Sustainable Design Principles

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1. Introduction

- **Sustainable design:** creating buildings and spaces that minimise environmental impact while meeting human needs.
- It balances environmental, economic, and social goals across a building's life.

2. Core Principles

- **Energy efficiency:** reducing demand through insulation, orientation, and efficient systems.
- **Resource conservation:** using renewable, recycled, and low-impact materials.
- Minimising waste, water use, and pollution throughout the life cycle.

3. Key Strategies

- Passive design uses sunlight, shade, and natural ventilation to cut energy use.
- Renewable energy such as solar and wind reduces reliance on fossil fuels.
- Water harvesting and greywater recycling conserve resources.

4. Assessment and Standards

- Rating systems such as LEED and BREEAM benchmark building performance.
- **Life-cycle assessment:** evaluates impacts from material extraction to demolition.
- Embodied carbon and operational carbon are both considered.

5. Benefits

- Lower running costs and reduced greenhouse gas emissions.
- Healthier indoor environments and improved occupant wellbeing.
- Greater resilience and long-term value for communities.