S L O A N

A NEW CONCEPT FOR A TOWER

Height of 600 Meters

Usable surface area of 650 000 square meters

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FOREWORD

The following pages describe a New concept for a Tower in one of its various possible configurations.

Therefore, the dimensions may vary... More or less than 8 pillars may be included in the concept... The module is not necessarily 120 meters high... One can admit more or less than 15 floors inside the building blocks...

On an architectural point of view, the project may get different aspects depending on the program, on the wishes and on the creativity of the different partners involved in the implementation of the tower.

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Press release

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Towers, essential to the development of cities whose lands are restricted, became in less than a period of 100 years, the symbol of our age marked by technical and urban increase. But they still have important drawbacks as result of the concept itself.

Their instability, their insufficient housing possibilities and ergonomics, the lack of profitability and moreover the high risks incurred by their inhabitants bring up problems and compromise solutions which can be very onerous, hard to run and inadequate.

In order to be settled, these fundamental questions lead to a radically different concept such as the one proposed in the polycentral tower.

Denis Sloan breaks with the principle of a central core including all the means of vertical circulation and around which surfaces articulate. In this configuration, the rooms situated more than 8 up to 10 metres away from the facade are doomed to continuous and unnatural light. Plus, would a disaster occur in the central core, then would it lead to dramatic consequences.

The architect made the choice of a powerful and apparent circular structure, that frames independent and light building blocks of a human scale. These building blocks form a thin and discontinuous ring that is built on a large central space and that entirely benefits from the natural light.

The powerful pillars standing on the periphery set a great resistance against fire risks and other disasters. They offer numerous possibilities for the evacuation and the emergency aid in comparison with the population of the building. The propagation of a disaster in the whole building is avoided.

Therefore, the conditions of a maximum security and of a well-being are gathered once without hurting the economics and financial interests.

The “useful” areas are given natural light and increase the profitability of the polycentral tower whose construction does not pose any technical difficulty.

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I - A polycentral and stable mega structure

The structure, powerful and of great stability, is characterized by its simplicity, its light and airy quality.
It is composed of 8 pillars and 4 associated platforms which develop between a “base” and a “crown”. 48 building blocks are inserted in this structure.
The whole reaches close to 600 meters in height, considered here as a maximum. However, the modularity of the structure allows also for constructions of much smaller proportions. The structure is comprised of a series of units or modules; each module is composed of a platform, 8 pillars and 12 blocks.

a) The Pillars

The mechanical resistance is enhanced by the minimization of material built up on the periphery of object which it defines. (cylinder, sphere, and so on...)
Applying this principle, the mega structure is comprised of tubular pillars placed 30 meters in equidistance. These pillars stand on the periphery of a circular figure, or regular polygon, whose diameter (or apothem) on the ground level is roughly 120 meters.

The pillars provide a fire-resistance of 4 hours. Each pillar contains 12 elevators capable of simultaneously transporting 2 400 individuals. The addition of two ample stairwells offer an additional instantaneous capacity of 600 individuals.
The pillars also incorporate the building network and fluids necessary for the functionality of the ensemble.

b) Platforms

The bonding ring platforms are 8 meters high and 20 meters wide. They also are fire-resistant for 4 hours.

Each platform is the equivalent of a continuous road-bridge in which the pillars are embedded. This element represents a ring composed of three parallel, resistant and impenetrable caissons.

Apart from their structural role, the platforms function in supporting and carrying the building blocks.

These elements also play an essential role in the general security of the building linking the pillars to their means of vertical communication by ways of a triple circulation. The circulations participate with reception rooms and fire stations insuring the protection of the modules controlled by each platform.

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II – A light and transparent urban network in the space

The whole of the mega structure, with its 48 blocks, forms a district, or rather a small city of roughly 40 000 inhabitants.

a) Modules and blocks

Each module is composed of 8 pillars and a platform that supports 12 identical building blocks, 6 under and 6 on the platform.

As the “useful” part of the mega structure, the blocks provide the space for offices or housing.

In the solution presented today, for example, the blocks including 15 floors are identical, forming trapezoids of a 45 x 25 meters at their base. In opposition to the strength of the mega structure, the blocks, less than 20 meters in width, are thin and transparent, bringing light and clarity to the inhabitants.

Each block is easily compared to a typical building, in which the principle problem is to provide simple floor spaces, at a human scale (roughly 850 square meters per unit) and where the entire area is naturally day-lit.

This condition of well-being, required by French labour laws, is to a great extent, absent in the building towers today, where only the spaces benefiting from natural light are those situated directly in contact with the facade.

The gables of each block are built up to two pillars between which they stand. At the extremities of the floors, one can reach the secure stairs and elevators in the pillars.

b) Facades

Here the parallel facades are completely open to daylight.
One face is open to the outer environment, while the other is open to the inner spaces of the structure. In the most modest hypothesis, the nearest vis-à-vis is approximately 45 meters away (wider than the Georges V Avenue, in Paris). In our example, the distance between both inner facades is 75 meters in comparison to the Champs Elysées where this width is 70 meters.

Additionally, the inner facade includes two wide windows in each module. These 100 meters height on 35 meters openings provide large faraway views to the surroundings and to the sky. Always positioned vis-à-vis, each window provides direct sunlight for one-third of the day.

The windows of the different modules are organised in spirals or staggered rows. This system provides for constant sunshine for the facades all the day long and on every level.
In addition to this and on the median part of each module, a 15 meters high, horizontal void allows light and air to flow through the structure.

c) Construction lines

Half of the 48 blocks on 15 floors of the mega structure are supported over the resistance platforms, the other half is suspended underneath.
We have previously seen that 6 blocks are carried on and 6 other blocks are hanging from each platform. With the 8 pillars, the whole forms a module.

The 15 floors of one block are made of mixed steel and concrete structures, in a classical manner, incorporating a small technical void. Each floor includes a slab and a technical void, which together are 0,80 meters deep. The “useful” height in the offices is roughly 2,70 meters per floor.

The structural grid, in the case of a block which is supported by and on the resistance platform, is 6m by 9m; it remains the same for the frame of the tie-rods in the case of the suspended blocks.

The overall wind-bracing is insured by the pillars framing the blocks.

Two more elements are incorporated in the blocks in order to reinforce them. The first is located on the 8th floor, in the middle of the block, made up of two parallel floor-height girders (3,5m). It forms a coffer and enables a secure and median circulation space from one pillar to the other. A second identical group is then either placed at the top of the block, when it is carried on, or under the lower floor when the block is suspended from the platform.

We saw that each block is always separated from the following one by the surrounding pillars, by the resistance platform and by an horizontal void of about 15 meters high which forms a natural and effective firebreak.

First and foremost, the project provides appropriate and simple solutions to major security issues as far as they concern individuals and tall buildings. In every circumstances, the project insures a very tight security for individuals and buildings. It also provides natural and maximal light in every useful part of the building.

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III – Security issue as a fundamental item of the concept

The project's goal is to insure the best stability of the construction and the highest security whatever the type and the importance of the attack may be, notably fire risks.

Several fundamental measures work towards the highest possible security.

a) The load bearing structure is outside and partially open to the air

The present constructive option is far from the principles that are currently ruling the construction of very tall buildings all over the world.

Nowadays, the resistance of these buildings is principally insured by two elements ; a central and vertical core containing fluids and technical shafts which is firmly rooted in the ground so as to resist to lateral pressures and the facade including the building's frame.
Both alpine road tunnels and the twin towers of Manhattan tragically showed that the temperature increases very fast when gas are confined in an enclosed space, as it occurred in the central parts of the twin towers. The increase of temperature makes it impossible to evacuate and help the people inside and leads to the building collapsing.

In the project, the external structure helps minimize the human losses and to avoid a total disaster.

The pillars, since they are placed on the periphery of the mega structure make the construction very resistant to earth tremors, to fire or other attacks.

The resistance platforms play an important role in the safety device. The platforms form horizontal rings 8 meters high which make up indestructible volumes every 100 meters.

They offer additional ways of circulation between all the pillars and important reception areas for emergency aid. They supply real security stations with equipment (such as covers, fire engines, tools, oxygen masks, helmets, fire overalls, etc...) that can be used effectively while waiting for outside help.

The conception of the whole structure minimizes the risks when the temperatures become exceedingly high, as in an usual and enclosed structure.

b) Independent blocks
A systematic division of the risks involved

Owing to the constructive option taken in this proposal, a serious disaster can not touch more than two pillars or two blocks at the same time.

The building blocks are independent from one another. Each block is systematically surrounded on its three sides by indestructible elements of the mega structure, 2 pillars and 1 resistance platform.
On its 4th side, the block is isolated by a void which is either a free ring 15 meters high or a window 100 meters high.
A secure circulation way cuts through the block in its middle section.

Such a physical division guarantees a tighter security than in most current tall buildings. The risks of total disaster and disaster propagation are practically eradicated.

A building block may accommodate 50 people on each floor, i.e. about 750 people. In order to evacuate or assist them, both surrounding pillars of the block include 4 wide stairs and 24 elevators plus 2 additional stairs located in the center of the block.

3 000 individuals can be evacuated at the same time in each pillar, i.e. 2 400 in the elevators and 600 in the stairs. This capacity of evacuation is therefore very high if we compare it with the population of one building block.

This high capacity of circulation provides the best chances of success for the rescue operations which would be implemented for a small population in a limited area.

c) A dense network of circulation ways

Should a disaster occur at a floor, an individual could easily reach one of the exits placed in the two pillars, each in a distance of 15 meters.

If it is impossible for that individual to reach a pillar, the two internal stairs in the block, lead (only 3 floors lower or higher) to one of the secure ways towards the nearest pillars.

Each block of 15 floors includes 3 levels of secure ways : the resistance platform, an intermediate level (8th floor) and the last one, which is placed either on the upper floor for a block supported by the platform, either under a lower floor for the suspended block.

It is important to point out that the circulation capacity is quadrupled on each resistance platform and leads to the security equipment placed in the pillars.
In the worst cases, only 15 floors rest between the platform and the disaster.

As an example, would a disaster affect two building blocks, it would then make the evacuation through the two nearest pillars very difficult.
1500 people could then make their way towards the 6 other pillars where 72 elevators can transport 15 000 people every 5 minutes.
At the same time, 12 stairs which are included in the pillars have a flow of 3 600 people.

Thanks to this system, where several means of circulation are implemented, the problems of blocking or paralysing the operations of emergency to which the current tall buildings may be confronted, are avoided.

On the contrary, it allows to accelerate the evacuation of people and to fight the disasters in the best conditions.

At the present time, no tall building is able to offer such capacities of emergency aid and evacuation.

EXPERIENCE

Denis Sloan has been strongly influenced by his teachers –Paul Herbé, Edouard Albert and Jean Prouvé, all forerunners in their own fields.

With great freedom and with an attentive observation of realities, he strives to discover the correct or exact responses to the complexity of an urban planning project or of architectural program, each with propositions as pertinent and straightforward as possible.
Denis Sloan is constantly driven by a technical approach and by a respect for cultures and aspirations, without ever losing sight of the topographic aspects of climate and economical imperatives.

It is for this reason that it is often difficult to find a formal relationship, a "hallmark", which might make his project highly recognizable.

What do the French Pavilion for the Universal Exposition of OSAKA 70 and the Universities of Madagascar and Cameroon have in common ?
One call for the most advanced techniques, even inventing new ones, while the others are successful "bio climatic" buildings, far in advance their time.
Their sole link is a consideration and understanding for that physical and human constraints while going beyond them in order to lead to better-adapted and innovative solutions.

One can enumerate many examples of this process :

- For the great urbanism and development schemes for Alsace (late 60's) Denis Sloan perfected a method of computer processing, integrating the numerous parameters which were aligned in order to properly orchestrate works of such size and complexity.

- Responsible with the impressive extension of Erbil in Iraq, (40 000 inhabitants for a city of 500 000 inhabitants), which includes an University of 12 000 students as well as important public facilities for the region, Denis Sloan drove the project with a principal concern to reconcile the Oriental culture and lifestyles with Occidental contributions.

Though this project met with a very good reception from the Government, it was interrupted by the war in 1990.

- From the beginning Denis Sloan anticipated the transformation into a multifunctional district for the construction of the World TV and Radio Centre for the 92 Winter Olympics in Albertville. It was showed, for the first time in France, that an industrial metallic construction could achieve unequalled thermal and acoustic comfort for its time and for the price of social housing.

- The “Dome” of Marseille, a concert hall and theatre for 8 500 spectators and built in 1993, is a technical achievement. Built on a shipyard, this inversed soldered hull attains 100 meters in its longest span. Its forms an original and innovative solution to site, delay and cost constraints.

Today, Denis Sloan’s reflections on high-rises and sky-scrapers have lead up to yet another amazing and logical project.

Throughout all of the projects and realizations that he has undertaken, one can find a underscoring constant : a powerful response, finely detailed, properly suited to its place and time.

Denis Sloan
Former student of the French National High School of Arts of Paris
Architect recognised by the French government (DPLG)
Qualified by the French Unit of Urbanism

Silver Medal for Art and Industry

Member of the Academy of Architecture

PRINCIPAL REFERENCES

Urbanism

Uproad

- Spreebogen in Berlin – Germany : 1993
- Erbil in Iraq : 1985 – 1990
- Agadir in Morocco : 1981

In France

- Development for Languedoc Roussillon (sea resort in Agde) – France : 1963 – 1966
- New district for the city of Chartres (La Madeleine) – France : 1964 – 1966
- Master plan for urban development in Colmar, Alsace. France : 1968 – 1972
- Master plan for urban development in Mulhouse, Alsace. France : 1968-1972
- Study for the district of Montparnasse train station in Paris, France (business centre, public garden over the train station of Paris) : 1985
- Guiding outlines for urbanism in the suburban cities Canteleu and Mont Saint-Aignan near Rouen – France : 1975 – 1995
- Study for the improvement of the district of Reuilly in Paris – France : 1990
- Study for the new guiding outlines for development and urbanism in the region of Troyes – France : 1992
- Study for improvement of the Saint-Just district in Marseille – France : 1995

Universities and research (France and uproad)

- Madagascar : built in 1963 – 1966
- Amiens : built in 1966 – 1970
- Créteil (near Paris) : built in 1970 – 1975
- Cameroun : built in 1980 – 1985
- Erbil in Iraq : 1985 – 1990 study
- Research centre of Illkirch in Strasbourg : study in 1985
- Study for improvement of the University of Jussieu in Paris : 1990

- Study and realisation of a research centre for Thomson semi-conductors in Saint-Égrève near Grenoble – France : 1984 – 1985
- Formation Centre for the Treasury in Marne la Vallée near Paris : 1986
- Study for the research centre of the company Général Électric in Buc near Paris – France : 1989

Airports France

- Lille Lesquin : built in 1994 – 1996
- Saint Denis de la Réunion – study : 1995
- Pau – Tarbes – Lourdes – study 1997-1998
- Rennes : 1992
- Montpellier – study : 2000- 2001
- Toulouse : 1998
- Heliport of Paris Issy-Les-Moulineaux in current study : 2001...

Leisures and sports

- Project Club Méditerranée in the Yonne near Paris – France : 1987 – 1991
- Concert hall of 6 000 seats in Nancy realised from 1991 until 1993
- Concert hall of 8 500 seats in Marseille realised from 1992 until 1994

- Stadium project of 100 000 seats in Vincennes – Paris – France : 1963
- Stadium project in Caen
- Stadium project Bonal in Sochaux Montbéliard – France : 1994
- Project of a Velodrome Stadium in Marseille (60 000 seats) – France : 1995

Urban great equipment and public services

- TV and radio centre for Winter Olympics in Albertville – France – built : 1989 – 1994

Telecommunications

- Telecommunication management unit of Angers. France – built : 1981 – 1984
- Research centre of France Télécom in Caen – France – built : 1984 – 1987
- Study for the National Direction of France Télécom in Paris – France : 1985
- Research centre for European telecommunication in Sophia-Antipolis (Cannes) – France – built : 1988 – 1992
- Regional direction of France Télécom in Caen – France – built : 1989 – 1993

Motorways, bridges

- Competition for a new tollgate on the motorway A5 out of Paris : 1992
- Competition for the tall viaduct of Millau on the motorway A-75 (length 2,5 km, height 300 metres) : 1993 – 1995
- Competition for the Viaduct of La Rauze – France : 1995
- Study of motorway stations : motorways A-19 and A-77 for the company « Société des Autoroutes de Paris Rhin Rhône" – France – realisation : 1996 - 2000

Military Projects

- Study and building of a ballistic missiles testing centre for the French navy near Lorient –built : 1986 – 1990
- Rehabilitation of the former Polytechnic school in order to build a new block (facilities, sports, housing...), Montagne Sainte Geneviève, Paris : 1980 – 1994
- Study for the new Polytechnic and military school in Palaiseau near Paris : 1992
- Rehabilitation of the staff headquarters barracks for the Republican guard of Paris – realisation : 1996 – 2001

Miscellaneous

- 300 meter-high Tower project in the business district of La Défense Paris : 1988
- Gergovia business centre in Clermont Ferrand – France – built : 1990 – 1992
- Study for covering the outer boulevards of Paris – 2001 in progress...