

Sustainable Site Planning

1. Site Selection and Evaluation for Sustainable Construction

Selecting and evaluating a site is the foundation of sustainable construction. Proper decisions early in the process lead to significant long-term benefits, including reduced environmental impact, improved building performance, and enhanced occupant well-being.

Key Considerations

- **Environmental Sensitivity**
 - Avoid ecologically sensitive areas: wetlands, floodplains, habitats for protected species, and prime agricultural land.
 - Assess the site's biodiversity value and potential for habitat conservation or restoration.
- **Location Efficiency**
 - Favor sites with access to public transportation, existing infrastructure, and community amenities to minimize car dependence and sprawl.
 - Prioritize redevelopment of brownfields or previously developed land over undisturbed "greenfield" sites.
- **Solar Orientation and Microclimate**
 - Analyze sun path, prevailing winds, topography, and shading to optimize passive design strategies and energy performance.
 - Consider opportunities for renewable energy integration (e.g., solar, wind).
- **Soil, Topography, and Water Table**
 - Investigate soil health and stability, slope, and potential for erosion or landslides.
 - Avoid sites with high contamination unless remediation is feasible.
- **Regulatory and Community Context**
 - Ensure compliance with land use policies, local codes, and zoning.
 - Engage with stakeholders and the local community to understand concerns and garner support.

Site Assessment Process

Step	Action
Site Visit	Survey topography, vegetation, hydrology
Environmental Audit	Screen for habitats, contamination, water features

Step	Action
Access Analysis	Check transportation, walkability, infrastructure
Risk Assessment	Evaluate flooding, landslide, hazard vulnerability

2. Green Space Planning and Landscaping

Integrating green spaces and thoughtful landscaping enhances sustainability, improves microclimates, and supports biodiversity.

Strategies for Green Space Planning

- **Preserve and Enhance Natural Features**
 - Retain existing mature trees, native vegetation, waterways, and landforms.
 - Restore degraded landscapes and establish ecological corridors.
- **Provide Functional Green Spaces**
 - Design multi-purpose green areas for recreation, community gardening, or wildlife habitat.
 - Use green roofs, green walls, and rooftop gardens to expand vegetated area in dense developments.
- **Biodiversity and Plant Selection**
 - Use diverse, native and drought-resistant plant species to reduce maintenance needs and support pollinators.
 - Avoid invasive species that could disrupt local ecosystems.
- **Water-Efficient Landscaping (Xeriscaping)**
 - Group plants by water needs, use mulch to retain soil moisture, and minimize turfgrass areas.
 - Install efficient irrigation systems such as drip irrigation.

Benefits

- Improves air and water quality.
- Mitigates urban heat island effect.
- Enhances mental and physical wellness of occupants.
- Supports stormwater infiltration and habitat provision.

3. Sustainable Stormwater Management

Reducing and treating stormwater runoff is essential for site sustainability, ecosystem health, and regulatory compliance.

Sustainable Techniques

- **Minimize Impervious Surfaces**
 - Limit paved areas and use permeable paving solutions for walkways, drives, and plazas.
 - Design shared parking and reduce unnecessary hardscape.
- **Low Impact Development (LID) Practices**
 - **Rain Gardens and Bioswales:** Shallow depressions planted with native vegetation filter and absorb stormwater.
 - **Green Roofs:** Vegetated roof surfaces retain rainfall and release it slowly.
 - **Infiltration Trenches/Percolation Pits:** Direct runoff underground, recharging groundwater.
- **Capture and Reuse**
 - Install rainwater harvesting systems to collect runoff for landscape irrigation or non-potable uses.
 - Use cisterns or storage tanks sized to local rainfall patterns.
- **Stormwater Treatment**
 - Implement oil/grit separators or vegetated filter strips to remove contaminants before water leaves the site.
- **Natural Waterways and Buffers**
 - Maintain or restore riparian buffers along streams or ponds to filter pollutants and provide habitat.

Planning and Implementation

Component	Sustainable Approach
Design Stormwater Flow	Simulate pre-development hydrology (reduce peak flows)
Maintenance	Ensure systems remain functional (e.g., cleaning, plant health)
Integration	Combine stormwater controls within site landscaping

Key Takeaways

- Thoughtful site selection avoids environmental harm, enhances connectivity, and lays the groundwork for green infrastructure.
- Green space planning and landscaping using native species help conserve resources, create healthy environments, and support urban biodiversity.
- Sustainable stormwater management practices protect water quality, reduce flood risk, and contribute to overall site resilience.

An integrated, multi-disciplinary approach to sustainable site planning incorporates ecological, social, and economic goals—delivering long-term value to both project stakeholders and the

broader environment.