

Low Impact Development Demonstration & Validation at a Southeastern Army Installation

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Environment, Energy & Sustainability
Symposium, Denver, CO

17 June 2010

9938



US Army Corps of Engineers
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Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 17 JUN 2010		2. REPORT TYPE		3. DATES COVERED 00-00-2010 to 00-00-2010	
4. TITLE AND SUBTITLE Low Impact Development Demonstration & Validation at a Southeastern Army Installation				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Army Engineer Research and Development Center, Construction Engineering Research Laboratory, Champaign, IL, 61826-9005				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Presented at the NDIA Environment, Energy Security & Sustainability (E2S2) Symposium & Exhibition held 14-17 June 2010 in Denver, CO.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 38	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Energy Independence and Security Act of 2007

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, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.”

Wow! This is a really high hurdle...and it seems to conflict with 100+ years of drainage practice



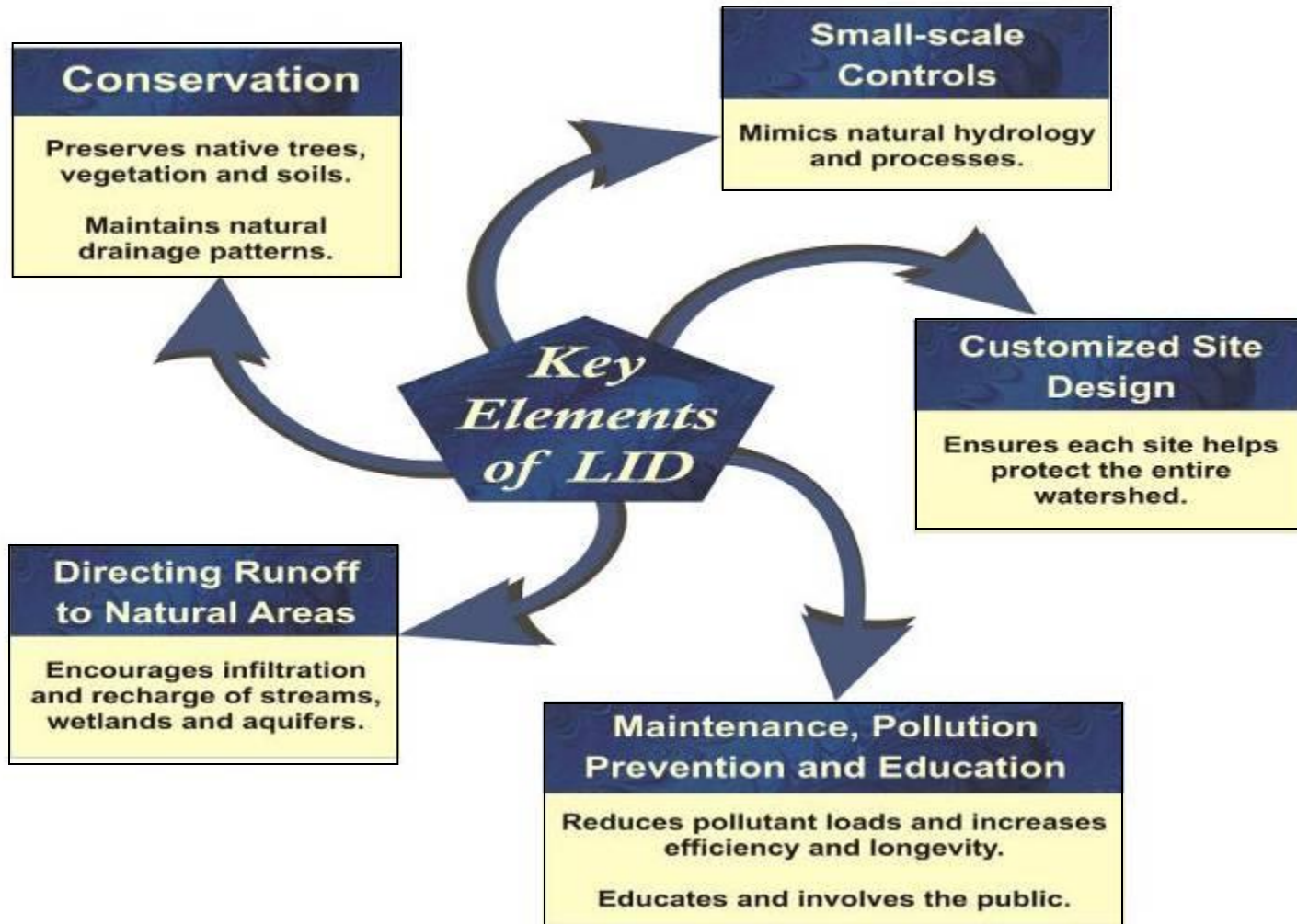
Principles of Low Impact Development (LID)

- EISA, Section 438 and other Army guidance promotes LID approaches over more traditional approaches for stormwater management.
- Manage stormwater close to where precipitation lands.
- Maintain or restore pre-development hydrology, reduce runoff volume and peak runoff rates and reduce potential transport of pollutants to receiving waters.
- Widely proven in nonmilitary applications.
- One limit to mass Army adoption has been lack of demonstrations while combating a perception of increased costs.



Low Impact Development (LID)

principles in a nutshell



But, ERDC and the Corps have already addressed the question!


(Before Section 438 was published)

PUBLIC WORKS TECHNICAL BULLETIN 200-1-36
30 SEPTEMBER 2005

SUSTAINABLE STORMWATER STORAGE
ALTERNATIVES FOR ARMY INSTALLATIONS

Find at:
http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215

- Describes basic LID practices
- Many graphics showing techniques
- Relates to SPiRiT guidance, but LEED® adaptable




PWTB 200-1-36

PUBLIC WORKS TECHNICAL BULLETIN 200-1-62
1 OCTOBER 2008

LOW IMPACT DEVELOPMENT FOR
SUSTAINABLE INSTALLATIONS:
STORMWATER DESIGN AND PLANNING
GUIDANCE FOR DEVELOPMENT WITHIN
ARMY TRAINING AREAS

Find at:
http://www.wbdg.org/ccb/browse_cat.php?o=31&c=215

- Emphasizes non-cantonment training facilities
- Photos and graphics
- Shows possible LEED® credits



PWTB 200-1-62

Easiest technique is to search for PWTB by number

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Representative technologies

- ▶ Bioretention cells
- ▶ Permeable pavement
- ▶ Bioswales
- ▶ Rain gardens
- ▶ Others



LID Examples



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Project Emphasis

- Protect jurisdictional wetlands
- Address and mitigate impact on installation wetlands
- Implement corrective actions for outfalls which can degrade water quality and fill in wetlands
- Support Clean Water Act
- Original intent to upgrade structure, control runoff volume and reduce velocity of stormwater discharge
- Utilize LID with conventional approaches as needed
- Bioretention facilities, modifications to discharge channels, infiltration swales
- Expected results: filtration of metals and surfactants, reduction in quantity of runoff, improved quality of runoff
- Options for groundwater recharge
- Conduct demonstrations, monitor, collect data.





Proposed to collect water from downspouts
and send to rain garden





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Proposed site for rain garden infiltration area



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Street runoff



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Storm sewer collector

Open lateral trench



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Temporary Barracks



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Culvert filled with sediment and sand



HOWEVER!



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Focus Change

- State inspection prompted emphasis on one site
- Upstream tenant had constructed detention basin with inadequate design
- Also nearby landfill cap washout.
- Result – major erosion problem.





This is the start of
the problem



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30 inch drain from tenant's retention basin



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Siltation threatens wetland area



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Planning a Solution

- Selecting possible treatments
- Evaluating tenant's catchment outfall structure
 - ▶ Outlet non-functional
 - ▶ Redesign for staged release
- Reality check



Step infiltration – a preferred approach





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Summary

- LID testbed demo needed validation for wetland protection
- Overcome by high priority problem
- Solutions must be compatible
 - ▶ Appropriate to magnitude of problem
 - ▶ Compatible with environmental setting



Questions, Comments?

Contact information or for additional information or resources

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