

Course 10

Sustainable Architecture



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Master 1 architecture





Introduction

Sustainability has become a central concern in the field of architecture, where professionals are increasingly committed to designing and constructing buildings that minimize environmental impact and promote healthier, more efficient spaces. This course equips you with the knowledge and language skills needed to excel in sustainable architectural practice.



Course Objectives

- Build a comprehensive vocabulary related to sustainability in architecture in English.
- Explore and understand the principles of sustainable design.
- Discover the application of sustainability in real world architectural projects.



Section1 :
Vocabulary
Related to
Sustainability in
Architecture.



Key Terminology

01 | Sustainable Architecture:

Sustainable architecture, also known as green architecture, refers to the practice of designing and constructing buildings that have a minimal negative impact on the environment, reduce energy consumption, and enhance the quality of life for occupants.





"Sustainable architecture aims to create buildings that are environmentally responsible and resource-efficient."

Key Terminology

02 | LEED Certification:

LEED: Leadership in Energy and Environmental Design a program started by the **USGBC**, is the most widely used green building rating system. It evaluates buildings based on criteria such as energy efficiency, water conservation, and indoor air quality.

It operates through a four-level point-based certification that rewards projects for implementing green building strategies:

- Certified: 40–49 points
- Silver: 50–59 points
- Gold: 60–79 points
- Platinum: 80+ points



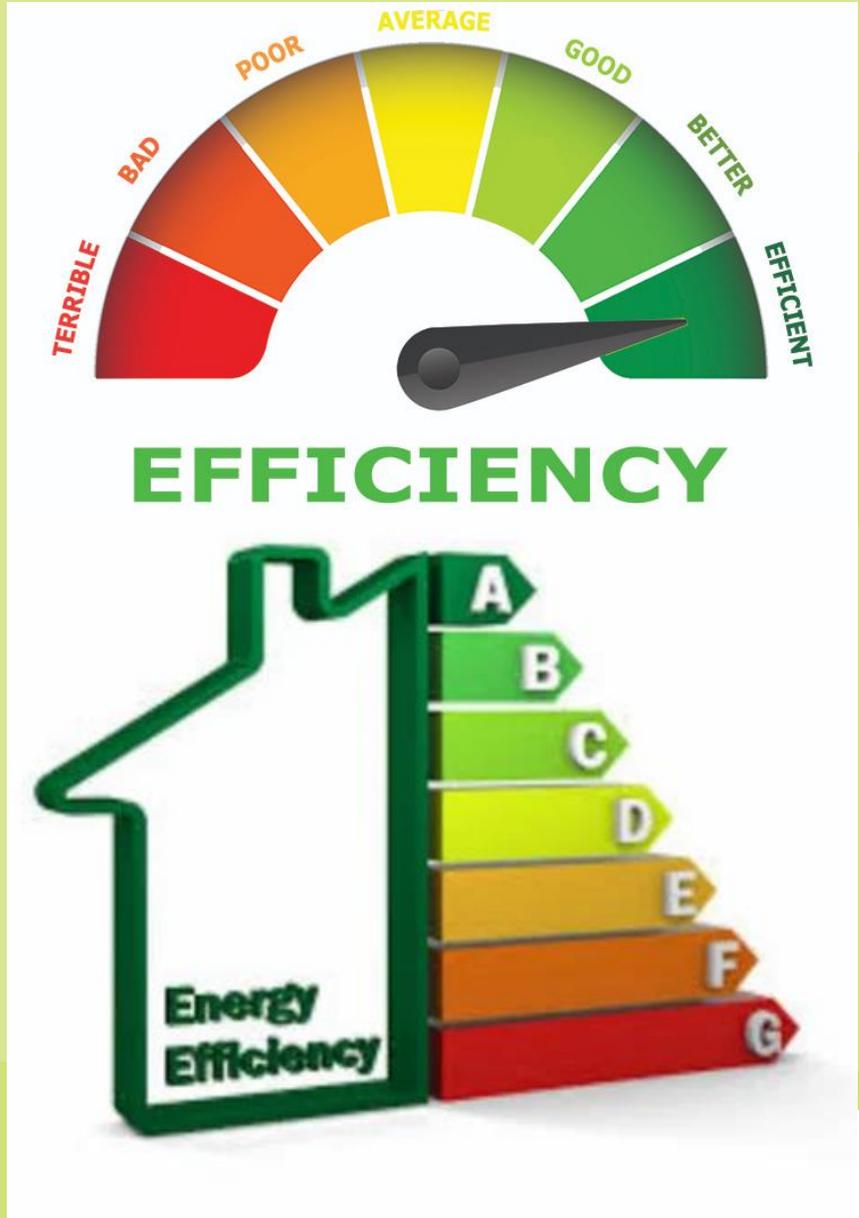


"Achieving LEED certification demonstrates a commitment to sustainable building practices."

Key Terminology

03 | Energy Efficiency:

Energy efficiency in architecture involves designing buildings that use less energy for heating, cooling, and lighting. It often includes features like high-efficiency HVAC systems and well-insulated walls.





"Energy efficiency is a cornerstone of sustainable building design."

Key Terminology

04 | Renewable Energy:

Renewable energy sources, such as solar panels and wind turbines, generate electricity without depleting finite resources. They play a vital role in sustainable architecture.



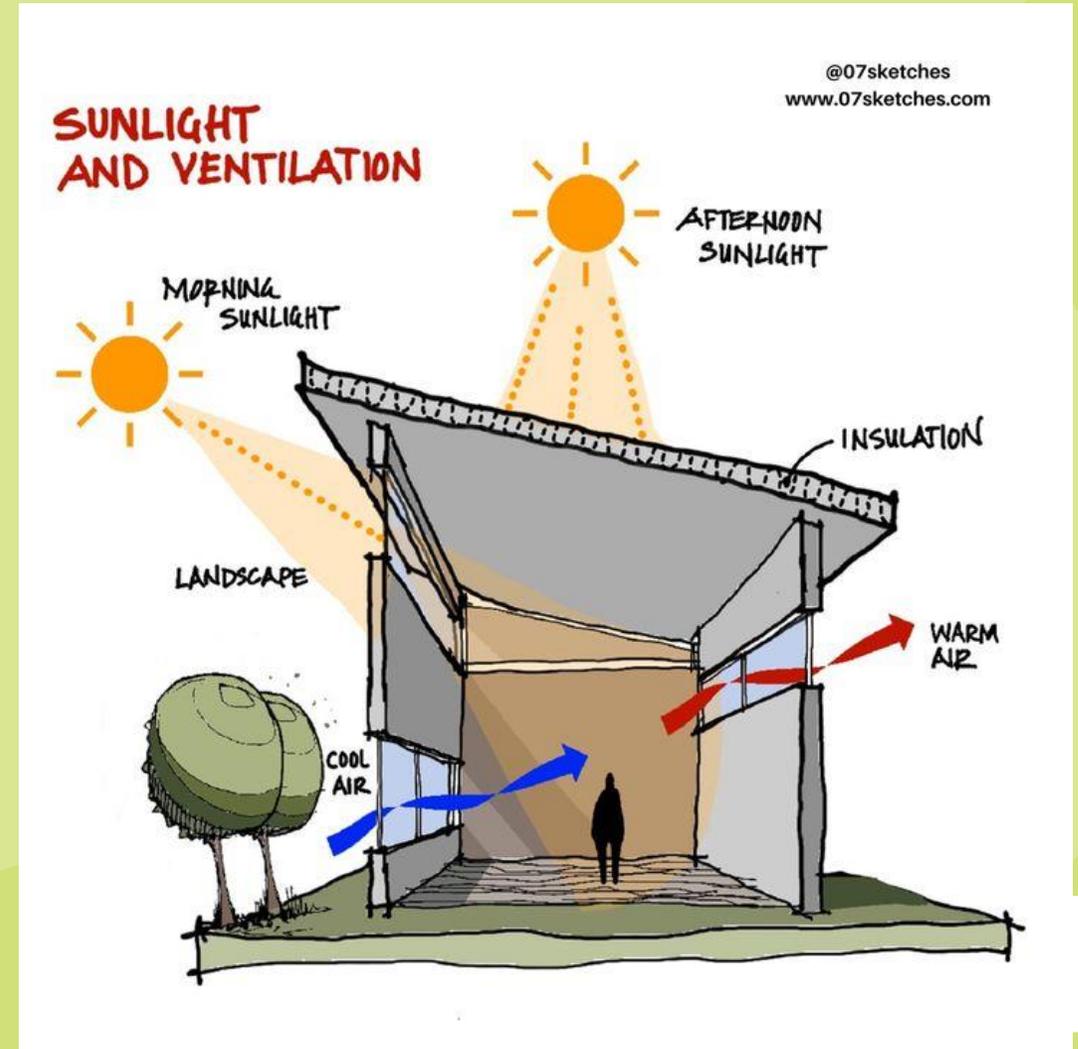


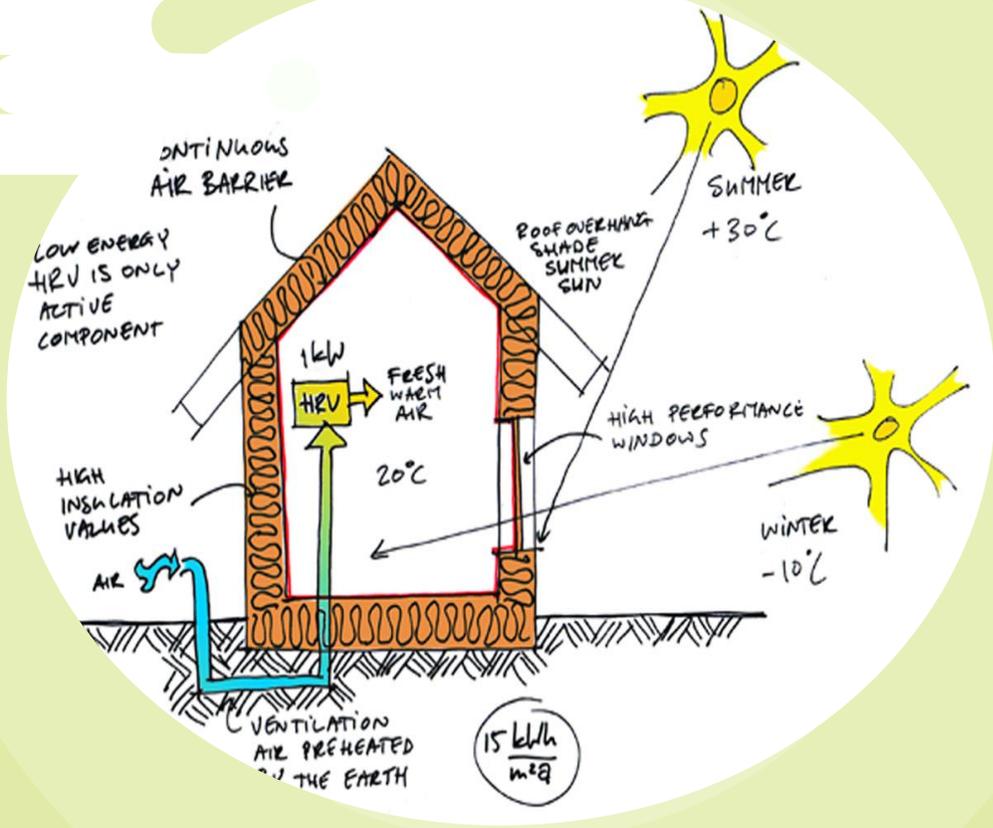
"Incorporating renewable energy sources can make a building more sustainable and reduce its carbon footprint."

Key Terminology

05 | Passive Design:

Passive design strategies use natural elements like sunlight, wind, and shading to regulate temperature and lighting within a building, reducing the need for mechanical systems.





"Passive design techniques can significantly contribute to energy savings."

Key Terminology

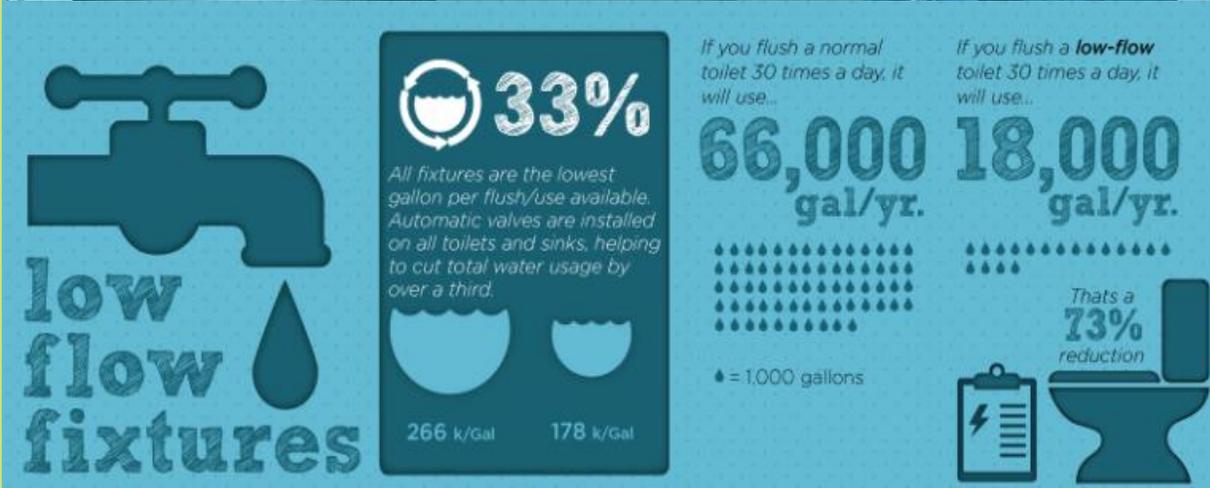
06 | Water Conservation:

Water conservation strategies aim to reduce water consumption within a building through technologies like low-flow fixtures and rainwater harvesting.



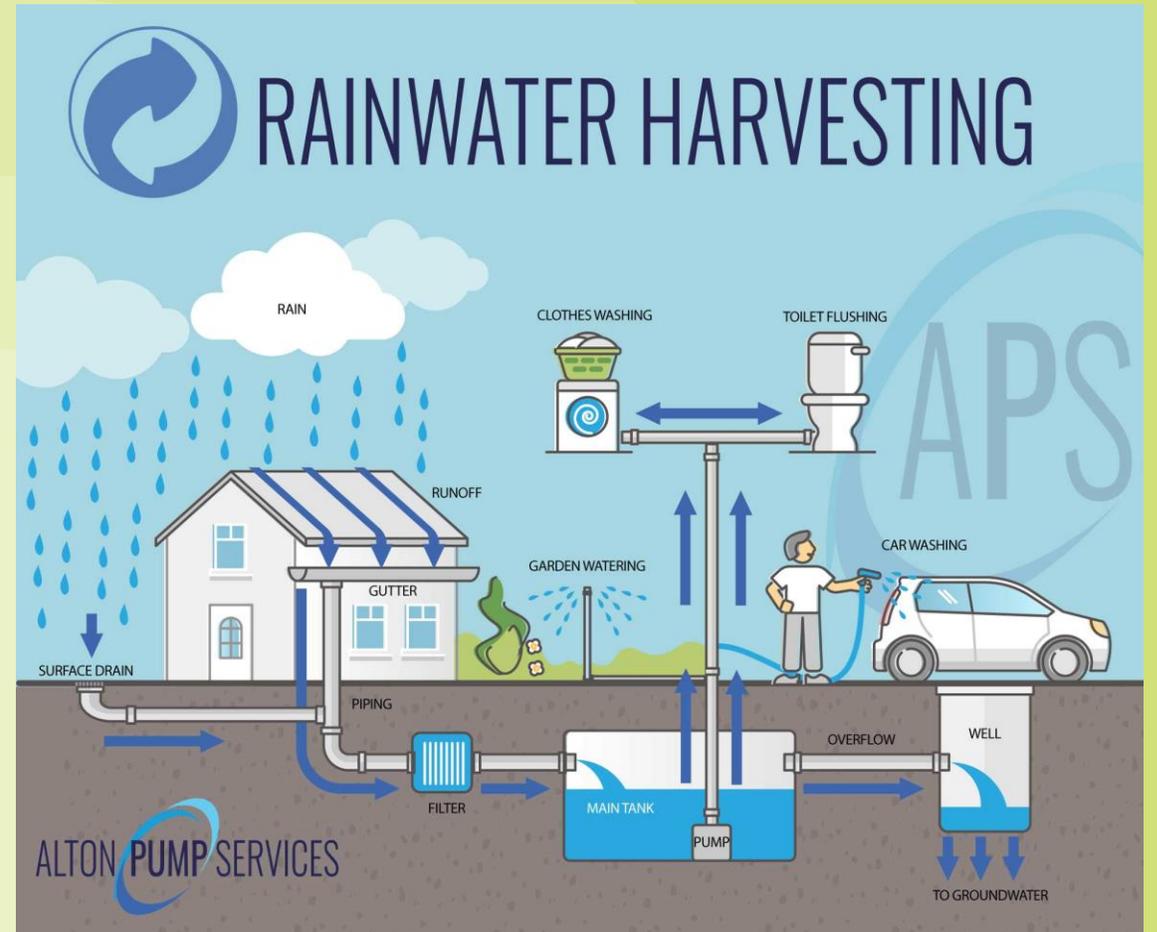
low-flow fixtures

water-saving plumbing devices designed to reduce water consumption in homes and businesses.



rainwater harvesting

is the process of collecting and storing rainwater that falls on roofs or other surfaces for later use.





"Water conservation is a critical aspect of sustainable building practices, especially in regions with water scarcity."

Key Terminology

07 | Green Roof:

A green roof is a roof covered with vegetation, which helps reduce stormwater runoff, improve air quality, and enhance thermal insulation.





"Green roofs are becoming increasingly popular for their environmental benefits."

Section 2 :

Key Sustainable Design Principles





Key Sustainable Design Principles



01 | Energy Efficiency

Minimize energy consumption by optimizing insulation, selecting efficient HVAC systems, and incorporating renewable energy sources.



03 | Sustainable materials

Selection based on their environmental impact, durability, and recyclability.



05 | Site Planning and Land Use

Responsible land use, reduced pollution, and preservation of natural ecosystems.



02 | Passive design technique

Utilize natural elements like sunlight, wind, and shading to regulate temperature and lighting within a building. This reduces the reliance on mechanical systems.



04 | Water Conservation

Water-saving aims minimize the building's impact on local water resources.



06 | Indoor Environmental Quality

Enhance indoor air quality, thermal comfort, and natural lighting, contributing to the well-being and productivity of building occupants.



Section 3 :

Writing Reports on Sustainable Architectural Projects





Introduction

Writing reports is an integral part of documenting and communicating the outcomes of sustainable architectural projects. This steps will guide you through the process of crafting well-structured and informative reports that highlight the sustainability aspects of your projects.



Key Components of Sustainable Architectural Reports



01 | Executive Summary:

Start your report with a concise summary of the project, emphasizing its sustainability goals and key achievements. This section provides a quick overview for readers.

"The executive summary provides a snapshot of the project's sustainability objectives and outcomes."



02 | Introduction:

Introduce the project, its location, purpose, and the context of sustainable design. Explain the importance of sustainability in the architectural field.

"The introduction sets the stage for understanding the significance of sustainable design in this project."





Key Components of Sustainable Architectural Reports



03 | Sustainability Goals and Objectives:

Clearly state the sustainability goals and objectives of the project. Describe what the project aimed to achieve in terms of environmental, social, and economic sustainability.

"The sustainability goals and objectives guide the project's focus on ecological and societal benefits."



04 | Design Strategies:

Detail the sustainable design strategies implemented in the project. Discuss elements such as energy-efficient systems, material choices, passive design features, and water conservation measures.

"The design strategies section elaborates on how sustainable principles were integrated into the project's architectural elements."





Key Components of Sustainable Architectural Reports



05 | Performance Metrics:

Present data and analysis related to the project's performance in achieving sustainability goals. Include energy consumption, water usage, indoor air quality, and other relevant metrics.

"Performance metrics provide empirical evidence of the project's sustainability achievements."



06 | Challenges and Solutions:

Describe any challenges or obstacles encountered during the project and the innovative solutions devised to overcome them.

"Highlighting challenges and solutions showcases the project's adaptability and problem-solving capabilities."





Key Components of Sustainable Architectural Reports



07 | Lessons Learned:

Reflect on lessons learned during the project, both in terms of what worked well and areas for improvement in future sustainable projects.

"Documenting lessons learned contributes to continuous improvement in sustainable architectural practices."



08 | Recommendations:

Offer recommendations for further sustainability improvements or enhancements in future phases of the project or similar projects.

"The recommendations section provides actionable insights for ongoing sustainability efforts."



Section 4 :

Sustainable Building Case Studies





1 | The Edge, Amsterdam

Key Design Principles Implemented:

Energy Efficiency:

The Edge maximizes natural light penetration, reducing the need for artificial lighting. The building is equipped with smart LED lighting systems that adjust based on occupancy and natural light levels.

Photovoltaic solar panels cover the roof and facade, generating renewable energy to power the building.



1 | The Edge, Amsterdam

Water Efficiency:

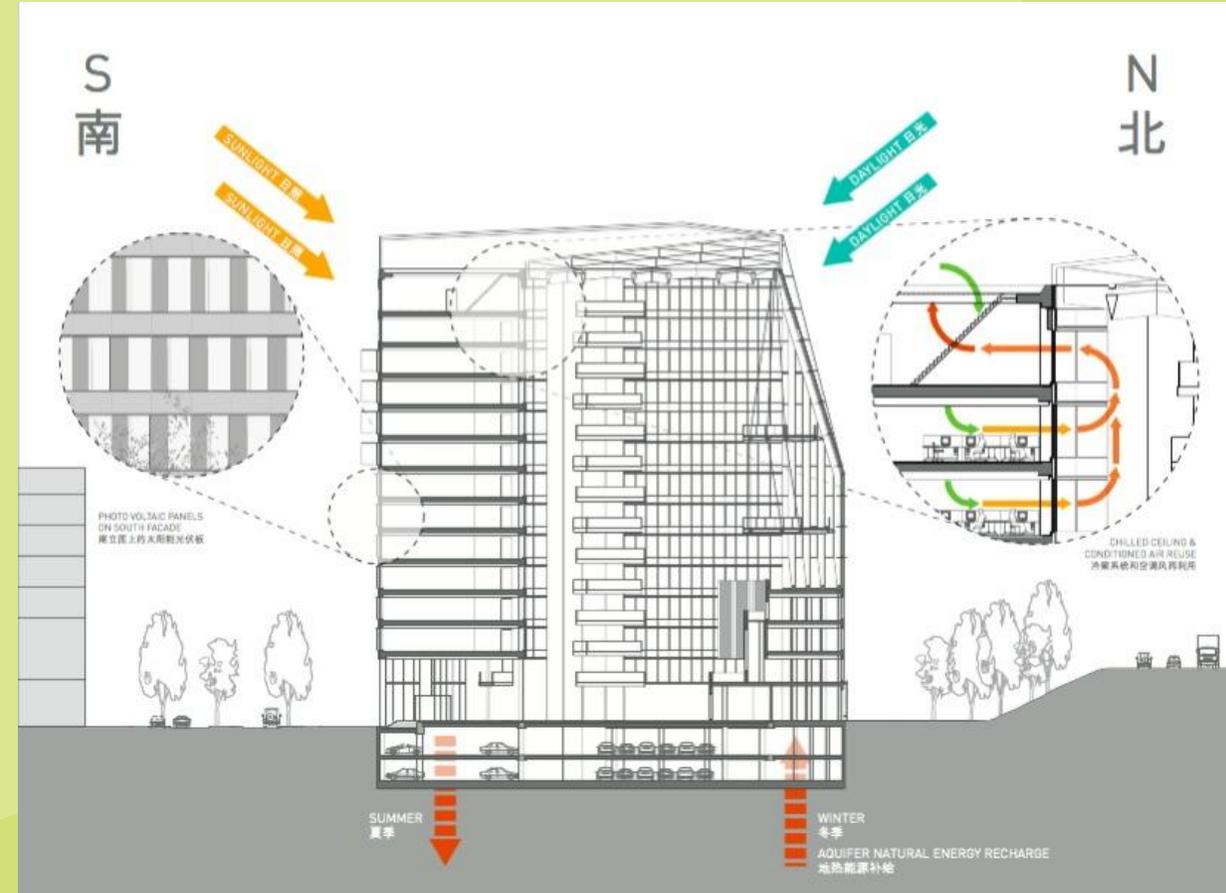
Rainwater harvesting systems collect and store rainwater for landscape irrigation and toilet flushing.

Water-efficient fixtures and fittings, such as low-flow faucets and dual-flush toilets, contribute to reduced water consumption.

Passive Design Strategies:

The architectural design maximizes natural ventilation, reducing the reliance on mechanical cooling systems.

Shading devices and high-performance glazing are used to control solar heat gain and enhance thermal comfort.



1| The Edge, Amsterdam

Materials and Resources:

Sustainable and recycled materials were used in construction, including recycled steel and concrete.

Timber used in the building is certified by sustainable forestry initiatives, promoting responsible sourcing.

Smart Building Technology:

The Edge is equipped with advanced sensors and automation systems to optimize energy use. Lighting, heating, and cooling are controlled based on occupancy and environmental conditions.

Employees can use a smartphone app to control their individual workspace environment, contributing to personalized comfort and energy savings.





1| The Edge, Amsterdam

Sustainable Accessibility:

The Edge promotes sustainable mobility by offering eco-friendly options like bicycle parking, electric vehicle charging stations, and easy access to public transportation. These features effectively reduce the building's carbon footprint and encourage the use of sustainable transportation methods.

Waste Management:

The construction process focused on minimizing waste, and a robust recycling program is in place for ongoing waste management.

Composting facilities are available for organic waste generated on-site.





Thank you!

Do you have any questions?

