Mission Accomplished
Stormwater Management & LID Success

Presenter:
Dale Stewart PE
When the well’s dry, we know the worth of water.

BENJAMIN FRANKLIN
EISA 2007 now effectively mandates LID for federal projects

SEC. 438. STORM WATER RUNOFF REQUIREMENTS FOR FEDERAL DEVELOPMENT PROJECTS:
The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the Maximum Extent Technically Feasible (METF), the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

http://epa.gov/greeningeapa/stormwater/requirements.htm
Determining Maximum Extent Technically Feasible (METF)

GOAL

“…maintain or restore the pre-development hydrology conditions specifically with respect to temperature, rate, volume and duration of flow.”
**ACTIONS**

“...the Federal facility must use all known, available and reasonable methods of stormwater retention and/or reuse to prevent the off-site discharge of stormwater runoff consistent with the performance standard.”

“In cases when a facility seeks or claims an exception, it is expected that there will be serious and documented attempt to comply.”

If technically infeasible...

“designer must document and quantify, to the satisfaction of the agency or department, that the processes of infiltration, evapotranspiration, and harvesting/reuse have been used to the METF, and the full employment of these types of controls are infeasible due to site constraints.”

Potential documentation: engineering calculations, geologic reports, hydrologic analysis, and site maps regard to the temperature, rate, volume, and duration of flow.
Draft Strategic Plan for Army Sustainability

ARMY REGULATION (AR) 210-20

- Will define EISA 2007, Section 438 adherence
- Currently being vetted by all USACE District Commanders, Questions and Comment Period Currently Open
- Planned implementation: Spring 2010

*Source: As reported by Wanda Johnsen, DAIM-ISE at SAME South Atlantic District Regional Conference, Charleston, SC, 20 Oct 09*
So what exactly is LID?
CONVENTIONAL BMP’S

NOT LID
LOW IMPACT DEVELOPMENT (LID) IS A DESIGN STRATEGY
with the goal of maintaining or replicating the pre-development
hydrologic regime through the use of design techniques to create a
functionally equivalent hydrologic site design.

*Source: LID Technical Bulletin Final Draft, November 2005. Produced as a result of the efforts of
Virginia’s Low Impact Development Assessment Task Force
**KEY ELEMENTS OF LID**

- **Intention of Section 438**
- **Small Scale Controls**
  - Mimic natural hydrology and processes
- **Conservation**
  - Preserves native trees, vegetation and soils
  - Maintains natural drainage patterns
- **Customized Site Design**
  - Ensures each site helps protect the entire watershed.
- **Directing Runoff to Natural Areas**
  - Encourages infiltration and recharge of streams, wetlands and aquifers.
- **Maintenance, Pollution Prevention & Education**
  - Reduces pollutant loads and increases efficiency and longevity.
  - Educates and involves the public.

**LandDesign.**
Imitate nature.
AN ECOSYSTEM-BASED APPROACH TO SITE DESIGN AND ITS STORMWATER MANAGEMENT.

- Minimize development impacts
- Conserve natural areas
- Match Pre- and Post-Development site runoff rate
- Use integrated and decentralized stormwater management practices
- Implement pollution prevention plans
- Assure proper maintenance
- Train staff on operations and maintenance of stormwater BMPs
THE NEED FOR LID

- Conventional strategies are not working
- Loss of vegetation and wildlife habitat
- Polluted waterways
- Decreased recharge of streams, wetlands, aquifers
Mission Accomplished

Case Studies
PUBLIC STREET

DELINEATED WETLAND

UPLAND PORTION OF SITE
+/- 2.1 ACRES

PUBLIC STREET

MUNICIPAL FACILITY
UPLAND PORTION OF SITE
+- 2.1 ACRES

PUBLIC STREET

DELINEATED WETLAND

PUBLIC STREET

MUNICIPAL FACILITY

PRE-DEVELOPMENT HYDROLOGY
CONVENTIONAL STORMWATER POND AND FOREBAY
WETLAND IMPACT = 3/10 AC.

PUBLIC STREET

MUNICIPAL HQ / DETENTION FACILITY

PUBLIC STREET

MUNICIPAL FACILITY

CONVENTIONAL BMP’S
When the only tool you own is a hammer, every problem begins to resemble a nail.”

ABRAHAM MASLOW
LID Toolbox
LID Toolbox
Parking lot islands
Median strips
Rooftop runoff
Bioretention Pond
Grass Pavers
Paving stones
Porous asphalt
Pervious concrete
Rain Barrels
Natural Tree Protection
Level Spreader
Infiltration Swale
Pay attention: When the U.S. Army desegregated, the country really desegregated; when the Army goes green, the country could really go green.”

THOMAS FRIEDMAN, Author of “Hot, Flat and Crowded: Why We Need a Green Revolution & How It Can Renew America”
Questions
Mission Accomplished