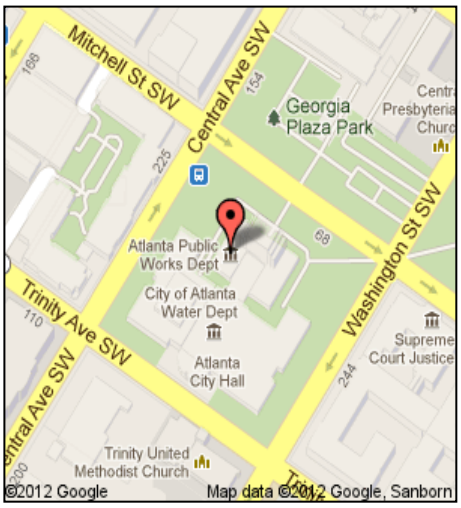
Atlanta City Hall Green Roof

Location: 55 Trinity Avenue Atlanta, GA 30303

Type of BMP: Green Roofs



Green roofs represent an alternative to traditional impervious roof surfaces. They typically consist of underlying waterproofing and drainage materials and an overlying engineered growing media that is designed to support plant growth. Stormwater runoff is captured and temporarily stored in the engineered growing media, where it is subjected to the hydrologic processes of evaporation and transpiration before being conveyed back into the storm drain system. This allows green roofs to provide measurable reductions in post-construction stormwater runoff rates, volumes and pollutant loads on development sites. *(GSMM Coastal Supplement, 2009)*

City Hall's Green Roof was the first municipal project of its kind in the south. The project covered 3,000 sq ft and took $60,000 to complete. The plants are predominantly sedums with some perennials, cacti, and herbs. The landscape plan called for over 2,800 plants from 31 species. The growth media varies in depth from 3 to 10 inches, and 70 cubic yards of soil was installed on the roof. Structurally the building was designed to hold approximately 560,000 pounds, or 186 pound per square foot. With the construction of the greenroof, 175,000 pounds (58 pounds per square foot) was added to the structure. The greenroof was designed with no supplemental irrigation system. In the design, a one-inch PVC line was installed along the perimeter of the greenroof as well as from each drainage box to drainage box. The one-inch conduit is available for monitoring equipment or supplemental irrigation if needed. The greenroof was officially completed on December 18, 2003. Then Mayor Shirley Franklin and City Council informally opened the greenroof to City employees just days after it was completed, and in April 2004, the Mayor officially dedicated the greenroof as a feature of City Hall. *(Greenroofs.com)*

The City Hall Green Roof can be accessed through the Cafeteria on the 5th Floor.

Southface Eco Office

Location: 241 Pine St Atlanta, GA 30308

Type of BMP: Green Roof & Rainwater Harvesting

Rainwater harvesting is the ancient stormwater management practice of intercepting, diverting and storing rainfall for later use. In a typical rainwater harvesting system, rainfall is collected from a gutter and downspout system, screened and "washed," and conveyed into an above- or below-ground storage tank or cistern. Once captured in the storage tank or cistern, it may be used for non-potable indoor or outdoor uses.

If properly designed, rainwater harvesting systems can significantly reduce post-construction stormwater runoff rates, volumes and pollutant loads on development sites. Rainwater harvesting also helps reduce the demand on public water supplies, which, in turn, helps protect aquatic resources, such as groundwater aquifers, from drawdown and seawater intrusion. *(GSMM Coastal Supplement, 2009)*

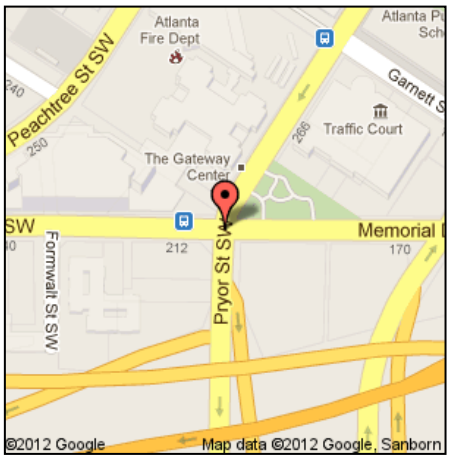
Southface's 2,000 sq ft green roof includes a 6.4 KW photovoltaic array and reflective roof pavers. A 1,750-gallon cistern collects rainwater for toilet flushing, rooftop irrigation, and an evaporative mesh cooling system. It is wrapped in a wooden vat salvaged from an abandoned winery in South Atlanta. Tours of this facility are available by appointment, (404) 872-3549.

Built by a consortium of construction firms using widely available, off-the-shelf products, materials and technologies, the Southface Eco Office is a three-story structure with a rooftop green roof. It was officially opened in 2009 after receiving its ENERGY STAR label, as well Platinum LEED® certification from the U.S. Green Building Council and EarthCraft Light Commercial certification – a regional green building designation specific to the Southeast. The Eco Office noted for its average energy cost of less than $25 per day. *(Southface, 2009)*

Atlanta City Jail parking lot

Location: Pryor Street &Memorial Drive

Type of BMP: Pervious Concrete



Pervious concrete (also known as porous concrete) is similar to conventional concrete in structure and form, but consists of a special open-graded surface course, typically 4 to 8 inches thick, that is bound together with portland cement. This open-graded surface course has a void ratio of 15% to 25% (conventional concrete pavement has a void ratio of between 3% and 5%), which gives it a high permeability that is often many times more than that of the underlying native soils, and allows rainwater and stormwater runoff to rapidly pass through it and into the underlying stone reservoir.

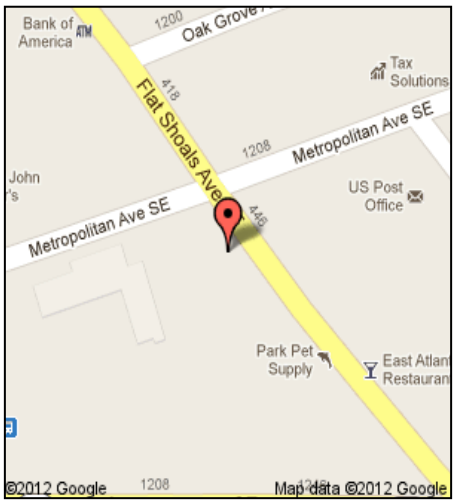
Although this particular type permeable pavement surface may not require an underlying base layer to support traffic loads, site planning and design teams may wish to provide it to increase the stormwater storage capacity provided by a pervious concrete system. *(GSMM Coastal Supplement, 2009)*

The pervious concrete at the Atlanta City Jail parking lot accommodates 55 cars and is used for Department of Corrections employees. During a rain event, the parking lot does not produce any storm water runoff. Cool Communities, the Georgia Concrete & Products Association, and Trees Atlanta were instrumental in coordinating efforts to build the facility and secure landscaping. *(Portland Cement Association)*

East Atlanta Branch Library parking lot

Location: 457 Flat Shoals Ave Se, Atlanta, GA 30316

Type of BMP: Pervious Concrete



Permeable pavements represent an alternative to traditional impervious paving surfaces. They typically consist of an underlying drainage layer and an overlying permeable surface layer. A permeable pavement system allows stormwater runoff to pass through the surface course (i.e., pavement surface) into an underlying stone reservoir, where it is temporarily stored and allowed to infiltrate into the surrounding soils or conveyed back into the storm drain system through an underdrain (Figure 7.28). This allows permeable pavement systems to provide measurable reductions in post-construction stormwater runoff rates, volumes and pollutant loads on development sites.

This parking lot features Pervious concrete with a retention pond below. The lot is maintenance free and no rain water leaves the site.

Fulton County Government, working collaboratively with the construction management team, specified pervious concrete for the material's environmental benefits and to facilitate their LEED—Leadership in Energy & Environmental Design—Green Building Rating System™ certification (LEED certification recognizes building projects that demonstrate a commitment to sustainability and meet the highest performance standards). Stormwater chambers were used beneath the pervious concrete foundation to increase water storage capabilities and to eliminate the need for a separate retention pond. Cultec, Inc. of Brookfield, CT, manufactured the stormwater chambers. *(Southeast Cement Association)*

Sq. Ft. Poured: 10,000
Thickness: 6 inches
Base Thickness & type: 6 to 24 inches of #57 stone
Use of Fabric: Geotextile fabric
Soil Type: Clay

Georgia Tech Klaus Advanced Computing Building

Location: 266 Ferst Dr NW Atlanta, GA

Type of BMP: Bioretention Area & Rain Gardens

Bioretention areas are shallow depressional areas that are filled with an engineered soil mix and are planted with trees, shrubs and other herbaceous vegetation. They are designed to capture and temporarily store stormwater runoff in the engineered soil mix, where it is subjected to the hydrologic processes of evaporation and transpiration, before being conveyed back into the storm drain system through an underdrain or allowed to infiltrate into the surrounding soils. This allows them to provide measurable reductions in post-construction stormwater runoff rates, volumes and pollutant loads on development sites.

Klaus' bioretention areas accept building's roof runoff and first flush into two underground cisterns, with a combined volume of 174,149 gallons. The bioretention area of the site used 350 cu yd of engineered soil, comprised of 40% clay topsoil, 20% sand, 20% ERTH food compost and 20% HydRocks. Manufactured by Big River Industries, HydRocks is an expanded clay aggregate product, manufactured through a rotary kiln process in which selectively mined clay is fired at 2,000°F.

Ecos excavated 4-ft-deep cells between the retention walls, where it laid underdrain pipe that connects to the underground cisterns and wrapped the area with gravel and filter fabric. The engineered soil mix was then installed in a series of lifts, each watered down to ensure soil settlement until design elevation was reached. The channels were lined with native river rock broken up by large boulders salvaged during excavation of the building site. Cranes placed the boulders on graded aggregate to ensure that they did not move. The boulders were slightly elevated to absorb grade and encourage pooling behind them, maximizing infiltration time. The bioretention area was planted with a mix of native plant species to mimic a perennial stream condition in Georgia's Piedmont region, providing a drought-tolerant landscape. Any storm water that does not absorb is captured by the underdrain and sent to the cisterns, where irrigation pumps recycle it through the grounds. *(Drotleff & Eberly, 2010)*

Old Fourth Ward Stormwater Detention Pond

Location: Bordered by Morgan St on North, Rankin St on South

Type of BMP: Stormwater pond (wet)

Stormwater ponds are stormwater detention basins that have a permanent pool of water. Post-construction stormwater runoff is conveyed into the pool, where it is detained and treated over an extended period of time, primarily through gravitational settling and biological uptake, until it is displaced by stormwater runoff from the next rain event. Temporary storage (i.e., live storage) can be provided above the permanent pool for stormwater quantity control. This allows stormwater ponds to both treat stormwater runoff and manage the stormwater runoff rates and volumes generated by larger, less frequent rainfall events on development sites.

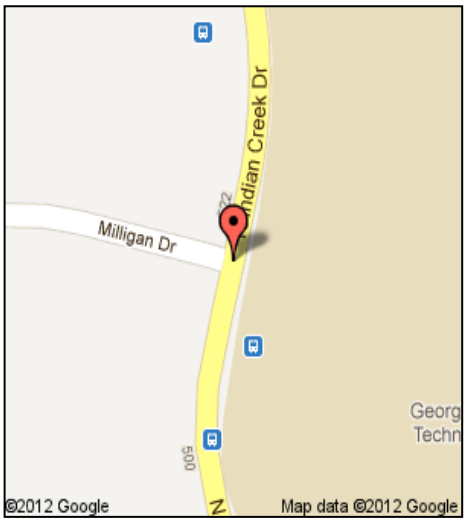
The Old Fourth Ward Stormwater detention pond has enough capacity to hold a 500 year storm event. Rain water recedes to Highland Ave. combined sewer trunk. In the case that the trunk fills, it has been retrofitted to prevent flow back into the basin.

With construction of the detention pond, the City is reclaiming what was once the original "Clear Creek" and creating a centerpiece for the future park at a materials cost savings of about $26 million which is lower than the cost of the tunnel extension. Therefore the pond project not only creates a functional, creative and sustainable feature for the neighborhood but also a cost savings to the City. More importantly by detaining stormwater flows for a 100-year storm event, this pond will address capacity relief problems in the overall 800-acre drainage basin and reduce the peak flow capacity of the Highland Avenue Combined Sewer Trunk to which it discharges. *(Historic Fourth Ward Park Conservancy)*

Georgia Piedmont Technical College, DeKalb Campus

Location: 495 North Indian Creek Dr, Clarkston, Georgia

Type of BMP: Rainwater Harvesting



There are two basic types of rainwater harvesting systems: (1) systems that are used to supply water for non-potable outdoor uses, such as landscape irrigation, car and building washing and fire fighting; and (2) systems that are used to supply water for non-potable indoor uses, such as laundry and toilet flushing. Rainwater harvesting systems used to supply water for non-potable indoor uses are more complex and require separate plumbing, pressure tanks, pumps and backflow preventers. Additionally, the use of harvested rainwater for non-potable indoor uses may be restricted in some areas of coastal Georgia, due to existing "development rules." Developers and their site planning and design teams are encouraged to consult with the local development review authority if they are interested in using harvested rainwater for non-potable indoor uses.

In 2011, ECOVIE installed an educational project involving rainwater collection at Georgia Piedmont Technical College. ECOVIE installed two 2,500 gallon tanks that will collect rainwater from 8,000 square feet of the GPTC C building at the Clarkston, Ga., campus where the Green Technologies Academy (GTA) is located. Students in the GTA Program will have the opportunity to gain real world knowledge of instruments by using signal from the system controller, level indicator and a variety of sensors that will then upload gather data to internet display.

Roof Square Footage: 8,000
Tank Capacity: 5,000 Gallons
Projected Annual Water Supply: 80,000 Gallons

Adair Park Rain Garden

Location: 742 Catherine St, Atlanta, GA30315

Type of BMP: Bioretention Area (Rain Garden)

A rain garden is a landscape element that is specifically designed to clean and infiltrate stormwater runoff. Rain gardens are designed to mimic the natural biological and physical processes that existed before the land was developed. During a storm, runoff water pools in the rain garden and slowly filters through a special soil mix. Pollutants and sediments are filtered and broken down by the natural biological activity of the plants and microbes in the soil. The now clean water will slowly soak into the surrounding soil, recharging the ground water. An underdrain at the bottom of the garden, as well an overflow above the soil level, control the depth and duration of the ponding.

The construction of the Adair Park Rain Garden was a joint effort by the Departments of Watershed Management and Parks, Recreation, and Cultural affairs. Watershed was responsible for design and project management, while Parks provided the funds.

The native soil was excavated and removed and replaced with a gravel drainage layer and a highly porous engineered soil mix composed of expanded slate fines (Carolina Stalite) and worm compost. With the exception of the daylilies, all of the plantings are Georgia natives (or cultivars of natives).

Contributing Drainage: 3.5 acres
Size: 1600 sf
Installed: Fall 2010
Cost: $35,000