Outline

- Background and partners
- What is NGICP?
- Overview of what the program covers
- Overview of the curriculum
- What’s Next for NGIP
Initiated under the leadership of DC Water and the Water Environment Federation, the National Green Infrastructure Certification Program (NGICP) sets national certification standards for green infrastructure (GI) construction, inspection, and maintenance workers. Designed to meet international best-practice standards, the certification advances the establishment of sustainable communities by promoting GI as an environmentally and economically beneficial stormwater management option, supporting the development of proficient green workforces, and establishing a career path for skilled GI workers.
National Green Infrastructure Certification Program (NGICP)

Summary:
- Sets national certification standards for construction, inspection and maintenance workers
- Designed to meet international best practice standards
- Aims to advance the establishment of sustainable communities by promoting green infrastructure (GI)
- Support the development of proficient green workforce
- Establish a career path for skilled GI workers
Background
What is NGICP?

- An entry level GI certification that validates that candidates possess the foundational knowledge that supports proper GI construction, inspection and maintenance
- National credential for individuals
- Developed in accordance with ANSI accreditation guidelines
- Supports the development of proficient green workforce
- Establish a career path for skilled GI workers

Roth Ecological Design Int.
Who is it for?

- Construction and maintenance workers
- High school diploma/GED
- 35 hour minimum training
- Chronically un- and under-employed*
Body of Knowledge

- Existing GI educational materials
- Publications/manuals/technical bulletins
- Brochures/factsheets/forms/checklists, videos/webcasts
- Books
Exam Blueprint

- Watershed fundamentals: 6-10%
- Practices: 19-23%
- Methods and materials: 50-54%
- Functionality/appearance: 17-21%
(Green) Workforce Development

- Top priority for WEF/partners
- Part of a larger workforce development program
NGICP goes to high school

- Woodson STEM High School, Ward 7, DC
- Incorporating curriculum into capstone program
- Test post-graduation
- Partner with DC Water and other city agencies for job placement
- Kick-off September 2018
INTRODUCTION
Green Infrastructure (GI)

- Green infrastructure is an approach to stormwater management that protects, restores, or mimics the natural water cycle.
The Rain Follows the Forest

ʻHahai no ka ua i ka ululaʻau
Hawaii’s Watersheds
Hawaii’s Watersheds
Impacts of Stormwater

THIS IS WHAT OAHU’S WAIMEA BAY LOOKED LIKE AFTER TROPICAL STORM DARBY HIT
What is stormwater?

“Stormwater is water that originates during precipitation events. When rain hits a surface such as a roof, road, or other surface it becomes stormwater.”

What is stormwater runoff?

“Stormwater runoff is excess precipitation that is not retained by vegetation, surface depressions, or infiltration, and thereby collects on the surface and drains into a surface water body.”

Name some pollutants in stormwater runoff?

Sediment, oil, pesticides, fertilizer, trash, paint chips, tire treads....
GI Mimics Natural Processes

**Natural Process**
- Soil and Vegetation Provide
  - Infiltration
  - Filtration
  - Storage
  - Evapotranspiration
  - Transpiration

**Developed Process**
- Runoff to piped system
- Pavement and Development
- Inhibit Natural Processes

**GI Process**
- GI Facilities Provide
  - Infiltration
  - Filtration
  - Storage
  - Evapotranspiration
  - Transpiration
**INTEGRATED LANDSCAPE AND BUILDINGS**
Green roofs, planters, and other elements can provide landscape on building facades, helping to cool buildings and the urban environment and increase biodiversity.

**ECO-BLOCK DEVELOPMENT**
Decentralized water and energy infrastructure while building community resiliency, and reducing the development’s carbon and water footprints.

**PERMEABLE PAVER**
Stormwater runoff percolates through or around pavers to either infiltrate or be collected and directed to storm drain line. Added depth of subbase can retain stormwater.

**PERMEABLE CONCRETE/ POROUS ASPHALT**
Stormwater percolates through pavement to either infiltrate or be collected and directed to storm drain line. Added depth of subbase can retain stormwater.

**BOARDWALK**
Allows stormwater to percolate through boards. Allows different look and provides structural support to bridge over green infrastructure or stormwater runoff storage areas.

**GREEN ROOF**
Provide cool roof and enhanced amenity to residents, employees, and visitors.

**DISCONNECTED DOWNSPOUT**
Collects and treats rainfall from rooftops.

**CONSTRUCTED WETLAND**
Engineered wetlands for stormwater or wastewater treatment and habitat restoration.

**BIORETENTION/GREEN INFRASTRUCTURE**
Captures and treats stormwater runoff with natural processes.

**STORMWATER TREE**
Captures and treats stormwater runoff with natural processes. May be "linked" to other trees for increased runoff storage.
Green Infrastructure—How does it work?

- GI provides filtration, infiltration, sedimentation, evapotranspiration, and phytoremediation
- Reduce stormwater runoff volume by reducing the surface flow and increasing groundwater recharge
- The time of concentration of runoff is increased and peak flows reduced → Runoff is slower and lessened
Green Infrastructure or Low Impact Development (LID)?

- GI typically is broader term to cover other types of infrastructure (besides stormwater) that are also natural-systems based.
- LID systems are generally “smaller” scaled Best Management Practices for stormwater that incorporate GI principles (EPA).
- NGICP program focuses only on stormwater green infrastructure (= LID).
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</table>
Module 2: GI Materials
Module 3: Vegetation in GI
Considerations of **materials**, **construction sequencing**, **inspection & maintenance**
Module 4: Safety Around GI Sites
Module 5: Site Management
Module 6: Bioretention Practices

- Bioretention cells and swales.
- Rain gardens.
- Vegetated curb extensions.
- Bioswales/vegetated swales.
- Planter boxes
- Tree trenches.

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<th>Additional Benefits</th>
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<td>✓ Infiltration (where allowed)</td>
<td>✓ Aesthetics</td>
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<tr>
<td>✓ Water quality treatment</td>
<td>✓ Habitat</td>
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<td>✓ Storage</td>
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Roth Ecological Design Int.
Considerations of materials, construction sequencing, inspection & maintenance
Module 1
Introduction to Green Infrastructure

Module 2
Materials Commonly Used in GI

Module 3
Vegetation in GI

Module 4
Safety In and Around GI Sites

Module 5
GI Site Management

Module 6
Bioretention Practices

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Permeable Pavements

Module 8
Rainwater Harvesting

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Module 10
Drywells

Module 11
Stormwater Wetlands

Module 12
Basics of Managing GI for Long-Term Performance
Module 7: Permeable Pavement

- Porous asphalt.
- Pervious concrete.
- Permeable pavers.
- Open-celled grid systems (also called reinforced turf).

### Functions

- Infiltration (where allowed)
- Water quality treatment
- Storage
- Evapotranspiration
- Transpiration

### Additional Benefits

- Aesthetics
- Habitat
Considerations of materials, construction sequencing, inspection & maintenance
Module 8: Rainwater Harvesting

- Rain barrels
- Cisterns

Functions
- Infiltration (where allowed)
- Water quality treatment
- Storage
- Evapotranspiration
- Transpiration

Additional Benefits
- Aesthetics
- Habitat
Considerations of **materials**, construction sequencing, inspection & maintenance

![Diagram of rainwater harvesting system]

[Image of a rainwater harvesting system installation]

Roth Ecological Design Int.
# Module 9: Rooftop Practices

## Functions
- Infiltration (where allowed)
- Water quality treatment
- Storage
- Evapotranspiration
- Transpiration

## Additional Benefits
- Aesthetics
- Habitat
- Roof longevity
- Urban heat island mitigation
Considerations of **materials, construction sequencing, inspection & maintenance**
Module 10: Dry Wells

Functions
- Infiltration (where allowed)
- Water quality treatment
- Storage
- Evapotranspiration
- Transpiration

Additional Benefits
- Aesthetics
- Habitat
Considerations of **materials**, construction sequencing, inspection & maintenance
Module 11: Stormwater Wetlands

Functions
- Infiltration (where allowed)
- Water quality treatment
- Storage
- Evapotranspiration
- Transpiration

Additional Benefits
- Aesthetics
- Habitat

Roth Ecological Design Int.
Considerations of materials, construction sequencing, inspection & maintenance
Module 1  
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Stormwater Wetlands

Module 12  
Basics of Managing GI for Long-Term Performance
Module 12: GI Long-Term Performance
What’s Next with NGCIP?

- More trainings: ongoing
- New partners: ongoing
- NRPA partnership: on-going
- Computer-based testing: Fall 2018
- Online modules: Fall 2018
- NGICP goes to high school: Fall 2018
- ANSI Accreditation application submission: January 2019
- Canadian roll-out of NGICP: Spring 2019
- Anticipated ANSI Accreditation award: Summer 2019
- Research projects
  - Return on investment quantification: kickoff Fall 2018
  - Performance improvement quantification
Questions?

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