THE ENVISION™ RATING SYSTEM

Driving Success for Sustainable Infrastructure Projects

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Kabbes Engineering, Inc., Karen C Kabbes, PE, CFM, D.WRE, ENV-SP
Aqua Vitae, Gary Paradoski, PE
America’s Infrastructure Today
ASCE Infrastructure Report Cards

Illinois 2018 Report Card GPA: C-
USA 2017 Report Card GPA: D-
ENVISION™ Infrastructure Rating System
Envision™ Is Uniquely Qualified to Address America’s Infrastructure

- Envision™ applies to all civil infrastructure
- Addresses design, planning, construction and maintenance
- Applicable at any point in an infrastructure project's life cycle
- Speaks to the triple bottom line: social, economic and environmental goals
- Designed to keep pace with a changing concept of sustainability
Why Was Envision™ Developed?

- Current US rating systems are sector-specific
- No system covers entire life cycle
- Designed to fill the gap
ENVISION™ – Incorporates a New Sustainability Paradigm

- Are we doing the right project?
- Are we doing the project right?
Envision Helps Project Teams:

- Incorporate Sustainable Philosophies
- Quantify Soft Benefits
- Apply a Consistent, Transparent Approach
- Benchmark and Track Infrastructure Performance

THE ENVISION™ RATING SYSTEM
Envision Helps Decision Makers:

- Meet Sustainability Goals
- Guide Decisions
- Evaluate Environmental Benefits
- Address Community Priorities
- Demonstrate Good Governance
What Types of Infrastructure Does Envision™ Rate?

**ENERGY**
- Geothermal
- Hydroelectric
- Nuclear
- Coal
- Natural Gas
- Oil/Refinery
- Wind
- Solar
- Biomass

**WATER**
- Potable water distribution
- Capture/Storage
- Water Reuse
- Storm Water Management
- Flood Control

**WASTE**
- Solid waste
- Recycling
- Hazardous Waste
- Collection & Transfer

**TRANSPORT**
- Airports
- Roads
- Highways
- Bikes
- Pedestrians
- Railways
- Public Transit
- Ports
- Waterways

**LANDSCAPE**
- Public Realm
- Parks
- Ecosystem Services

**INFORMATION**
- Telecommunications
- Internet
- Phones
- Satellites
- Data Centers
- Sensors

THE ENVISION™ RATING SYSTEM
60 Criteria in 5 Categories

- **QUALITY OF LIFE**: Purpose, Community, Wellbeing
- **LEADERSHIP**: Collaboration, Management, Planning
- **RESOURCE ALLOCATION**: Materials, Energy, Water
- **NATURAL WORLD**: Siting, Land & Water, Biodiversity
- **CLIMATE AND RISK**: Emissions, Resilience
THE ENVISION™ RATING SYSTEM

QUALITY OF LIFE
13 Credits

1 PURPOSE
QL1.1 Improve Community Quality of Life
QL1.2 Stimulate Sustainable Growth & 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 Site 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

LEADERSHIP
10 Credits

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

RESOURCE ALLOCATION
14 Credits

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
**THE ENVISION™ RATING SYSTEM**

**NATURAL WORLD**

15 Credits

1 **SITING**
- NW1.1 Preserve Prime Habitat
- NW1.2 Protect 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

**CLIMATE AND RISK**

8 Credits

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
Envision Components:

- Guidance Manual
- Pre-Assessment Checklist
- Online Scoresheet
- Verification & Award Program
- Professional Credential
Credit Levels of Achievement

The number of points earned in each credit depends on the Level of Achievement:

**Improved**: Performance that is above conventional

**Enhanced**: Sustainable performance that is on the right track; indications that superior performance is in reach

**Superior**: Sustainable performance that is noteworthy

**Conserving**: Performance that has achieved essentially zero impact

**Restorative**: Performance that restores natural or social systems
**QL1.1 IMPROVE COMMUNITY QUALITY OF LIFE**

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

**LEVELS OF ACHIEVEMENT**

<table>
<thead>
<tr>
<th>IMPROVED</th>
<th>ENHANCED</th>
<th>SUPERIOR</th>
<th>CONSERVING</th>
<th>RESTORATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2) Internal focus. The project team has localized and reviewed the most recent and relevant community planning information. Some, but not systematic outreach to stakeholders and decision makers has taken place. Some relatively easy, but not particularly important or meaningful changes made to the project. No significant adverse community effects are caused by the project. (A, B, C)</td>
<td>(5) Community linkages. More substantive efforts to locate, review, assess and incorporate the needs, goals and plans of the host community into the project. Most potential negative adverse impacts of the project on the host community are reduced or eliminated. Key stakeholders are involved in the project decision-making process. (A, B, C)</td>
<td>(10) Broad community alignment. All relevant community plans are reviewed and verified through stakeholder input. The project team works to achieve good project alignment with community plans, recognizing that the scope of the project is a limiting factor. Potential negative impacts on nearby affected communities are reduced or eliminated. (A, B, C)</td>
<td>(20) Holistic assessment and collaboration. The project makes a net positive contribution to the quality of life of the host and nearby affected communities. The project team makes a holistic assessment of community needs, goals and plans, incorporating meaningful stakeholder input. Project meets or exceeds important identified community needs and long-term requirements for sustainability. Remaining adverse impacts are minimal, mostly accepted as reasonable tradeoffs for benefits achieved. The project has broad community endorsement. (A, B, C)</td>
<td>(25) Community renaissance. Through rehabilitation of important community assets, upgraded and extended access, increased safety, improved environmental quality and additional infrastructure capacity, the project substantially reinvigorates the host and nearby communities. Working in genuine collaboration with stakeholders and community decision-makers, the project owner and the project team scope the project in a way that elevates community awareness and pride. Overall quality of life in these communities is markedly elevated. (A, B, C, D)</td>
</tr>
</tbody>
</table>
# Pre-Assessment Checklist

## Quality of Life

### 1. Purpose

#### QL 1.1 Improve Community Quality of Life

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

**Metric:** Measures taken to assess community needs and improve quality of life while minimizing negative impacts.

<table>
<thead>
<tr>
<th>Assessment Questions</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are the relevant community needs, goals and issues being addressed in the project?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are the potentially negative impacts of the project on the host and nearby communities been reduced or eliminated?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has the project design received broad community endorsement, including community leaders and stakeholder groups?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total: 0 of 0
## SCORES - TRIAL

### My Account Home

- My Projects
- My Credentialing
- My Membership
- My Invoices

### Project Details

**Name:**
- trial

**Location:**
- Chicago, IL

**Award Level:**
- No Award Level

### Project Stage

Register project for verification:
- **Register project**

### Quality of Life

<table>
<thead>
<tr>
<th>Quality of Life</th>
<th>Credits</th>
<th>Project Progress</th>
<th>Possible Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 credits</td>
<td></td>
<td>Project progress</td>
<td>0 of 181</td>
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</table>

### Leadership

<table>
<thead>
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<th>Leadership</th>
<th>Credits</th>
<th>Project Progress</th>
<th>Possible Points</th>
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<tbody>
<tr>
<td>10 credits</td>
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<td>Project progress</td>
<td>0 of 121</td>
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### Resource Allocation

<table>
<thead>
<tr>
<th>Resource Allocation</th>
<th>Credits</th>
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<th>Possible Points</th>
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<tbody>
<tr>
<td>14 credits</td>
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<td>Project progress</td>
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</table>

### Natural World

<table>
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<th>Credits</th>
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<tbody>
<tr>
<td>13 credits</td>
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<td>Project progress</td>
<td>0 of 203</td>
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</table>

### Climate and Risk

<table>
<thead>
<tr>
<th>Climate and Risk</th>
<th>Credits</th>
<th>Project Progress</th>
<th>Possible Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 credits</td>
<td></td>
<td>Project progress</td>
<td>0 of 122</td>
</tr>
</tbody>
</table>
# Online Scoresheet

**QUALITY OF LIFE**

13 credits in progress, 13 credits completed  
Last updated 03/24/2016 by Staff ISI

<table>
<thead>
<tr>
<th>Purpose</th>
<th>I</th>
<th>E</th>
<th>S</th>
<th>C</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>QL1.1 Improve Community Quality of Life</td>
<td>N/A</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>QL1.2 Stimulate Sustainable Growth and Development</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>QL1.3 Develop Local Skills and Capabilities</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wellbeing</th>
<th>I</th>
<th>E</th>
<th>S</th>
<th>C</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>QL2.1 Enhance Public Health and Safety</td>
<td>N/A</td>
<td>0</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>QL2.2 Minimize Noise and Vibration</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>QL2.3 Minimize Light Pollution</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>QL2.4 Improve Community Mobility and Access</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>QL2.5 Encourage Alternative Modes of Transportation</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>QL2.6 Improve Site Accessibility, Safety and Wayfinding</td>
<td>N/A</td>
<td>0</td>
<td>-</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Community</th>
<th>I</th>
<th>E</th>
<th>S</th>
<th>C</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>QL3.1 Preserve Historic and Cultural Resources</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>QL3.2 Preserve Views and Local Character</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>QL3.3 Enhance Public Space</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>6</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Innovate or Exceed</th>
<th>I</th>
<th>E</th>
<th>S</th>
<th>C</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>QL0.0 Innovate or Exceed Credit Requirements</td>
<td>N/A</td>
<td></td>
<td></td>
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</table>

The ENVIISON™ RATING SYSTEM

<table>
<thead>
<tr>
<th></th>
<th>Submitted</th>
<th>Verified</th>
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<tbody>
<tr>
<td>Maximum Level of 8</td>
<td>109</td>
<td>93</td>
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</table>
### Scoring Summary

<table>
<thead>
<tr>
<th>Credit Category</th>
<th>Applicable Points</th>
<th>Points</th>
<th>Innovation Points</th>
<th>Total Points Pursued</th>
<th>Percentage of Available Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUALITY OF LIFE</td>
<td>165</td>
<td>45</td>
<td>5</td>
<td>50</td>
<td>27%</td>
</tr>
<tr>
<td>LEADERSHIP</td>
<td>107</td>
<td>31</td>
<td>6</td>
<td>37</td>
<td>29%</td>
</tr>
<tr>
<td>RESOURCE ALLOCATION</td>
<td>182</td>
<td>50</td>
<td>0</td>
<td>50</td>
<td>27%</td>
</tr>
<tr>
<td>NATURAL WORLD</td>
<td>182</td>
<td>114</td>
<td>0</td>
<td>114</td>
<td>63%</td>
</tr>
<tr>
<td>CLIMATE AND RISK</td>
<td>122</td>
<td>45</td>
<td>0</td>
<td>45</td>
<td>36%</td>
</tr>
<tr>
<td>Total Workbook Points</td>
<td>758</td>
<td>285</td>
<td>11</td>
<td>296</td>
<td>38%</td>
</tr>
</tbody>
</table>

**Envision™ Scores**

- **QL**: Applicable Points 165, Points 140 (85%)
- **LD**: Applicable Points 107, Points 80 (74%)
- **RA**: Applicable Points 182, Points 120 (66%)
- **NW**: Applicable Points 182, Points 120 (66%)
- **CR**: Applicable Points 122, Points 90 (73%)
Award Levels

Minimum Percentage of Total Points Achieved:

20%  30%  40%  50%

BRONZE  SILVER  GOLD  PLATINUM
### Fee Schedule

- **Registration Fee:** $1,000
- **Verification Fee:**

<table>
<thead>
<tr>
<th>Project Size (M)</th>
<th>Non-Member Price</th>
<th>ISI Member Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to $5M</td>
<td>$11,000</td>
<td>$9,000</td>
</tr>
<tr>
<td>$5-25M</td>
<td>$17,000</td>
<td>$14,000</td>
</tr>
<tr>
<td>$25-100M</td>
<td>$25,000</td>
<td>$21,000</td>
</tr>
<tr>
<td>$100-250M</td>
<td>$34,000</td>
<td>$28,000</td>
</tr>
<tr>
<td>$250-500M</td>
<td>$42,000</td>
<td>$35,000</td>
</tr>
<tr>
<td>Over $250M</td>
<td>Contact ISI for large or multi-phase projects</td>
<td></td>
</tr>
</tbody>
</table>

- **Optional Appeals Fee:** $500 per credit

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**THE ENVISION™ RATING SYSTEM**
Who is Using Envision™*

*Partial List of Envision Supported Agencies from ISI Website

THE ENVISION™ RATING SYSTEM
Registered Projects
Verified and Pursuing an Envision Award
Madison Metropolitan Sewerage District
Pump Station Replacement

Marshall Park, A Madison Park on Lake Mendota
Madison Metropolitan Sewerage District
Pump Station Replacement

- Existing Pump Station Underground
- Next to Highway
- West of Parking lot
- Design Team lead by Baxter & Woodman
- Kabbes Engineering Inc, Envision professional
Public Meetings and Coordination
Sparked Park Renovation and Local Business* Participation

- Boat House Revitalization*
- Bike repair station*
- New washroom to be maintained by Madison Parks & water provided by City of Middleton
- Boat washing station to address invasive species, requested by local fishing club
- Signage to explain site and MMSD operation
- Roof partially solar, partially green
City of Dixon, California Waste Water Treatment Facility
City of Dixon

Source: Google Maps
Facility Improvements

- Upgrade aging wastewater treatment facility without an undue burden on ratepayers
- Meet increased capacity demands
- Address long-term salinity issues affecting groundwater resources in the area
- Address salinity limits placed on the facility by the state
Leadership

- Collaboration, Management, Planning

- Project took over 20 years to bring to fruition
- City established Wastewater Citizens Advisory Committee in 2007
  - Determine options
  - Robust public outreach
- Full life-cycle thinking to extend useful life
Resource Allocation

- Materials, Energy, Water

- Removed 130-acre treatment ponds
- Implemented oxidation ditch design
  - Smaller exposed surface area reduces evaporative water losses by 100-fold
  - Retained water keeps dissolved wastewater salts diluted
- A cost-effective and energy-efficient method to minimize salinity impacts to groundwater
Climate and Risk

- Comprehensive assessment of vulnerabilities that could lead to long term costs and risks

- Project designed to be resilient and adaptive to identified risks:
  - Potential seismic activity
  - Flooding / extreme rainfall
  - Long-term drought / water supply shortages
  - Changing economic conditions
City of Atlanta Water Supply Program

Pending Award 2018
City of Atlanta Water Supply Program

- City of Atlanta’s highest priority infrastructure project
- Reservoir at former quarry site
- Protect and supplement fresh water availability ~ up to 30 days worth
- Remaining quarry site conversion to parkland connecting Atlanta’s BeltLine park & trail system
- Sustainable design practices throughout project to capture energy efficiency and environmental benefits
City of Atlanta Water Supply Program

- Connects to existing Atlanta water treatment network and Chattahoochee River through innovative trenchless tunneling technology

- The project includes:
  - 5 miles of 10-foot diameter tunnel in bedrock (250 feet to over 500 feet in depth)
  - 2.4-billion-gallon quarry for raw water storage (one of the largest in the world)
  - 10 shafts, raw water intake, pump station retrofit, and three new pump stations.
Bellwood Quarry

* Fun Fact *
Filming site for:
The Hunger Games
AMC’s Walking Dead
Netflix Stranger Things
Boring Drill and Shaft Construction
Natural World

→ Siting, Land & Water, Biodiversity

- Pre-existing, abandoned site reuse for water storage reservoir
- Parkland amenities at quarry
Contamination reduction measures

- Sediment, erosion, and pollution control plans for runoff control
- Contractor pollution prevention practice training
- 150-foot buffer from storage boundary
- Water to construct tunnel system tested, treated
- Nearby landfill soils remediated
Resource Allocation

- Materials, Energy, Water

- Main purpose of the projects was to protect and supplement fresh water availability

- City conducted several studies to assess water demand, availability, and supply sources

- Reservoir will not contribute to any net withdrawal from the rivers or surface waters
Climate and Risk

- Comprehensive assessment of vulnerabilities that could lead to inform design and planning decisions
- Project designed to be resilient and adaptive to identified risks:
  - Short-term natural and human-induced hazards
  - Long-term climate change
Envision™ Sustainability Professionals (ENV SP)

- ISI Credentialed Practitioner Trained to Use the Envision Rating System
- Credentialed as an ENV SP
  - Currently no time limitation for expiration
  - V3 may have Continuing Education Requirements
- Role
  - Lead Project Team in Using Envision
## Credential Fees

<table>
<thead>
<tr>
<th>Applicant Type</th>
<th>Training Fee</th>
<th>Exam Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>$500</td>
<td>$250</td>
</tr>
<tr>
<td>ISI Member</td>
<td>$400</td>
<td>$250</td>
</tr>
<tr>
<td>Government Employees</td>
<td>$150</td>
<td>$0</td>
</tr>
<tr>
<td>Full-Time Faculty</td>
<td>$150</td>
<td>$0</td>
</tr>
<tr>
<td>Full-Time Students</td>
<td>$100</td>
<td>$0</td>
</tr>
</tbody>
</table>

- Training: 7, 1-hour modules
- Web Based, Open Book Exam
- 75 question, multiple-choice
- Successful score of 75%
- Registration includes 3 attempts
Envision™ Verifiers

- ISI Verifiers are qualified experts contracted to ISI to authenticate project assessments
- They are independent from the projects they verify
- They provide the rigorous, transparent, third party validation of the Envision Assessment

Qualifications

- Credentialed as an ISI Sustainability Professional
- At least 10 years of professional experience
- Current licensure, certification or credentialing, if applicable, to their professional field.
- Must be active in the profession (e.g. 1,000 hours work in the profession per year)
Envision™ Version 3

- Version 3 is expected out later this spring.
- Will keep the general outline and credits from V2, but include updates based on the last several years of rating projects.
- Test and training materials are expected to be using V2 until summertime.
- If taken V2 training class will still be able to take V3 test.
www.sustainableinfrastructure.org

Regional Sustainability LinkedIn Group: Sustainability Midwest