

RAIN GARDENS: WHEN LIFE GIVES YOU LEMONS



SCHUMACHER
LANDSCAPE
DESIGN & BUILD

Prepared for Buckingham Township
February, 2024

STORMWATER RUNOFF

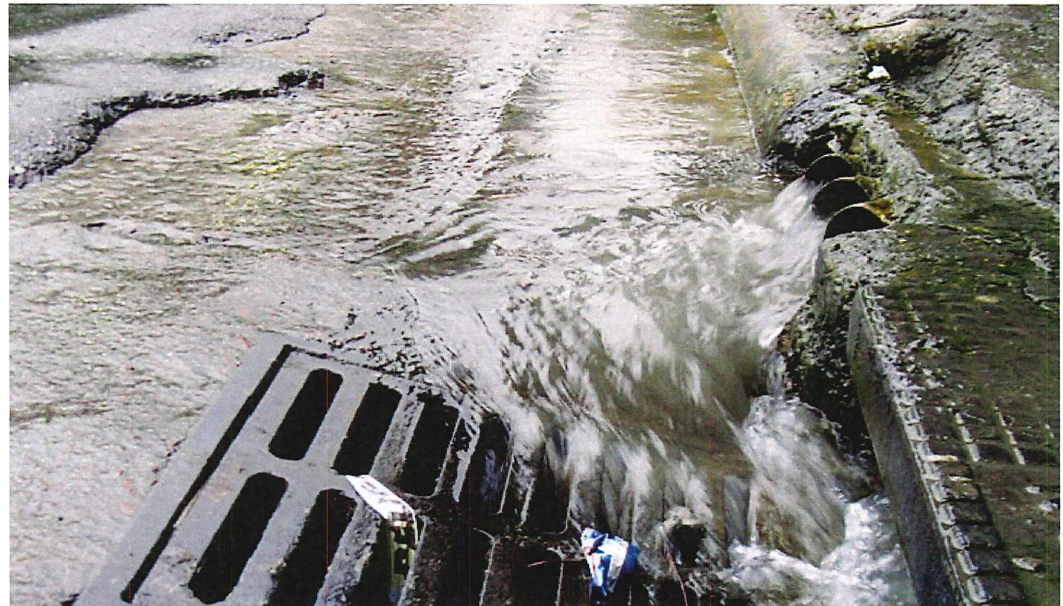
STORMWATER RUNOFF is generated from rain and snow melt that flows over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground.

RUNOFF picks up fertilizer, oil, pesticides, dirt, bacteria, and other pollutants as it makes its way through storm drains and ditches to our streams, rivers, lakes, and oceans.

WHEN RUNOFF leaves the storm drains and empties into a stream, its excessive volume and velocity blast out stream banks, damaging stream side vegetation and wiping out aquatic habitat.

SEDIMENT carried by storm water smothers stream and river habitat, destroying fish eggs and aquatic plants. It also transports pollutants like nitrogen and toxic PCBs into water systems.

BASED ON SCIENTIFIC STUDIES, as of 2020, more than 5,200 miles of Pennsylvania's rivers and streams were considered impaired due to stormwater runoff.



INTERCEPTING STORMWATER RUNOFF

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CAPTURE

A rain garden catches runoff and holds standing water for no more than 24 hours.

FILTER

In the soil, microbes break down pollutants and nutrients washed in by the rain.

INFILTRATE:

Deep-rooted plants loosen the soil, crating a sponge zone. Water soaks in and groundwater aquifers are recharged.

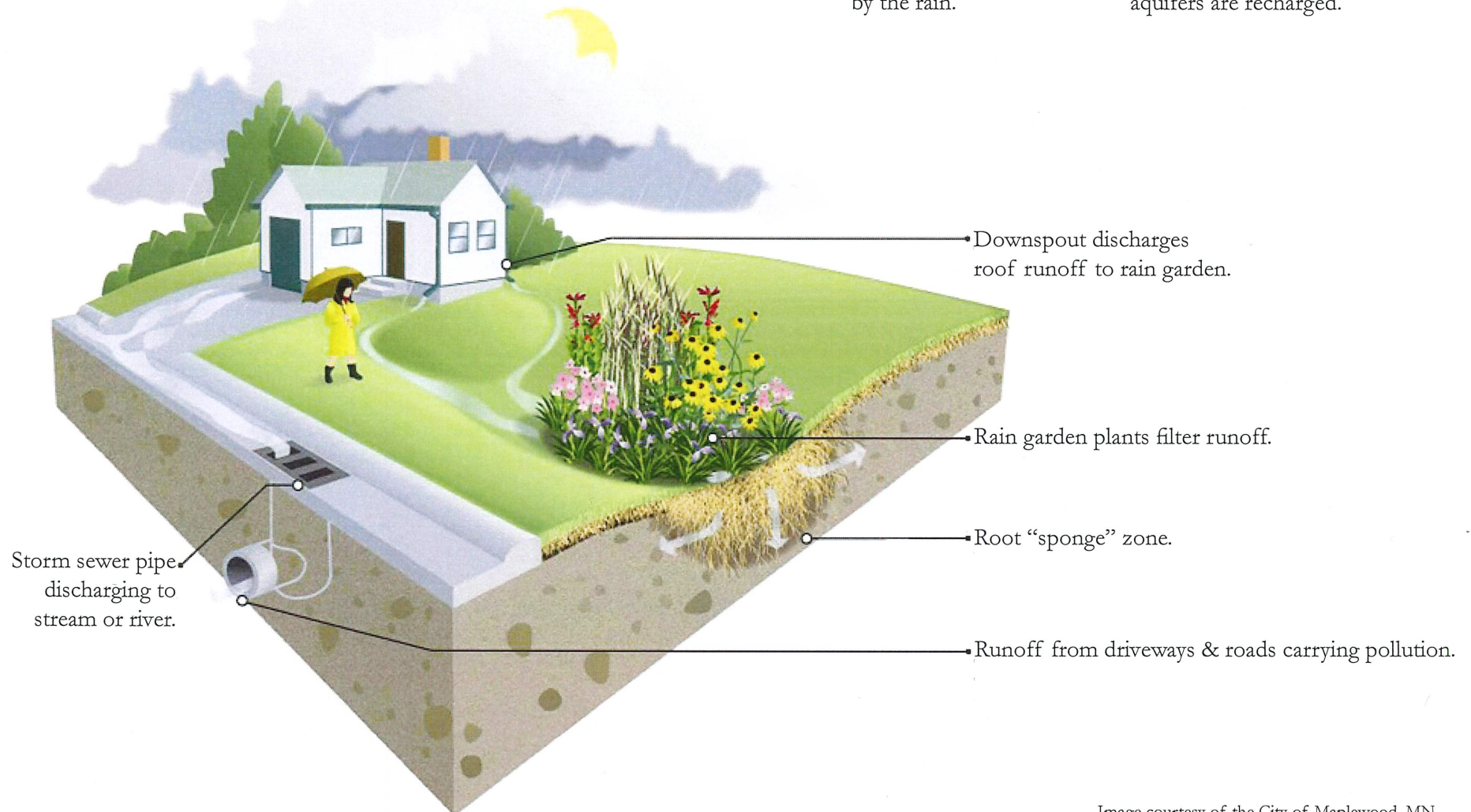
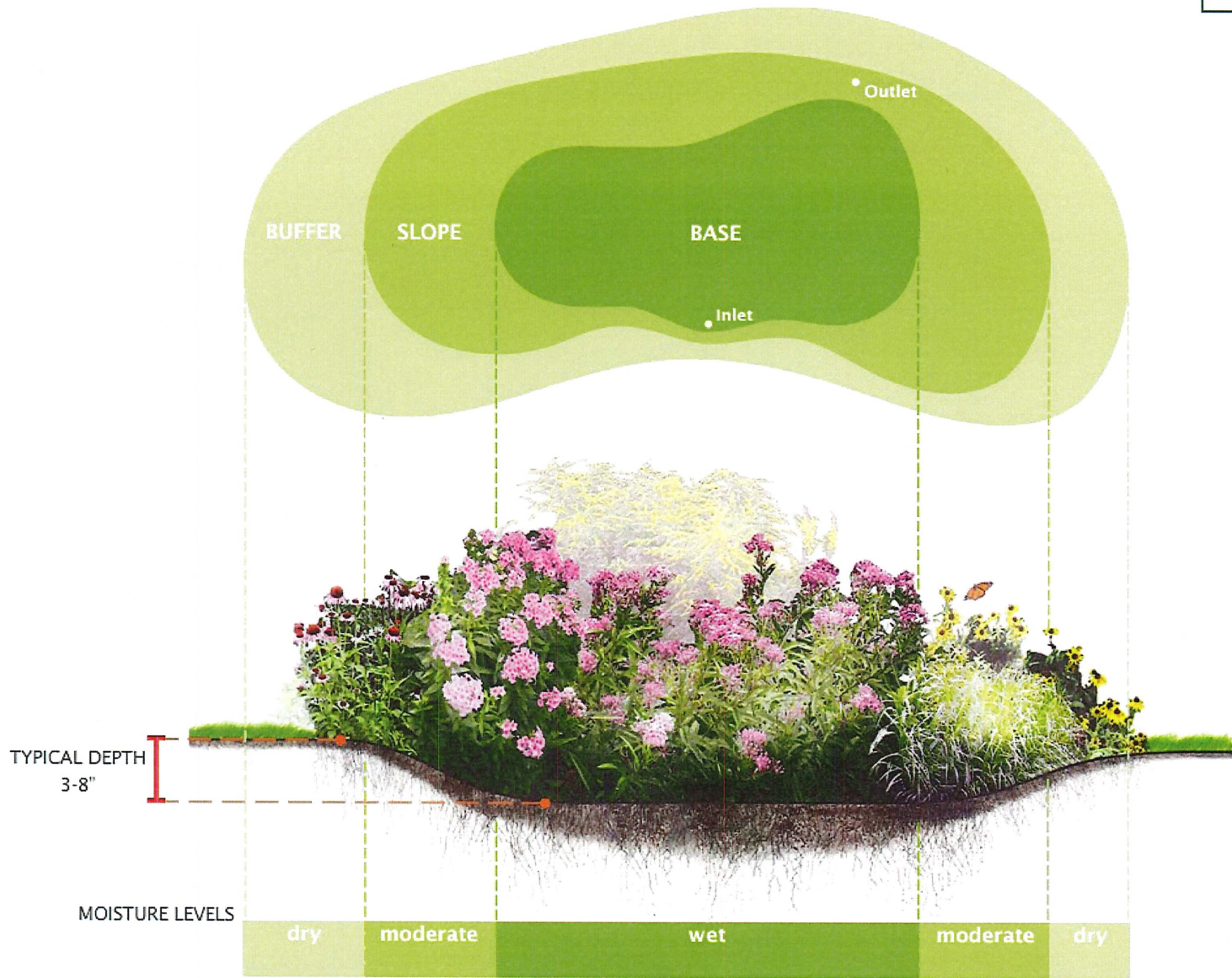
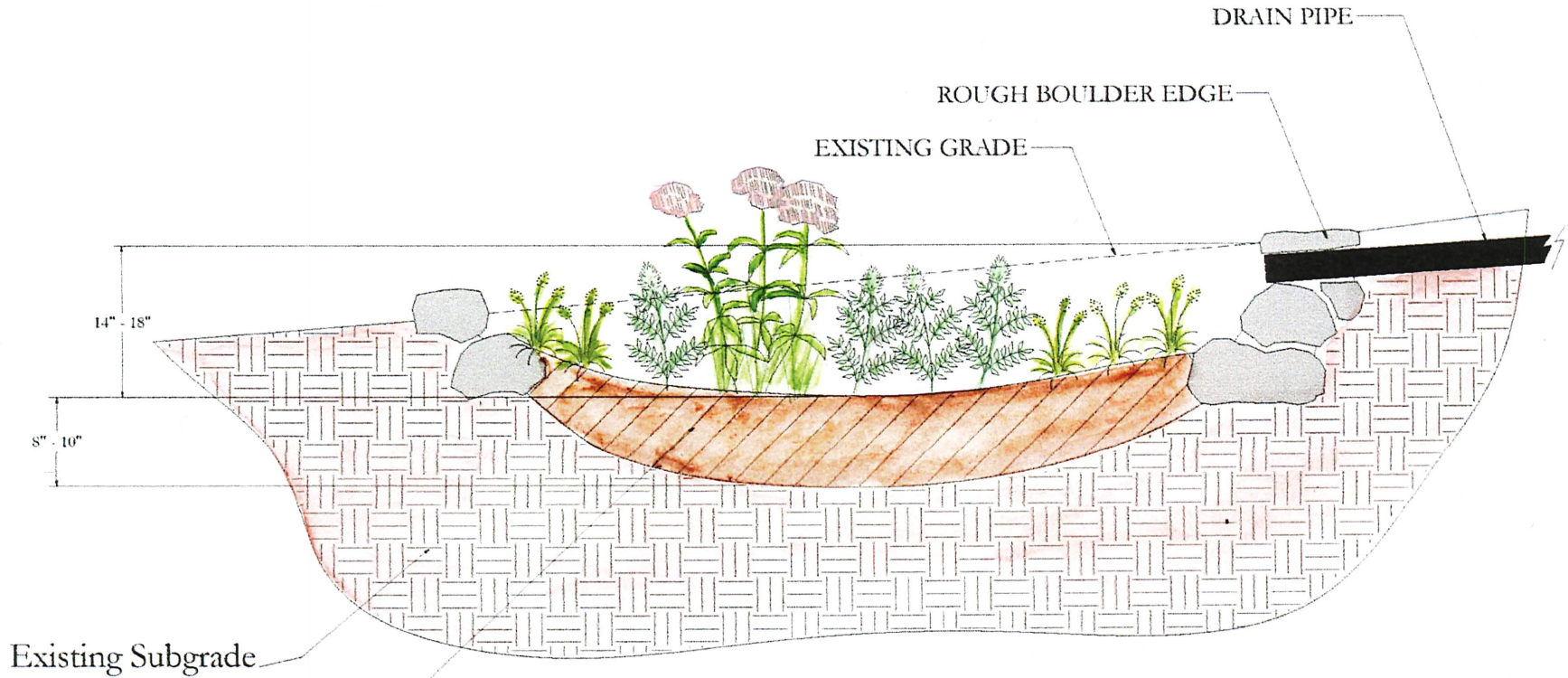


Image courtesy of the City of Maplewood, MN

RAIN GARDEN STRUCTURE



RAIN GARDEN CONSTRUCTION DETAIL

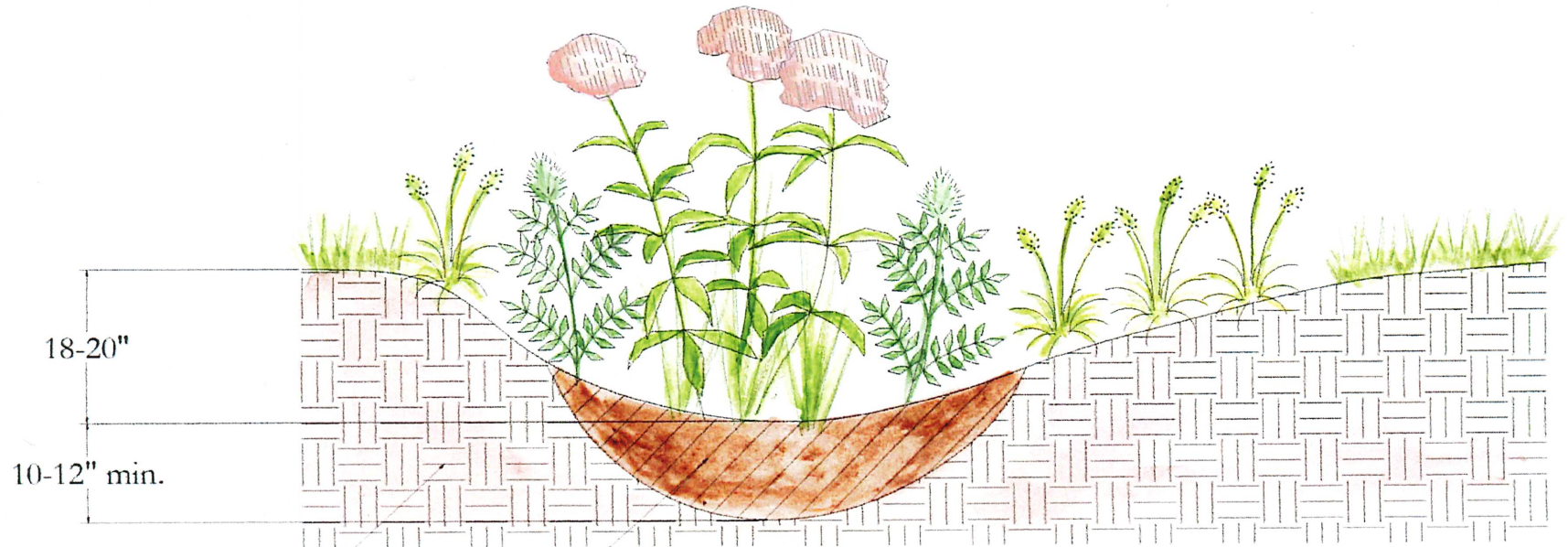


Mix 1 part native topsoil
1 part leaf compost
2 parts coarse sand
(depending on site soil porosity)

RAIN GARDEN
Not to Scale

VEGETATED SWALE CONSTRUCTION DETAIL

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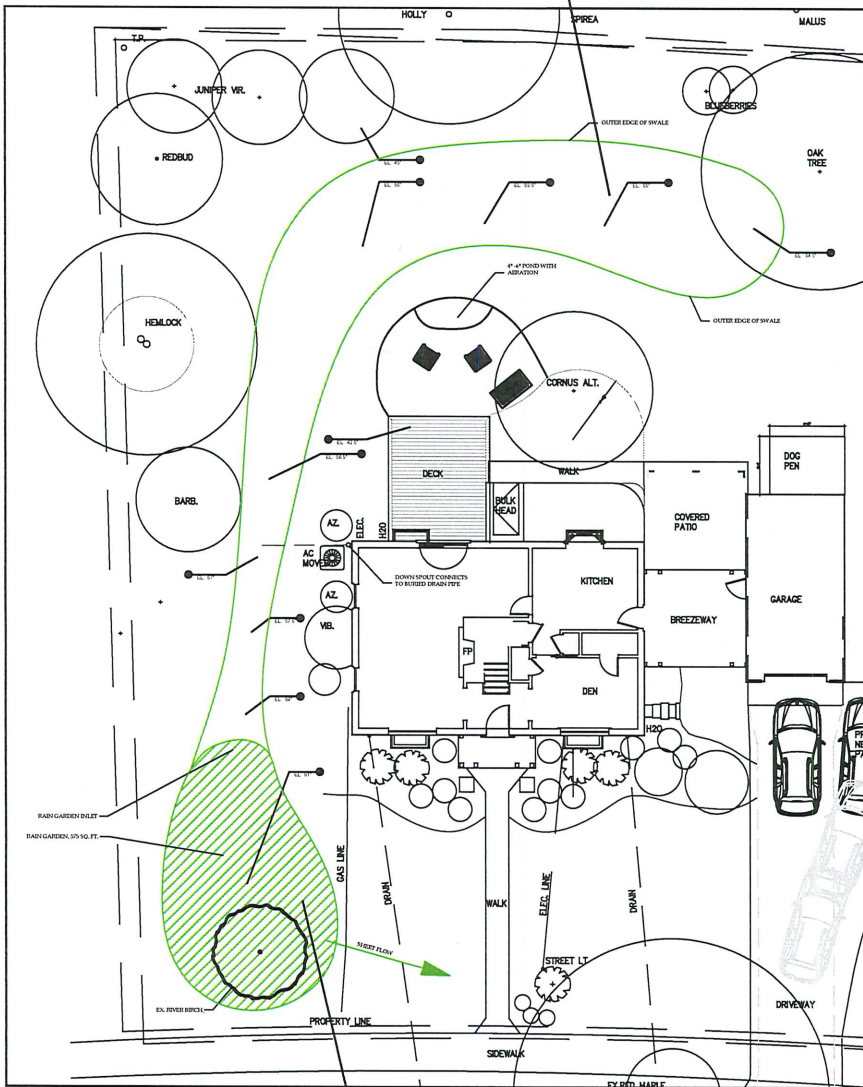
Existing Subgrade

Mix 1 part native topsoil,
1 part leaf compost
2 parts coarse sand
(depending on site soil porosity)

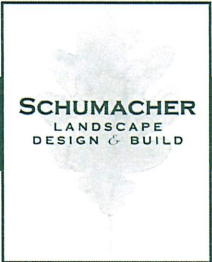
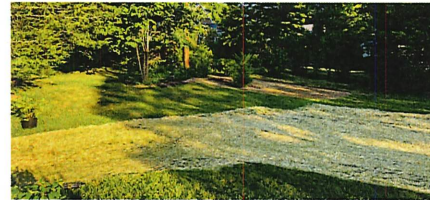
VEGETATED SWALE
Not to Scale

INSTALLATION

Wet lawn area regraded to form slight swale with underground drainage for sheet flow. Underground drainage installed.

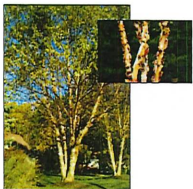
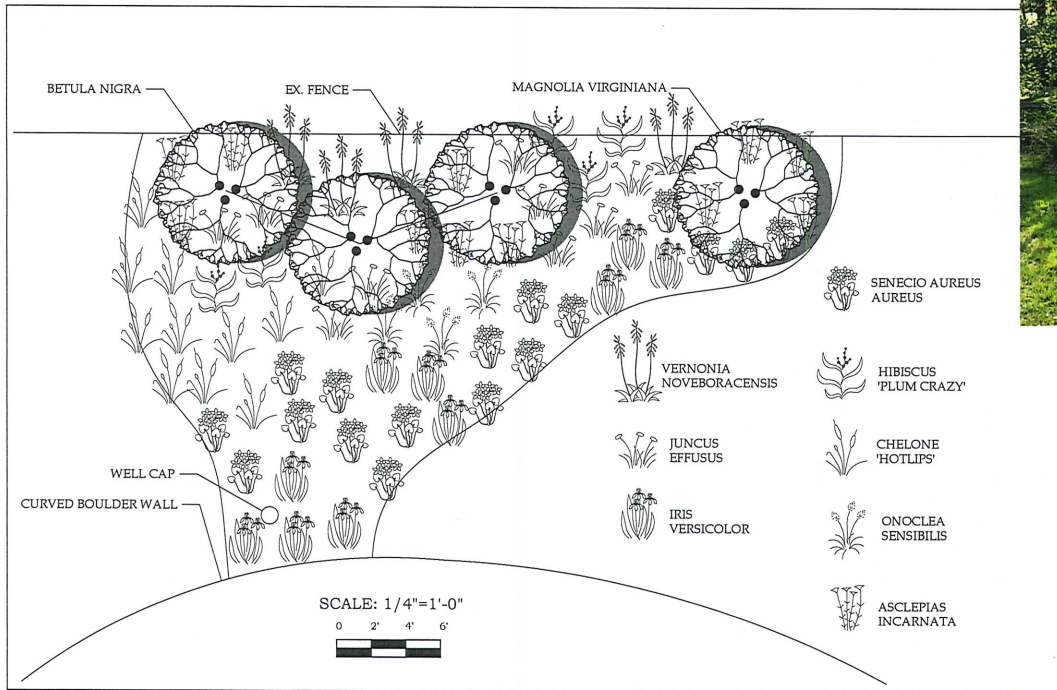


Swale drains to rain garden.



RAIN GARDEN DESIGN WITH NATIVE PLANTS

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BETULA NIGRA



MAGNOLIA VIRGINIANA



AESCLEPIAS INCARNATA



VERNONIA NOVEBORACENSIS



JUNCUS EFFUSUS



IRIS VERSICOLOR



SENECIO AUREUS



HIBISCUS 'PLUM CRAZY'

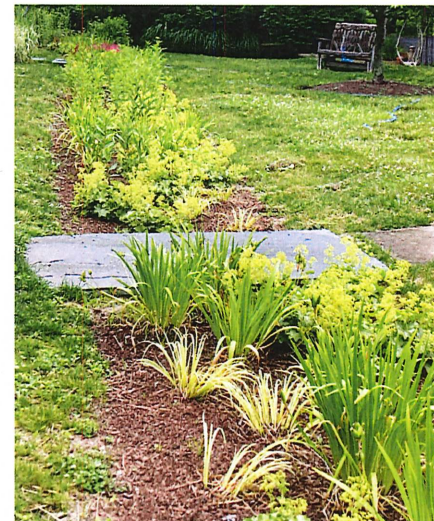
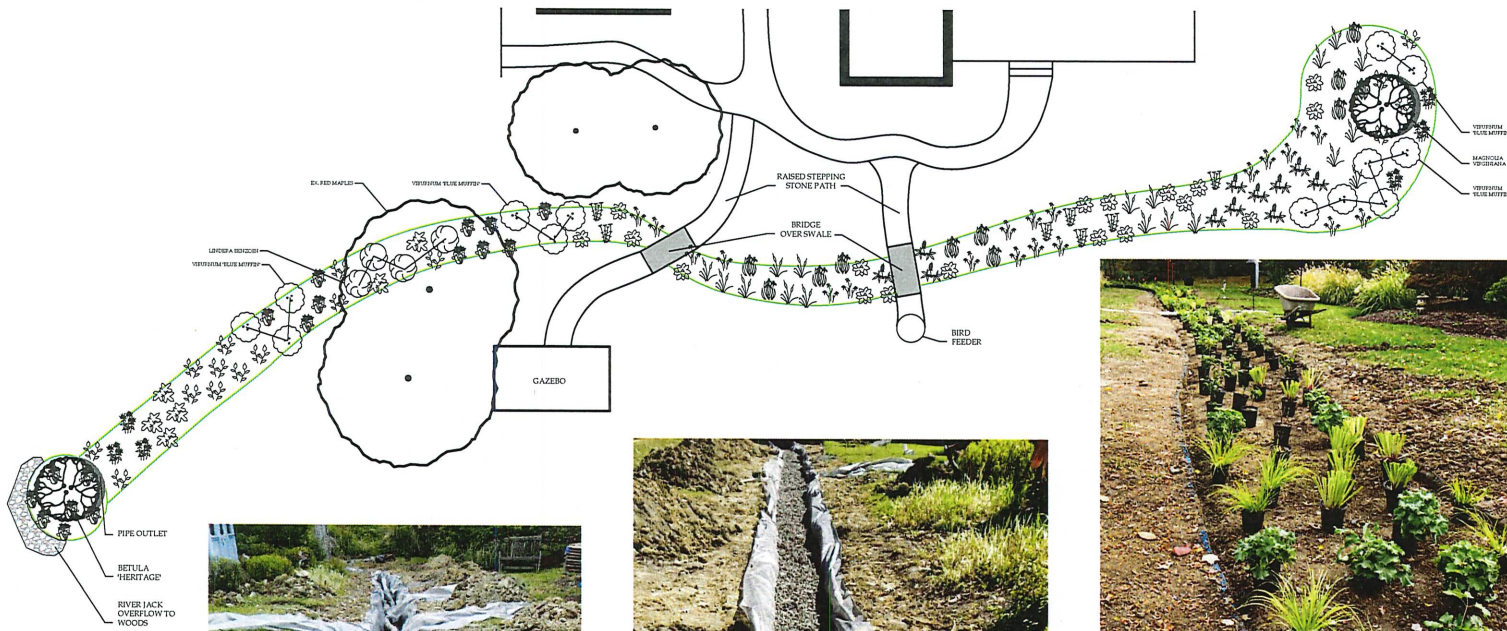


CHELONE 'HOTLIPS'



ONOCLEA SENSIBILIS

RAIN GARDEN AND VEGETATED SWALE



SUMMARY & RESOURCES

STORMWATER RUNOFF negatively impacts streams, lakes, and oceans.

RAIN GARDENS & VEGETATED SWALES can reduce stormwater runoff, filter pollutants, and recharge aquifers.

PROPER ENGINEERING, DESIGN, & INSTALL of drainage, soil fill, and native plants results in beautiful gardens, valuable habitat, and stormwater mitigation.

RESOURCES:

Pennsylvania Stormwater Best Management Practices Manual 363-0300-002

Penn State Extension: An Introduction to Rain Gardens

Rain Garden Manual of New Jersey

Native Plant Society of New Jersey

Bowman's Hill Wildflower Preserve

Mt. Cuba Center



NATIVE RAIN GARDEN PLANTS

* DEER RESISTANT

SHRUBS

Clethra alnifolia *
Cornus sericea
Ilex glabra *
Ilex verticillata
Itea virginica *
Physocarpus opulifolius
Sambucus canadensis
Viburnum dentatum

PERENNIALS

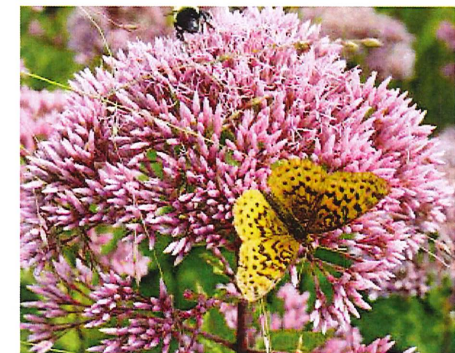
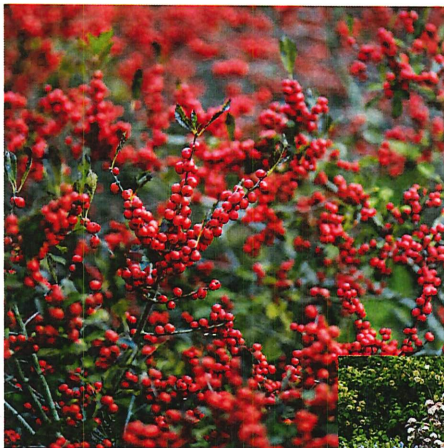
Asclepias incarnata *
Chelone glabra
Eupatorium purpureum
Hibiscus mosheutos
Iris versicolor *
Lobelia cardinalis
Monarda didyma *
Physostegia virginiana
Pycnanthemum muticum *
Senecio aureus *
Vernonia noveboracensis

FERNS

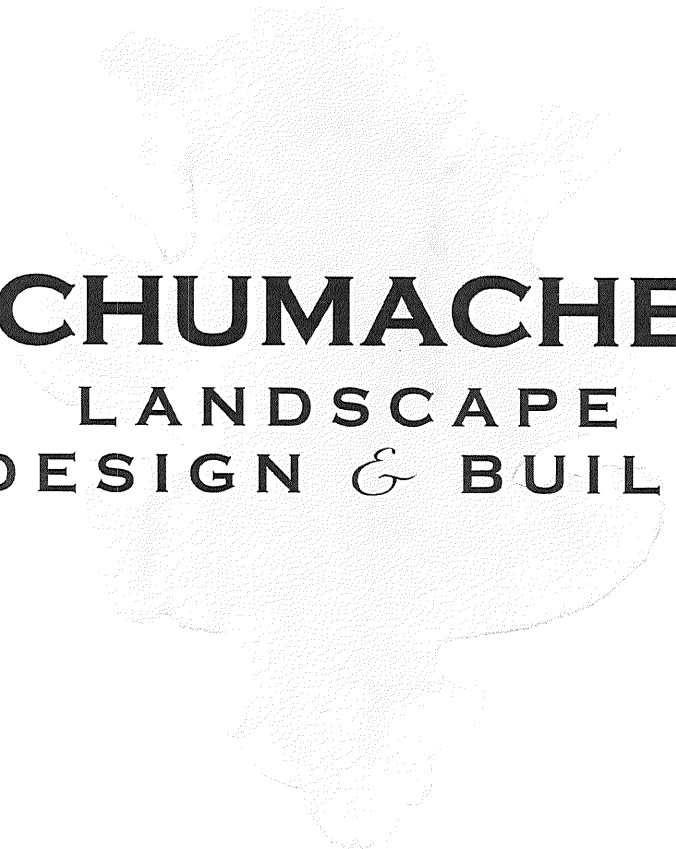
Osmunda cinnamomea *
Matteuccia pennsylvanica *
Osmunda regalis *
Onoclea sensibilis *

GRASSES & GRASS-LIKE SPECIES

Juncus effusus *



THANK YOU!



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