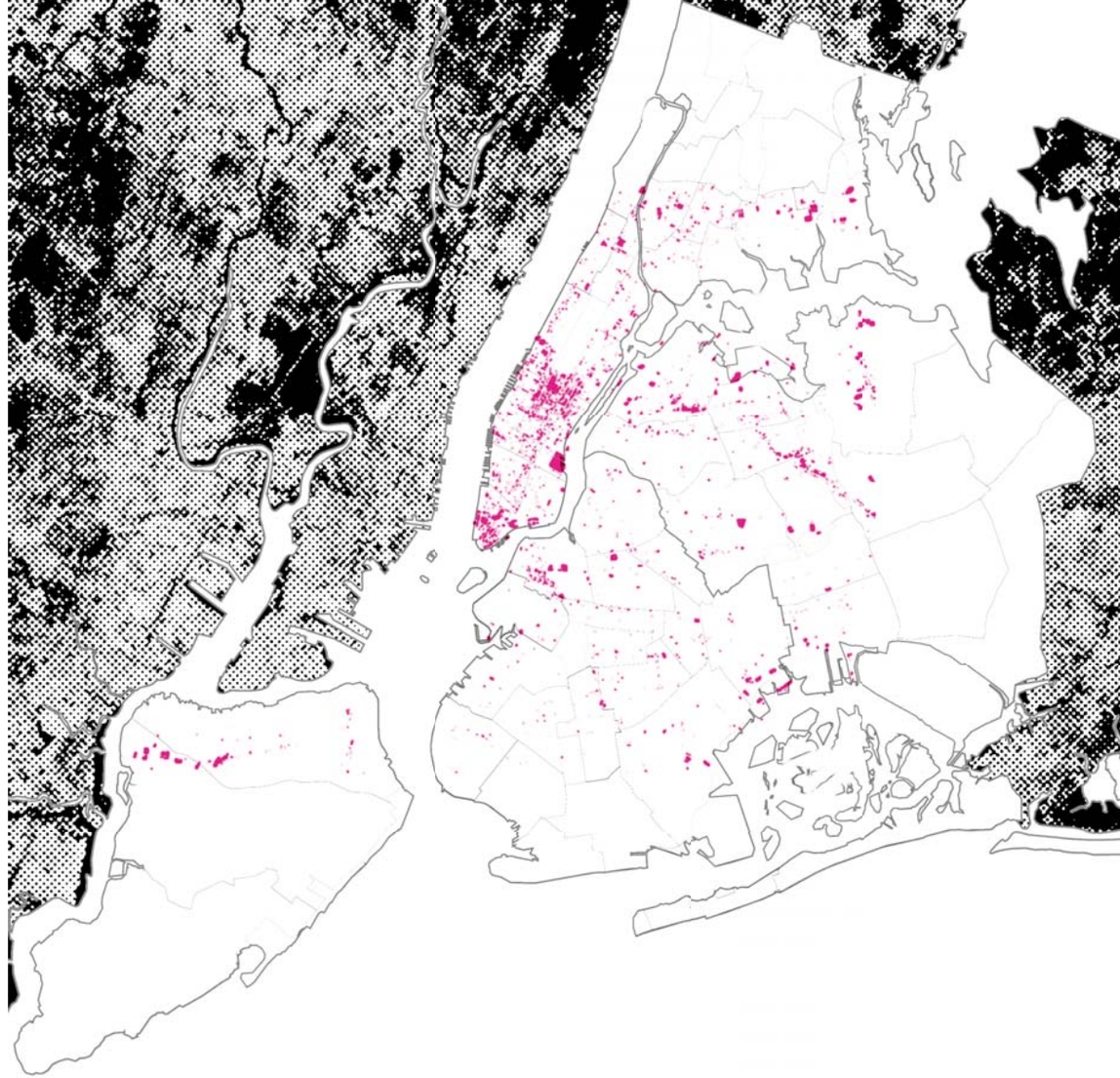
Z/08

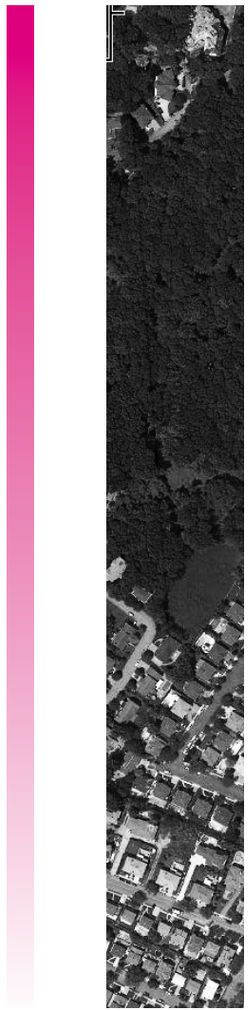
1800s LANDFORM



Z/09

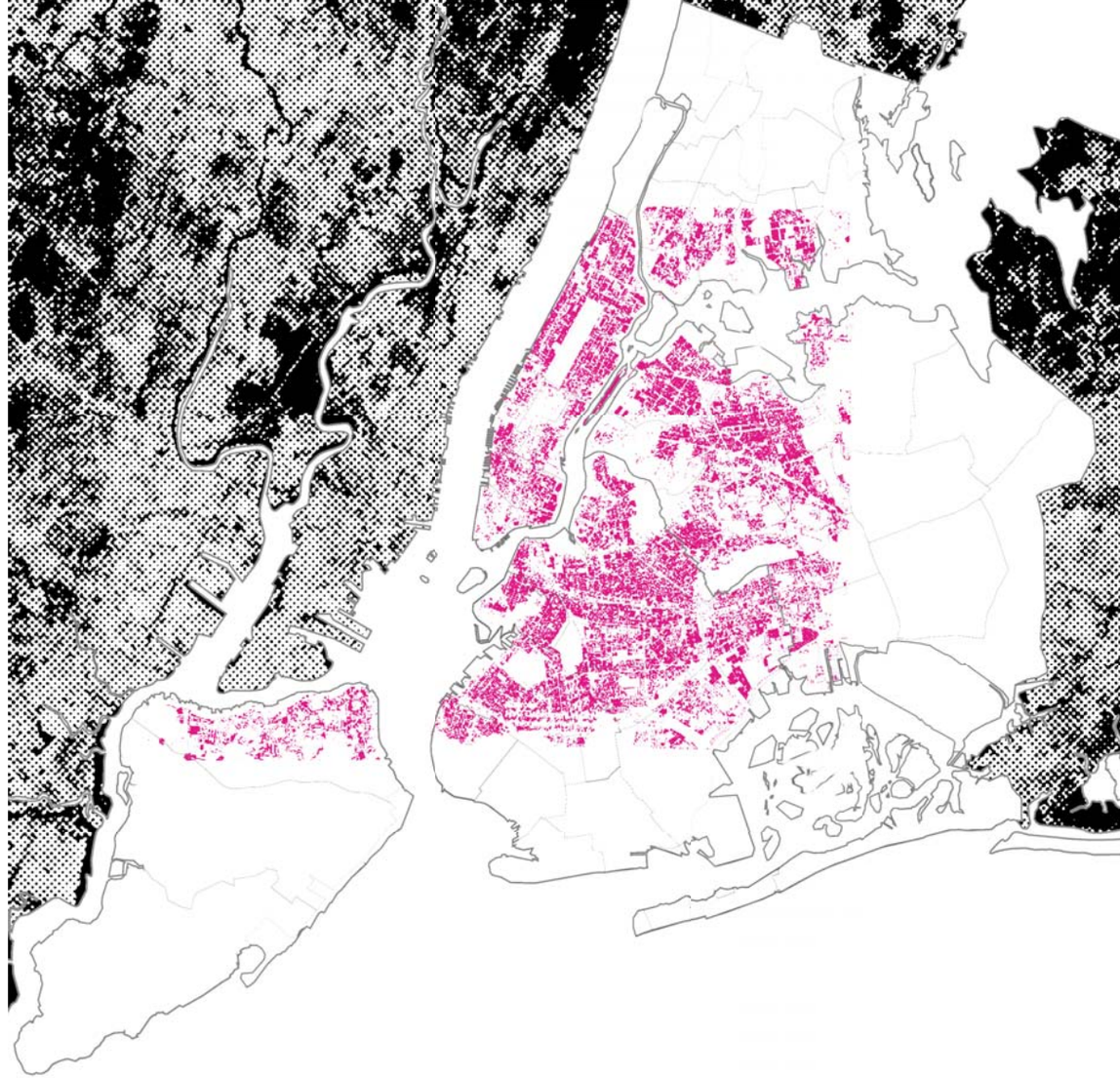
COMMERCIAL





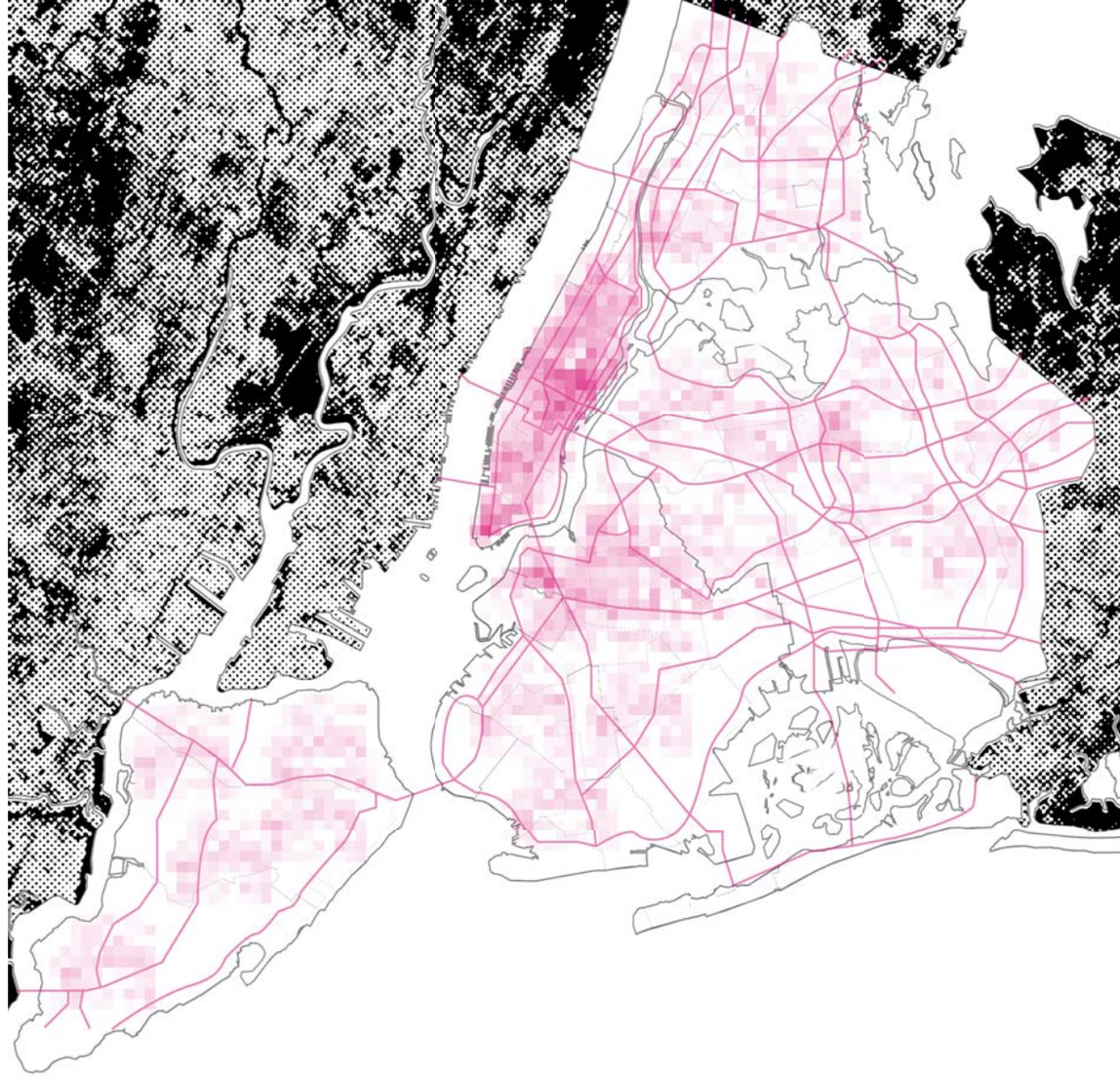
Z/10

RESIDENTIAL



Z/11

EXHAUST

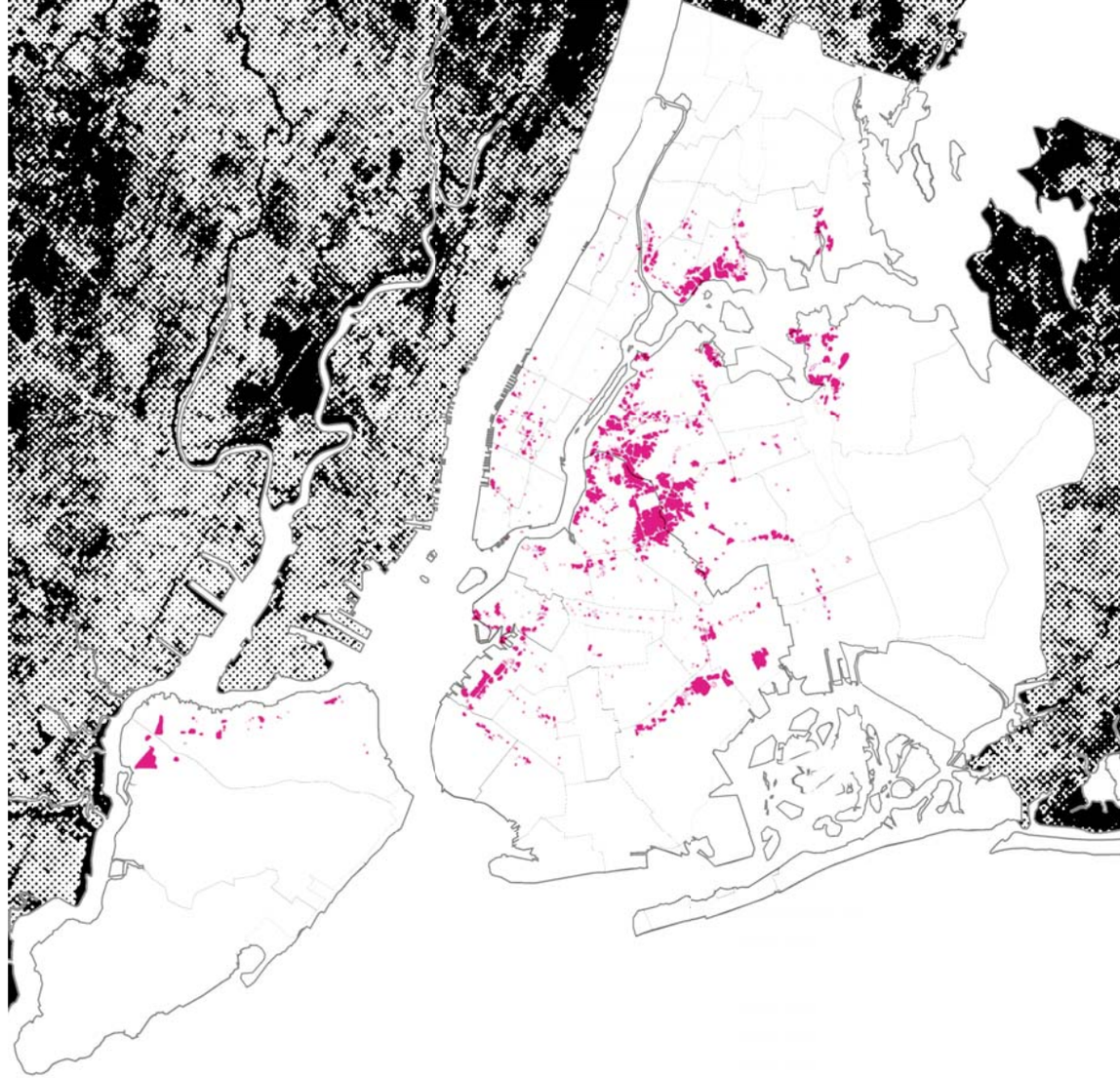


Z/12

WIND

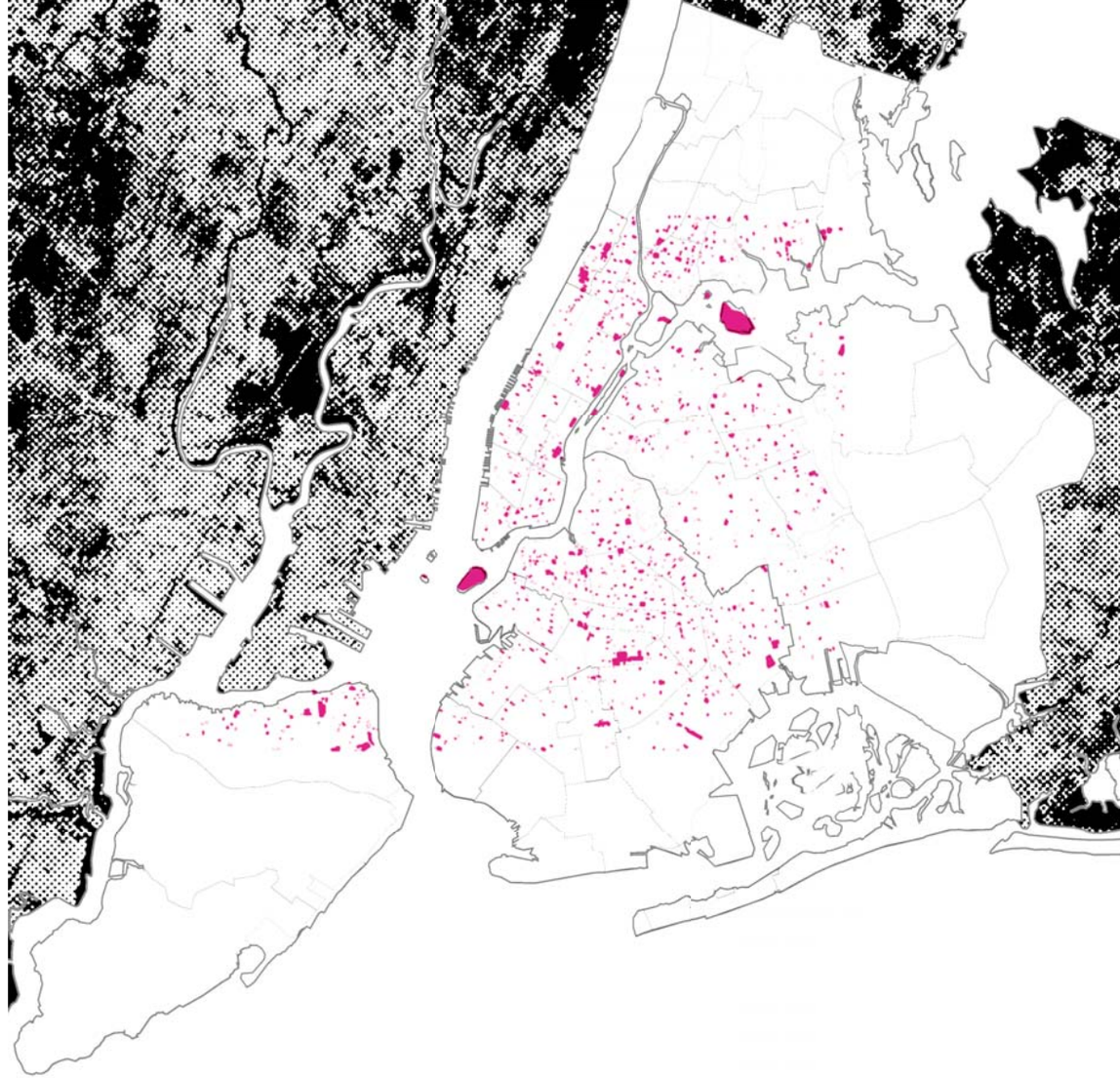
Z/13

INDUSTRIAL



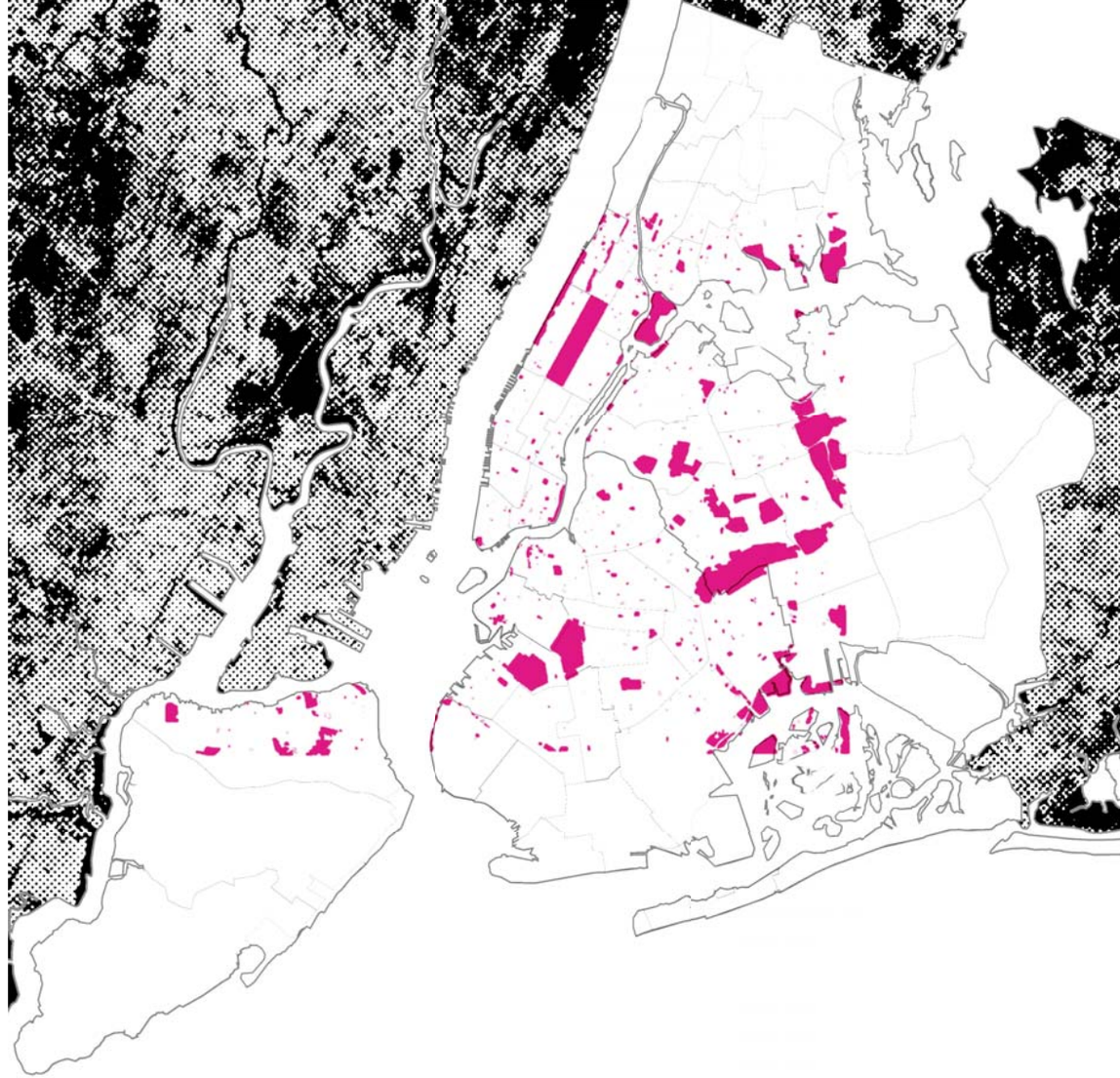
Z/14

INSTITUTIONAL



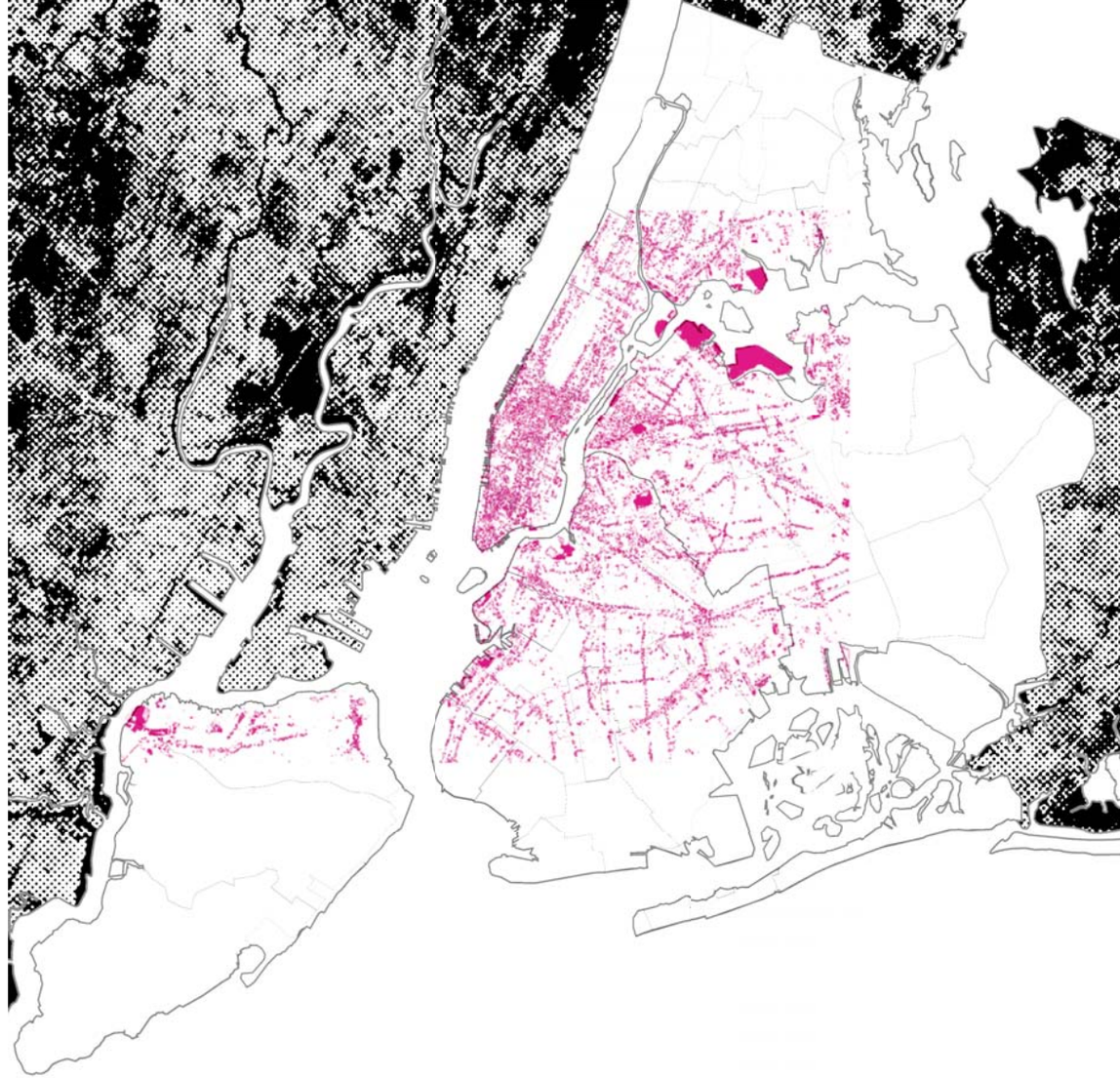
Z/15

RECREATIONAL



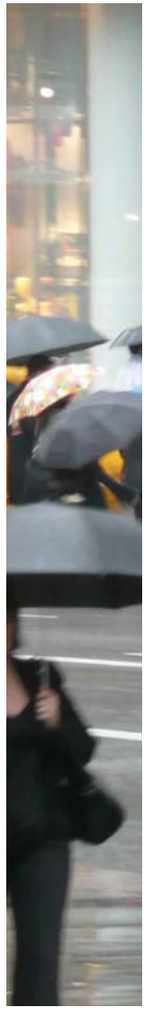
Z/16

PARKING



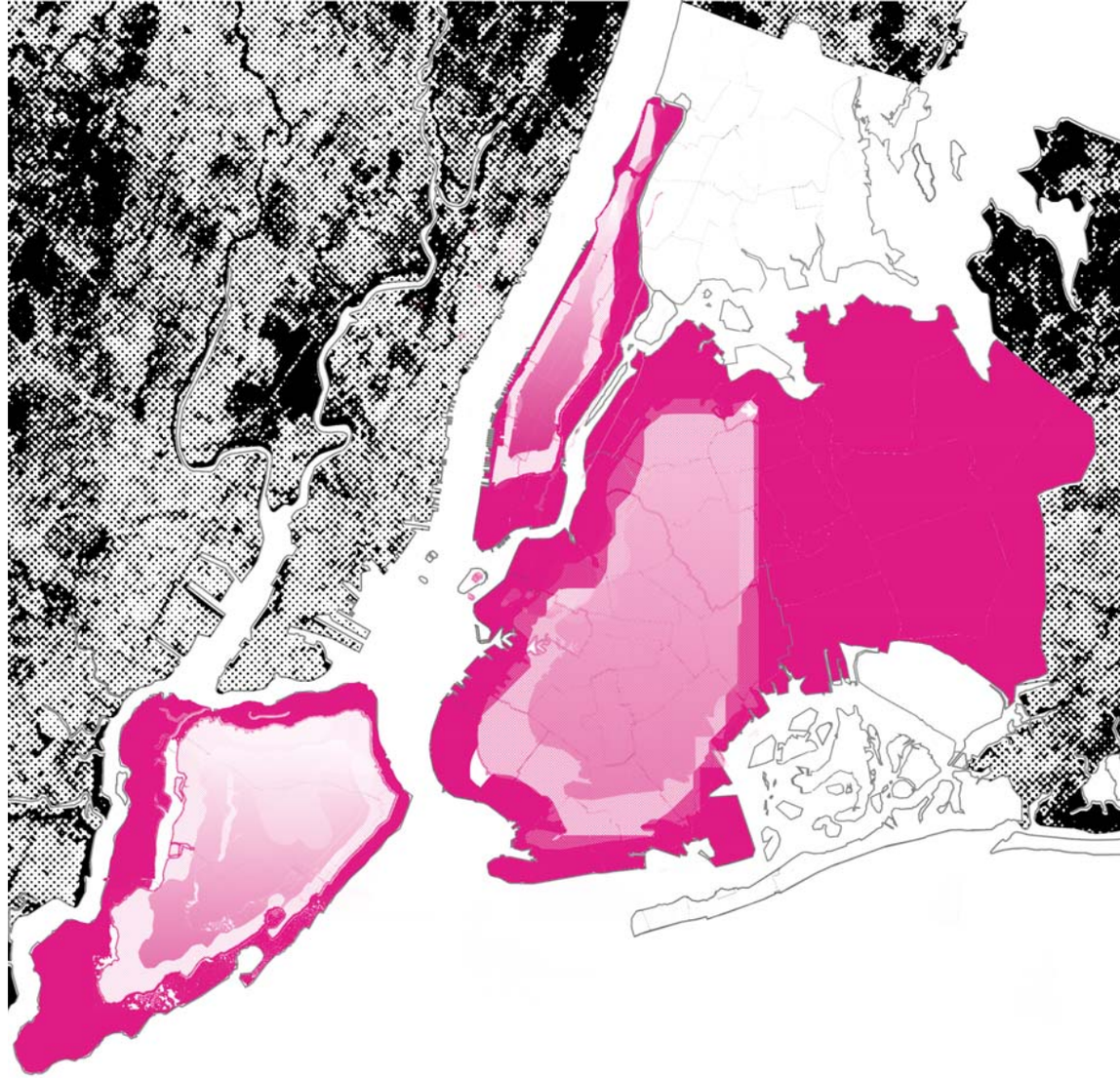
Z/17

HURRICANE & EARTHQUAKE



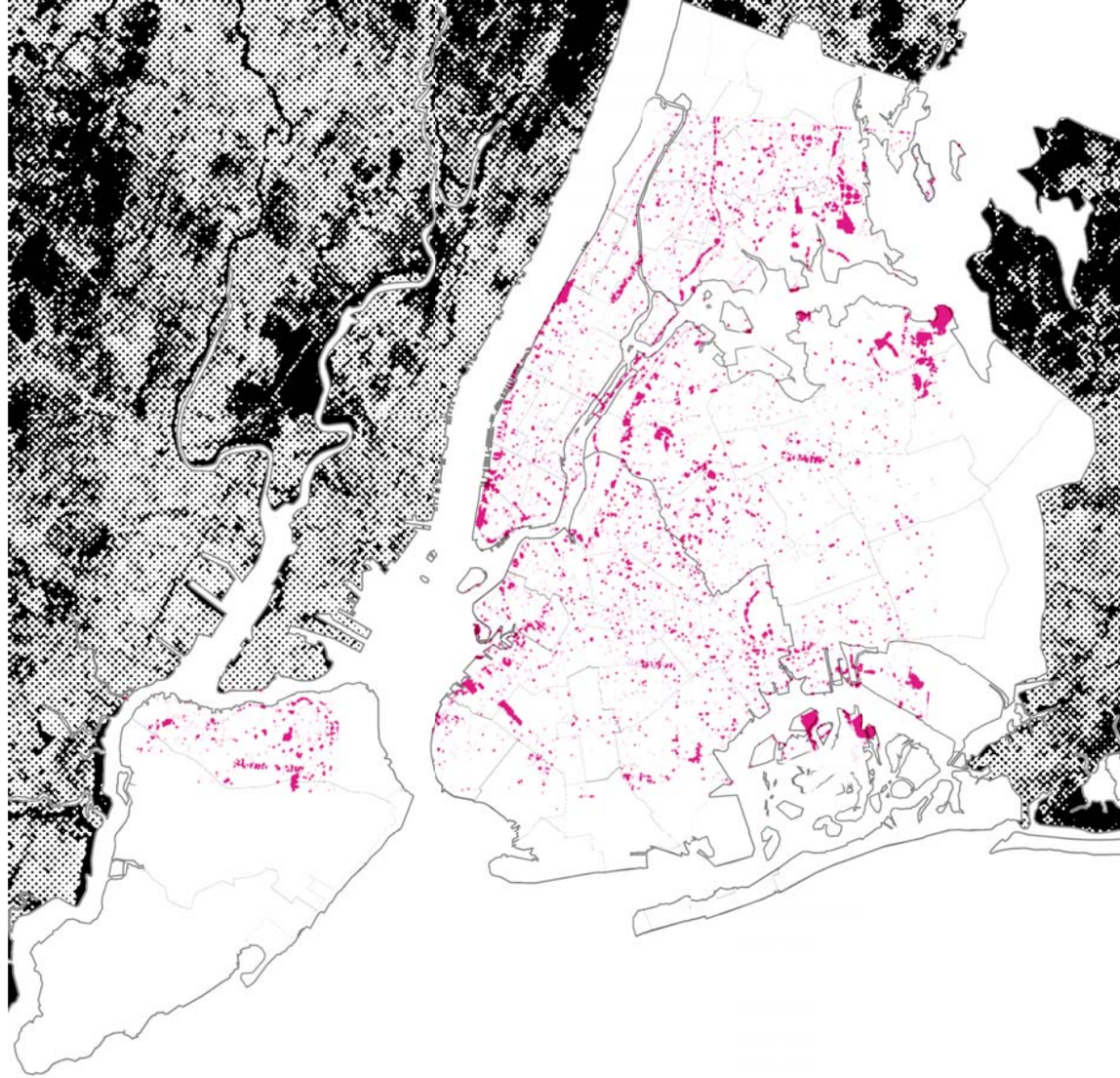
Z/18

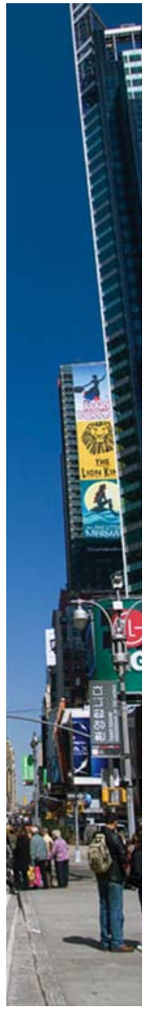
RAINFALL



Z/19

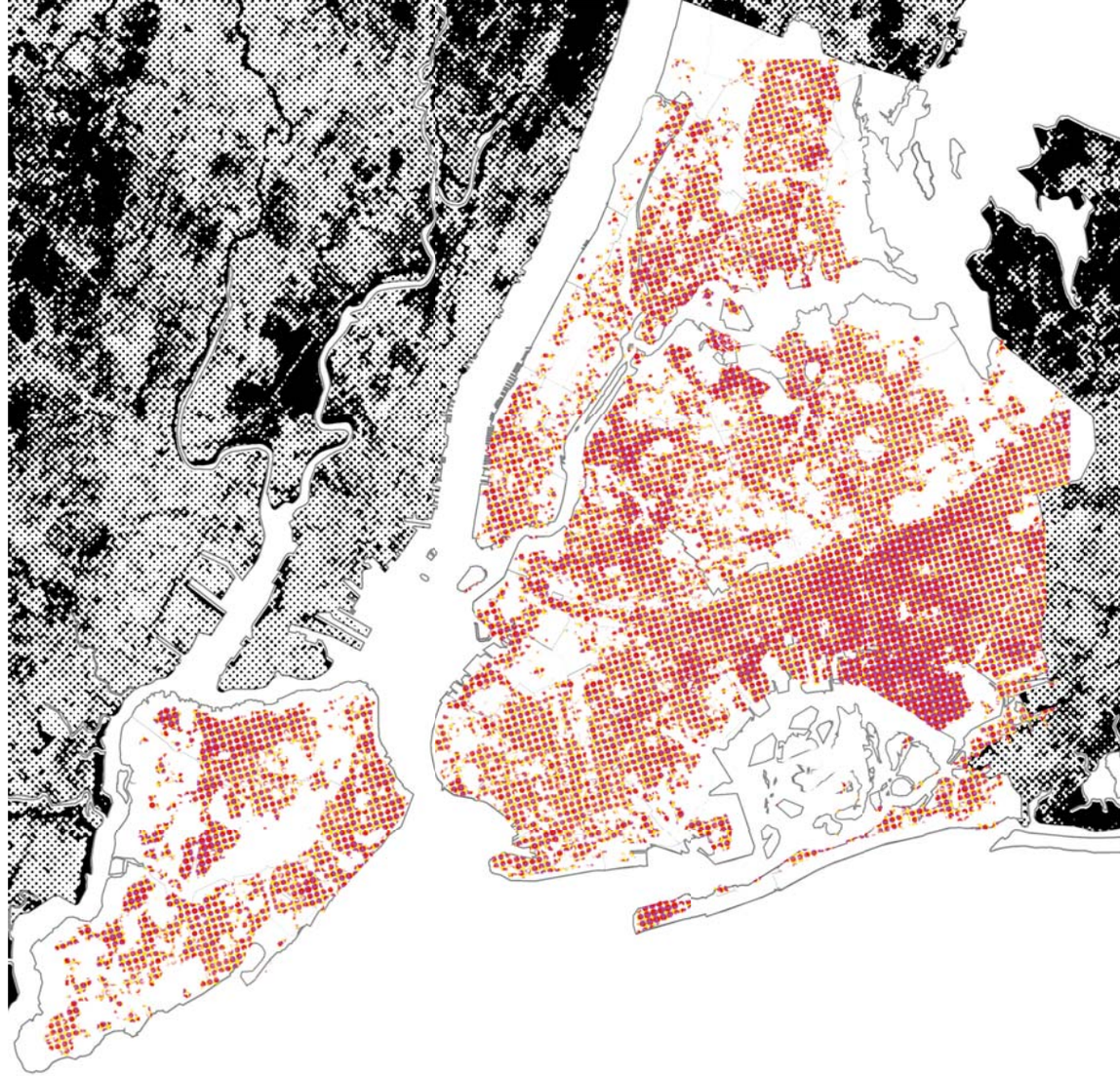
VACANT LAND





Z/20

TEMPERATURE

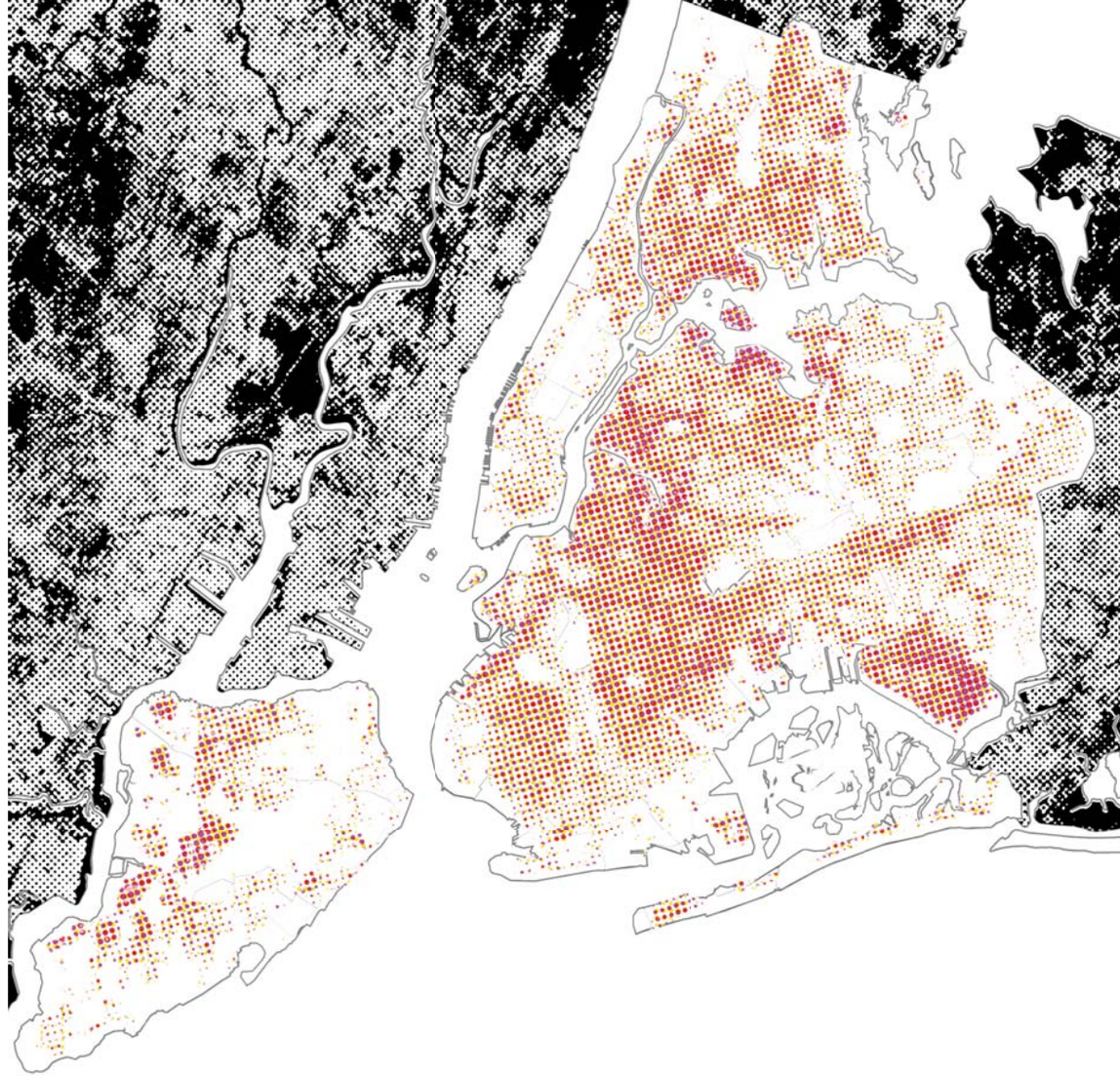


Surface Temperature
Daytime

10 miles
10 km

Z/21

TEMPERATURE

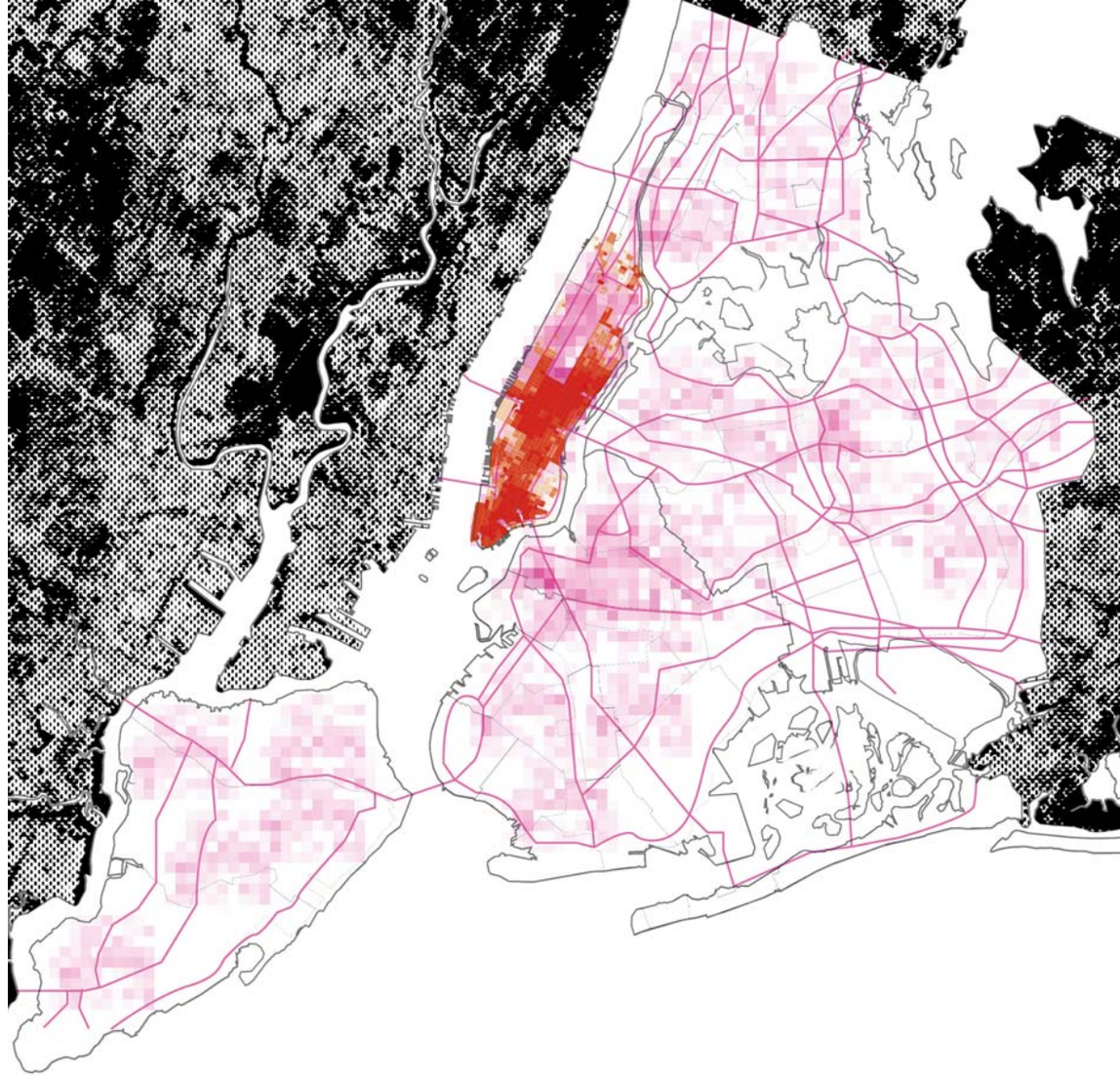


Surface Temperature
Mean

10 miles
10 km

Z/22

TRAFFIC



Traffic Density
Midday

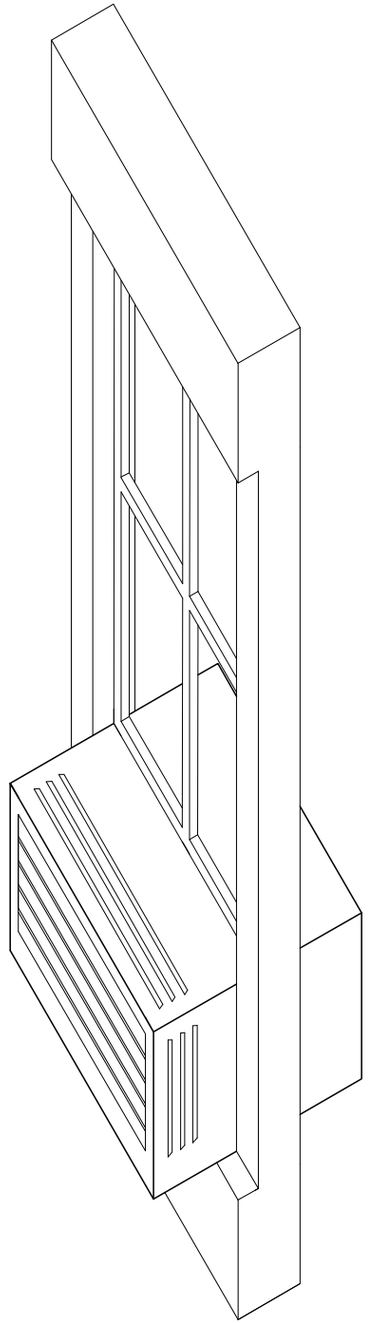
10 miles
10 km

P/ PROPOSALS

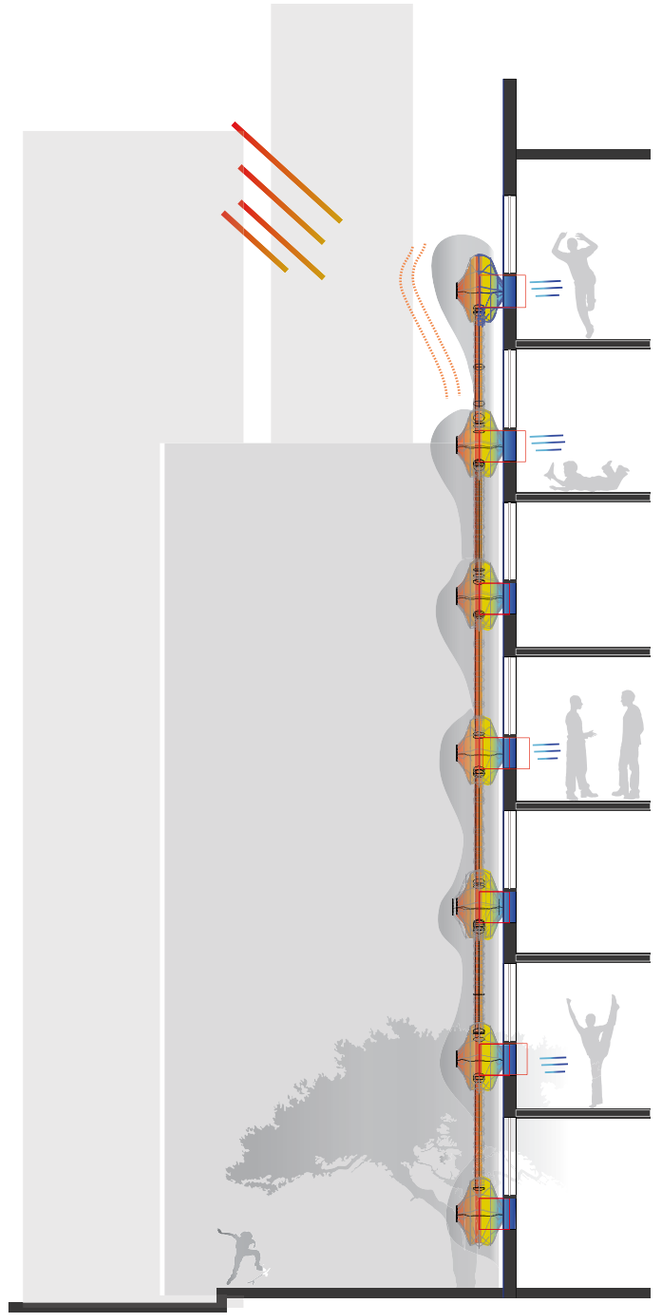
Vivamus tortor augue, semper a luctus at, consectetur ac nibh. Aenean dapibus elementum metus nec sodales. Quisque id libero dui. Aliquam eget commodo velit. Etiam vulputate tempus sem eu ultrices. Pellentesque et justo quis ante pretium venenatis. Mauris pharetra tincidunt dolor, et posuere odio luctus nec. Sed condimentum quam posuere nibh pharetra non cursus mauris pharetra. Maecenas sed magna purus, condimentum ultrices ante. Phasellus sit amet ultricies augue. Phasellus sed risus a purus viverra eleifend ut in tortor. Cras mollis ante non magna vehicula non tincidunt nibh molestie.

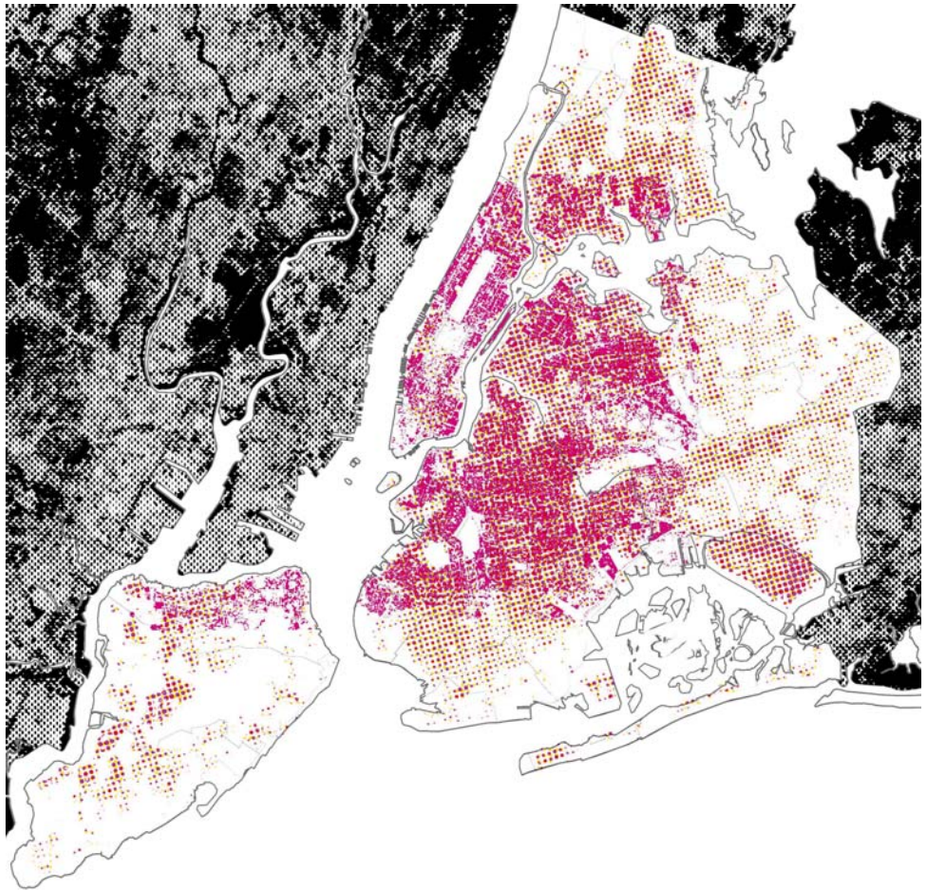
P/01

Name	Function	Site	Size
Air Conditioning Unit	Shading	Buiilding	L

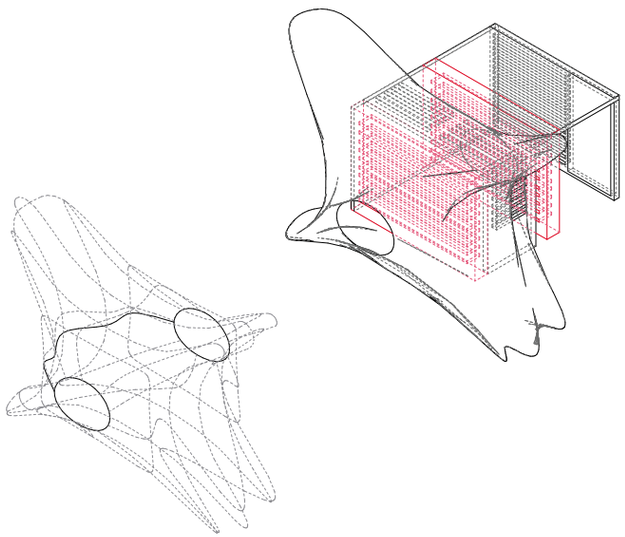


P/02





P/03



P/04

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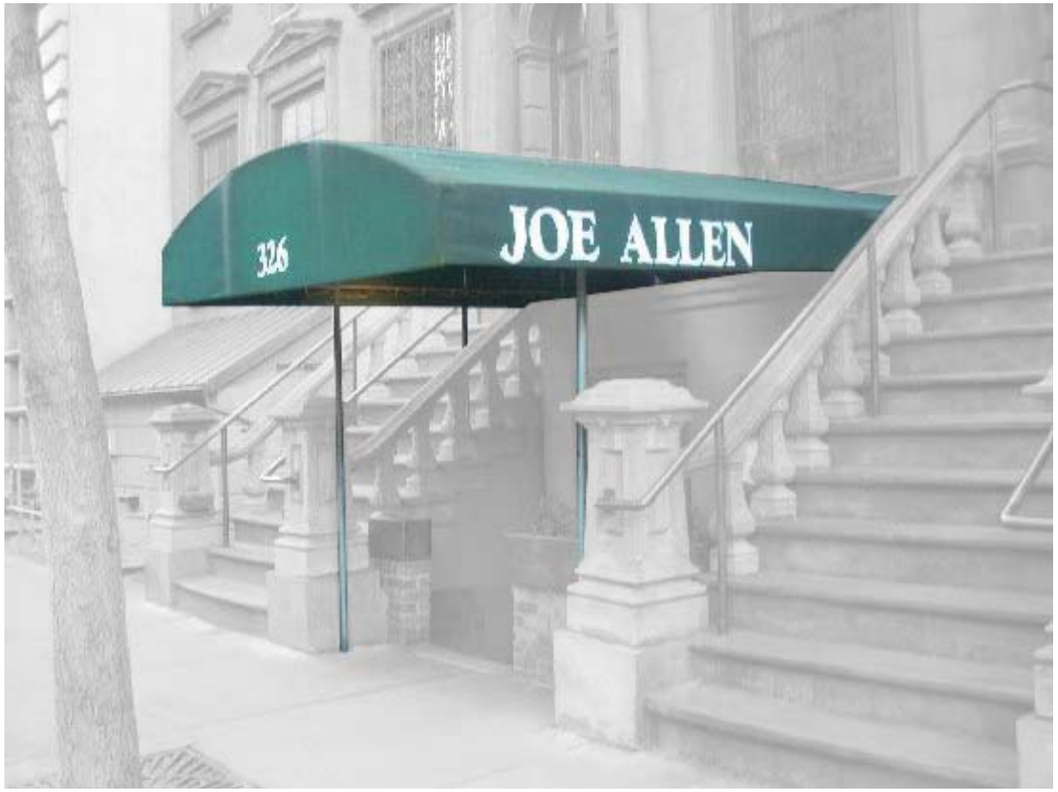

P/05

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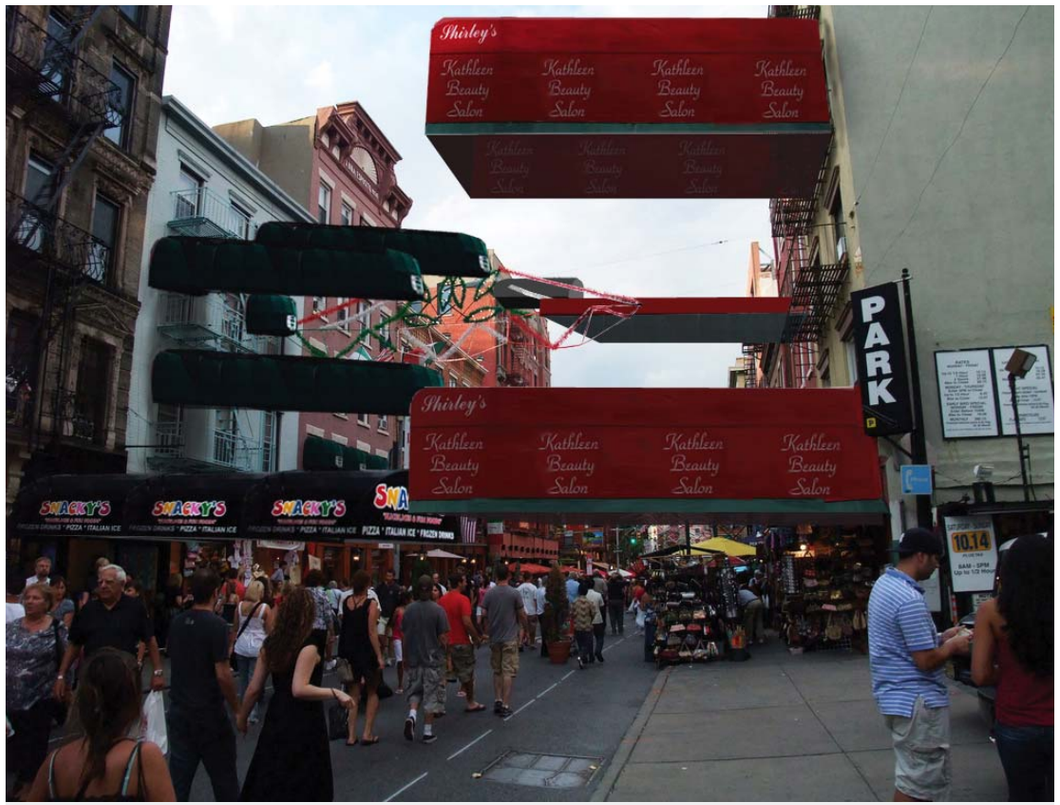

P/06

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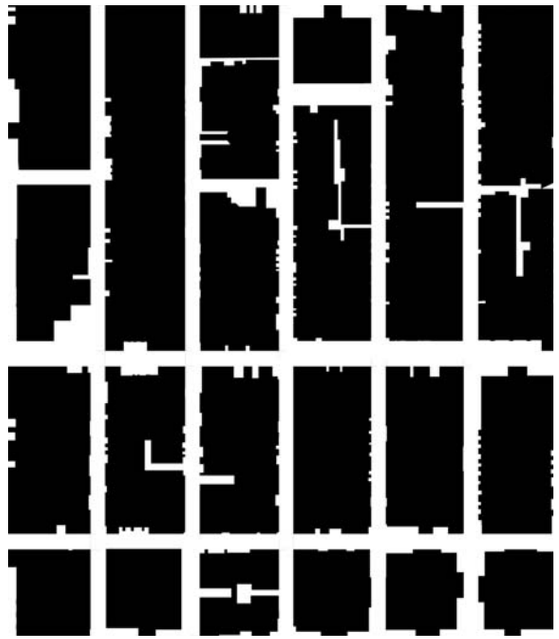
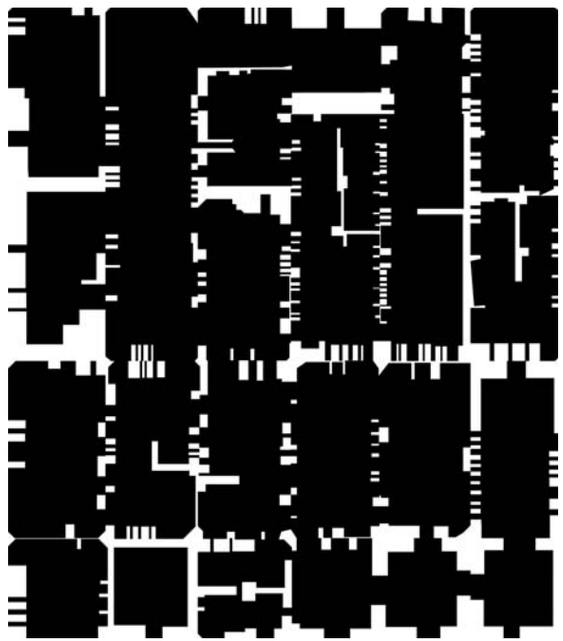
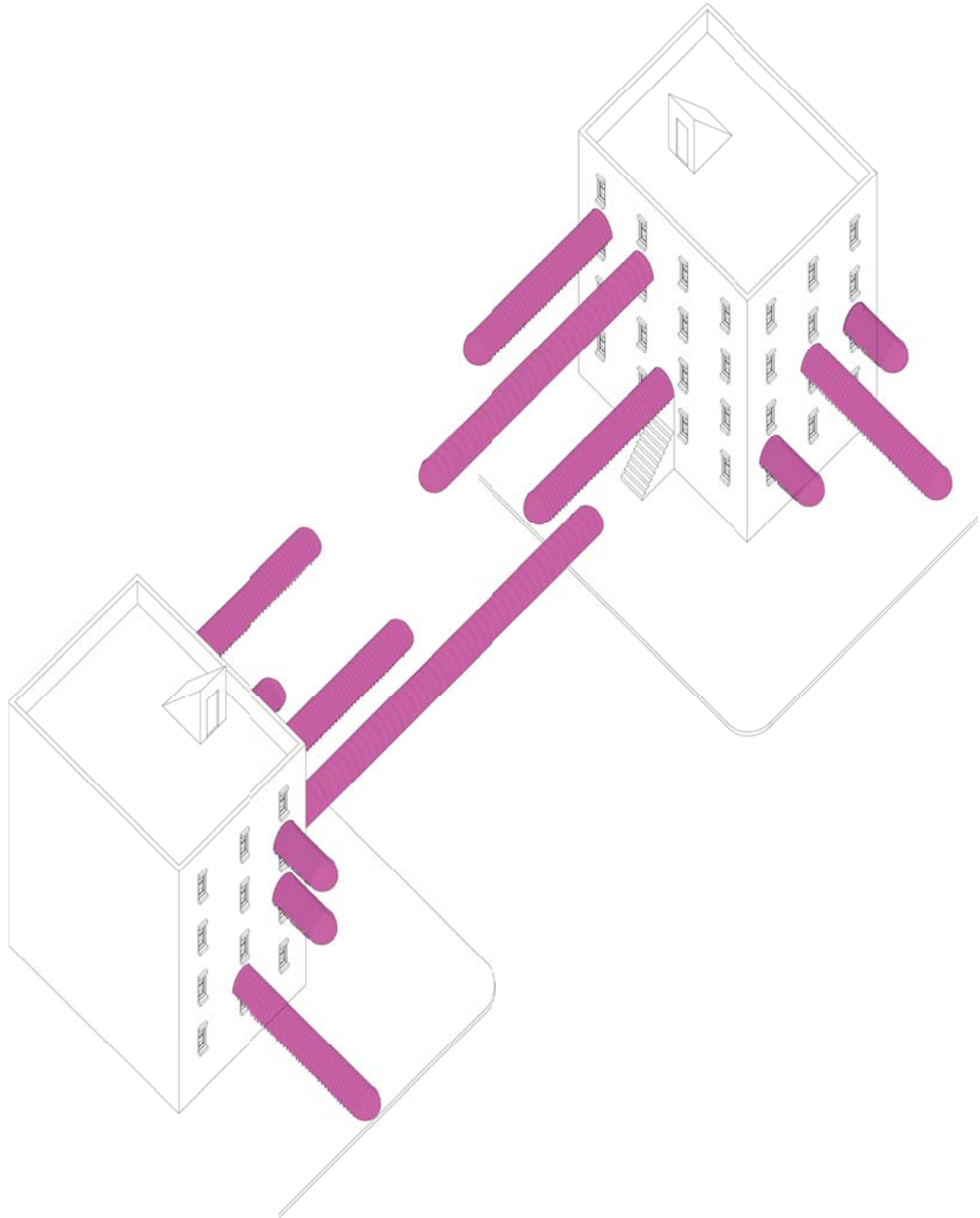
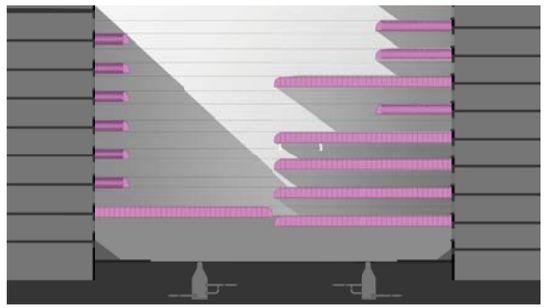
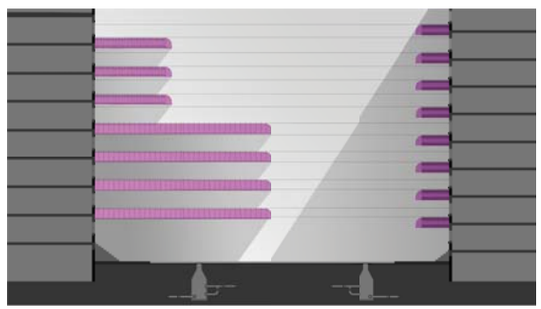


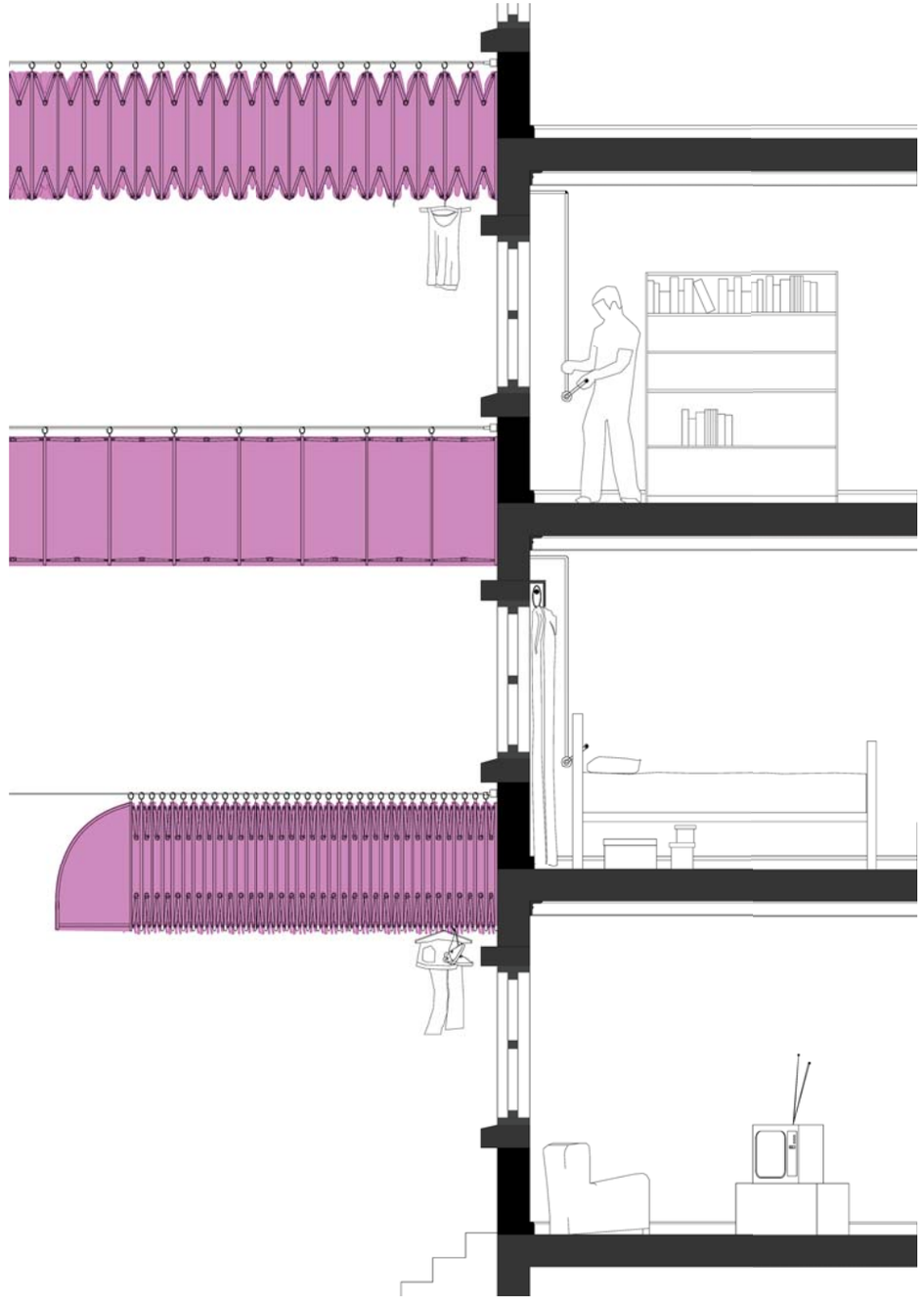


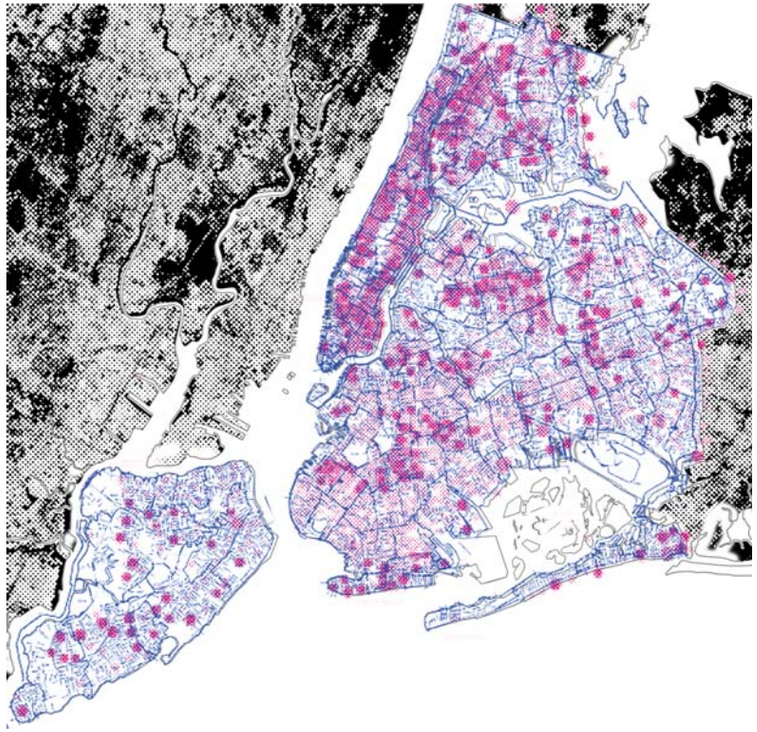
JOLIN
JOLIN
JOLIN
JOLIN
Scotty's DINER
FREE DELIVERY 905-5520
(212) 661-0033







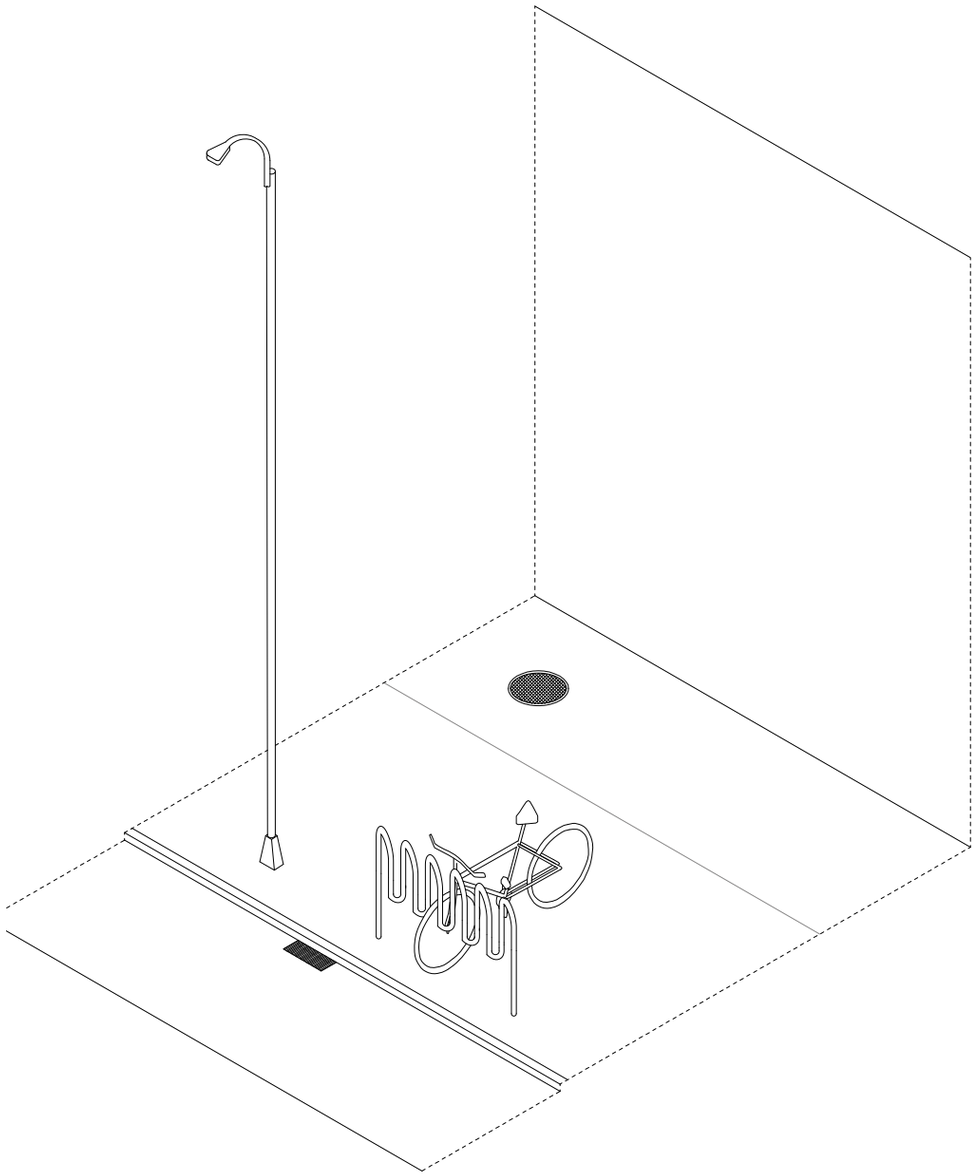


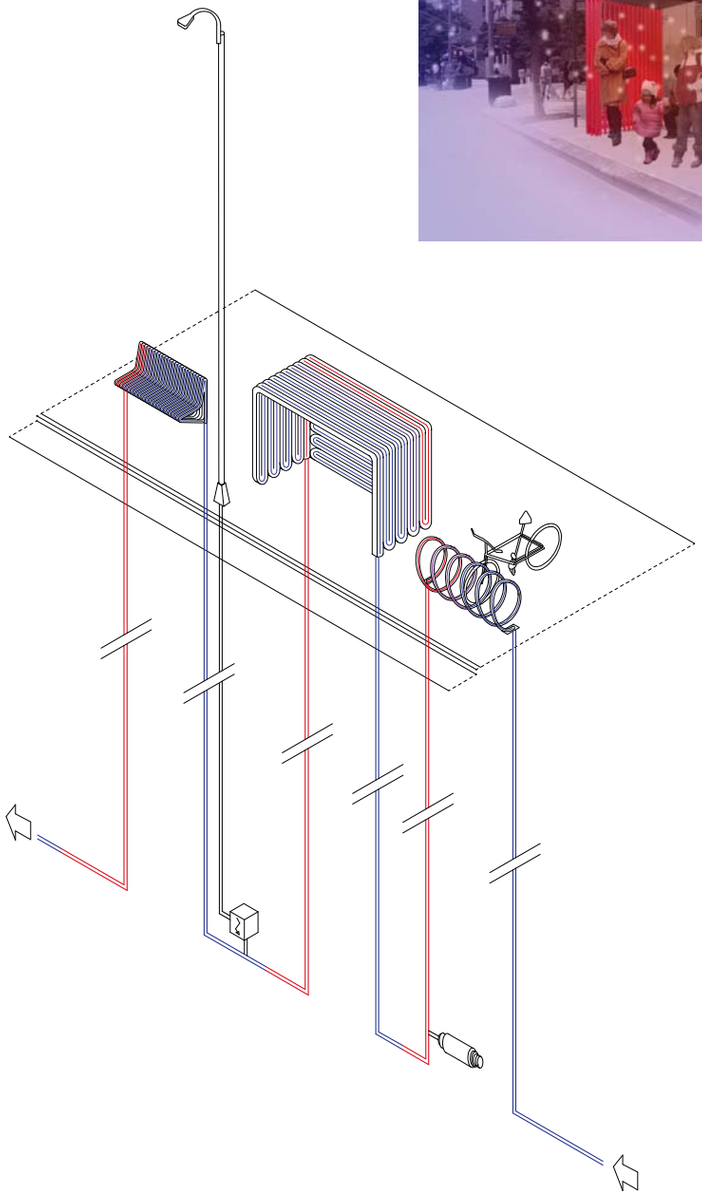


P/07

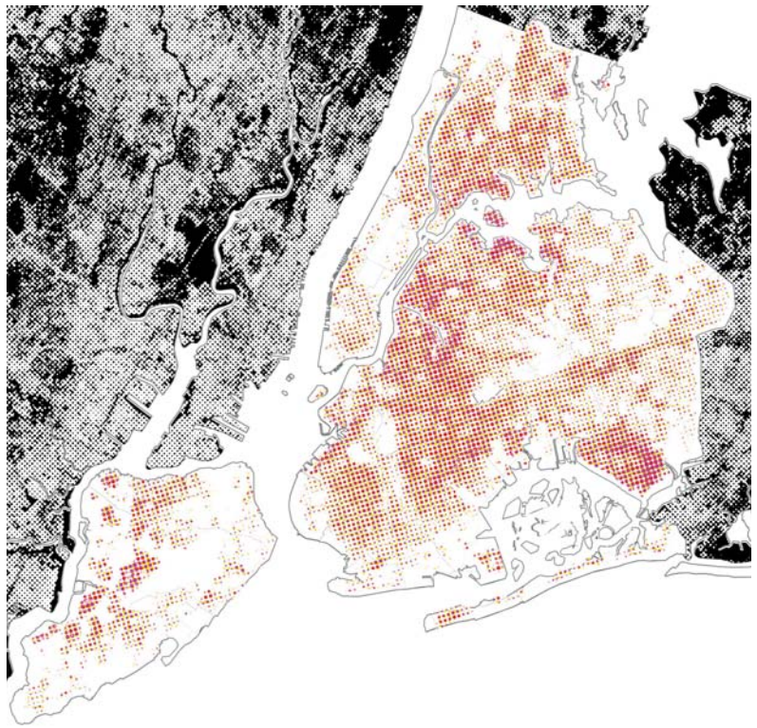
P/08

Name	Function	Site	Size
Bicycle Rack	Cooling	Street	XL

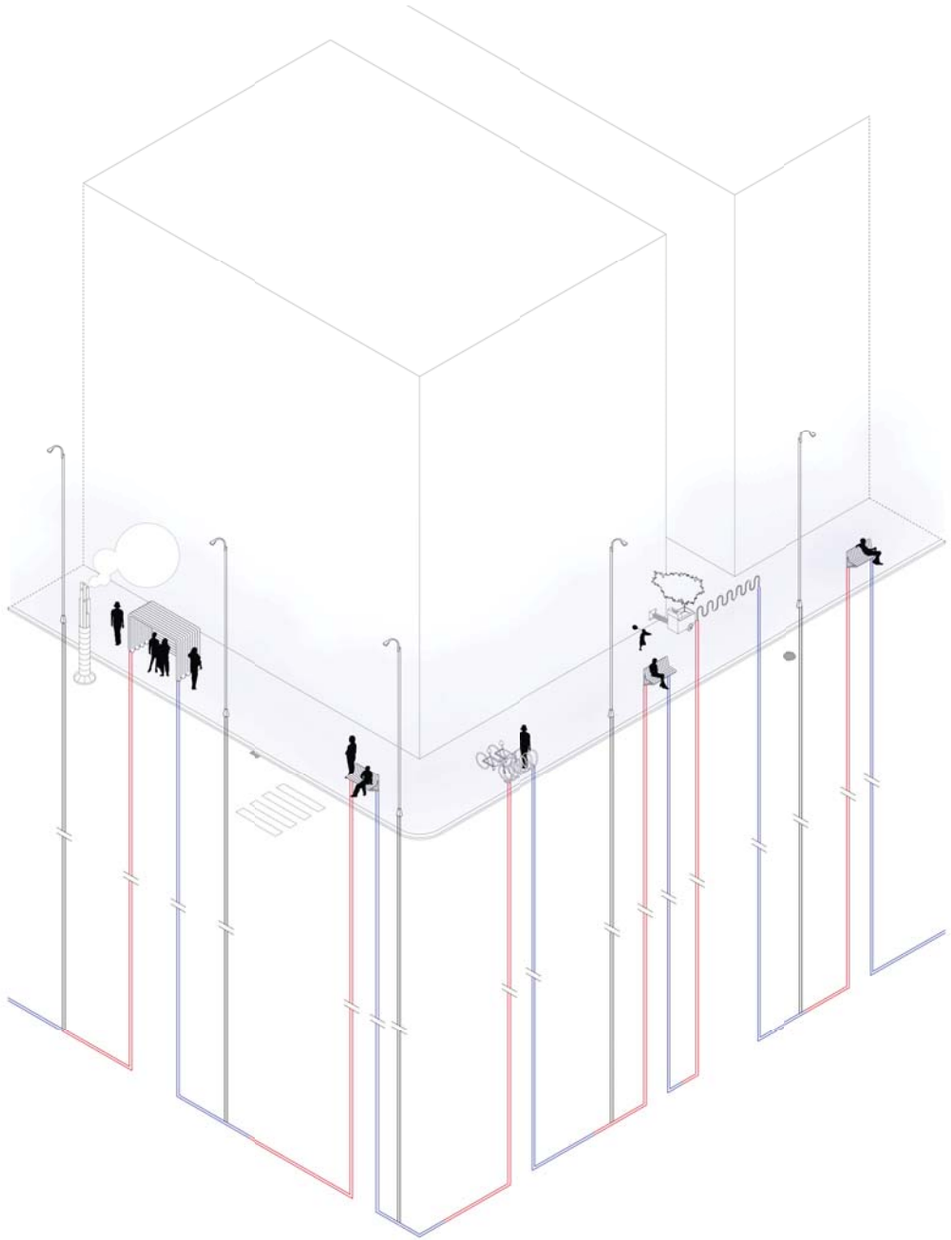


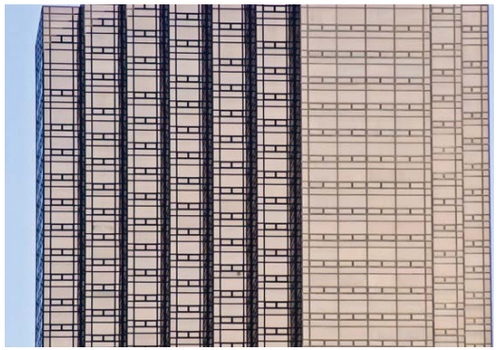


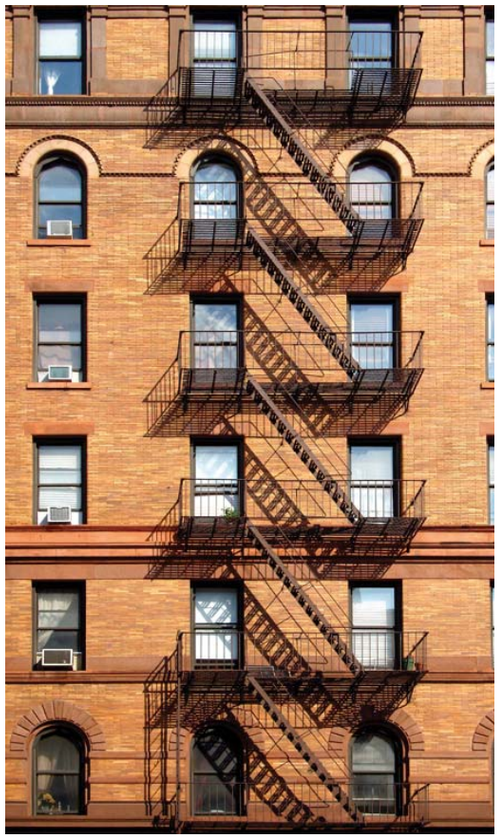
P/09



P/10

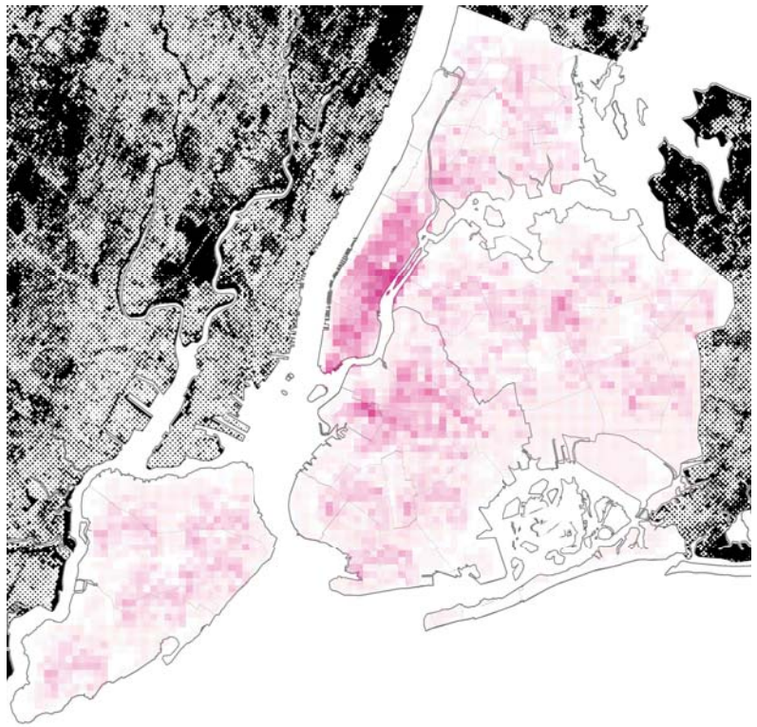


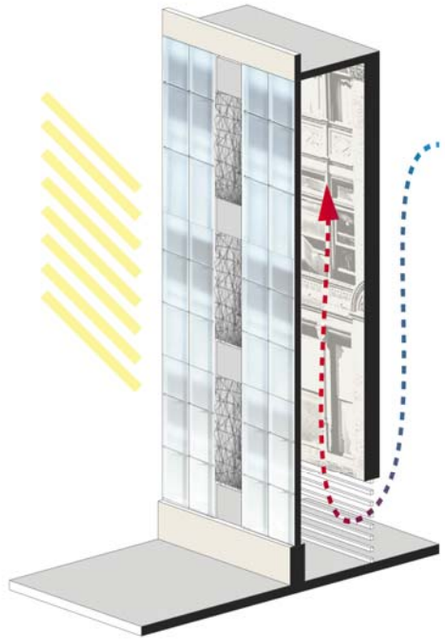


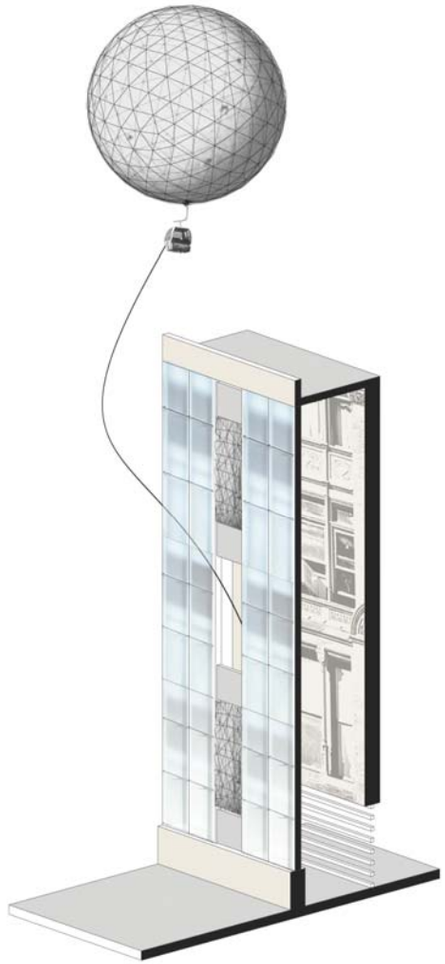


P/11

Name	Function	Site	Size
Facade	Shading/ Heat Sink	Air	L







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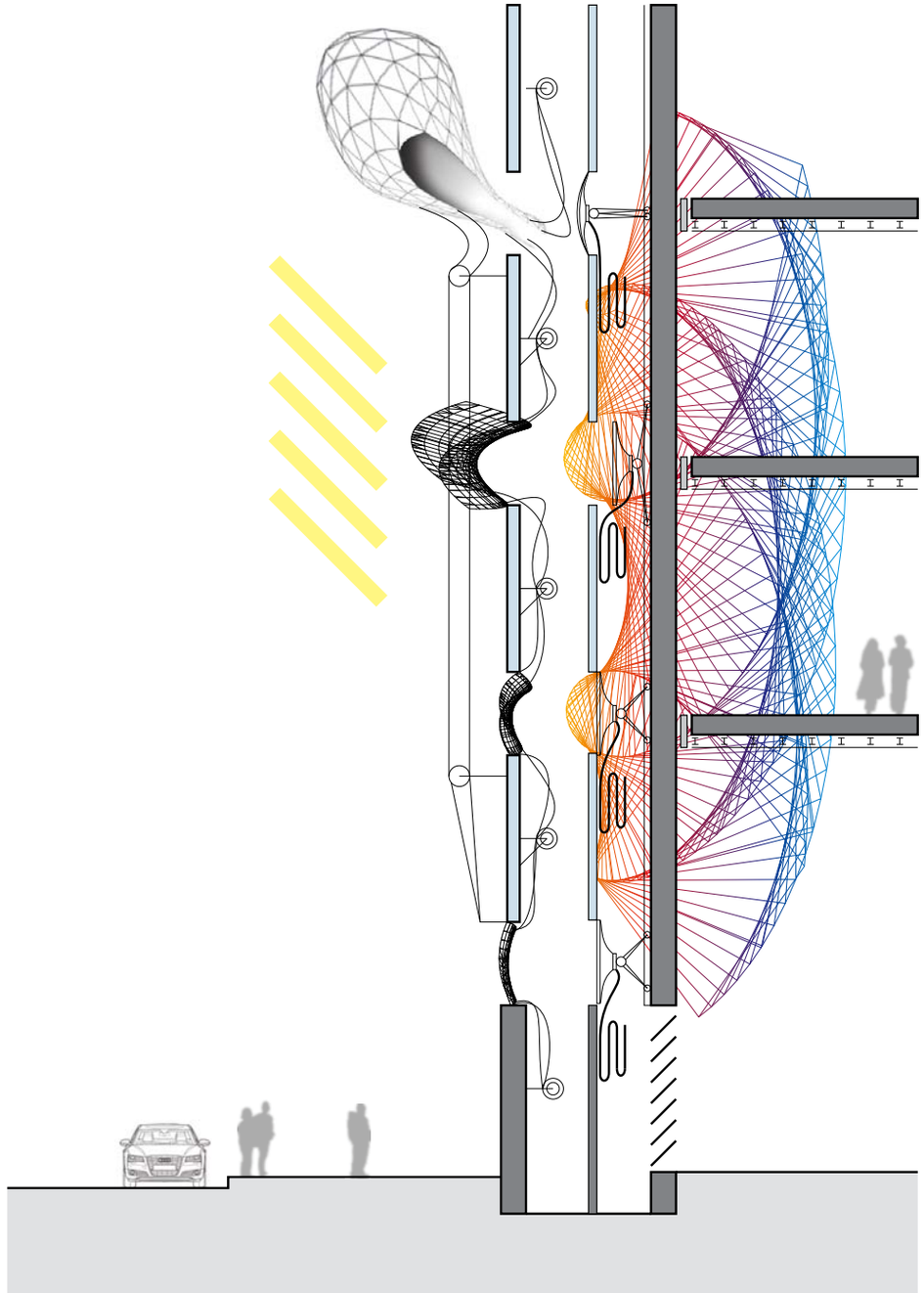

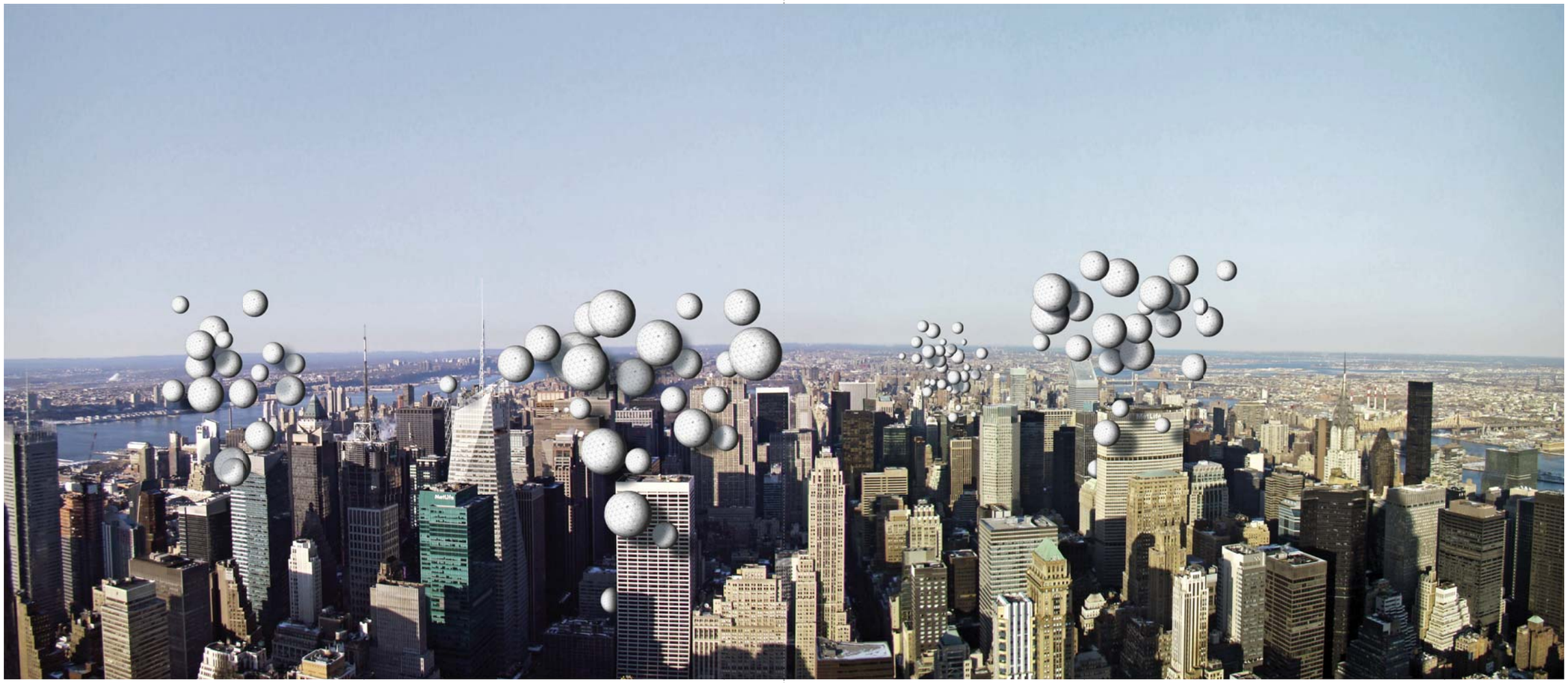

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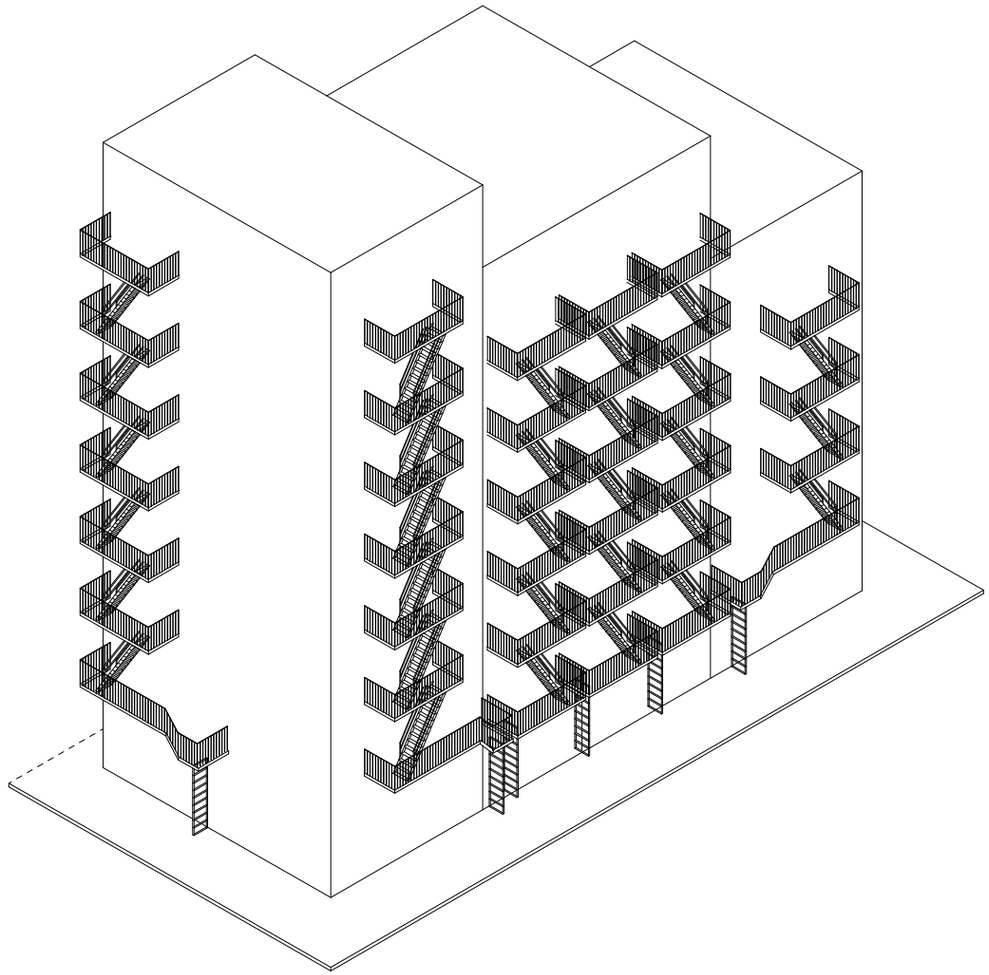
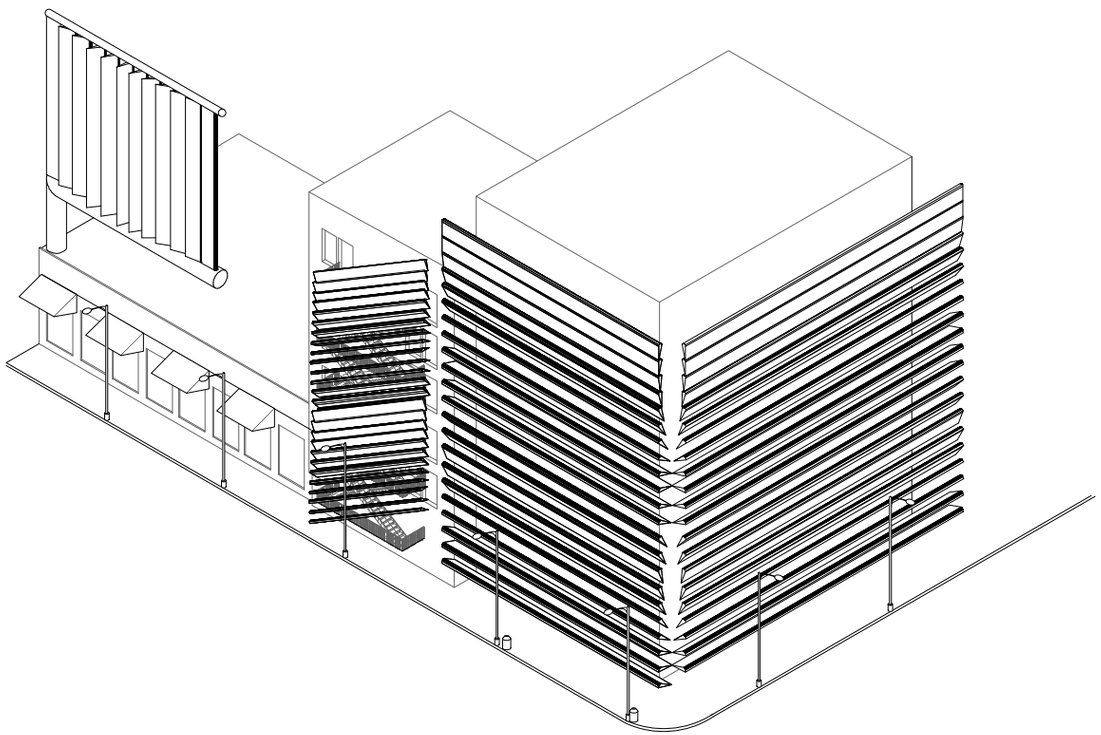
Name	Function	Site	Size
Fire Escape	Shading	Building	L





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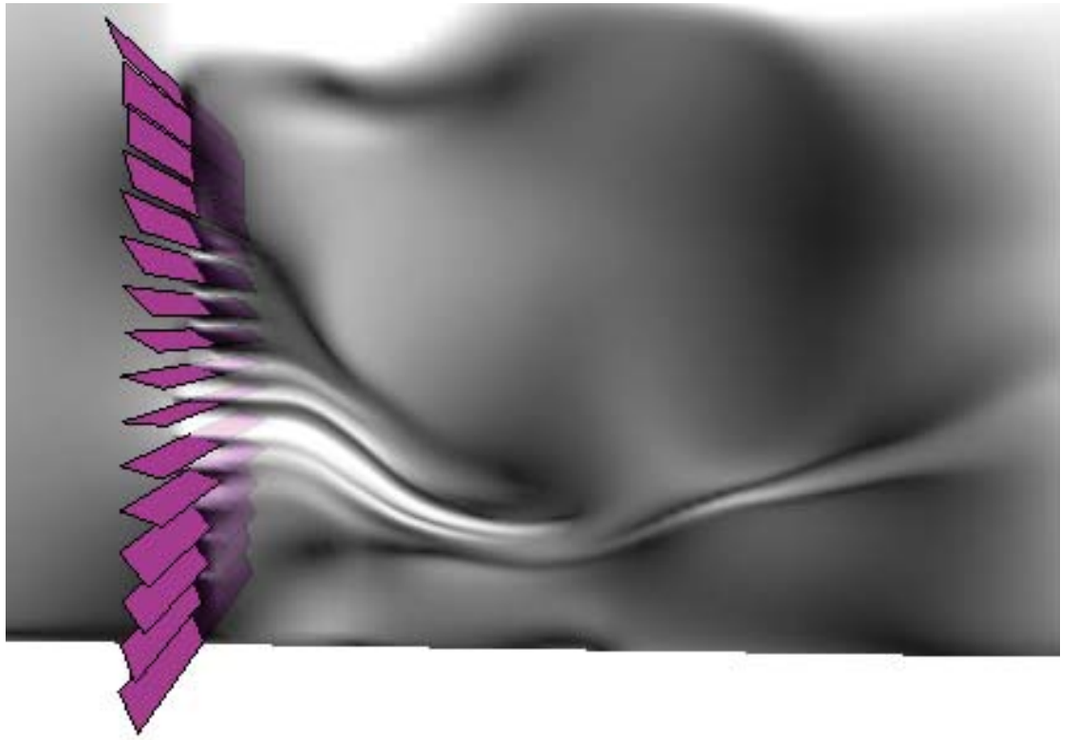

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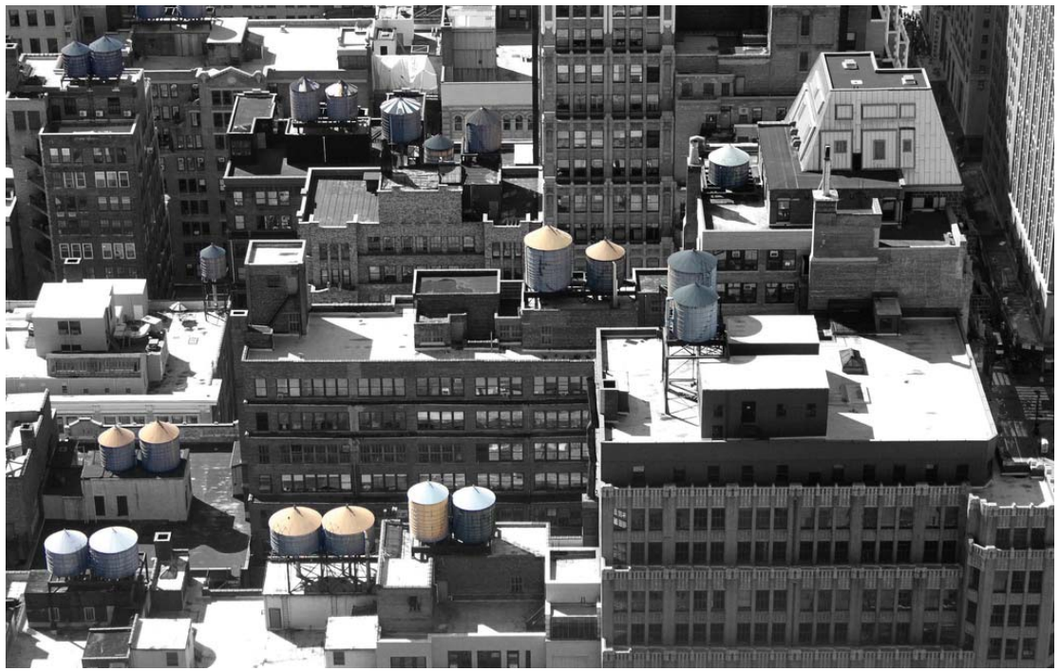
LEGION
1.22.10
LEGION
1.22.10
GRAY'S PAPAYA
GRAY'S PAPAYA
DVD VIDEO
OPEN 24 HRS.
EIGHTH AVENU



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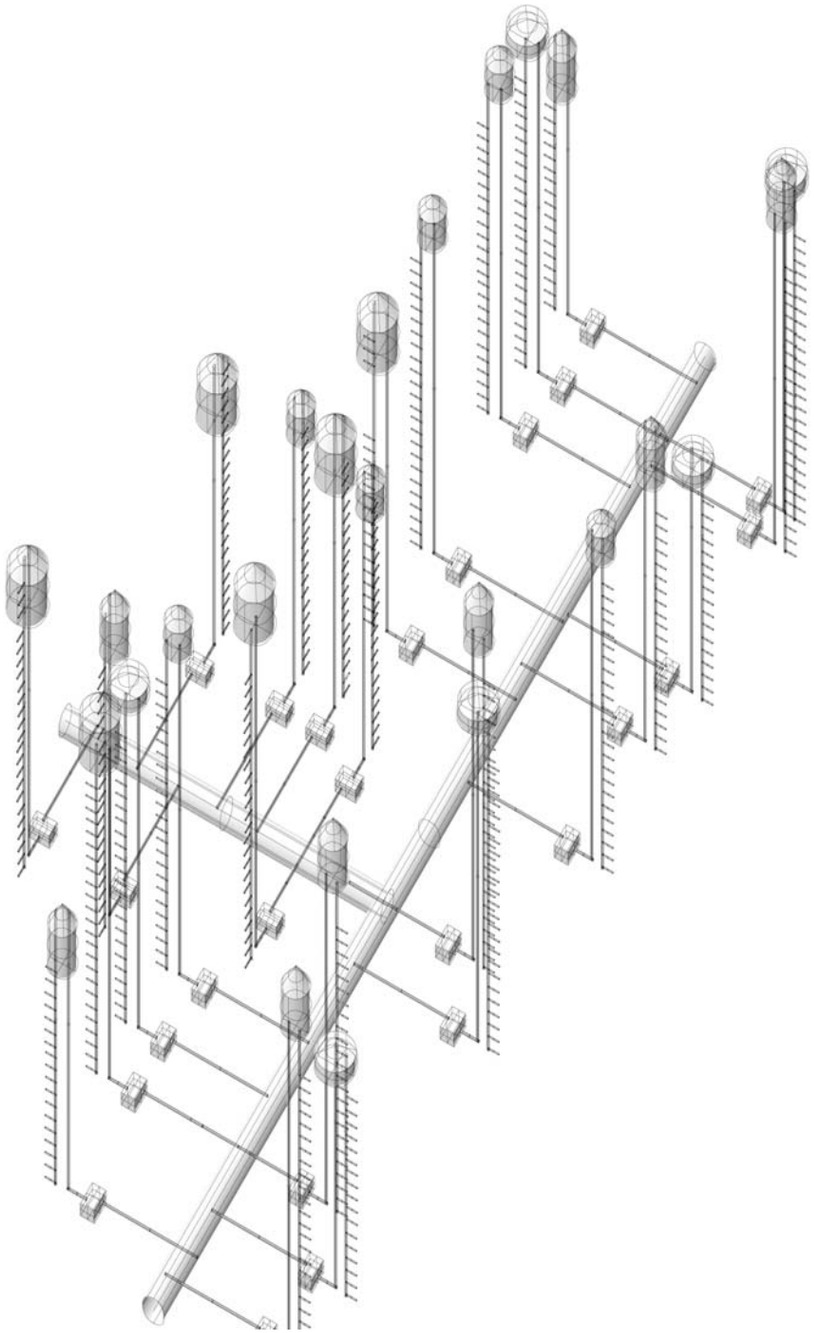
Name	Function	Site	Size
Water Tower	Rain/Shade	Rooftop	XL



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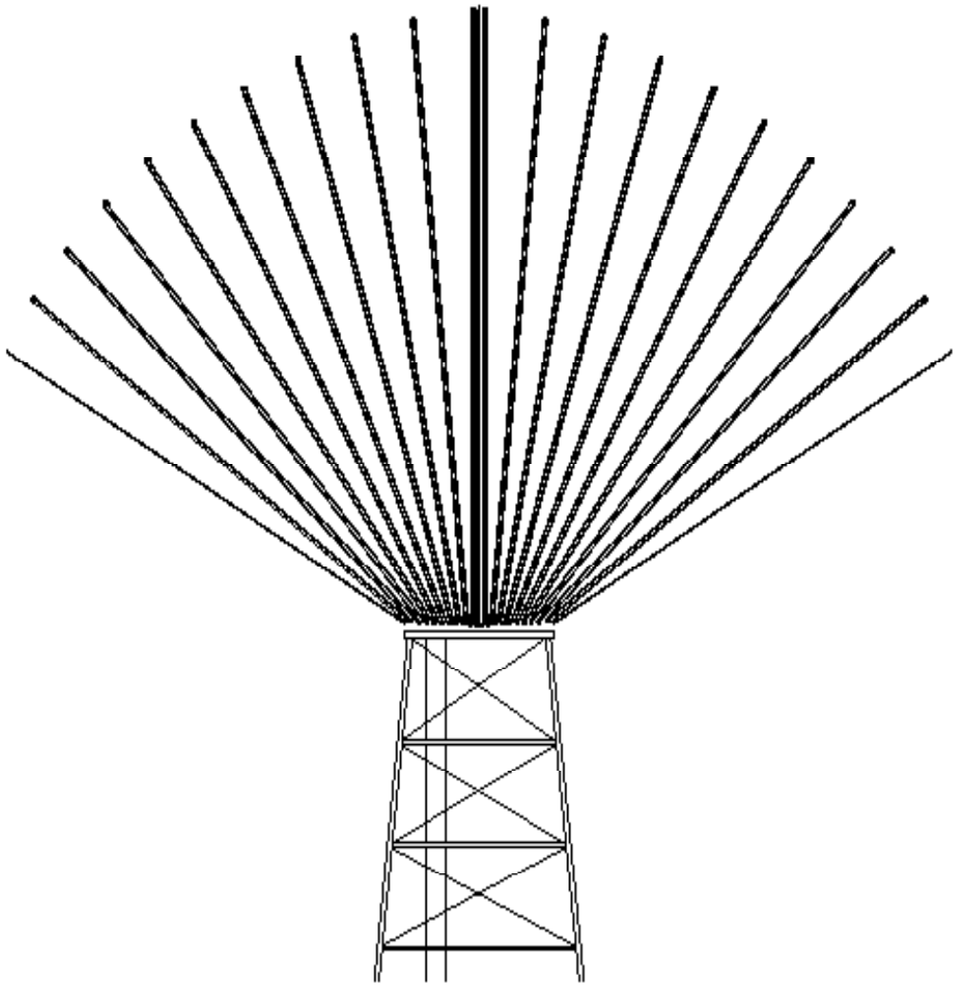

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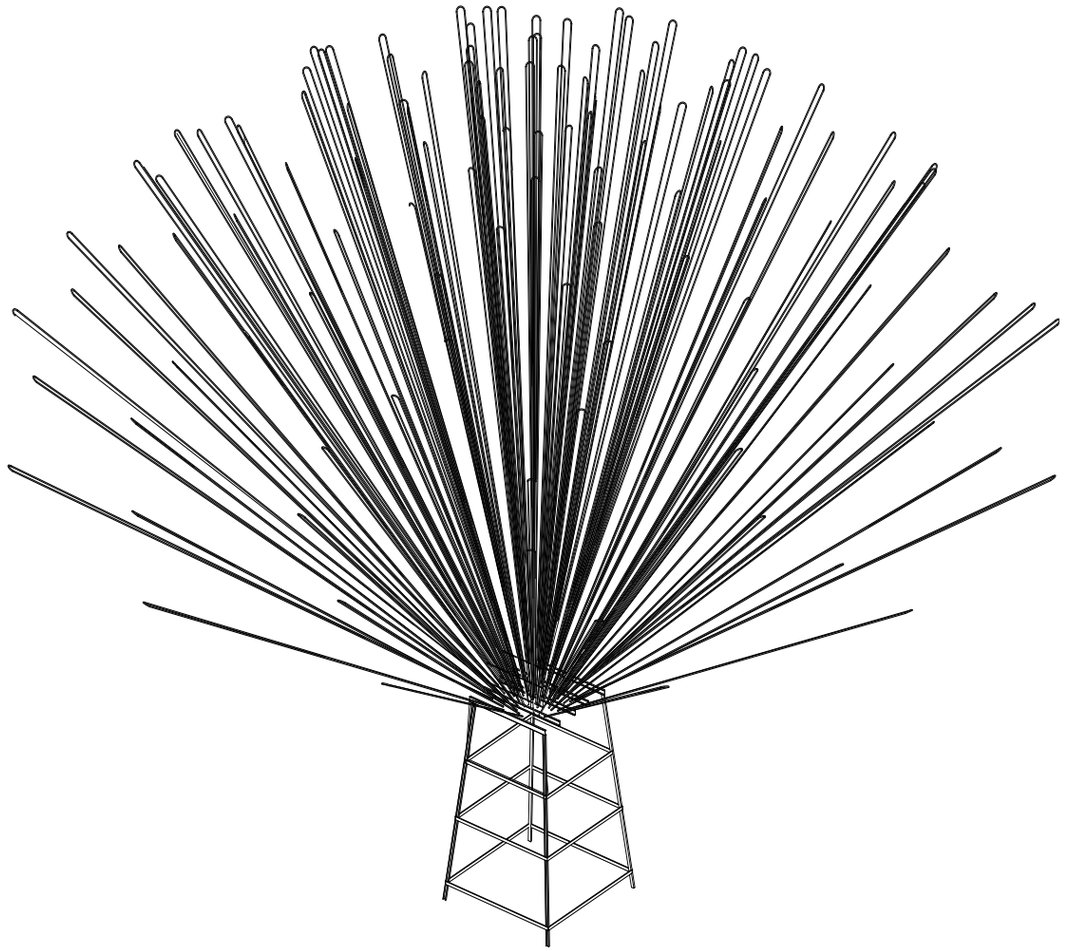

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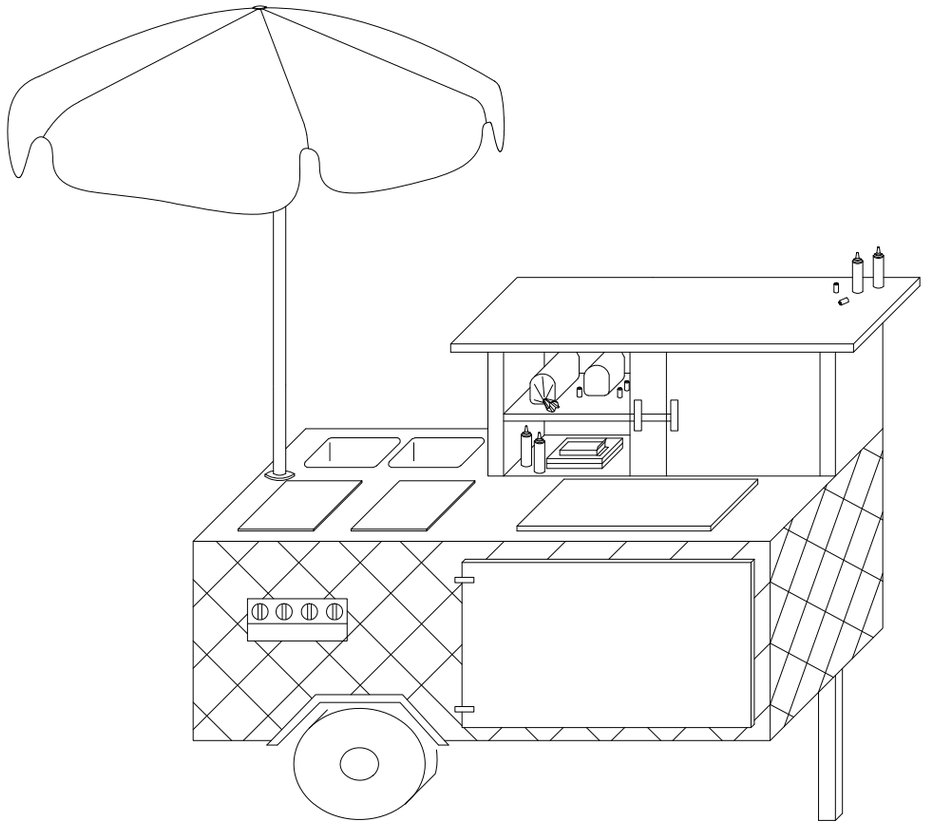
Name	Function	Site	Size
Hot Dog Stand	Shade	Street	M



Hot Dog Sausage
Hot Pretzel
COLD
Sodas, Water & Snapple
SABRETT
Hot Dog
Hot Sausage
Hot Pretzel
COLD
Sodas, Water & Snapple

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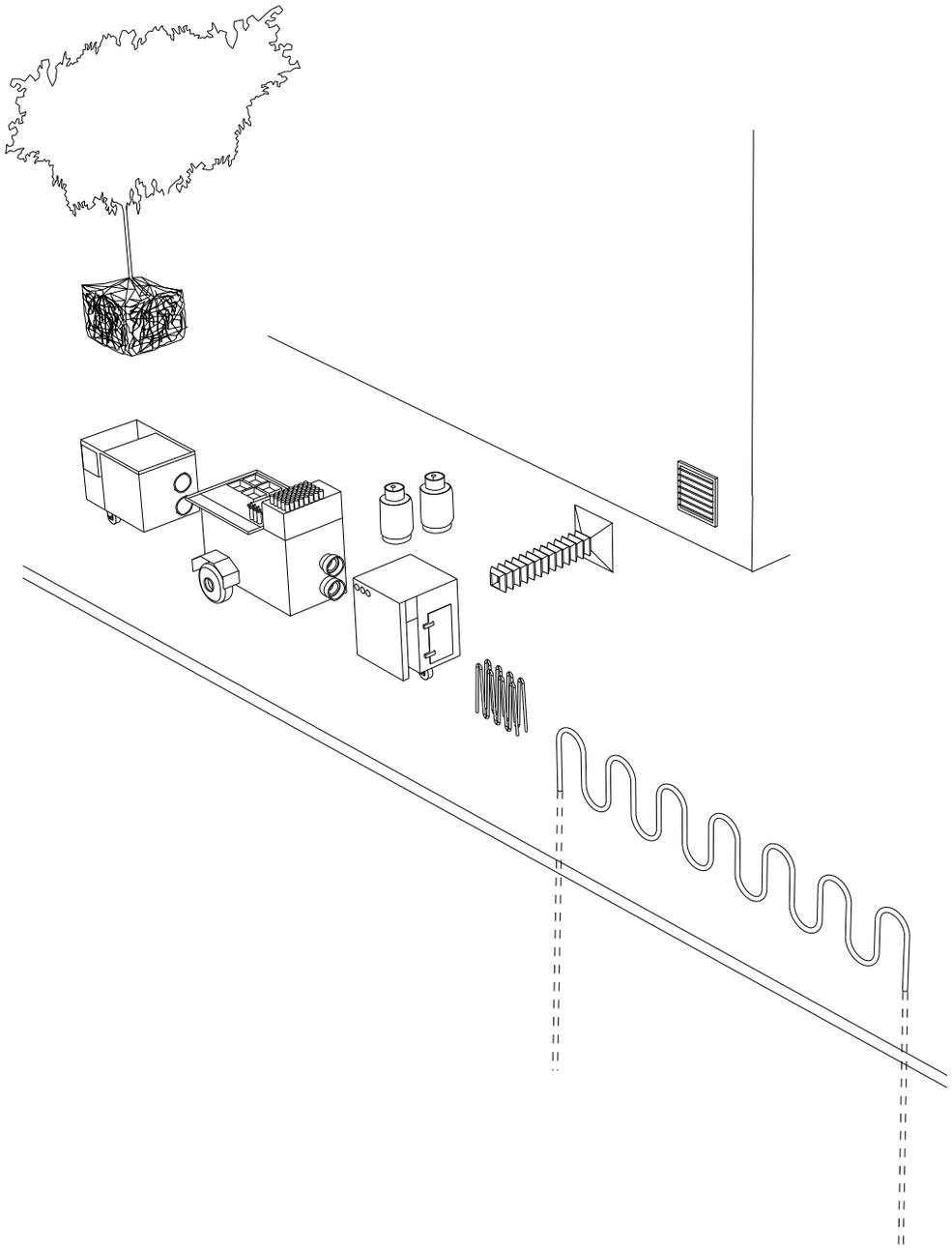

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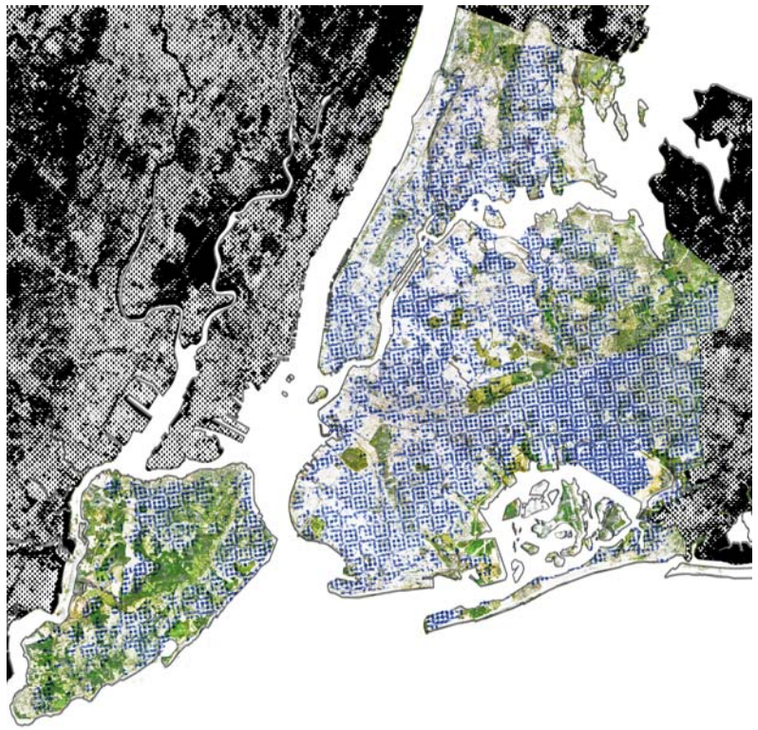
Google

Image © 2011 DigitalGlobe
Google

Image © 2011 DigitalGlobe
Google



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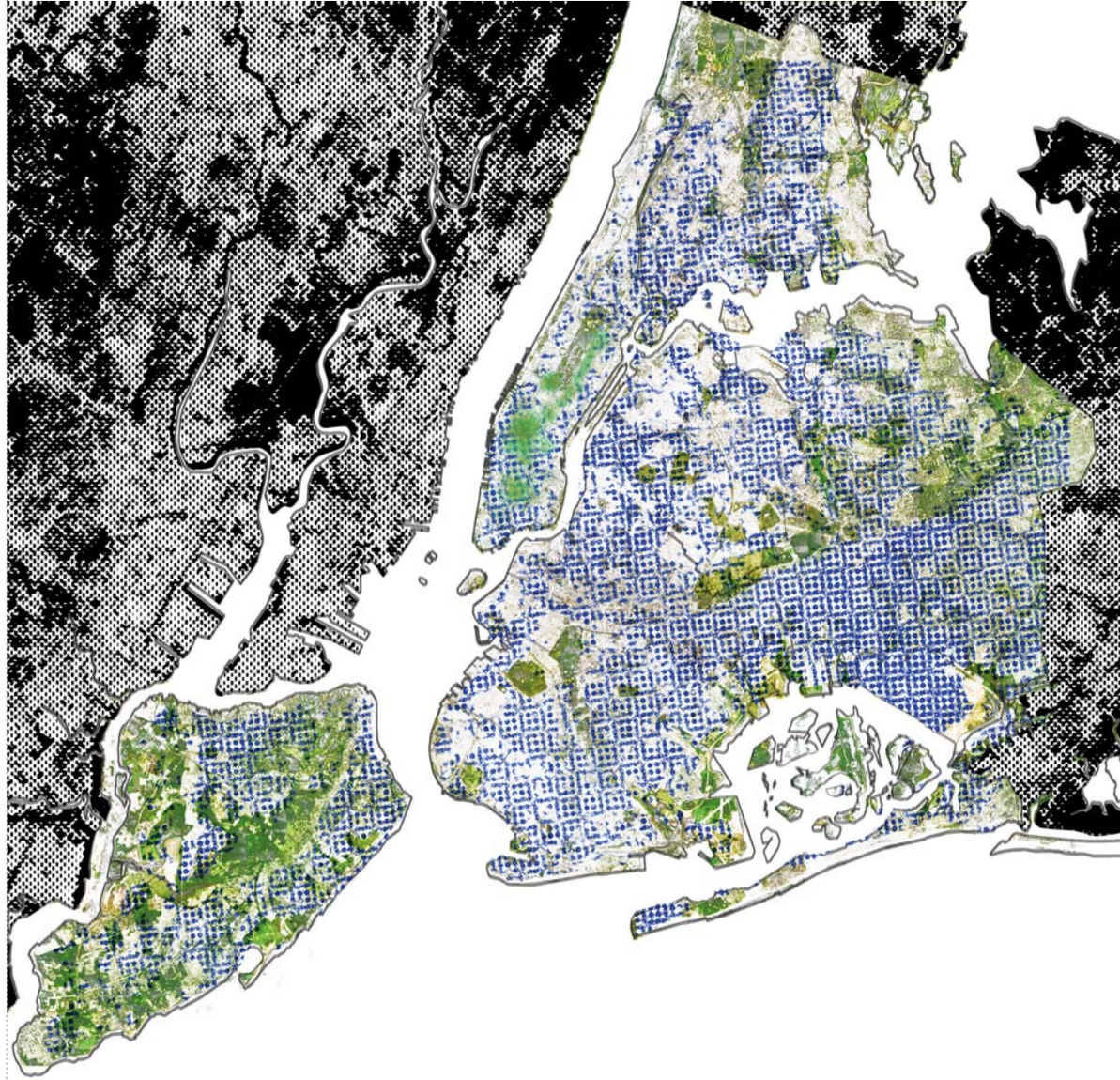

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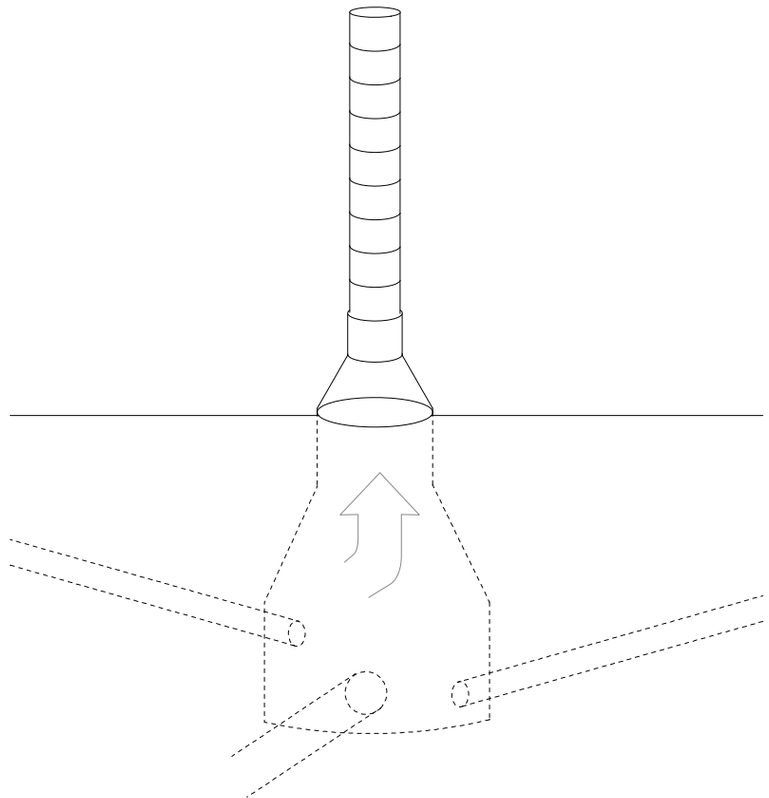
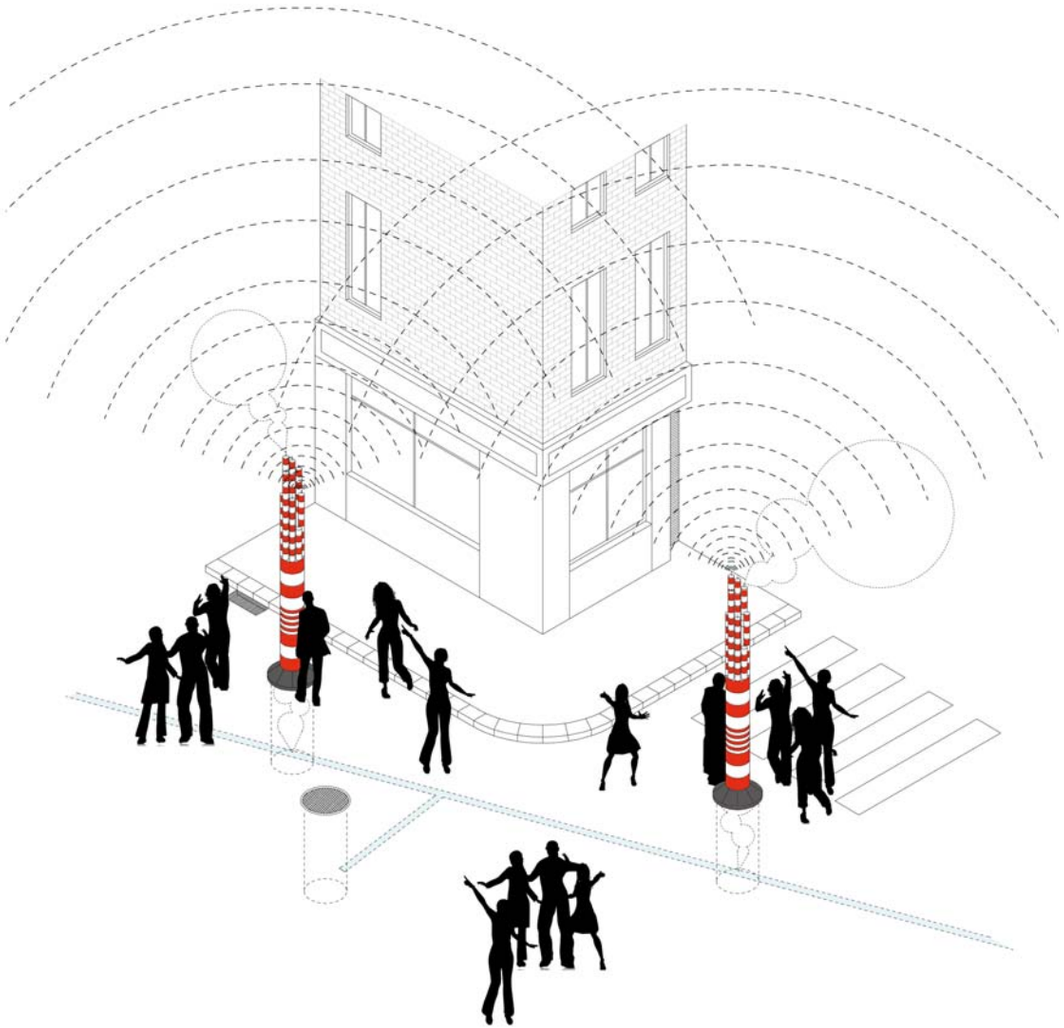
Name	Function	Site	Size
Steam Vent	Music	Street	M





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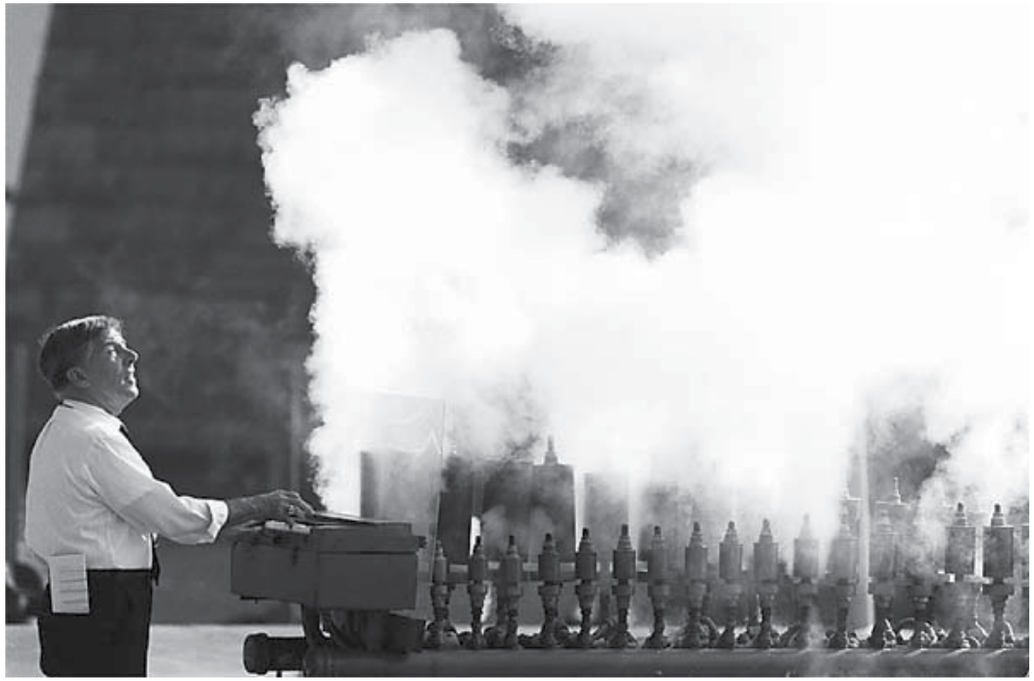

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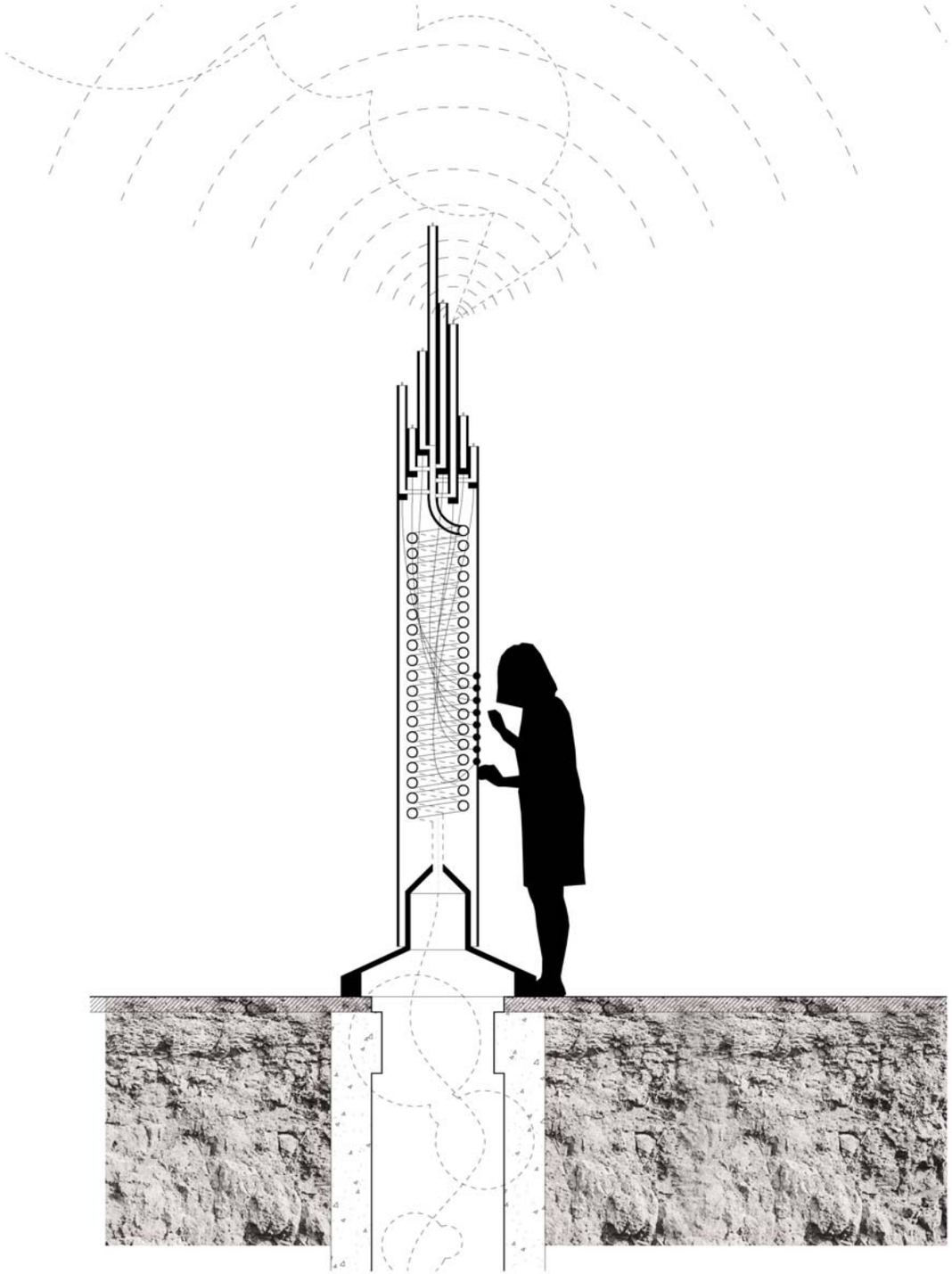

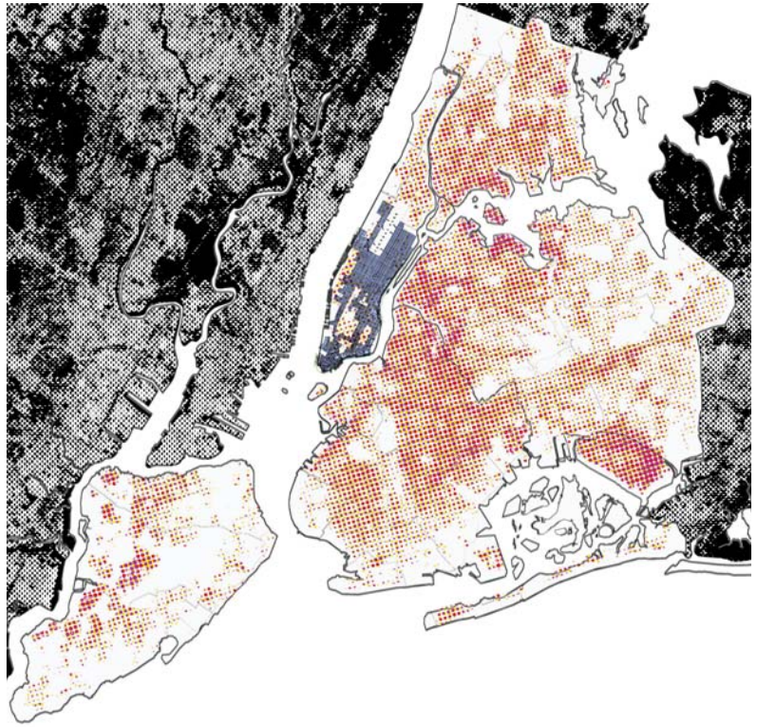

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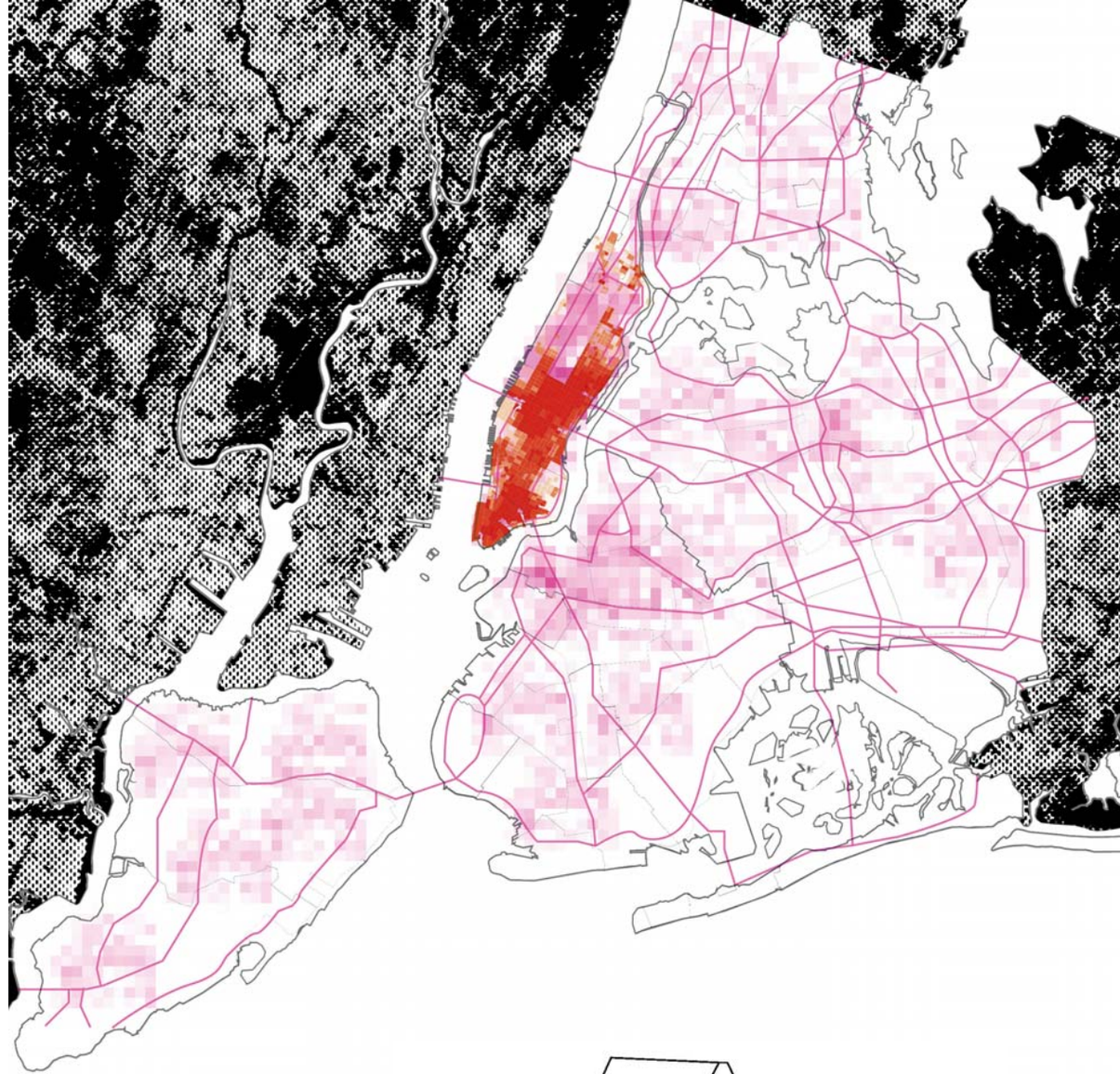

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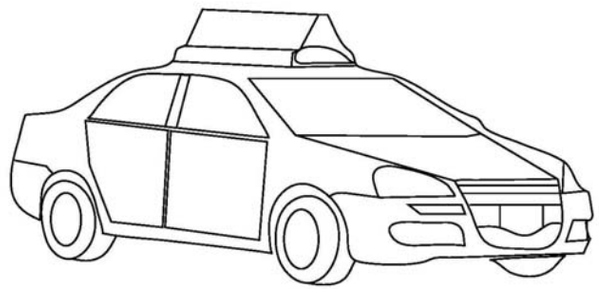
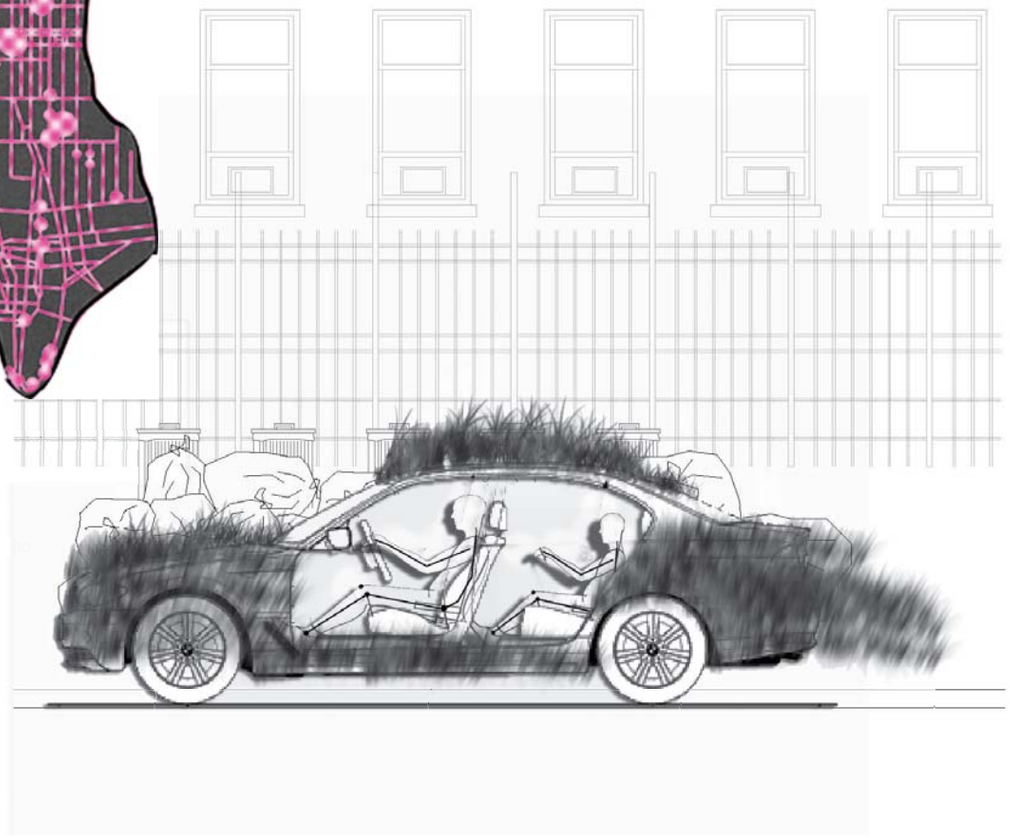
Name	Function	Site	Size
Taxi	Air Purifier	Street	L





GEOX