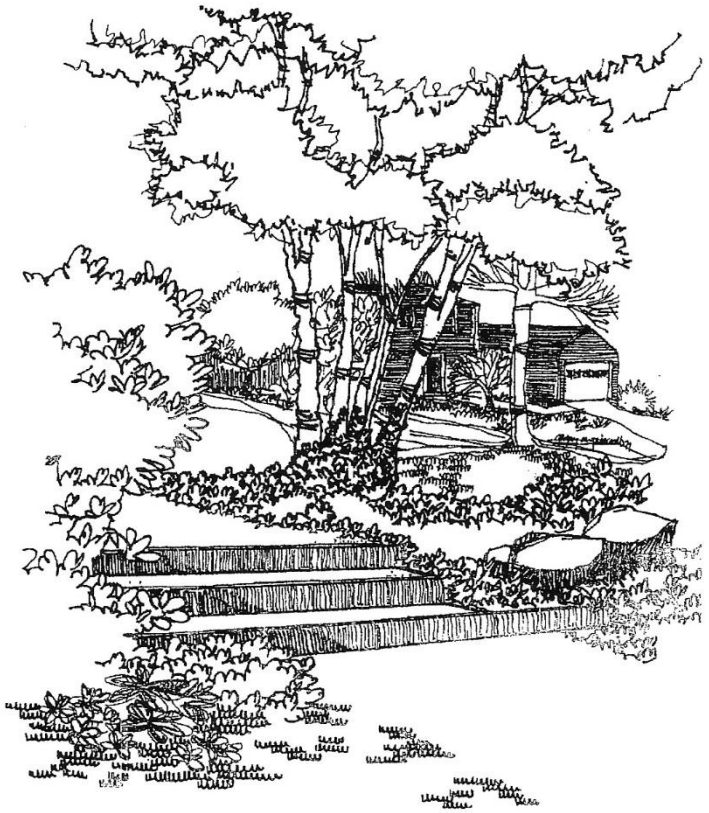
Grosse Ile Nature & Land Conservancy

Healthy Lawn & Garden Program

April 7, 2016

Sustainable Landscaping

Eco-Friendly Lawn Care



Rick Lazzell Horticultural Services ~ ricklazzell@sbcglobal.net

Principles Behind Healthy Lawn Care Program

Develop a Healthy Soil – The guiding principle
What is a healthy soil?
Full of healthy and diverse population of soil organisms
Soil Food Web

- Earthworms
- Arthropods
- Nematodes
- Potozoa
- Bacteria
- Fungi

How do these soil organisms promote plant health?

- Provide nutrients to the plants
- Decompose thatch
- Enhance soil aeration through the formation of aggregates
- Reduce populations of soil born pathogens

When these beneficial organisms thrive, the soil food web functions smoothly, and our plants flourish
What conditions are necessary create this healthy and diverse population of soil organism

- On-going additions of organic matter
- A near neutral pH
- A balanced supply of nutrients
- A well aerated and moist soil environment

Soil management practices that promote the growth of beneficial soil organisms:

- Add compost regularly
- Monitor soil pH
- Manage for consistent soil fertility
- Prevent soil compaction
- Minimize the use of synthetic chemicals

Advantages of adding compost

- Builds up populations of soil organisms by providing source of nutrients
- Decomposed compost improves soil structure
- Increases water and nutrient holding capacity
- Provides lawn with a balanced source of slow release nutrients
- Balances soil pH
- Prevents erosion
- Suppresses soil born plant diseases and pests

Application methods, how much, and when.
Hand spread ½ inch in spring or fall. Benefits are accelerated if you aerate first

Monitoring soil pH – as near neutral as possible 6.5-7.0
To high or low hinders the availability of some nutrients
Limits the ability of soil organisms to release nutrients from compost
PH near 6.5 stimulates the activity of microorganisms

To raise pH apply lime – the finer it is ground the quicker it works (dolomite)
To lower pH apply sulfur (gypsum)

Managing soil fertility – Few soils have enough natural fertility to maintain desired quality and recuperative ability throughout the growing season.
Primary objective in adding fertilizer is to add necessary nutrients in the required amounts and at the proper time to achieve desirable turf quality and plant health.
SOIL TEST for nutrient levels, pH and organic content

Lawns need a balances fertilizer, but they are nitrogen pigs.
Too little and growth suffers, color change, thinning, and susceptibility to some diseases increases
Too much leads to excessive growth, reduced root growth, low food reserves, increased susceptibility to environmental stresses and some diseases, encourages thatch.

Timing – Supply a steady, uninterrupted supply of readily available nutrients for maximum plant growth
2-3 times per year depending on lawn quality desired, type of fertilizer, age of lawn, your cultural practices.
Early –late spring, Labor Day and early November

Minimize use of synthetic fertilizer and completely eliminate fast release type.
If synthetic used go with at least a 50% slow release.

Organic fertilizers are better for your lawn and the environment.
Organic blends are readily available.

Avoid weed and feed – timing is usually off and it is bad for soil organisms
Low or zero phosphorus.

Prevent and alleviate soil compaction:

- Grass grows poorly in compacted soils
- Root growth is hindered
- Water infiltration is slowed
- Water and nutrient movement through the soil is restricted
- Thatch build up

Many activities can compact the soil

- Walking, playing and mowing
- High rates of N fertilizer
- Removing grass clippings without adding new organic matter
- All new site have compacted soil

Decrease compaction by aerating and regular additions of compost

Cultural Practices For a Healthy Lawn:

Mowing – One of the simplest but most important practices. The single most effective way of controlling weeds with out herbicides

- Increase mowing height – reduces stress, reduces weed invasions, encourages deeper roots, reduces water evaporation from the soil surface, and improves drought tolerance
- Continually scalping the grass will seriously weaken the grass plants
- Remove only 1/3rd of the grass blade per mowing – helps stimulate root growth and photosynthesis
- Mulch clippings back into the soil
- Keep a sharp blade – dull blades tear and stress the plant

Watering – Proper water of the lawn plays a major role in the grass plants ability to tolerate stress and resist pest problems.

- 1-11/2 inches needed per week during growing season to keep green
- Water deeply and less frequently – encourages deeper roots
- Amount applied at any one time governed by soil type. Avoid run-off
- Over watering predisposes the plant to fungal diseases
- Over watering creates a succulent plant that transpires water readily
- Let top 2-3 inches dry out between waterings
- Watering to lightly encourages shallow roots, increases potential for diseases and stimulates certain weeds
- Healthy lawns that are well aerated and have a sufficient level of organic matter need less water
- Summer dormancy? Ease into it and water deeply during each rainless month.

Do not let a thatch layer build up. More than 1/2 inch is too much.
Thatch is detrimental in that in hinders water infiltration, soil aeration and the growth of soil organisms. It acts as a home and harbor for several turf insect pests and some diseases.
Cultural practices that cause thatch

- High nitrogen levels
- Vigorous growing grass varieties
- Acidic conditions
- Over watering
- Soil compaction
- Poor soil aeration
- Infrequent mowing

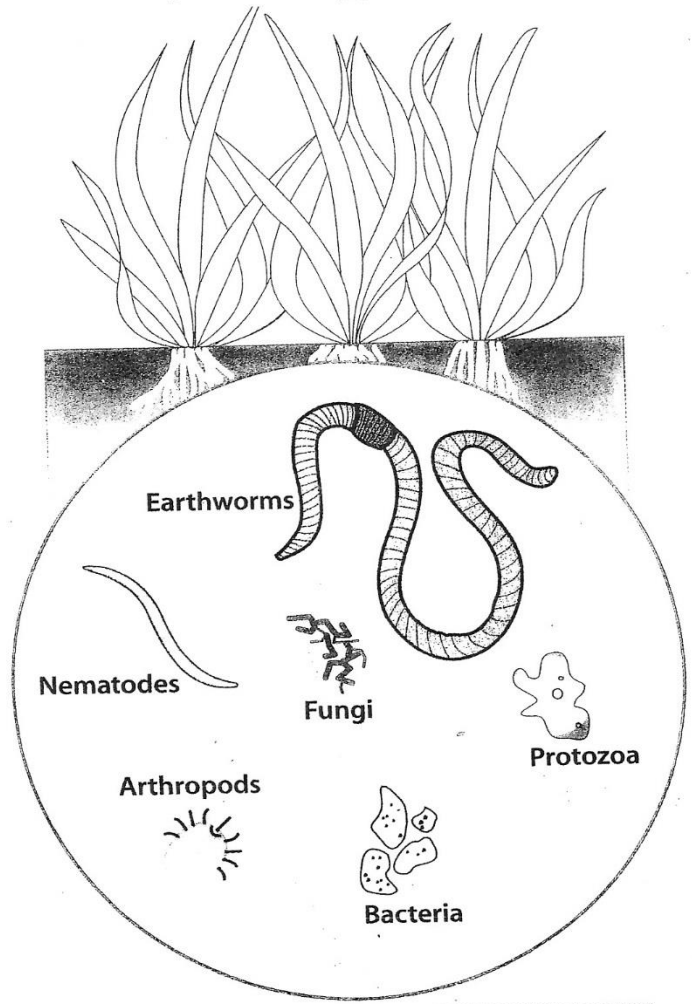
Aeration and adding compost will help to eliminate.

Choose appropriate grass for our area and adding species diversity – creates a more healthy lawn that needs less maintenance.
Choose varieties that need less mowing, watering, nitrogen, stand up to wear and tear, appropriate for cultural conditions and are resistant to common pests in our area.
Do not buy cheap seed.

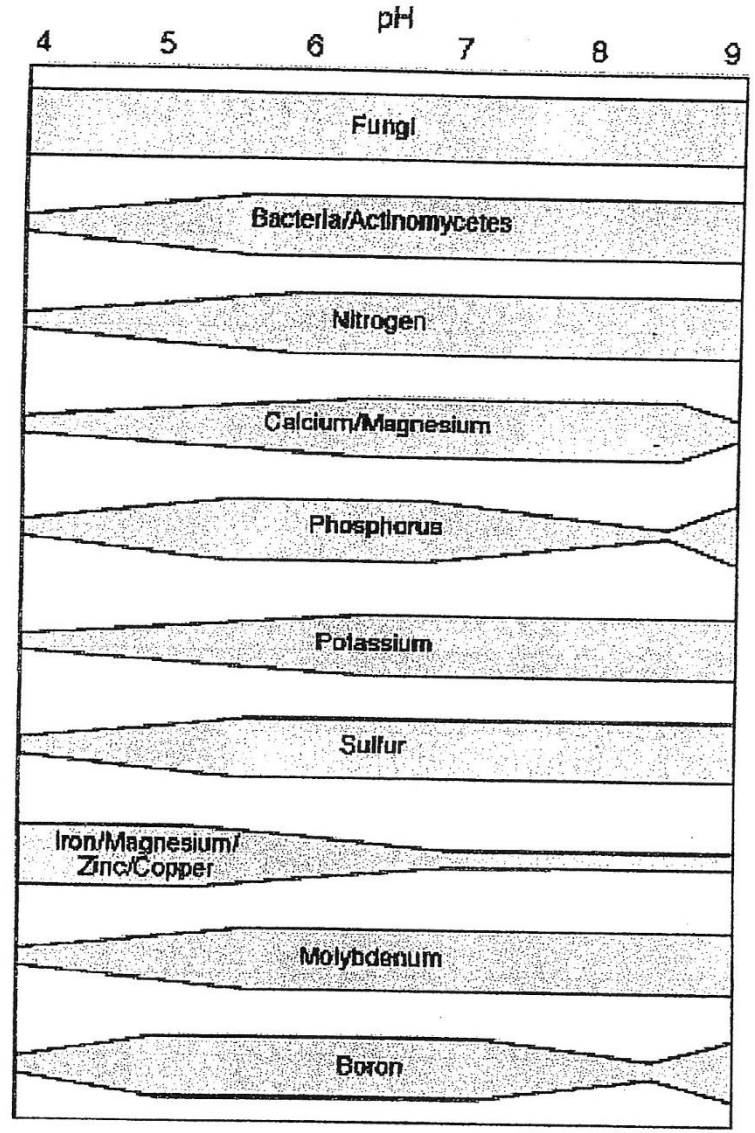
Over seed yearly

A Healthy Soil

Has an abundance of different organisms that benefit the soil.
A Healthy Soil = Happy Plants



A wide range of good and bad organisms lives in the soil. Collectively referred to as the soil food web, they are critical to the health of your garden.



Nutrient availability and microbial activity as affected by soil pH; the wider the band, the greater the availability

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SOIL AND PLANT NUTRIENT LABORATORY
EAST LANSING, MICHIGAN 48824-1325
(517) 355-0218

SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
L DEAN SOCWA 3910 W. WEBSTER ROYAL OAK MI 48073	SOCWA

DATE	LAB #	COUNTY	Previous Crop	ACRES	FIELD ID	SOIL
11/17/2005	40712	Oakland			1 Lathrup	Mineral

SOIL TEST RESULTS			Below Optimum	Optimum	Above Optimum
[1]Soil pH 7.7	Lime Index				
[2]Phosphorus (P)	43	ppm			
[3]Potassium (K)	112	ppm			
[3]Magnesium (Mg)	390	ppm			

ADDITIONAL RESULTS		Optional Tests									
[3]Calcium (Ca) (ppm)	CEC (meq/100 g)	% of Exchangeable Bases			Micronutrients (ppm)					Organic Matter %	Nitrate-N ppm
		K	Mg	Ca	B	Cu	Mn	Zn	Fe		
3024	18.7	1.5	17.4	81.0						9.2	

RECOMMENDATIONS FOR *Lawn Bluegrass*

Limestone:	NONE
Nitrogen (N):	2.5-5 lb/1000 sq ft
Phosphate (P_2O_5):	NONE
Potassium (K_2O):	.3 lb/1000 square feet

MESSAGES

Maximum single nitrogen application is 1 lb/1000 sq. ft. Nitrogen rate may be decreased 20 to 40 % if clippings are returned.
For shaded grass decrease nitrogen rate by ½ and apply primarily in fall.

Test Methods: [1] 1:1 soil/water pH, [2] Bray P1 Extraction, [3] 1N Ammonium Acetate Extractant

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11/17/2005	40717	Oakland			1 Troy Lawn	Mineral

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
[1]Soil pH	8.3	Lime Index			
[2]Phosphorus (P)	19	ppm			
[3]Potassium (K)	138	ppm			
[3]Magnesium (Mg)	244	ppm			

ADDITIONAL RESULTS:					Optional Tests:						
[3]Calcium (Ca) (ppm)	CEC (meq/100 g)	% of Exchangeable Bases K	Mg	Ca	Micronutrients (ppm) B	Cu	Mn	Zn	Fe	Organic Matter %	Nitrate-N ppm
3087	17.8	2.0	11.4	86.6						2.3	

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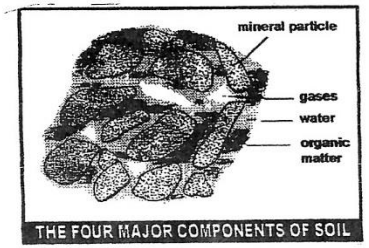
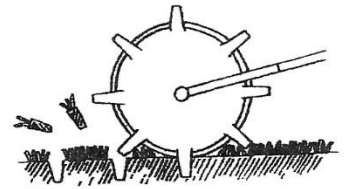
Soil Compaction



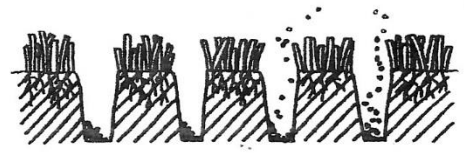
THE FOUR MAJOR COMPONENTS OF SOIL

Foot traffic in the garden bed is a major source of compaction. The impact of raindrops and sprinkler irrigation also compacts fine-textured soils.

Aeration

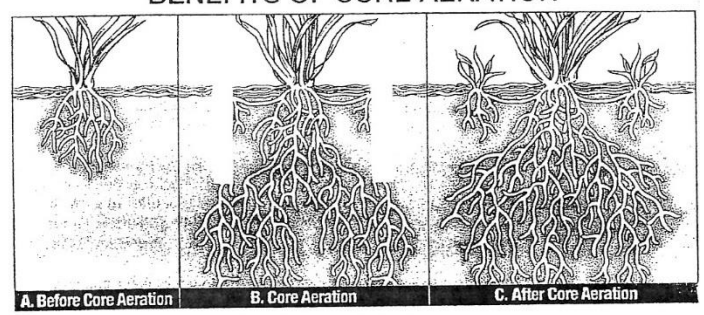


Aerating opens up the turf for fertilizer, air, and water.



A side view of the core aerating process.

BENEFITS OF CORE AERATION



A. Turfgrass in compacted soil. Grass is thin and lacks vigor.

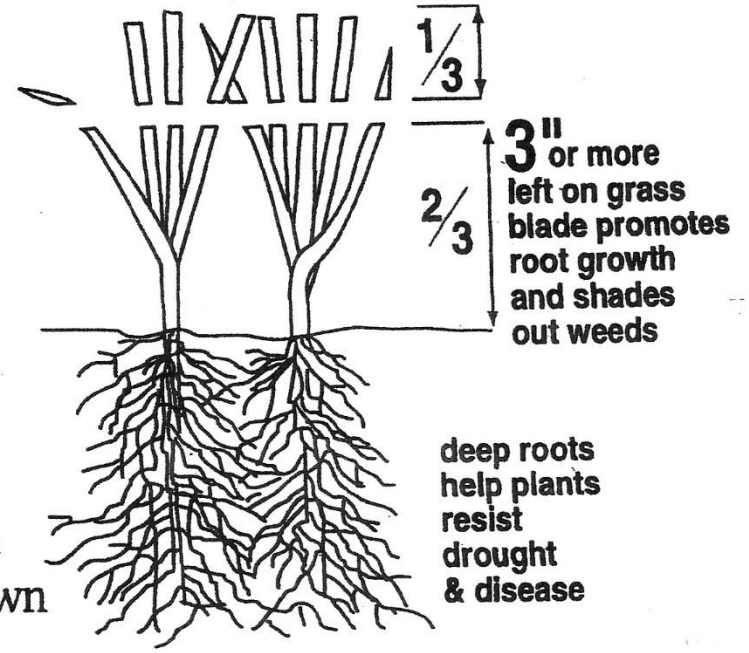
B. Through core aeration, small cores of soil are removed and deposited on the ground. Air, water, and nutrients can easily reach the roots.

C. Healthy turfgrass with thick roots naturally resists stress.

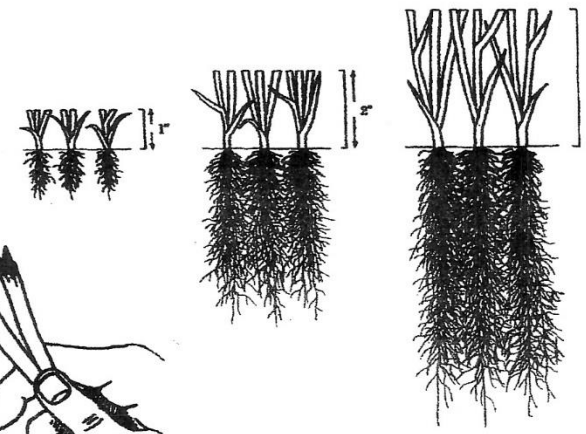
Graphic design prepared by SOCWA, Southeastern Oakland County Water Authority

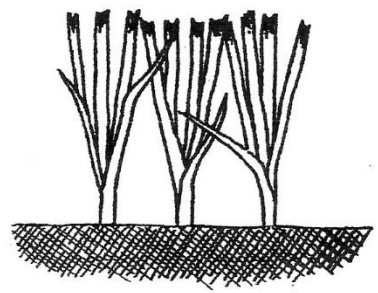
GRASS RECYCLING:

- reduces waste
- contributes nutrients to the soil
- improves your lawn
- reduces the need for lawn chemicals



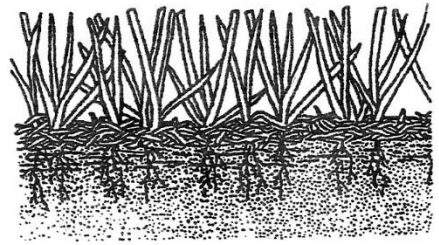
Longer blades mean longer roots.



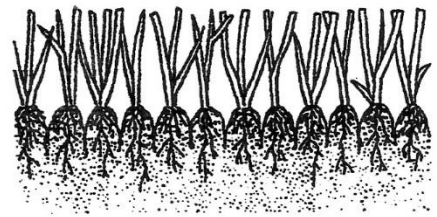


A dull mower blade rips rather than slices the grass.

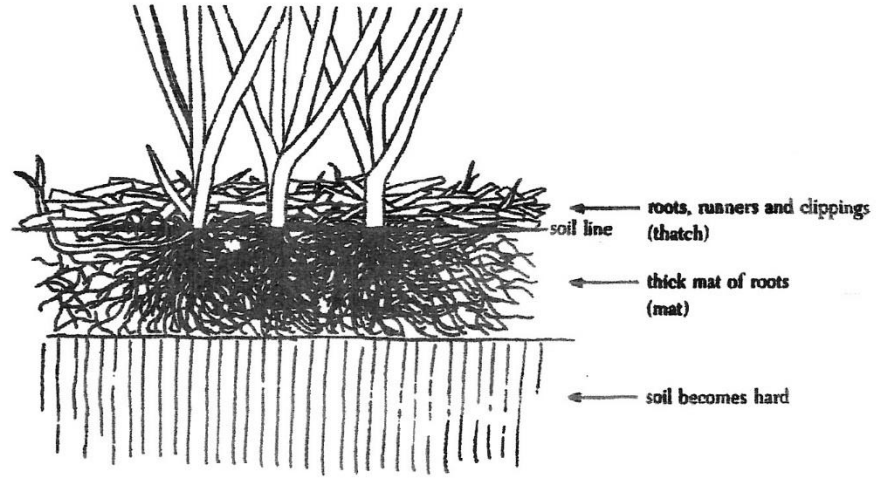
THATCH



Thatch is a tough, fibrous material that prevents water and nutrients from reaching into the soil and root zone, while offering a haven for destructive insects and other pests.



A thatch-free lawn is well-aerated and healthy, with roots reaching deep down into the soil to pick up nutrients and moisture. Near the surface, beneficial soil life breaks down organic matter, feeding the plants and ensuring that thatch will not develop.



COOL SEASON GRASSES

COOL SEASON GRASSES

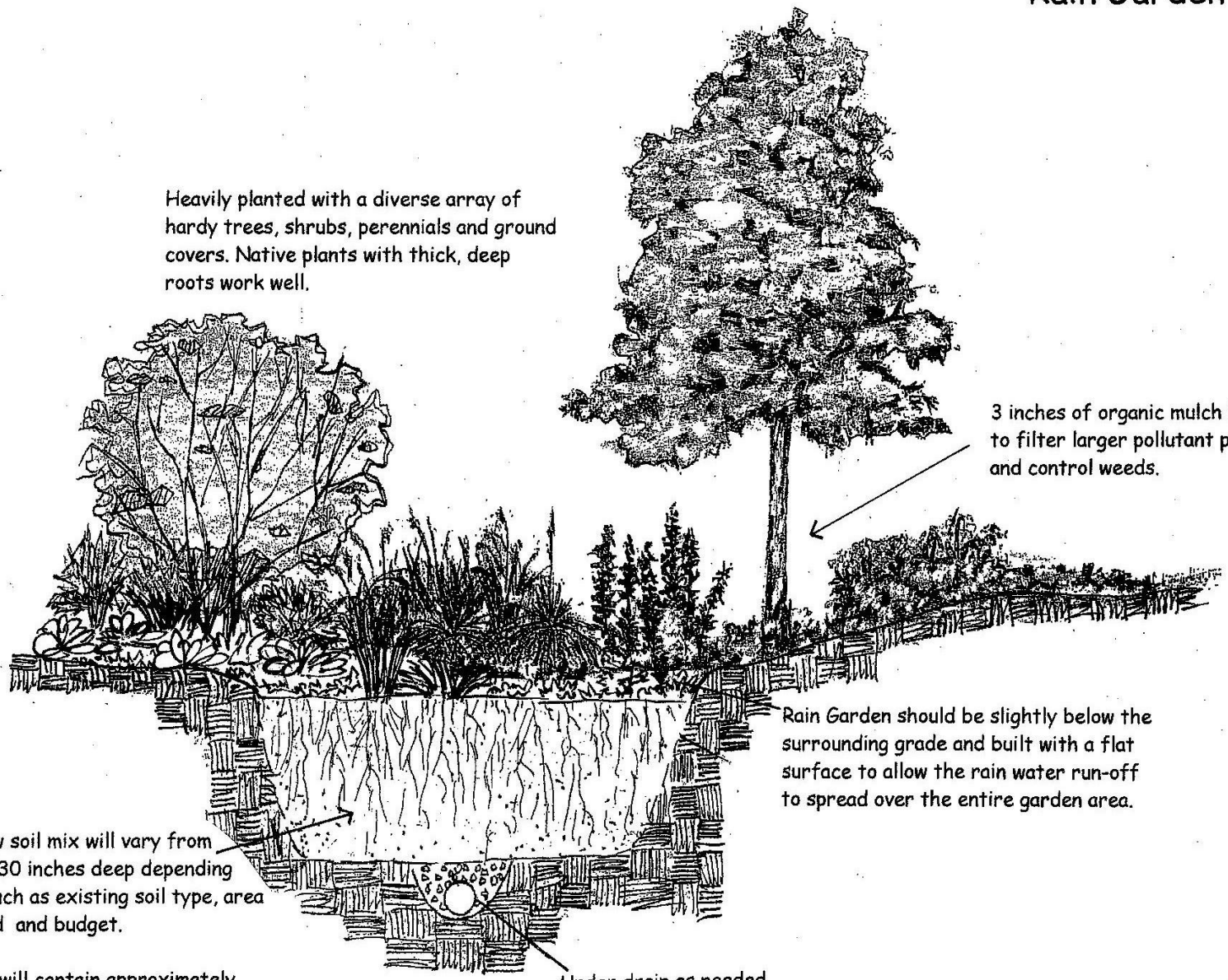
TYPE	Texture	Kind of Lawn	Maintenance	Major Usage
Bentgrass	Fine	Exhibition	High	Golf putting
Bluegrass Kentucky	Medium to Fine	Average to Good	Low	Lawns
Fescue Tall	Medium	Average to Good	Medium	Lawns - Sports
Fescue Fine	Fine	Medium - Exhibition	Medium	Lawns
Ryegrass Annual	Fine	Low	Low	Mixes in Lawns
Ryegrass Perennial	Medium	Low	Low	Lawns - Sports

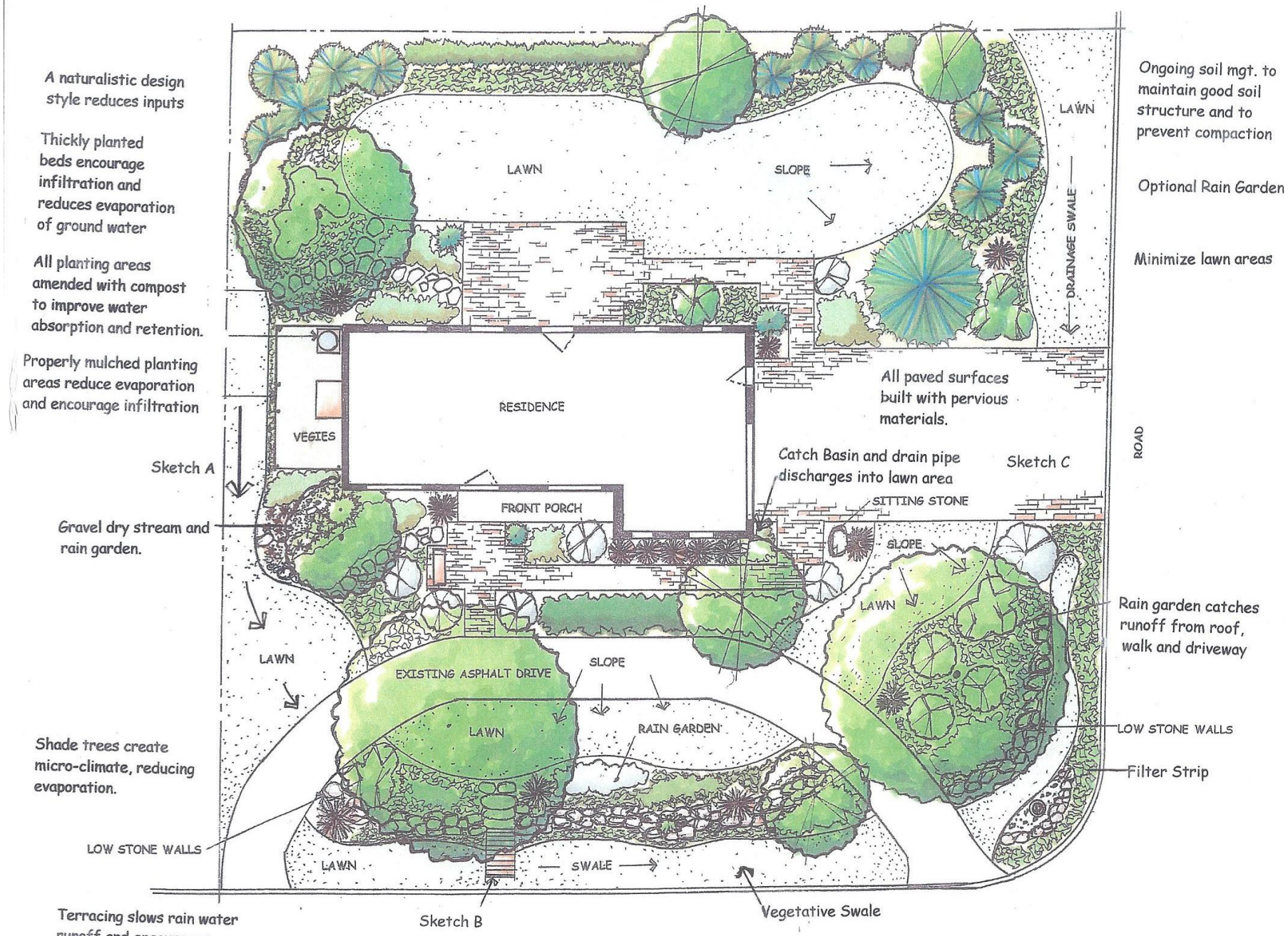
COOL SEASON GRASSES	RELATIVE TOLERANCES TO					
	Cold	Heat	Drought	Shade	Disease	Pests
Colonial Bentgrass	High	Mod	Mod	Mod	Low	Low
Creeping Bentgrass	High	Mod	Low	Low	Low	Low
Kentucky Bluegrass	High	Mod	Mod	Mod	Low	Mod
Rough Bluegrass	High	Low	Low	High	Low	Low
Chewings Fescue	High	Mod	High	High	Mod	Mod
Creeping Red Fescue	High	Mod	High	High	Mod	Mod
Hard Fescue	High	Mod	High	High	High	Mod
Tall Fescue	Low	Mod	High	Mod	High	High
Perennial Ryegrass	Mod	Mod	Mod	Mod	Mod	High
Annual Ryegrass	Low	Low	Low	Low	Low	Mod

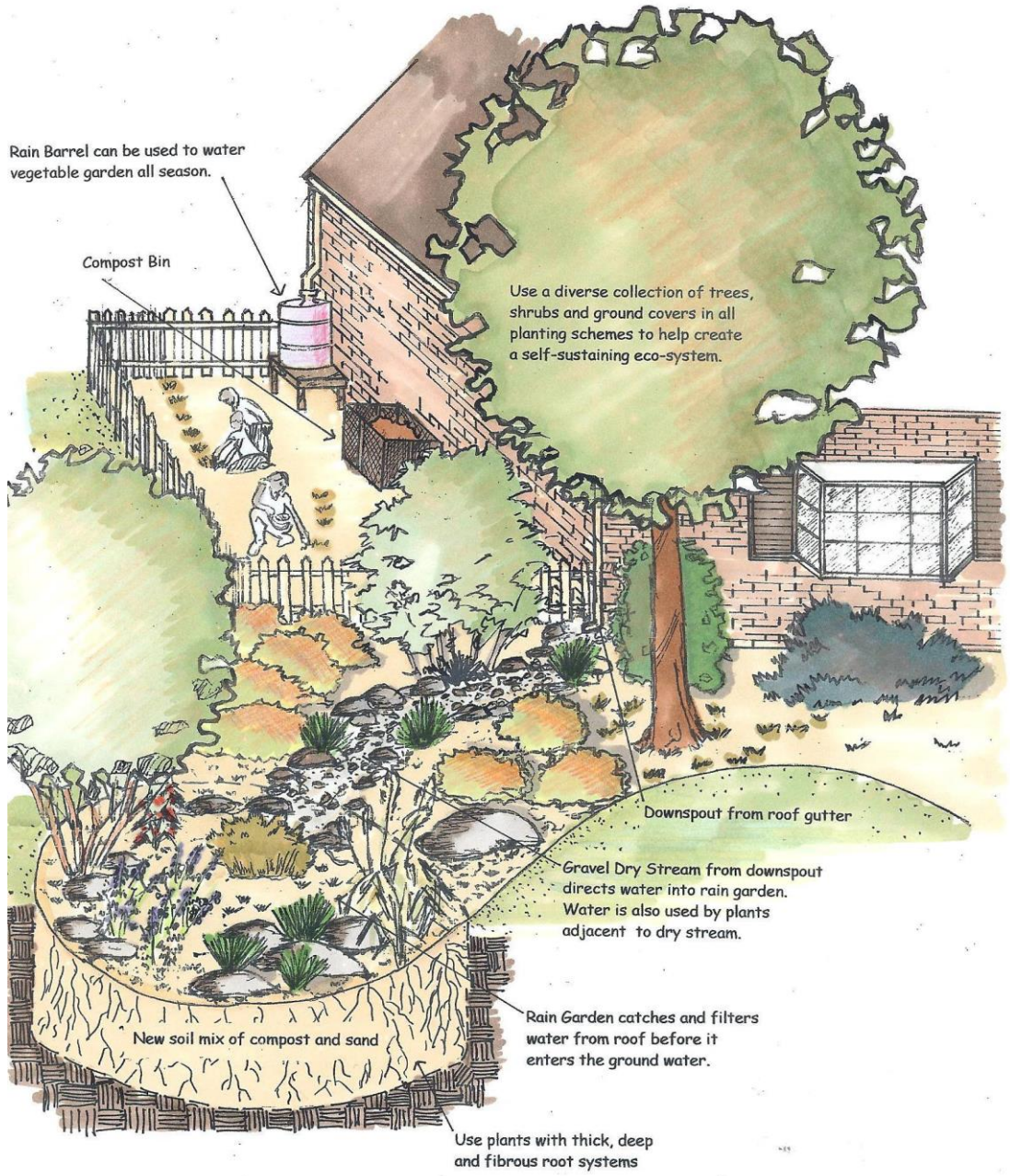
Rain gardens


580 Super K

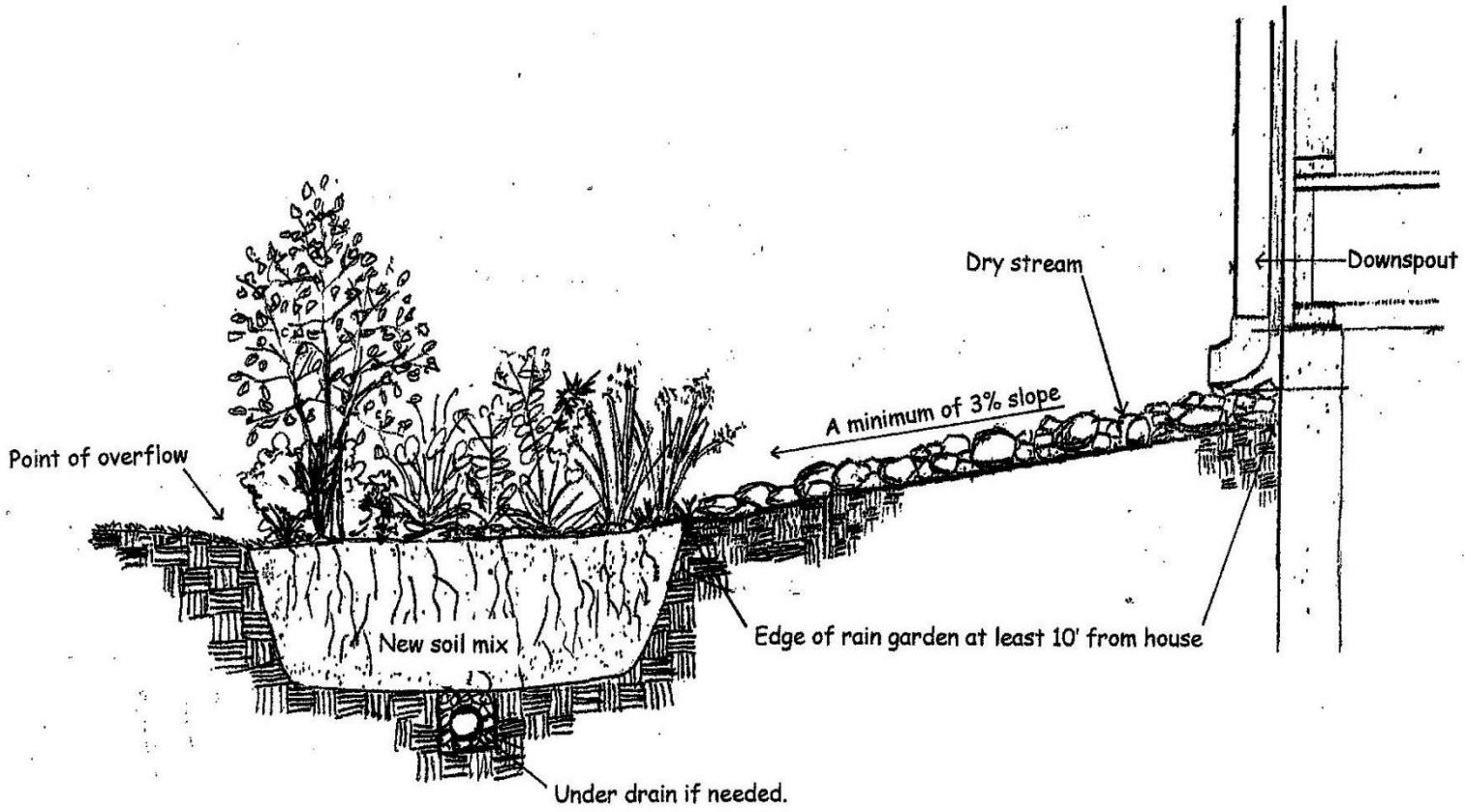
Rain Garden Profile



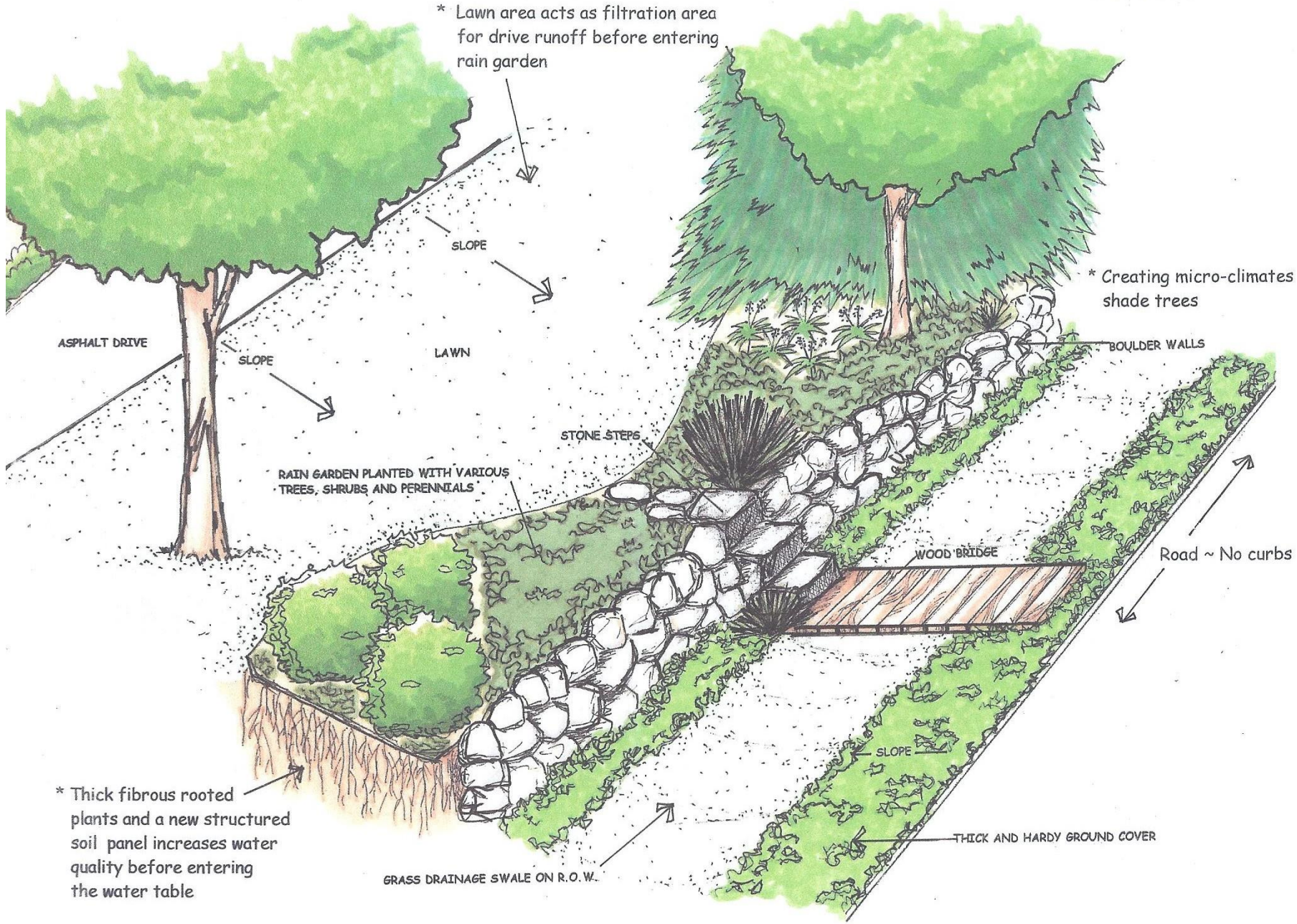

A naturalistic design style reduces inputs
Thickly planted beds encourage infiltration and reduces evaporation of ground water
All planting areas amended with compost to improve water absorption and retention.
Properly mulched planting areas reduce evaporation and encourage infiltration
Sketch A
Gravel dry stream and rain garden.
Shade trees create micro-climate, reducing evaporation.
LOW STONE WALLS
Terracing slows rain water runoff and encourages on-site infiltration
Sketch B
Vegetative Swale
Ongoing soil mgt. to maintain good soil structure and to prevent compaction
Optional Rain Garden
Minimize lawn areas
All paved surfaces built with pervious materials.
Sketch C
Catch Basin and drain pipe discharges into lawn area
Rain garden catches runoff from roof, walk and driveway
LOW STONE WALLS
Filter Strip
LAWN
SLOPE
DRAINAGE SWALE
RESIDENCE
VEGIES
FRONT PORCH
SITTING STONE
EXISTING ASPHALT DRIVE
RAIN GARDEN
SWALE
ROAD

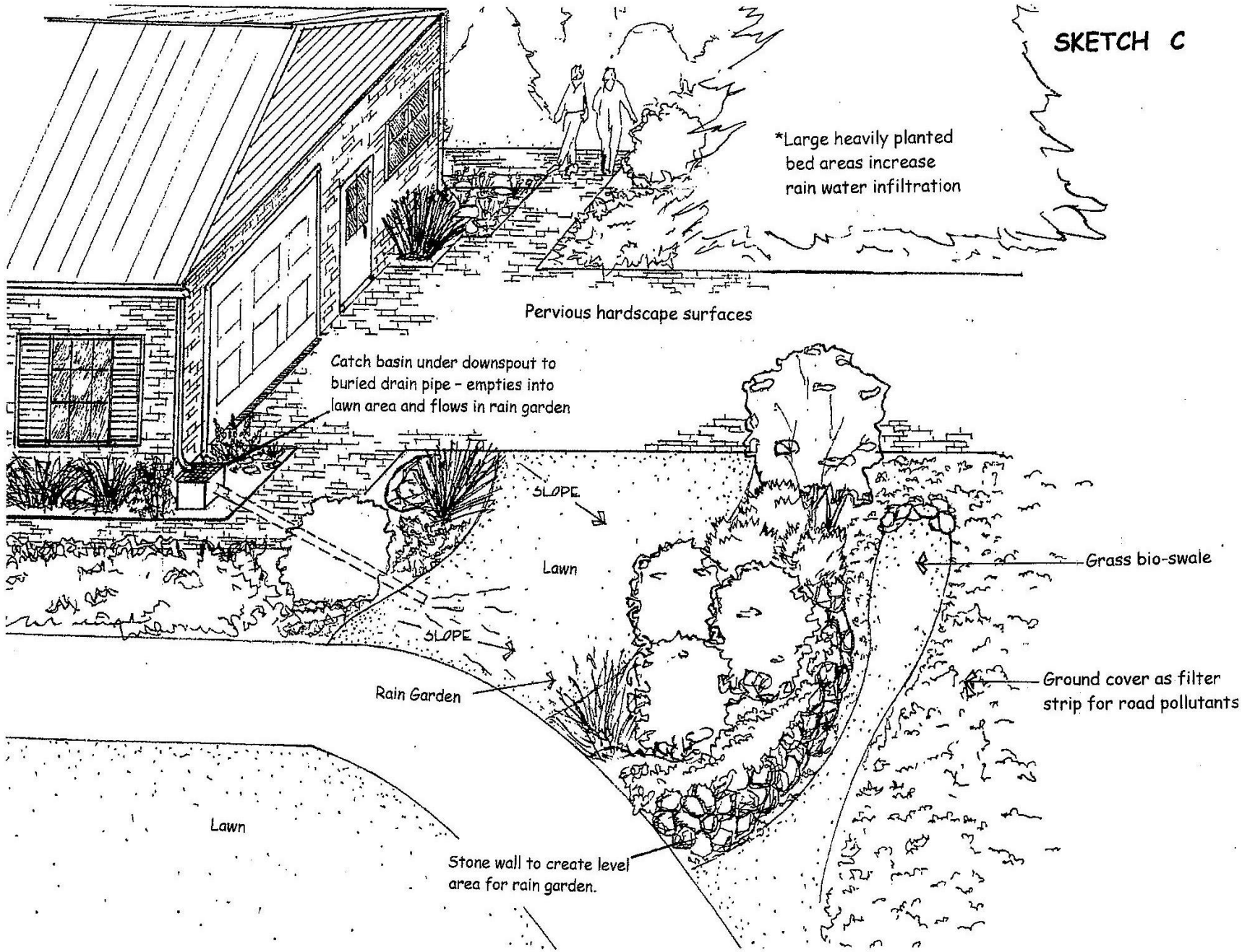

Rain Barrel can be used to water vegetable garden all season.
Compost Bin
Use a diverse collection of trees, shrubs and ground covers in all planting schemes to help create a self-sustaining eco-system.
Downspout from roof gutter
Gravel Dry Stream from downspout directs water into rain garden. Water is also used by plants adjacent to dry stream.
Rain Garden catches and filters water from roof before it enters the ground water.
New soil mix of compost and sand
Use plants with thick, deep and fibrous root systems

Dry Stream - Rain Garden Detail

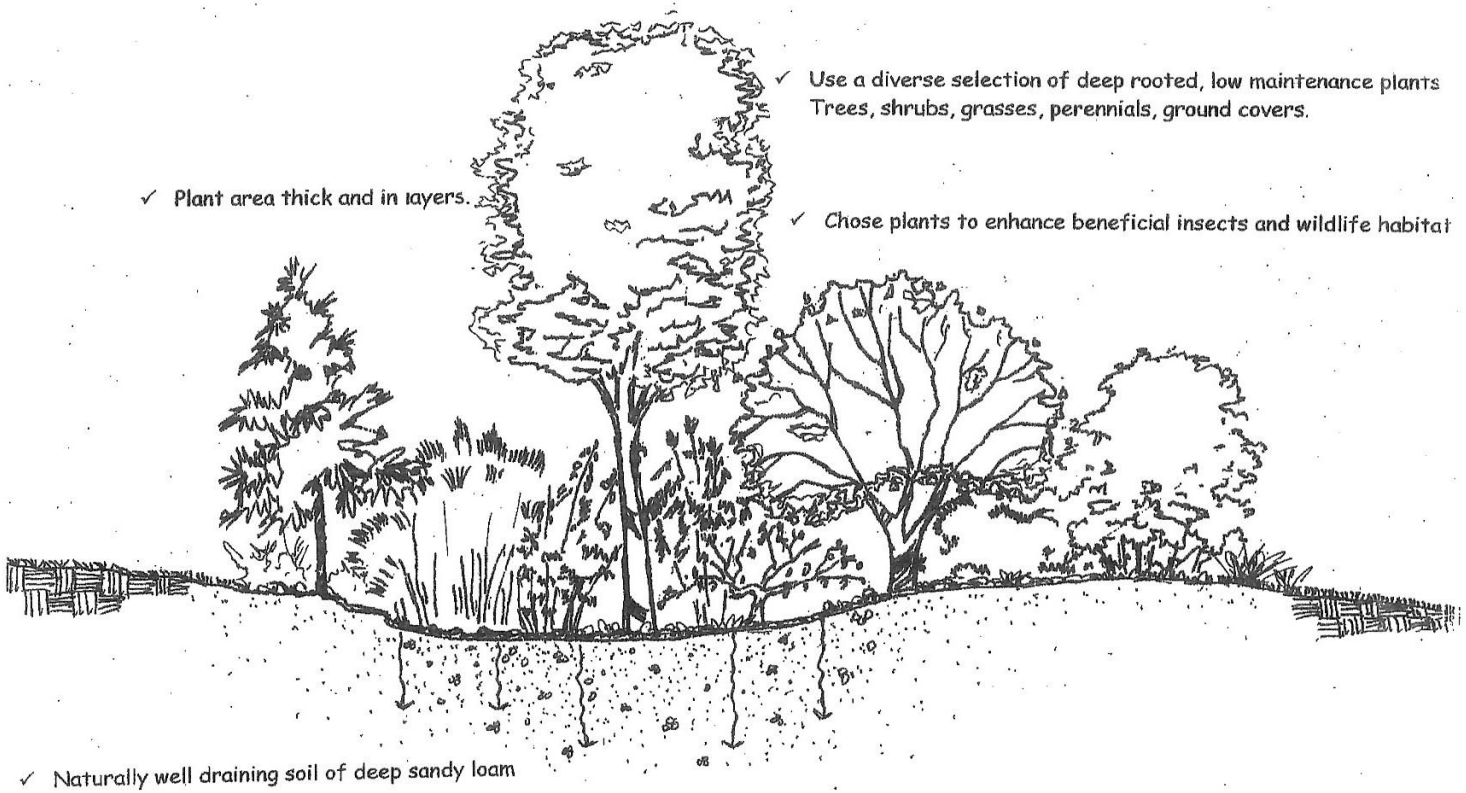


Sketch B


* Lawn area acts as filtration area for drive runoff before entering rain garden
SLOPE
ASPHALT DRIVE
SLOPE
LAWN
* Creating micro-climates shade trees
BOULDER WALLS
STONE STEPS
RAIN GARDEN PLANTED WITH VARIOUS TREES, SHRUBS AND PERENNIALS
WOOD BRIDGE
Road ~ No curbs
SLOPE
* Thick fibrous rooted plants and a new structured soil panel increases water quality before entering the water table
THICK AND HARDY GROUND COVER
GRASS DRAINAGE SWALE ON R.O.W.


SKETCH C
*Large heavily planted bed areas increase rain water infiltration
Pervious hardscape surfaces
Catch basin under downspout to buried drain pipe - empties into lawn area and flows in rain garden
SLOPE
Lawn
Grass bio-swale
SLOPE
Rain Garden
Ground cover as filter strip for road pollutants
Lawn
Stone wall to create level area for rain garden.

Natural rain garden. Test the soils drainage capacity by digging a hole 12" wide and 12" deep. Fill with water and let it drain - fill it again and measure drop in water after one hour. Need at least a 1" drop for a natural rain garden to work.



Rick Lazzell
Sustainable Landscape Design


Collection Area
Transportation System
Storage Facility
Rainwater Harvesting