

The logo for Onyx Green, featuring the word "onyx" in a lowercase, sans-serif font with a small circle above the 'o', and the word "GREEN" in a smaller, uppercase, sans-serif font below it. The logo is set against a dark, rounded square background.

onyx
GREEN

TECHNICAL CONSULTING SERVICES

GREEN

BUILDING



WE PROVIDE CONSULTING SERVICES IN

GREEN BUILDING



Onyx Green provides technical consulting services on sustainable building through the execution of computational simulation, seeking to find solutions that reduce energy costs and the impact on the environment.

To this end, we provide the following lines of action:

- Consultancy, auditing and execution in sustainable and bioclimatic building, LEED, GRIHA certification, compliance with the ECBC 2007 code of energy conservation in buildings, Building Star Rating Facilitation, etc.
- Computational simulation tools for building: Building Information Modeling (BIM), energy and rating analysis, solar analysis, photovoltaic production census, shadow and lighting analysis, etc.

We provide our analytical knowledge to develop methodologies that consume less, produce more and better relate to the surroundings.

Our objective is to deploy a wide spectrum of energy-efficient strategies, providing sustainable solutions from both the economic and the design points of view.

Onyx Green is an expert company in the Energy Conservation and Building Code (ECBC) being member of the US Green Building Council (USGBC), the Green Building Council of Spain (GBC España) and the United Kingdom one (UK GBC).

BENEFITS OF GREEN BUILDING:

1. Operation costs are reduced by between 8% and 9%
2. The value of the building increases by 7.5%
3. Return on investment increases by up to 6.6%
4. Occupation ratio increases by up to 3.5%
5. Income increases by 3%

One of the most important objectives when it comes to design a bioclimatic building consists of reducing its CO₂ emissions and even to succeed in making it neutral. That is to say, the amount of CO₂ liberated into the atmosphere is balanced out with the equivalent amount that is compensated for or transformed through various practices such as the increase of landscaped surface areas, dispensing with fossil fuel energy sources, etc.



BIOCLIMATIC BUILDINGS DESIGN



The design of buildings that implement bioclimatic measures and solutions has the objective of reducing environmental pollution and energy consumption as well as of improving indoor comfort and occupants well being.

This type of building shares spectacular designs and the use of the most innovative technology with a total respect for the environment, and it is able to reduce its energy consumption by up to 60% compared to traditional buildings.

Attaining the energy and environmental optimization parameters requires an approach to build design that takes into account aspects such as geographic orientation, the use of environmentally friendly materials, optimization of thermal insulation and lighting, installation of renewable energy sources, etc.

At Onyx Green we define bioclimatic strategies for the design and calculation of active and passive systems such as galleries and solar chimneys, hybrid ventilation, night-time cooling systems, building integrated photovoltaics (BIPV), which favor energy optimization once integrated into the build.

To this end, we perform simulations and energy and solar balance studies, DAFO analysis, fluid dynamics simulation, cyclograms and isopleth maps, among others.



BIOCLIMATIC PROJECTS FINANCIAL ANALYSIS



Sustainable or bioclimatic buildings are environmentally friendly thanks to a more reasonable use of design concepts and materials and the implementation of sustainable solutions capable of optimizing energy efficiency.

These buildings provide their occupants with a healthier atmosphere and reduce their environmental impact.

It has been demonstrated that achieving these objectives does not compromise a project's financial viability. On the contrary, it is totally possible to develop sustainable buildings that combine the economic, aesthetic and functional objectives of any architectural project.

This is why we are aware of the importance of financially assessing any project that seeks to be sustainable, and the equation must always take the financial aspect and the effective return on investment into account.



LEED CERTIFICATION



CONSULTING SERVICES

The LEED certification system (Leadership in Energy and Environmental Design) is a voluntary standard and the benchmark in green building worldwide, globally accepted as the norm in the design, build and management of sustainable and eco-efficient buildings.

It consists of a certification granted to a project on the basis of a rating system that encompasses different criteria such as energy efficiency, the use of clean and renewable energies, water harnessing and management, materials employed, surroundings, etc.

At Onyx Green we offer advisory and consulting services in achieving LEED certification for both building retrofits and new constructions.

Our LEED Accredited Professionals (LEED AP) will provide you with the necessary assistance throughout the certification process or can perform the integral process entirety.

To gain the LEED certification level, the applicant building must meet all the requisites and a minimum number of points required. The certification's review process consists of a series of steps that must be completed for the certificate to be awarded.

In addition to LEED certification, we also provide consultancy services for GRIHA, bioclimatic building, ECBC certification and Building Star Ratings.

Onyx Green is a member of the US Green Building Council, of the UK Green Building Council and of the Green Building Council of Spain.

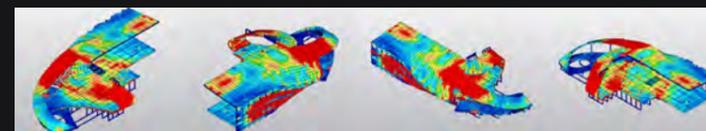




WE DESIGN
ECO-FRIENDLY
ENVIRONMENTAL
BUILDINGS



ANALYSIS AND COMPUTER SIMULATIONS



We work with different data sources (BIM models, CAD drawings, 3D models, 2D sketches, high resolution images, schemes, etc.) and through the use of state of the art simulation software we perform all kinds of analysis involving energy, lighting, shadows, thermal, acoustic, water, air current related, etc.

The computational simulation systems we employ allow us to address the thermodynamic complexities inherent to a building's design process and to evaluate the different alternatives sufficiently in advance and at a reasonable cost.

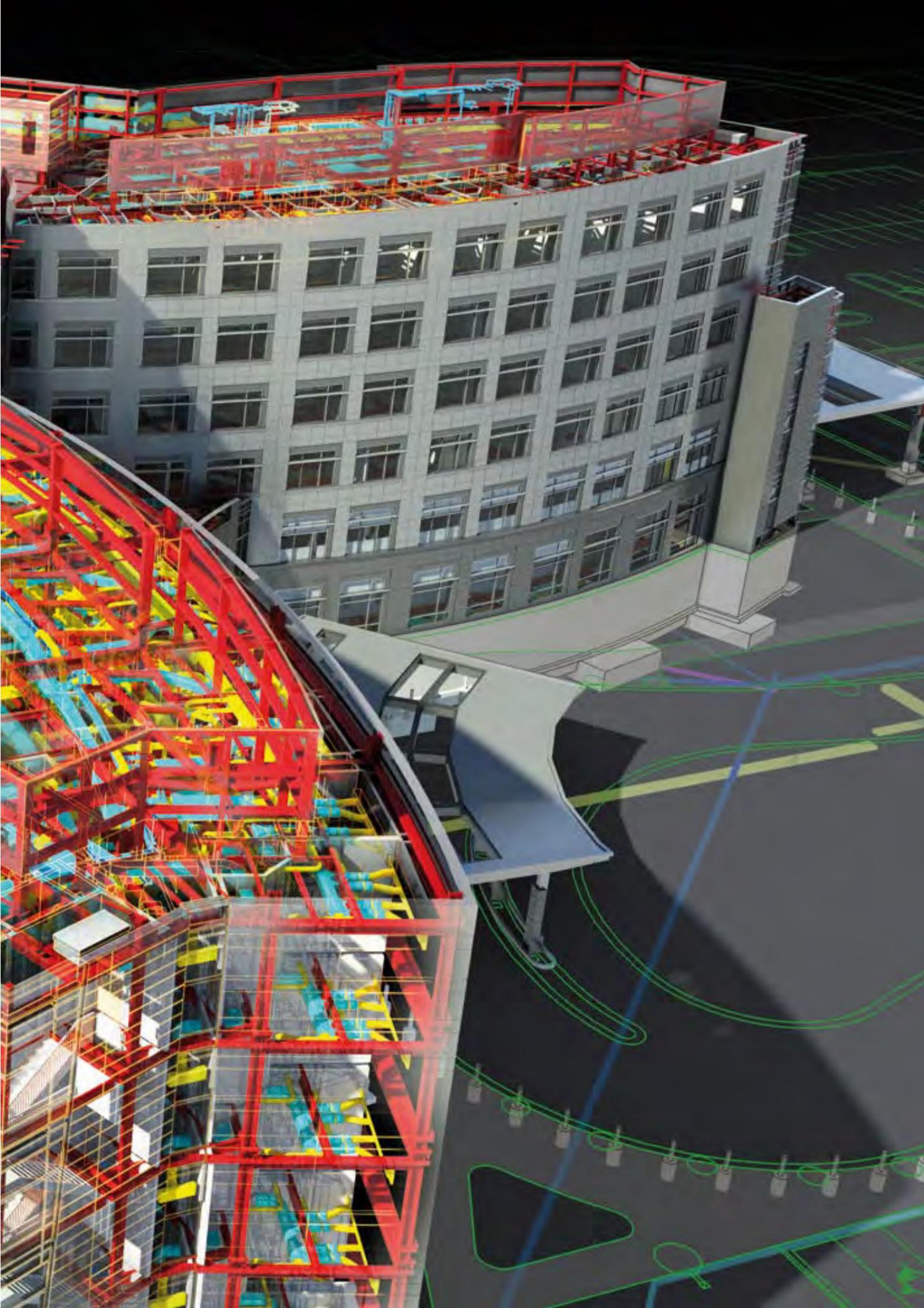
For the first time, the building industry has computational simulation tools at its disposal for performing calculations that are very similar to empirically validated results.

Simulation provides a way of evaluating the benefits of specific schemes, improves the building's performance throughout its life cycle, increases design quality and assesses measures that allow the effects of climate change to be mitigated.

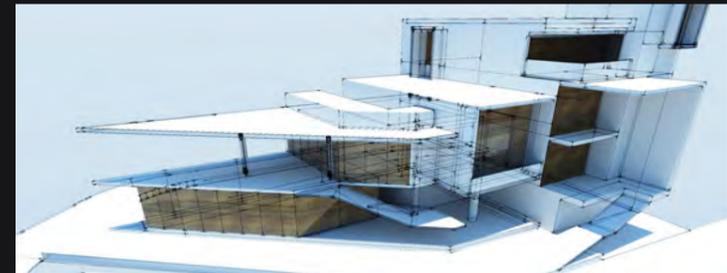
The greatest advantage of computational simulation is being able to integrate all of the building's technical aspects and identifying the critical points, comparing multiple design alternatives with the purpose of reaching the most optimal solution.

Autodesk
Clean Tech Partner

Onyx is Autodesk's first Clean Tech Partner in Spain



BIM MODELING

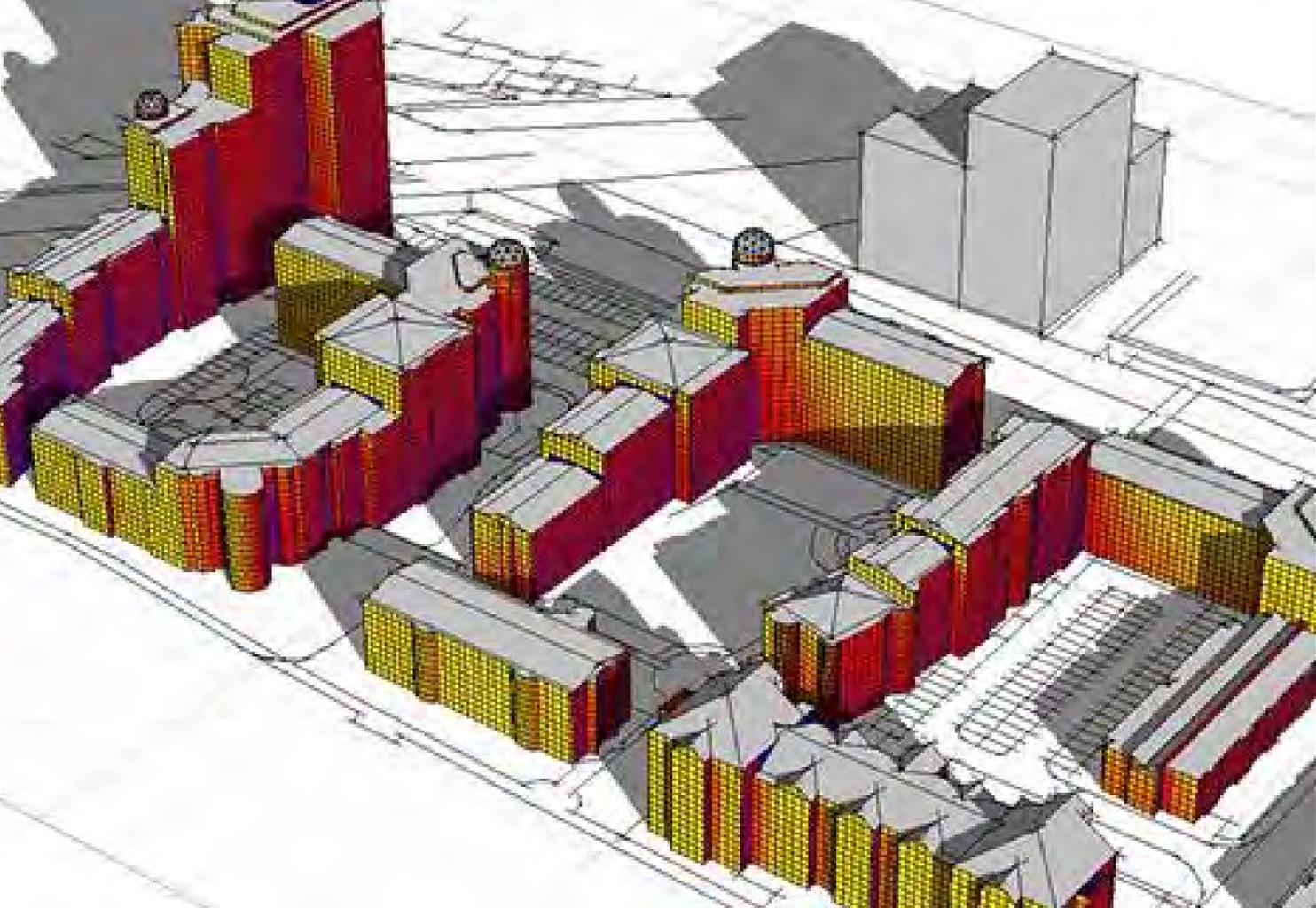


Building Information Modeling (BIM) is an innovative method that facilitates communication between the architecture, engineering and building sectors.

Counting on this model, architects and engineers generate and exchange information efficiently, create digital representations of all the phases in the building process and simulate performance in real life, thus perfecting the workflow, increasing productivity and improving the quality of the project's final result.

Our design team's use of the BIM modeling allows us to analyze multiple variables in the initial phases of the project, thus favoring critical decision making.

Generating high-quality documentation, besides facilitating interaction with other departments and with our clients, allows us to optimize building costs and planning, notably reducing delivery times and final budgets.



ANALYSIS OF SOLAR RADIATION IN COMPLEX URBAN ENVIRONMENTS



PHOTOVOLTAIC PRODUCTION CENSUS



Outstanding among our consultancy services is the possibility of performing photovoltaic production censuses within complex urban environments. Through this service the public administrations have at their disposal detailed information on the photovoltaic potential available in their city and on this basis define a suitable strategy that targets the utmost exploitation of the inexhaustible resource of the Sun.

This solar radiation analysis within extended and complex urban environments determines the economic viability and optimal implantation conditions for integrating photovoltaic solar energy into the building.

BUILDINGS THAT GENERATE THEIR OWN ELECTRICITY



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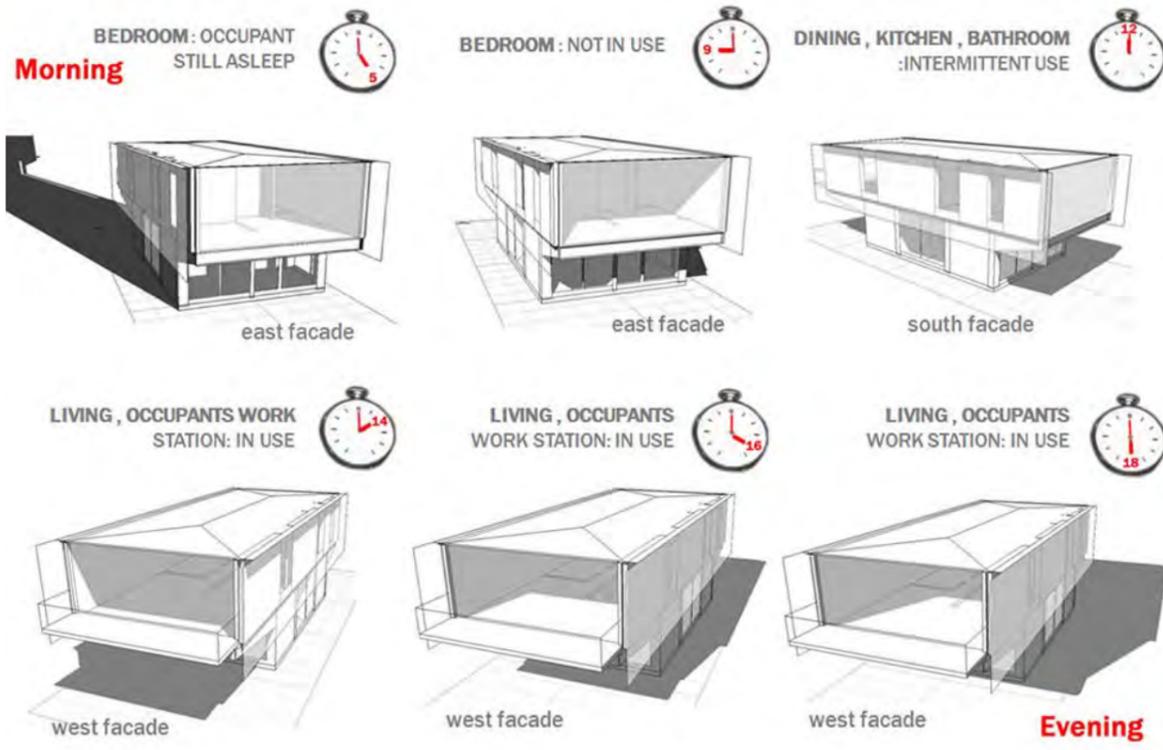
ENERGY ANALYSIS



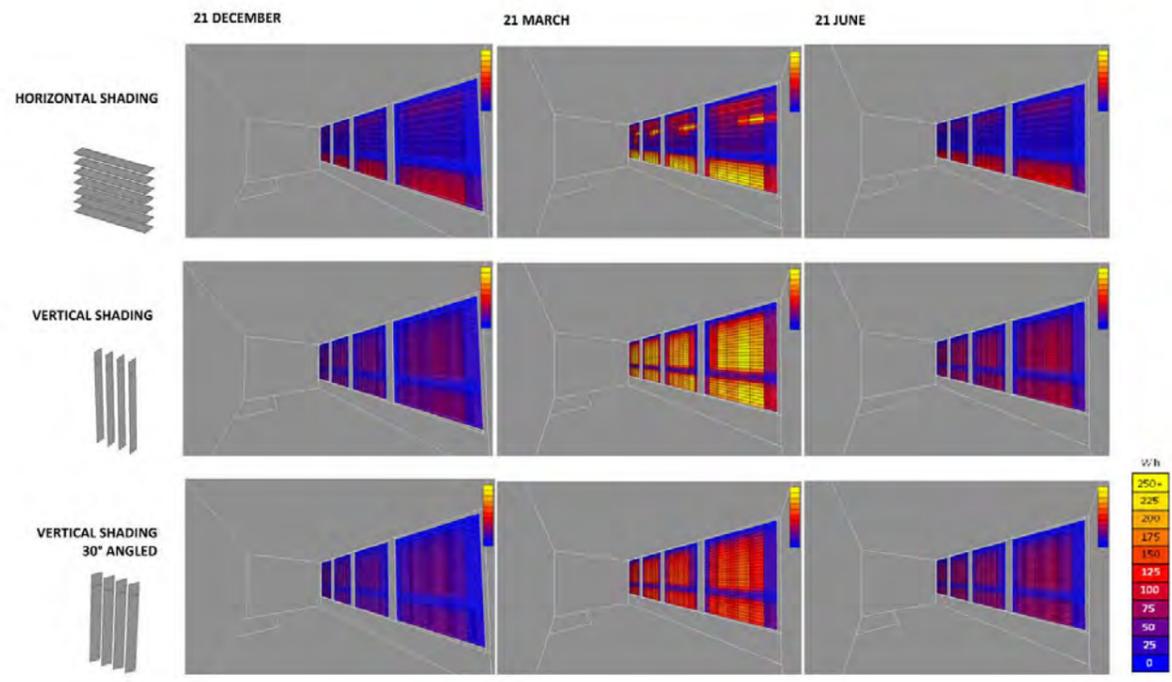
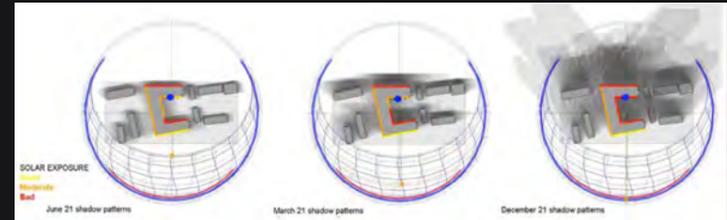
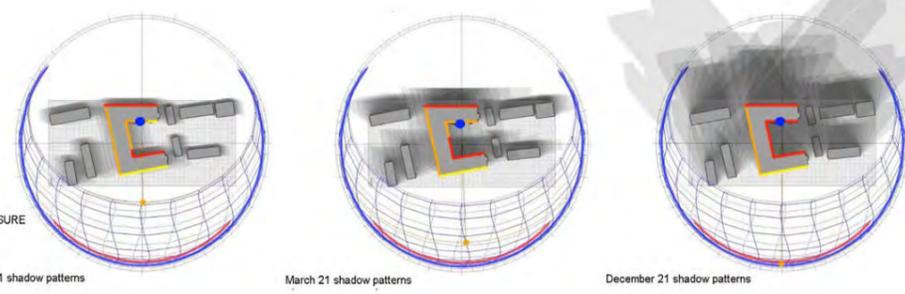
The purpose of an energy analysis is to perform an approximate calculation of the total energy consumption of the buildings over a specific period of time in order to adopt efficient alternatives from the point of view of energy consumption.

An energy analysis takes into account an extensive variety of design-related factors, including the following:

- Location of the building.
- Orientation and interior layout.
- Architectural characteristics.
- Types of materials used for walls, interiors, floors and ceiling.
- Energy exchange through ventilation.
- Heat generated by the occupants of a building.
- Density of points of light.
- Hot water requirements.
- Use of renewable energies.
- CO₂ emissions into the atmosphere.



SOLAR ANALYSIS

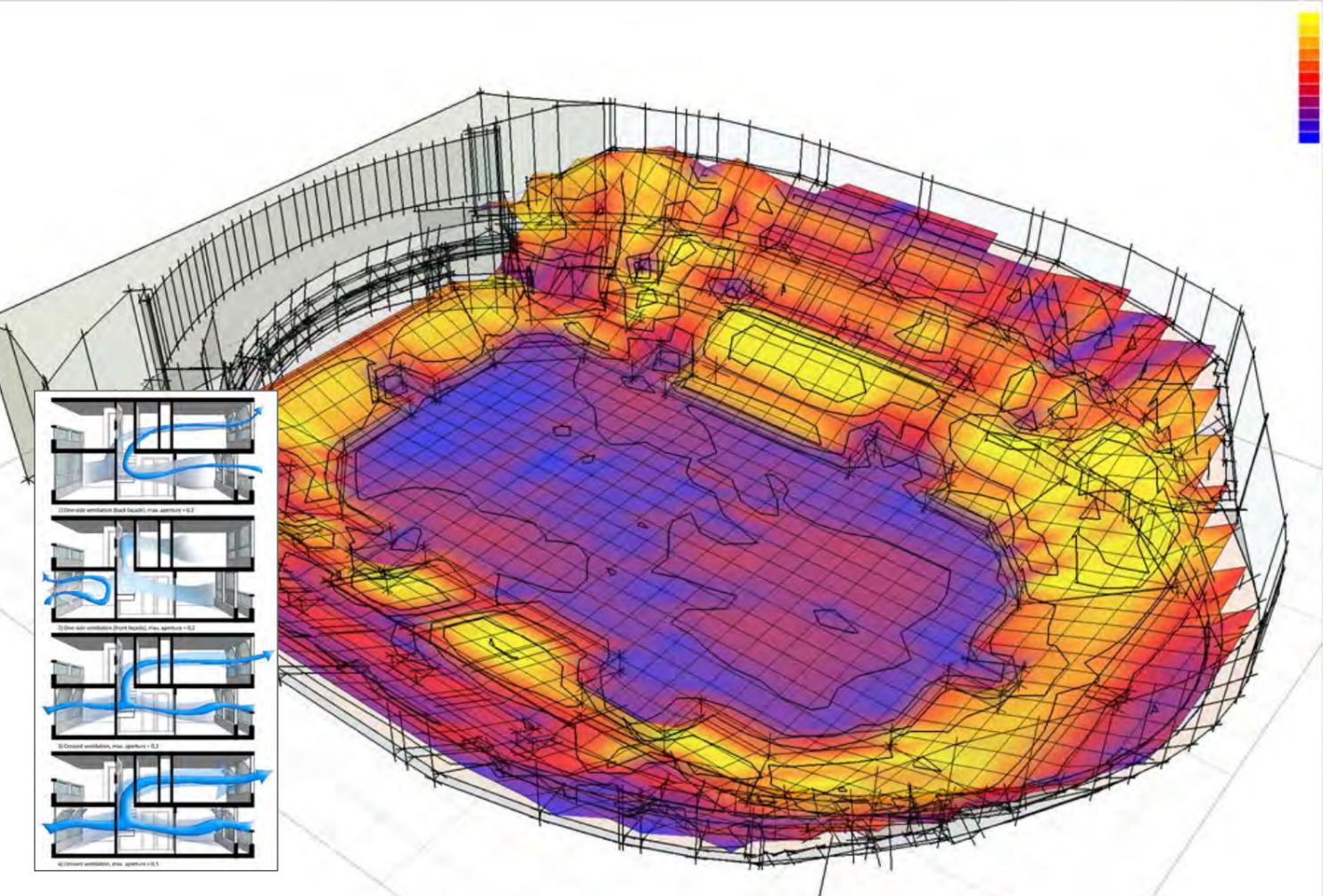


The analysis of solar reflection is the study of how the impact of solar radiation affects the object of study (building or groups of buildings).

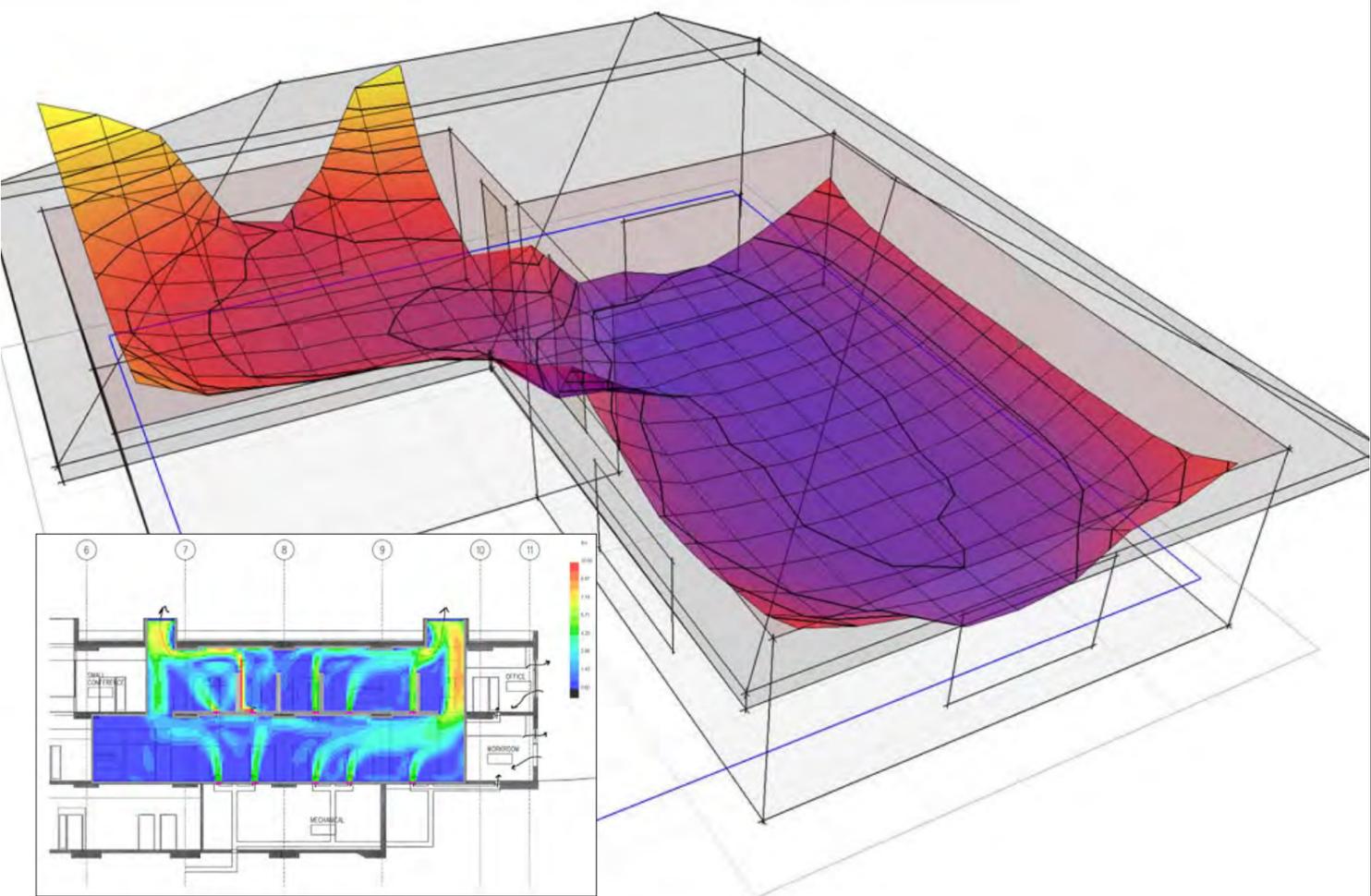
The impacting solar radiation refers to the wide spectrum of energies originating in the sun that strike an object or surface. This includes, on one hand, a direct component originating in the sun and another diffuse one originating in the visible part of the sky. Depending on the selected place, it can also contain a third component originating in the reflection on other surfaces.

The objective of solar analysis is to determine the amount of radiation that strikes the building's different surfaces. This allows us to evaluate the best location for implementing a photovoltaic integration in the building, for example.

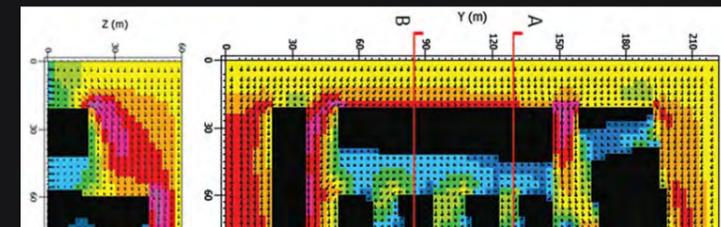
Solar analysis provides vital information for selecting the materials for the facades of the building, which leads to a better ambient quality in the interior while improving energy efficiency.



THERMAL ANALYSIS AND OF AIR AND WIND CURRENTS



THERMAL ANALYSIS



One of the key points when analyzing a building is the thermal analysis. It allows us to optimize energy performance through simulations and the analysis of the dynamics of fluids, observing heat flows and itemizing the cooling and heating requirements for building's interior spaces.

The heating and cooling needs for the models are calculated, whatever their geometry, and analyses are performed of the effects of occupation, internal gains, infiltrations, etc.

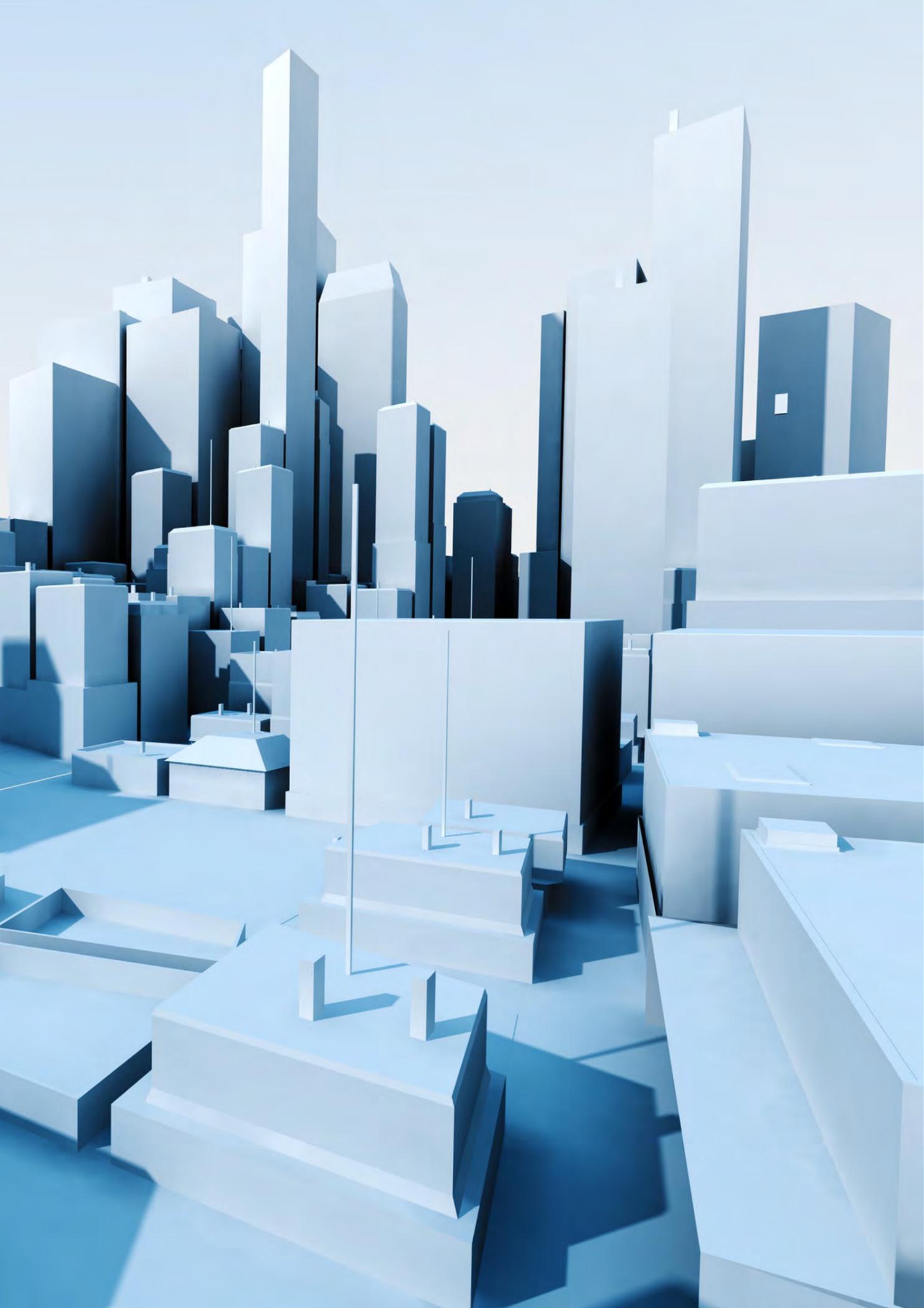


SHADOW ANALYSIS



Both shadows and solar reflection are crucial properties when it comes to designing a building. Through this analysis it is possible to calculate the way in which the shadows produced by other structures affect the building that is being studied.

Performing this analysis provides crucial information for architects and planners that will be key when it comes to taking decisions on the location of parking lots, pergolas, windows, photovoltaic installations, etc, as it will provide key data for them. It also permits improving some of the building's functional aspects.



REFLECTION ANALYSIS



Reflection analysis provides a more comprehensive vision of the different brightness and flash patterns that are generated when the radiation rebounds off the surfaces of the materials in a specific environment.

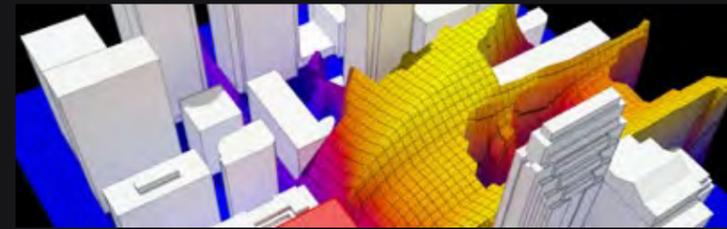
This analysis defines the building's façade design, taking into account the way the light strikes it and nearby constructions (swimming pools, parking lots, streets).

By using reflection analysis, it is possible to calculate the effects of the solar reflections as well as the shadows. Through the simulation of a sun-path diagram you can obtain the potential solar reflection at any selected point of a building. This aspect is vital when selecting the location for a photovoltaic installation and the technology of the photovoltaic panels employed.

In the majority of occasions it is advantageous to perform a reflection study of nearby buildings to check their impact on the project that is being studied particularly. The data obtained will be critical for defining the shape, structure and orientation of the new project.



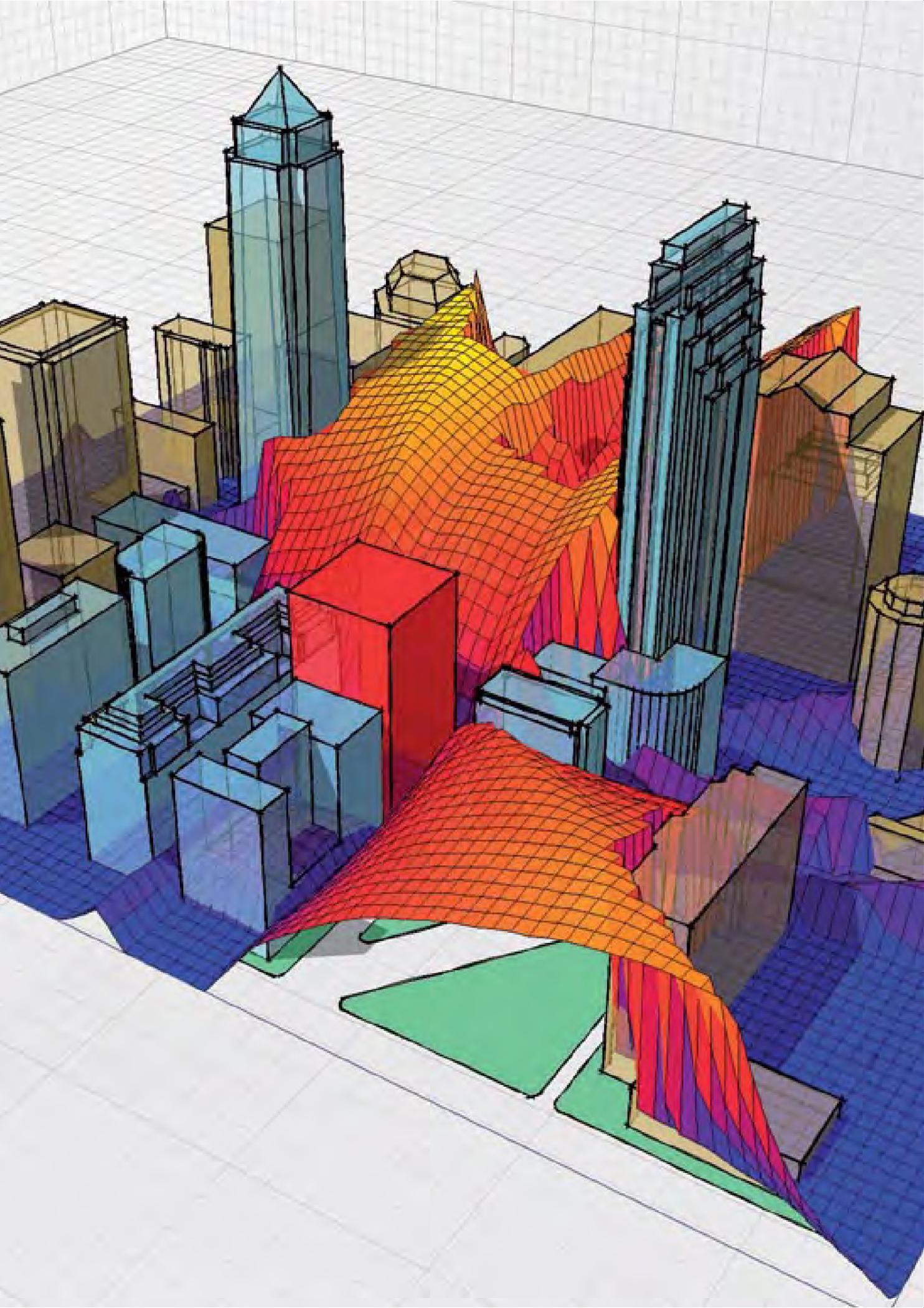
VISIBILITY ANALYSIS

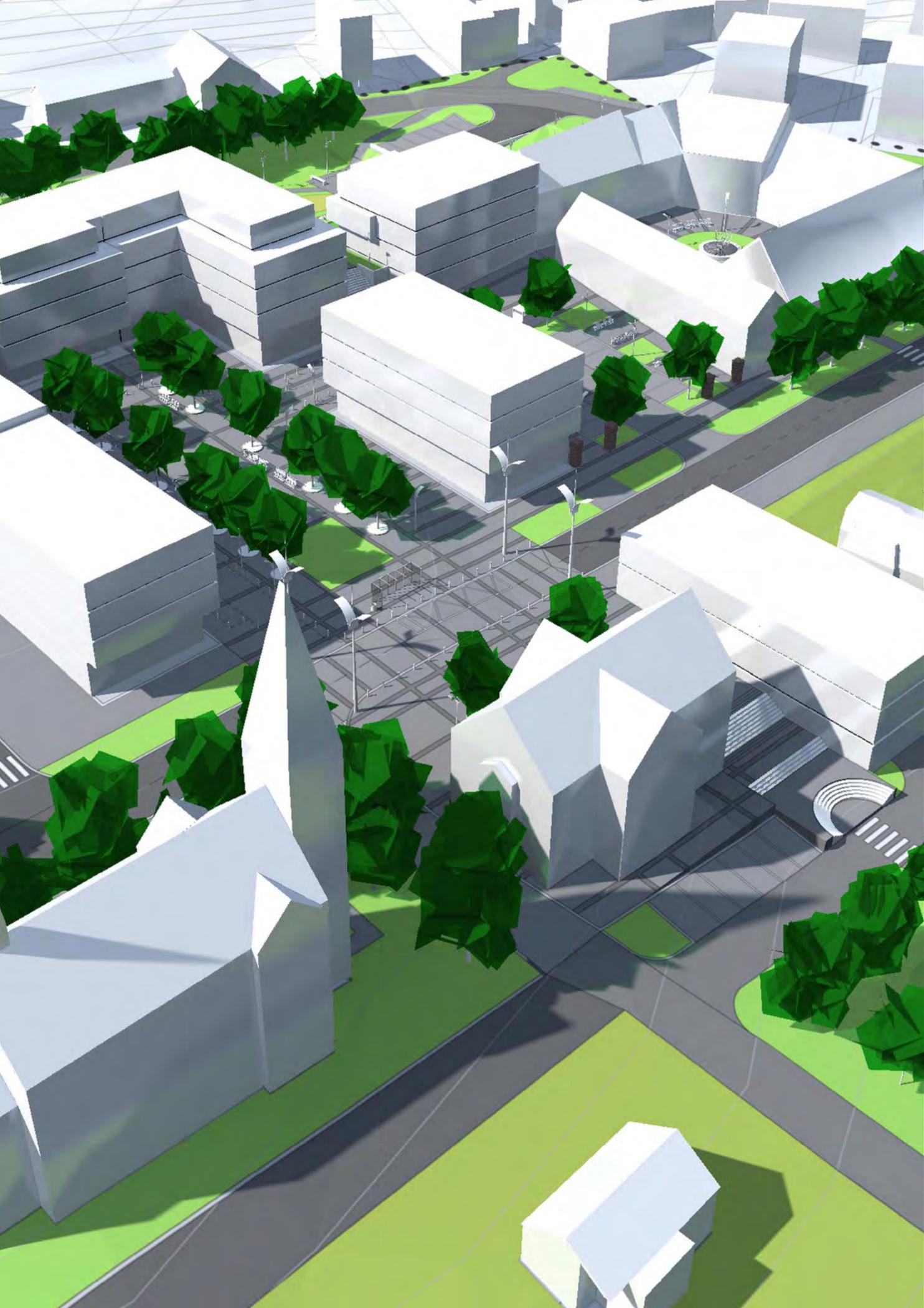


Even in a preliminary stage of the design it may be important to find out the degree of visibility of certain objects from different points of the building and workstations.

Visibility analysis provides highly useful assessments of the areas in a room that have suitable views of the exterior through windows and open spaces.

It consists of establishing a specific point for analysis on the drawing to then select the most suitable location for the windows. This permits a quick calculation of the exact area that is visible from that selected point.





LOCATION ANALYSIS



The prior consideration of the environmental limitations and possibilities will help the architect to design his or her plans keeping location factors in mind.

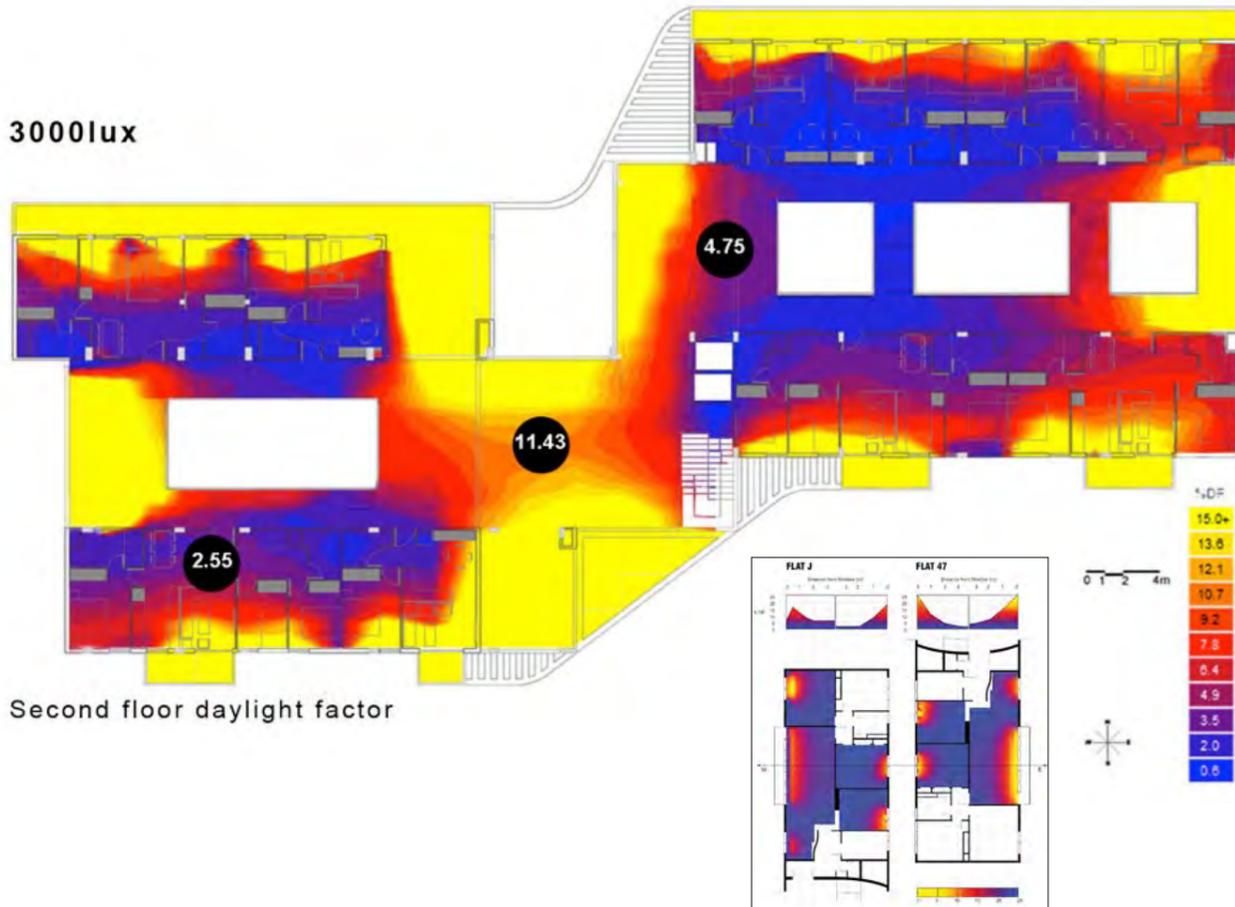
Location analysis allows designers to make the most of climatic conditions to maintain comfort while reducing the need for artificial control to a minimum. It also helps in choosing suitable materials.

A location analysis includes:

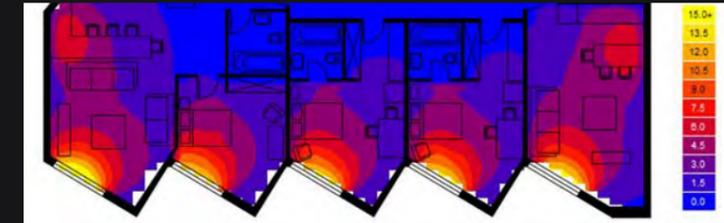
- Wind currents.
- Temperatures.
- Humidity conditions.
- Summary of the climate in a specific place.
- Rainfall.



3000lux



DAYLIGHT ANALYSIS



Winter solstice

Summer solstice

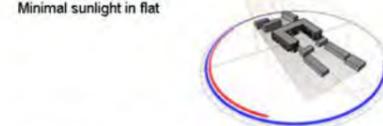
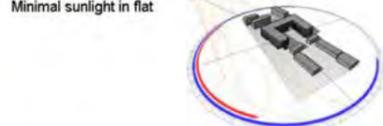
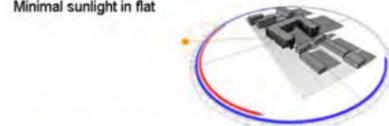
Location of Flat 208



December 21 : 9:00 am
Minimal sunlight in flat

March 21 : 9:00 am
Minimal sunlight in flat

June 21 : 9:00 am
Minimal sunlight in flat



December 21 : 12:00 pm
Seemingly lot of sunlight though its actually very diffused light

March 21 : 12:00 pm
Seemingly lot of sunlight though its actually very diffused light

June 21 : 12:00 pm
Some sunlight in flat

A right building design requires an appraisal of the amounts of daylight that reach the interior for performing daily tasks.

This is achieved by providing the means that will allow diffuse light to enter from the exterior while preventing direct sunlight from entering in order to avoid overheating.

Daylight analysis is the process that estimates the amount of diffuse light entering into a building from the exterior. This analysis permits evaluating the impact of external surfaces on the way this type of light enters a building interior.



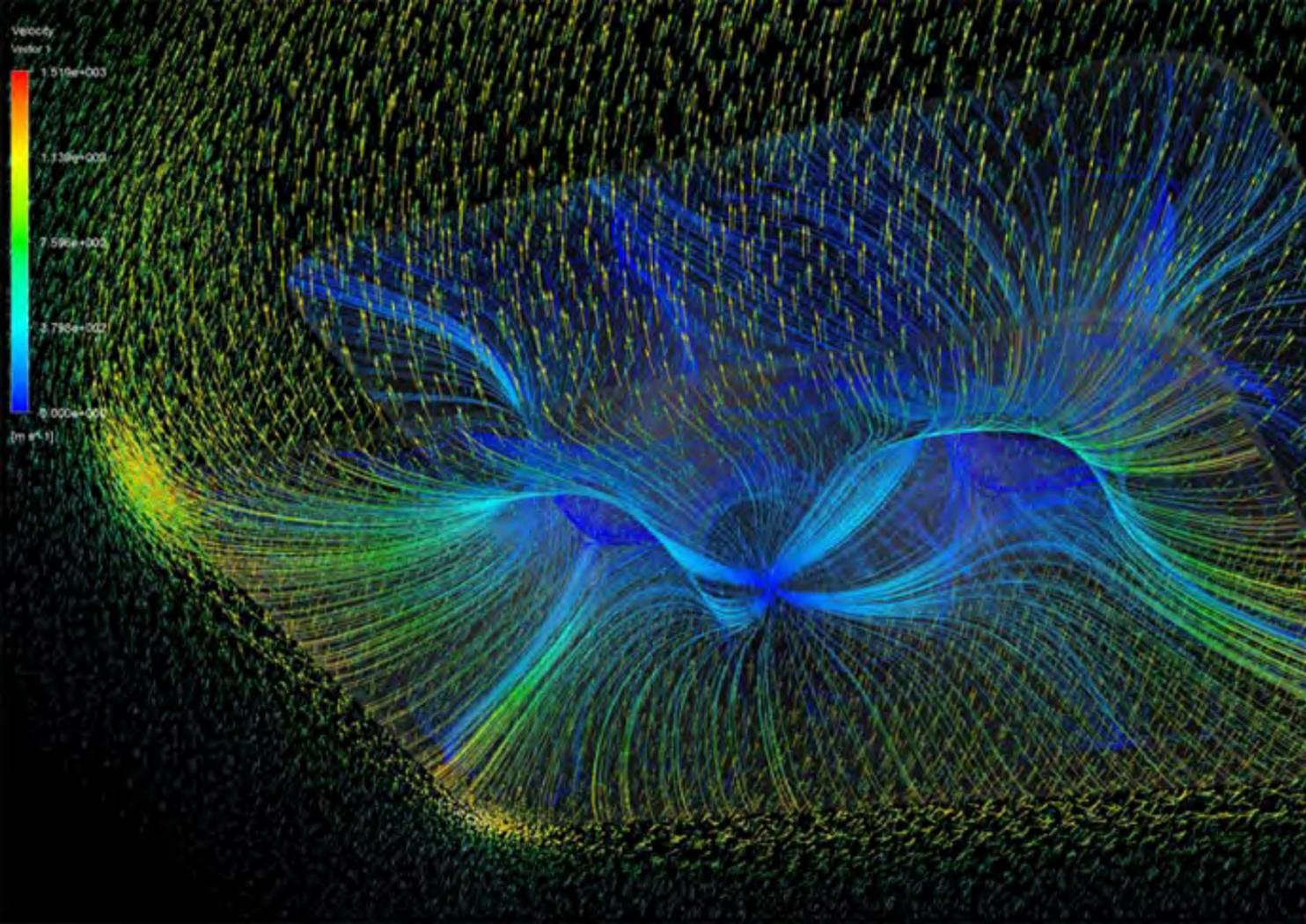
LIGHT POLLUTION ANALYSIS



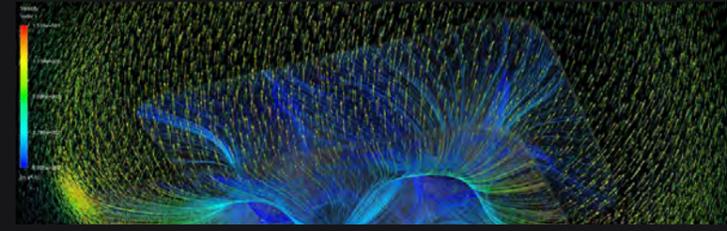
Light pollution is an excess of artificial lighting that alters the ecosystems and has adverse effects on health.

The analysis of light pollution seeks to quantify the level of light pollution and encompasses the following aspects:

- **Light Trespass:**
Luminosity values in specific locations.
- **Over-illumination:**
Evaluation of areas that exceed recommended lighting density.
- **Skyglow:**
Occasioned by outdoor lighting and natural atmospheric factors.



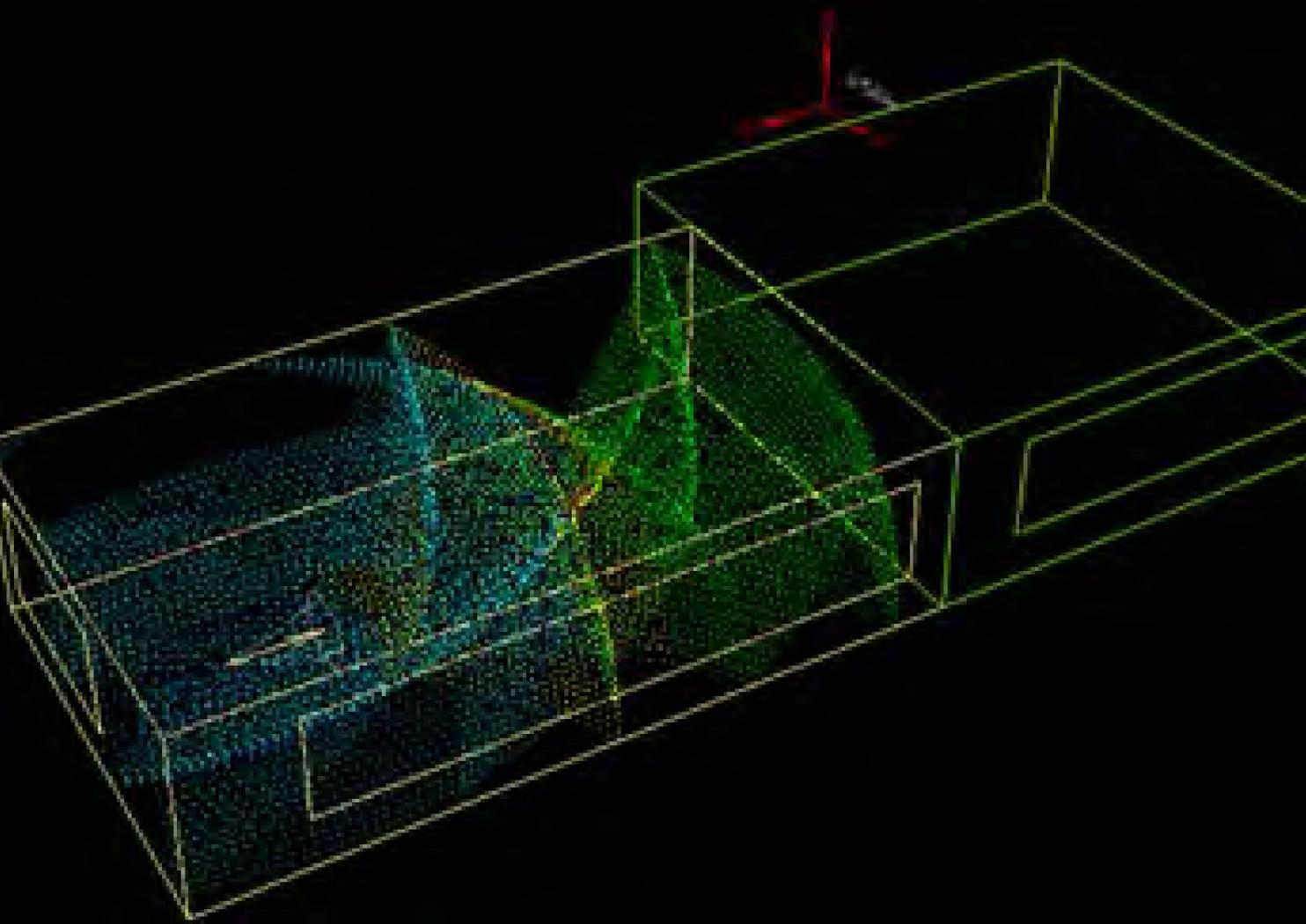
ACOUSTIC ANALYSIS



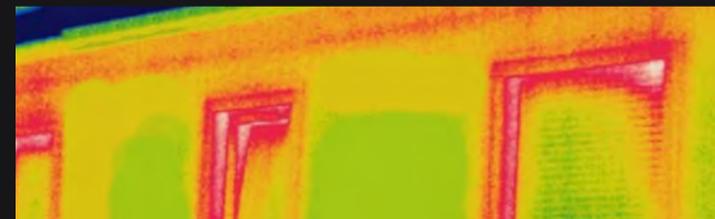
Acoustics is one of the factors that most affects the deterioration of environmental quality, one that may generate discomfort in the occupants of a building.

Acoustical analysis takes into account the study of sound in a room, its transmission, the intelligibility of voices and the levels of ambient sound inside a building.

The principal objective of this analysis is to reduce the sound level inside a building as well as to mitigate the sound transmitted from the exterior in order to optimize environmental sound quality.



OPENINGS & SURFACES ANALYSIS



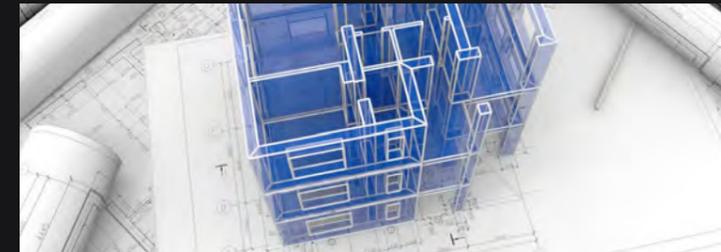
The analysis of glazed openings and surfaces studies the thermal, solar and optical properties of windows and glass panes in buildings.

These elements play a very important role as they condition the building's energy needs; some innovative and effective techniques such as thermography are used for the study of its properties.

The results of these analyses provide highly valuable information for the process of energy simulation that also helps in the choice of the most suitable systems for each building, according to its location, orientation, etc., and their purpose is to optimize energy consumption.

The logo for Onyx Green, featuring the word "onyx" in a lowercase, sans-serif font with a stylized "o" that has a dot, and the word "GREEN" in a smaller, uppercase, sans-serif font below it.

BUILDING LIFECYCLE MANAGEMENT SYSTEM



Developing sustainable alternatives requires the application of several measures within all the project phases.

Onyx Green's Building Life Cycle Management System (BLMS) provides solutions in all the project phases, from design to execution and even beyond.

If you are interested in improving Return on Investment (ROI), strengthening your position in the marketplace or developing smart and sustainable buildings, we are the ideal partner for you.

PHOTOVOLTAIC
STRUCTURE
PARC

www.onyxsolar.es

onyx
GREEN

BIPV BUREAU

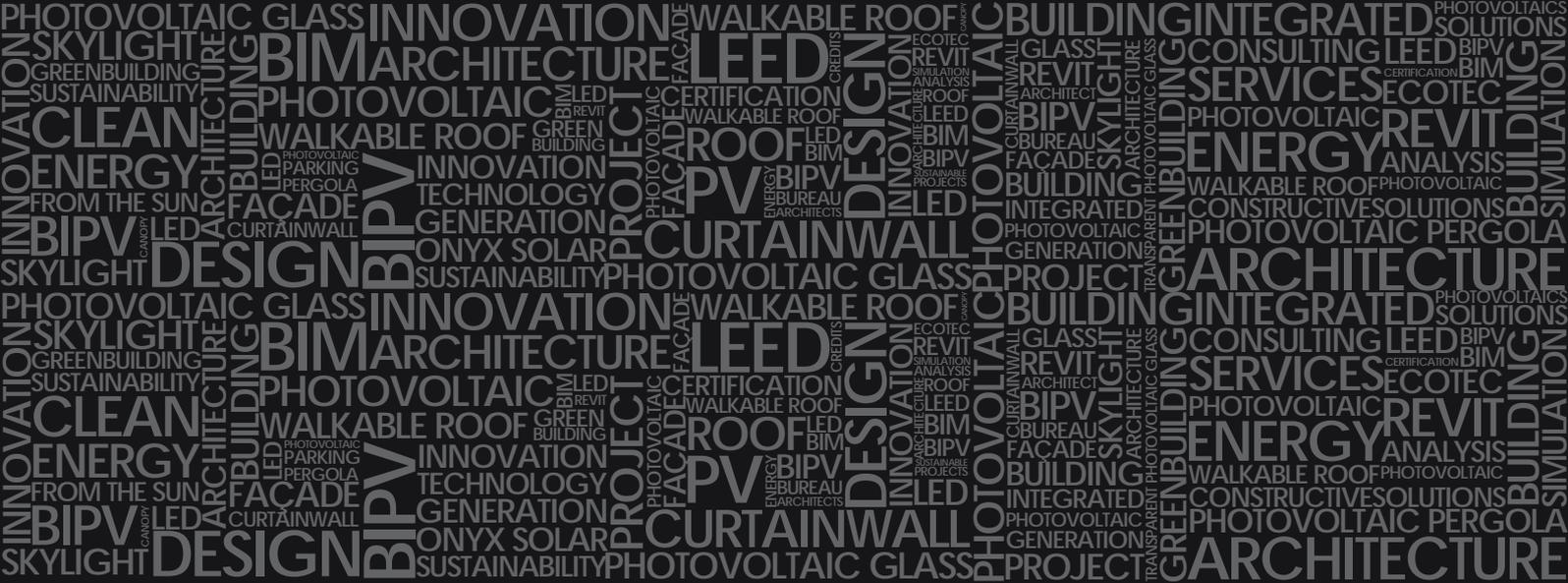


VALUE ADDED SERVICES
**PREPARATION
DESIGN
CONSTRUCTION INFO
TENDER ACTION
CONSTRUCTION WORK
AFTER HAND-OVER**

Onyx Solar counts on a multidisciplinary team of architects, engineers and physicists with proven experience in the field of Building Integrated Photovoltaics (BIPV), who are able to provide answers to any concern of any project.

Its Technical Department offers "tailor made" solutions, taking into account all the singularities of each project. This includes specialized technical consulting in the design, installation and maintenance of its advanced photovoltaic construction solutions.

For further information, please visit us in www.onyxsolar.com



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