Low Impact Development Demonstration & Validation at a Southeastern Army Installation

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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."

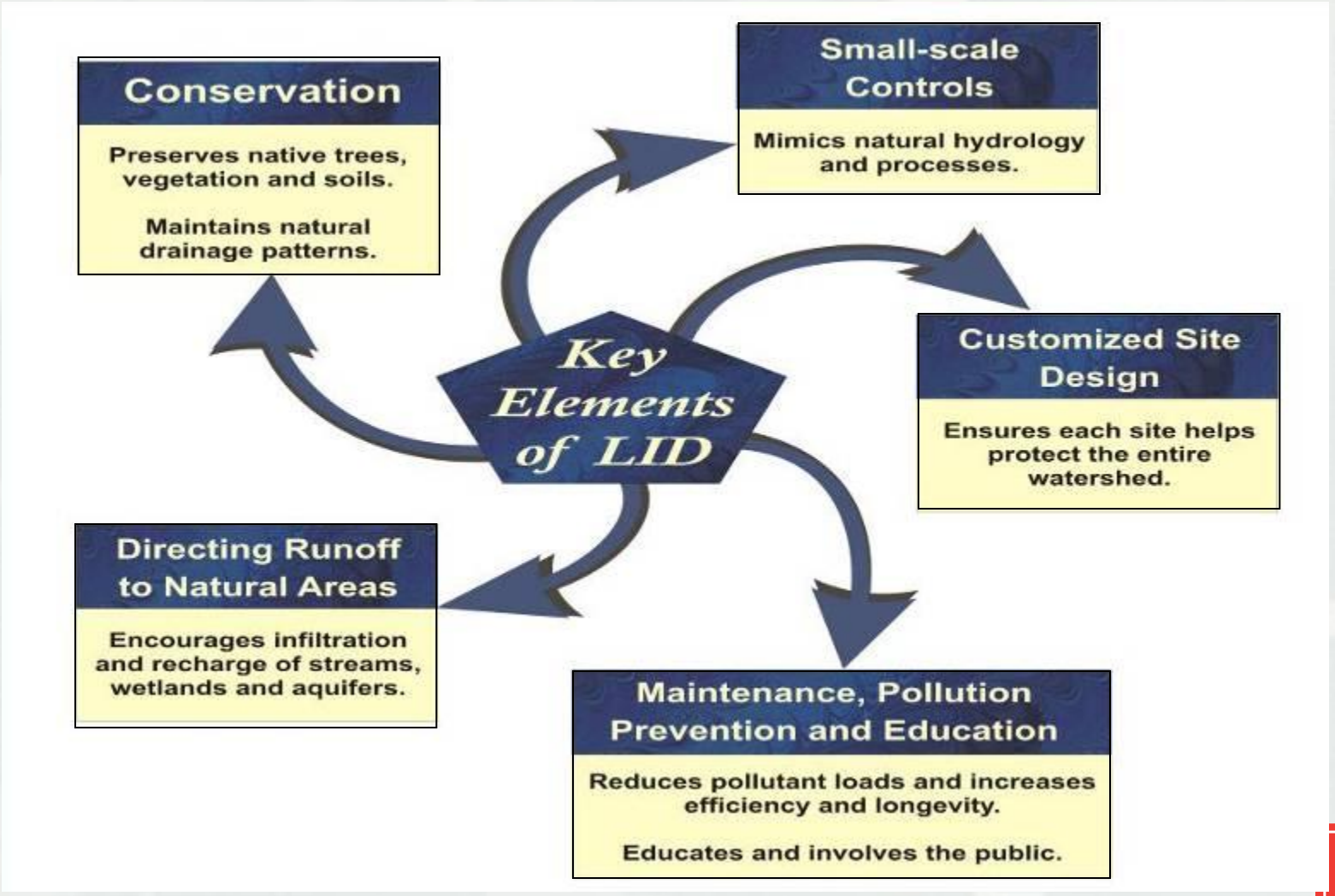
Wow! This is a really high hurdle…and it seems to conflict with 100+ years of drainage practice

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.

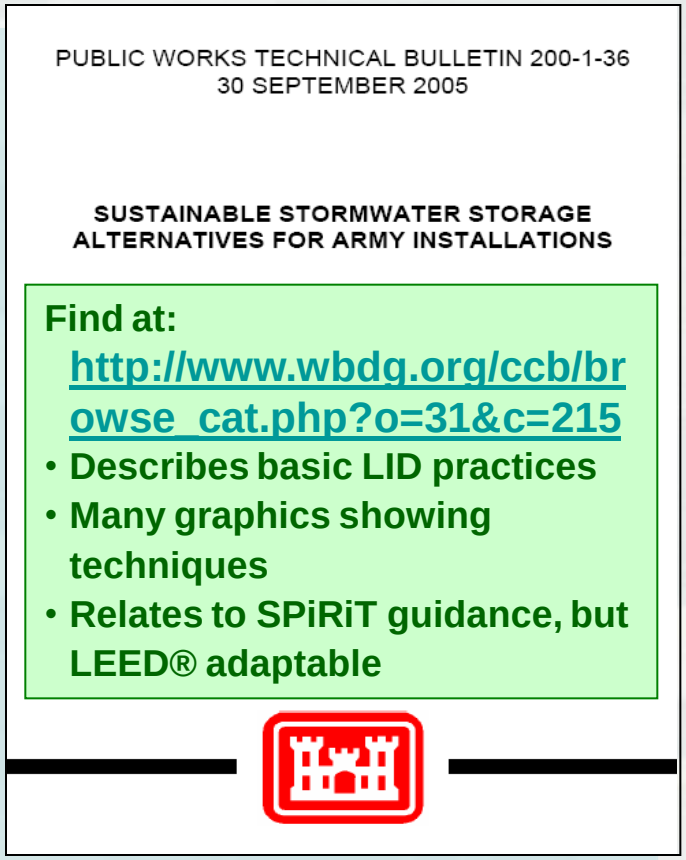
Low Impact Development (LID)

principles in a nutshell



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

(Before Section 438 was published)



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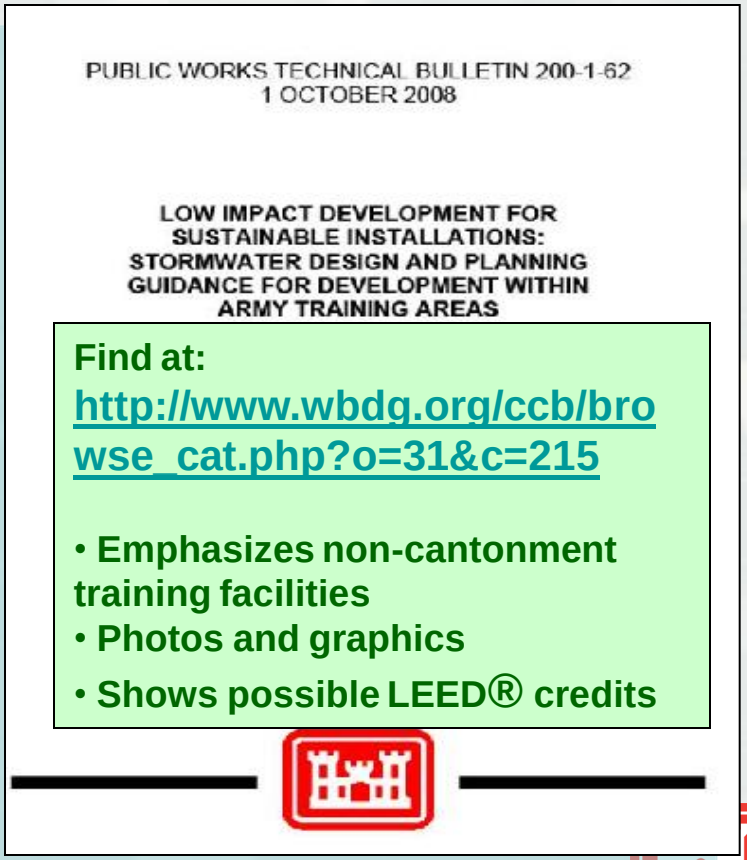

PWTB 200-1-62

Easiest technique is to search for PWTB by number

Representative technologies

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

LID Examples

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Project Emphasis

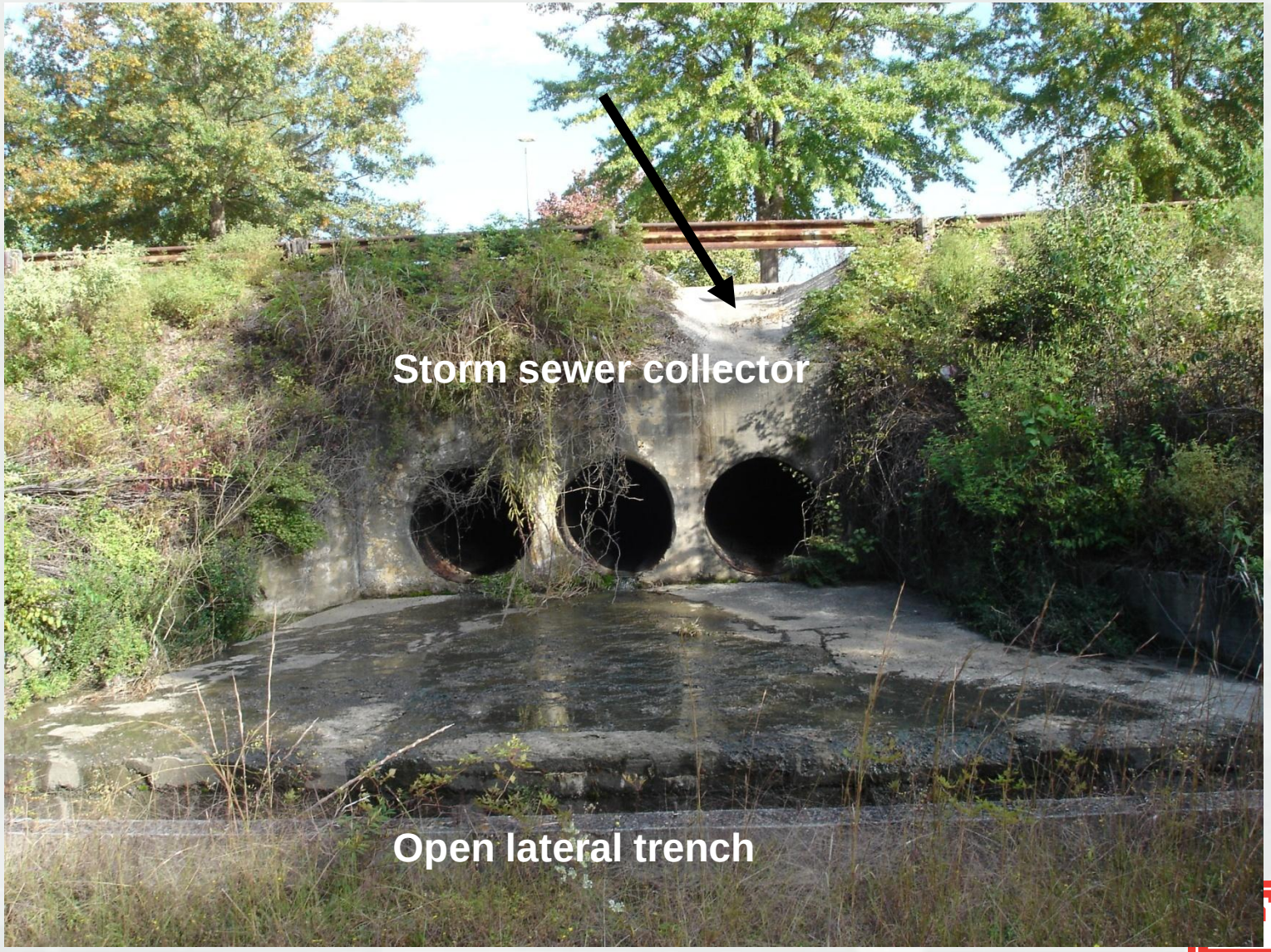
- Protect jurisdictional wetlands
- Address and mitigate impact on installation wetlands
- Implement corrective actions for outfalls which can degrade water quality and fill in wetlands
- Support Clean Water Act
- Original intent to upgrade structure, control runoff volume and reduce velocity of stormwater 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


24405


Proposed site for rain garden infiltration area


Street runoff


Storm sewer collector
Open lateral trench


Temporary Barracks

Culvert filled with sediment and sand

HOWEVER!

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


30 inch drain from tenant’s retention basin


Siltation threatens wetland area

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

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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