LANDSCAPING

Sustainable building pursuits lack sustenance without an equally eloquent and thought-out landscape. A sculpted whole-systems landscape will address storm water mitigation, create favorable microclimates, provide wildlife habitats, produce food, improve the air quality and sequester CO2, and last but not least, improve public health and the quality of life. We began by using the iTree tool (found at www.itreetool.org) to create a baseline for the existing ecological functions of our site. Once these were established, we looked to see how we could improve upon these functions. We again used the iTree tool and overlaid our design components onto the site and worked the landscape until we achieved a final product that was functioning at a productive and efficient rate.

EROSION CONTROL (FIGURE 1)

The erosion control plan for the construction phase of the project has many standard features such as a single layer silt fence, a catch basin, and a fifty foot long track mat to keep the road way clean. In order to protect the tree on the Northeastern corner of the property, a temporary fence will be placed at the drip line of the tree. We are removing the existing ash trees along the South side of the site because they are becoming a hazard for nearby homes and also as a preventative measure against the spread of the Emerald Ash Borer. Usable lumber will be sold and all other scrap from the trees will be chipped and used as mulch to cover the stockpiled topsoil on site. Once the ash trees are removed, the space will be allotted for a resource recovery sorting station during the construction phase.

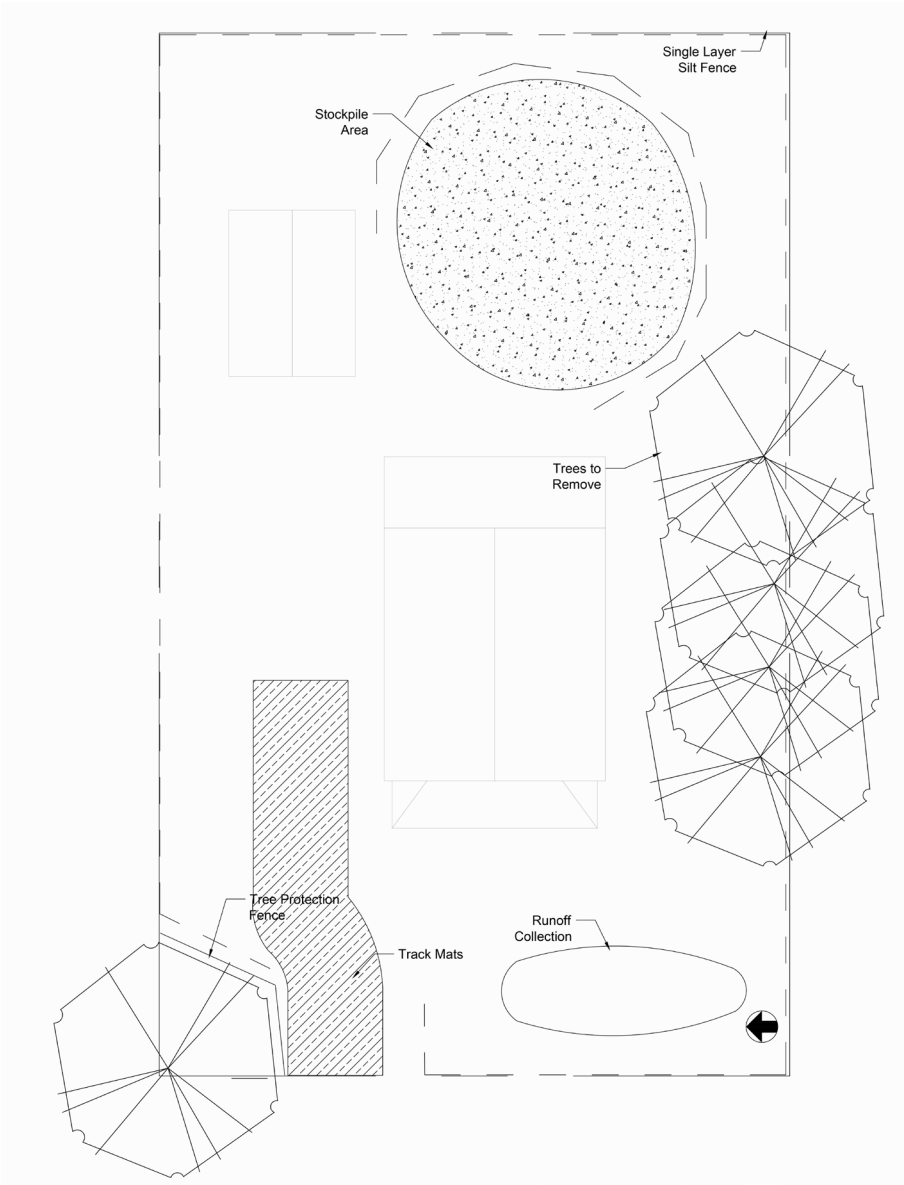

Figure 1: Erosion Control

LAYOUT PLAN (FIGURE 2)

The abiotic factors in the layout plan include a gravel termite barrier, a concrete-grass paved driveway, and a composting station. The termite gravel barrier is discussed in section D Envelope Durability. The grass-paver driveway (Figure 3) is a permeable surface that reduces runoff and has a high albedo rating, helping to reduce the urban heat island effect. A composting station was located at the rear of the garage in order to reduce the amount of waste leaving the site and to provide good soil for the vegetable garden.

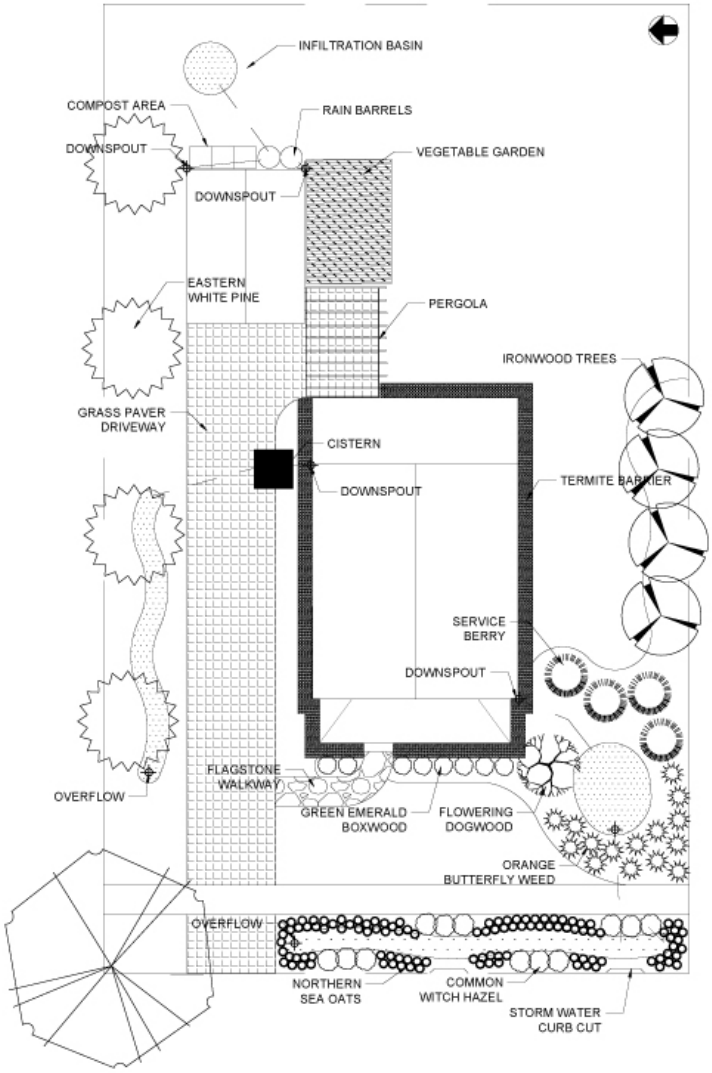

Figure 2: Layout Plan

Figure 3: Grass-Paver Driveway

PLANT MATERIAL

All the plants in the landscape are native and/or drought tolerant (Figure 4). A notable attribute of the landscape is its food production by the service berry that produces food for both humans and birds. We also included a mass planting of Orange Butterfly Weed, which is a food source for Monarch butterflies. This plant is considered a vulnerable species in NY. The lawn is a "No Mow" turf grass that tops out at approximately six inches and requires no irrigation (Figure 5). If the homeowner chooses to mow the lawn on a regular basis, this seed mix will function as a traditional lawn does.

COMMON NAME	SCIENTIFIC NAME
EASTERN WHITE PINE	PINUS STROBUS
IRONWOOD	CARPINUS CAROLINIANA
FLOWERING DOGWOOD	CORNUS FLORIDA
BOXWOOD	BUXUS spp.
SERVICEBERRY	AMELANCHIER spp.
ORANGE BUTTERFLYWEED	ASCLEPIAS TUBEROSA
NORTHERN SEA OATS	CHASMANTHIUM LATIFOLIUM
COMMON WITCH HAZEL	VIRGINIANA HAMMEMELIS

Figure 4: Plants in Landscape

Figure 5: "No Mow" turf grass

ENERGY CONSUMPTION

There is a row of evergreens along the North side of the property which functions as a traditional windbreak. There is also a deciduous tree planting along the South side of the house (Figure 2). The deciduous planting was chosen specifically to be ironwood trees for two reasons. The first reason is for their deciduous characteristics. There is a solar thermal system located on the South facade of the house and the shading provided by these trees in the summer prevent this system from over functioning in direct summer sunlight. In the winter, these trees drop their leaves, allowing maximum solar exposure to the solar thermal system allowing for productive, efficient functionality year round. The second reason Ironwood trees were chosen was because they top out at approx. twenty feet tall. This allows them to grow naturally without ever shading the photovoltaic system located on the South roof of the house. These two plantings, the evergreen windbreak, and the Ironwood tree planting combine to save the homeowner over 91,000 kilowatt-hours of electricity and reduce heating cost by almost 13,000 therms over the expected 100 year life span of the landscape. A few other benchmark functions of the landscape over its lifetime include the mitigation of over 1.3 million gallons of storm water and the sequestration and avoided production of over 88,000 lbs of CO_2 which is the equivalent to removing eight cars from the road. All of the ecological functions of the landscape when quantified into a dollar amount total over $50,000.

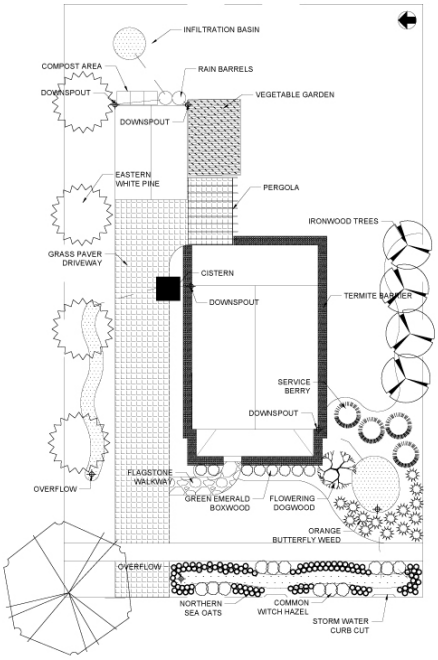

Figure 2: Layout Plan

RAIN WATER CATCHMENT (FIGURE 6)

There are two artificial components to our storm water management system. The first is two 50 gallon recycled whiskey rain barrels that are located behind the garage and will be used to irrigate the vegetable garden. The second is a 500 gallon cistern that is buried under the driveway in close proximity to the house that will collect rain water from the house roof and discharge from the sump pump. The initial purpose of the cistern will be to decrease peak flow coming from the property and will be emptied into one of our infiltration basins between storm events. The homeowner can choose to upgrade the cistern system to tie it back into the house for future grey water use.

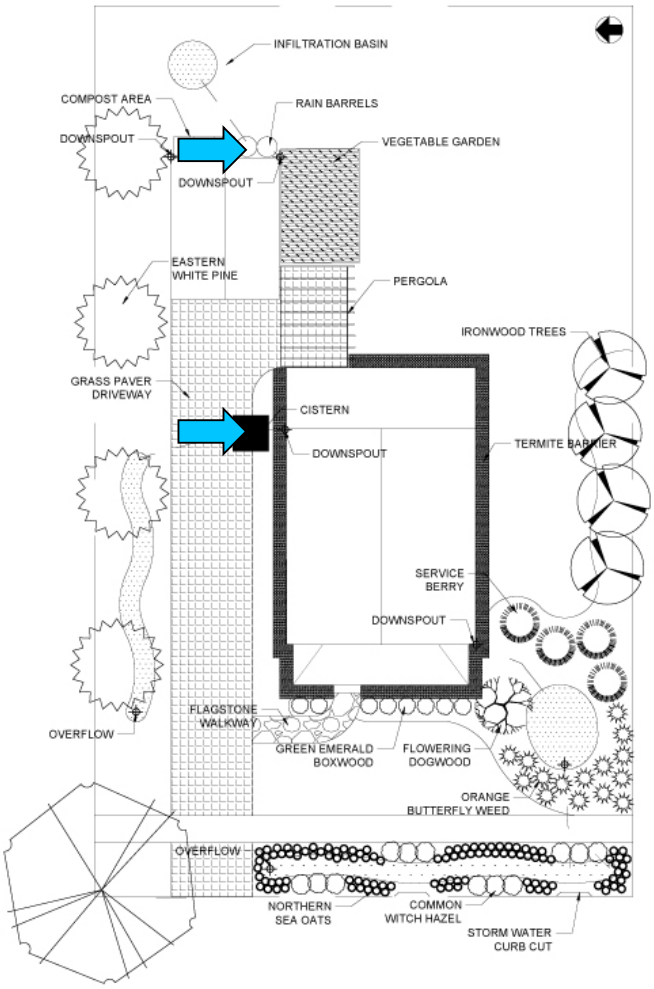

Figure 6: Rain Water Catchment

STORM WATER MANAGEMENT (FIGURE 7)

We are managing the storm water on the site through three infiltration basins. These basins are designed to have a very low visual impact and an average depth of only six inches. Two of the basins are part of the lawn as inconspicuous depressions and the third is tucked away in a planting bed. These three basins can handle all of the 1,317 gallons of storm water runoff from average 90% storms.

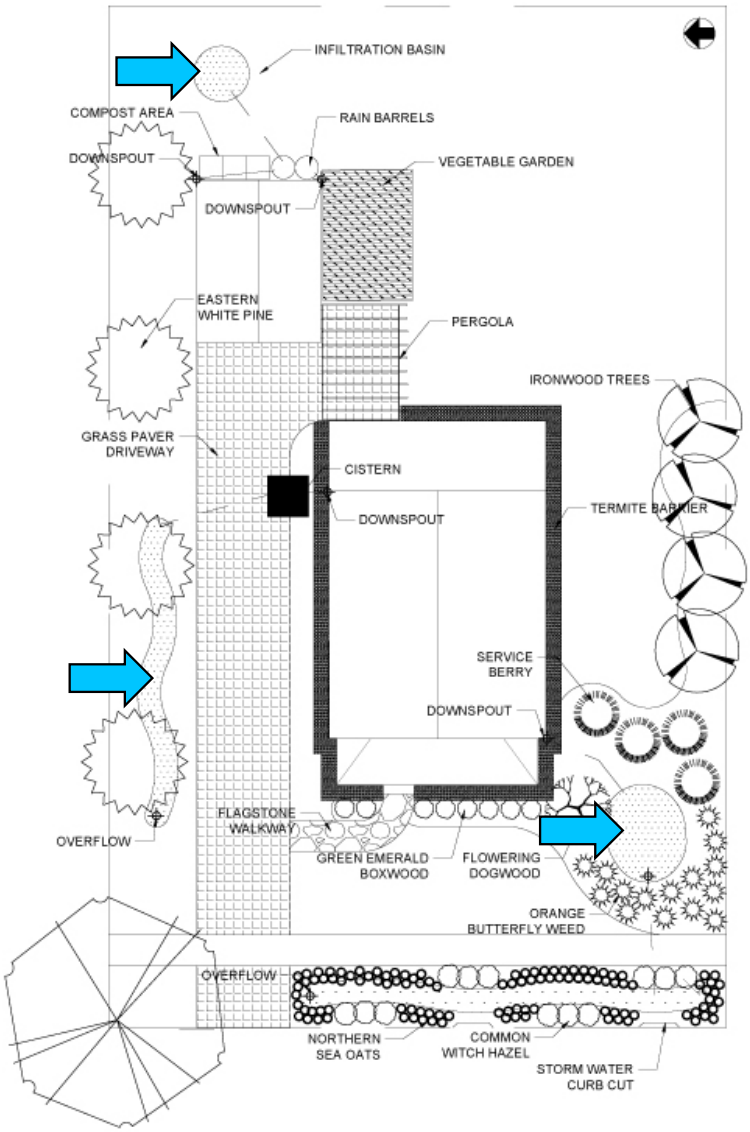

Figure 7: Storm Water Management

SAVE THE RAIN (FIGURE 8)

By volunteering a small portion of our site between the road and the

sidewalk to handle storm water from the road, we qualified for a $50,000 grant from the Save the Rain program here in Syracuse. We designed this area as a combination compacted gravel basin and a ponding depression system. The total capacity of the system is 10,400 gallons. To put this into perspective, that equates to the amount of runoff of 610 linear feet of a standard thirty foot wide road. The plant material in this basin is native and salt tolerant to survive the salting of the roads during our long upstate winters. Also, the plantings are of short stature as to not interfere with the utility wires overhead.

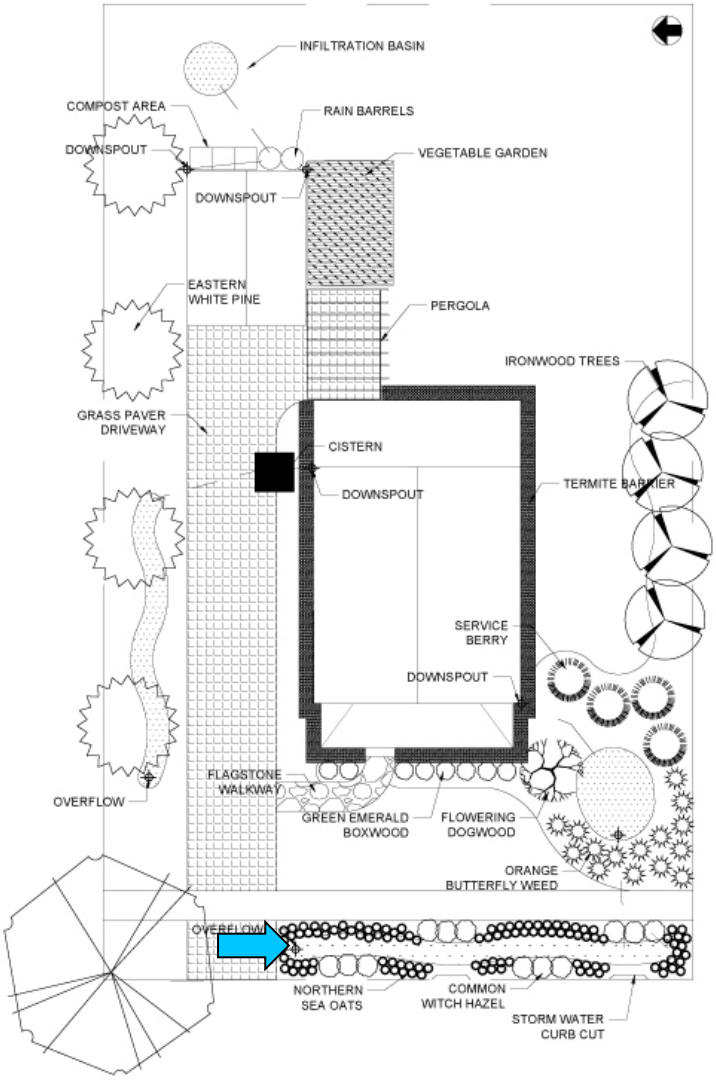

Figure 8: Save the Rain