The Benefits and Challenges of Adopting the Envision Rating System: Lessons Learned from a Water Treatment Plant Project

Tripp Shealy, Ph.D.
Civil and Environmental Engineering
Virginia Tech
Envision Certification for Seneca, SC Water Treatment Plant
Project Summary

- Significant Improvements to Existing Water Treatment Plant
- Coordination of 11 Key Stakeholders
- Equipment Upgrades & Aesthetic Enhancements
- Decommissioning of Chlorine Gas
Outline for presentation

1. Reasons why team pursued Envision
2. Process for Envision Certification
3. Envision Credits for Seneca WTP project
4. Challenges in Certification
Why Harper Pursued Envision:

1. Sustainability is Part of Our Guiding Principles
2. 75% of Our Project Management Staff are LEED Certified
3. Excited About a Framework for Sustainability in Infrastructure
4. Selling tool to future clients – first Envision project in South Carolina
ENVISION CERTIFICATION

Why the owner pursued Envision:

- Quantifiable Reason to Select a Project Team
- Justification for Project Selection
- Sustainability is an Economic Development Driver
- Framework for Stakeholder Engagement
- Stimulates Long-term Community Growth
- Potential for Funding from EPA/SRF (pending)
Why engineer pursued Envision:

- Unique Approach to Project / Alternate Design
- Framework for Sustainable Design
- Supported by ASCE, APWA, ACEC, AWWA, and the DOT
- Reputation as Sustainability Expert
Who Should Use Envision?

- Community Organizations
- Design Teams
- Construction Managers
- Regulators

- Owners / Operators
- Public Officials
- City Managers / Planners
- Policy Makers
Envision is a rating system for infrastructure and land development, not buildings.

- Infrastructure & Land Development Projects
- Created by Professional Engineering Associations
- Sponsored by the Institute for Sustainable Infrastructure (ISI)
- Improves Project Delivery by Examining Performance
Envision during early infrastructure design process:

Berkeley, California: Envision is used to prioritize backlogged projects. The ones with highest potential Envision points move up.

Dallas, Texas: Envision is a qualifier for design firms. Each firm “must provide verifiable lists of projects when envision rating system was followed.”

San Antonio, Texas: Envision used as judging criteria during design competition for Port Development, Mixed Use commercial residential, and Roadway redesign.

Reston, Virginia: Envision is used by stakeholders to approve or reject design proposals.

Truckee, California: CDM Smith used Envision during Snow Creek Restoration project.

Edina, Minnesota: Envision is a safety net before moving to construction phase. The final design plans are reviewed to ensure meeting Envision standards. If not, fix before proceeding.

Anchorage, Alaska: HDR completed Envision during construction.
Envision is a design tool with multiple ways to improve project delivery.

**LEED vs Envision**

**LEED**
- Install bike rack
- Energy efficient HVAC
- Percent recycled material

**Envision**
- How did you improve community mobility?
- What other project designs/methods were considered?
- How infrastructure life cycle is extended?

*Multiple Methods*
Envision is composed of 4 pieces:

1. Checklist
2. Rating Tool – design questions
3. Credentialing program, ENV SP
4. Project Verification/Recognition
Verification Process:

1. Decision to Incorporate Envision
2. Project Team Gathers Supporting Data
3. Project Team Submits Project to ISI
4. Initial Review by ISI & Assignment of Verifier
5. Review by Envision-Certified Verifier
6. Response Period by Project Team
7. Award Level Approval & Project Award by ISI
8. Project Award & Recognition
Envision is 60 credits, 5 categories.

- Achievement Level Determined by Percent of 60 Credits Earned
- All Credits Will Not Be Applicable for All Projects
1 PURPOSE

QL1.1 Improve Community Quality of Life
QL1.2 Stimulate Sustainable Growth and Development
QL1.3 Develop Local Skills and Capabilities

2 WELLBEING

QL2.1 Enhance Public Health and Safety
QL2.2 Minimize Noise and Vibration
QL2.3 Minimize Light Pollution
QL2.4 Improve Community Mobility and Access
QL2.5 Encourage Alternative Modes of Transportation
QL2.6 Improve Accessibility, Safety & Wayfinding

3 COMMUNITY

QL3.1 Preserve Historic and Cultural Resources
QL3.2 Preserve Views and Local Character
QL3.3 Enhance Public Space

QL0.0 Innovate or Exceed Credit Requirements
**INTENT:**

Improve the net quality of life of all communities affected by the project and mitigate negative impacts to communities.

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<tbody>
<tr>
<td></td>
<td>Some outreach to community.</td>
<td>Key stakeholders involved.</td>
<td>Broad Community Alignment.</td>
<td>Project team exceeds identified community needs.</td>
<td>Rehabilitation of community assets provides community renaissance.</td>
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To what extent has the affected communities been meaningfully engaged in the project design process?
A formal meeting was held with the head of the HOA. Followed by kickoff meeting HOA.
The Mayor of Seneca posted an online video at the beginning of the project to the community.

Seneca Light and Water is proud to announce that the Water Treatment Plant Renovation is underway. We will keep you updated on the progress of this project with periodic picture uploads of the most recent work performed.

Enjoy the Pictures Below!
Please check back regularly for ongoing updates.

Video Posted on October 5, 2014

Seneca Water Treatment Plant Construction from Seneca Video on Vimeo.
Meetings with the community led to removing a tank that was not part of the original design.
**Leadership**

1. **COLLABORATION**
   - LD1.1  Provide Effective Leadership & Commitment
   - LD1.2  Establish a Sustainability Management System
   - LD1.3  Foster Collaboration and Teamwork
   - LD1.4  Provide for Stakeholder Involvement

2. **MANAGEMENT**
   - LD2.1  Pursue By-Product Synergy Opportunities
   - LD2.2  Improve Infrastructure Integration

3. **PLANNING**
   - LD3.1  Plan Long-Term Maintenance and Monitoring
   - LD3.2  Address Conflicting Regulations and Policies
   - LD3.3  Extend Useful Life
   - LD0.0  Innovate or Exceed Credit Requirements

*Seneca, SC Water Treatment Plant
Aerial Site View*
LD1.3 FOSTER COLLABORATION AND TEAMWORK

INTENT:
Eliminate conflicting design elements, and optimize system by using integrated design and delivery methodologies and collaborative processes.

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<tr>
<td>No particular process:</td>
<td>Systems view towards sustainability.</td>
<td>Team chartering between broad set of</td>
<td>Whole system design process integrated into</td>
<td></td>
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<tr>
<td>Random sustainability.</td>
<td></td>
<td>stakeholders.</td>
<td>project delivery.</td>
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To what extent has the project team incorporated the principles of collaboration, teamwork and systems thinking into the execution of the project?
Entire team was open to suggestions: value engineering saved over $700,000 from the original bid price.

Meetings with HOA showed desire for decreased truck traffic – able to decrease sludge using new equipment and decrease in trucks on-site.
Overhead doors in sludge building yield easy maintenance.
1 MATERIALS
RA1.1 Reduce Net Embodied Energy
RA1.2 Support Sustainable Procurement Practices
RA1.3 Use Recycled Materials
RA1.4 Use Regional Materials
RA1.5 Divert Waste from Landfills
RA1.6 Reduce Excavated Materials Taken Off Site
RA1.7 Provide for Deconstruction and Recycling

2 ENERGY
RA2.1 Reduce Energy Consumption
RA2.2 Use Renewable Energy
RA2.3 Commission and Monitor Energy Systems

3 WATER
RA3.1 Protect Fresh Water Availability
RA3.2 Reduce Potable Water Consumption
RA3.3 Monitor Water Systems

RA0.0 Innovate or Exceed Credit Requirements
RA2.1 REDUCE ENERGY CONSUMPTION

INTENT:
Conserve energy by reducing overall operation and maintenance energy consumption throughout the project life cycle.

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<tr>
<td></td>
<td>10% to 30%</td>
<td>31% to 50%</td>
<td>51% to 70%</td>
<td>&gt;70%</td>
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*To what extent does the project reduce energy consumption over industry norms?*
Overhaul of sludge removal and drying process streamlined material flow and replacement of plate press with screw press.

Screw press improved dewatering & decreased sludge hauled from site 35% energy reduction and over $37,000 in savings a year.
1 SITING

NW1.1 Preserve Prime Habitat
NW1.2 Preserve Wetlands and Surface Water
NW1.3 Preserve Prime Farmland
NW1.4 Avoid Adverse Geology
NW1.5 Preserve Floodplain Functions
NW1.6 Avoid Unsuitable Development on Steep Slopes
NW1.7 Preserve Greenfields

2 LAND+WATER

NW2.1 Manage Stormwater
NW2.2 Reduce Pesticides and Fertilizer Impacts
NW2.3 Prevent Surface and Groundwater Contamination

3 BIODIVERSITY

NW3.1 Preserve Species Biodiversity
NW3.2 Control Invasive Species
NW3.3 Restore Disturbed Soils
NW3.4 Maintain Wetland and Surface Water Functions
NW0.0 Innovate or Exceed Credit Requirements
NW1.5 PRESERVE FLOODPLAIN FUNCTIONS

INTENT:
Preserve floodplain functions by limiting development and development impacts to maintain water management capacities and capabilities.

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<td>Limit new development within floodplain.</td>
<td>Maintain or enhance vegetation and soil protection zones.</td>
<td>Flood plain emergency plans in place.</td>
<td>Enhance connectivity and sediment transport.</td>
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- **Documentation showing the location of the project relative to the 100-year or design floodplain.**
- **Documentation showing siting choices relative to floodplains and how impacts to the floodplain have been reduced.**
Climate and Risk

1 EMISSIONS
CR1.1 Reduce Greenhouse Gas Emissions
CR1.2 Reduce Air Pollutant Emissions

2 RESILIENCE
CR2.1 Assess Climate Threat
CR2.2 Avoid Traps and Vulnerabilities
CR2.3 Prepare For Long-Term Adaptability
CR2.4 Prepare for Short-Term Hazards
CR2.5 Manage Heat Island Effects
CR0.0 Innovate or Exceed Credit Requirements

Seneca, SC Water Treatment Plant
Chemical Feed Pumps
CR2.4 PREPARE FOR SHORT-TERM HAZARDS

INTENT:
Increase resilience and long-term recovery prospects of the project and site from natural and man-made short-term hazards.

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<tr>
<td>Hazard Assessment.</td>
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<tr>
<td>Preparation for 1 in 50 year hazard.</td>
</tr>
<tr>
<td>Preparation for 1 in 100 year hazard.</td>
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<td>Restore environment to reduce risk.</td>
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- Has the project team considered natural and man-made hazards that are possible in the region?
- Has the project team incorporated design strategies to safeguard against these natural hazards?
Challenges

• Requires time to collect all required documents

• Easier to implement early in the process rather than later.

• Submission and verification process takes time. ISI in integral partner.

• Some credits are questionable whether met or not. Hard to know if to submit.
Submission Process

- **June 2014**: Initial Exploration of Envision
- **September 2014**: Decision Made to Pursue Envision
- **September 2014**: Harper Begins Data Gathering
- **January 2015**: First Data Submitted for Internal Review
- **December 2015**: Data Submitted to ISI for Comment
- **January 2016**: ISI Initial Review Period
- **February 2016**: Project Submitted for Official Verification
- **March 2016**: Anticipated Project Verification Completed
- **May 2016**: Anticipated Project Award
Lessons Learned

- Plan for Submission Early in Project
- ISI is an Active Participant in Process
- Submit Data Clearly and Concisely
- A Certified Team Member is Required
- Certification is a Full Team Effort
- Envision Encourages Out-of-the-Box Ideas