

Table of contents

- **Foreword**
- **Preface**
- **Framing the Design Challenge**
- **Integrating Disciplines: Architects and Engineers**
- **Design Drivers for Sustainable Infrastructure Systems**
- **Defining Desired Outcomes and Metrics**
- **Creating Frameworks and Action Plans**
- **Implementing the Process**
- **Applying Integrative Design on Old Mint Plaza**
- **Goal-Setting at Aquatera, Florida**
- **Establishing a Framework**
- **Green Building Rating Systems - Helping or Hurting? An Architect's Perspective**
- **Framework #1 Pillars of Sustainability**
- **Pillars of Sustainability at The Great Wall Eco Villages**
- **Introduction**
- **Part 1 Process and Systems of Sustainable Design**
- **The Sustainable Design Team - An Engineer's Perspective**
- **Using Sustainable Infrastructure Frameworks**
- **Chapter 1 The Process of Applied Sustainable Engineering Design**
- **Creating a New Paradigm for Design**
- **Chapter 2 Sustainable Infrastructure Frameworks**
- **Project Drivers**
- **Using Frameworks for Different Types of Development**
- **Establishing Project Values and Setting Goals**
- **Design Strategies**
- **PlaNYC: Pillars of Sustainability in Action**
- **Framework #2 The Scale-Density Framework**
- **Applying the Scale-Density Framework to New Development**
- **Framework #3 The Transect**
- **Using the Transect to Redevelop Tehachapi**
- **AIA COTE "Ten Measures of Sustainability"**
- **Framework #4 The Built Form-Ecology Framework**
- **Balancing Human and Ecological Development on the Santa Lucia Preserve**
- **Table of Ecosystem Services**
- **Synergy and Sustainable Community Design**
- **One Planet Living Framework - Sonoma Mountain Village**
- **Endnotes**
- **Part 2 Sustainable Resource Systems**
- **Chapter 3 Water Conservation & Supply**
- **The Aspen Institute: Energy and Environment Program**
- **Water Management Plans**
- **Achieving Water Balance**
- **Looking at a Water Balance for a Buddhist Center in California**
- **Water Balance on the "Ahwahnee" Project**

- **The Living Building Challenge - WATER**
- **Analyzing Water Sources**
- **Groundwater**
- **Surface Water**
- **Rainwater**
- **Brackish Water**
- **Seawater**
- **Stormwater**
- **Reduce Demand / Conserve Water**
- **Improvements to Infrastructure**
- **Expansion of Existing Water Resources**
- **Rainwater Harvesting for a residential property in Sausalito**
- **Endnotes**
- **Chapter 4 Integrated Water Management**
- **Water as Resource, Not Waste Product**
- **Impacts of Modern Wastewater Practice**
- **Water Supply Strategies**
- **Redefining Waste Water**
- **Integrated Stormwater Management**
- **Effects of Development on Stormwater Runoff**
- **Low Impact Development Design Principles**
- **Benefits of LID Stormwater Management**
- **Order of Design Operations**
- **Urban Stormwater Treatment Strategies in San Mateo County**
- **Urban Stormwater Treatment Strategies**
- **Extensive Stormwater Treatment Systems**
- **Addressing Constraints and Barriers to Implementation**
- **Inadequate Local Resources**
- **Cost**
- **Physical Site Constraints**
- **Utility Conflicts**
- **Maintenance Burden**
- **Mint Plaza**
- **San Francisco's Urban Watershed Planning Charrette**
- **Graywater Treatment and Reuse**
- **Graywater Quality Characterization**
- **Potential as an Alternative Water Source**
- **Graywater Reuse Systems**
- **Keys to Long-term Success of a Graywater System**
- **Berkeley Ecohouse**
- **Hillside Residence**
- **Integrating Graywater into a Water Resources Master Plan**
- **System Process and Components**
- **Blackwater Management Approaches**
- **Blackwater Treatment Levels**
- **Treatment Technologies**

- **Blackwater Reuse Potential**
- **Shifting the Water Treatment Paradigm**
- **Endnotes**
- **Chapter 5 Energy and Greenhouse Gases**
- **Reducing Demand through Design**
- **Reducing Energy Use in Buildings**
- **Passive Design Strategies**
- **Using Energy Efficiently**
- **Energy Efficient Systems for Communities**
- **Accounting for Water as an Energy Use**
- **Reducing Demand through Transportation Changes**
- **Designing Sustainable Power Supplies**
- **Solar Power**
- **Photovoltaics (PVs)**
- **Solar Thermal**
- **Wind Power**
- **Permitting Steps for Small Wind Turbines**
- **Geothermal Systems**
- **Biomass**
- **Biogas**
- **Water Power**
- **Addressing Climate Change and Reducing Carbon Footprint**
- **Measuring a Project's Carbon Footprint**
- **Reducing a Project's Carbon Impact**
- **Developing Carbon-Neutrality Management Plans**
- **Policy Measures for Increasing Energy Security & Efficiency**
- **Setting Caps**
- **Net-Metering**
- **Renewable Energy Certificates**
- **Green Power Programs**
- **Incentive Programs**
- **Regional Power Purchasing Agreements**
- **Building Scale Financing Options**
- **Utility Profit Decoupling Strategies**
- **Efficiency Incentives & Requirements**
- **Design Guidelines and Performance Standards**
- **Efficiency Programs and Standards**
- **Performance Standards**
- **Endnotes**
- **Chapter 6 Sustainable Site Planning, Built Systems and Material Flows**
- **Sustainable Site Planning**
- **Understanding a Site as a Living System**
- **Understanding Natural Patterns**
- **Analysis: Performing Contextual Background Studies**
- **Synthesis: Interpretation and Response**
- **Green Streets and Transportation Networks**

- **Complete Streets**
- **Typical Street Types and Uses**
- **Implementing a Woonerf - Santa Monica Borderline**
- **Implementing Smart-Growth Streets**
- **Green Streets**
- **City of Portland Green Streets Program (Portland, OR)**
- **Chicago Green Alleys Program**
- **Working with the Land**
- **Sensitive Streetscape Design**
- **Santa Lucia Preserve Street Design Process**
- **Sensitive Site Design**
- **Balancing Earthwork using Grading Analysis**
- **Material and Waste Flows**
- **Evaluating the Environmental Impact of Infrastructure Materials**
- **Materials Red List1**
- **Choosing Environmentally Appropriate Materials**
- **Post Tensioning in Concrete Structures**
- **Construction Methods and Management**
- **Solid Waste Management**
- **Endnotes**
- **Part 3 Design Applications**
- **Chapter 7 City-Scale Approaches**
- **Guangzhou - City-Scale Transformation in China**
- **Tianjin Eco-City Master Plan**
- **PlaNYC - An Integrated Stormwater Approach**
- **San Francisco City Greening Initiatives**
- **1 San Francisco Better Streets Plan**
- **2 Urban Forest Master Plan**
- **3 Stormwater Design Guidelines**
- **4 Sewer System Master Plan**
- **5 Mission Streetscape Plan**
- **6 Cesar Chavez Green Street Corridor**
- **7 Old Mint Plaza**
- **8 Pavement to Parks Initiative**
- **The Expressive Potential of Infrastructure**
- **Endnotes**
- **Chapter 8 Applications for Sustainable Communities**
- **Achieving a Perfect Balance: Pearl Island, Panama**
- **Going beyond Engineering - Sharing Standards for Sustainability**
- **Integrating Stormwater Strategies into the Transect at the Community Scale: Cattle Creek, Colorado**
- **Stitching Together Lost Connections with Green Infrastructure**
- **Chapter 9 Building-Scale Sustainable Infrastructure**
- **The California Academy of Sciences, San Francisco, California**
- **Creating the New Academy**
- **Chartwell School: Design Teaches Children to Celebrate Water, Energy**

- **Pearl Island, Panama - Designing Buildings for Energy Savings**
- **Sustainable Sites Initiative**
- **Brisbane City Hall - Green Site Design**
- **Stanford Green Dorm - Living Laboratory**
- **Pearl River Tower - Guangzhou, China**
- **Endnotes**
- **Conclusion**