



Agenda

- **Porous Pavement**
 - Water quality credit
 - Flood detention
- **Artificial Turf**
 - Brief summary of policy
- **Rainwater Harvesting (RWH)**
 - RWH for conservation & water quality
 - RWH with green roof irrigation
 - RWH and Impervious Cover Determination
- **Wrap-up/Next meetings**

Porous Pavement Proposal for 4th Quarter ECM Submittal (Fall 2014)

- Expand ECM criteria to allow water quality credit for porous pavement for non-pedestrian surfaces
- Limited to privately maintained facilities
 - Yes: private parking lots, driveways, streets and alleys
 - No: public roads and public sidewalks
- Cannot propose over karst/recharge zone or certain “hot spot” land uses (e.g., gas stations, etc.)
 - OK on “hot spot” site, just not in area drained by hot spot use
- Acceptable systems: interlocking concrete pavement and porous asphalt for both vehicular & pedestrian surfaces; porous concrete for pedestrian surfaces only

Proposed ECM Design Info for Porous Pavement

Water Quality Applications

- Require 5 inches gravel thickness
 - Accommodates “half-inch-plus” water quality volume sizing
 - Addresses loss volume via sedimentation
- Must show captured water infiltrates into underlying soil within 48 hours
- City pond inspectors to inspect every 3 years (per standard cycle like other controls)

Proposed ECM Design Info for Porous Pavement

On-Site Testing

- Essential to test on-site conditions:
 1. Prior to design proposal to determine infiltration rates
 2. During construction to confirm design infiltration rates have been maintained (prior to placement of gravel & pavement)
- Must have minimum 12 inches soil above bedrock and 3 feet above water table
 - If not accounted for, groundwater can fill the water quality volume, creating more bypasses of stormwater

Porous Pavement & Flood Mitigation

Flood Detention for Water Quality design (5-inch gravel)

- Same as sedimentation-sand filter methodology: Quick Sheet (credit for volume provided after 24 hours)
- Surface assumed to be impervious for Curve Number (CN) since effectively impervious after WQ volume fills
- If want both Water Quality credit and flood detention, must provide stacked volumes for each with appropriately placed outlet for detention

Porous Pavement & Flood Mitigation

Stand-Alone Flood Detention Systems

- Provide flood storage in rock below pavement similar to water quality applications
- Must provide monitoring port
- Must provide annual 3rd party inspection (like other subsurface ponds)
- Must provide extra storage for sedimentation

Town & Country Optimist Club Parking Lot: Porous Pavement Water Quality & Detention Facility

Storm Event	Peak Flow (cfs)	Peak Flow (MGD)	Volume Detention (cu ft)	Retention Time (min)	Peak Detention (ft)
10 Year	120	1.00	20,000	15.0	0.50
25 Year	150	1.25	25,000	18.8	0.63
50 Year	180	1.50	30,000	22.5	0.75
100 Year	210	1.75	35,000	26.3	0.88

Moon Units Condominiums: Porous Pavement Detention Facility

Area Name	Area (sq ft)	Runoff Coefficient	Peak Flow (cfs)	Volume (cu ft)	Retention Time (min)
Proposed Building	1,500	0.80	120	20,000	15.0
Offsite Drainage Area	10,000	0.50	1,000	100,000	100.0
Total	11,500	0.65	1,120	120,000	115.0

Artificial Turf

Example cross sections

Tony Burger Center, Austin, Texas
(from Google Maps)

Artificial Turf Proposal

Artificial turf considered impervious

No water quality credit: need to provide water quality controls

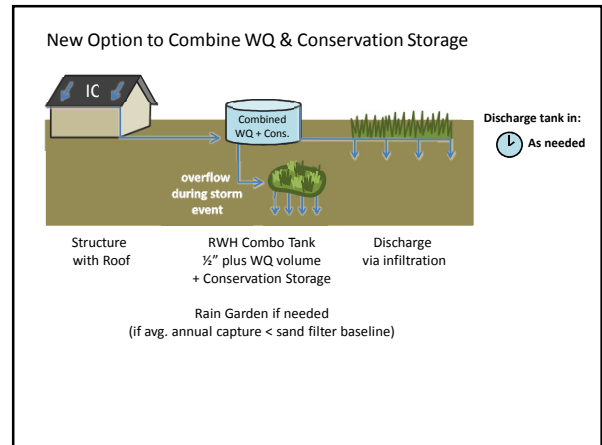
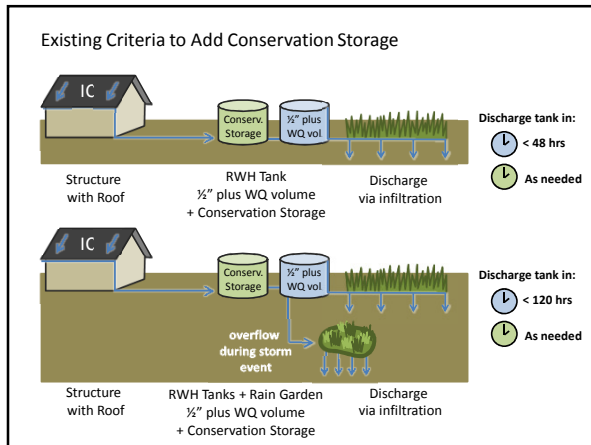
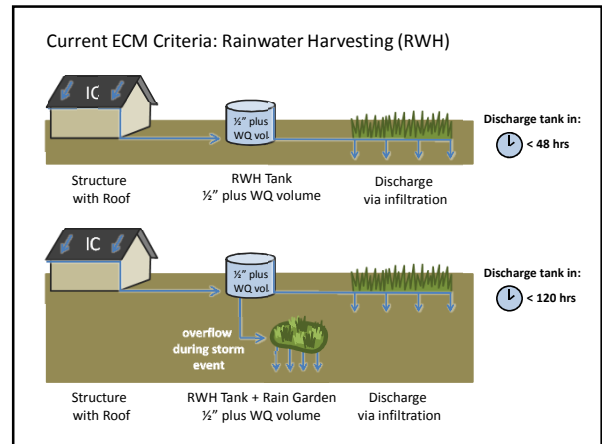
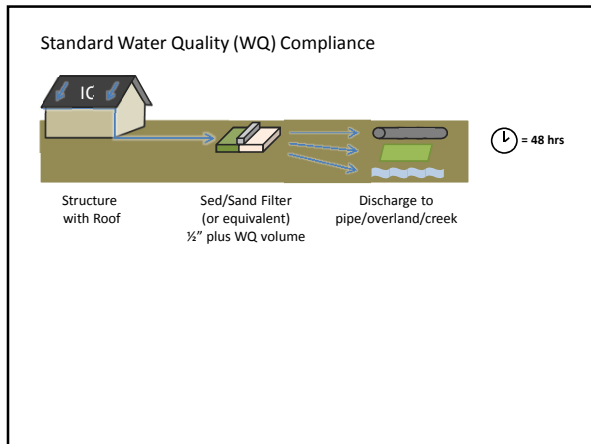
Pollutant levels too high

Can receive flood mitigation credit: applicant must demonstrate peak flow reduction

Rainwater Harvesting for Water Quality and Conservation

Staff proposal:

- Develop ECM criteria and spreadsheet calculator to demonstrate “equivalency” of rainwater systems with standard water quality controls
 - Flexibility to release water from tanks longer than allowed under existing criteria (5 days) for greater conservation
 - Cannot receive flood detention credit since cannot assure required storage is available
- Explain additional options in ECM, e.g., installation of second, separate tank for water conservation.



Rainwater Harvesting + Green Roof Irrigation

➤ Options to use green roofs for stormwater control exist now but are not widely known and lack ECM & DCM criteria

Staff proposal:

- Add ECM option to treat water with rainwater harvesting (storage) & green roof (irrigation). Applicant must consider:
 - Storage of water quality volume;
 - Application rate and drawdown time;
 - Infiltration rate of green roof;
 - Other factors such as ET, flow-back to tank, etc. to show how water moves through and out of the system.
 - Plan to frame in simplified text for 4th Quarter ECM; expand later
- Add DCM consideration for rooftop detention
 - Will be very similar to parking lot detention

Rainwater Harvesting & Impervious Cover Determination

➤ Are rainwater harvesting systems given impervious cover credits for tank and/or catchment areas?

Staff proposal:

- WPO/code: water quality controls don't count against impervious cover limits. So rainwater tank footprints are counted as pervious
 - Discuss conservation-only systems
 - Note: some systems capture water from lid (via drains) to tank
- Staff does not support counting the drainage catchment area as pervious

WPO Phase 2 Schedule, 2014	
Phase 2 Kickoff	Jan. 22
Perviousness: Introduction	Feb. 21
Perviousness: Porous Pavement (part 1)	Mar.07
Porous Pavement (part 2), Artificial Turf & Rainwater Harvesting	Mar.21
<ul style="list-style-type: none"> • Porous pavement: conclusion • Rainwater harvesting options (conservation storage, green roofs, etc.) 	
Rain Gardens for Single-Family Residential	Apr. 04
Beneficial Use of Stormwater: Potential Policy Approaches	
Introduction/National Examples	Apr. 18
Conclusion	May 02
Next Steps	TBD

Contact Information
<p>Mike Kelly Watershed Protection Department City of Austin (512) 974-6591 mike.kelly@austintexas.gov</p>
<p>Matt Hollon Watershed Protection Department City of Austin (512) 974-2212 matt.hollon@austintexas.gov http://austintexas.gov/department/watershed-protection-ordinance</p>