

Sustainable Infrastructure: Using ENVISION® to Plan, Design, and Rate Infrastructure Projects

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LEARNING OBJECTIVES

1. Participants will increase their awareness of the ENVISION tool for incorporating sustainability principles into engineering planning and design
2. Participants will increase their knowledge of how to use the ENVISION tool for planning and rating infrastructure projects
3. Participants will be motivated to pilot and test the ENVISION system on their own projects
4. Participants will understand the ENVISION system and how it can relate to different types of infrastructure (water, transportation, etc...)

- Infrastructure Sustainability
- ISI & Envision
- Case Study
- Q&A



✓ Sustainable infrastructure is also infrastructure that can be *sustained*

AMERICA'S INFRASTRUCTURE G.P.A. D+

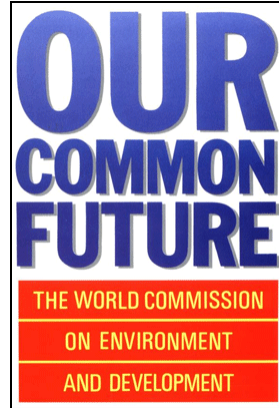
Each category was evaluated on the basis of capacity, condition, funding, future need, operation and maintenance, public safety and resilience. [METHODOLOGY >](#)

AVIATION	D	PORTS	C
BRIDGES	C+	PUBLIC PARKS AND RECREATION	C-
DAMS	D	RAIL	C+
DRINKING WATER	D	ROADS	D
ENERGY	D+	SCHOOLS	D
HAZARDOUS WASTE	D	SOLID WASTE	B-
INLAND WATERWAYS	D-	TRANSIT	D
LEVEES	D-	WASTEWATER	D

A = Exceptional
 B = Good
 C = Mediocre
 D = Poor
 F = Failing

ESTIMATED INVESTMENT NEEDED BY 2020:
\$ 3.6 TRILLION

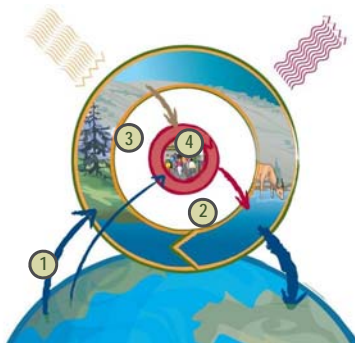
- 1987 **Brundtland Report** - *Our Common Future*
 - “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”
- It contains two key concepts:
 - the concept of “**needs**”, in particular the essential needs of the world’s poor,
 - and the idea of **limitations** imposed by the state of technology and social organization on the environment’s ability to meet present and future needs.



(Source: World Commission on Environment and Development. *Our Common Future*. The Brundtland Report. Oxford University Press, 1987, p. 43.)

In a sustainable society, nature is not subject to systematically increasing:

The Natural Step (TNS)



- 1 concentrations of substances extracted from the earth's crust
 - 2 concentrations of substances produced by society
 - 3 degradation by physical means
- and, in that society...
- 4 people are not subject to conditions that systematically undermine their capacity to meet their needs.

Source material from TNS Canada

■ **The “Triple Bottom Line”**

- “three-pronged fork of profitability, environmental quality, and social justice.”

■ **ICLEI Local Governments for Sustainability**

- “Triple Bottom Line is an integrated decision-making toolkit that assists policymakers to embed sustainability priorities in their planning process, and to take social, economic and environmental concerns into account.”



The triple bottom line model suggests that business should be accountable on three measures: social stewardship (people), environmental stewardship (planet), and the ability to maximize profits. Photo credit: http://mattress.springintoactionnyc.com/socialmission/the_triple_bottom_line_model

■ **The “Triple Bottom Line”**

Sustainability Supplier Assessment Questions

Energy and Climate
Reduce energy costs and greenhouse gas emissions



- 1. Have you measured and taken steps to reduce your corporate greenhouse gas emissions? (Y/N)
- 2. Have you opted to report your greenhouse gas emissions and climate change strategy to the Carbon Disclosure Project (CDP)? (Y/N)
- 3. What are your total annual greenhouse gas emissions in the most recent year measured? (Enter total metric tons CO2e, e.g. CDP 2009 Questionnaire, Questions 7-11, Scope 1 and 2 emissions)
- 4. Have you set publicly available greenhouse gas reduction targets? If yes, what are those targets? (Enter total metric tons and target date, e.g. CDP 2009 Questionnaire, Question 23)

Material Efficiency
Reduce waste and enhance quality



- Scores will be automatically calculated based on participation in the Packaging Scorecard in addition to the following:
- 5. If measured, please report total amount of solid waste generated from the facilities that produce your product(s) for Walmart for the most recent year measured. (Enter total lbs)
- 6. Have you set publicly available solid waste reduction targets? If yes, what are those targets? (Enter total lbs and target date)
- 7. If measured, please report total water use from the facilities that produce your product(s) for Walmart for the most recent year measured. (Enter total gallons)
- 8. Have you set publicly available water use reduction targets? If yes, what are those targets? (Enter total gallons and target date)

Nature and Resources
High quality, responsibly sourced raw materials



- 9. Have you established publicly available sustainability purchasing guidelines for your direct suppliers that address issues such as environmental compliance, employment practices, and product/ingredient safety? (Y/N)
- 10. Have you obtained 3rd party certifications for any of the products that you sell to Walmart? If so, from the list of certifications below, please select those for which any of your products are, or utilize materials that are, currently certified.

People and Community
Vibrant, productive workplaces and communities



- 11. Do you know the location of 100% of the facilities that produce your product(s)? (Y/N)
- 12. Before beginning a business relationship with a manufacturing facility, do you evaluate their quality of production and capacity for production? (Y/N)
- 13. Do you have a process for managing social compliance at the manufacturing level? (Y/N)
- 14. Do you work with your supply base to resolve issues found during social compliance evaluations and also document specific corrections and improvements? (Y/N)
- 15. Do you invest in community development activities in the markets you source from and/or operate within? (Y/N)

■ LEED ND V 4 2014

LEED® for Neighborhood Development	
Total Possible Points**	110*
Smart Location & Linkage	27
Neighborhood Pattern & Design	44
Green Infrastructure & Buildings	29
<i>* Out of a possible 100 points + 10 bonus points</i>	
<i>** Certified 40+ points, Silver 50+ points, Gold 60+ points, Platinum 80+ points</i>	
Innovation & Design Process	6
Regional Priority Credit	4

- Neighborhood Development
- Rating System
- CNU, NRDC, USGBC collaborated in development



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■ ASCE defines sustainability:

“A set of environmental, economic, and social conditions – the **“Triple Bottom Line”** – in which all of society has the capacity and opportunity to maintain and improve its quality of life indefinitely, without degrading the quantity, quality or the availability of natural, economic, and social resources.”

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ISI FOUNDERS & PURPOSE OF ENVISION



Institute for Sustainable Infrastructure

The Institute for Sustainable Infrastructure is a not-for-profit education and research organization founded by the American Public Works Association, the American Council of Engineering Companies and the American Society of Civil Engineers.



ZOFNASS PROGRAM FOR SUSTAINABLE INFRASTRUCTURE
Graduate School of Design
Harvard University

Envision® was developed in joint collaboration between the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure.

ASCE

APWA

ACEC

What Types Of Infrastructure Will 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
Natural Infrastructure



INFORMATION

Telecommunications
Internet
Phones
Satellites
Data Centers
Sensors

 **QUALITY OF LIFE**

 **LEADERSHIP**

 **RESOURCE ALLOCATION**

 **NATURAL WORLD**

 **CLIMATE AND RISK**

 **QUALITY OF LIFE**
13 Credits

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

 **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 Long-Term Maintenance and Monitoring
- LD3.2 Address Conflicting Regulations and Policies
- LD3.3 Extend Useful Life

LD0.0 Innovate or Exceed Credit Requirements

 **RESOURCE ALLOCATION**
14 Credits

 **NATURAL WORLD**
15 Credits

 **CLIMATE AND RISK**
8 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

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

1 EMISSIONS

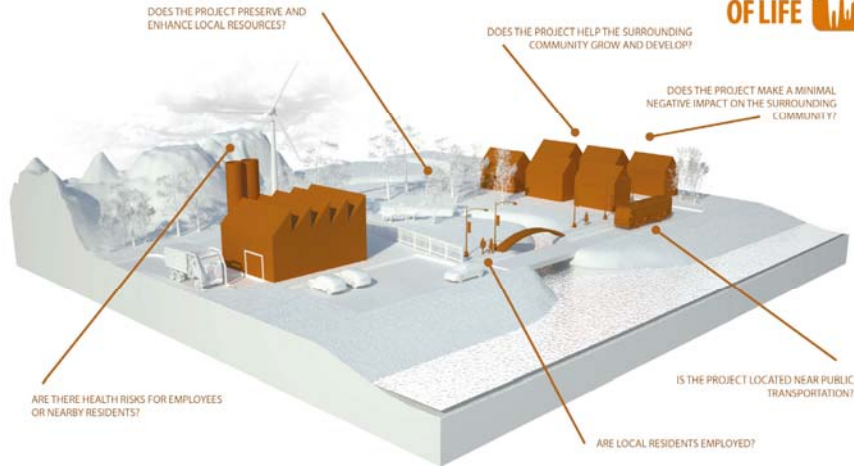
- CR1.1 Reduce Greenhouse Gas Emissions
- CR1.2 Reduce Air Pollutant Emissions

2 RESILIENCE

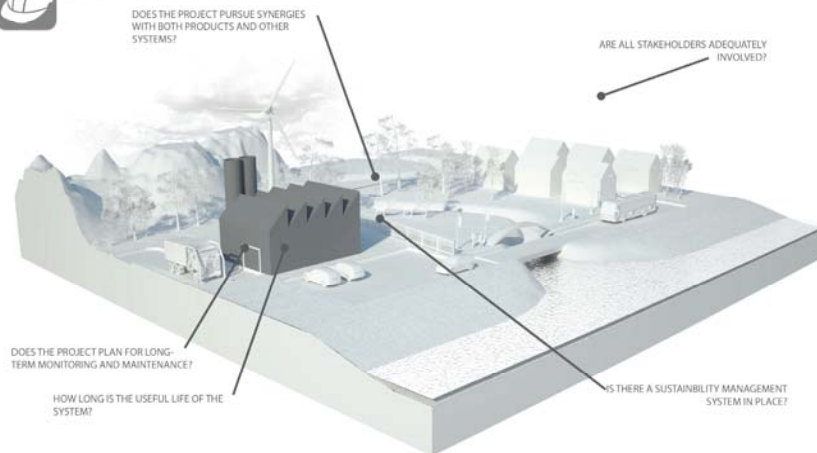
- CR2.1 Assess Climate Threat
- CR2.2 Avoid Traps and Vulnerabilities
- CR2.3 Prepare For Long-Term Adaptability
- CR2.4 Prepare for Short-Term Hazards
- CR2.5 Manage Heat Island Effects

CR0.0 Innovate or Exceed Credit Requirements

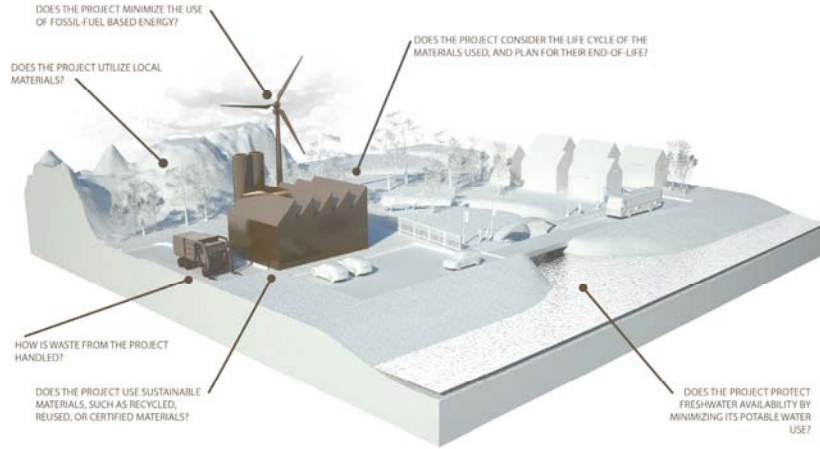
QUALITY OF LIFE



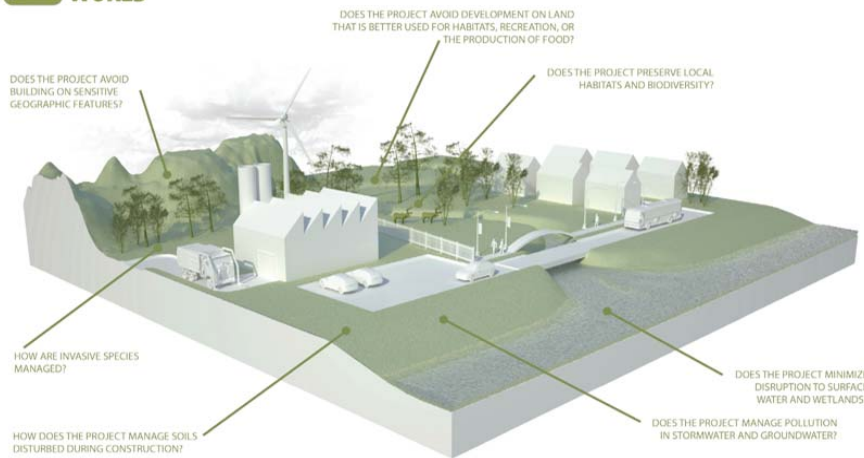
LEADERSHIP

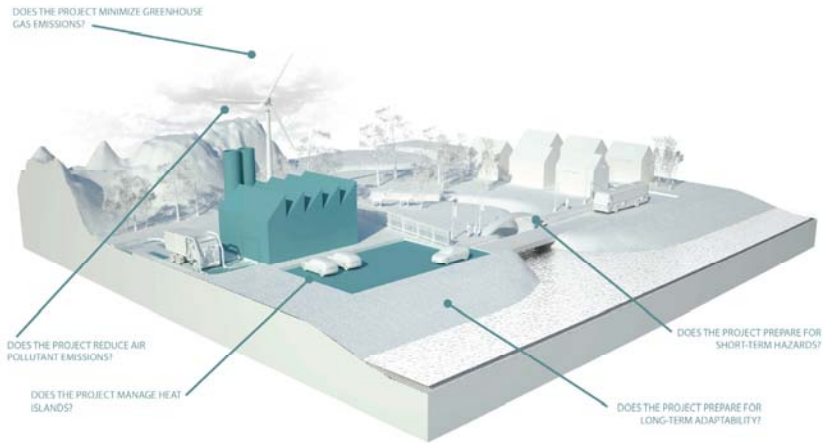


RESOURCE ALLOCATION



NATURAL WORLD





- ❑ ENVISION can benefit the planning & design process:
 - Link Sustainability Policy to Planning & Design
 - Provide a Framework for Project Teams to Define “Sustainability”
 - Generate Better Alternatives
 - Improve the Process for Comparing Alternatives



- Provides Framework for Project Teams to Define “Sustainability”

ENVISION SUSTAINABILITY CREDIT RATING SYSTEM		INCL?		
Subcategory		YES	NO	
QUALITY OF LIFE	PURPOSE	QL1.1 Improve community quality of life		
		QL1.2 Stimulate sustainable growth and development		
		QL1.3 Develop local skills and capabilities		
	COMMUNITY	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 and wayfinding		
	WELLBEING	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		

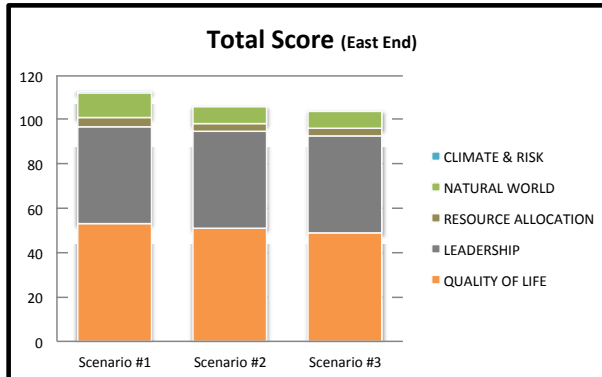
- Links Sustainability Policy to Planning & Design

Policies & Programs	Applicable ENVISION Credits <small>(for illustrative purposes only and are not intended to be all inclusive)</small>
Greenroads	QL 1.1; QL 2.4; QL 2.5, QL 2.6;
Zero Waste	RA 1.3; RA 2.2; RA 1.3; RA 1.4; RA 1.5;
ICLEI’s Star Program	All credits
The Natural Step	QL 2.1, QL 1.3; RA 1.1-RA 3.3; NW 1.1; NW 1.3; NW 1.7
Climate Adaptation	CR 2.1; CR 2.2; CR 2.3; CR 2.4; CR 2.5
LEED ND	All credits

- Links Issues & Solutions within Context of Sustainability



KEY ISSUES ADDRESSED	
● Safety, pedestrians	Parking
● Safety, bicyclists	Water quality
● Creek access/safety	Road drainage
● Speeding	Park flooding
● Road geometry	



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West 54th Street Roadway Reconstruction, City of Edina

- Incorporates community's values
- Educates and engages stakeholders
- Builds stakeholder consensus
- Evaluates alternatives
 - Uses sustainability objectives
 - Refines scenarios
 - Reinforces Feasibility Study



KEY ISSUES ADDRESSED	POTENTIAL IMPACTS	SUSTAINABILITY CREDITS
Safety, pedestrians	Positive	1
Safety, bicyclists	Positive	1
Creek access/safety	Positive	1
Speeding	Positive	1
Road geometry	Positive	1
Parking	Positive	1
Water quality	Positive	1
Road drainage	Positive	1
Park flooding	Positive	1

Discussion on project elements during planning process

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Lyons Park Creek Flood Management – Kinnickinnic River Watershed and Milwaukee Metropolitan Sewerage District (MMSD):

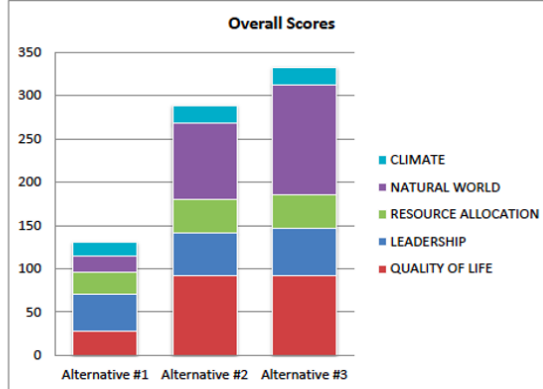
- Compared Envision with MMSD analysis
- Used quantitative and qualitative analysis

Analyzed three alternatives:

1. Conveyance only
2. Increase storage within existing ROW
3. Acquire properties for additional storage

	STRENGTHS	WEAKNESSES
MMSD WORKSHEET	<ul style="list-style-type: none"> • Inexpensive • Easy to modify • Developed in-house • Focus on aspects of sustainability most relevant to MMSD 	<ul style="list-style-type: none"> • Little scoring guidance • Narrow focus • Stand alone tool
ENVISION	<ul style="list-style-type: none"> • Provides recognition • National standard allows for benchmarking comparisons • Comprehensive 3BL decision-making tool • ISI provides continual improvement • 3rd party verification 	<ul style="list-style-type: none"> • Complexity • Cost • Steep learning curve • Value proposition uncertain

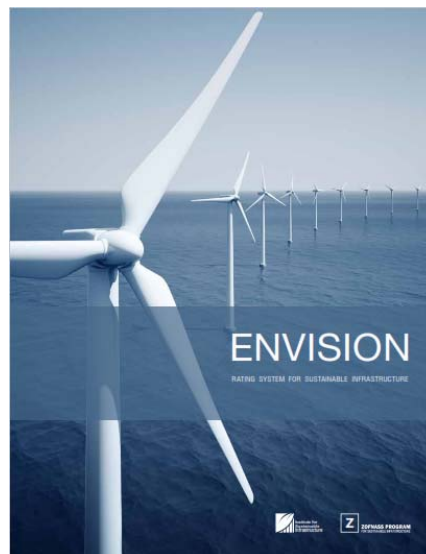
Envision rating compared to MMSD worksheet



QL2.6 IMPROVE SITE ACCESSIBILITY, SAFETY, AND WAYFINDING

Alt.	Strengths and Weaknesses	Evaluation Criteria	Level of Achievement
1	<ul style="list-style-type: none"> > Each alternative will improve public safety through flood protection > Design documents will likely address safety issues at site regardless of alternative > Project may not meet minimum criteria for "improved" level of achievement due to lack of pedestrian accessibility 	<ul style="list-style-type: none"> > Has team developed appropriate signage for safety and wayfinding around construction site? > Have project owner and team extended accessibility and signage to project nearby sensitive sites (wetlands, cultural sites, etc.) in populated areas neighborhood safety and security? 	<ul style="list-style-type: none"> Level of Achievement: 4/5 Level of Achievement: 4/5
2	<ul style="list-style-type: none"> > Project will likely reduce threat of drowning > Project integrates with surroundings 	<ul style="list-style-type: none"> > Has team designed project to have a net positive impact on public safety? 	<ul style="list-style-type: none"> Level of Achievement: 4/5
3	<ul style="list-style-type: none"> > Project will likely reduce threat of drowning > Purchasing and demolishing existing homes undermines neighborhood integration aspect of project 	<ul style="list-style-type: none"> > Does project integrate well with surroundings? > Has team incorporated features into project design that restore and improve overall access and safety in adjacent neighborhoods? 	<ul style="list-style-type: none"> Level of Achievement: 4/5 Level of Achievement: 4/5

- **TOOL #1 - ENVISION PRE-ASSESSMENT CHECKLIST**
- **TOOL #2 - ENVISION RATING SYSTEM**
- **TOOL #3 - ENVISION RATING SYSTEM VERIFICATION & AWARD**



Project Design

The Pre-Assessment Checklist

The Rating System

Professional Accreditation

Verification and Award

Documentation and Reporting

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THE PRE-ASSESSMENT CHECKLIST

Natural World

1. Siting

NW 1.1 Preserve Prime Habitat

Intent: Avoid placing the project – and the site compound/temporary works – on land that has been identified as of high ecological value or as having species of high value.

Metric: Avoidance of high ecological value sites and establishment of protective buffer zones.

Assessment Questions:	Yes	No	N/A	
Has the project team taken steps to identify and document areas of prime habitat near or on the site?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	?
Does the project avoid development on land that is judged to be prime habitat?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	?
Does the project establish natural buffer zones around all areas deemed prime habitat?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	?
Does the project significantly increase the area of prime habitat through habitat restoration?	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	?
Does the project improve habitat connectivity by linking habitats?	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	?
Total	3	of	5	

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ENVISION PRE-ASSESSMENT CHECKLIST

Natural World				Yes	No	N/A
1. Siting						
NW 1.1 Preserve Prime Habitat						
Intent: Avoid placing the project – and the site compound/temporary works – on land that has been identified as of high ecological value or as having species of high value.						
Metric: Avoidance of high ecological value sites and establishment of protective buffer zones.						
Assessment Questions:						
Has the project team taken steps to identify and document areas of prime habitat near or on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A <input type="radio"/> ?						
Does the project avoid development on land that is judged to be prime habitat? <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A <input type="radio"/> ?						
35	SITING	NW1.1 Preserve prime habitat	3	2	0	3 of 5
36		NW1.2 Protect wetlands and surface water	2	1	0	2 of 3
37		NW1.3 Preserve prime farmland	2	2	0	2 of 4
38		NW1.4 Avoid adverse geology	4	1	0	4 of 5
39		NW1.5 Preserve floodplain functions	3	0	0	3 of 3
40		NW1.6 Avoid unsuitable development on steep slopes	0	2	1	0 of 2
41		NW1.7 Preserve greenfields	3	1	0	3 of 4
42	LAND & WATER	NW2.1 Manage stormwater	0	1	1	0 of 1
43		NW2.2 Reduce pesticide and fertilizer impacts	0	0	3	0 of 3
44		NW2.3 Prevent surface and groundwater contamination	3	0	0	3 of 3
45	BIODIVERSITY	NW3.1 Preserve species biodiversity	2	2	0	2 of 4
46		NW3.2 Control invasive species	1	1	1	1 of 2
47		NW3.3 Restore disturbed soils	1	1	0	1 of 2
48		NW3.4 Maintain wetland and surface water functions	4	1	0	4 of 5
		TOTAL	28	15	6	
Does the project avoid development on wetlands, shorelines, and waterbodies? <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A <input type="radio"/> ?						
Does the project maintain soil protection zones (VSPV) around all wetlands, shorelines, and waterbodies? <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> N/A <input type="radio"/> ?						
Does the project restore degraded existing buffer zones to a natural state? <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A <input type="radio"/> ?						
		Total	2	4		

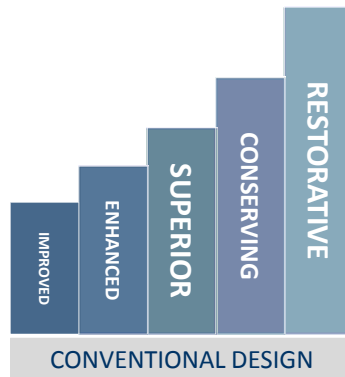
THE PRE-ASSESSMENT CHECKLIST

- Credits
 - Addressed = 17
 - Not Addressed = 34
 - Not Applicable = 4
- } 55
- Results
 - Documents Sustainable Actions
 - Promotes Discussion of Potential Actions

Envision Rating System Pre-Assessment Checklist Results Table						
			Y	N	NA	
1	PURPOSE	QL1.1 Improve community quality of life	3	0	0	3 of 3
2		QL1.2 Stimulate sustainable growth and development	3	0	0	3 of 3
3		QL1.3 Develop local skills and capabilities	3	0	0	3 of 3
4	COMMUNITY	QL2.1 Enhance public health and safety	0	1	0	0 of 1
5		QL2.2 Minimize noise and vibration	1	0	0	1 of 1
6		QL2.3 Minimize light pollution	1	0	0	1 of 1
7		QL2.4 Improve community mobility and access	3	0	0	3 of 3
8		QL2.5 Encourage alternative modes of transportation	2	0	0	2 of 2
9		QL2.6 Improve site accessibility, safety and wayfinding	3	0	0	3 of 3
10	WELLBEING	GL3.0 Preserve historic and cultural resources	2	0	0	2 of 2
11		GL3.2 Preserve views and local character	2	0	0	2 of 2
12		GL3.3 Enhance public space	2	0	0	2 of 2
		TOTAL	23	1	2	23 of 24
13	COLLABORATION	LD1.1 Provide effective leadership and commitment	3	0	0	3 of 3
14		LD1.2 Establish a sustainability management system	1	0	0	1 of 1
15		LD1.3 Foster collaboration and teamwork	3	0	0	3 of 3
16		LD1.4 Provide for stakeholder involvement	3	0	0	3 of 3
17	MANAGEMENT	LD1.1 Plan for hydro-potential energy opportunities	1	0	0	1 of 1
18	PLANNING	LD2.2 Improve infrastructure integration	3	0	0	3 of 3
19		LD3.1 Plan for long-term monitoring and maintenance	2	0	0	2 of 2
20		LD3.2 Address conflicting regulations and policies	0	2	0	0 of 2
21		LD3.3 Extend useful life	1	0	0	1 of 1
		TOTAL	17	2	0	17 of 18
22	MATERIALS	RA1.1 Reduce Net Embodied Energy	1	1	0	1 of 2
23		RA1.2 Support Sustainable Procurement Practices	0	3	0	0 of 3
24		RA1.3 Use Recycled Materials	2	0	0	2 of 2
25		RA1.4 Use Regional Materials	2	0	0	2 of 2
26		RA1.5 Divert Waste from Landfills	3	0	0	3 of 3
27		RA1.6 Reduce Encased Materials Taken off Site	3	0	0	3 of 3
28		RA1.7 Provide for Deconstruction and Recycling	1	2	0	1 of 3
29	ENERGY	RA2.1 Reduce energy consumption	3	0	0	3 of 3
30		RA2.2 Use renewable energy	0	2	0	0 of 2
31		RA2.3 Commission and monitor energy systems	3	0	0	3 of 3
32	WATER	RA3.1 Protect fresh water availability	3	4	0	3 of 7
33		RA3.2 Reduce potable water consumption	1	3	0	1 of 4
34		RA3.3 Monitor water systems	4	0	0	4 of 4
		TOTAL	28	12	0	28 of 41
35	SITING	NW1.1 Preserve prime habitat	2	3	0	2 of 5
36		NW1.2 Protect wetlands and surface water	0	0	3	0 of 3
37		NW1.3 Preserve prime farmland	3	0	0	3 of 3
38		NW1.4 Avoid adverse geology	3	0	0	3 of 3
39		NW1.5 Preserve floodplain functions	4	2	0	4 of 6
40		NW1.6 Avoid unsuitable development on steep slopes	0	2	1	0 of 2
41		NW1.7 Preserve greenfields	2	0	0	2 of 2
42	LAND & WATER	NW2.1 Manage stormwater	0	2	0	0 of 2
43		NW2.2 Reduce pesticide and fertilizer impacts	0	0	3	0 of 3
44		NW2.3 Prevent surface and groundwater contamination	4	0	0	4 of 4
45	BIODIVERSITY	NW3.1 Preserve species biodiversity	4	0	0	4 of 4
46		NW3.2 Control invasive species	1	2	0	1 of 3
47		NW3.3 Restore disturbed soils	0	2	0	0 of 2
48		NW3.4 Maintain wetland and surface water functions	4	1	0	4 of 5
		TOTAL	28	12	0	28 of 38
49	EMISSION	CR1.1 Reduce greenhouse gas emissions	0	2	0	0 of 2
50		CR1.2 Reduce air pollutant emissions	2	0	0	2 of 2
51	RESILIENCE	CR2.1 Assess climate threat	1	0	0	1 of 1
52		CR2.2 Avoid traps and vulnerabilities	2	0	0	2 of 2
53		CR2.3 Prepare for long-term adaptability	1	0	0	1 of 1
54		CR2.4 Prepare for short-term hazards	2	0	0	2 of 2
55		CR2.5 Manage heat islands effects	0	1	0	0 of 1
		TOTAL	8	3	0	8 of 11

RATING SYSTEM

To what extent did you address each credit?
(select a level of achievement...)



RATING SYSTEM

NW1.1 Preserve prime habitat

LEVELS OF ACHIEVEMENT				
IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
		<p>(9) Avoid development. The project has avoided the use of land that is judged to be "prime habitat" including, but not limited to, patches of old-growth forest, land of high ecological value or home to species of high value; national parks, monuments, seashores, and forests; wildlife refuges; wildlife preserves; wild and scenic rivers; and other protected areas. (A)</p>	<p>(14) Protection of existing habitat. The project establishes a minimum 300 ft. natural buffer zone around all areas deemed prime habitat. Exceptions are possible if developed sites not within the project scope exist within the minimum distance. (A, B)</p>	<p>(18) Restore habitat. Project significantly increases the area of prime habitat and connectivity. This should involve the restoration of habitat, as determined by a qualified ecosystem professional. The habitat produced can be part of a protective buffer zone and can be at the site of the project or adjacent to the site. (A, B, C)</p>
<p>EVALUATION CRITERIA AND DOCUMENTATION</p> <p>A. Does the project avoid development on land that is judged to be "prime habitat" by a third party (including SFI, FSC, or CSA)?</p> <ol style="list-style-type: none"> 1. Narrative describing efforts by an interdisciplinary team to research and document all areas of "prime habitat" near or on the site using local, state, or national prime habitat information. 2. Documentation demonstrating no areas of prime habitat are located on-site or within the specified distance of developed areas. <p>B. Does the project preserve, at minimum, an appropriately sized buffer zone of undeveloped land or other habitat protection and connectivity according to the specified width around all prime habitat areas?</p> <ol style="list-style-type: none"> 1. A site map illustrating a buffer of undeveloped land, fulfilling the requirements above, is preserved (or created if the site is currently developed) around all areas of prime habitat. Provide documentation to demonstrate appropriate size of buffer or other protection. <p>C. Does the project significantly increase the area of prime habitat through the restoration of vegetation and habitat connectivity to a degree suitable as habitat (as determined by a qualified habitat restoration professional), either as part of the protective buffer zone or adjacent to the site?</p> <ol style="list-style-type: none"> 1. A restoration plan outlining any efforts to restore prime habitat either on the project site or adjacent to the site, including, at a minimum a site map outlining locations of restoration, and a species list of plants used. This documentation must be signed by a qualified natural resource professional who assisted with the restoration and monitoring plan. 				

VERIFICATION & AWARD



www.sustainableinfrastructure.org

The screenshot shows the homepage of the Institute for Sustainable Infrastructure (ISI). The header includes the ISI logo, navigation links for ENVISION, JOIN, WHO USES ENVISION, and LEARNING CENTER, and a search bar with 'Blog' and 'About ISI' links. A 'Login' button is highlighted with a yellow arrow. The main content area features a large blue background with a grid pattern and the text 'SUPPORTING THE INFRASTRUCTURE COMMUNITY'. Below this, a text box states: 'Envision is a tool for owners, design teams, community and environmental groups, constructors, regulators, and policy makers.' A 'Learn More' button is positioned below the text box. The ASCE | KNOWLEDGE & LEARNING logo is visible in the bottom left corner.

Home » Create a Free Envision Account

To create your free ISI account, please provide the following information.

Profile Information

First Name	Last Name
Email	Phone
Password	Confirm Password

Please note: ISI will only use your phone number to contact you if there is a problem with your account and we are unable to reach you by email.

Connect to an Organization

Organization you are affiliated with

Organization name

Subscribe Sign up for our newsletter

Click or touch the Foot

I have read and agree to the [terms & conditions](#)

ISI does not, and will not, sell or share your information.

Create Account

ASCE | KNOWLEDGE & LEARNING

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ACCOUNT HOME

TOOLS

- My Account Home
- My Projects
- My Credentialing
- My Membership
- My Invoices
- My Content

My Organization: Institute for Sustainable Infrastructure (Non-Member Organization)

My Status: Denise Nelson, Authenticator, Verifier, ENV SP, Trainer, Admin

[Edit Profile](#)
[Organization Benefits](#)

[Envision Scoresheet \(begin assessing a project\)](#)
[Envision Guidance Manual](#)
[Envision Pre-Assessment Checklist](#)

Terms and Conditions

ASCE | KNOWLEDGE & LEARNING

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ACCOUNT HOME

TOOLS

- My Account Home
- My Projects
- My Credentialing
- My Membership
- My Invoices

My Organization: Institute for Sustainable Infrastructure - Non-Member Company

My Admin: William Bertera - Basic User, Basic User, Basic User, Authenticator, Authenticator, Admin

My Status: Denise Nelson - Basic User, Verifier, ENV SP, Trainer, - Basic User



[Edit Profile](#)

[Organization Benefits](#)

[Envision Scorecard](#)
(begin assessing a project)

[Envision Guidance Manual](#)

[Envision Checklist](#)

[Terms and Conditions](#)

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Project Name and Location

Project Name*	United States
Project City*	Alabama
Zip Code	

Project Point of Contact

Contact Name	Contact Email
Contact Phone	

ENV SP Contact

ENV SP Name	ENV SP Email
ENV SP Phone	

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My Account Home [Home](#) > [Projects](#) > Fake project

My Projects
My Credentialing
My Membership
My Invoices

Fake project
Richmond, VA
Action -

21
Bronze

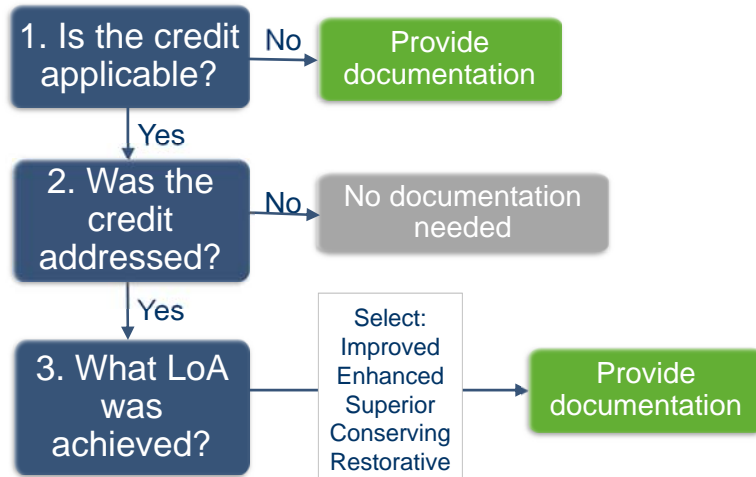
Project Stage
Unregistered
Student: Awaiting Registration by Project Leader.

Select All/None [Generate printable view of selected credits](#) [Download selected credit attachments](#)

QUALITY OF LIFE 12 credits	12 credits in progress, 0 credits completed Last updated 08/07/2016 by DEN Hobson	Project progress	65 of 181 Possible points - 36%
LEADERSHIP 10 credits	8 credits in progress, 0 credits completed Last updated 08/07/2016 by DEN Hobson	Project progress	106 of 121 Possible points - 88%
RESOURCE ALLOCATION 14 credits	0 credits in progress, 0 credits completed Last updated 08/07/2016 by DEN Hobson	Project progress	0 of 182 Possible points
NATURAL WORLD 15 credits	0 credits in progress, 0 credits completed Last updated 08/07/2016 by DEN Hobson	Project progress	0 of 200 Possible points
CLIMATE AND RISK 8 credits	0 credits in progress, 0 credits completed Last updated 08/07/2016 by DEN Hobson	Project progress	0 of 122 Possible points

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Credit Assessment



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12 credits in progress, 8 credits completed
Last updated 09/07/2016 by DEN Nelson

Project progress

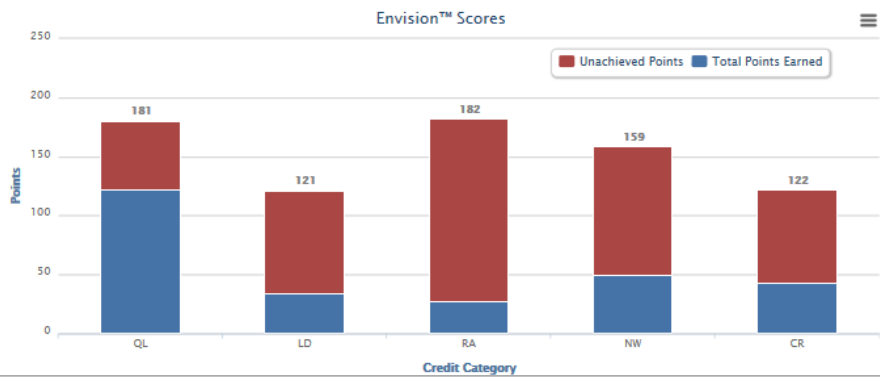
65 of 181 Possible points - 36%

					I	E	S	C	R			
Purpose	<input type="checkbox"/> QL1.1 Improve Community Quality of Life					N/A	0	2	5	10	20	25
	<input type="checkbox"/> QL1.2 Stimulate Sustainable Growth and Development					N/A	0	1	2	5	13	16
	<input type="checkbox"/> QL1.3 Develop Local Skills and Capabilities					N/A	0	1	2	5	12	15
Wellbeing	<input type="checkbox"/> QL2.1 Enhance Public Health and Safety					N/A	0	2	-	-	16	-
	<input type="checkbox"/> QL2.2 Minimize Noise and Vibration					N/A	0	1	-	-	8	11
	<input type="checkbox"/> QL2.3 Minimize Light Pollution					N/A	0	1	2	4	8	11
	<input type="checkbox"/> QL2.4 Improve Community Mobility and Access					N/A	0	1	4	7	14	-
	<input type="checkbox"/> QL2.5 Encourage Alternative Modes of Transportation					N/A	0	1	3	6	12	15
	<input type="checkbox"/> QL2.6 Improve Site Accessibility, Safety and Wayfinding					N/A	0	-	3	6	12	15
Community	<input type="checkbox"/> QL3.1 Preserve Historic and Cultural Resources					N/A	0	1	-	7	13	16
	<input type="checkbox"/> QL3.2 Preserve Views and Local Character					N/A	0	1	3	6	11	14
	<input type="checkbox"/> QL3.3 Enhance Public Space					N/A	0	1	2	6	11	13
Innovate or Exceed	<input type="checkbox"/> QL0.0 Innovate or Exceed Credit Requirements					N/A	Maximum Level of 8				8	
						Submitted		65	Verified			

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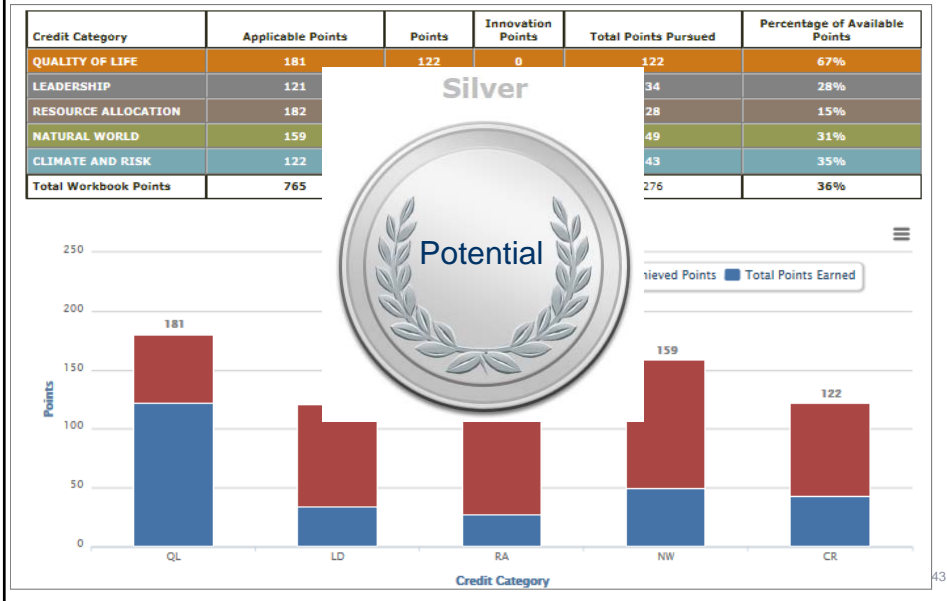
THE RATING SYSTEM

Credit Category	Applicable Points	Points	Innovation Points	Total Points Pursued	Percentage of Available Points
QUALITY OF LIFE	181	122	0	122	67%
LEADERSHIP	121	34	0	34	28%
RESOURCE ALLOCATION	182	28	0	28	15%
NATURAL WORLD	159	49	0	49	31%
CLIMATE AND RISK	122	43	0	43	35%
Total Workbook Points	765	276	0	276	36%



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THE RATING SYSTEM



PROFESSIONAL CREDENTIAL (ENV SP)

PAYMENT OPTIONS

TOOLS

[Home](#) » [Credentialing](#) » [Payment Options](#)

- My Account Home
- My Projects
- My Credentialing
- My Membership
- My Invoices

ENV SP Training

Register and pay for the online training course. After completing the course, you will be required to register and pay for the exam to complete the credential process.

[Training »](#)

ENV SP Training + Exam

Register and pay for the online training course and exam in one step. After you complete the training, you will be able to proceed directly to the exam.

If you do not pass the exam the first time, you are allowed to re-test up to two more times at no cost. If you do not pass the exam after three attempts, your credential application will expire and you will be required to register and pay for both the training and exam again.

[Training and Exam »](#)

PROFESSIONAL CREDENTIAL (ENV SP) – TRAINING

These training modules are designed to educate you on Envision and prepare you to take the exam to earn the Envision Sustainability Professional (ENV SP) credential. You must complete the training modules to be eligible to take the exam.

Module/Status	Date Started
ENV SP Training Module 1 - Complete	11/21/2016
ENV SP Training Module 2 - Not Started	-
ENV SP Training Module 3 - Not Started	-
ENV SP Training Module 4 - Not Started	-
ENV SP Training Module 5 - Not Started	-
ENV SP Training Module 6 - Not Started	-
ENV SP Training Module 7 - Not Started	-

PROFESSIONAL CREDENTIAL (ENV SP) – THE EXAM

You are ready to go, lets start the exam!

Go »

- The accreditation exam is accessible via the internet
- Registration and payment is required
- The test consists of 75 multiple choice questions
- Open book
- 75% is considered a passing grade

PROFESSIONAL CREDENTIAL (ENV SP)



VERIFICATION AND AWARD



TOOLS

[Home](#) » [Projects](#)

- My Account Home
- My Projects
- My Credentialing
- My Membership
- My Invoices

Projects Overview

Search Projects

Project Name	Project Lead	Project Status	Modified	
Road Project (test)	D Nelson <input checked="" type="checkbox"/> Edit Team	Unregistered <small>Register Project for Verification:</small>	03/11/2016	



Register Project

VERIFICATION AND AWARD

Project Size, \$	Non-Member Price	ISI Member Price
Up to 5 million	\$11,000	\$9,000
5 to 25 million	\$17,000	\$14,000
25 to 100 million	\$25,000	\$21,000
100 to 250 million	\$33,000	\$28,000
250 to 500 million	\$42,000	\$35,000
Over 500 million	Contact ISI for large or multi-phase projects.	

VERIFICATION AND AWARD

Evaluation Criteria and Documentation

A. What is the expected degree to which the project will contribute to local employment, training, and education, with an emphasis on the most needy and/or disadvantaged groups through project planning, design, and construction?

1. Explanation of how the project team identified community employment, training, and worker education needs.
2. Documentation of plans and commitments for hiring local workers for the project, including people from disadvantaged groups.
3. Documentation of the extent and skill level of work planned for local firms.
4. Documentation of the proposed skills mix of local project hires in relation to overall project employment.
5. Statement of the ratio of proposed local hires to overall hires and the skills mix of local hires in relation to overall project hiring and employment.

B. How will the project contribute to long-term community competitiveness?

1. Documentation of proposed education and training programs to be developed and implemented, and an explanation of the extent to which these programs will address identified current and future community needs and improved community competitiveness.

Supporting Files

20151101 restoring natural infrastructure.pdf

File *

Browse...

10 file/10MB limit

File Description

Describe the supporting document (Max 150 characters)

Submit

Cancel

VERIFICATION AND AWARD – SAMPLE DOCUMENTATION

QL1.2 Stimulate sustainable growth and development

RESTORATIVE

(16) Developmental rebirth.


At the early development stages, the project owner and the project team work with the community to identify existing community assets in the natural or built environment which, if restored, would improve the economic growth and development capacity of the community. The constructed works improve attractiveness through restoration of existing infrastructure, including physical, knowledge and social assets. Adaptive to changing conditions. (A, B, C, D, E)



VERIFICATION AND AWARD – VERIFICATION AND AUTHENTICATION

QUALITY OF LIFE				
QL1.1	Improve community quality of life. Improve the net quality of life of all communities affected by the project and mitigate negative impacts to communities.			
ENV SP INITIAL SUBMISSION	INCLUDE	Conserving (20 / 25)	• QL 1.1 Final_submittal.pdf	Credit Verified?
VERIFIER FEEDBACK		Conserving (20 / 25)	Agreed. Conserving.	AGREE? YES

VERIFICATION AND AWARD – VERIFICATION AND AUTHENTICATION

LD1.3 Foster collaboration and teamwork. Eliminate conflicting design elements, and optimize system by using integrated design and delivery methodologies and collaborative processes.				
ENV SP INITIAL SUBMISSION	INCLUDE	Conserving (15 / 15)	See updated submittal attached. • LD 1.3 Final_submittal.pdf	Credit Verified? 
VERIFIER FEEDBACK		Superior (8 / 15)	Disagreed. Superior. To achieve Conserving, provide clear evidence of risk/reward sharing (CM/GC). AGREE? NO	
ENV SP VERIFICATION RESPONSE	INCLUDES	Conserving (15 / 15)	See updated submittal attached. • LD 1.3 Final_submittal.pdf • LD 1.3 FINAL RESUBMIT.pdf	
VERIFIER FINAL FEEDBACK		Conserving (15 / 15)	Agreed. Conserving. AGREE? YES	

VERIFICATION AND AWARD





Grand Bend Area Wastewater Treatment Facility

Grand Bend, Ontario



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Low Level Road

Vancouver, British Columbia



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WHY USE ENVISION?

- **Quantify Sustainable Practices** with Standardized, Nationally-recognized Metrics
- **Comprehensively Evaluate** Sustainable Aspects of Projects
- Apply Industry-vetted Definitions of Sustainable Practices for **Comparing and Selecting Solutions** Case-by-case (e.g. Compare the Impact of a Vegetated Roof to a Roof with Solar Panels)
- Document Level of Sustainability and **Inspire Incremental Improvements** Toward Sustainable Development

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WHAT CAN YOU DO?



www.sustainableinfrastructure.org

- Become Envision Accredited (ENV SP)
- Use the Envision Checklist (Self-Assessment)
- Use the Envision Rating System (Self-Assessment)
- Register a Project for Verification and Award
- Integrate ISI Concepts in Operating Practices, Policies and Design Standards, RFPs

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Sustainable Infrastructure: Using ENVISION® to Plan, Design, and Rate Infrastructure Projects



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