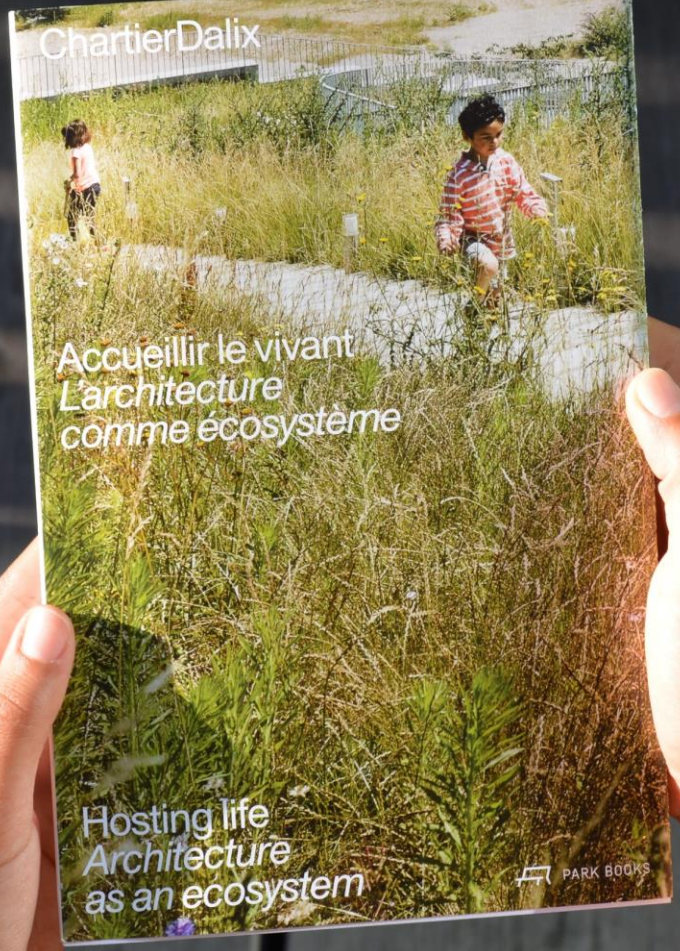


ChartierDalix

The image shows a spacious, bright office environment. The ceiling is high and features a complex wooden beam structure with skylights. The walls are white, and the floor is a light-colored, polished surface. On the left, a large, leafy tree stands in a pot. In the foreground, several desks are arranged, each equipped with a computer monitor and various office supplies. Numerous potted plants, including several large Monstera plants, are placed throughout the office, adding a natural touch. The overall atmosphere is clean, modern, and well-lit.



Chartier Dalix

Accueillir le vivant
L'architecture
comme écosystème

Hosting life
Architecture
as an ecosystem

 PARK BOOKS





B. Le bois de l'école de la Biodiversité

FR

1 Caractérisation générale de la toiture
Hauteur moyenne de la toiture : 14 m
Formation végétale dominante : arborée
Surface du bois : 1,399 m²
Année de conception : 2014
Épaisseur moyenne du substrat : 100 cm
Type de toiture végétalisée : intensif

2 Analyses du substrat
Substrat à texture limono-argileuse.

[FIG. B1] Fraction granulométrique en %.

3 Éléments-traces métalliques
Les concentrations en éléments-traces métalliques (en mg/kg) pour cette toiture (en argenté) sont toutes en dessous des seuils réglementaires (en vert).

[FIG. B2] Éléments-traces métalliques.

4 Fertilité du substrat
Le stock de matière organique est très élevé. Il correspond à 3,7% du volume de sol (pour une moyenne de 2,7% dans les sols agricoles). Le rapport C/N (carbone/azote) de cette matière organique est de 8,1. Cette valeur est normale, elle illustre une potentielle bonne décomposition de la matière organique par les organismes du sol.

5 Fonction de rétention de l'eau
Le volume d'eau que peut retenir le substrat dans des conditions idéales, c'est-à-dire préalablement sec, en fonction du volume total du substrat est de 50%. La toiture peut absorber une pluie de 508 mm, ce qui est largement supérieur aux pluies courantes en Île-de-France, et supérieur à une pluie décennale. Étant donné sa surface et sa profondeur, la toiture peut absorber au total 710 m³ d'eau. Parmi toutes les toitures étudiées, c'est celle qui a la plus grande capacité de stockage.

[FIG. B3] Rétention de l'eau par le substrat des toitures végétalisées. Ces données sont valables dans des conditions idéales, c'est-à-dire pour des sols secs. Elles sont susceptibles de varier en fonction des conditions climatiques précédant les mesures et en fonction du type de végétation sur la toiture.

6 Flore
Cette toiture est dominée par le lieron (présent dans les dix carrés) et deux poacées : la Fétuque rouge et l'Ivraie vivace. Mis à part les arbres plantés, la composition observée est plutôt caractéristique d'une friche. Le nombre moyen d'espèces relevées (2017 et 2018) est de treize, ce qui est bien inférieur à la moyenne de dix-huit

B. The School of Biodiversity woodland

EN

1 General specifications of the roof
Average height of the roof: 14 m
Dominant plant type: trees
Woodland surface area: 1,399 m²
Implementation year: 2014
Average depth of substrate: 100 cm
Type: intensive

2 Substrate analyses
Substrate with silty clay texture.

[FIG. B1] Size fraction in %.

3 Trace metal elements
Concentrations for trace metal elements (in mg/kg) for this roof (in silver) are all below regulatory thresholds (in green).

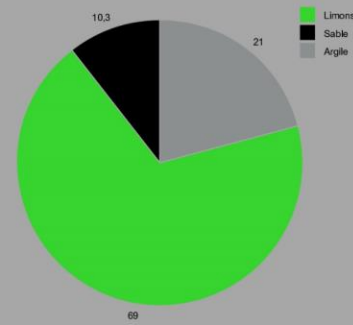
[FIG. B2] Trace metal elements.

4 Fertility of the substrate
The stock of organic matter is very high. It corresponds to 3.7% of the volume of soil (compared with a 2.7% average for agricultural soils). The carbon-to-nitrogen ratio for this organic matter is 8.1. This figure is normal – it shows that organisms in the soil are decomposing organic matter as they should.

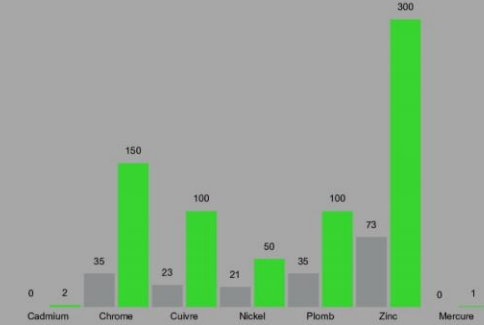
5 Water retention function
The volume of water which the substrate can retain in ideal conditions, that is to say from dry, depending on the total volume of the substrate, is 50%. The roof can absorb 508 mm of rain, which is well above usual rainfall in the Ile-de-France region, and above the one-in-ten-year rainfall rate. Given its surface area and depth, the roof can absorb 710 m³ of water in total. Out of all the rooftops studied, this is the one with the greatest storage capacity.

[FIG. B3] Substrate water retention for green roofs. Please note, this data only holds for ideal conditions, that is to say when the soil starts dry. They may vary depending on weather conditions preceding measurements and depending on the type of vegetation on the roof.

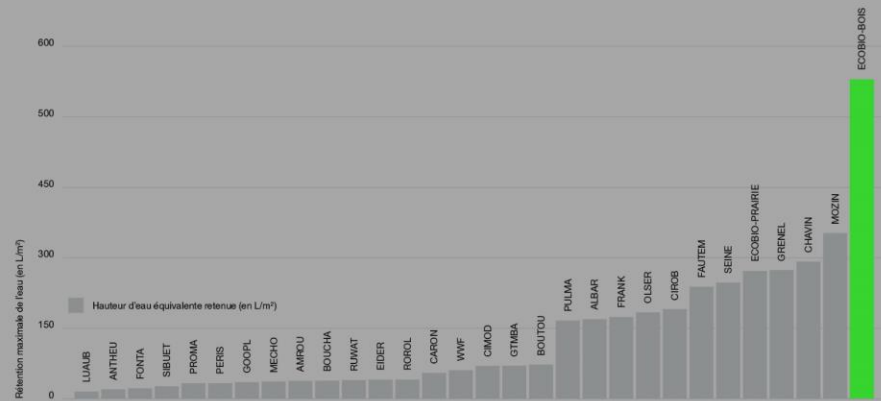
6 Flora
This roof is dominated by bindweed (present in the ten squares) and two grasses: red fescue and perennial ryegrass. Apart from the trees which have been planted, the composition observed is more characteristic of wild lands. The average number of species identified (2017 and 2018) is thirteen, which is well below the average of eighteen observed on all of the roofs involved in the study.



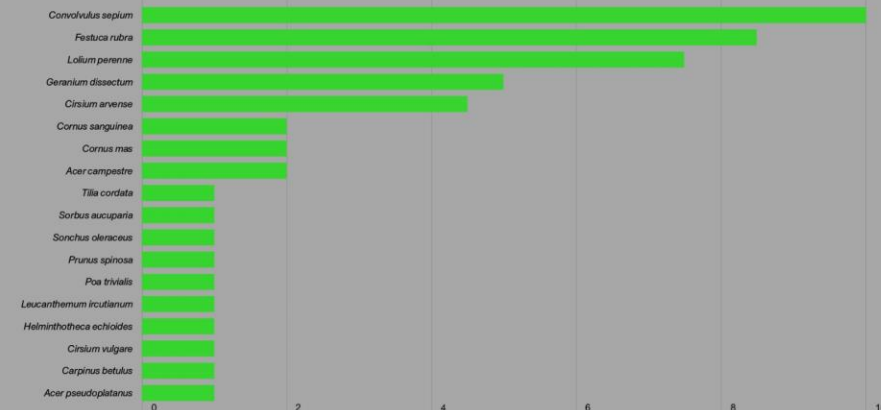
[FIG. B1]



[FIG. B2]

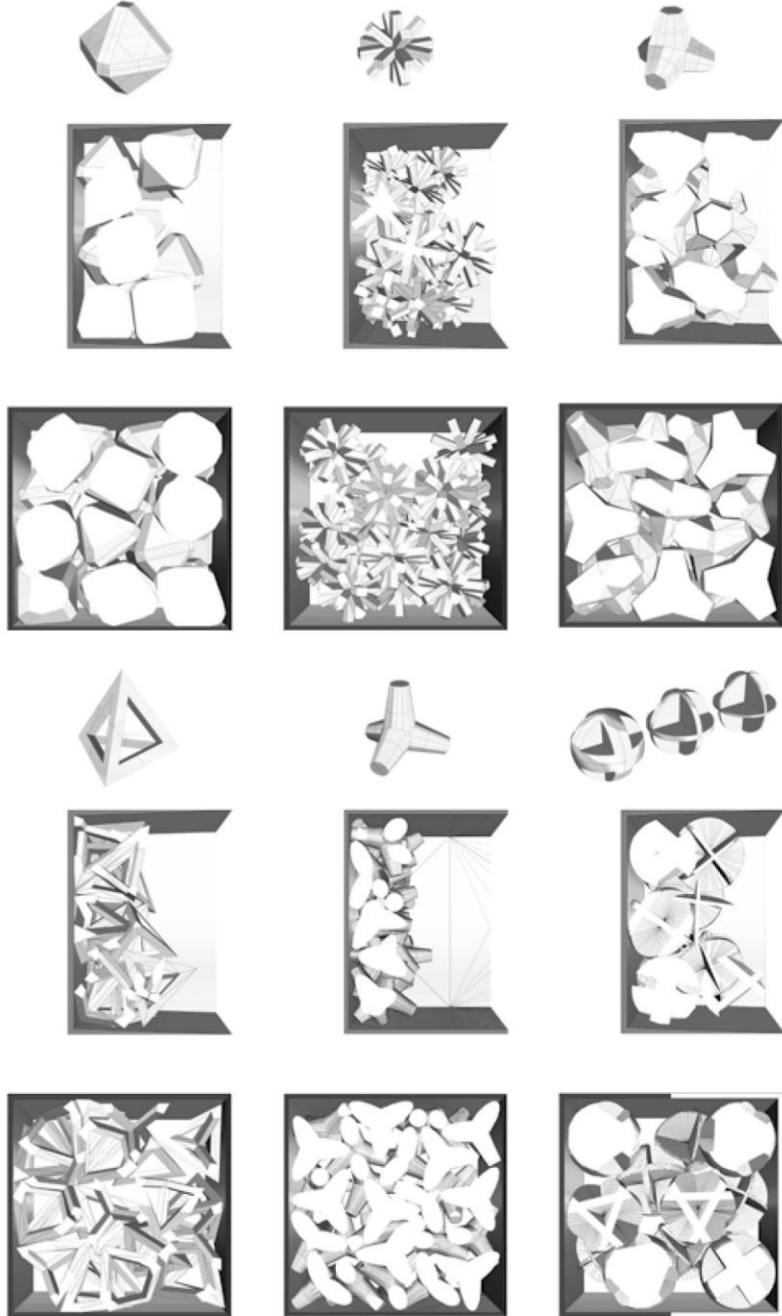


[FIG. B3]



[FIG. B4]









SLA

startingpoint

16/08/2007
Bismuth
pulv. 2007

Bismuth
pulv. 2007

WE WORK WITH
NATURE AND DESIGN



Mental disorder is an increasing future treat,
currently affecting 450 million people globally

Danish scientist has mapped 1 million kids,
and concluded that **growing up in nature**
surroundings reduces the risk of mental
disorders with 55 %

(WHO and Bioscience Aarhus University, 2019)





REINVENT PARIS

**HOW TO SELL THE AREA ABOVE A RINGROAD
(AND CLEAN THE AIR WITH PLANTS)**

AVRIL 2019

BATS LES SECRETS DE NOS
COMPAGNONS DE L'OMBRE

UGANDA DANS LE PLUS GRAND
CAMP DE RÉFUGIÉS D'AFRIQUE

NATIONAL
GEOGRAPHIC

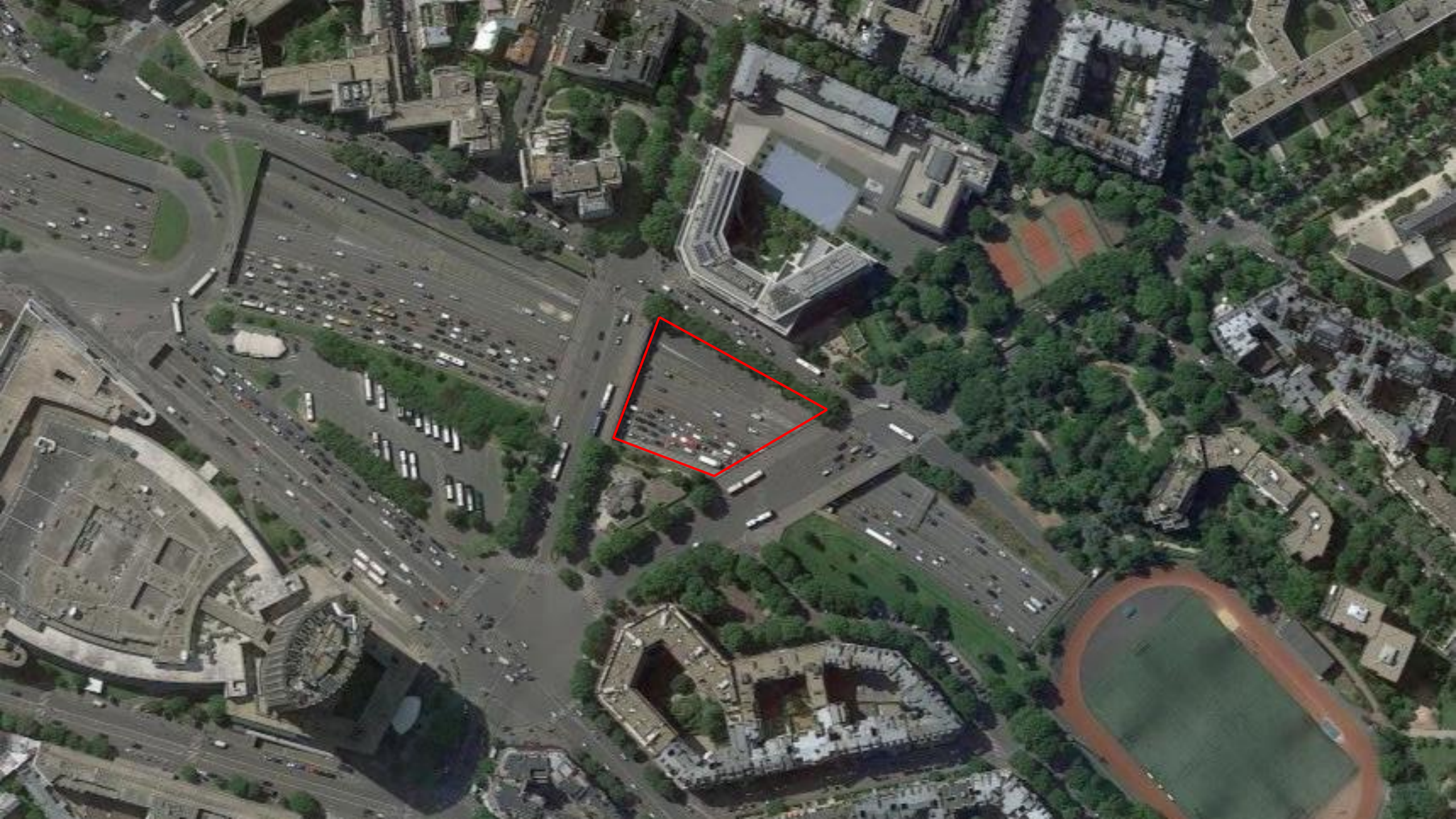
PARIS, LONDRES, TOKYO, PÉKIN, SINGAPOUR...

VILLES

LES IDÉES POUR UN AVENIR MEILLEUR









Concours
Le paysage pont

J JACQUES
F FERRIER
A ARCHITECTURE
SLA BNP PARIBAS
REAL ESTATE
ChartierDalix

BD PERIPHERIQUE

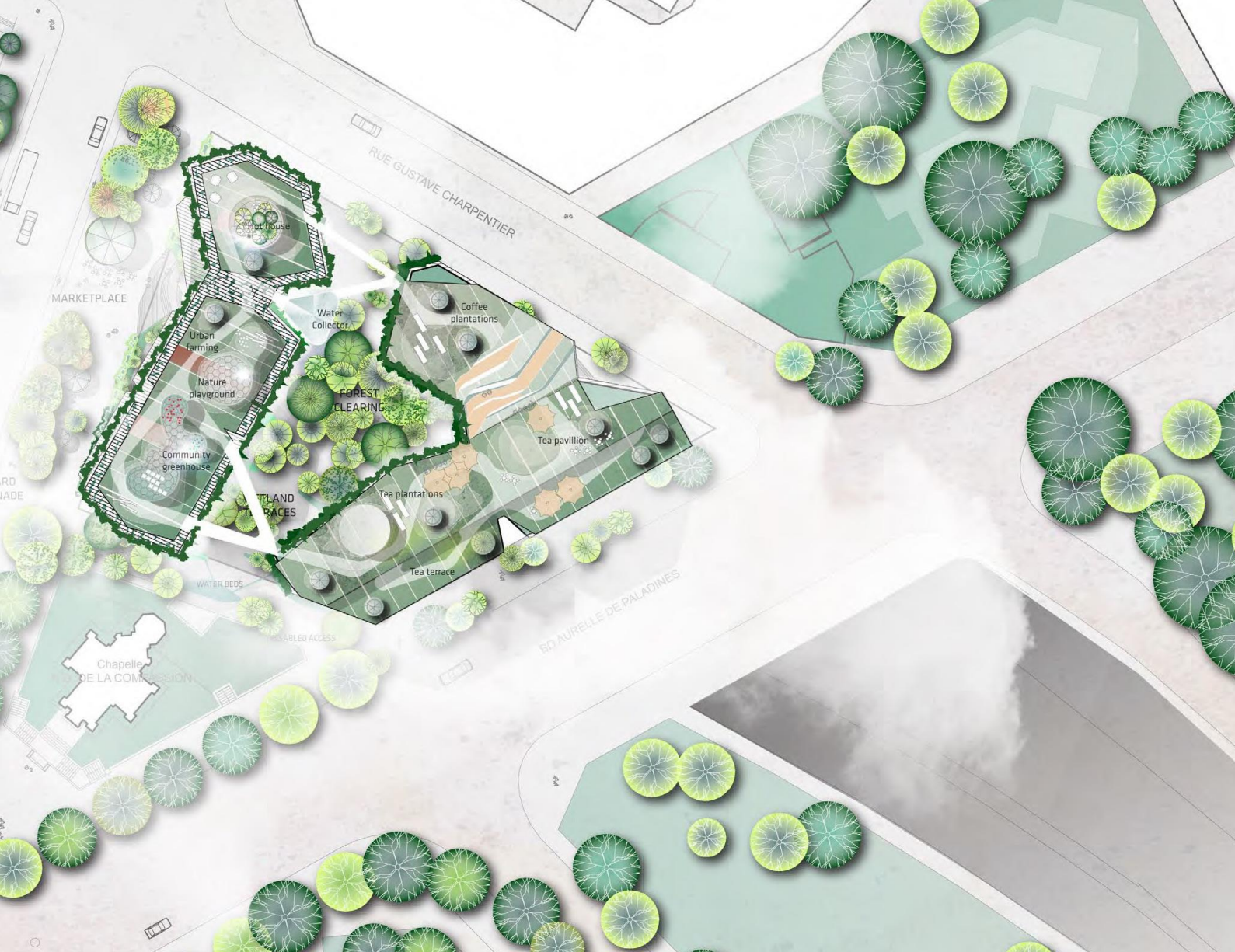
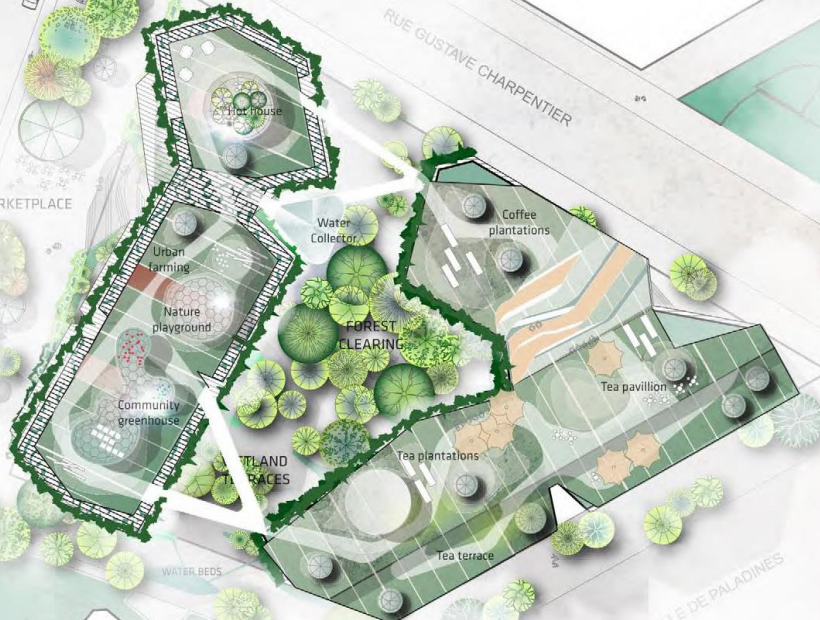
RUE GUSTAVE CHARPENTIER

MARKETPLACE

ORCHARD PROMENADE

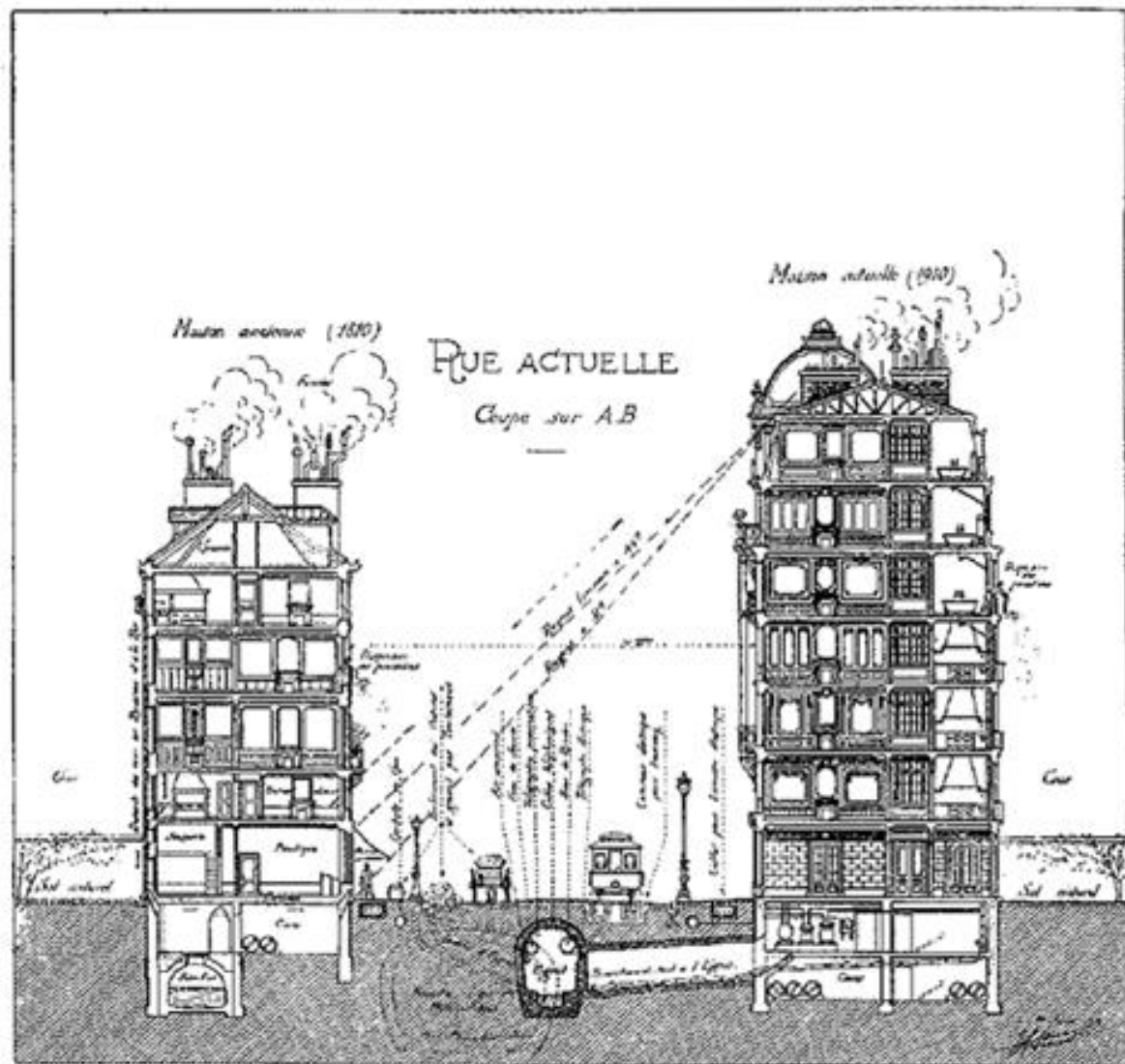
AV PORTE DES TERNES

BOULEVARD DE PALADINES

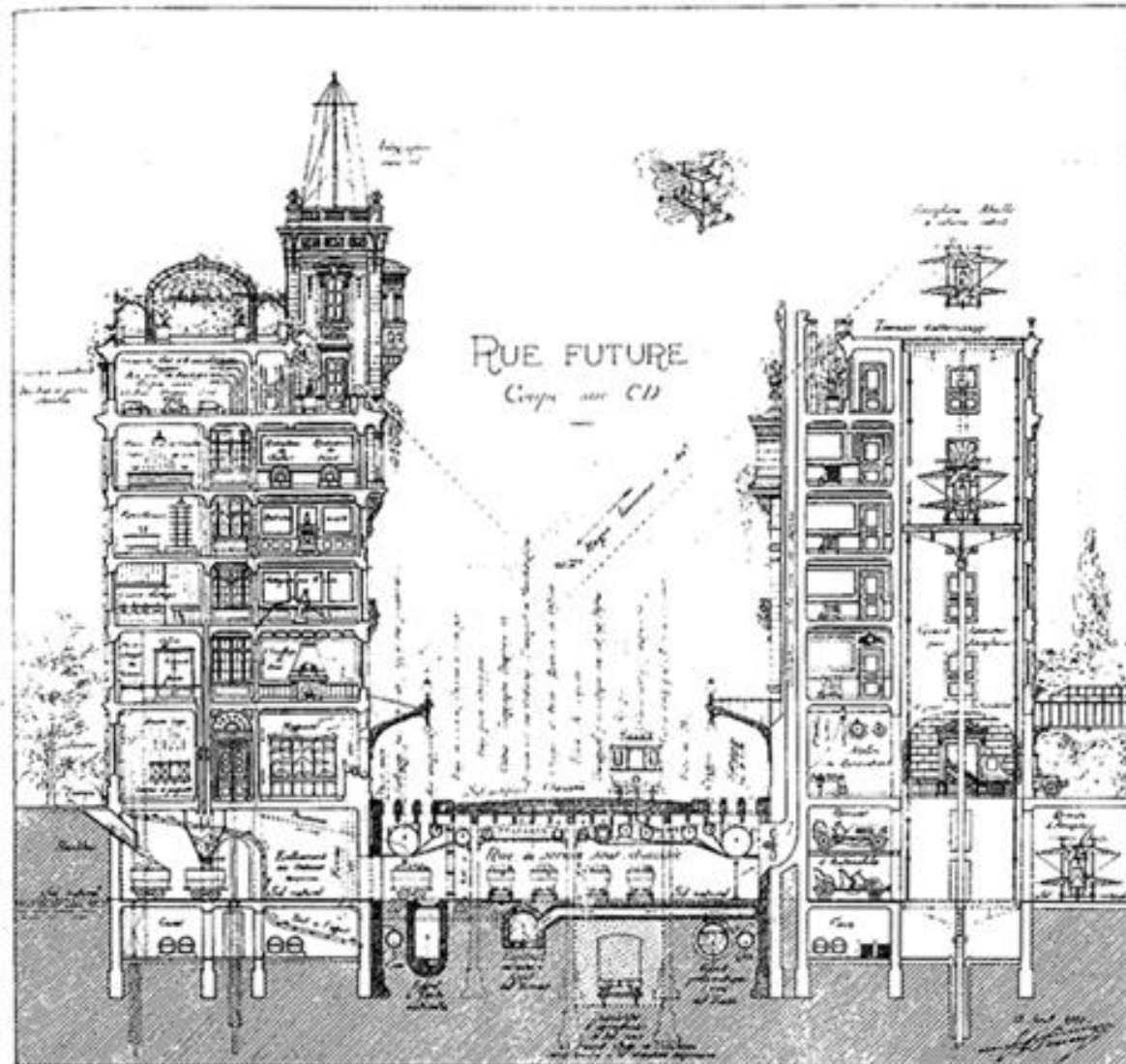




BEFORE YOU CAN **REINVENT** A CITY
YOU NEED TO KNOW THE **REALITIES**



Plan du sous-sol



Plan de la Rue de service sous chaussée



400.000 PEOPLE DIE YEARLY OF AIR POLLUTION IN EUROPE

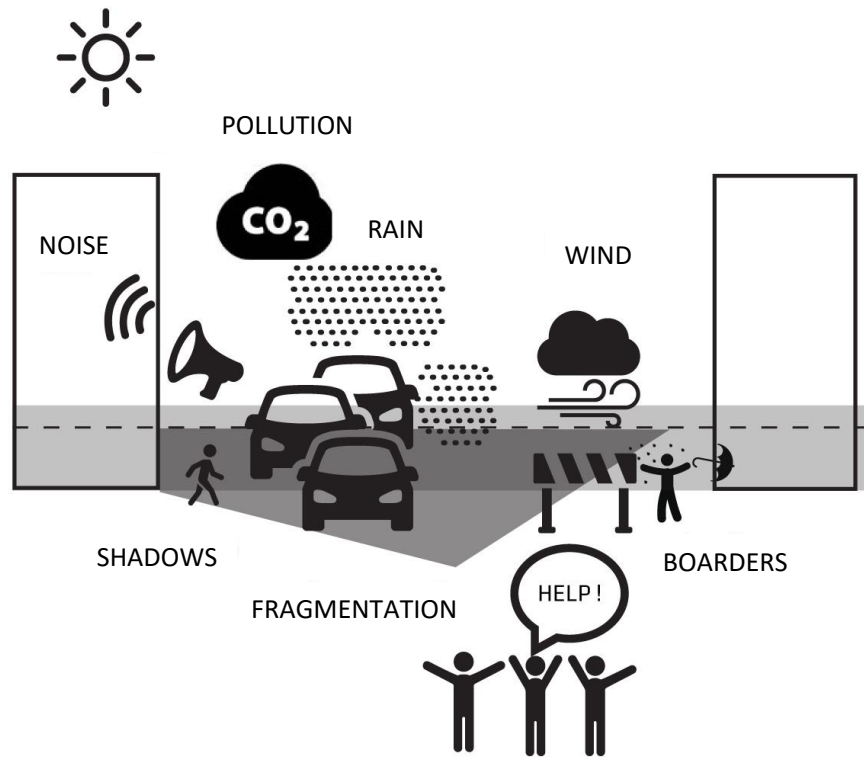
(EUROPEAN COURT OF AUDITORS)

HIGHEST POPULATION DENSITY FOR BIG CITIES IN EUROPE

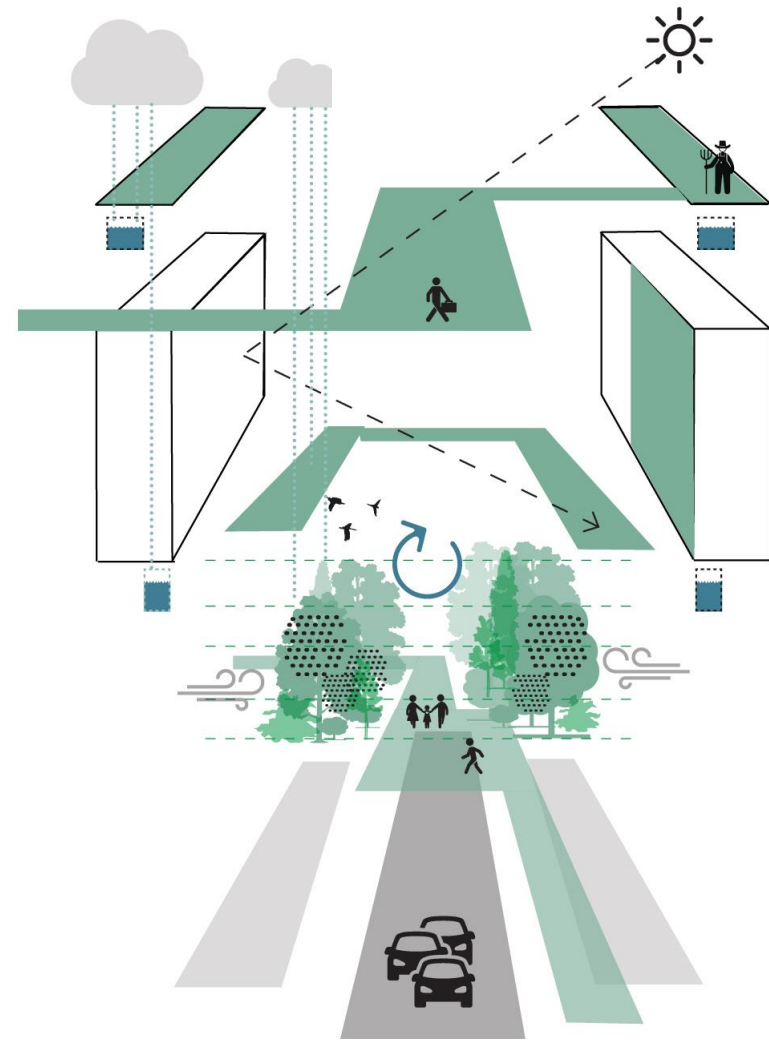
(9.5% PARKS AND GARDENS)

LOWEST GREEN SPACE DENSITY FOR BIG CITIES IN EUROPE

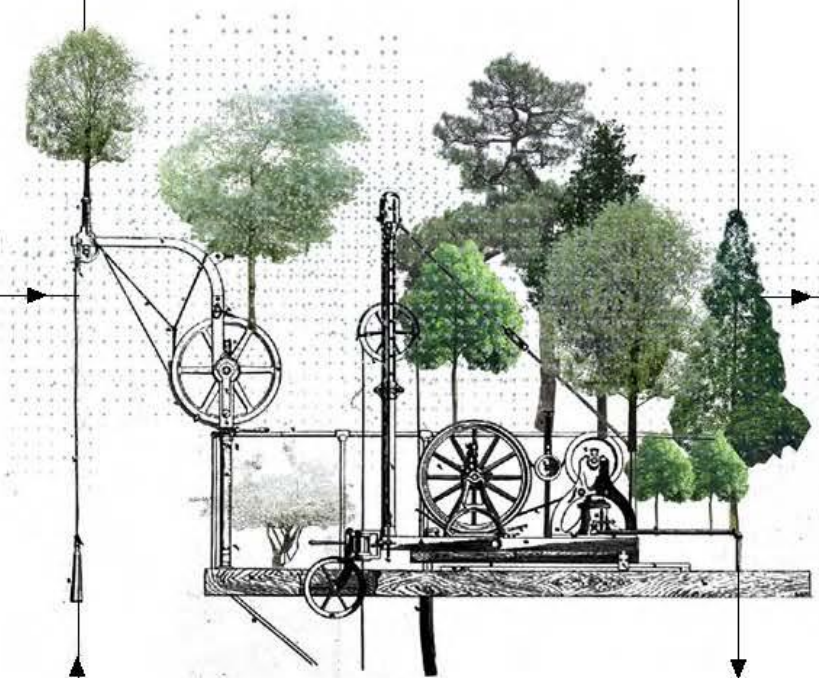
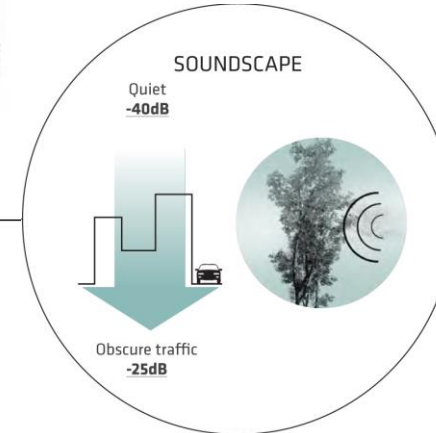
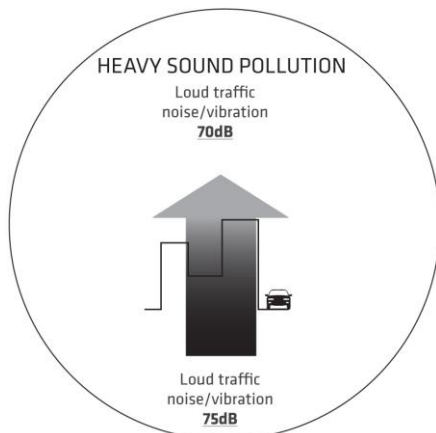
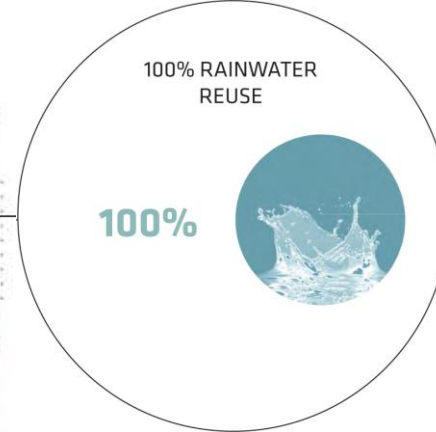
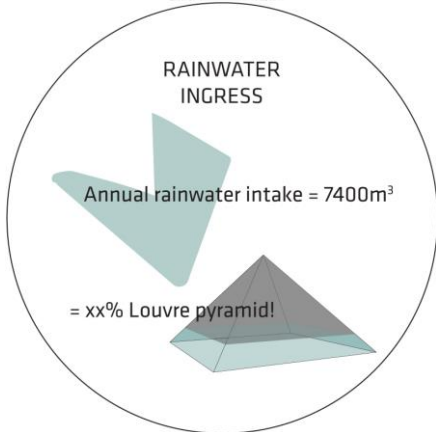
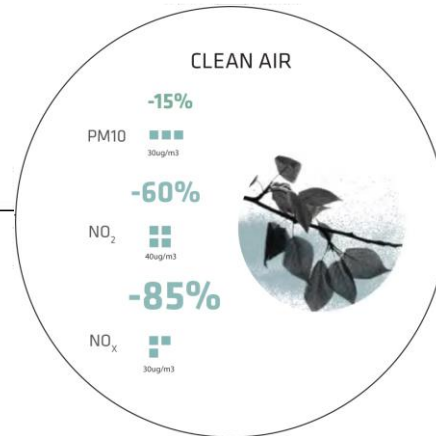
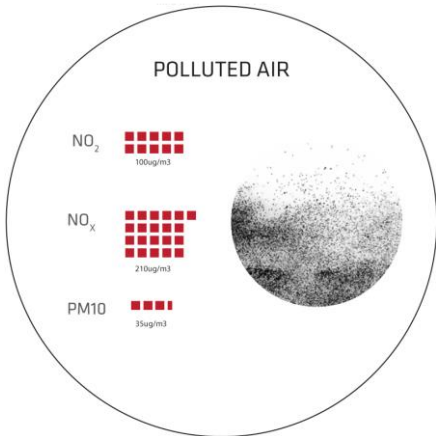
(22.000 INHABITANTS PR. KM2)



CHALLENGES



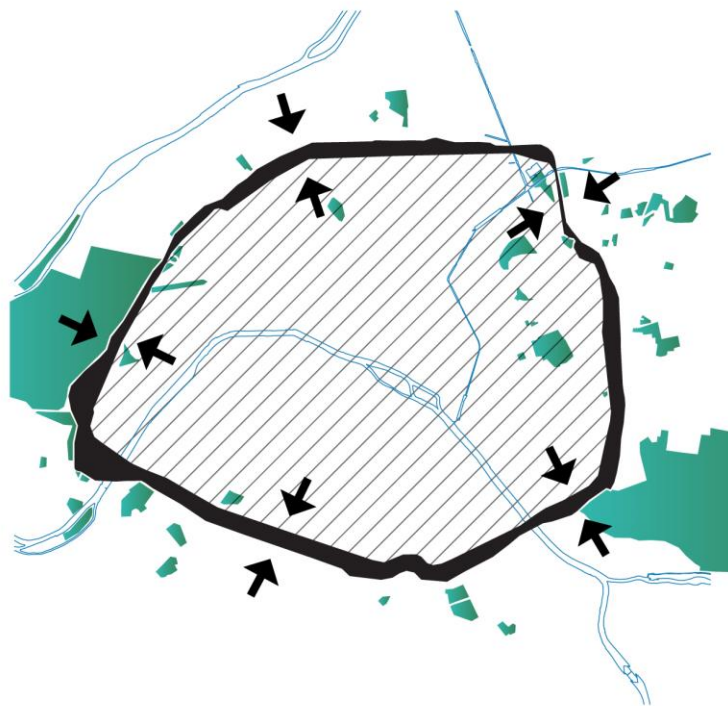
SOLUTION



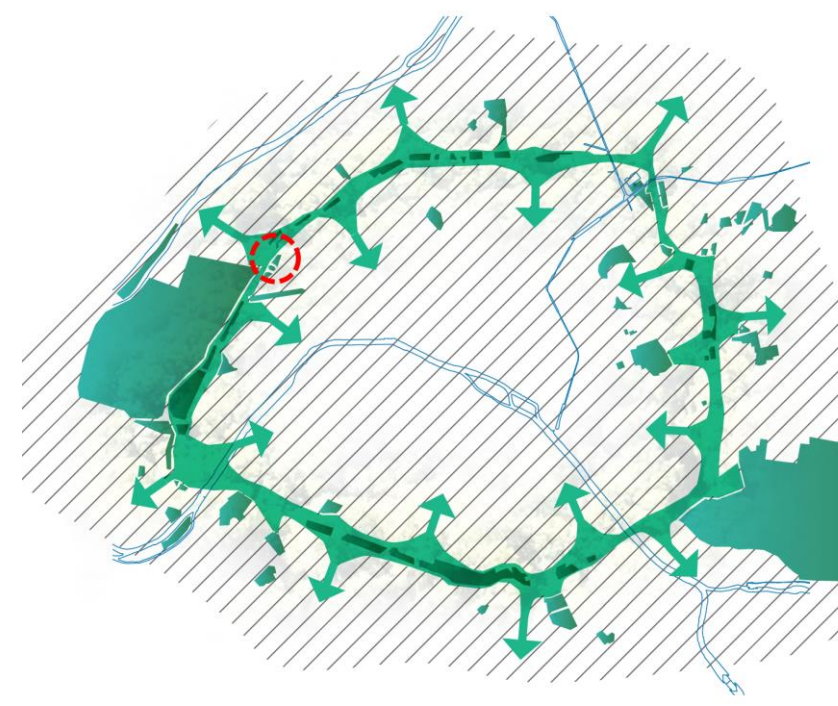




PAST



PRESENT



FUTURE: THE GREEN BELT

TERNES

THE MULTILAYERED LANDSCAPE



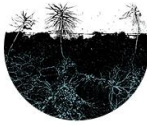
ENVIRONMENTAL PERFORMANCE



RAINWATER COLLECTION
Roofs catch and store rainwater for further uses.



POLLUTION CATCHER
The green facades catch air polluting particles, provide shade in hot summer months and act as an acoustic barrier.



WATER FILTERING GARDENS
Bioretention beds filter rainwater and phytoremediates the soil.



AIR CLEANING
The depolluting concrete paving catch air pollutants.



CLEAN WATER STORAGE
Rainwater, cleaned by filtering gardens, is stocked for further irrigation uses.

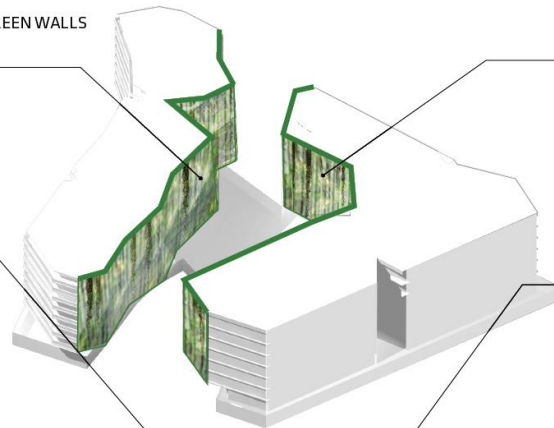


HIGHWAY DEPOLLUTION
A mushroom cladding covers the underside of the bridge building. The mushrooms feed off car emitted gases.

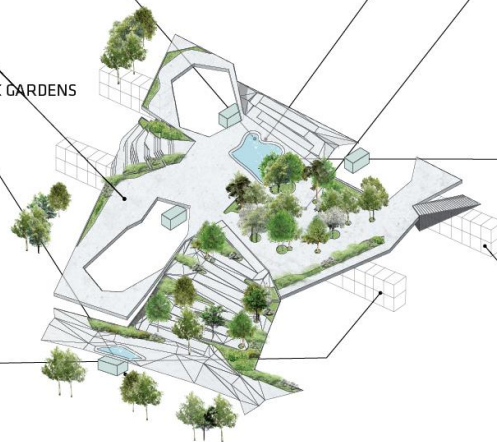
ROOFTOPS



GREEN WALLS



PUBLIC GARDENS



SENSORY AND AESTHETIC EXPERIENCES



URBAN FARMING
Urban farming creates social interactions and a new learning platform. The roofs produce a variety of rare and delicate fruits, vegetables and teas for a multitude of culinary applications!



PRIVATE RETREATS
The planted facades evolve with the seasons and weather. The leaves filter light and dance with the wind and rain. Each private unit thus has an access to nature, on whichever floor.



REFRESHING PLACES
The mist irrigation provides a fresh urban ambiance. The mist also plays with the natural light, which blurs, in moments, the specific contours of the building.



NEW MEETING PLACES
The stratified landscape is divided in smaller and more comfortable urban spaces, suitable for spontaneous meetings and interactions. The multiple levels creates a diverse and dynamic stage for all.



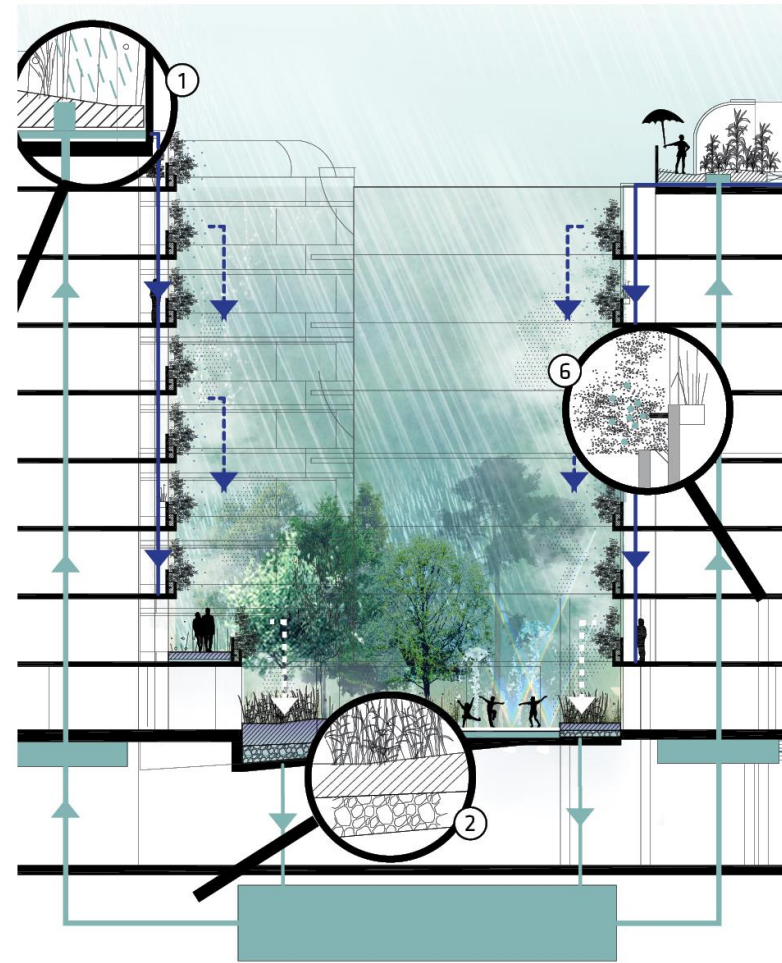
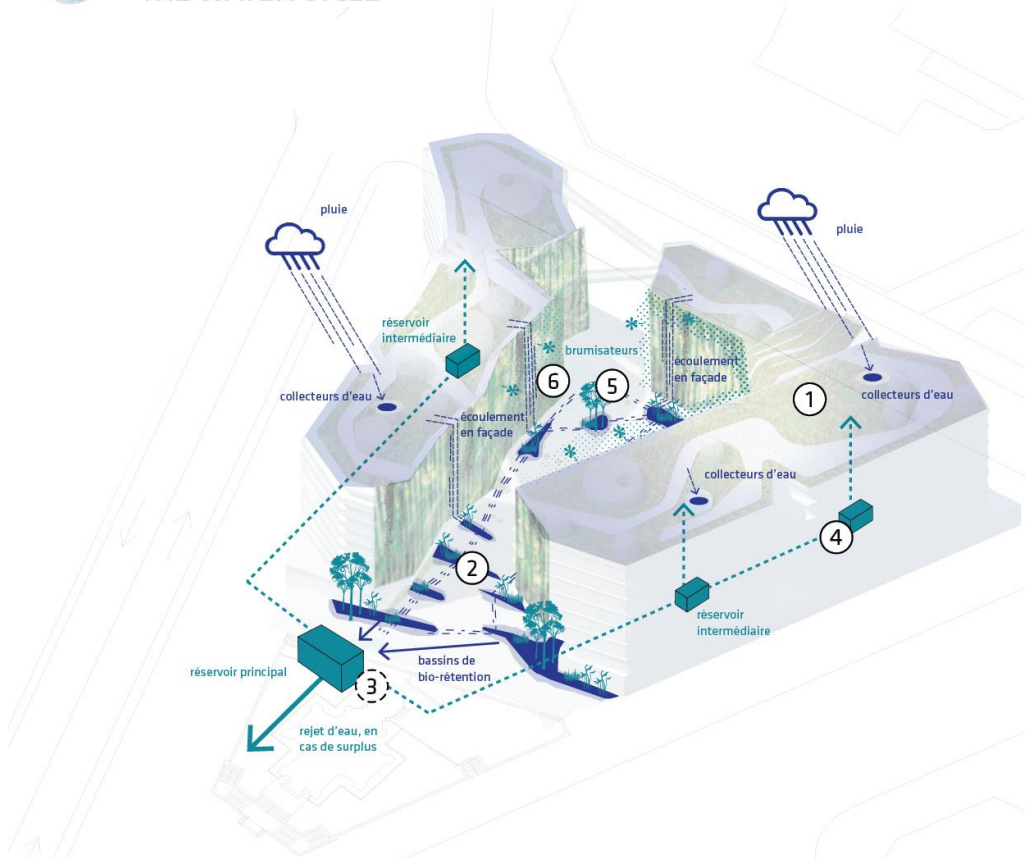
LEARNING AND SHARING
Water is manifested under all its forms. Bioretention basins, water fountains, water mirrors, and mist irrigation gives a new life to the reused rainwater, underlining the importance of that element in our lives.



ECOSYSTEMIC INNOVATION
A place suitable for innovation. The project as a laboratory evaluating nature's impact of humans and cities.



TERNES THE WATER CYCLE

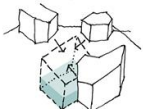


①



The roofs cover almost **50% of the site imprint**, so most of the water must pass through this first filter. The drainage mat can **store up to 600m³ of rainwater**, which will be directly used for the plants and rooftop agriculture.

③



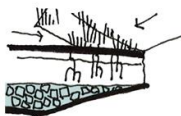
The main water storage is placed underground near the adjacent chapel. It stores water for future uses. This reservoir is connected to the city's sewer network in case of overflow.

⑤



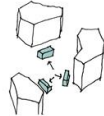
The collected water is used to irrigate the totality of the plants on site.

②



The garden level is punctuated by many filtering gardens. These bio-retention basins **catch and filter rainwater**. Water descends from one garden to another, to the extremities of the site, until it ends in large underground reservoirs.

④



Each building has a secondary water reservoir for immediate usage. These smaller reservoirs contain enough water for **two weeks use**.

⑥



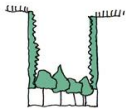
Mist irrigation tubes are installed on the planted facades to clean the leaves of the many plants. This way, pollutant particles fall down on the soil, which can be slowly remediated by the roots of the plants. The mist also helps to lower ambient temperatures, and thus, heat island effects.



TERNES AIR DEPOLUTION



①



The planted facades can catch up to **40% OF NO2, AND 60% OF PM10** in the air. The building geometry creates a "canyon" effect, enhancing the ratio of surfaces per air volume, maximising the air depollution capacity of the green walls.

②



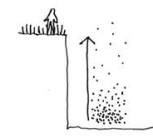
The majority of the trees are planted on the edges of the site in order to **reduce the wind speed**, which transports pollutants. The trees also catch **0.5% of NO2 and PM10**.

③



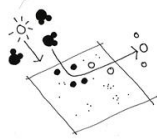
The mushrooms, used as a cladding underneath the bridging building, can catch up to **50% of NO2, while reducing the surrounding temperature by 5°C, and the noise by 3db.**

④

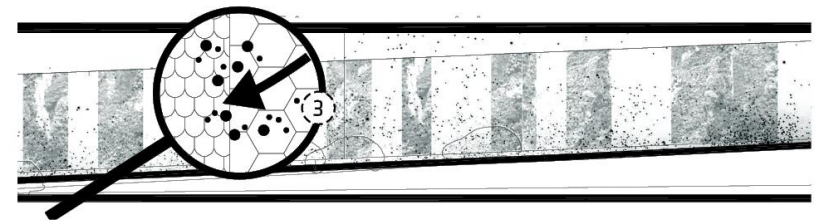
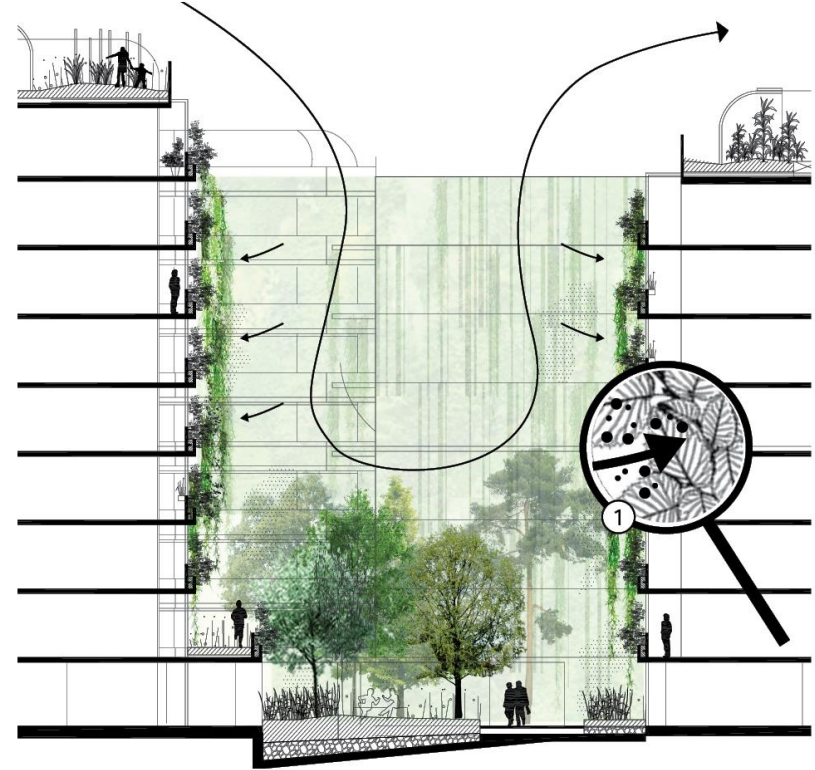


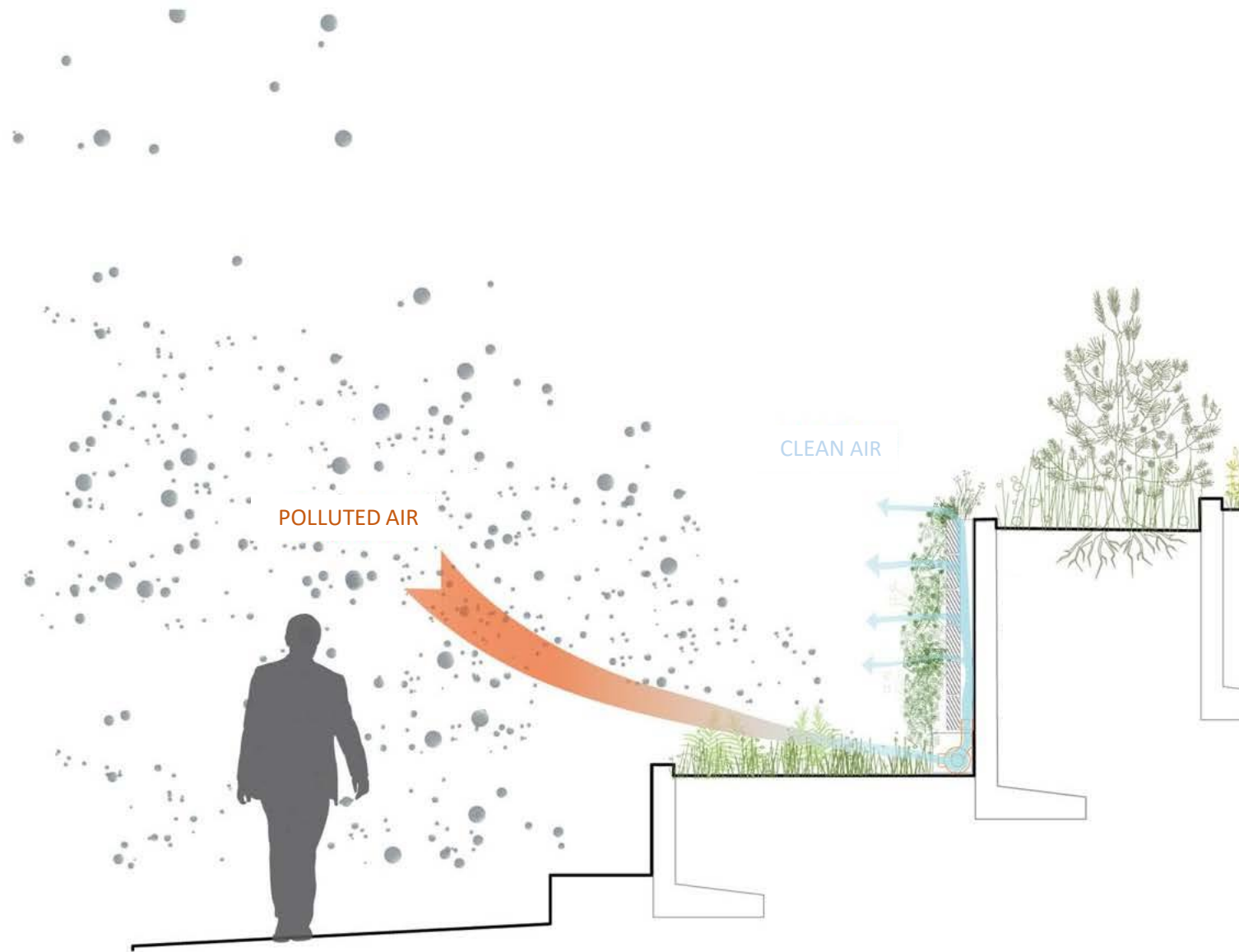
The NO2 and PM10 concentrations **reduce by 30% as we get to the second floor.** Another important point in favour of the vertical stratified city!

⑤

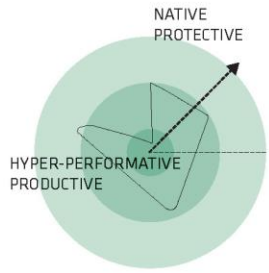


The depolluting concrete is the principal paving material for the public spaces. This material can store up to **25% of surrounding NO2.** Its light color reflects light and reduces heat island effects.





PLANTING STRATEGY



SITE STRATEGY

Protective plantation around the site, with hyper performative and productive in the center.



PERFORMANCE

Planting is chosen for it's high performative qualities - air catching, wind trapping, water cleaning etc. Species are selected to combine with local native species and to encourage and extend the local biodiversity.



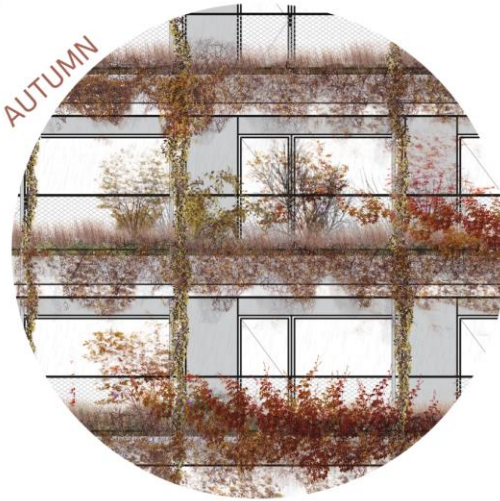
EXPRESSION

Driven by the performative function, the planting expression varies from ground floor to roof. From wetland grasses and robust planting on the public ground floor gardens, to a more wild, low-maintenance typology at roof level.

- BIRD FRIENDLY
- LOW MAINTENANCE
- BIODIVERSITY
- NATIVE LOCAL SPECIES
- WINDBREAKER
- WATER CLEANING
- AIR CLEANING
- PRODUCTION

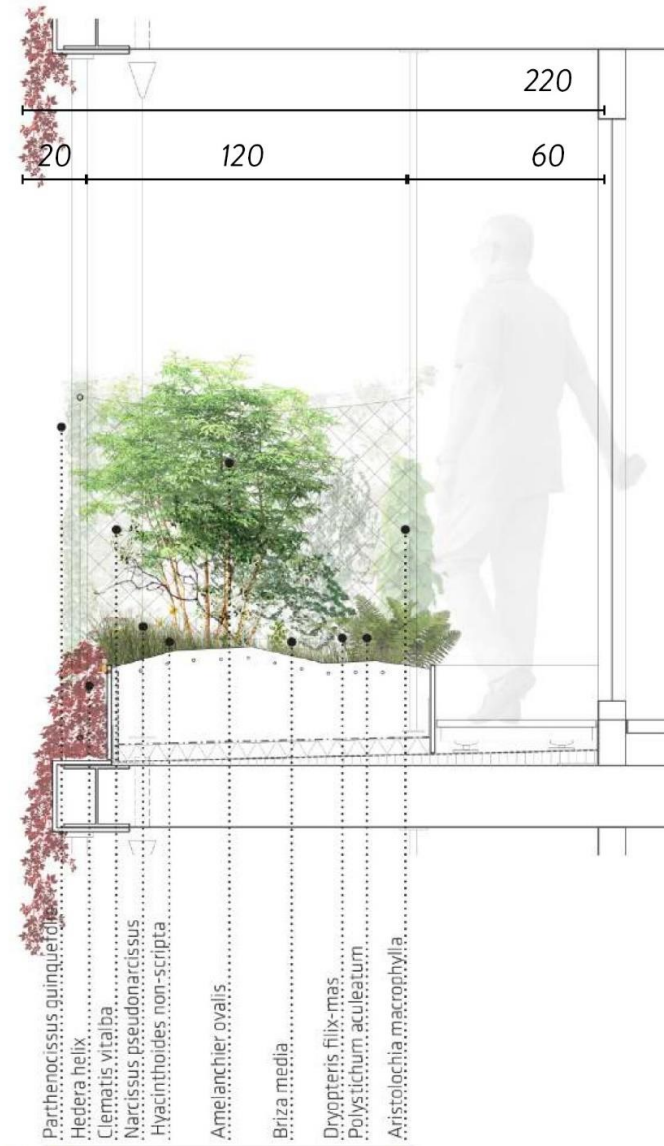
ROOF 	 MALUS SYLVESTRIS 	 PINUS MUGO 	 STEPHANANDRA INCISA 	 TAXUS MEDIA HILLI 	 RIBES NIGRUM 	 BRIZA MEDIA 	 SALIX CINEREA 	 PRUNUS SPINOSA 	 LONICERA XYLOSTEUM 	 CRATAEGUS LEAVIGATA
URBAN FARMING 	 RHEUM RHABBARBARUM 	 FRAGARIA SP. 	 ASPARAGUS SP. 	 SPINACH SP. 	 THYMUS SP. 	 REBUS IDAEUS 	 LIPPIA CITRIODORA 	 MENTHE PIPERATA 	 FILIPENDULA ULMARIA 	 COFFEE PLANT
GREEN WALLS 	 PARTHENOCISSUS TRICUSPIDATA 'VEITCHII' 	 HEDERA HELIX 	 CLEMATIS MONTANA RUBENS 	 LONICERA SEMPERVIRENS 	 ACTINIDIA CHINENSIS 	 CLEMATIS ALBA 	 POLYGONATUM BIFLORUM 	 WISTERIA VENUSTA 	 PARTHENOCISSUS QUINQUEFOLIA 	 LONICERA 'HENRYI'
PUBLIC GARDENS 	 BETULA PENDULA 	 MALUS SYLVESTRIS 	 METASEQUOIA GLYPTROOIDES 	 TILIA CORDATA 	 LARIX DECIDUAS 	 PLATANUS OCCIDENTALIS 	 POPULUS TREMULA 	 PINUS SYLVESTRIS 	 SALIX ALBA SERICEA 	 ROBINIA PSEUDOACASIA
	 CAREX ACUTA 	 CAREX ACUTIFORMIS 	 CAREX PENDULA 	 JUNCUS INFLEXUS 	 JUNCUS EFFUSUS 	 TYPHA ANGSTIFOLIA 	 CAREX MORROWII 	 FESTUCA GLAUCA 	 LOLIUM MULTIFLORUM 	 FESTUCA PSEUDOVINA
MUSHROOM GARDENS 	 BOLETUS EDULIS 	 CALVATIA EXCIPULIFORMIS 	 LEPISTA RHACODES 	 PAXILLUS INVOLUTUS 	 PLEUROTUS OSTREATUS 	 RUSSULA DELICA 	 TRICHOLOMA TERREUM 	 AGARICUS BISPORUS 	 LEPISTA NUDA 	 ARMILLARIA BISPORUS

SEASONALITY STUDY
EXTRACT, RESIDENTIAL FACADES





- GRIMPANTES ●●●
- BULBES ●●●
- GRAMINÉES ●●



- GRIMPANTES ●●●●●
- ARBUSTE ●●●●●
- BULBES ●●●●●
- FOUGÈRES ●●●●●
- GRAMINÉES ●●●●●

The Multi-layer City, Reinventing Paris















unused space above train tracks, tube lines and the over ground network in cities

LONDON 280.000 homes of 100 m²

MELBOURNE 80.000 homes of 100 m²

VANCOUVER 50.000 homes of 100 m²