



Green Infrastructure & Stormwater Management CASE STUDY

Landis Homes Retirement Community - South Campus Expansion

Location: Manheim Township, Lancaster County, PA

Client: Landis Homes Retirement Community

Design Firm(s): RGS Associates, Inc. - Landscape Architects, Civil Engineers, RLPS
Architects - Architect, LandStudies - Environmental Consultants, ARM Group - Geologists

Landscape architect/Project contact: Mark A. Hackenburg, RLA, ASLA

Email: mhackenburg@rgsassociates.com

ASLA Chapter: Pennsylvania/Delaware

Project Specifications

Project Description: RGS worked with Landis Homes Retirement Community in the design of approximately 40 acres in the south portion of their 114 acres campus. The plan ultimately proposes 6, three story apartment buildings with lower level parking totaling 75 units as well as 70 cottages. This unique project will be pursuing LEED certification through the use of renewable and regional building materials as well as energy efficient heating, cooling and electrical systems. Rainwater capture and reuse, native drought tolerant landscaping, rain gardens and porous asphalt for promoting storm water infiltration and pollutant removal are examples of sustainable design components being implemented. The project will ultimately include stream channel restoration that will involve legacy sediment removal and floodplain restoration to promote groundwater recharge of storm water runoff as well as an enhancement of the natural systems on the site. The floodplain will be re-shaped and planted, improving its overall stormwater management capacity and ecological qualities resulting in a unique natural environment and aesthetic enhancement for the residents of the Landis Homes Community.

Project Type:

Other (please specify)

Part of a new development

Design features: Bioretention facility, rain garden, bioswale, cistern, rain barrels, and porous asphalt. Other features include rainwater capture and reuse, native/adaptive drought tolerant landscaping, and future stream channel/floodplain restoration - which includes legacy sediment removal.

This project was designed to meet the following specific requirements or mandates:

State statute, local ordinance, PADEP NPDES requirements

Impervious area managed: greater than 5 acres

Amount of existing green space/open space conserved or preserved for managing stormwater on site: greater than 5 acres

The regulatory environment and regulator was apprehensive about the project.

Did the client request that other factors be considered, such as energy savings, usable green space, or property value enhancements? The ability for the additional volume within the floodplain to function as a means of stormwater management has been analyzed. The result would mean that the three detention basins would no longer be necessary, providing additional space for the development of future rain gardens and residential cottages, thus enhancing the value of the property.

Cost & Jobs Analysis

Estimated Cost of Stormwater Project: 500,000-\$1,000,000 (Public funding: Not available)

Related Information: \$650,830.00 - Total cost for stormwater improvements includes labor, materials, and equipment.

Was a green vs. grey cost analysis performed? No

Cost impact of conserving green/open space to the overall costs of the site

design/development project: The intent of the project was to develop the South Campus into a tightly knit community, while conserving the existing site amenities for the enjoyment of the residents. The ability to preserve these finite resources was also seen as a necessity in order to allow Landis Homes to continue to operate on this tract of land for the many years to come. The existing tree grove was maintained, and the stream and floodplain which bi-sect the property are to be part of a future restoration project to promote groundwater recharge as well as the overall enhancement of the natural systems. As such, additional costs will be incurred as part of this future restoration project. The preservation of the remainder of the existing green/open space within the South Campus was simply a driving factor in the overall design.

Cost impact of conserving green/open space for stormwater management over

traditional site design/site development approaches (grey infrastructure)? Significantly increased. The inclusion of the future legacy sediment removal and floodplain restoration project has significant costs associated with its inclusion in the project. Although, Landis Homes believes such measures associated with stormwater management and “green design” are essential to their long-term goals.

Number of jobs created: currently unknown

Job hours devoted to project:

Planning and Design: 5,500 hours

Construction: Construction commenced November 2009; anticipated completion of Phase 2 of 3: March 2011

Annual Maintenance: Not available

Performance Measures

Stormwater reduction performance analysis:

The site drains to Kurtz Run (classified as WWF), which is located within The Conestoga River Act 167 Watershed Stormwater Management area. The release rate for the Act 167 area is 50%. Three stormwater basins, associated stormwater piping, and overland swales have been designed to meet the required 50% reduction. A pre-post analysis was performed for the drainage area for the South Campus expansion to determine the net two year increase to be infiltrated. The total drainage area is 36.20 acres and the two year net increase is 96,253 cubic feet. In order to control the two year increase in runoff, numerous structural and non-structural BMP's are proposed to infiltrate stormwater. The future floodplain restoration project and associated BMP's are designed to infiltrate approximately 60% (57,752 cubic feet) of the total net increase of 96,253 cubic feet. On site BMP's associated with the proposed South Campus expansion are designed to infiltrate approximately 40% (38,501 cubic feet) of the total net increase.

Community & economic benefits that have resulted from the project: Upon completion of all phases of the project, both the Landis Homes Community and adjacent property owners will benefit from the improvements to the natural systems on the property. Those property owners downstream will also benefit from the removal of the legacy sediment and restoration of the stream channel, due to the long term storm water rate and volume control, as well as water quality benefits within the restored floodplain.

Additional Information

Links to images:

<https://docs.google.com/leaf?id=0B8f7DyvUHm2bMTgzMzgzM2UtYzVhZi00ZjUwLWlwYjEtMzZkYzIxZjI2ZmM0&hl=en>



STORAGE TANKS



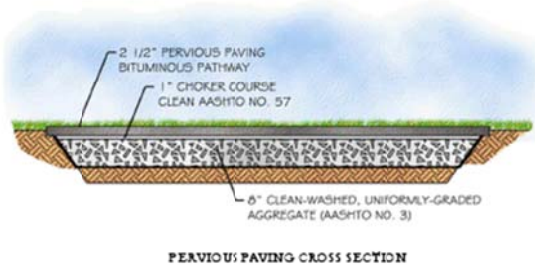
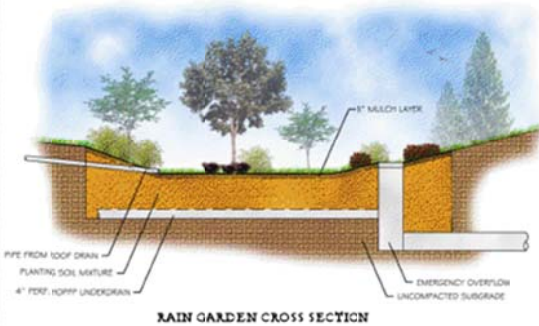
COTTAGE RAIN BARREL



RAIN GARDEN



- RAIN GARDENS
- POROUS ASPHALT
- RAINWATER HARVESTING
- COTTAGE RAIN BARREL
- HYBRID RAIN WATER TANKS
- FLOODPLAIN RESTORATION
- LEGACY SEDIMENT REMOVAL
- LEED CERTIFICATION



LANDIS HOMES SUSTAINABLE DESIGN

LANCASTER COUNTY, PENNSYLVANIA