



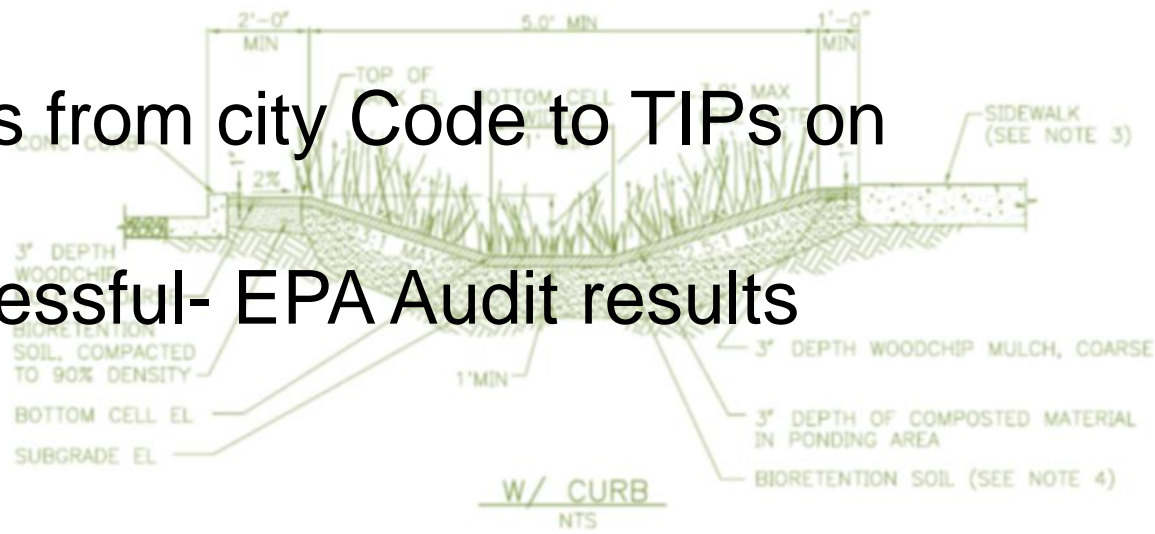
LID Plan Review City of Seattle

Washington Stormwater
Conference



2009 Code - Overview

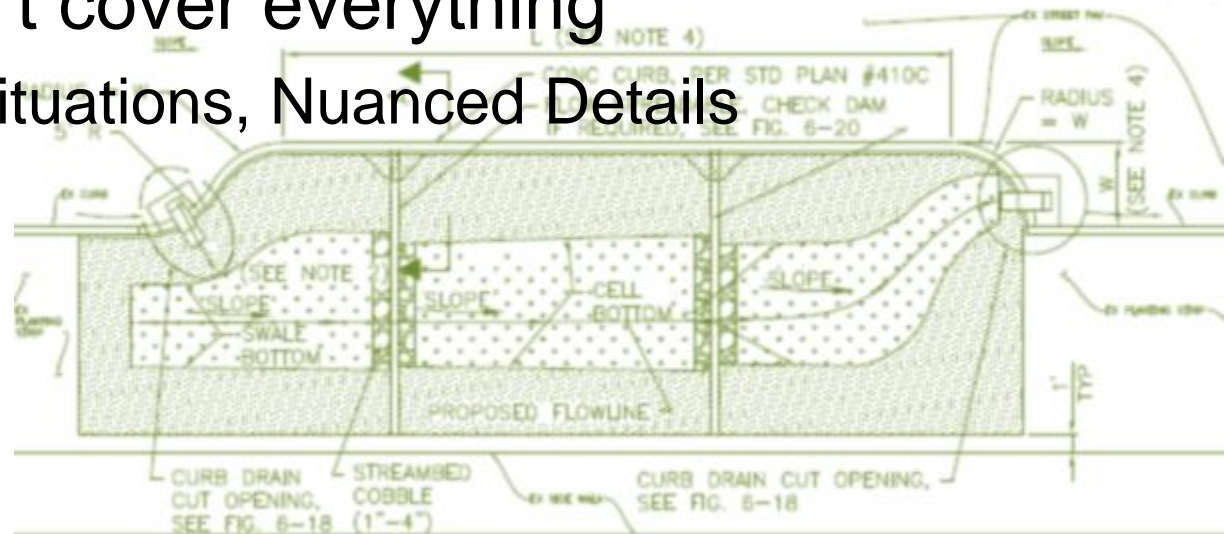
- Seattle review breakdown: Parcel & ROW
 - Different Departments review each part of project
- New Requirement: Green Stormwater Infrastructure to the Maximum Extent Feasible
 - GSI to the MEF is similar to MR 5, 2015 Code effort is tweaking GSI to the MEF
 - These implementation challenges were generally from 2009 code.
- All new documents from city Code to TIPs on the website
- Overall quite successful- EPA Audit results were positive





Challenges: Create Standards & Get buy-in

- Getting buy-in from other parts of the department
- Set up tools, databases, & procedures early
- Inspection
- Data Tracking & Mapping systems
- Documents didn't cover everything
 - Unanticipated Situations, Nuanced Details





2009 Code - Successes

- Standardized Submittal Templates were biggest ‘bang for the buck’.
- Most useful tools and documents were:
 - Standardized Drainage Control Plan for Small Projects
 - Construction Stormwater Control Standardized plan
 - Soil Amendment Calculator
 - GSI Calculator
 - Feasibility Checklist
 - Volume 3 of the Manual (Technical Requirements)
 - GSI to the MEF Director’s Rule for ROW projects
 - Technical Requirements
 - Right Of Way Improvement Manual Figures

City of Seattle GSI to MEF Requirement Calculator (2013-03-01)

Building Permit Number: [] Project Type: []
Project Area: [] Project Area: []
New plus Replaced Impervious Area: []
Area Requiring Mitigation: []

Reduction Method	Facility Size	Credit	Area
Grass	Total Grassy Area of Tract [] Total Grassy Area of Tract []	= 20% Credit (per 500 sq ft) = 10% Credit (per 1000 sq ft)	
Soil Amendment	Soil Amendment Area [] Soil Amendment Area []	= 50% = 50%	
Detention	Detention Area [] Detention Area []	= 50% = 50%	
Mitigation and Storm Facilities	Electrode Cell (Underdrain) [] Permeable Pavement [] Drainage Infiltration Rate []	Electrode Cell Area [] Electrode Cell Area [] Electrode Cell Area []	Subst/Precip Type [] Subst/Precip Type [] Subst/Precip Type []
Stormwater Management	Stormwater Management [] Stormwater Management []	Stormwater Management [] Stormwater Management []	Stormwater Management [] Stormwater Management []
Permeable Pavement	Permeable Pavement Area [] Permeable Pavement Area []	Permeable Pavement Area [] Permeable Pavement Area []	Permeable Pavement Area [] Permeable Pavement Area []
Green Roofs	Green Roof (Single-Ply Green) [] Green Roof (Multi-Ply Green) []	Green Roof Area [] Green Roof Area []	Green Roof Area [] Green Roof Area []
Other Facilities	Other Facilities [] Other Facilities []	Other Facilities [] Other Facilities []	Other Facilities [] Other Facilities []



Documents: 2015 Code Updates and 2009 Documents

- ❑ [2015 Stormwater Code Update Documents](#)
- ❑ 2009 Stormwater Code
- ❑ [Vol. I - Source Control Technical Requirements Manual](#)
- ❑ [Vol. II - Construction Stormwater Control Technical Requirements Manual](#)
- ❑ [Vol. III - Stormwater Flow Control and Water Quality Treatment Technical Requirements Manual](#)
- ❑ Director's Rule 15-2012, [Requirements for Green Stormwater Infrastructure to the Maximum Extent Feasible for Single-Family Residential and Parcel-Based Projects](#)
- ❑ [Right of Way Improvements Manual Figures](#)





2009 Code - Tools

- [DPD's Stormwater Code Website](#)

- TIPs documents

- [GSI Calculator](#)

- [Standardized Drainage Control Plan for Small Projects](#)

- [Construction Stormwater Control Standardized plan & Soil Amendment Calculator](#)

- [Pre-Sized Calculator](#)

- Only applicable to a subsection of projects

City of Seattle GSI Calculator (2013-03-01)

Building Permit No. Project Type

Project Address Project Area sf

New plus Replaced Impervious Area sf

Area Requiring Mitigation sf

Tree Credit

Category	Count	Value	Formula	Area
Existing Evergreen	<input type="text"/>	100	Total Canopy Area of Tree <input type="text"/> sf × 20% Canopy (or min. 100 sf/tree)	<input type="text"/>
Existing Deciduous	<input type="text"/>	50		
New Evergreen	<input type="text"/>	100	Total Canopy Area of Tree <input type="text"/> sf × 50% Canopy (or min. 50 sf/tree)	<input type="text"/>
New Deciduous	<input type="text"/>	50		
Total			Total Area Mitigated by Trees	<input type="text"/> sf

Discharge

Discharge or Sheet Flow Deposition sf × 100.0% = sf

Infiltration and Reuse Facilities

Facility	Facility Size	Sizing Factor	Area
Infiltration Facility			
1. Elevation Cull (without Underdrain)			
Contributing Area	<input type="text"/> sf	Elevation Bottom Area <input type="text"/> sf	Select Project Type <input type="text"/> sf
Pending Depth	<input type="text"/> in		
Duration Infiltration Rate	<input type="text"/> in/hr		
2. Elevation Cull (with Underdrain)			
Contributing Area	<input type="text"/> sf	Elevation Bottom Area <input type="text"/> sf	Select Project Type <input type="text"/> sf
Pending Depth	<input type="text"/> in		
Duration Infiltration Rate	<input type="text"/> in/hr		
3. Elevation Cull (with Underdrain)			
Contributing Area	<input type="text"/> sf	Elevation Bottom Area <input type="text"/> sf	Select Project Type <input type="text"/> sf
Pending Depth	<input type="text"/> in		
Duration Infiltration Rate	<input type="text"/> in/hr		
4. Elevation Cull (with Underdrain)			
Contributing Area	<input type="text"/> sf	Elevation Bottom Area <input type="text"/> sf	Select Project Type <input type="text"/> sf
Number Orifices	<input type="text"/>		
BC Pending Depth	<input type="text"/> in		
BC Duration Infiltration Rate	<input type="text"/> in/hr		
5. Permeable Pavement Facility (permeable pavement)			
Contributing Area	<input type="text"/> sf	Permeable Pavement Area <input type="text"/> sf	Enter Contributing Area <input type="text"/> sf
Pending Depth	<input type="text"/> in		Plus Permeable Pavement Facility Area <input type="text"/> sf
Duration Infiltration Rate	<input type="text"/> in/hr		
6. Reuse Facility			
Reinwater Harvesting	<input type="text"/>	Applicant must provide documentation of area mitigated by reinwater harvesting <input type="text"/> sf	

Impervious Surface Reduction Methods

Method	Facility Size	Credit	Area
Alternative Pavement Surfaces			
Permeable Pavement Surface (Subgrade Slope ≥ 2%)	Permeable Pavement Area <input type="text"/> sf	100.0%	<input type="text"/> sf
Permeable Pavement Surface (Subgrade Slope < 2%)	Permeable Pavement Area <input type="text"/> sf	55.0%	<input type="text"/> sf
Alternative Road Surfaces			
Green Road (Single/Multi-Course / 4" Growth Medium)	Green Road Area <input type="text"/> sf	55.0%	<input type="text"/> sf
Green Road (Multi-Course / 8" Growth Medium)	Green Road Area <input type="text"/> sf	14.0%	<input type="text"/> sf
Partial Infiltration			
Elevation Cull with Detention (without Underdrain)			
Contributing Area	<input type="text"/> sf	Elevation Bottom Area <input type="text"/> sf	Select Project Type <input type="text"/> sf
Pending Depth	<input type="text"/> in		



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