

The project was initiated to remediate and redevelop a Brownfield site known as Stafford Park in Stafford Township, NJ in order to increase the amount of residential and commercial space in the town, preserve several hundred acres of land in the Pinelands Region, and create renewable energy sources to sustain the current and future energy needs of the development. The project was built to basic LEED Certification, with all retail uses achieving at least LEED Silver Certification, all Stafford Park Apartments expected to achieve LEED Silver Certification, and the affordable Stafford Park Apartments expected to achieve LEED Gold Certification. The project serves as an exemplar of a sustainable public/private partnership that has resulted in great financial, economic, social, and environmental benefits to the township and the region.



Stafford Park Apartments Stafford Township, NJ



“Stafford Park is unique in that it involved a complex degree of cooperation between various governmental agencies ... Fortunately, the leaders within the municipality, county, Pinelands, and NJ DEP saw the overwhelming benefits in this redevelopment project. Stafford Park is truly the result of good policy, good planning, and public/private partnership.”



Location of Project: Stafford Township, NJ

Overview

Completed in 2010, Stafford Park Apartments provide the residential component of the larger mixed use Stafford Park development in Stafford Township, Ocean County, NJ. The mixed use development was built on property that was formerly occupied by two landfills and lies in the Regional Growth Area of the Pinelands region. Prior to redevelopment, the site was owned and operated by various County and Township facilities. Several of those public facilities were located on top of buried debris in landfills. The landfills posed a substantial threat to the groundwater aquifer underlying the Pinelands, so redevelopment was viewed as a unique opportunity to address the environmental risks posed by the site. It was estimated that the remediation would cost somewhere between \$45 and \$65 million, which would have been a significant cost burden to the Township. The Walters Group and Stafford Township were able to negotiate a deal in which the private developer covered all site remediation, site improvements, and relocation expenses of County facilities. The site is now occupied by residential and commercial uses. The site currently has 112 affordable apartments, with 349 single-family homes and 216 apartments planned for construction. The site also has up to 650,000 square feet of retail space.

Transportation

Due to the lack of public transit options in most of Ocean County, potential transportation improvements were limited to those that could be made to the road and highway system. The location of Stafford Park at the intersection of State Route 72 and the Garden State Parkway necessitated rethinking the Exit 63 interchange. As such, The Walters Group worked with DOT and the New Jersey Turnpike Authority to improve the flow of traffic by widening portions of Route 72 and elongating the southbound off-ramp to the Garden State Parkway. The design solution chosen – the “English Couple System” – to help with the flow of future traffic accompanying enhanced retail destinations and residential units, was to implement a new flow system for vehicles to improve highway access and decrease vehicle time at stoplights. In addition to interchange improvements, roadway improvements were made and bicycle racks were installed for use by residents. These bicycle racks were installed to provide employees a place to park their bicycles when they bike to work. These racks may in prac-

Project Team

Public: *Ocean County, NJ, Manahawkin, NJ*

Developer: *The Walters Group*

Landscape Architect: *Jonathan Alderson Landscape Architects*

Architect: *Minno & Wasko, The Martin Architectural Group*

Civil Engineer: *Speitel & Speitel, Inc.*

LEED Consultant: *Magrann Associates*

ENERGY STAR Rater: *EAM Associates*

General Contractor: *Stafford Park Residential LLC*

Legal: *Giordano, Halleran & Ciesla*

tice promote healthy commuting options, neighborhood interaction, and a reduction of vehicle-related emissions that contribute to air pollution.

Water and Energy

Utilizing green principles in the design and construction of Stafford Park has favorably reduced the water and energy use of the new development. Reductions in water use have been achieved through three design decisions. With the first decision, low-flow plumbing fixtures were chosen to reduce consumption of clean water. With the second decision, rooftop runoff capture was deployed to eliminate water consumption due to irrigation by only irrigating with recaptured rainwater. This decision was made in conjunction with the decision to plant drought tolerant, indigenous species to lessen the impetus to irrigate. As a result, no irrigation system utilizing potable water was required. In the third decision, new wetlands were installed to improve bioretention and infiltration, resulting in retention of 96% of suspended solids in runoff. This new stormwater management system, coupled with the rooftop runoff capture, has resulted in primarily clean water recharge of receiving water bodies near the development. Taken together with the landfill capping which reduced the risk of groundwater contamination on-site, Stafford Park has been an improvement when considering water resources. In addition to reductions in water consumption that have resulted from conscious design decisions, reductions in energy consumption were planned for the Stafford Park Apartments. In the apartments, all appliances were chosen to be ENERGY STAR-rated, as they require less energy for operation than non-rated ones. On the site, solar panels were installed on the rooftops of the new apartment buildings to lower grid energy demand. Additionally, a 6.5 MW solar field of 30 acres is being installed on top of the capped and closed licensed landfill. In total, the solar panels should result in reducing the unmet energy needs of the Stafford Park development by up to 70%.

HVAC and Envelope

Heating and cooling were designed to be energy efficient. The Stafford Park Apartments feature high efficiency heating and cooling units to lower energy costs for residents. With the same goal in mind of reducing heating and cooling costs, furnace ducts were insulated to reduce unnecessary losses. To further reduce cooling demand, low-emittance windows were chosen for the



Ratings and Awards

Governor's Excellence in Housing Award for "Best in Housing" in 2010

Environmental Commission Stafford Township - Community Steward Award

US EPA Brownfield Redevelopment Award, Environmental Impact

NJ Biz Magazine - Green Leadership Award Finalist

Delaware Valley Smart Growth Alliance - Smart Growth Award

Market Rate Housing - LEED Silver Certification Expected

Affordable Housing - LEED Gold Certification

apartments, meaning that they feature a glazing with films and gas specifically designed for the project site, orientation, and climatic needs. The glazing allows visible light to transmit the window panes while eliminating the heat gains, assisting in the reduction of cooling load and electricity usage.

Interior and Operations

Many environmentally friendly materials were installed, such as flooring made from recycled consumer content and regional materials. Materials were also installed to improve the air quality within the buildings. These include low- or no-VOC paints, coatings, adhesives, sealants, and carpeting. To support the ongoing mission of sustainability and a carbon neutral community, Ocean County has also implemented a composting program on the site of the capped and closed licensed landfill. It has notably committed funds to ongoing landfill monitoring, following remediation of both landfill sites. Finally, Stafford Park and The Walters Group have committed more than \$2 million over the next 7 years to support on-site herpetologists to study the effectiveness of the Threatened and Endangered Species Management Plan. Between the mitigation, land restoration, and extensive use of Pinelands Development Credits, Stafford Park provides for the continued protection and preservation of more than 2,000 acres of land. With its renewable energy production, site remediation, land preservation, green construction techniques, and green building innova-

tions, Stafford Park serves as a model for developers everywhere to follow if they wish to implement sustainable technologies in their new developments.

Process

Design

From the start, the design of Stafford Park was a collaborative effort between The Walters Group, Ocean County, Stafford Township, the Pinelands Commission, and tenants. The Stafford Park project was the first in which The Walters Group sought to create a sustainable development. Since The Walters Group had never before planned for a green development, the design process was largely educational for the engineers, architects, project managers, and construction staff involved in the multiple parts of the mixed-use project. Having scaled the learning curve, the design team worked with retail tenants and consultants to re-engineer the development to LEED standards. Successful planning required carrying out biweekly and sometimes weekly calls to keep each other informed. Throughout the design process, the various professionals worked together to cap and close the landfills, plan for the creation of new habitats, and create the blueprints for new high performance commercial and residential buildings.

Build

As part of the process of greening the project, construction practices were considered. Material reuse was one of the goals in building the new development. Material reuse was accomplished by using concrete and asphalt salvaged from building and road demolition, using crushed glass from the on-site recycling facility, and reusing soil from the site. This final action was notable as the soil operations on the site were entirely self-contained, meaning no new soil had to be transported to the site for grading, capping, or filling. Soil recycling, in conjunction with concrete, asphalt, and glass recycling, decreased the total carbon emissions resulting from construction. During construction, those overseeing the project made sure to gather and upload the necessary documents to the LEED website for eventual review by the USGBC. The general contractor worked with subcontractors to gather necessary paperwork for documentation of the material LEED credits, while the design professionals reviewed submittals to verify compliance with the sustainable-based construction drawings and specifications. Due to the excellent coordination among collaborators, the construction team was able to maintain schedule and compliance with the LEED requirements of the project.

Operate

The heating and cooling units for each of the buildings are highly efficient. Taken together with the water reuse, reductions in demand, and wetland infiltration, the costs of operation and maintenance of the development have been lowered from what they would otherwise have been. The site benefits from adjacency to County facilities, which were relocated and paid for in part by The Walters Group. The recycling program ensures fewer materials entering landfills elsewhere. The no-VOC materials used in construction of the buildings improve day-to-day air quality. Monitoring of the old landfill sites is ongoing to protect the envi-

ronment. The Species Management Program shares that goal of tracking the health of air, water, flora, and fauna at Stafford Park. The preservation of Pinelands acreage nearby further fulfills this goal.

Evaluate

The site remediation that took place before construction could occur was heavily regulated and documented by NJDEP and the Pinelands Commission. The commissioning agents were present throughout the design development and construction document phase to assist in preparation of the drawings and specifications. The commissioning agents for Stafford Park worked with other project professionals to ensure that the buildings were made in accordance with the plans. Throughout the first year of occupancy, the mechanical and building management system will be monitored and adjusted. After a baseline of a full climatic year and post-occupancy review of systems may be completed, the apartments will hopefully demonstrate their fulfillment of all LEED requirements in order to be fully LEED Certified.

Finance

The Walters Group financed Stafford Park through private equity, though it was and is eligible for public assistance under New Jersey's Brownfield Reimbursement Program. These two former landfill sites and adjoining properties were developed under conditions that Stafford Park would remediate the landfills at an estimated cost of between \$45 and \$60 million, make improvements to water, sewer, and roads at a cost of greater than \$12 million, cover the costs of constructing several new county facilities and \$1 million compost facility, and implement a \$1 million species management plan. Subsequently, development costs also came to include the lawsuit costs resulting from groups arguing that development of the landfill sites amounted to a loss of habitat for endangered and threatened species. The actual total remediation costs amounted to more than \$30 million; however, this cost was significantly lower than that \$45-60 million that was estimated for the municipality of Stafford Township to undertake the remediation themselves. The Walters Group covered all of these costs, as well as the costs of construction development. Moreover, The Walters Group managed to develop the site in a far more sustainable manner than was required. All of the green building design elements were reviewed for cost and payback before deciding which elements to include in this project. As such, green features like solar panels were included in addition to building design ele-

ments in order to improve the cost effectiveness of the project and help with the pursuit of a zero carbon footprint development. Final purchases associated with development included Pinelands Development Credit purchases to preserve 1,100 acres of land in addition to the 1,070 acres of land already preserved adjacent to the project. With the collection of commercial tenants and several hundred housing units within the development, Stafford Park now represents a substantial source of tax revenue for Stafford Township and has resulted in great cost savings.

Performance

To date, many of the structures in the Stafford Park development have not yet been commissioned, but are still in the process of being commissioned. Stafford Park Apartments are expected to at least achieve LEED Silver Certification, while affordable units have achieved LEED Gold Certification. For the commercial buildings in Stafford Park, it has been estimated that the green building elements have in total resulted in 30% lower energy costs for the buildings, so similar results may be achieved in the residential structures. The solar panels, once installed and operational on the adjacent site, are expected to produce up to 70% of the energy needs of Stafford Park. The performance of the buildings and energy saving design features will continue to be monitored, in conjunction with the species management and landfill monitoring programs.

Lessons and Trade-offs

Successful completion of this project was dependent on the quality of communication between all parties involved, from The Walters Group to NJDEP and the Pinelands Commission to commercial tenants who were looking for a space to rent to the engineers, architects, and other professionals involved in the remediation, design, construction, and evaluation of the development. The scale of this project necessitated support from all parties involved, especially during times when the project was threatened by lawsuits and other challenges. One of the most challenging aspects of the project was bringing people on-board with the design and commissioning requirements that are integral to the LEED Certification process. In the future, it should be much easier for The Walters Group to manage green building projects because of the extensive trainings and trials that the professionals faced in this large-scale project. It remains to be seen whether the payback times for the various green building elements and solar panels will be consistent with the projections of design professionals. As



long as the spaces are rented out and the facilities are operational, Stafford Park is expected to provide long-term benefits to Stafford Township and Ocean County. Continued monitoring of the site should provide additional insights into the usefulness of these design strategies for potential sites elsewhere.

List of Green Strategies

Design

- Alternative Transportation: Bike Racks
- Certified Clean Fill as Backfill
- Impermeable Cap and Gas Venting System
- Native and Adapted Plants
- Regional Materials
- Recycled Materials
- Threatened and Endangered Species Program
- Rooftop Runoff Capture for Irrigation
- New Wetlands for Bioretention/Infiltration
- Low-Flow Fixtures
- Rooftop Solar Panels
- High Efficiency Windows (Low-Emittance)
- High-Efficiency HVAC Equipment
- Insulated Furnace Ducts
- ENERGY STAR Appliances
- Low Emitting Materials

Build

- Construction and Demolition Waste Plan
- Monitoring Wells and Vents for Landfills
- Self-Contained Soils Operations On-Site
- Concrete and Asphalt Recycling On-Site

Operate

- Landfill Monitoring
- Threatened and Endangered Species Program
- Composting

Evaluate

- Building Performance Evaluation
- Species Program Performance Evaluation

