

IN SEARCH OF A COMMON SENSE

A virtuous duality between natural ventilation and working practices

Architecture Paul Vincent / ENSAL



Nouméa
Tjibaou Culture
in natural
ventilation



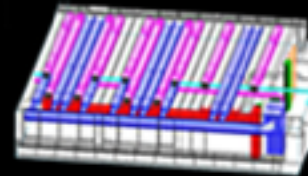
Turin
Bio-climatic
tower
with mixity



Amiens
Public University
with mixity



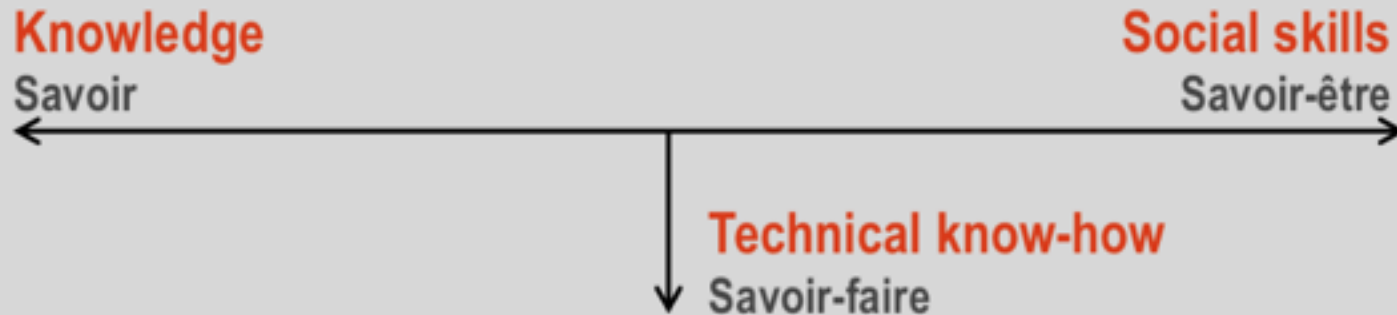
E.N.S. Cachan
in Saclay
Hybrid ventilation



Lago's School
« Les puits du désert »
Valley of Tidène - Niger



Innovations, Experiments,
Transmission and Sharing of the knowledge
Master ATEC AV- ENSAL - School of Architecture of Lyon



“Looking for virtuous architecture,
a **COOPERATIVE, COLLABORATIVE** and
EXPERIMENTAL design practice”

“A la recherche d’une architecture vertueuse,
une pratique de projet **COOPÉRATIVE,**
COLLABORATIVE et **EXPÉRIMENTALE**”

The reference starting point in 1990 :
Greenhouses Porte d'Auteuil in Paris
The purpose : Create the first double skin
facade controlled by temperature

- International City of Lyon
Number and types of openings according
to the orientation and practices



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1991 – 1998

Le Centre Culturel Jean-Marie Tjibaou

Nouméa, Nouvelle Calédonie

A MODUS OPERANDI :

Let us always conceive with a multidisciplinary team ...
Since the first pencil stroke the coherent projects have to integrate the site, the sun, the wind, a globale conception of the structure, the natural ventilation and virtuous and happy practices.

The Tjibaou Cultural Center is 20 years old... following this process.

A project is a whole and the environmental vision should strongly recommend us to create « globally virtuous projects ».

A project conceived globally with the "Sun" and to the "Wind"



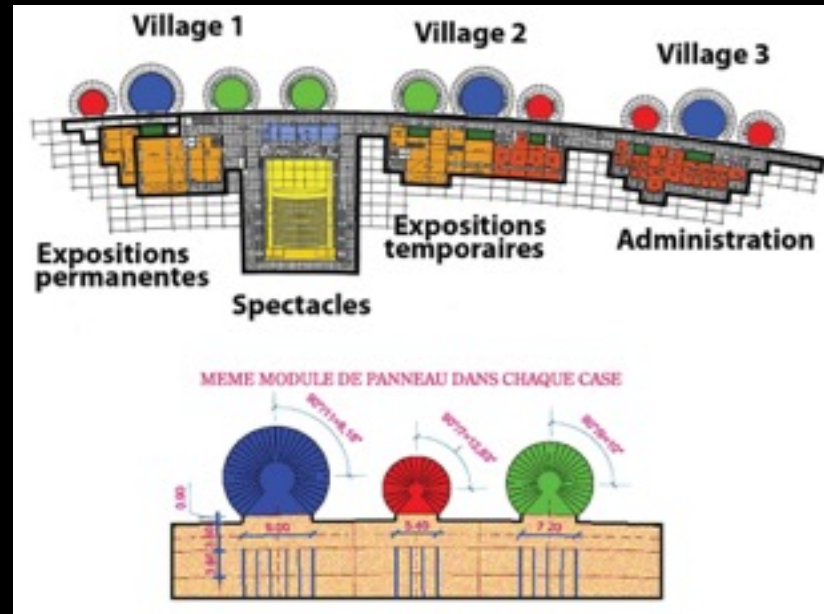
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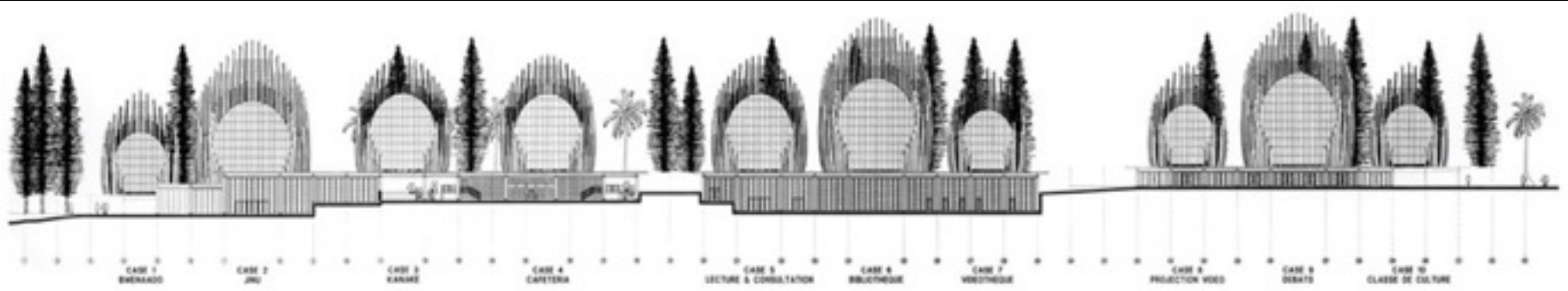
**The outside skin allows to move away the outside layer of hot air,
and to integrate the chimney for inside air**



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3 villages and 3 sizes of « cases » put on grids of 100 and 180 cm

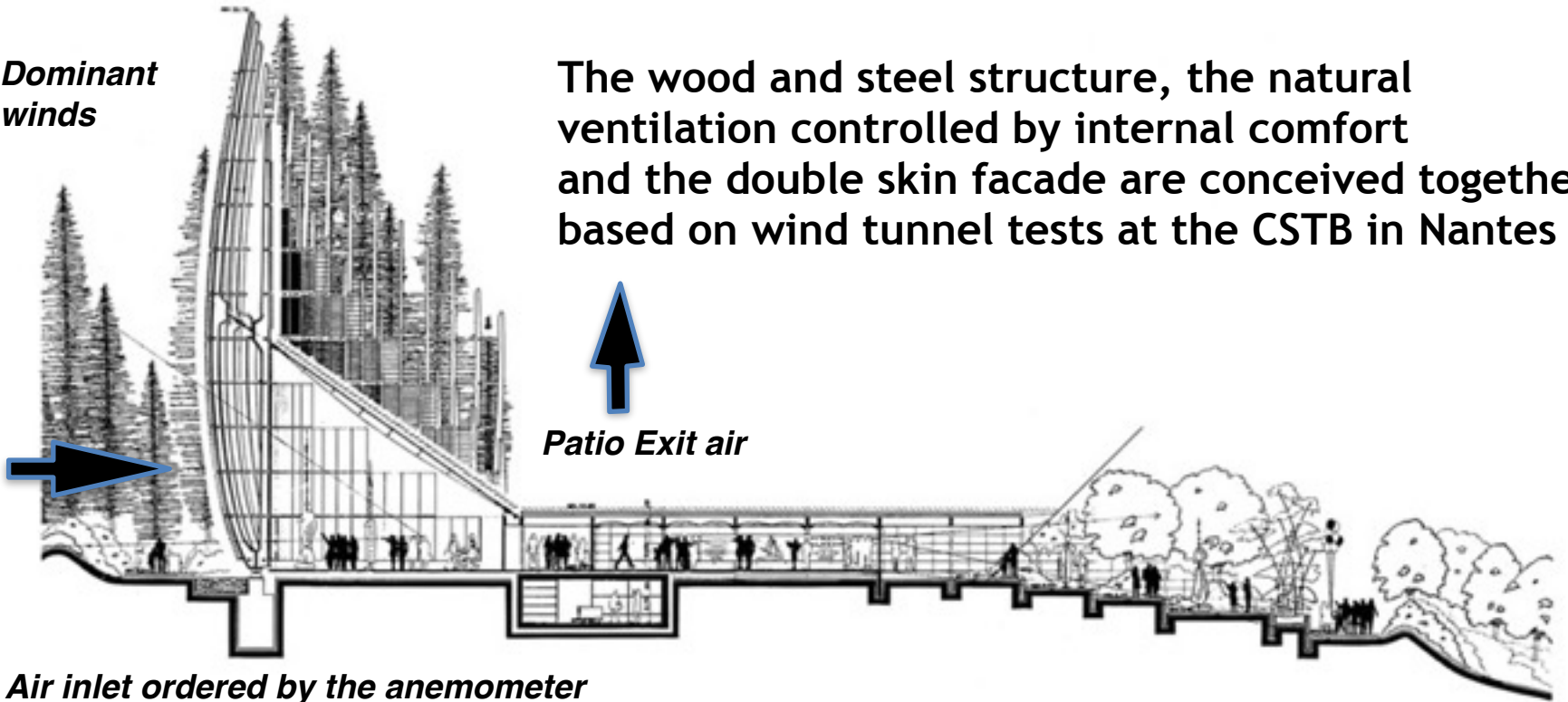




Cyclonic double structure

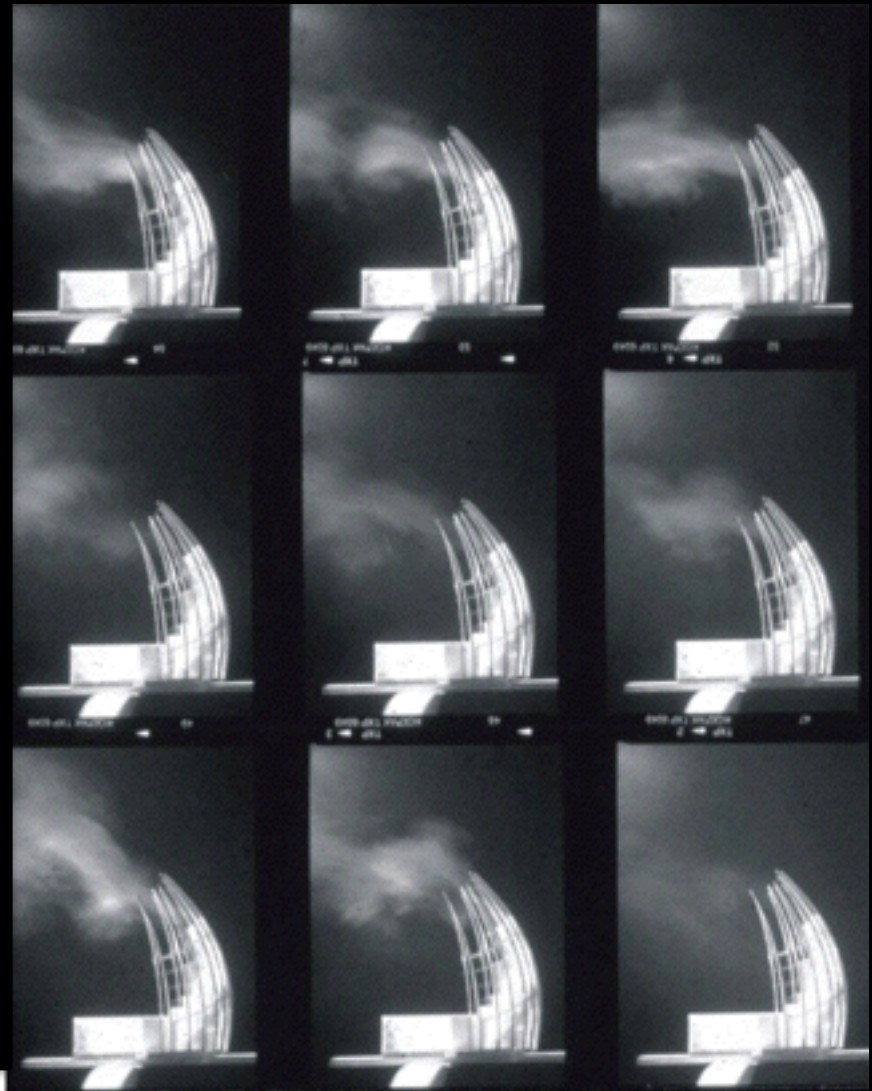
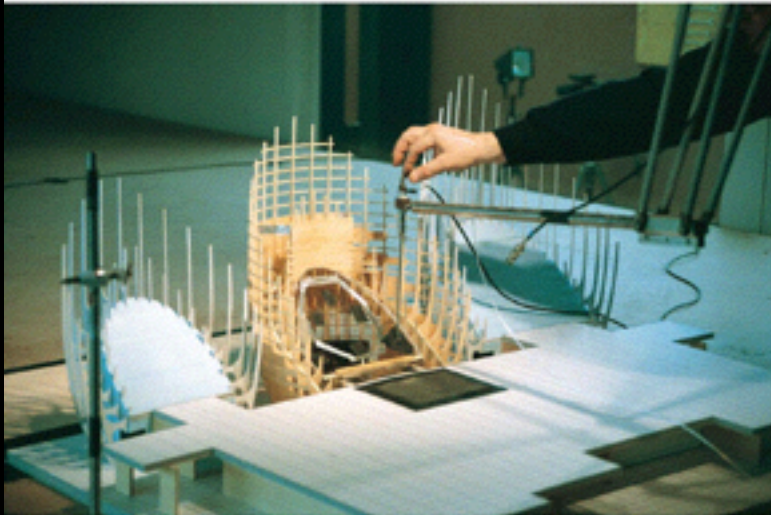
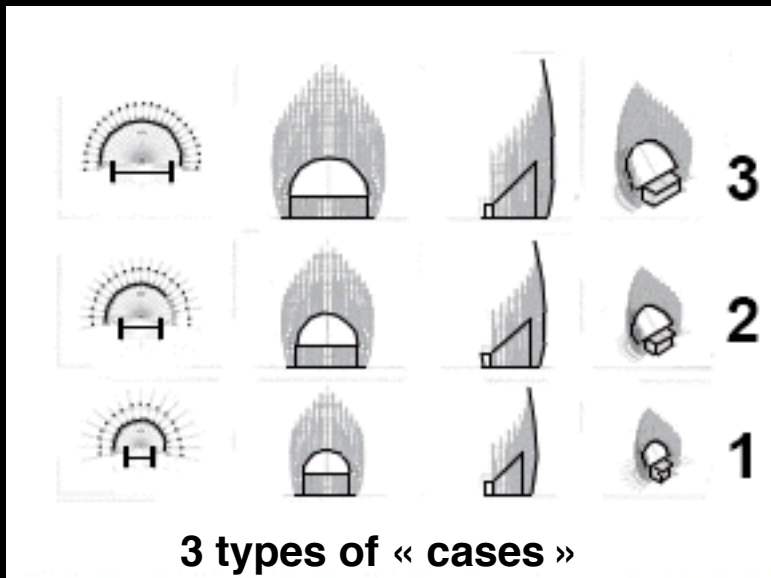
Dominant winds

The wood and steel structure, the natural ventilation controlled by internal comfort and the double skin facade are conceived together based on wind tunnel tests at the CSTB in Nantes



Air inlet ordered by the anemometer

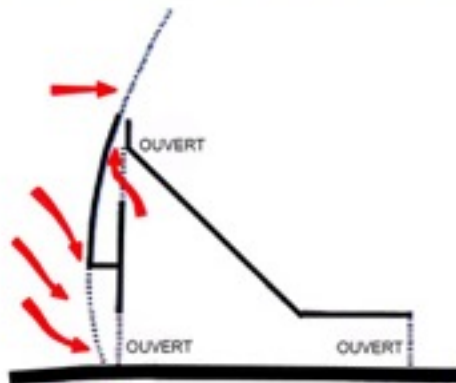
Tests CSTB Nantes - Jacques Gandemer - for cyclonic winds and natural ventilation



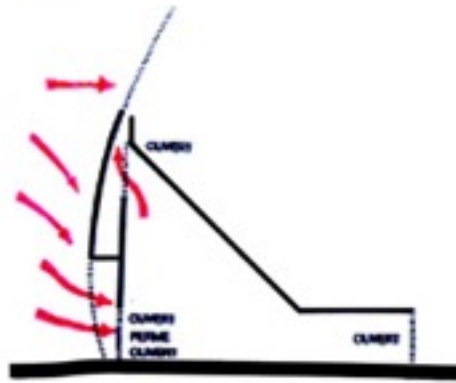
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Concept sections natural ventilation

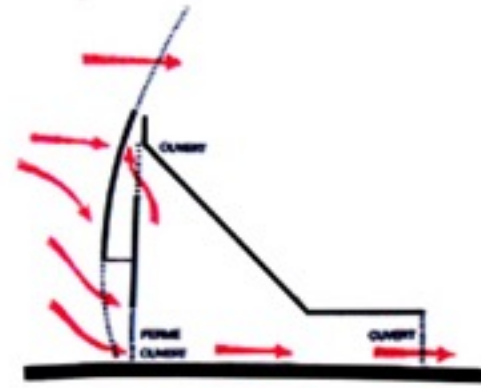
SCHEMAS DE VENTILATION NATURELLE



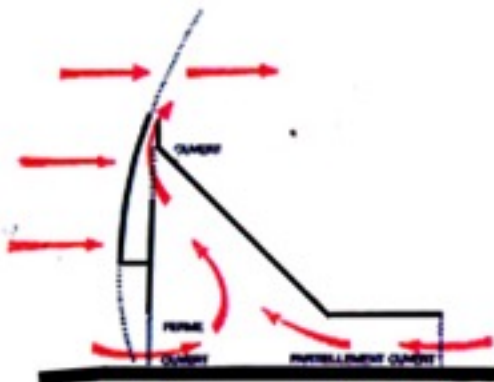
VENTS TRÈS LÉGERS (inférieur à 3m/s)



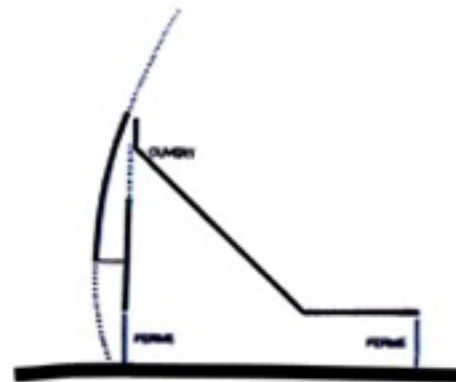
VENTS LÉGERS (de 3 à 6m/s)



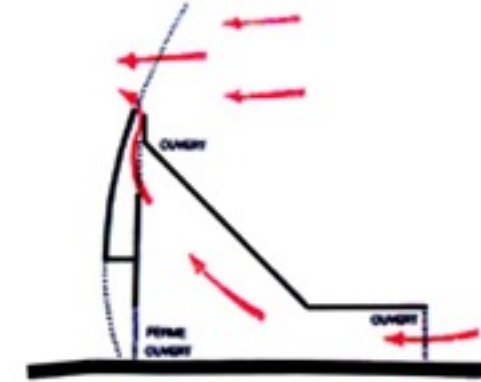
VENTS MODÉRÉS (de 6 à 10m/s)



VENTS FORTS (de 10 à 15m/s)



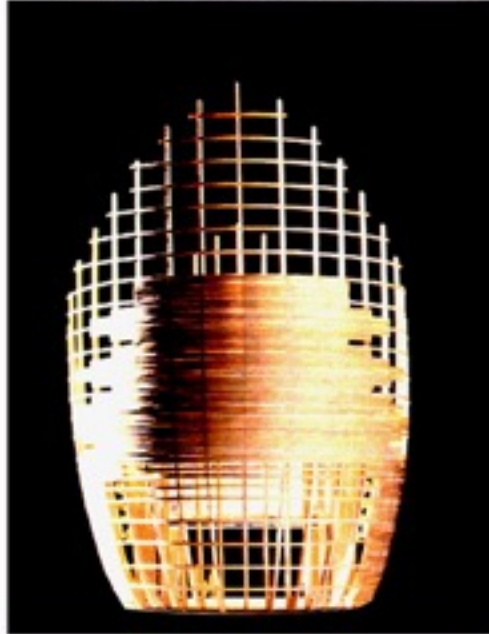
CYCLONE



VENTS SENS INVERSE (de 3 à 10m/s)

Models of studies for natural ventilation and tests of structure with cyclonic Winds

MAQUETTE D'ESSAIS VENTILATION NATURELLE C.S.T.B.



ESSAIS REALISES EN SOUFFLERIE AU C.S.T.B.

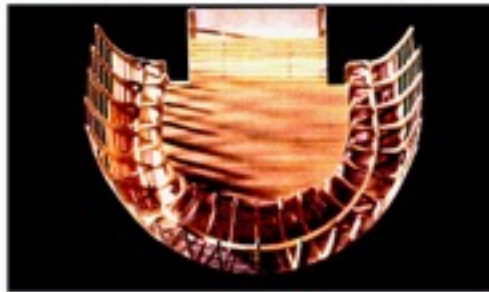


FEVRIER '93

MAQUETTE D'ESSAIS PRESSION AU VENT C.S.T.B. FEVRIER '93



MAQUETTE D'ESSAIS VENTILATION NATURELLE C.S.T.B.

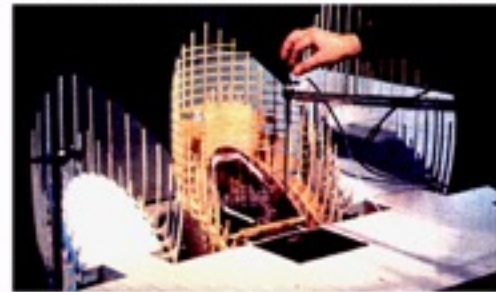


ESSAIS REALISES EN SOUFFLERIE AU C.S.T.B.

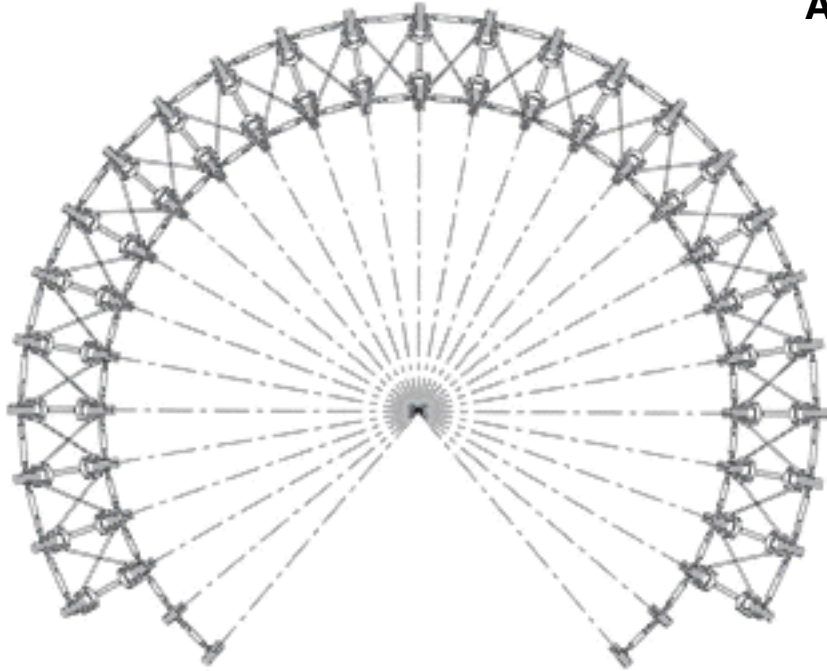


FEVRIER '93

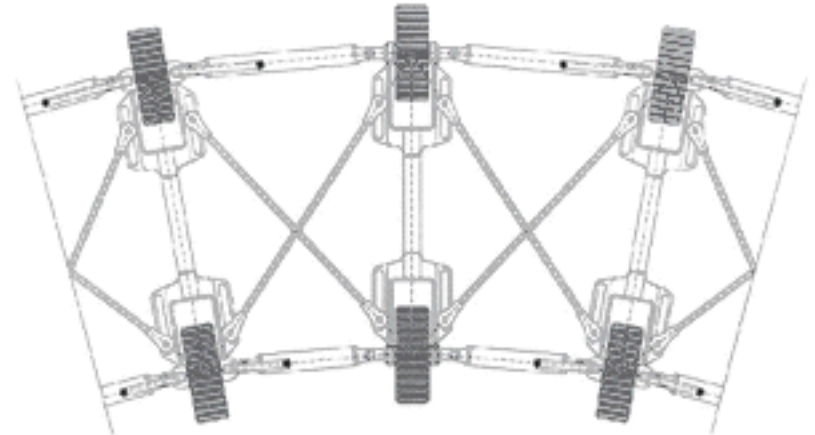
ESSAIS REALISES EN SOUFFLERIE AU C.S.T.B. FEVRIER '93



Iroko structure / steel divided into halves in double encircles



Amounts iroko stuck on cast-iron parts
Tested in laboratory in Toulouse



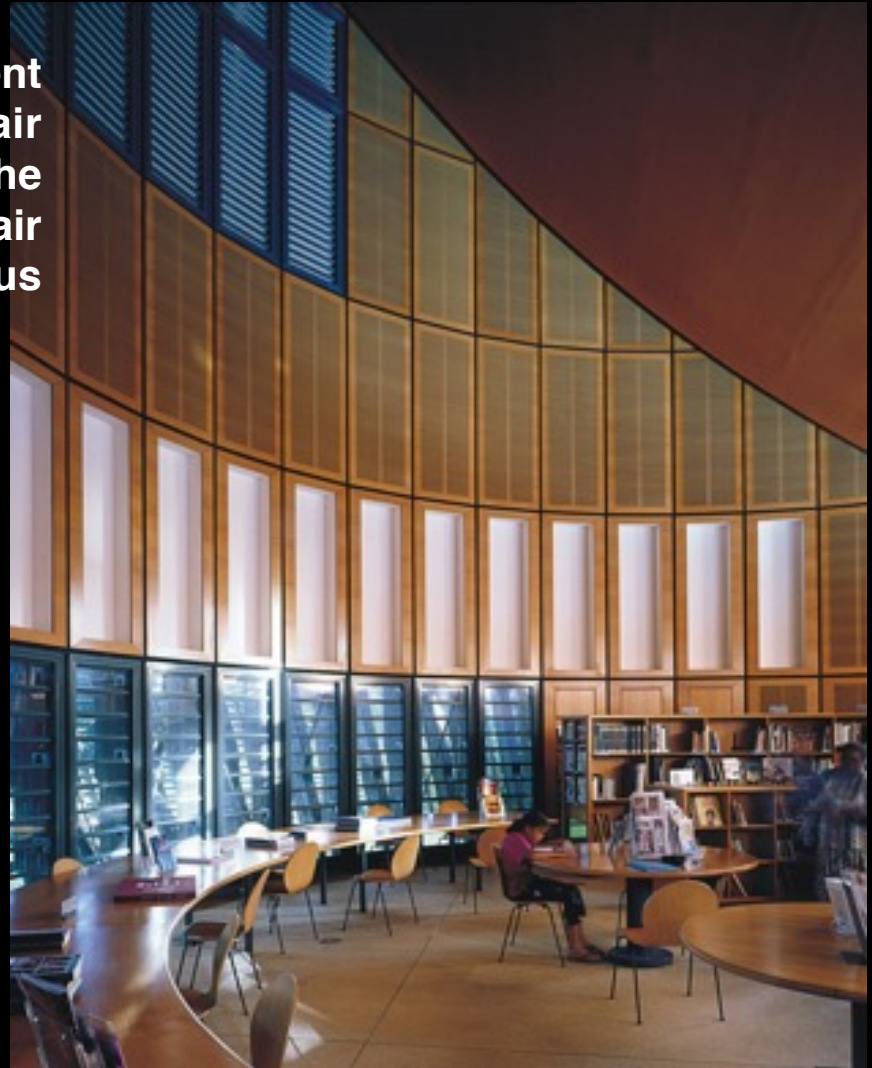
Double skin wood structure to resist
cyclonic winds rising up to 250 kph
Iroko + crossbars and conterbracing made
of steel + cast connections and welding



Maximum comfort... thanks to the regulated natural ventilation

The nacos of the facade open according to the signal from building management system, according to the speed of air measured by an inside anemometer. The level of comfort is much better than with air conditioning with a very light continuous draft.

The energy consumption is very low.
In service for 15 years!



2006-2015

Intesa Sanpaolo office building

Leed platinum bio-climatic tower
Turin, Italy

A REPORT :

**Air conditioning is not necessary, most of the time.
It generates moreover an important absenteeism.
It is possible, and even fascinating, to replace it by other much
more successful thermal models with natural ventilation with
the possibility of designing hybrid buildings as this tower
classified Leed Platinum ...
but we then have to fight in France against the lobby of nuclear
power who likes consuming energy and against old-fashioned
current training in the french schools of engineering.**

A tower drawn by " THE SUN " and by " THE WIND "

Facades are different for every orientation because of the thermal contributions, the Greenhouse is a cold greenhouse enslaved with a double inverted skin



est and west

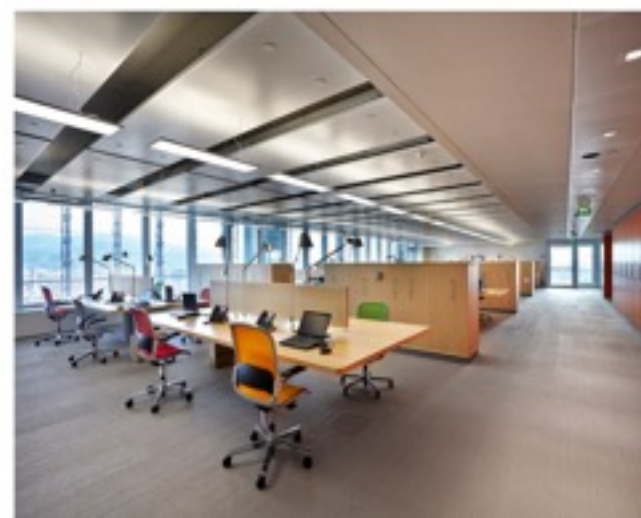
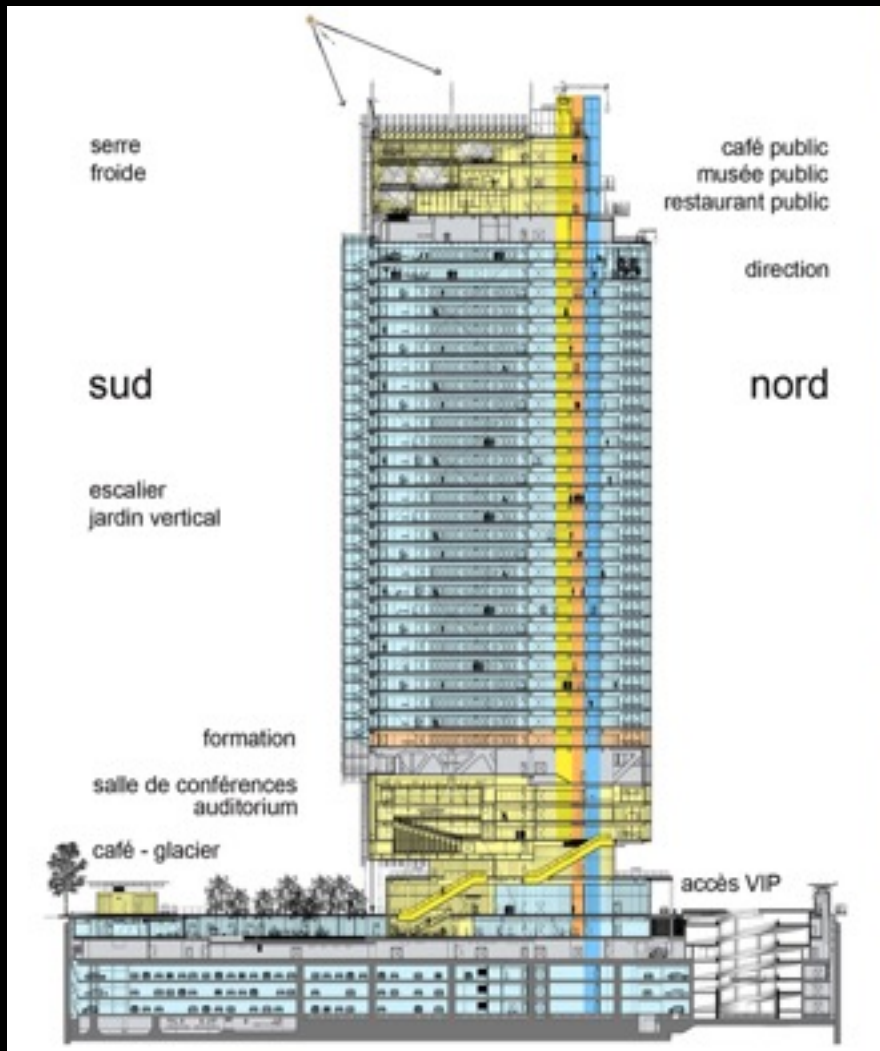
south

north



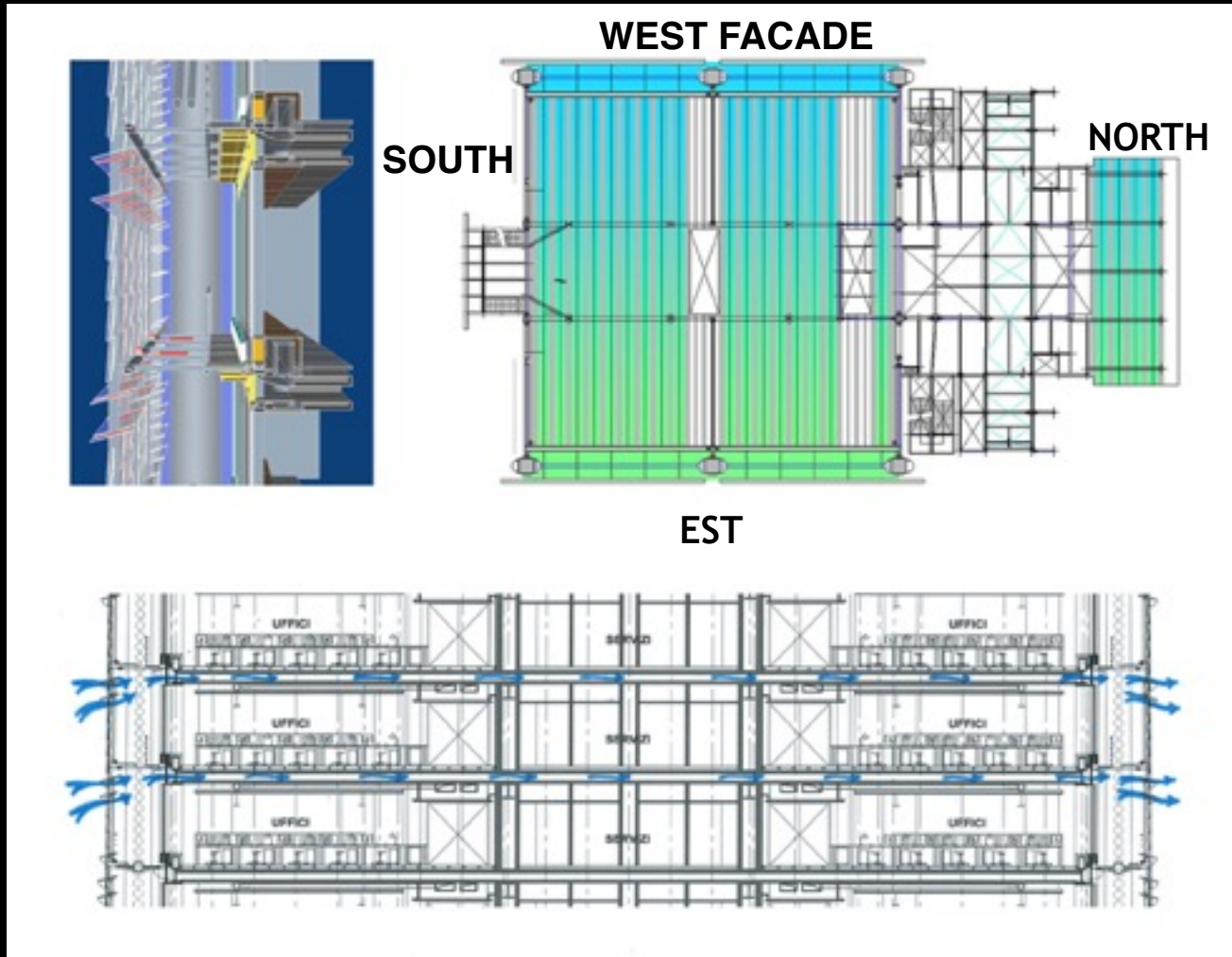
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The functions in **yellow** and **orange** are opened to the public
The functions in **blue** are booked for the bank

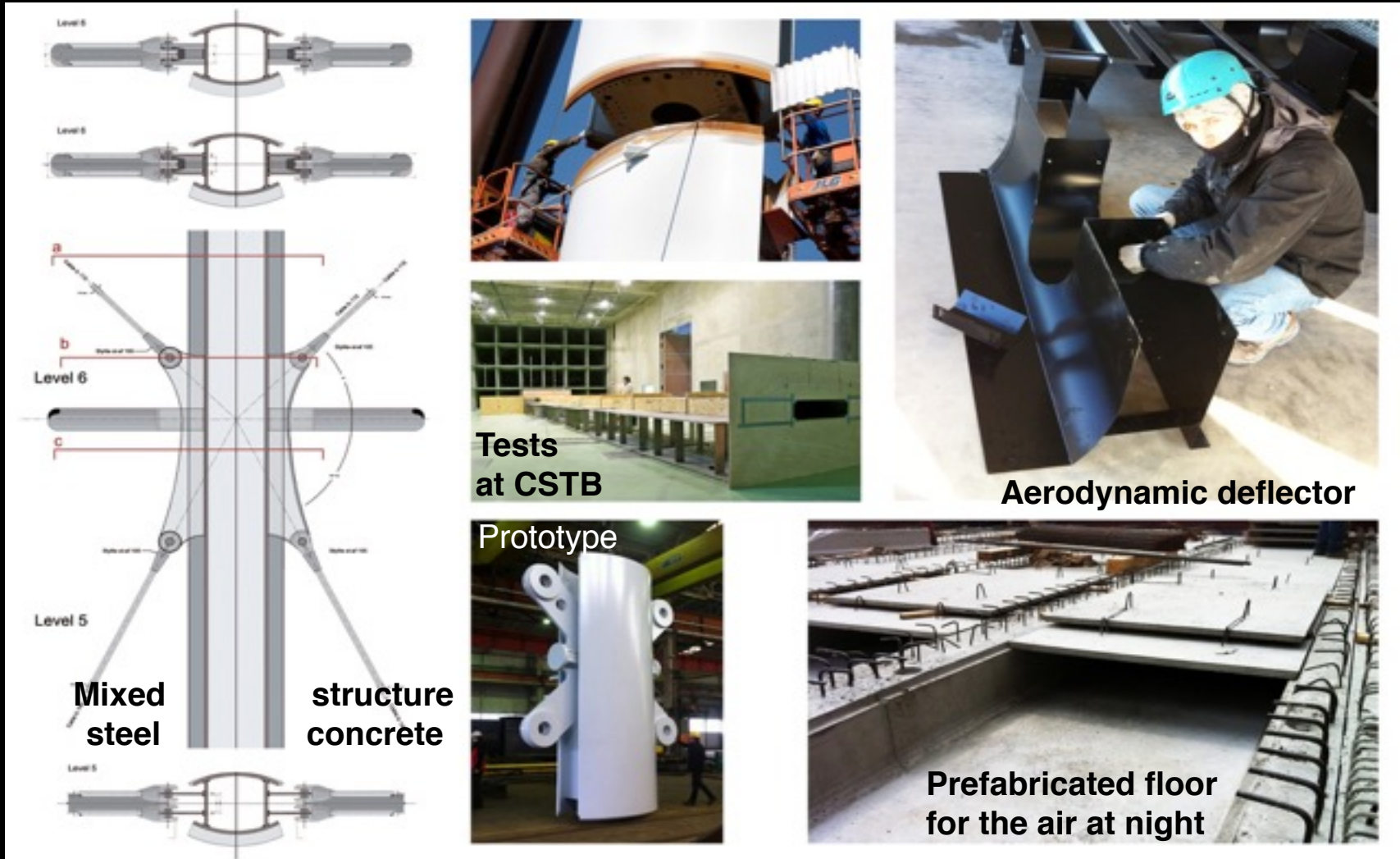


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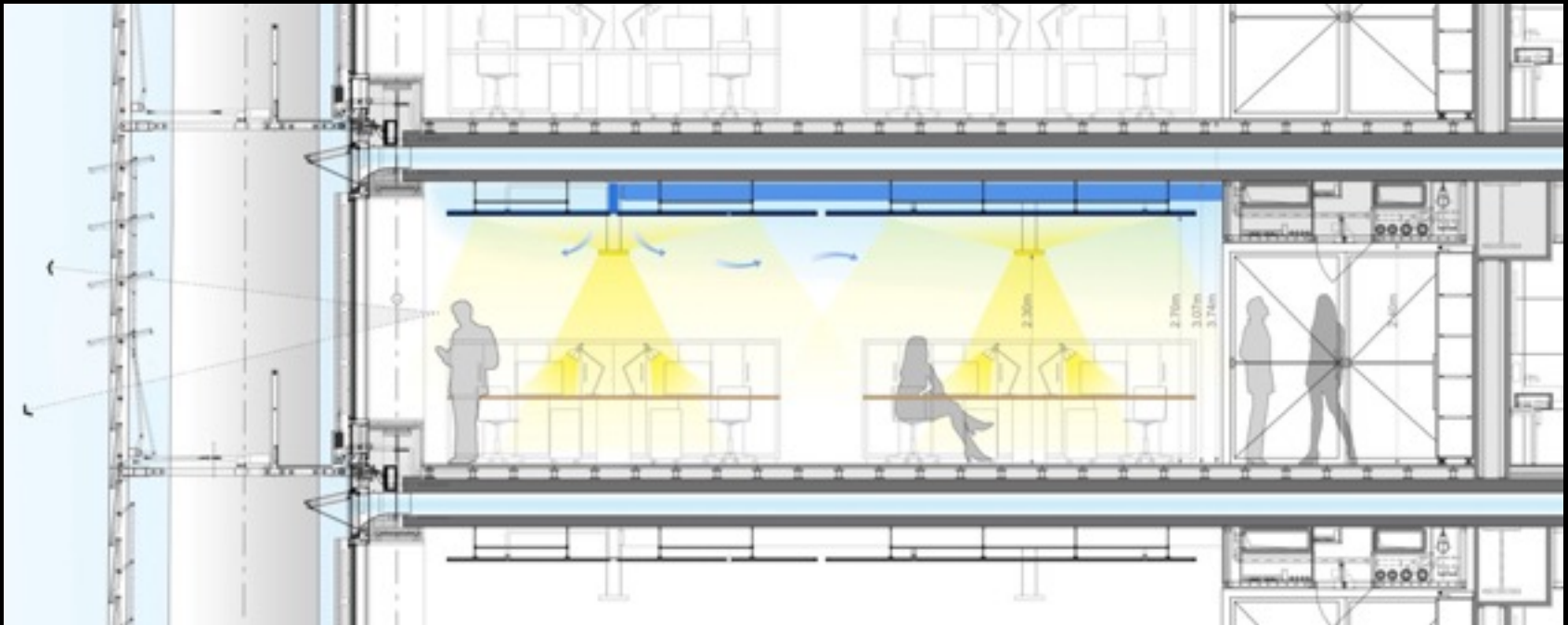
Floors prefabricated in concrete, with big spaces for the wind to cool down the structure during the night (delta of temperature with the Alps)



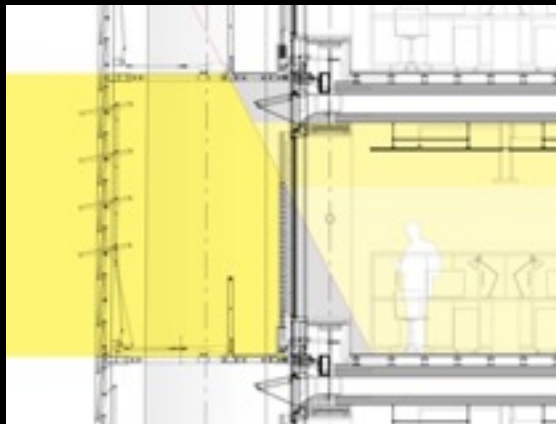
The structure, the prefabricated floors, the concept of controlled natural ventilation and the facades are globally designed in connection with a sophisticated BMS



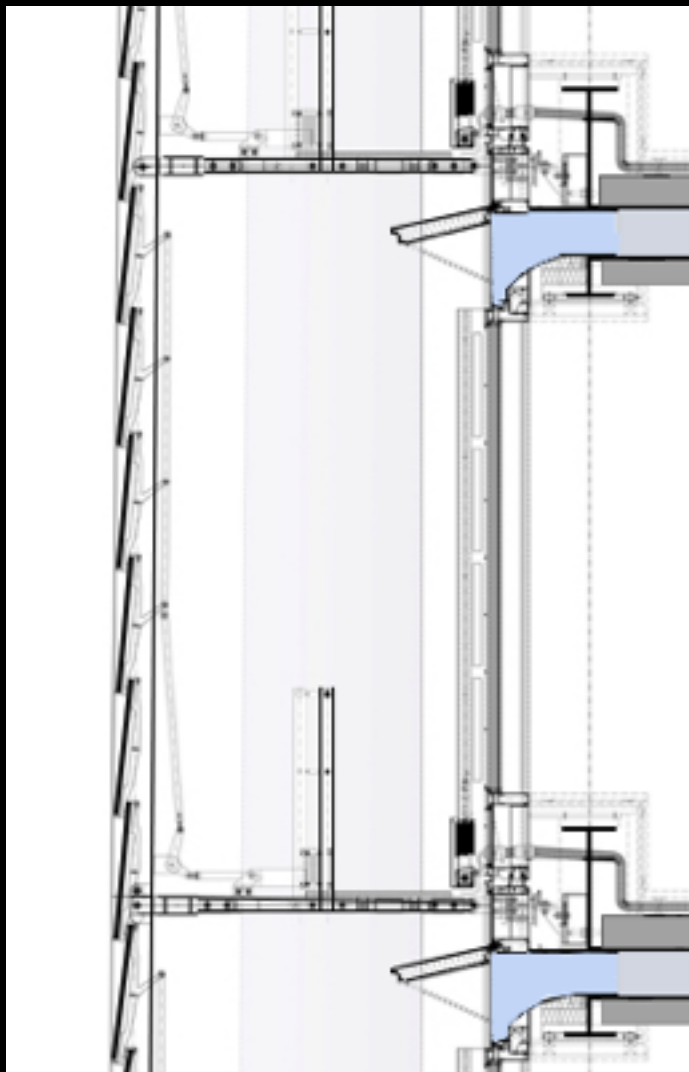
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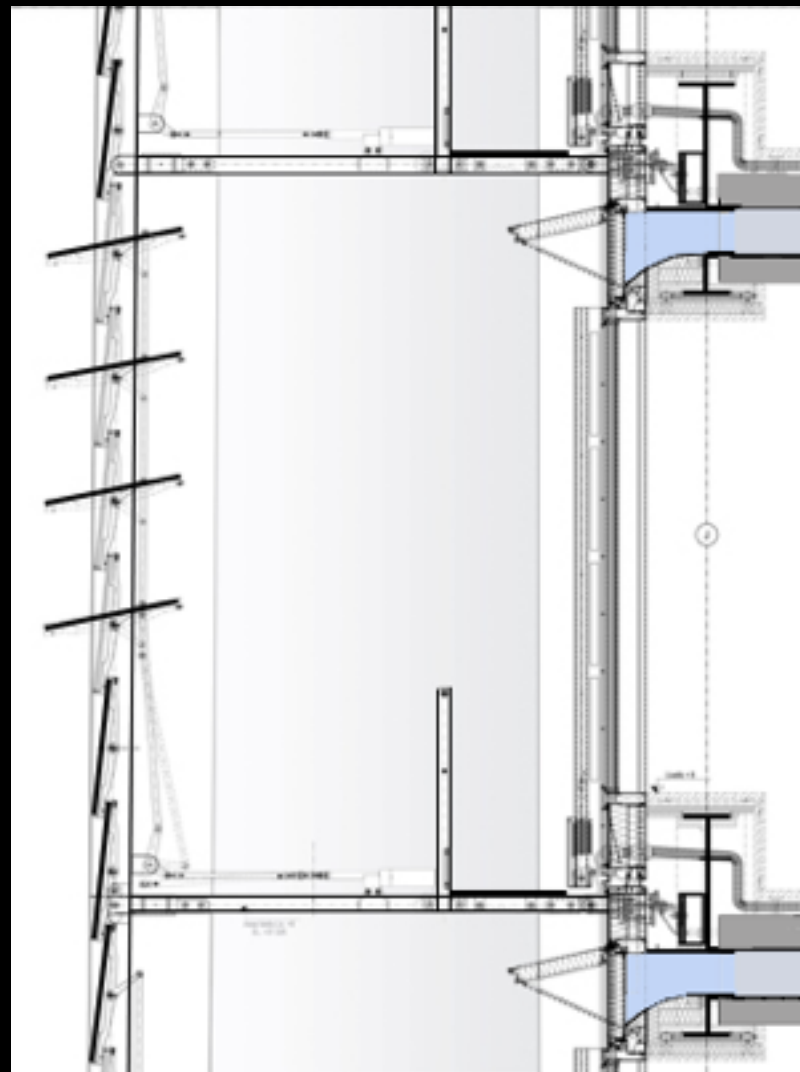
Blinds motorized and inverted in small strips - Glazed Facade all height



motorized flaps close at day time



motorized flaps opened at night



Prototypes opening facade



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Internal spaces of the offices at the end of construction site Indirect lighting towards the cold ceilings - Continuous glazing



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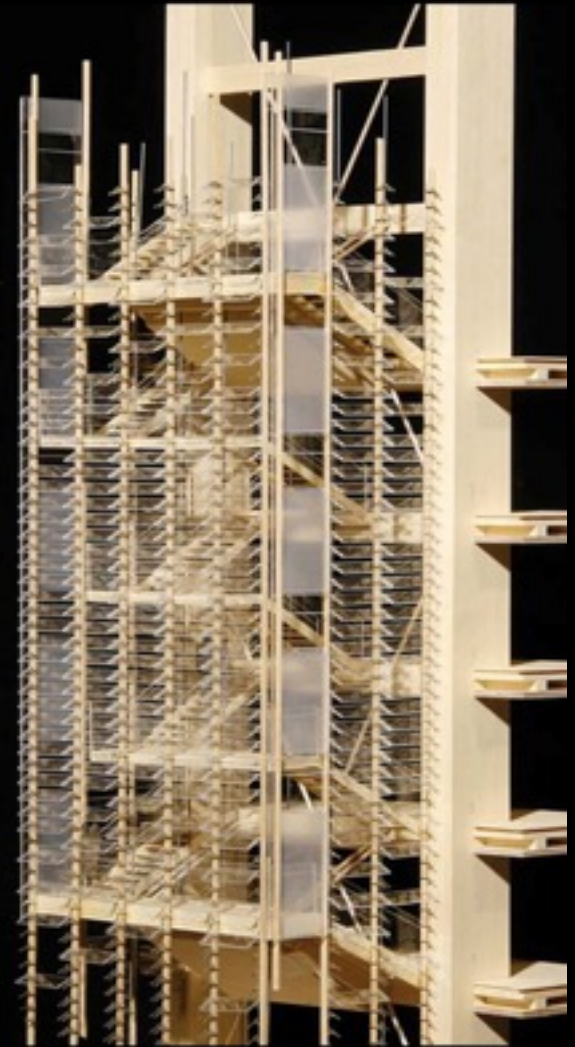
The south staircase - garden with the conterbracings of the structure An immense vegetated canopy with a contemplative use



Landings oversized to take
a coffee and discuss



Mattress of plants every 4 floors

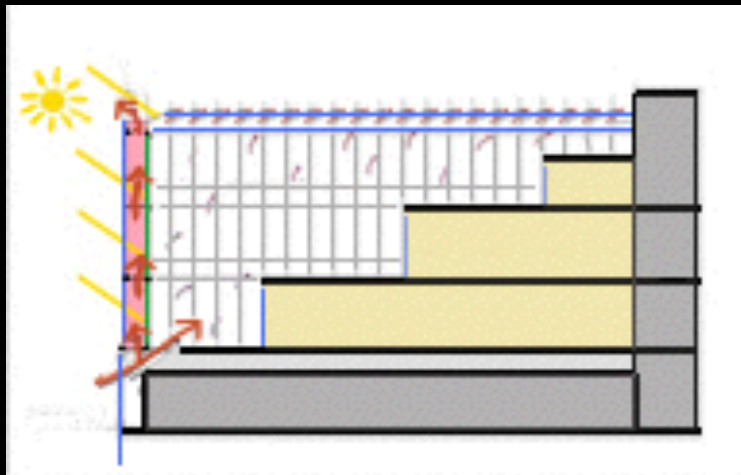
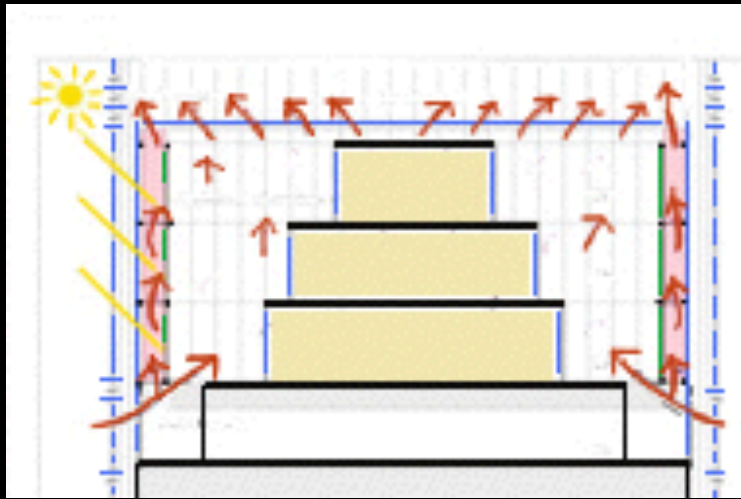


Climbing plants against the Sun



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A cold greenhouse ventilated naturally, controlled in the BMS with a double facade inverted skin and facing north sheds



**The Greenhouse is a public place at 160 meters altitude,
including
a garden, a restaurant, a small museum and a coffee shop**



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Structure of the greenhouse, air inlets and exhaust for the natural ventilation



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Exterior air inlets



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2010- Work in progress

Public and university Citadel

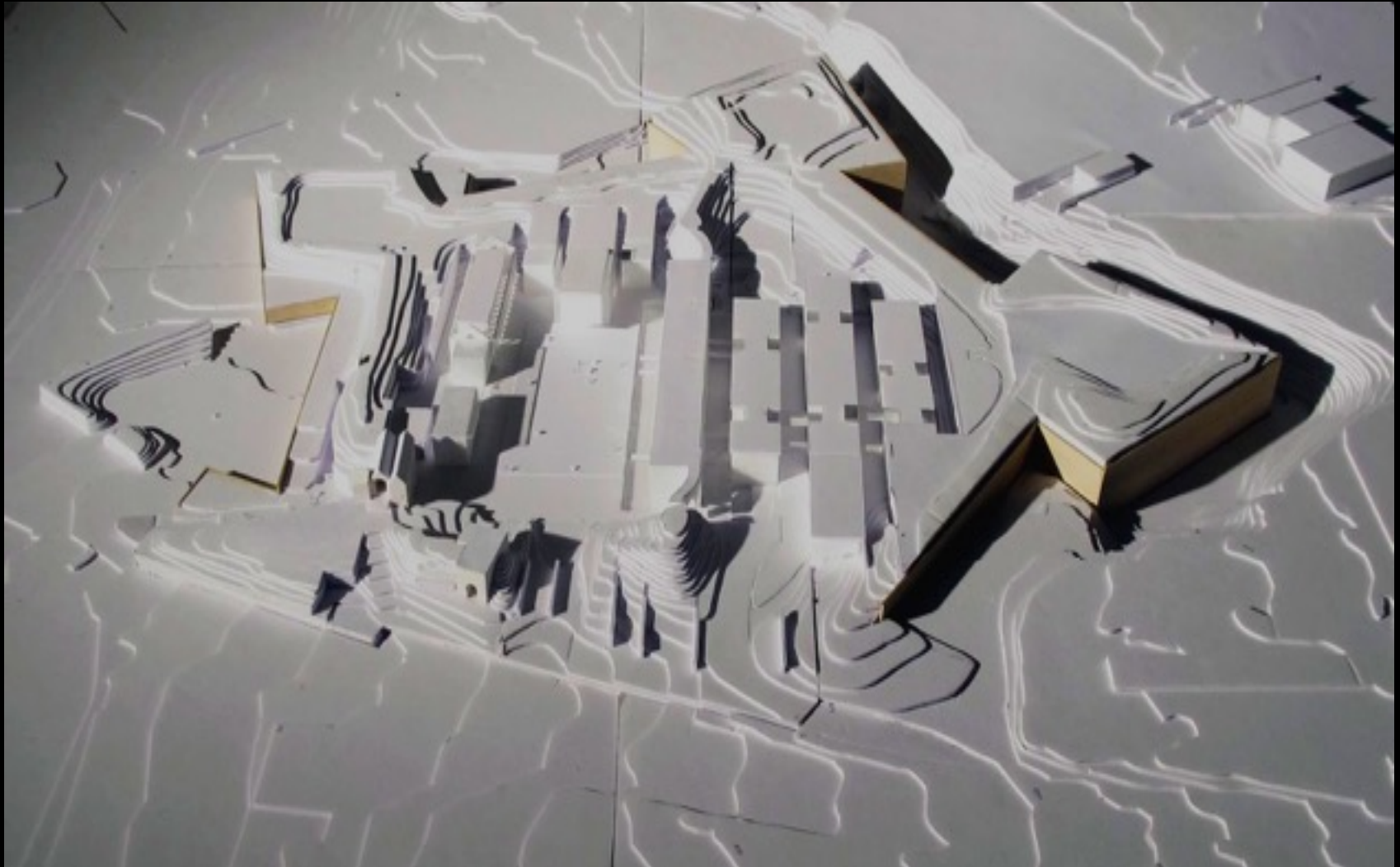
Amiens, France

3 VIRTUOUS INVENTIONS :

- **THE DIABOLO**, a vegetated ground, draining, horizontal.
Patent PV RPBW TERREAL
- **RED BOXES, 2 HYBRID BUILDINGS**, in natural ventilation,
a new generation with motorized openings, driven by probes
of air speed and by temperature
- **THE MIXED FLOOR VOUSOIR / CONCRETE**, a composite floor
allowing to lead the air and to cross networks in alveoli.
Patent PV RPBW AIA TERREAL

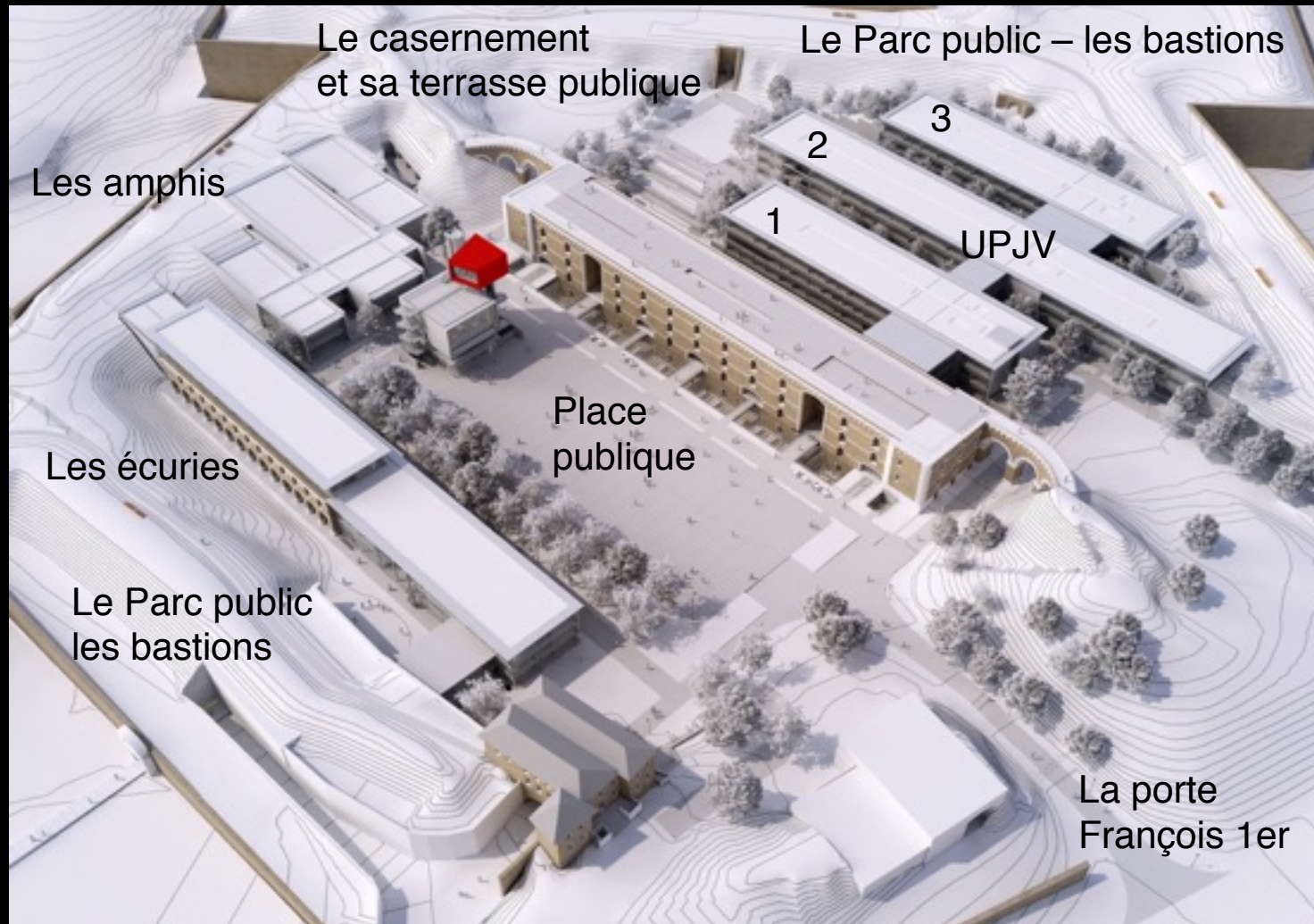
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Inscription of the project in the site in coherence with existing parts



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**Innovation with a rewriting of the program : Picardie Jules Verne University
is built with public places, animation spaces and a real mixity of uses**



Cross sections - the divisions in volumes « Amiens city / University »

Le Parc public – les bastions

La terrasse publique du casernement



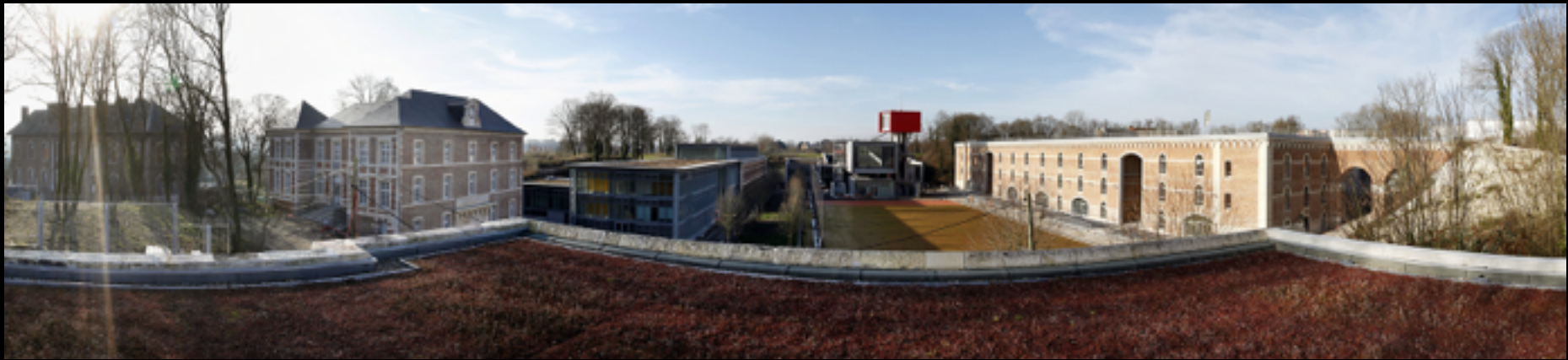
La rue des amphis

La brasserie publique
sous les 2 boites rouges UPJV

Le casernement
et la rue universitaire

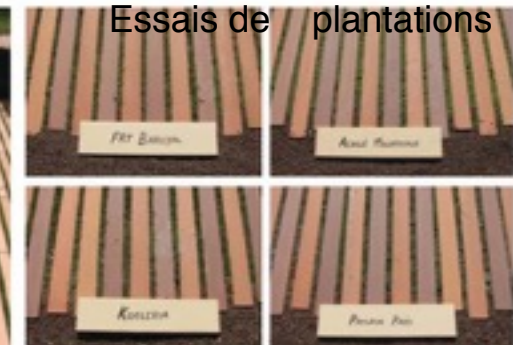
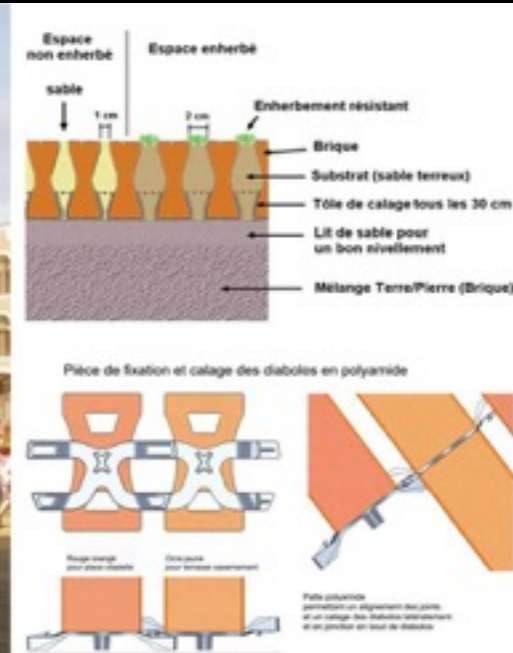


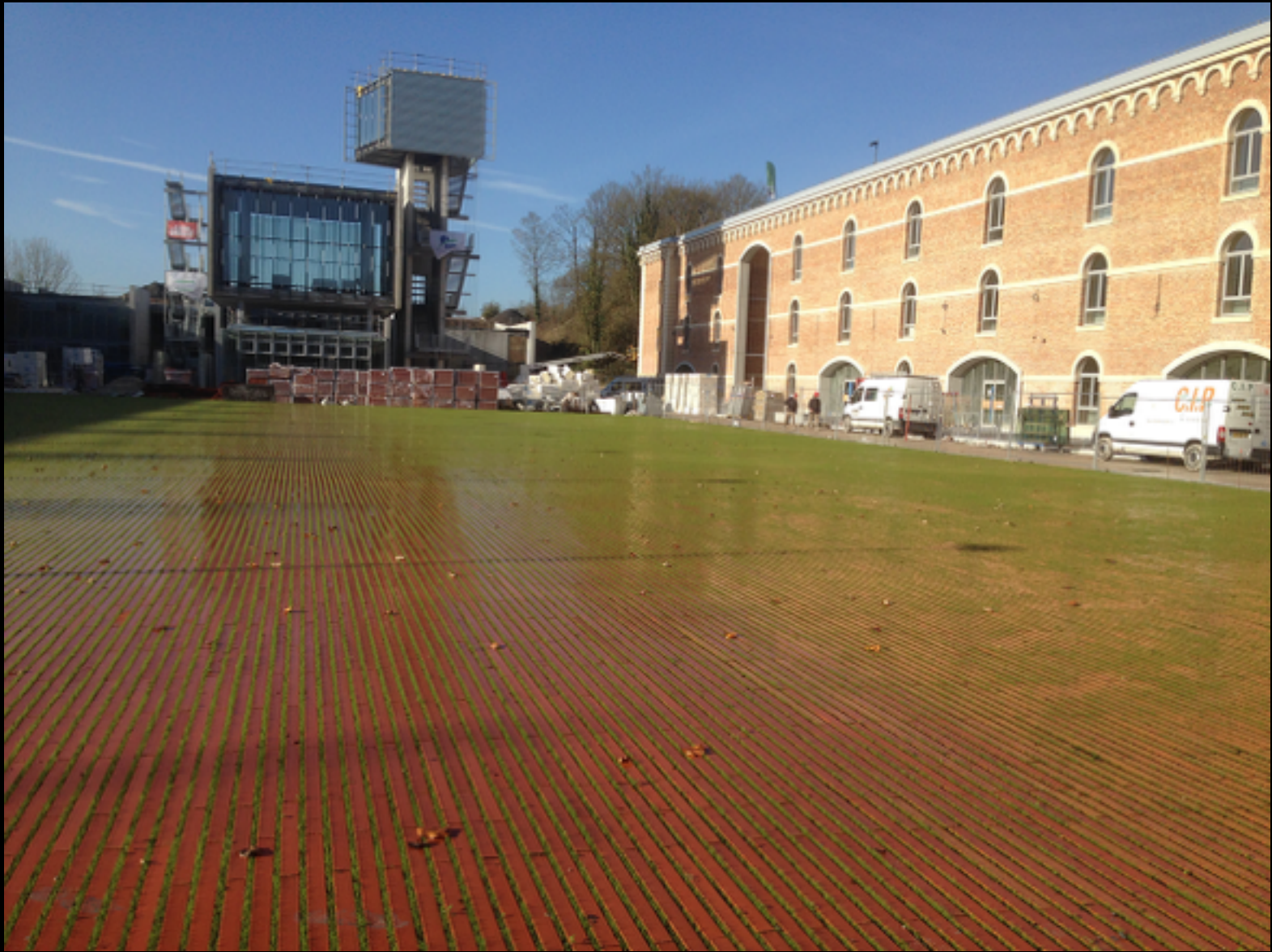
Le préau et la Place publique



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An invention P Vincent + Terreal adapted to the project : 4200 m2 of planted horizontal ground draining and rolling... for the place and the high terrace





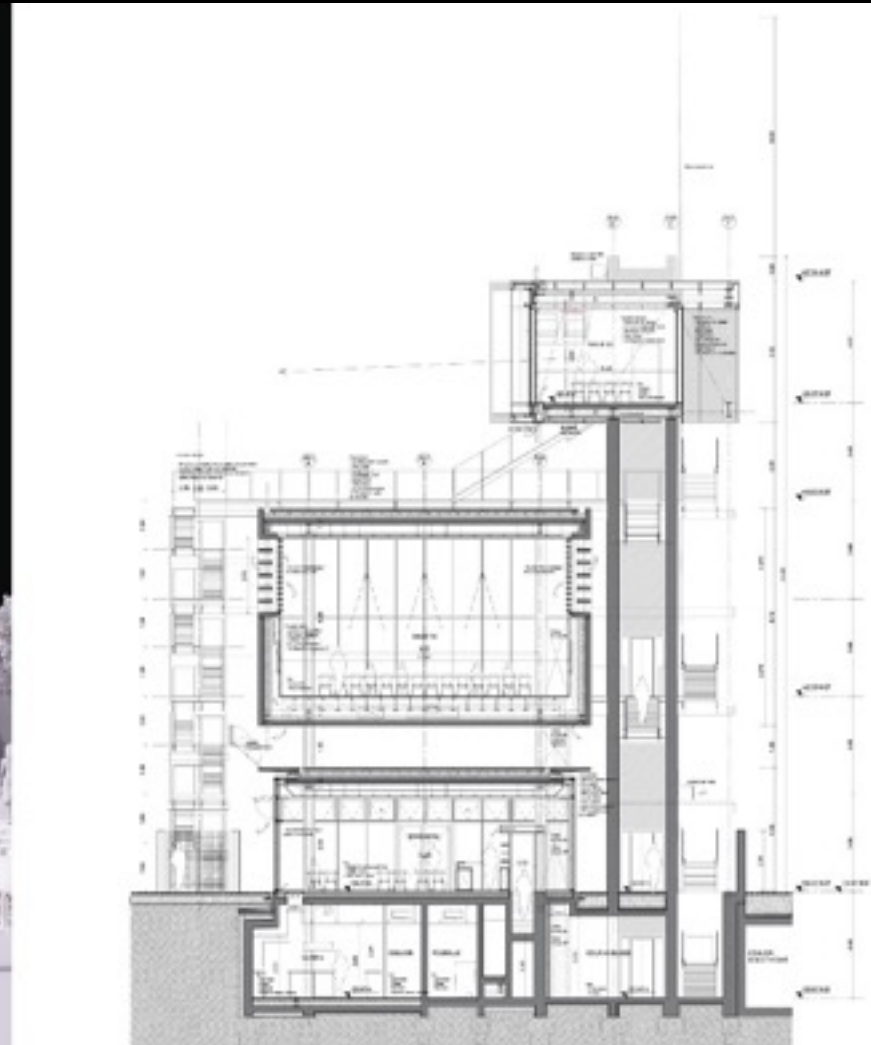
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The red box UPJV are hybrid buildings by PV-RPBW + AIA Nantes

Natural ventilation controll

ed 7 months and refreshment /

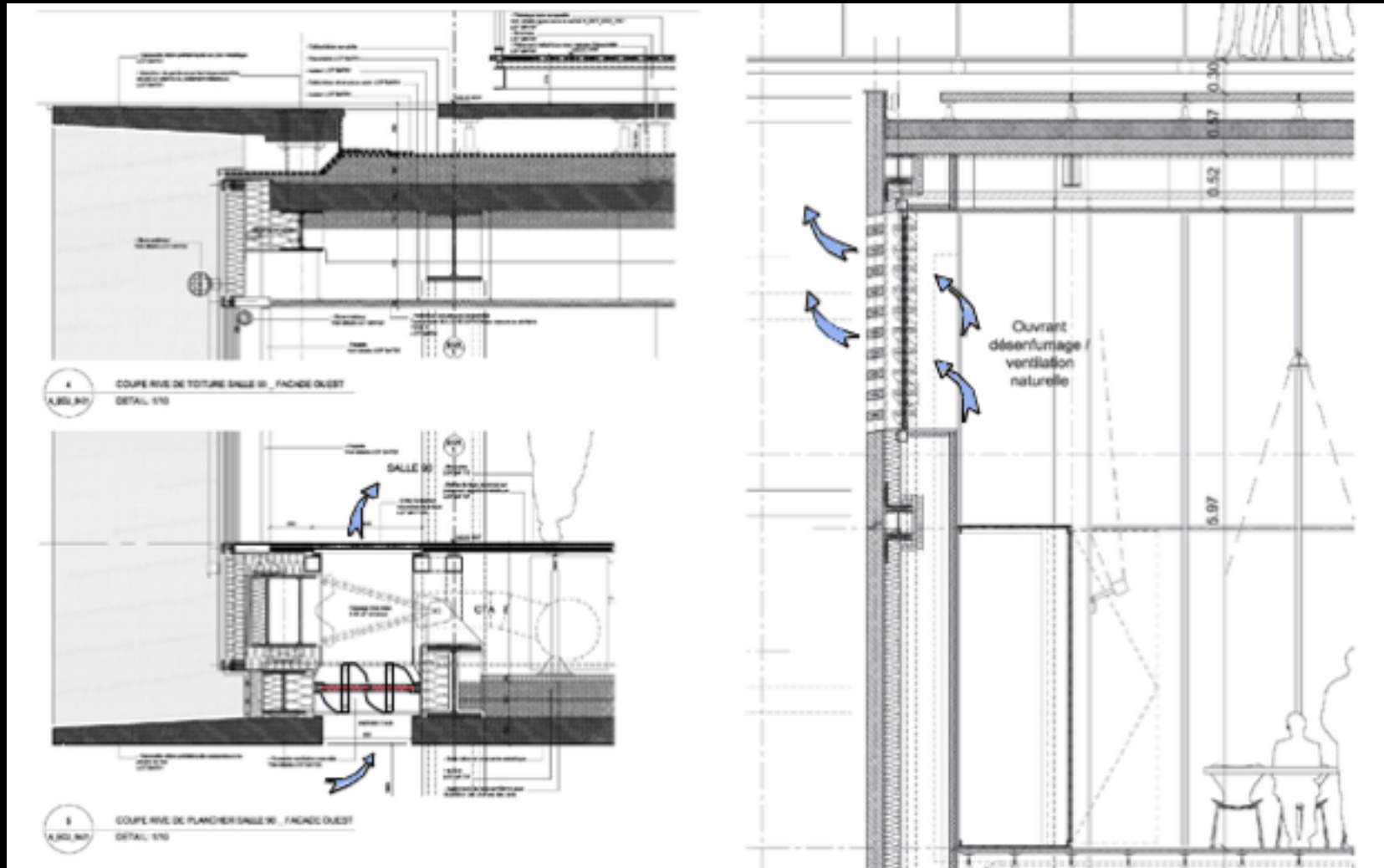
heating 5 months / year



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We have to develop alternative systems

Details of air inlets in sub-face and side air outlets





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Creation of a collaborating floor with voussoirs in terra cotta + concrete

Patented invention: PV-RPBW + AIA Lyon + Terreal



ATEX in the CSTB - Implementation Léon Grosse

EP 2 677 990 B1

FASCICULE DE BREVET EUROPEEN

010 Date de publication au brevet EP 2 677 990 B1
020 Numéro de classement EP 2 677 990 B1
030 Numéro de dépôt 1973286.2
040 Date de dépôt 17.08.2018

050 **Brevet européen relatif à un ensemble plancher-plancher associant la technique de la dalle et celle du profilé en bois et de la dalle en béton armé**
Profiled timber beam and ceiling floor assembly combining the beam and reinforced concrete

060 **Etat contractant désigné**
FR, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IL, IT, LI, LU, NL, PL, PT, RO, SE, SI, SK, TR, UA, UK

070 **Profilé** 21.08.2018 FR 1288614

080 **Date de contribution de la demande** 18.08.2018 Budapest 261049

090 **Vendeur** **Novat** 30.08.2018 18.08.2018 30.08.2018

100 **Inventeur** **Philippe** 30.08.2018

110 **Attestation de priorité** 30.08.2018

120 **Attestation de priorité** 30.08.2018

130 **Attestation de priorité** 30.08.2018

140 **Attestation de priorité** 30.08.2018

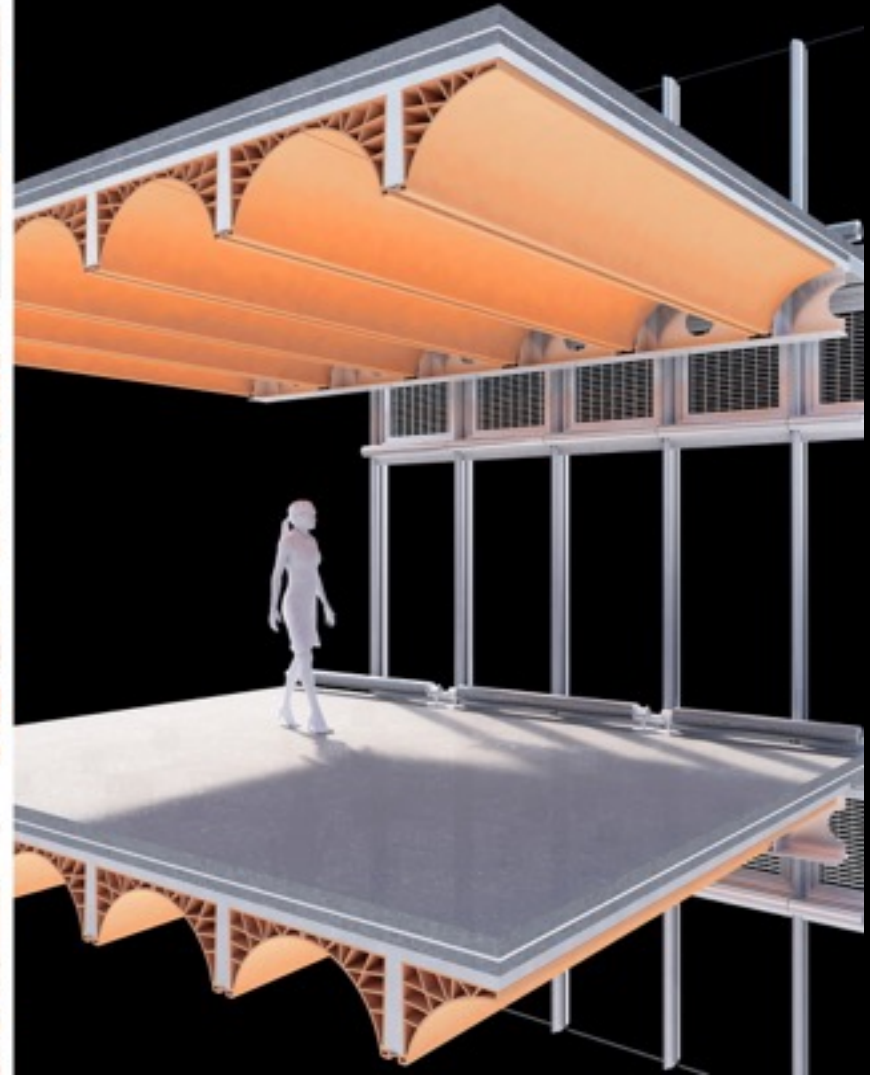
150 **Attestation de priorité** 30.08.2018

160 **Attestation de priorité** 30.08.2018

170 **Attestation de priorité** 30.08.2018

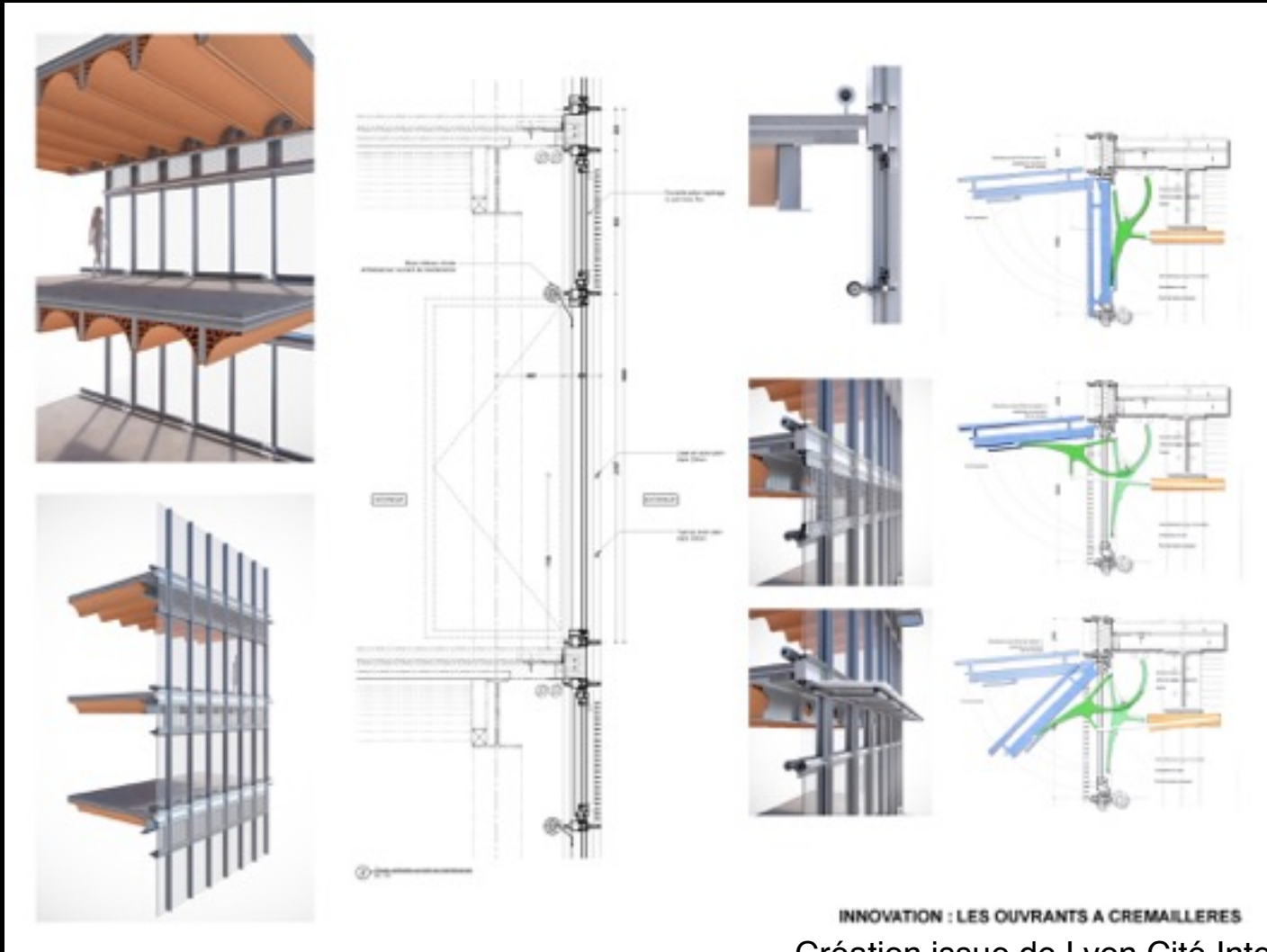
180 **Attestation de priorité** 30.08.2018

190 **Attestation de priorité** 30.08.2018

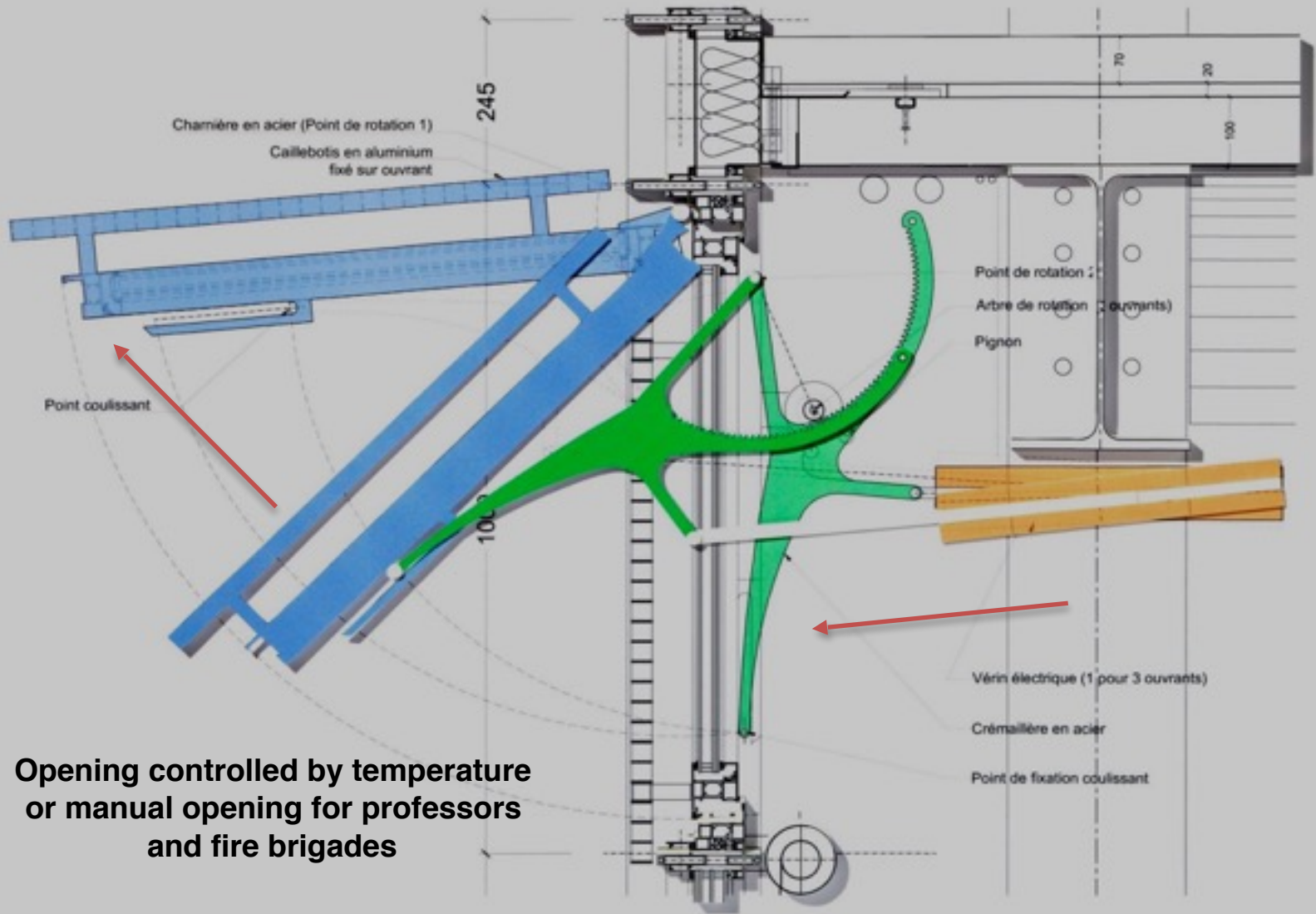


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The mixed structure, the natural ventilation and facades controlled by the temperature are part of a single concept



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**Opening controlled by temperature
 or manual opening for professors
 and fire brigades**



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2013-in progress

E.N.S. de Cachan

Plateau de Saclay, France

A GLOBALLY VIRTUOUS CONCEPT :

- AN INTERNAL BOTANICAL GARDEN FOR THE FRESHNESS**
- AN ACTIVE POND, A BOTANIC GARDEN, VEGETATED ROOFS**
- FUNCTIONS OPEN TO THE PUBLIC**
- THE NATURAL VENTILATION WITH CHIMNEYS OF AIR EXTRACTION**
- LOGIAS REDUCING THE THERMAL CONTRIBUTIONS**
- etc...**

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« Partager et transmettre »

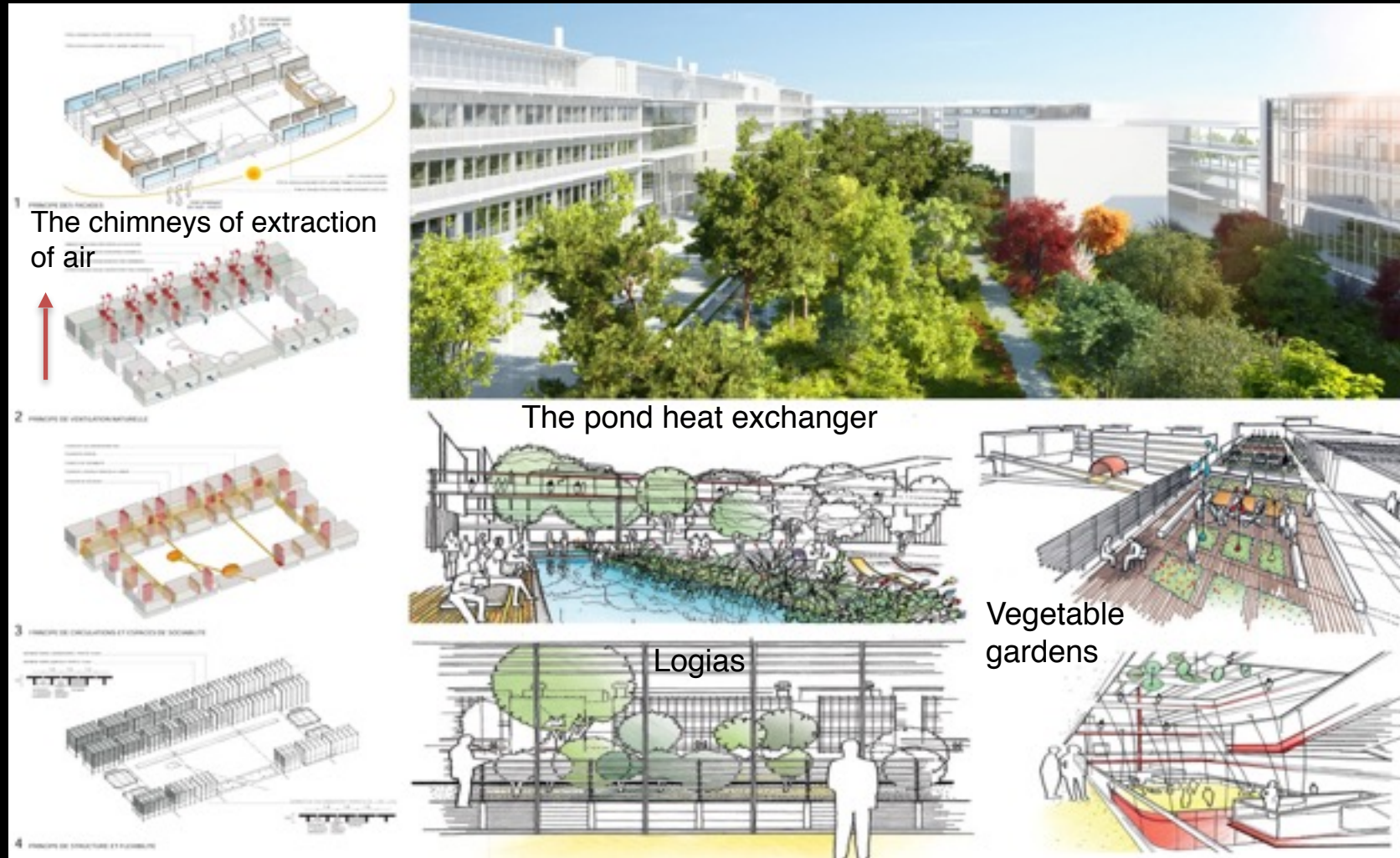
The botanical garden open to the public, the symbol of an open-mindedness



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Develop a "VIRTUOUS" project, in every sense of the word...

Since the environmental aspects until the mixing of the practices



**Hold alternative solutions to lower appreciably energy consumptions
and propose a happy working environment**



The Pond also serves as heat exchanger

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First Tests in the Eiffel WindTunnel

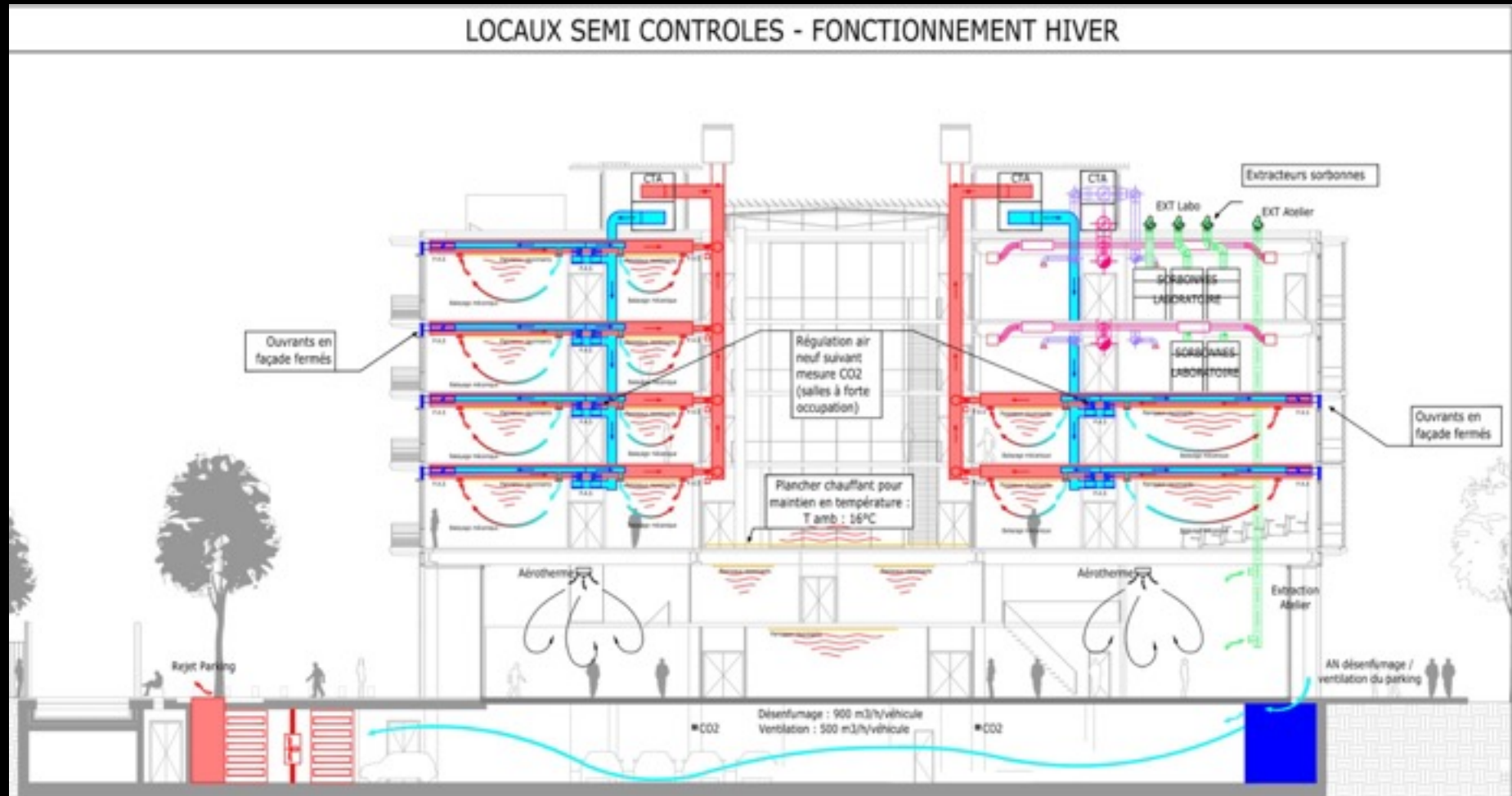
Thanks to Benoît Blanchard
and Jacques Gandemer



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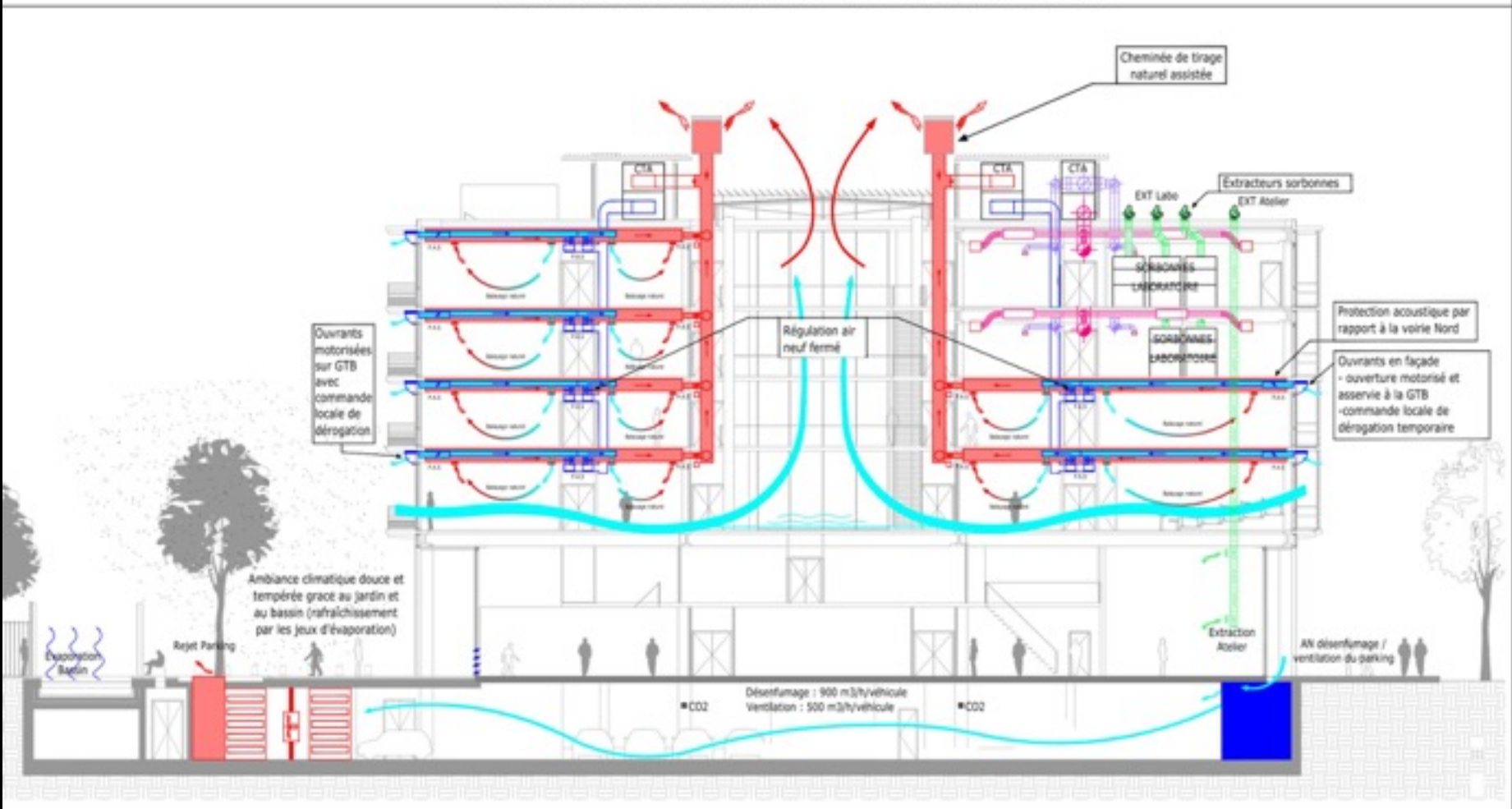
Section ENS Hybrid natural ventilation - WINTER

LOCAUX SEMI CONTROLES - FONCTIONNEMENT HIVER

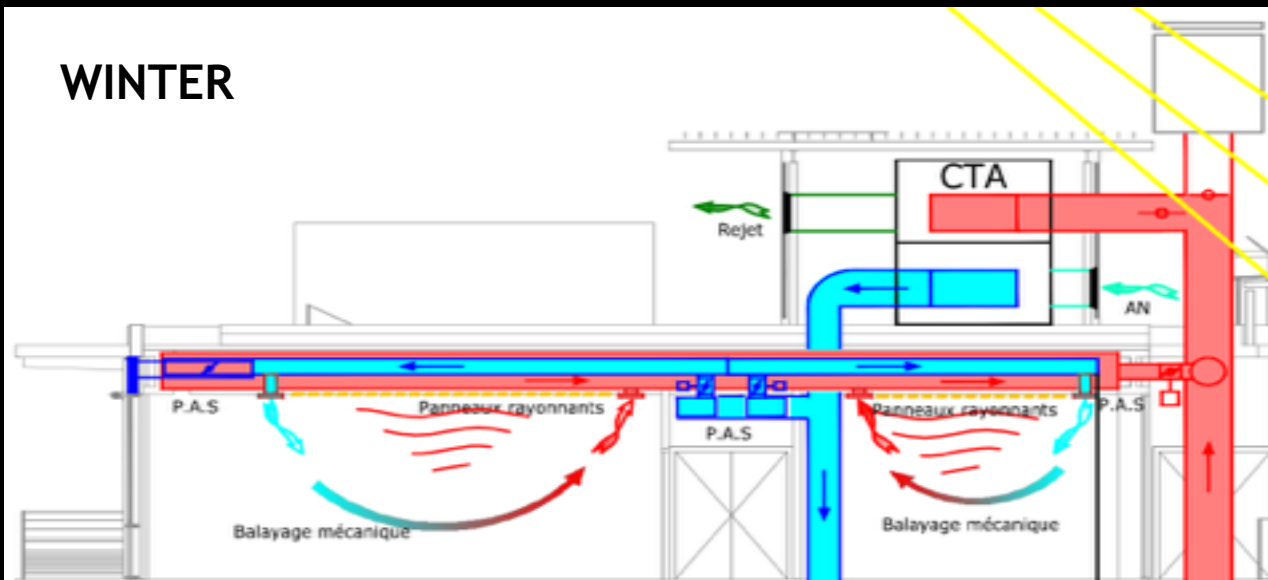


Section ENS Hybrid natural ventilation - SUMMER

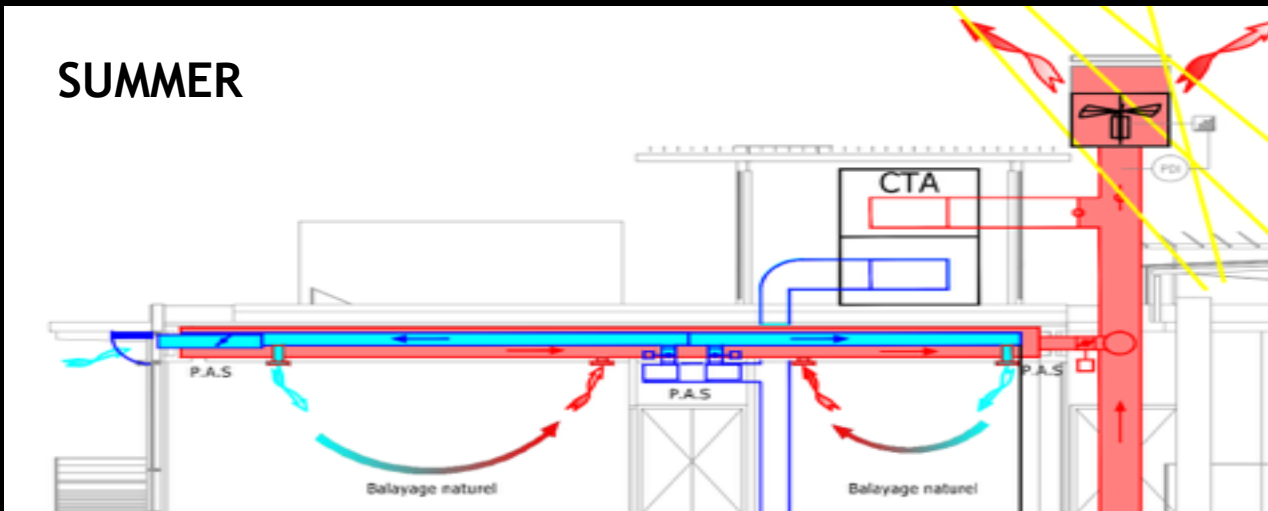
LOCAUX SEMI CONTROLES - FONCTIONNEMENT ETE



WINTER



SUMMER



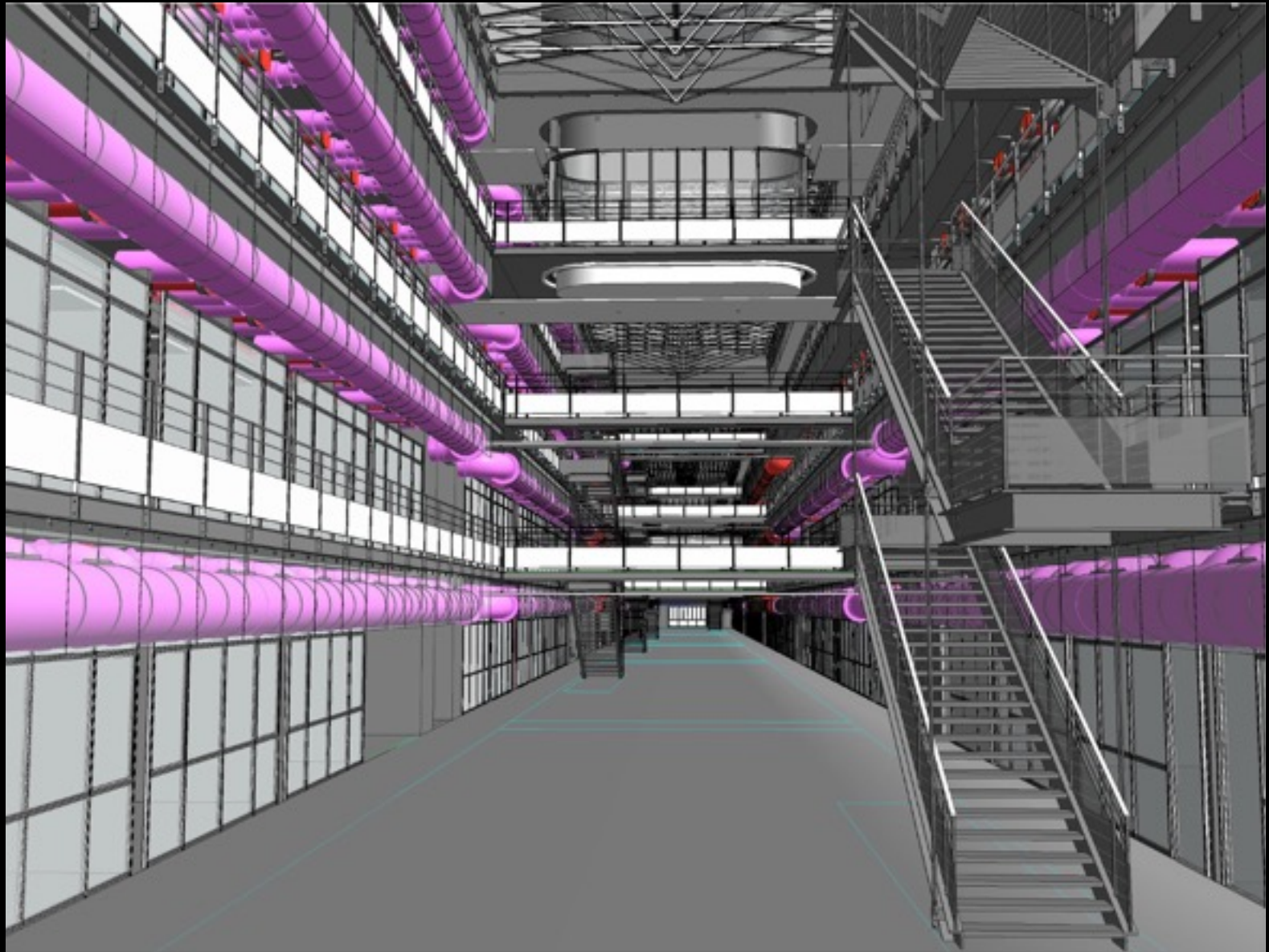
Digital model fluids - AIA engineering



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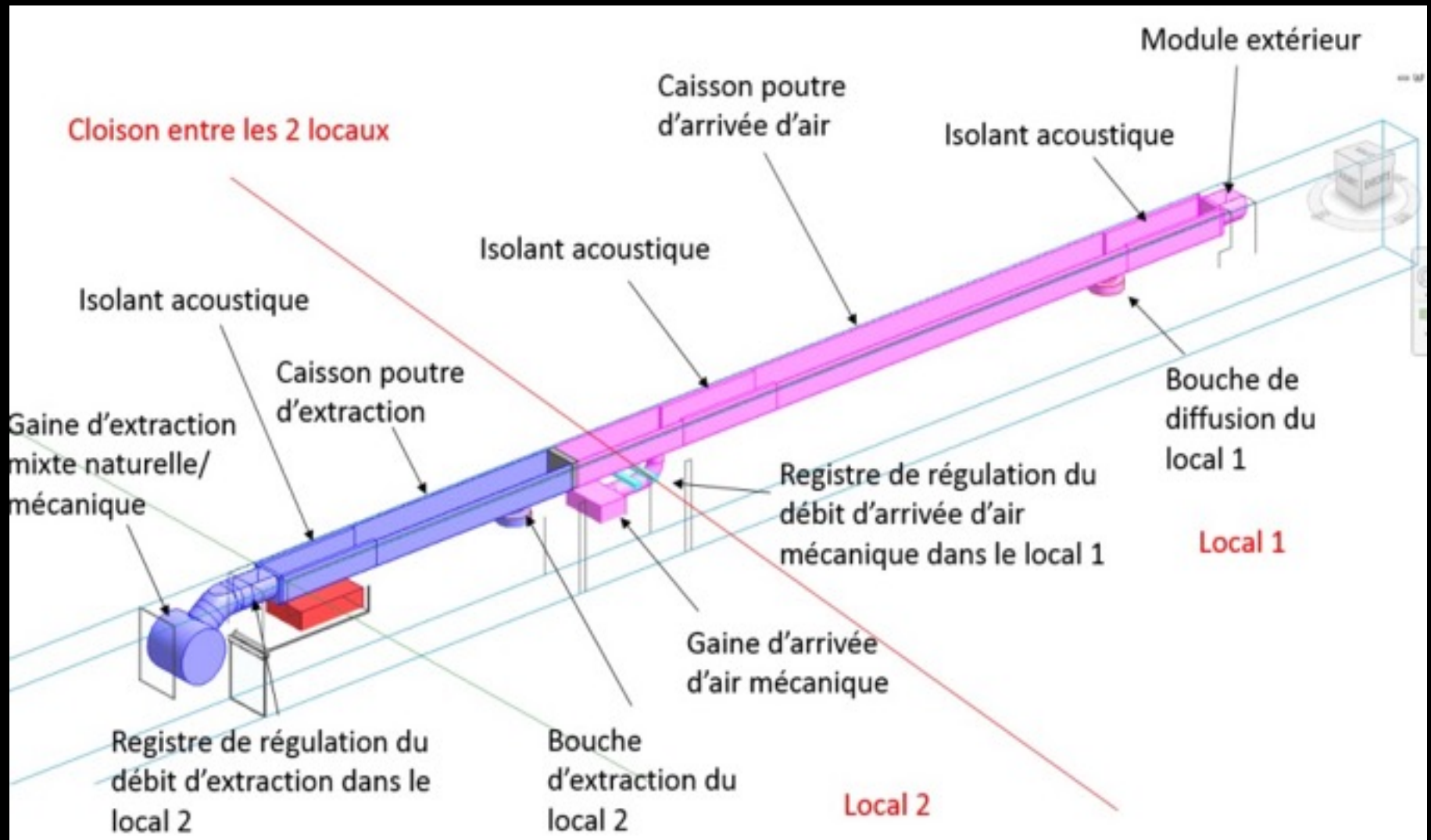
Boxes of air inlets in facade

Boxes of extractions of air connected with the chimneys

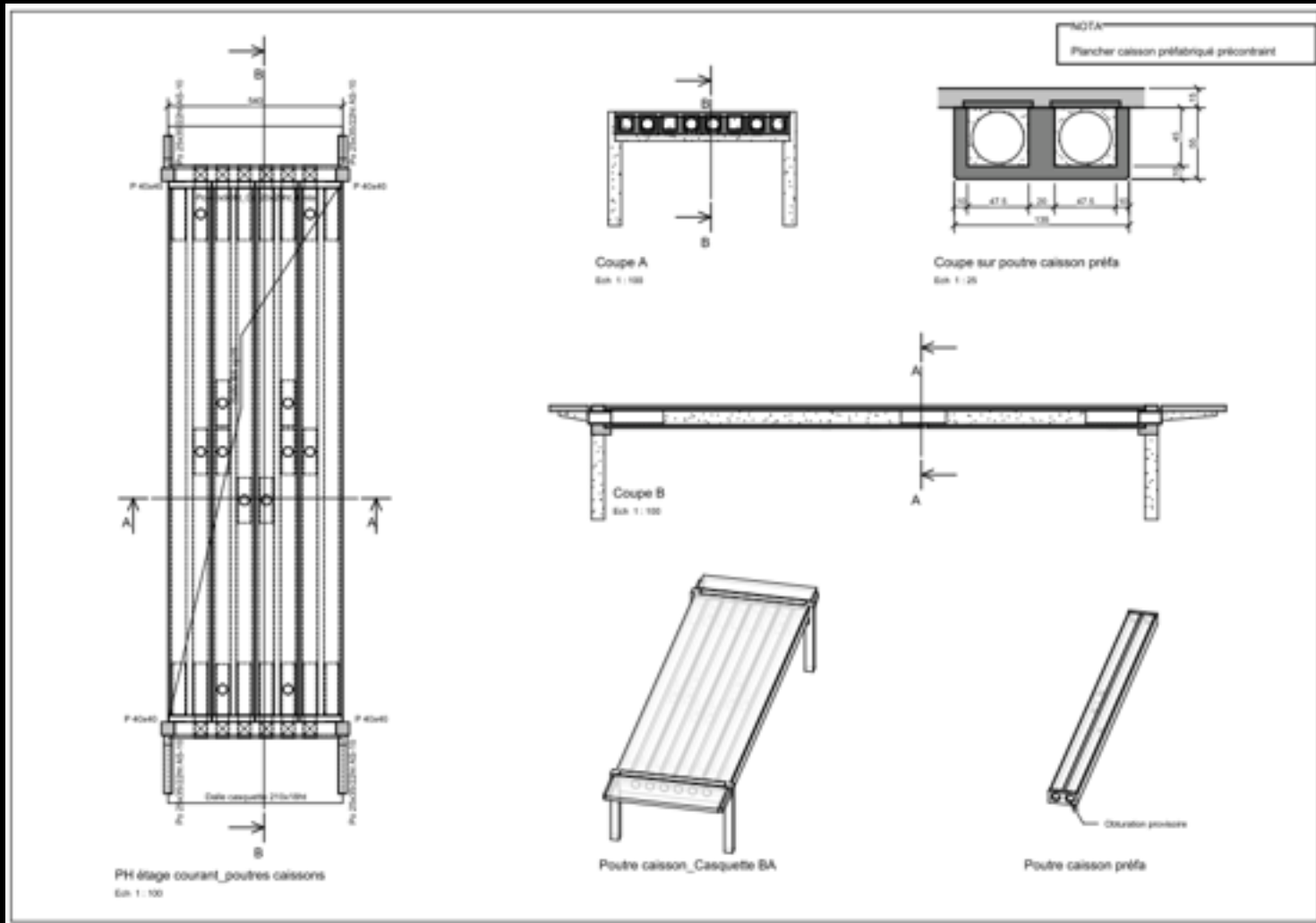


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Prefabricated floors supports of the hybrid ventilation



We transport the air through the structure



Prototype Labo - CSTB Champs sur Marne



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Functioning of the hybrid ventilation

WINTER : mechanical Ventilation double flow

- Recycling of the energy clearedn by the occupants
- Adaptation of the flow in the activity

SUMMER : Assisted natural hybrid ventilation

- Chimneys thermal and mechanical
- Very energy-saving ventilation
- Summer comfort

Inoccupation SUMMER : natural Ventilation

- Natural load with night freshness

Innovate needs a truly global interdisciplinary approach

Innover nécessite un travail d'équipe

L'architecte doit bénéficier de consultants très bons, motivés et d'associés au développement du produit ou des idées.

Rien ne peut se faire sans une Maîtrise d'ouvrage déterminée.

Je tiens à associer à cette présentation de véritables "amis d'aventures".

Une soixantaine, par ordre alphabétique :

Éric Bazard - SEM Cité Lyon

Rémi Beauvais - SLETEC

Alban Bensa ethnologue

Florian Bolle - ex RPBW

Olivier Canat - AIA Ing Lyon

Olivier Caro

Henri Chabert

Cédric Chaigneau - AIA Ing Nantes

Annick de Chaunac - juriste HERMES

Julien Coeurdevey - ex RFR Éléments

Michel CORAJOUR

Loïc Couton - ex RPBW

Le CSTB Paris

Le CSTB Nantes

Le CTICM Metz

Catherine David - Grand Lyon

Hervé Desbois - SEM Cité Lyon

Olivier Duverger - CETIM

Rolf FEHLBAUM

Nicolas Frize musicien

Jean Louis Galea - SCHMIDLIN

Jacques Gandemer - ex CSTB

Hélène Gobert - ENS

Claude Guinaudeau

Laurent Guiraud

Pascal Hendier - ex RPBW

Pierre Kerien - AIA Ing Nantes

Frank La Rivière

Jean Lelay - ex RPBW

Hoshino Makoto / TAKENAKA

Phillippe Malé - GUIRAUD / TERREAL

Thomas Metge - RFR Éléments

Pierre Mercy - DURAND Structure

Sophie Moreau - CSTB / RFR Éléments

Jean Bernard Mothes - RPBW

Jean-Maurice Moulène - SEM Amiens

Jean Pattinson - RPBW

Christel Permet - ONG TIDENE

Francis Petit - GEC Ing

Raphaël Petit - RFR

Bertrand Peuble - PMN

Renzo PIANO

François Peyron - F BOUTTE

Lorenzo Piazza - RPBW

Marianne Piketty

Cristina Pilara - RPBW

Marie Pimmel - RPBW

Nicolas Prouvé - ex RPBW

Valentina Serafini - RPBW

Sœur Brigitte de SINGLY

Anne Hélène Temenides - RPBW

Jean Claude Thouvenin - GEC Ing

Octave Togna - CCJM Tjibaou

Bertrand Toussaint - RFR

Vincenzo Turini - Intesa SanPaolo

William Vassal - ex RPBW

Fabio Viero - MANENS

Alain Vincent - OUVRAGE

Jean Vincent avocat

Marie Christine Vincent

Timothée Vincent - ReCyclo

Chris Wise - EXPEDITION

Pierre-Paul Zalio - ENS

2009-in progress

Lago's Scholl

Valley of Tidène, Niger

ONG TIDENE - Les Puits du désert - Christel Pernet

**BRING HELP TO DEVELOP A TUAREG SCHOOL IN THE DESERT
WITH WATER AND ELECTRICITY :**

- A WELL FOR FAMILIES
- A KITCHEN GARDEN, A SCHOOLYARD, GOATS
- A DIRECTOR AND PROFESSORS, TABLES
- THE PHOTOVOLTAIC, BATTERIES, LIGHT
- MOBILES AND VIDEO-PROJECTORS, MOVIES

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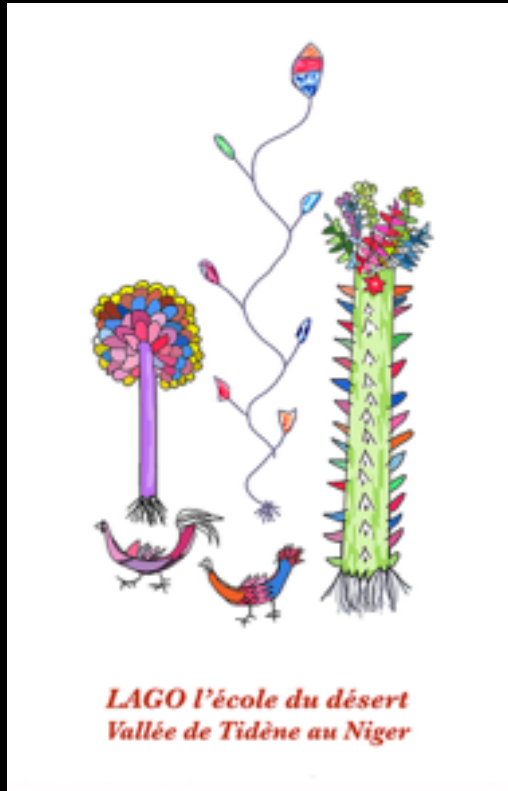


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dessine moi un chameau !
draw me a camel !



4 teenagers are now in Universities in Europe



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The touareg tent gets up very simply to assure a natural ventilation



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IN SEARCH OF A COMMON SENSE

A virtuous duality between natural ventilation and working practices

« L'inspiration chante toujours... L'inspiration n'explique jamais »

« The inspiration always sings... The inspiration never explains »

Gibran Khalil

« Le monde dans lequel chacun vit dépend de la façon de le concevoir »

« The world in which each lives depends on the way of conceiving it »

Arthur Schopenhauer

« On ne peut pas résoudre les problèmes qui se posent dans le monde en faisant appel aux modes de pensées qui les ont engendrés »

« We cannot solve problems that arise in the world by calling to the ways of thinking which engendered them »

Albert Einstein