

## **DASH Administration Building and Operations Center**

Address: 3000 Business Center Drive  
Alexandria, VA 22314

Building Usage: Administrative Offices,  
Operations Center, Bus  
Warehouse

Occupied Area: 147,000 ft<sup>2</sup>

Year Built: 2009

Rating: U.S. Green Building Council  
LEED-NC, v.2.2

Level: Gold (40 points)



### **Overview**

The modernization of the Alexandria Transit Authority (“DASH”) administration building and operations center, located at 3000 Business Center Drive in Alexandria, Virginia is an exciting Brownfield redevelopment project. The new building is located adjacent to DASH’s previous administration building and operations center which is now being reused for alternate City business.

The state-of-the-art DASH facility is 147,000 ft<sup>2</sup> incorporates green building features while maintaining functionality as a transit-oriented operation. Ultimately, the design and construction of the DASH facility includes building materials and methods, which promote environmental quality, economic vitality, and social benefit.

### **Design Methodology and Strategy**

The DASH facility was designed to not only feature advanced approaches to green building, but also to include significant functionality unique to a transit company. The final design and construction reflect building a facility which accomplishes the facility’s functional goals while achieving maximal societal value and minimal environmental impact. Decisions of site layout, building orientation, space use, building materials, building systems, and building operations were framed through the aforementioned paradigm.

The DASH facility was originally designed to meet LEED<sup>®</sup> Silver certification as required by City of Alexandria policy. However, the center ultimately has been designated as a LEED<sup>®</sup> Gold-certified facility due to additional LEED<sup>®</sup> parameters achieved during the construction, commissioning, and operations process.

## **Energy Efficiency and Green Building Measures**

The following details delineate the exemplary energy efficiency and green building measures incorporated in the DASH facility construction. These measures combined provided the facility's recognition as a LEED® Gold-certified facility.

### *Enhanced site design*

The facility utilizes a previously designated Brownfield site which was remediated prior to construction. The site focuses on community integration where a significant number of community services are available to the facility within ½ mile of its location. These services include banks, residential housing, grocery, laundry, restaurants, convenience stores, and other locations providing value-added services. The building is oriented on a south facing for optimal daylighting and passive solar utilization.

### *Stormwater management*

Facility drainage is directed away from building foundations and conveyed by sheet flow across landscaped areas and travel lanes. In some locations exterior downspouts daylight to splash blocks within custom flow-through bio-retention planter boxes placed at the south facing of the building. These compact BMPs are planted with an attractive and drought-tolerant mix of vegetation, both removing stormwater pollutants and enhancing the aesthetics of the building. Runoff filters through the planting media to be collected gradually in an underdrain and is piped to the nearest drainage structure. Stormwater from all portions of the site is routed to an extended detention basin at the western limit of the site. The stormwater strategies also incorporated selected landscaping in order to maintain the appearance of the facility consistent with the surrounding area. Stormwater is discharged to a relocated storm sewer pipe which is routed around the west side of the facility.

### *Energy efficiency heating, cooling, and lighting systems*

The facility utilizes the ASHRAE 90.1-2004 Appendix G energy code to meet compliance. The facility achieves LEED® Enhanced Refrigerant Management credit by using no CFC-based refrigerants. The facility utilizes high-efficiency HVAC and lighting systems integrated into the building function. Integrated HVAC systems include:

- Water-source heat pump with evaporative cooler tower and condenser.
- Radiant-tube heating in bus-parking bays.
- Modulating high-efficiency condensing boiler.
- Variable Speed Drives (VSDs) on supply and exhaust fans and pumps.
- T8 fixtures with high-efficiency ballast and lamps achieving a 30.4% savings over baseline design.

These systems drive the energy and cost savings - 23.2% and 20.4%, respectively, over a baseline design.

General commissioning was employed to maximize the building HVAC, lighting, and control system efficiencies.

#### *Lighting, CO<sub>2</sub>, and Energy-reduction controls*

The facility utilizes occupancy sensor lighting controls, CO<sub>2</sub> monitors for demand control ventilation (DCV), differential pressure transducers for air-flow measurement and VSD operation, temperature and humidity monitors, and enthalpy sensors. These controls are connected to a building management system (BMS) for optimal control and scheduling. Moreover, exterior lighting controls reduce light pollution to exceed requirements.

#### *Water saving fixtures*

The facility achieves a 42% reduction in water use over baseline design even while including bus washing stations requiring significant use of water resources. This magnitude of reduction is accomplished most notably by use of a wash-water recycling system. This system recycles 86% of the water used to wash busses; ultimately reducing water use by over 2 million gallons per year. In addition, the facility's public bathrooms and locker-rooms feature low-flow water closets with dual-flush capabilities, low-flow lavatories, aerated sink faucets, aerated showers, and waterless urinals.

#### *Heat Island Reduction: Roof and non-roof*

Eighty-six percent (86%) of the compliant roofing area exceeds SRI requirements and sixty-three percent (63%) of the non-roof exceeds SRI requirements with an SRI of 35.

#### *Enhanced building envelope*

The facility features a metal frame, pre-cast concrete structure with architectural colonnades at the building entrance. Windows are fixed-assembly, vertical glazing, low-e windows with a SHGC of 0.378. The window-to-gross wall area ratio is 30%. The ceiling features an insulated metal roofing structure.

#### *Recycled content and regional building materials*

The facility incorporates a combined 20.7% of recycled content value as a percentage of the total material bill and exceeds the necessary post-consumer/pre-consumer recycled content requirements. Moreover, the facility construction sources 78.6% of material value of the total material bill from regional sources and includes structural and site elements.

#### *Enhanced occupant comfort*

Temperature and humidity conditions within occupied spaces are controlled within tight requirements. These temperature and humidity requires comply with ASHRAE 55-2004. Temperature and humidity ranges are 73°F – 75°F / 50 RH and 66°F - 68°F / 50 RH for Spring / Summer and Fall / Winter, respectively. To accommodate ongoing occupant comfort, a survey instrument is being utilized to monitor and adjust indoor comfort conditions as necessary.

### *Clean and healthy indoor environment*

During construction, all air handling units were opened and MERV-8 filters were used for air filtration. These filters were subsequently replaced before occupancy. Additionally, the facility interior was flushed and subsequent air quality testing was completed before occupancy.

Indoor pollution control was extensively implemented, where all adhesives, sealants, paints, carpets, wall boards, and other indoor chemical and pollution sources were significantly less than the maximum threshold amounts. Moreover, all wood materials used in the facility contain no Urea Formaldehyde Resins. Indoor ventilation is increased to 30% above ASHRAE 62.1-2004 requirements. Moreover, MERV-13 filters are installed in HVAC systems to mitigate pollutant transmission into the interior space. A Demand Control Ventilation (DCV) system provides ventilation requirements based on facility CO<sub>2</sub> concentrations.

Installed instrumentation monitors indoor conditions, generating alarm signals when indoor conditions vary beyond  $\pm 10\%$  of set-point values. The facility achieves nearly 100% accessibility to daylight with 79% of occupied spaces featuring a minimum 25 foot-candles from natural daylight achieving a minimum 2% glazing factor.

### *Clean transportation accessibility (bicycle accessible, commuter rail service, clean/hybrid vehicle preference)*

The facility is located within ¼ mile of two (2) bus stop locations and within ½ mile of the Eisenhower Metro rail line; both providing access to locations throughout the Metropolitan Washington region. The facility achieves meeting the requirements of providing bicycle storage for four bicycles (6%) of the operations peak occupancy and adequate shower facilities which exceeds the required 0.5% of peak occupancy. Finally, the facility's parking lot features eighteen (18) preferred parking locations for low-emitting vehicles, equaling five percent (5%) of the total parking capacity.

### *Construction Waste Reduction*

Eighty-six percent (86%) of all waste generated during construction was separated offsite for recycling. Moreover, 500 tons of waste were diverted from a landfill and recycled into the current facility's construction.

### *Additional Innovations in Design*

Additional exciting innovations featured at the DASH facility is the implementation of an efficient and environmentally-friendly elevator system. The elevator design reduces electricity use, eliminates need for a mechanical space, and mitigates the use of harmful hydraulic fluids and oils.

## **Partnerships**

The design and construction coordinated multiple public, private, and community organizations, including:

- City of Alexandria City Council
- Alexandria Transit Authority (DASH)
- City of Alexandria
  - Department of General Services
  - Department of Planning and Zoning
  - Department of Transportation and Environmental Services
- Hensel Phelps Construction Co.
- Michael Baker, Jr. Inc.
- Timmons Group

