Our Washington Quad Renovation

To be completed June 2008

This $3.03 million initiative could not have been completed without
the commitment, energy and contributions of dozens of people from
on and off campus.

Off-Campus Partners

University Partners

Capstone Development - Developer
Valley Forge American Elm

Design Collective - Architect
Whiting-Turner - Construction contractor

A. Moten-Turner - Civil engineer
Mohan Rijal - Landscape architect
BMK - Electrical engineer
ESM - Traffic control engineer

Hope Pater - Structural engineer

We also recognize the residents who lived around the Quad and who
endured the inconvenience and interruptions from the construction
activities outside their windows and front doors during the 2007-
2008 school year.

An American Success Story –
Valley Forge American Elm

As the primary tree in the Washington Quad site design, 32 Valley
Forge American elms line the perimeter sidewalk system, providing
shade to pedestrians while reducing the heat absorbed by the
pavement.

The destructive fungus Ophiostoma ulmi was first recognized in the
1920s by Dutch researchers in the Netherlands, hence, how it
received its name Dutch elm disease (or, DED). DED has been
estimated to have killed between 70-80 million elm trees, roughly
95% of all American elms in the United States. DED is widely
believed to have been accidentally introduced to North America in
1931 in shipments of logs from either France or the Netherlands
destined for use as veneer in the furniture industry of
Cleveland and Columbus, Ohio. By the 1970s, the American elm had largely
vanished from forests nationwide. Infection occurred when an elm
bark beetle brought the fungus from an infected tree and then
burrowed into the living tissue of a healthy tree. Once a tree became
infected with this disease, other nearby American elm trees died
quickly when the fungus spread across tree roots underground.

After 20 years of research and selective breeding, researchers in the
1990s at the Department of Agriculture’s National Arboretum
research station in Beltsville, Maryland identified several types of
elm trees that were genetically resistant to Dutch elm disease. Eight
new “cultivars” (or, cultivated varieties) became available in the
United States in 1995 when the Valley Forge and Harmony cultivars
were released. To many researchers, the Valley Forge seems to be the
newest American elm most resistant to the dreaded Dutch elm
disease.

Ecosystems flourish that have a wide diversity of plant and animal
species. We are pleased to reintroduce the American elm back onto
campus, restoring these elms where they once thrived widely
throughout this region of the country.

What’s in our Environmental Design

The design requirements for the restoration of the Washington Quad involved:

- 3,100 tons of concrete, asphalt, brick, and various
tree and plant materials removed during demolition
were diverted to reprocessing centers to become
crushed stone, mulch, and other valuable supplies
for use in other construction projects.

- The new site design removed over 30% of the
former concrete and asphalt surfaces, increasing
green space in the Quad and further reducing storm
water run-off.

- A 10,000 gallon storm water collection cistern
captures rain water from nearby residence hall
roofs for re-use in an irrigation system in the
planting beds.

- Much of the original brick sidewalk in front of
Washington Hall was salvaged and reused in the
new brick plazas at each of Washington’s three
main entrances.

- Ninety-six new trees are to be planted on this site,
almost three times more than when the project
started. The majority of these trees shade
pedestrian walkways and in time reduce the
amount of heat absorbed and then emitted by
concrete and brick surfaces throughout the quad –
otherwise known as reducing the heat island effect.

- Fifty-two bike rack U-tubes are installed near
building entrances to support increasing student
bicycle use across campus.

- Both trellis structures included non-wood
composite columns instead of wood.

Our Storm Water Irrigation System

The system captures rainwater and snow melt from the roofs of the
surrounding residence halls, carrying it through the building
downspouts and underground piping to a storage tank or cistern
buried near the center of the Washington Quad. The cistern stores up
to 10,000 gallons of water for using irrigating planting beds throughout
the Washington Quad. Rain water run off from the sidewalks and
grassy areas is not captured due to the presence of leaves, grass
clippings and fertilizer that would contaminate the water being held
underground until its use for irrigation.

The capture and recycling of storm water reduces water use by
eliminating the need for either hand watering or standard irrigation
systems that use domestic water to help sustain landscape plantings.
Harvested water also reduces the amount of storm water run-off
entering, stressing, and potentially polluting nearby streams.

Our high efficiency drip irrigation system will maximize the use of
harvested rain water as soil moisture sensors send irrigation water
only as needed to each of four different “micro-climates” found in
the quad. For example, planting beds with a southern exposure
require more watering than other planting areas and would be
watered more frequently or for longer durations, as determined by
the sensors and the microprocessor controlled pumping system.

How It Works

1. Rain water collected from 16,500 square feet of residence hall
roof surfaces flows through gutters and downspouts connected to
an extensive web of underground collection lines.

2. Prior to entering the cistern, the rain water from collection lines is
filtered to remove leaves or other matter that could clog
irrigation piping.

3. Using data from sensors, the system’s microprocessor pumps
water from the cistern through the underground supply piping to
nearly 5,600 square feet of planting beds.

4. The buried irrigation piping in each planting bed is perforated
to allow water to slowly drip into the surrounding soil, minimizing
the loss of water from run-off and evaporation.

With every inch of rainfall, the system will harvest an estimated
10,000 gallons of rainwater for reuse, enough to completely fill the
storage cistern.