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HIGH-PERFORMANCE BUILDING DESIGN PROFESSIONAL-HBDP OVERVIEW

ONLINE PROFESSIONAL COURSES LED BY THE
WORLD'S TOP SPECIALISTS

ONLINE TRAINING BY KRISHNAJI PAWAR

LEED AP(BD+C), GSAS CGP, GCP, ISO 14001

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MODULE

5

Sustainable Processes

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HIGH-PERFORMANCE BUILDING DESIGN PROFESSIONAL HBDP OVERVIEW

Sustainable high-performance building processes involve incorporating green building practices, renewable energy sources, and efficient design strategies to create environmentally friendly, energy-efficient, and cost-effective structures that minimize environmental impact while maximizing performance.

Learning Objectives

- Introduction
- Getting Started with HBDP
- Sustainability Concepts
- HVAC Processes
- **Sustainable Processes**
- Environmental Improvement Programs and Rating Systems
- Certification for High-Performing Building Specialists
- Summary and Resources
- High-Performance Building Design Professional - HBDP Practice Test V.4.1



INTRODUCTION

- Incorporating green building practices, renewable energy sources, and efficient design strategies to minimize environmental impact.
- Energy efficiency: Use of energy-efficient materials and passive design strategies to reduce energy consumption.
- Water efficiency: Use of water-saving fixtures and systems like rainwater harvesting and greywater recycling to minimize strain on local water resources.
- Materials and resources: Use of environmentally friendly materials like recycled and reclaimed materials, locally sourced materials, and durable materials.
- Renewable energy sources: Use of solar panels and wind turbines to reduce reliance on fossil fuels and lower greenhouse gas emissions.

UNDERSTANDING NATURAL RESOURCE UTILIZATION



- Natural resources are classified into renewable and non-renewable categories.
- Renewable resources, like sunlight, wind, water, and forests, can be replenished naturally over time.
- Non-renewable resources, like fossil fuels, are finite and cannot be easily replenished once depleted.
- Resource utilization involves sustainable extraction, processing, and use to meet human needs while minimizing environmental impacts.
- Resource management involves planning, monitoring, and regulating the use of natural resources to ensure sustainability.
- Environmental, social, and economic impacts of resource utilization must be considered.
- Sustainable practices like reforestation and selective logging can minimize negative impacts.
- Implementing sustainable practices ensures long-term resource availability and protects the planet's health.

RENEWABLE ENERGY SOURCES AND THEIR APPLICATIONS

- Solar energy is a popular alternative to fossil fuels due to climate change concerns.
- Solar assisted domestic hot water (DHW) heating and photovoltaic systems are two common applications of solar energy.
- Solar assisted DHW heating systems use solar collectors to absorb sunlight, converting it into heat for household use.
- Photovoltaic systems convert sunlight directly into electricity using solar panels, reducing dependence on grid electricity.
- Excess electricity generated by photovoltaic systems can be fed back into the grid for credit or compensation.
- Air to water heat pumps use ambient air heat to warm water for domestic use.
- These technologies offer sustainable and environmentally friendly solutions, reducing carbon emissions and reliance on fossil fuels.



NET-ZERO ENERGY BUILDINGS: A COMPREHENSIVE



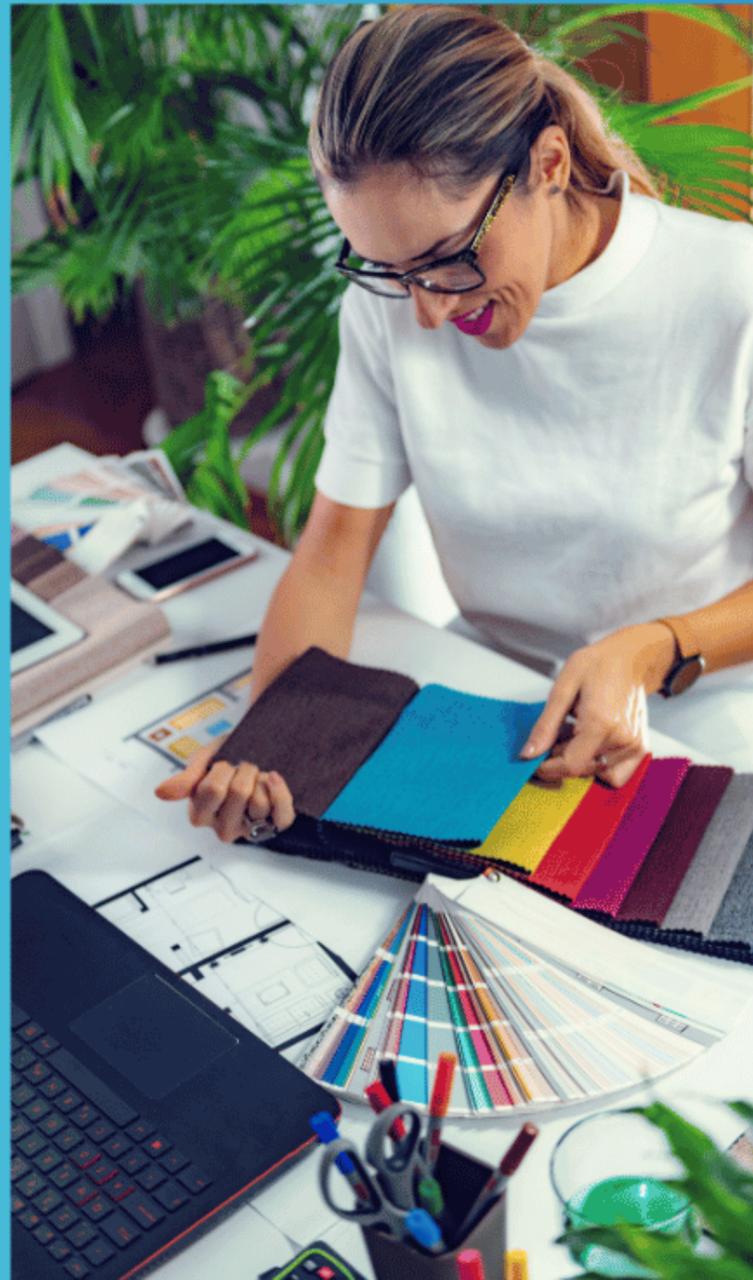
- Net-zero energy buildings are structures that produce as much energy as they consume annually, typically using renewable energy sources like solar panels, wind turbines, and geothermal systems.
- Evaluating the feasibility of a net-zero energy building involves assessing the building's location, orientation, energy consumption patterns, available renewable energy resources, and budget constraints.
- The building's energy consumption profile, including peak demand times, daily fluctuations, and seasonal variations, is crucial for implementing strategies to reduce energy consumption and optimize energy performance.

NET-ZERO ENERGY BUILDINGS +

- The building's location and orientation directly impact the feasibility of achieving net-zero energy status. A building in a sunny, windy area has greater potential for generating renewable energy.
- Energy efficiency measures, including incorporating energy-efficient appliances, lighting, insulation, and HVAC systems, are critical for minimizing energy consumption and increasing potential for net-zero energy status.
- The financial implications of a net-zero energy project, including the initial investment in renewable energy technologies and energy-efficient systems, should be considered.
- By analyzing these factors and implementing effective strategies, designers can create sustainable, high-performance buildings that minimize environmental impact.



NET-ZERO ENERGY BUILDING SITING IMPLICATIONS



- Solar Access: The building's orientation affects its solar energy generation potential. A south-facing orientation receives more direct sunlight, allowing for greater solar energy capture.
- Surrounding Environment: Trees, buildings, and other structures can provide shade or block sunlight, affecting the building's energy needs. A dense urban area with tall buildings may reduce solar access and energy generation capabilities.

NET-ZERO ENERGY BUILDING SITING IMPLICATIONS +



- Climate: The climate of the region can influence the building's siting considerations. A hot and sunny climate may benefit from strategic placement to maximize passive cooling and minimize solar heat gain.
- Overall, proper siting can significantly impact the sustainability and success of a net-zero energy building.

GREEN BUILDING RATING SYSTEMS - BENEFITS

- Reduce energy consumption
- Reduce water consumption
- Reduce materials waste
- Reduce heat island effect
- Improve indoor air quality
- Reduce absenteeism
- Reduce Toxins in environment
- Improve productivity
- Preserve open space
- Preserve species habitat
- Improve asset value
- Increase infrastructure vitality





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