SUSTAINABLE ASSESMENT OF HINES OFFICE BUILDING TRIPARK LAS ROZAS USSING VERDE TOOL

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Summary

The project consists of a building with an unitary image as a whole. It is fragmented in three blocks in order to adapt itself to the slope of the terrain. The three blocks are separated from each other by closed courtyards. They generate a layout of full and empty spaces, in alternate positions, boosting the presence of light inside the offices. Functionally, each of the blocks is shaped with two sections of offices attached by a center-core of vertical access. These cores are divided into three parts by courtyards placed in intermediate positions.

The longest façade is designed by the premise of displaying a unitary building. Thus, there are some elements connecting the blocks in between the courtyards and closing them to the exterior. With the aim of watching the energy efficiency, each façade presents a different skin-like design, taking advantage of the northwest-southeast axis. The design is exhaustive in the search for materials to control solar reflectance keeping visual transparency, adopting constructive solutions with stressed fabric.

The design of the enclosure, as well as the indoor air quality and the choice of HVAC systems, have led the building to be selected as one of the few to be assessed by the VERDE tool, measuring its environmental performance.

1. Building description

This office building of 56,822.05 m2, has been promoted by Hines, built by Acciona and designed by tGabriel Allende Architectural Practice. It is a detached building with four stories, whose design is directly affected by the urban conditions such as building suitability, deviation from general line and height, as well as the topography and different levels within the plot.

In order to face the project and give the optimum proposal for the city and the future users, three main concepts have been considered:

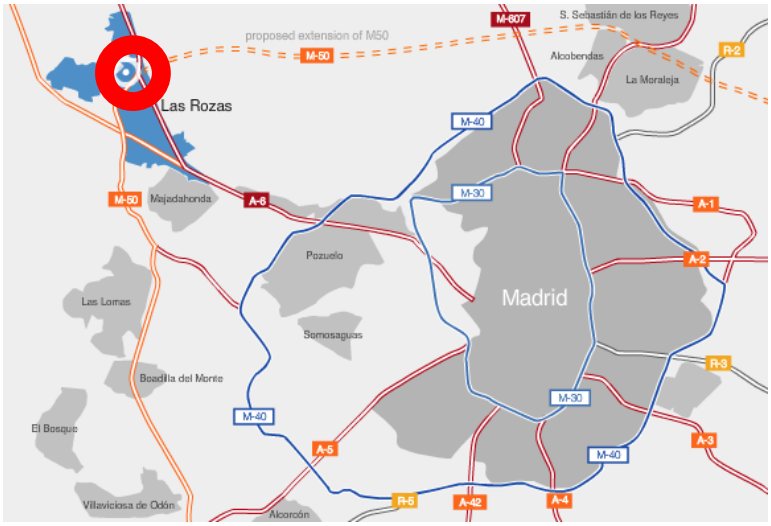
1.- Volumetric and formal unity, with a unitary character through the compositions of facades and their relation with indoor and outdoor spaces.

2.- Rationality in function and construction, given its tertiary use for offices, plus designing all the constructive elements according to the new technologies and needs.

3.- Maximum use of the available space, with the appropriate design and layout.

1.1 Location:

Hines has selected an unbeatable location for its first Tripark Project in Madrid within Parque Empresarial Las Rozas.



Tripark Las Rozas is clearly visible from the M-50 and is surrounded by many prestigious companies with a wide range of high quality amenities in the area. It is also the last large scale development to be built within the Business Park.

Shopping areas and restaurants are within a 10 minute walk or 5 minute cycle, and the center of the city and airport in 45 minutes by intercity bus. There is also a commuter rail line that connects the center of the city in 25 minutes.

1.2 Architectural and energy systems:

The project consists of a building with a unitary image as a whole. It is fragmented in three blocks (block A, block B and block C) in order to adapt itself to the slope of the terrain. The resulting image is fruit of the leveling operations, showing a stepwise skyline.

The three blocks are separated from each other by closed courtyardsThe access to the building is through these courtyards. They generate a layout of full and empty spaces, in alternate positions, boosting the presence of light inside the offices and enormously improving the thermal inertia of the building.

Functionally, each of the blocks is shaped with two sections of offices attached by a center-core of vertical access. These cores contain elevators and freight elevators, building systems facilities, restrooms, a staircase in the center and a fire escape. These cores are likewise divided in three parts by courtyards placed at intermediate positions.

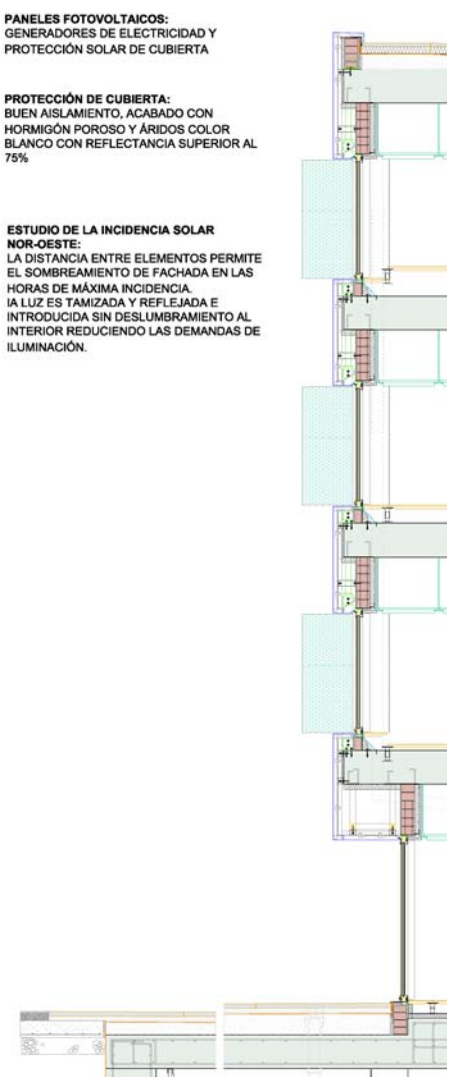
All access to the building, either for pedestrians or for vehicles, is from Jacinto Benavente Street. Pedestrian access is perpendicular to this street while vehicles get inside the plot through separate driveways parallel to the street.

The longest façade is designed on the premise of displaying a unitary building. Thus, there are some elements connecting the blocks in between the courtyards and closing them to the exterior.

Due to the massive nature of the project, required to utilize all the building suitability, all the non-built spaces are treated as continuous green areas, including the parking lot on the surface which is integrated and camouflaged by vegetation.

The proposal embraces the possibility of including 52 offices of 500 m² each, and two parking levels whose surface and number of parking spaces are equally distributed between each block.

The project watches the energy efficiency of the building. Each façade presents a different skin-like design, taking advantage of the northwest-southeast axis. The design is exhaustive in the search for materials to control solar reflectance while maintaining visual transparency, adopting constructive solutions with stressed fabric.



The most relevant characteristics of the building are:

-. Functional and high quality design

-. 3 totally independent blocks

-. High levels of natural light and facades that control the interior gains

-. Green areas with vegetation and plants suited to the Madrid climate

-. Fire detection and extinguishing system, including automatic sprinklers

-. Independent air conditioning with a 3 pipe variable cooling system (VRV)

-. Raised floor height of 12 cm and suspended ceiling of 50 cm

-. 2450 sqm flooring space that can be divided into four modules of approximately 600 sqm

-. Efficient space distribution and clear floor to ceiling heights of 2,7 m.

-. 1,120 parking spaces, one for every two workplaces

-. 4 elevators and 2 goods lifts in every block

-. 360 photovoltaic panels totaling 16 kW power and 10 solar thermal collectors on every block for DHW

-. HVAC systems chosen ??? VRV with heat recovery that achieve high efficiency.

2. VERDE assessment

2.2 Site selection:

In this remarkable area, the use of outdoor luminaries that reduce light pollution as much possible avoiding the waste of energy to illuminate the sky as well as reducing the impacts of light pollution on local biodiversity is of great importance Plants were chosen with little need for irrigation, thereby reducing potable water consumption and maintenance needs that include the use of fertilizers and other compounds that contribute to soil contamination

2.3 Energy and atmosphere:

Proposed Building results for utility use per Conditioned Floor Area using CALENER simulation tool (Motor DOE 2.2) including miscellaneous equipment is 112,7 kWh/m^2/y

Much of this reduction in demand for cooling is obtained by the efficiency of equipment and the treatment of each orientation depending on its needs.

2.4 Natural resources:

In the area of natural resources, Tripark presents a reduction of almost 25% in water consumption for the building's use over the consumption VERDE stipulates as a reference. This action, besides avoiding the depletion of drinking water, reduces costs and impacts of wastewater treatment.

2.5 Indoor environment quality:

Indoor environmental quality is enhanced by the quality of lighting, both artificial and natural, the latter being encouraged in all areas of building work.
Special care has also been taken that these workspaces enjoy exterior views, even in offices that are oriented towards courtyards enjoying a treatment plant and dimensions that give high quality to these spaces.
sound insulation has been considered an important element in improving indoor air quality reductions of noise exceeding the applicable standards.

2.6 Service quality:

The system design allows very complete local management, both in HVAC systems, as in the illumination of the workspaces.

2.7 Social and economic aspects:

Although the building construction cost is above average, the use cost is significantly reduced due to savings made during the use of both water consumption and energy consumption

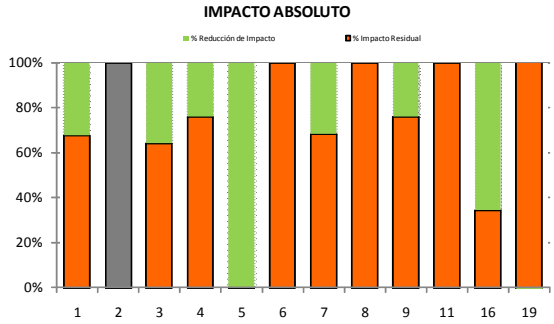
2.8 Final score:

The project has won two “HOJAS VERDE” and an assessment of 1.83 points on 5.
The most significant aspects in the evaluation are reduced by 31.5% in the consumption of nonrenewable energy, which implies a reduction of 32.3% of the impact of climate change on the reference building GREEN.

It achieves a 65.6% reduction on the impact on health, wellness and productivity for users, which implies indoor environmental quality and conditions of work spaces.

Evaluación del proyecto Edificio de Oficinas y Garaje "Las Rozas Business Campus-Fase II", ESPAÑA		
Resultados de la valoración basados en la documentación aportada de la fase de Diseño.	*Fase del proyecto (Según Archivo Regional)*	**Fase de Diseño**
Este es un proyecto de nueva construción, Tiene un ciclo de vida estimado de 50 años, con los siguientes usos: Oficinas con Aparcamientos ubicado en La Rozas de Madrid, ESPAÑA		

EVALUACIÓN	Resultados de la evaluación Relativa



Resultados de la evaluación Absoluta

#	*Los datos estan basados sobre las puntuaciones obtenida en la Auto-evaluacion*	*Indicador/ m2 año*	Peso	Edificio de Referencia	Edificio objeto	Impacto Evitado	% de Redución de Impacto	% de Impacto	Impacto Evitado Reltivo
1	Cambio Climatico	kg CO2eq	27%	308.93	209.17	99.76	32.3%	67.7%	1.6
2	Aumento de las radiacione UV a nivel del suelo	kg CFC11eq	0%	0.00	0.00	0.00	0.0%	100.0%	0.0
3	Perdida de fertilidad	Kg SO2eq	5%	0.0091	0.0059	0.00	35.8%	64.2%	1.8
4	Perdida de vida acuática	kg PO4eq	6%	0.02	0.01	0.00	24.1%	75.9%	2.4
5	Emision de productos foto-oxidantes	kg C2H4eq	8%	0.01	0.00	0.01	99.7%	0.3%	5.0
6	Cambios en la biodiversidad	%	4%	100%	100%	0.00	0.0%	100.0%	0.0
7	Agotamiento de energía no renovable, energía primaria	MJ	8%	4314.66	2955.41	1359.25	31.5%	68.5%	1.6
8	Agotamiento de recursos no renovable diferente de la energía primaria	kg de Sb	9%	0.00	0.00	0.00	0.0%	100.0%	0.0
9	Agotamiento de aguas potables	m3	10%	0.64	0.49	0.15	24.1%	75.9%	2.4
11	Generación de residuos no peligrosos	kg	6%	0.64	0.64	0.00	0.0%	100.0%	0.0
16	Salud, bienestar y productividad para los usuarios	%	12%	100%	34%	0.66	65.6%	34.4%	3.3
19	Riesgo financiero o beneficios para los inversores-Coste del Ciclo de Vida	€ (EUR)	5%	38.14	43.44	-5.30	-13.9%	113.9%	0.0
	Impacto Evitado		100%						**1.83**

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