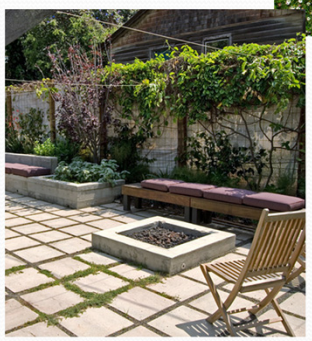
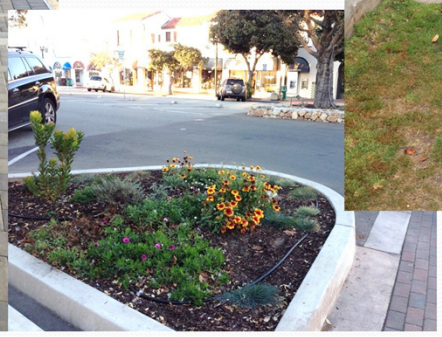
PERVIOUS SURFACES

- PATIOS



PERVIOUS SURFACES

- STREETSCAPE



PERVIOUS SURFACES

- PARKING

PERVIOUS SURFACES

Benefits

- Many types of pervious surfaces and paving types
- Paver systems are easy to repair or replace
- Promotes infiltration of stormwater
- Slows stormwater runoff; decreasing peak storm water flows
- Helps clean the stormwater through filtering it through the base material and soil
- Beneficial to street trees as roots can have more access to air and water

Considerations

- Properly install/compact the base layer to ensure an even surface
- The depth of the base layer and reinforcement should be considered based on the type of load the pavement will receive
- Install pavers with the correct joint spacing
- Pervious concrete or asphalt may require vacuuming over time
- Typically more costly on large scale projects

- I will present water harvesting examples at a smalle and medium scale.

WATER HARVESTING

- SMALL SCALE

WATER HARVESTING

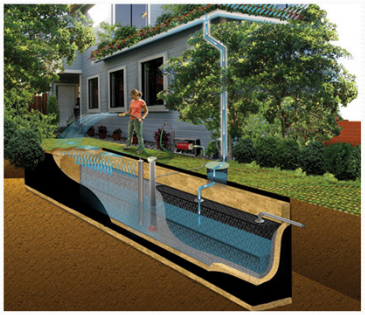
- SMALL SCALE

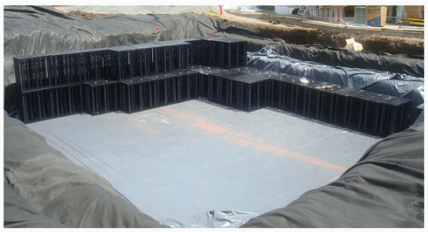
WATER HARVESTING

- MEDIUM SCALE

WATER HARVESTING

- MEDIUM SCALE





WATER HARVESTING

Benefits

- Free water for landscape
- Slows roof/downspout runoff; reducing peak stormwater flows
- Plants prefer rainwater
- Inexpensive and take little space
- Easy to expand system

Considerations

- Maintenance
  - Clean filters
  - Clean tank
- Screen all vents
- Prevent algae growth with a dark colored tank
- Size: tanks above 5000 gallons may need a building permit
- Route overflow pipe away from structures and neighboring properties
- Provide a filter for excessive/large debris from rooftop
- Non-potable

I will present some downspout disconnections at different locations.

DOWNSPOUT DISCONNECTS

DOWNSPOUT DISCONNECTS

DOWNSPOUT DISCONNECTS

Benefits

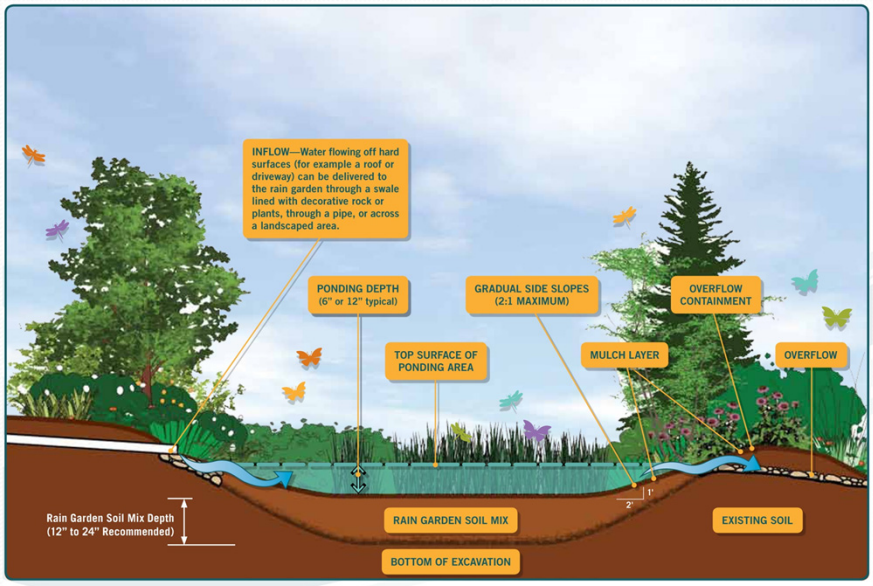
- Free “seasonal’ water for landscape
- Slows roof/downspout runoff; reducing peak stormwater flows
- Inexpensive and easy
- Add a rain chain or bowl for decoration

Considerations

- Runoff to be routed to a porous landscape, landscape depression, mulch pit, or gravel basin
- Overflow to be routed away from structures and neighboring properties
- Cap downspout connection leading to storm drain

- I will present some rain gardens, vegetated swales in residential and larger scale properties.
- I think they are one of the most beautiful LID techniques that you can install on your property.

RAIN GARDENS



Graphic: Rain Garden Handbook for Western Washington June 2013, page 30

Design considerations:

- Location and Overflow
- Sizing and Depth
- Soil Mulch and Planting
- Maintenance

- Parking lots and streetscape

- Other local examples

- Other local exampless

RAIN GARDENS

- VEGETATED SWALES & BASINS

Benefits

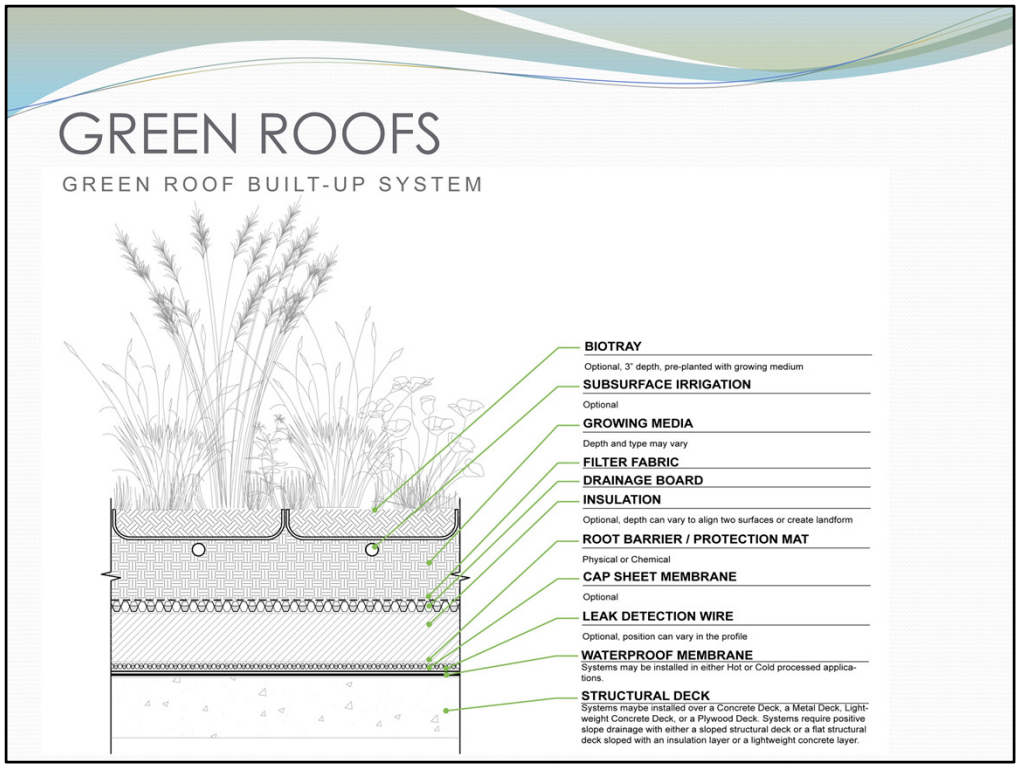
- Adds an aesthetic landscape feature with endless planting design possibilities
- Plants promote native habitat and food source for hummingbirds, butterflies, and honey bees
- Promotes infiltration of stormwater
- Slows stormwater runoff; decreasing peak storm water flows
- Helps clean the stormwater through filtering it through the base material and soil
- Add mulch and compost for added water retention
- Low cost

Considerations

- The required size, shape, and depth of the garden depend on how much water is captured (water should be drained within 48 hours)
- For larger systems, subsurface drains with base rock may be needed
- Rain gardens and swales to be located away from building foundations and on a relatively flat area
- Overflow to be routed away from structures and neighboring properties
- Irrigation will be needed for plant establishment
- Select appropriate plants (sun/shade, wind exposure, soil type, CA coastal native plants)
- Regular landscape maintenance required to meet plant species needs. Regularly check rain garden has a clear inlet and overflow path.
- For newly installed rain gardens which are mulched, be aware that after a large rain event, bark may float and clog drains or outlets.

2 kinds of green roof profiles

- Extensive – 4-6” soil profile
- Intensive – over 6” and may support heavy loads



- Green roof built up systems can vary greatly
- Depends on many things: the load of your roof, type of roof, waterproofing required, tray system or direct planting, etc…

- They are so amazing!

GREEN ROOF

Benefits

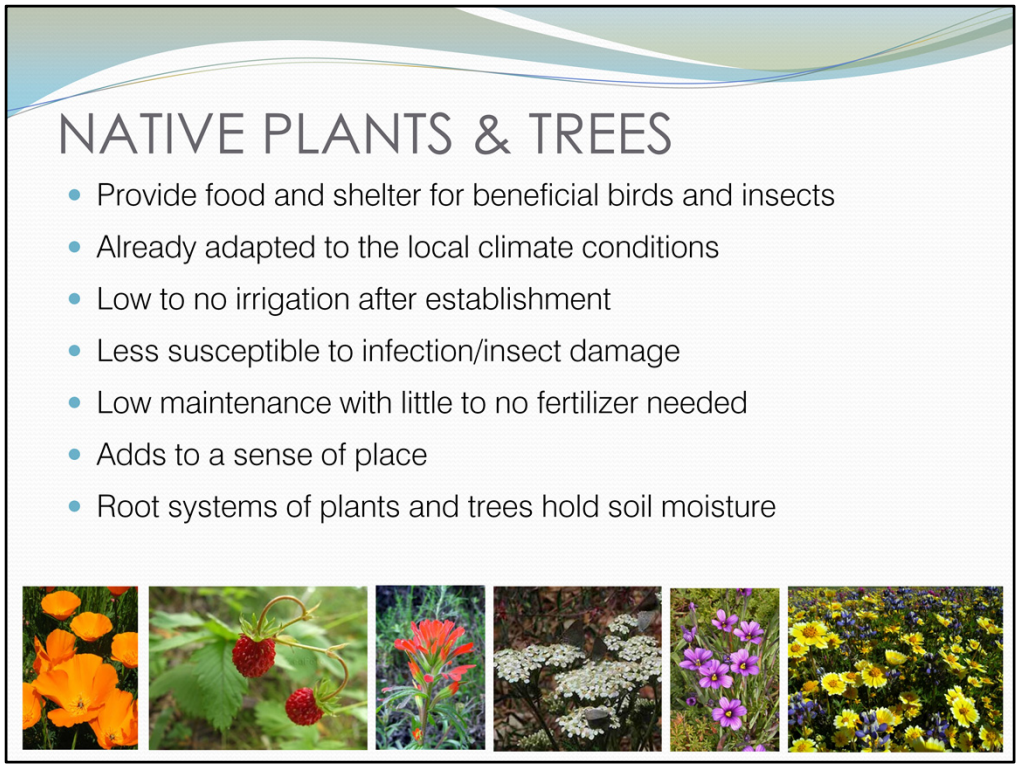
- Beautiful with endless design possibilities
- Promotes habitat for beneficial insects and birds
- Attenuates sound
- Improves thermal performance of a roof, reducing the buildings energy demand
- Reduces heat island affect in urban communities
- Increases the life of the roof's waterproof membrane
- Can provide additional open space needed in urban environments
- Slows roof/downspout runoff; reducing peak stormwater flows
- Filters stormwater runoff through the soil media
- Waterproofing manufacturer offer warranties for green roofs

Considerations

- Expensive
- For existing roofs, a structural engineer will be needed to evaluate the load and to identify if the roof requires structural reinforcement for the green roof profile desired
- Light weight growing media
- Best for non-sloped roofs
- Consider the waterproofing
- Irrigation will be required in our area
- Consider sightlines of the green roof
- Consider access to the roof for maintenance (weeding, fertilization, replanting, irrigation system check)

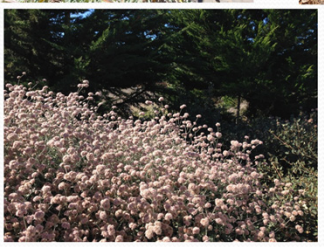
SOIL & MULCH

- Soils help to achieve infiltration rates and support plant health; mix of compost and aggregates.
- Mulch is a protective layer of material spread on top of the soil. 2-3" layer recommended.
- Mulches can be organic such as straw, bark chips or inorganic such as stone or recycled glass.
- Mulch keeps the soil moist, replenishes organic material in the soil, prevents erosion, and discourages weeds.



- PG Natural History Museum
- MEarth
- Mix with drought resistant plants!

NATIVE PLANTS & TREES



OTHER:

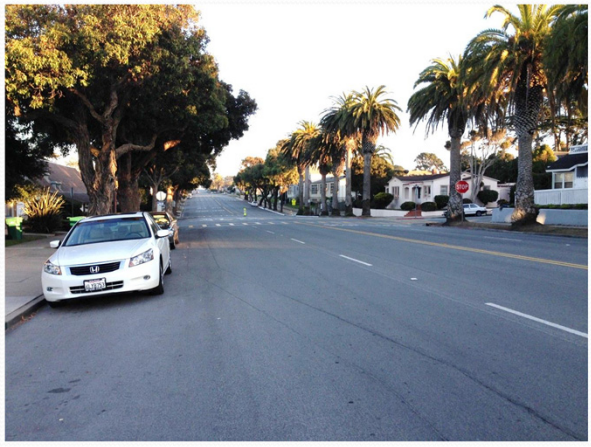
- Proper herbicide and pesticide choice and use*
- Proper soaps for washing cars*
- Proper disposal of household hazardous waste*
- Pick up litter
- Scoop poop
  - Pet waste
  - Seagull deterrents on rooftops

* Refer to MRWPCA guidelines

- Now that you have been introduced to the concept of LID. Please tell me what would be beneficial here in terms of managing the stormwater better?
- (stree trees, planting / more vegetation, rain garden)

WHAT WOULD YOU DO HERE?

WHAT WOULD YOU DO HERE?



RainScapes
Landscapes for Healthy Watersheds

TIMELINE: SPRING 2014

www.ci.pg.ca.us – LIVING/GREEN PG/RAINSCAPES

LID TECHNIQUE	REBATE AMOUNT
1) Roof Downspout Disconnection	$0.50 per square foot of impervious roof catchment area.
2) Creating Rain Gardens	$2.00 per square foot of rain garden. Based on square foot of rain garden as per the Design Guidelines
3) Rainwater Harvesting (barrel or cistern)	$25 per 100 gallons harvested and stored ($0.25/gallon)
4) Replacement of Impervious Surfaces with Pervious Surfaces	$2.00 per square foot of impervious surface replaced
5) New Tree Planting	Rebate per tree gallon/box size: 15 Gallon = $25.00 24" Box = $50.00 36" Box = $100.00 48" Box and greater = $200.00
6) Gull Rooftop Deterrent Devices	$0.50 per square foot of roof area with bird deterrent installed $0.50 per linear foot of parapet bird deterrent installed

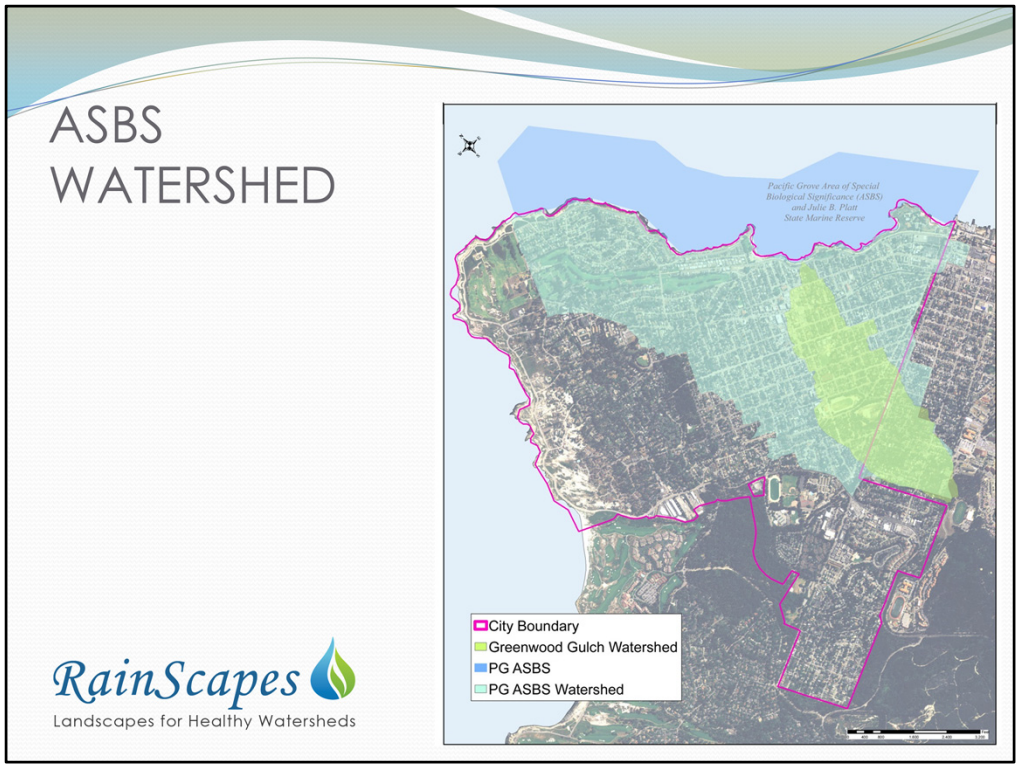
CITY OF PACIFIC GROVE, CA INC. 1889

greenPG ENVIRONMENTAL PROGRAMS

CALIFORNIA Water Boards

ASBS ONLY

Now I will go into a more detailed overview of the RainScapes rebate program. Again, the program is still under development and will be online in April. In the meantime, please visit the website for information as it becomes available. If you would like to be notified when the rebate program is active, please fill out your name and contact information at the check in table on your way out.



- Those of you who have homes/businesses within this light green shaded area are eligible for the 6 rebates offered in the RainScapes program. If you live outside the boundary, there is another rebate program called Monterey Bay Friendly Landscaping Rebate Program which I will describe next.

This lecture is a kick off to the RainScapes program which will offer other resources to the community, besides the rebate themselves, there will be additional lectures of on the LID techniques on how to design/install them, as well as workshop to assist with the rebate application process.

The city of PG has initiated a project which will demonstrate 3 of the LID techniques, 1)Downspout disconnect, 2)Create rain garden, 3) Remove impervious surface with pervious surface

At the end of the Rebate program, we will offer pre arranged neighborhood tours of installed LID techniques

More detailed information about the RainScapes rebate program and other rebate programs will be discussed towards the end of the lecture.

MONTEREY BAY-FRIENDY LANDSCAPING REBATE PROGRAM

Up to $500 in additional rebates.

LID TECHNIQUE	REBATE AMOUNT
1) Rainwater Harvesting - barrel or cistern	$25 per 100 gallons harvested and stored ($0.25/gallon)
2) Run-off Redirect - from downspouts or hardscapes	$0.50 per square foot of impervious surface diverted
3) Impervious Surfaces Replacement - with permeable pavement and/or summer dry landscaping	$1.00 per square foot
4) Irrigated Turf Replacement – with summer dry landscaping	$1.00 per square foot of irrigated turf replaced

TIMELINE: First come-first served beginning April 2014

Administered by MPWMD: http://www.mpwmd.dst.ca.us/

- Working with MPWMD rebates as well – integrate together more money!

OTHER REBATE PROGRAMS

MPWMD WATER REBATE PROGRAMS

1. Residential: High efficiency toilets, clothes washers, dishwashers, graywater system, etc.
2. Non-Residential: High efficiency toilets/urinals, clothes washers, dishwashers, graywater system, etc.
3. Irrigation System Improvements:
    a. Smart controller, soil moisture sensor, rotating sprinkler nozzle
    b. Rainwater storage
    c. Graywater irrigation system supplied by clothes washer
4. Lawn Removal

More information: http://montereywaterinfo.com/rebatesNEW.html

TIMELINE: NOW!

CALIFORNIA AMERICAN WATER

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

- More lectures and workshops to come when the RainScapes rebate program gets underway.
- Pdf of lecture slides available on web site