

## **One and Two Potomac Yard Crystal Yard and Potomac Avenue, Arlington, Virginia**

*300-acre 4.5m sq ft multi-use redevelopment of brownfield railyard. LEED® Gold. Analysis of component sustainable aspects and benefits, importance of sustainable aspects in attracting anchor tenant, effect on permits and development bonuses. Comparison of extra costs with benefits.*

### **OUTLINE**

Potomac Yard is a 300-acre redevelopment of the former Richmond Fredericksburg and Potomac Railroad (RF&P) rail transfer station in Arlington and Alexandria, Virginia. Upon completion, the mixed-use project will include 4.5 million square feet of office space, 3,000 residential units, 200,000 square feet of retail space, 1,250 hotel rooms, and 92.4 acres of open space and parks.

This extensive redevelopment first required the completion of a 1.7-mile trunk sewer project in Alexandria, VA. Upon completion of this phase, Crescent Resources, LLC (“Crescent”), the development company that purchased the Potomac Yard site from RF&P, then completed over \$10 million of infrastructure improvements in Arlington.

Subsequently, Crescent developed One and Two Potomac Yard, a two-building office development comprising 654,000 square feet of rentable area. The buildings serve as the headquarters for the Environmental Protection Agency and house approximately 1,650 EPA employees. The buildings opened in May 2006, having achieved a LEED Gold certification.

### **RATIONALE / BUSINESS CASE**

The primary business goal of Crescent in developing One and Two Potomac Yard was to secure the Environmental Protection Agency (EPA) as lead tenant for the development. The EPA’s commitment to sustainability complemented Crescent’s own corporate environmental commitments, so the venture made sound business sense from both an economic and environmental perspective. To achieve their common goals, the “greening” of One and Two Potomac Yard focused on the following:

Some of the more significant green elements of the project are summarized below:

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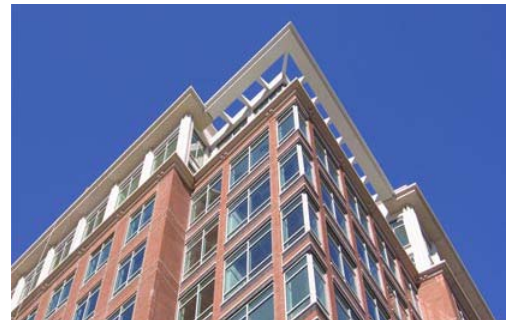
Date: March 2007

Review:

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- EPA lease requirements
- LEED Green Building Rating System
- LEED Certification process
- LEED points that Crescent Resources pursued to earn at least a Silver rating for each of the two office buildings in the project

As of March 2006, the EPA occupies 406,000 square feet of the 654,000 square foot office portion of Potomac Yard. During the pursuit of their initial goal of LEED Silver certification, Crescent chose to go beyond preliminary objectives and incorporate design and systems innovations that ultimately resulted in the project receiving not Silver, but LEED Gold certification.



**Figure 1**

More in-depth information on the project and business rationale can be found in a presentation created for the 22nd annual meeting of the American Real Estate Society by Elizabeth Adams, LEED AP, Elena M.S. Garrison, R.A. and Daniel B. Kohlhepp, PhD, MAI. This work and additional comments from Mr. Kohlhepp served as the primary data sources for this discussion.

## **KEY GREEN FEATURES**

Some of the most notable sustainable elements of the project are summarized below:

### *SITE / LOCATION*

Potomac Yard is built on a formerly contaminated rail yard site. Remediation of a former brownfield site is a significant green component of the project.

Potomac Yard achieved LEED Gold certification, which means that many aspects of the sustainable sites credit were accomplished. For example:

- Development density- LEED encourages developers to channel development into urban areas. One way in which Potomac Yard met this goal was by redeveloping the former rail yard to a density of 60,000 square feet of built space per acre.
- The development achieved points for alternative vehicle provisions, bike storage, and carpool preference.

- Potomac Yard utilized a non-roof/eco roof and a curved heat reflective roof, both of which reduce the heat island effect.
- The development's location within an urban environment also garnered it an alternative transportation credit.

### *MATERIALS & RESOURCES*

- Building materials contain 27% recycled content (value of post-consumer content plus half of post-industrial content as percentage of total cost of materials).
- Portions of the below grade, poured-in-place concrete structure incorporated 35% recycled content - approximately 670,000 pounds of ground granulated blast furnace slag.
- 63% of materials were manufactured regionally within a 500-mile radius; of those, 61% were also extracted regionally.
- Forest Stewardship Council (FSC) certified wood comprised 83% of all wood used in the project.
- 71% of construction period waste was recycled, diverting 2,000 tons from landfills.



**Figure 2**

### *WATER EFFICIENCY*

- Water saving technologies achieved a 41% water use reduction.
- The project achieved the water efficient landscaping credit by eliminating the need for permanent landscaping systems.

### *ENERGY & ATMOSPHERE*

- One and Two Potomac Yard is designed to save 23.5% energy over baseline.
- Additional commissioning was completed for the design and construction elements of the development. This ensures optimal efficiency and the highest level of performance from building systems.

- EPA signed a three-year green power contract in the form of renewable energy credits. This purchase offsets 100% of the facilities' electricity consumption and supports the generation of renewable energy at wind farms elsewhere in the US.
- Potomac Yard uses Energy Star efficient light strategies to reduce energy use.

### INDOOR AIR QUALITY

- During construction an IAQ plan was established to protect the facilities' finish materials (such as drywall, ceiling tiles, and HVAC system open duct work) that were stored on site. To prevent contamination from odors, dust or liquids, plastic sheet covers and raised pallets were used until the materials were installed and the mechanical system was fully enclosed.
- Low emitting materials were used throughout the project. This includes adhesives and sealants, paints and coatings, carpet and composite wood.

**Importance of Green Features in Attracting Owners, Tenants.** Crescent Resources was able to attract EPA as a tenant only by developing One and Two Potomac Yard to: (1) meet federal green guidelines and (2) achieve at least a LEED Silver certification. Attaining a specified level of sustainability or "green" was the driving impetus for this project, with Crescent's corporate commitment to environmentally responsible development second only to the tenant requirements.

**Non-Green Comparables.** There are few developments of this magnitude that have been completed and achieved this level of environmental certification. We are not aware of any other single development in the United States that could serve as a direct comparable for this project. Rather, portions of Potomac Yard would most likely be compared to other developments that may be of similar size, if not comparable design and construction.

**Other impacts on the Environment.** In completing One and Two Potomac Yard, Crescent was responsible for more than \$28 million worth of infrastructure improvements that have either directly or indirectly improved the quality of water entering the Potomac River Watershed.



**Figure 3**

For example, the Potomac Yard Trunk Sewer was designed with excess capacity to allow the City of Alexandria to divert flow into the sewer system and eliminate storm discharges directly into the Potomac River.

*SOCIAL*

**Reputation of Owner/Occupant/Tenant.** Crescent Resources, LLC, formed by Duke Power, is a land-based management and real estate development company. As stated in its company description, “Promoting strong environmental guidelines, adhering to, and exceeding stringent standards set by regulatory agencies is [Crescent’s] hallmark.” Crescent’s corporate commitment to quality and the environment exemplifies the qualities upon which the EPA selects its developers, as well as the locations in which it locates.



**Figure 5**

The EPA’s commitment to environmental responsibility is uncompromising, and Crescent’s approach to the remediation and redevelopment of the Potomac Yard site is exactly the level of commitment that the EPA would seek in a provider. Their mutual dedication to sustainability and the environment made each a stakeholder in the project; this, in turn, resulted in both achieving, and in Crescent’s case, exceeding their respective goals.

*ECONOMIC*

A specific project cost breakdown was not available; however, overall project development costs, including hard and soft costs, were estimated at \$100 million. The following information on those costs specifically associated with the incorporation of LEED standards was provided by Mr. Dan Kohlhepp of Crescent:

**Break-Out of LEED Related Costs** (see chart to the right). Including six floors of structured parking (three below grade and three above), the development area of One and Two Potomac Yard equates to 1.1 million square feet. However, please note that the cost analysis above is presented on the basis of the project’s 654,000 square feet of rentable space.

The information in the previous chart indicates that the cost of meeting LEED Gold certification was \$6.36 per rentable square foot, or roughly 4% of total development costs. This is well within the premiums typically associated with LEED certification and actually quite impressive given it was the first LEED Gold certified development of this magnitude undertaken by Crescent.

Based on conversations with Mr. Kohlhepp, lessons learned on this project should help reduce premiums on future green developments undertaken by Crescent. This, of course, depends on the level of LEED certification sought, as well as the availability of experienced design and construction teams.

Though building performance has yet to be validated via post occupancy evaluations, the fundamentals of the project are well-documented. Pre-leasing more than 60% of the project’s rentable area on a 10-year lease to a tenant like the EPA has significant financial benefits, as well as wide market recognition. As with other new green developments, performance over time will determine whether or not initial investments prove worthwhile from a financial standpoint. The long term “value” of the contributions this development made to improving water quality in the Potomac River Watershed is much more difficult to quantify.

## FINDINGS/POST-OCCUPANCY EVALUATION

Since opening in May of 2006, all building systems have been monitored for performance and efficiency. This information will be assimilated and analyzed at the end of the first year of occupancy to assess actual performance versus pre-occupancy projections.

## VALUATION ASPECTS

According to information provided by Crescent, a LEED commissioning consultant cost the development \$568,500; however, all systems were fully and optimally operational from day one of tenant occupation. This optimized both operational efficiencies and tenant satisfaction, and at the same time minimized maintenance and management time and efforts. There is currently insufficient data to estimate the savings in maintenance costs from not having to re-calibrate new systems numerous times. Plus it is difficult to quantify the value of tenant comfort and satisfaction other than to note that it will inevitably be reflected in tenant retention, rental rates and renewal levels.

An issue that Crescent had to deal with, and that we understand is not uncommon where very large developments are involved, is the fact that their lender held back \$18 million until the project achieved certification at a minimum LEED Silver standard. This obviously impacted both cash flow and project risk parameters and warrants further investigation by valuers into the possibility of whether or not this might occur in a development being analyzed and if so, how this occurrence will impact overall returns.

DESCRIPTION	TOTAL	COST
<b>LEED Additional Consulting Costs (in dollars):</b>		
LEED Consultant	75,000	.12
Commissioning Consultant	568,500	.91
Energy Modeling Consultant	40,000	.06
Mechanical, Electrical,	68,600	.11
Architect	20,000	.03
Civil Engineer	20,000	.03
Landscape Architect	20,000	.03
Lighting Consultant	20,000	.03
Indoor Air Quality Testing	100,000	.16
Total LEED Consulting	932,100	1.50
LEED Additional Hard Costs	1,524,000	2.45
General Contractor LEED	1,500,000	2.41
Total LEED Construction	\$3,956,100	\$6.36

Mr. Kohlhepp is both a PhD and an MAI, and thus well versed in market analysis and valuation practices. In his role as Senior VP of Development at Crescent, he formulated a number of analyses relative to the implications of LEED certification on the potential value of One and Two Potomac Yard. Based on his analyses, a 5% decrease in operating expenses equated to an increase in overall property value of just over 2%.

His analyses specifically addressed such issues as reduction in energy consumption, cost of debt and equity capital and the annual appreciation or depreciation rate. He also focused on investor holding period, life of the building holding period and an appropriate risk-adjusted discount rate.

Additional comments of interest in Mr. Kohlhepp's literature include the following caveats:

- There are currently no market-driven incentives for LEED certification.
- Operating efficiencies for a large number of the projects certified are, for the most part, unproven.
- Federal government requirements for LEED certification can increase private development costs without a corresponding increase in "expected" value.
- Municipal requirements increase development costs and risks.
- Green and sustainable development and construction will continue to be a part of the political and economic landscape for the foreseeable future.

Though Crescent met and exceeded client expectations relative to client-mandated environmental responsibility, Mr. Kohlhepp's comments reflect mainstream investor emphasis on the economic aspects of green development. The valuation profession needs to be aware of an increasing focus on "responsible investing" by both the institutional and corporate investment worlds, to determine if any additional and/or different types of analyses are being incorporated into their investment and development decisions going forward.

## INTERVIEW

Mr. Kohlhepp is Senior Vice President in charge of development worldwide for Crescent Resources, LLC, an international real estate development and investment firm. The company developed Potomac Yard with the goal of attracting a sizable US government tenant whose mandate was to occupy only LEED certified projects.

This was Mr. Kohlhepp's and Crescent's first LEED project and the learning curve was steep. He experienced the typical challenges and push backs from contractors and sub-contractors that this type of development would be more costly and difficult, despite the fact they had no actual experience upon which to base their assumptions. While Crescent did find that the project cost approximately 4% more than



uncertified, traditional construction, they felt the long-term benefits far outweighed the minimal, additional upfront expenditures.

With the lessons learned on this project, Mr. Kohlhepp believes there can be even more efficiencies on future projects, decreasing even this small premium. A self-proclaimed “commissioning agnostic” he now considers the money spent on employing third party experts to “fine tune” the systems as “money in the bank”. According to him, the ability to open the project with all systems at 100% efficiency was invaluable from both an operational and tenant satisfaction basis.

Furthermore, Mr. Kohlhepp believes there is additional value and competitive advantage in the enhanced marketability achieved by producing a LEED certified building. By developing Potomac Yard in the Washington, D.C. metro area, one of the first municipalities in the US to introduce LEED standard requirements into building codes for the private sector, Crescent was able to successfully leverage off of market recognition of the value of incorporating sustainable practices and products.