LEED v4 for BD+C New Construction

1616 North Fort Myer Dr.

October 21, 2021

SUSTAINABLE BUILDING PARTNERS

1	0	0	Integrative Process		Possible Points:	1
Y	?	N				
1			Credit 1	Integrative Process		1

13	2	1	Location and Transportation		Possible Points:	16
Y	?	N				
		16	Credit 1	LEED for Neighborhood Development		16
1			Credit 2	Sensitive Land Protection		1
	2		Credit 3	High Priority Site		2
5			Credit 4	Surrounding Density & Diverse Uses		5
5			Credit 5	Access to Quality Transit		5
		1	Credit 6	Bicycle Facilities		1
1			Credit 7	Reduced Parking Footprint (v4.1)		1
1			Credit 8	Electric Vehicles (v4.1)		1

PATH 1	16
PATH 2	1
	2
	5
	5
	1
	1
	1

5	4	1	Sustainable Sites		Possible Points:	10
Y	?	N				
Y			Prereq 1	Construction Activity Pollution Prevention		Required
1			Credit 1	Site Assessment		1
	1	1	Credit 2	Site Development - Protect or Restore Habitat		2
1			Credit 3	Open Space		1
	3		Credit 4	Rainwater Management		3
2			Credit 5	Heat Island Reduction		2
1			Credit 6	Light Pollution Reduction		1

5	3	3	Water Efficiency		Possible Points:	11
Y	?	N				
Y			Prereq 1	Outdoor Water Use Reduction		Required
Y			Prereq 2	Indoor Water Use Reduction		Required
Y			Prereq 3	Building-Level Water Metering		Required
1	1		Credit 1	Outdoor Water Use Reduction		2
3	2	1	Credit 2	Indoor Water Use Reduction		6
		2	Credit 3	Cooling Tower Water Use (v4.1)		2
1			Credit 4	Water Metering		1

14	3	16	Energy and Atmosphere		Possible Points:	33
Y	?	N				
Y			Prereq 1	Fundamental Commissioning and Verification		Required
Y			Prereq 2	Minimum Energy Performance		Required
Y			Prereq 3	Building-Level Energy Metering		Required
Y			Prereq 4	Fundamental Refrigerant Management		Required
3		3	Credit 1	Enhanced Commissioning		6
8	3	7	Credit 2	Optimize Energy Performance		18
1			Credit 3	Advanced Energy Metering		1
		2	Credit 4	Demand Response		2
		2	Credit 5	Renewable Energy Production		3
		1	Credit 6	Enhanced Refrigerant Management		1
2		1	Credit 7	Green Power and Carbon Offsets		2

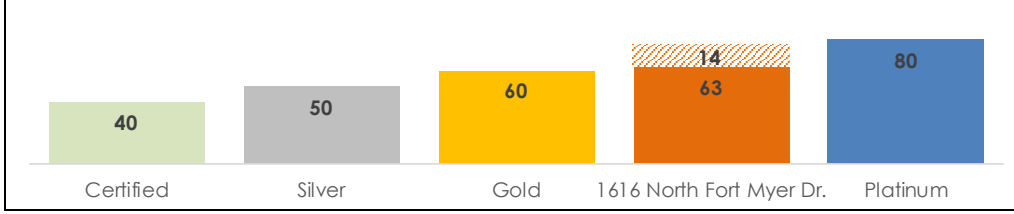
8	0	5	Materials and Resources		Possible Points:	13
Y	?	N				
Y			Prereq 1	Storage and Collection of Recyclables		Required
Y			Prereq 2	Construction and Demolition Waste Management Planning		Required
3		2	Credit 1	Building Life-Cycle Impact Reduction		5
2			Credit 2	Product Disclosure & Optimization - EPDs		2
		2	Credit 3	Product Disclosure & Optimization - Sourcing of Raw Materials		2
1		1	Credit 4	Product Disclosure & Optimization - Material Ingredients		2
2			Credit 5	Construction and Demolition Waste Management		2

8	1	7	Indoor Environmental Quality		Possible Points:	16
Y	?	N				
Y			Prereq 1	Minimum Indoor Air Quality Performance		Required
Y			Prereq 2	Environmental Tobacco Smoke Control (v4.1)		Required
2			Credit 1	Enhanced Indoor Air Quality Strategies		2
3			Credit 2	Low-Emitting Materials (v4.1)		3
1			Credit 3	Construction Indoor Air Quality Management Plan		1
		2	Credit 4	Indoor Air Quality Assessment (v4.1)		2
1			Credit 5	Thermal Comfort		1
	1	1	Credit 6	Interior Lighting		2
		3	Credit 7	Daylight		3
1			Credit 8	Quality Views		1
		1	Credit 9	Acoustic Performance		1

6	0	0	Innovation		Possible Points:	6
Y	?	N				
1			Credit 1.1	Exemplary Performance: BPDO: EPDs		1
1			Credit 1.2	Exemplary Performance: Heat Island Reduction		1
1			Credit 1.3	Innovation Credit: Assessments for Planning and Resilience		1
1			Credit 1.4	Innovation Credit: Green Education		1
1			Credit 1.5	Pilot Credit: Integrative Analysis of Building Materials		1
1			Credit 2	LEED Accredited Professional		1

3	1	0	Regional Priority Credits		Possible Points:	4
Y	?	N				
1			Credit 1	Access to Quality Transit (thrsh: 4 pts)		1
1			Credit 2	Green Vehicles		1
1			Credit 3	Reduced Parking Footprint		1
	1		Credit 4	Optimize En. Perf. (thrsh: 10 pts), Rainwater Mgmt (thrsh: 3 pts)		1

63	14	33	Possible Points: 110



LEED v4 for BD+C New Construction

1616 North Fort Myer

October 21, 2021

Concept Drawings - 4/22/21 and 5/13/21

Scorecard

Credit		Requirement & Comments	Yes	Maybe	Responsible Party	Action	Drawing Reference
General							
General	LEED Certification Level ArlCo Site Plan Condition Alignment	Project is required to achieve LEED Gold as required by Arlington County for 0.25 bonus density.			Monument Realty	**No action required at this time.**	--
General	2020 Green Incentive Policy	Summary of elements to be included in project: - LEED Gold - ENERGY STAR Score 75 - 20% energy cost savings - In-unit ENERGY STAR appliances and fixtures (clothes washer, dishwasher, clothes dryer, refrigerators, and 90% of lighting) - WaterSense labeled in-unit toilets, lavatory faucets, and showerheads - Refrigerant leakage verification by CxA - Air sealing of central ventilation and exhaust duct w/ aerosolized duct sealant - Human interaction with nature - Bird-friendly glass - 4% EV charging stations and 15% EV ready - Renewable Energy (2W/sf, or 12% green roof with 1.5W/sf, or 1 pt under LEED v4.1 Renewable Energy Credit-Tier 2). - Light pollution reduction for 90% of exterior fixtures (do not emit above 90 degress with no sag/drop lenses and ≤3000K temperature; must also be placed on motion/photo/timeclock control - Equity, diversion, and inclusion program by one development team member			Monument Realty	Team acknolwedges full 2020 Green Incentive Policy requirement and will incorporate them into the project.	--
General	Area	GSF = 663,385 sf Residential = 663,385 sf Units = 615 Parking = 323			Arquitectonica	Confirm the areas and unit counts are accurate.	
General	Occupancy	FTE = 5 Visitors = 146 Residents = 1455			Arquitectonica	No Action Required. Counts are based on LEED Default Occupancy Calculations.	
General	LEED Project Boundary	Follows building footprint, ~51,525 sf			Vika	Comment on LEED Project Boundary relative to the [Rainwater Management and Heat Island credits].	
Integrative Process							
Credit 1	Integrative Process	Required: Identify opportunities for synergies across disciplines and building systems, through an analysis of energy and water-related systems and a LEED charrette. At concept design or before completion of SD: - Perform simple box energy model - Perform simple water budget analysis - Complete the BOD and OPR (commissioning requirements) Discussed: Box model analysis shows >20% energy cost savings and potential for 25% energy cost savings.	1		Monument Realty	No action required at this time.	--
					Arquitectonica	No action required at this time.	--
					Dewberry	Include EEOs for a Path to >25% energy cost savings.	--
					Vika	No action required at this time.	--
Location and Transportation							
Credit 2	Sensitive Land Protection	Required Option 1: Locate the development footprint on land that has been previously developed. Observed: Project located on previously developed site.	1		Vika	**No Action Required**	--
Credit 3	High Priority Site	Required Option 3: (2 pts) Brownfield Redevelopment Discussed 5/20/21: Not aware of any on-site contamination at this time; Geotech report will be issued in a couple of weeks.		2	Monument Realty	Provide copy of Geotech report, once available to determine credit feasibility.	--
Credit 4	Surrounding Density and Diverse Uses	Required Option 1: (2-3 pts) Surrounding Density Observed: Anticipated based on similar projects.	3		SRP	**No Action Required**	**e achieved for a**

Scorecard

Credit		Requirement & Comments	Yes	Maybe	Responsible Party	Action	Drawing Reference
Credit 4	Surrounding Density and Diverse Uses	Required Option 2: (1-2 pts) Diverse Uses Observed: Anticipated based on similar projects.	**2**		SBP	No Action Required	--
Credit 5	Access to Quality Transit	Required: Locate the project within 1/2-mile of metro or 1/4-mile of bus lines. Demonstrate the number of weekday/weekend trips as follows: Option 1: (1 pt) 72/40 Option 2: (3 pts) 144/108 Option 3: (5 pts) 360/216 Observed: 437 weekday trips / 229 weekend trips	**5**		SBP	**No Action Required**	--
Credit 7	Reduced Parking Footprint v4.1 credit substitution	Required Option 2: Reduce Parking Number of spots does not exceed the minimum local code requirements for parking capacity and parking is reduced by 30% per ITE Handbook. Observed and Discussed 5/20/21: Parking does not exceed zoning. 323 parking spaces provided and 991 required per ITE = 67% parking reduction for EP.	**1**		Arquitectonica	**No Action Required**	--
Credit 8	Electric Vehicles v4.1 credit substitution ArlCo Site Plan Condition Alignment	Required: Provide electric charging spaces for 2% of parking capacity OR provide electric vehicle ready spaces for 6% of parking capacity (4% EV charging stations (13) and 15% (49)EV ready for ArlCo). Discussed 5/20/21: Load letter currently allows for 22%, but will plan for 25% (81 spaces) or parking with EV Charging Stations/EV-Ready to meet ArlCo requirements.	**1**		Monument Realty	Select an EV Charging Station to be used for 13 spaces.	--
					Dewberry	Of the 81 spaces, located at least 13 spaces with EV Charging Stations. Provide conduit and panel space for the remaining 68 spaces to support 25% of parking with EV charging infrastructure.	
Sustainable Sites							
Prereq 1	Construction Activity Pollution Prevention	Required: Erosion and Sediment Control Plan must conform to 2012 EPA Construction General Permit (CGP) or more stringent local regulations.	**Y**		Vika	Include compliant erosion and sediment control measures in the drawings.	--
Credit 1	Site Assessment	Required: Provide documentation explaining if/how the following site features influences the project design: - Topography - Hydrology - Climate - Vegetation - Soils - Human Use - Human Health Effects	**1**		Vika	Provide the Geotechnical Report or any preliminary Site Assessment of existing conditions for SBP to review.	--
					SBP	SBP to complete site assessment credit documentation.	--
Credit 2	Site Development - Protect or Restore Habitat v4 credit	Required Option 2 (1 pt): Preserve and protect 40% of the greenfield area on the site (if area exists). Donate $0.40 per sf (total site area) to approved conservation organizations (i.e NFWF)		**1**	Monument Realty	No action required at this time. Back pocket credit if needed. Would require a NFWF purchase for approximately $20,500.	--
Credit 3	Open Space	Required: Provide outdoor space ≥ 30% of the total site. 25% of the outdoor space must be vegetated or have overhead vegetated canopy. Turf does not count towards vegetation. Outdoor space must be physically accessible. Observed: 24,800 sf (48%) of open space (terraces + accessible green roof) located on Level 3, 4, and 30. 8,650 sf (35%) of green roof provided within open space.	**1**		Landscape	**No action required.** Notify SBP of any changes to the roof and SBP will determine if compliance is still achieved.	--
Credit 4	Rainwater Management v4 credit	Required: Option 1 Manage on-site runoff for the following percentile rainfall events as determined by the EPA Technical Guidance on Implementing the Stormwater Runoff Requirements under Section 438. - Path 1: 95th percentile (2 pts) - Path 2: 98th percentile (3 pts) - Path 3: 85th percentile (3 pts) Zero Lot line projects Discussed 5/20/21: Large bioretention planter on Level 3. Refining stormwater calcs and will determine percentile storm event being captured. Will explore collection and re-use of stormwater for irrigation on Level 4.		**3**	Vika	Complete design of Level 3 bioretention and determine percentile storm event being managed. Consider and optimize roof area being directed to bioretention facility. Consider collection and re-use of stormwater for irrigation (Level 4).	--

Scorecard

Credit		Requirement & Comments	Yes	Maybe	Responsible Party	Action	Drawing Reference
Credit 5	Heat Island Reduction	Required: Option 1 (2 pts) - Nonroof and roof. Nonroof (/0.5) + Roof (/0.75) + Vegetated Roof (/0.75) > Total Site Paving Area + Roof Observed: 6,880 sf of contributing green roof on Level 5 & 30 and 18,271 sf of potential high-SRI roofing. When weighted, total 33,500 sf of compliant roof area which is > 29,400 sf of contributing roof area.	1		Arquitectonica	Select a high SRI roofing product for High-roof (SRI 100 suggested).	--
					Landscape	Confirm total green roof area. 13,330 sf Level 3, 12,005 sf Level 4, 285 sf Level 5, 6595 sf Level 30.	--
Credit 5	Heat Island Reduction	Required: Option 2 (1 pt) - 75% of parking is undercover Observed: All parking located undercover.	1		Arquitectonica	**No action required.**	--
Credit 6	Light Pollution Reduction ArtCo Green Incentive Policy Alignment	Option 1: Backlight uplight glare (BUG) method. Can be included in luminaire cut sheets. - Uplight = U3 - Trespass = backlight & glare requirements in Appendix. Most restrictive are B1 and G3 for building mounted or G0 for all other fixtures. Observed: LZ3	1		Dewberry	Select full cut-off exterior lights that have BUG ratings that meet B1-U3-G3 (building mounted) and B1-U3-G0 (all other fixtures). Place facade and landscape lighting on timeclock control to be exempt from BUG rating requirements.	--
Water Efficiency							
Prereq 1	Outdoor Water Use Reduction	Required Prereq: Reduce irrigation by 30% (prereq)	Y		Vika	Confirm extent of irrigation to be provided. Use drip, moisture sensors, and smart controllers to achieve 50%+ water use reduction. Consider collecting and re-using rainwater for irrigating Level 4 green roof.	--
Credit 1	Outdoor Water Use Reduction	Required Option 1: No irrigation (2 pts)					--
Credit 1	Outdoor Water Use Reduction	Required Option 2: 50% Reduction (1 pt), 100% Reduction (2 pts) Strategies include drought tolerant plantings, drip irrigation, moisture control sensors, or cisterns. Discussed 5/20/21: Level 3 bioretention; potential for stormwater reuse for Level 4 green roof	1	1			--
Prereq 2	Indoor Water Use Reduction ArtCo Green Incentive Policy Alignment	Required (Prerequisite): 1. Reduce indoor water use by 20% 2. All qualifiable plumbing fixtures must be labeled EPA WaterSense 3. ENERGY STAR residential clothes washer and dishwasher. 4. Process Water: a) No once through cooling for heat rejecting equipment b) Cooling tower and evaporative condensers must have: - makeup water meters - conductivity controllers - efficient drift eliminators Discussed 5/20/21: Will request property management feedback on suggested flow rates.	Y		Arquitectonica	Target 35% water use reduction. Potential flow rates to achieve targeted savings: WC - 1.0 gpf (and WaterSense) Lav - 1.0 gpm (and WaterSense) Showerhead - 1.8 gpm (and WaterSense) Kitchen Faucet - 1.5 gpm Select ENERGY STAR clothes washers, dishwashers, and refrigerators.	--
Credit 2	Indoor Water Use Reduction	Required: Reduce demonstrate a water use reduction from UPC/IPC baseline and EPAct 1992 standards. 25% (1 pt), 30% (2 pts), **35% (3 pts),** 40% (4 pts), 45% (5 pts), 50% (6 pts) Discussed 5/20/21: Will request property management feedback on suggested flow rates.	3	2	Arquitectonica		--
Prereq 3	Building-Level Water Metering ArtCo Green Incentive Policy Alignment	Required: Design to include whole building water meter and provide meter data to USGBC for 5 years.	Y		Monument Realty	Sign and add company letterhead to the Owner Letter of Commitment provided by SBP.	--
					Dewberry	Indicate the location of the whole building water meter in the drawings.	--
Credit 4	Water Metering	Required: Install permanent water submeters for two or more of the following: irrigation, indoor plumbing fixtures, domestic hot water, boiler (min 100,000 gal/yr), reclaimed water, or cooling tower.	1		Dewberry	Add submeters to pool and irrigation.	--
Energy and Atmosphere							

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Concept Drawings - 4/22/21 and 5/13/21

Scorecard

	Credit	Requirement & Comments	Yes	Maybe	Responsible Party	Action	Drawing Reference
Prereq 1	Fundamental Commissioning and Verification	Required: Contract Commissioning Agent to commission energy systems in the building. Note that Fundamental Commissioning now requires a contract at beginning of DD, includes a review of the mid-construction documents, and includes review of the building envelope. Observed: CxA not hired at this time.	Y		Monument Realty	Hire a CxA by DD. Develop OPR and BOD.	--
Credit 1	Enhanced Commissioning	Option 1: Enhanced systems commissioning (3-4 pts) - Path 1: (3 pts) Enhanced Commissioning (similar to v2009) - Path 2: (4 pts) Enhanced Monitoring-based commissioning Achieve Path 1 AND include procedures and measurement points in the commissioning plan.	3		Monument Realty	Hire a CxA by DD.	--
Prereq 2 / Credit 2	Minimum / Optimize Energy Performance ArlCo Green Incentive Policy Alignment	Required: Meet mandatory provisions and demonstrate 12% energy improvement beyond ASHRAE 90.1-2010. (5% required for Prerequisite) 6%-1pt, 8%-2pts, 10%-3pts, 12%-4pts, 14%-5pts, 16%-6pts, 18%-7pts, **20%-8pts**, 22%-9pts, 24%-10pts, 26%-11pts, 29%-12pts, 32%-13pts, 35%-14pts, 38%-15pts, 42%-16pts, 46%-17pts, 50%-18pts 2019 Green Incentive Policy: 20% required for 0.25 FAR Discussed 5/20/21: Systems - VRF, central domestic hot water system Performance - Box model results show path to 25%+. Will track 20% and identify and present and decide on measures to achieve 25%. Electrification - Explore non-electric resistance for DOAS; Appliances will be electric (load designed for electric appliances), but gas option will be provided to Condos.	8	3	Dewberry	Identify and present energy efficiency measures to achieve 25% energy cost savings. Explore non-electric resistance for DOAS.	--
Prereq 3	Building-Level Energy Metering ArlCo Green Incentive Policy Alignment	Required: Install building energy meters to encompass all energy used by the building and provide meter data to the USGBC for 5 years.	Y		Monument Realty	Sign & add letterhead on Energy Sharing Commitment letter provided by SBP.	--
					Dewberry	Show building-level electrical and gas meters on drawings.	--
Prereq 4	Fundamental Refrigerant Management	Required: Do not use CFC based refrigerants	Y		Dewberry	Note refrigerants within mechanical schedule.	--
Credit 3	Advanced Energy Metering ArlCo Green Incentive Policy "Extra" Alignment	Required: In addition to the whole building energy meters, install submeters to monitor all energy end uses that represent 10% or more of the total annual consumption of the building. Meters must use BAS or other network, must store data for minimum of 36 months, data must be remotely accessible, must record consumption and demand, must report hourly, daily, monthly and annual. Discussed 5/20/21: Common area end uses can be submetered.	1		Dewberry	Use energy model to determine the applicable end uses that represent 10% or more of annual consumption and must be metered. Identify additional metering infrastructure and equipment required to achieve credit.	--
Credit 7	Green Power and Carbon Offsets ArlCo Green Incentive Policy Alignment	Required: Purchase carbon offsets, RECs, or green power for the threshold of annual building energy use for 5 years. 1pt - 50%, 2 pts - 100% Discussed 5/20/21: Explore installation of PV on high roof. Early estimate - 15% of high roof dedicated to PV could meet ArlCo policy requirements.	2		Monument Realty	No action required at this time. If on-site PV not provided, purchase 50%-100% of annual energy use for 5 years (exceeds ArlC Policy requirements of 10% over 10 years).	--
Materials and Resources							
Prereq 1	Storage/Collection of Recyclables	Required: Provide an easily-accessible, dedicated area for the collection and storage of paper, cardboard, glass, plastics, and metals. Additionally, provide collection areas for 2 of the following: batteries, mercury lamps, and/or electronic waste	Y		Arquitectonica	Show recycling chute. Identify a location for collection and storage or batteries and electronic waste.	--

Scorecard

	Credit	Requirement & Comments	Yes	Maybe	Responsible Party	Action	Drawing Reference
Prereq 2	Construction and Demolition Waste Management Planning	Required: Develop and implement a Construction Waste Management plan that identifies 5 main materials targeted for recycling during construction.	**Y**		Arquitectonica	SBP to provide Spec 017419 at DD for inclusion in Project Manual.	--
Credit 1	Building Life-Cycle Impact Reduction v4 credit ArtCo Green Incentive Policy "Extra" Alignment	Required Option 4: Whole Building LCA (3-4 pts) v4.1 Path 3 (3 pts): Conduct an LCA that demonstrates a 10% reduction in 3 of 6 impact categories, one of which must be Global Warming Potential (GWP). v4.1 Path 4 (4 pts): Incorporate building reuse for the proposed design. Conduct an LCA that demonstrate a 20% reduction in GWP and a 10% reduction in two additional impact categories. Paths 3/4: No impact category may increase more than 5% compared to the baseline building. Discussed 5/20/21: Will pursue LCA	**3**		Arquitectonica	1. Provide REVIT files. 2. Quantify material reduction strategies deployed, relative to an industry standard or early design. SBP will facilitate brainstorming session as part of LCA Kick-off Meeting.	--
					Structural	1. Consider using performance specifications and stating max cement content for each mix design. Provide feedback to SBP on cement reduction opportunities. 2. Quantify material reduction strategies deployed, relative to an industry standard or early design. SBP will facilitate brainstorming session as part of LCA Kick-off Meeting.	--
Credit 2	Building Product Disclose and Optimization (BPDO): EPDs v4 credit	Required Option 1: Use 20 different permanently installed products, sourced from at least 5 different manufacturers, with EPDs. - Critically reviewed LCA - 0.25 products - Industry-Wide EPD - 0.5 products - Product-Specific Type III EPD - 1 product	**1**		Arquitectonica	SBP to provide Spec 018113 and Spec Language at DD for inclusion in Project Manual.	--
					Interior Designer		--
Credit 2	Building Product Disclose and Optimization (BPDO): EPDs v4.1 credit substitution	Required Option 2: Use products that comply with criteria for 10% by cost of the total value of permanently installed products, or at least 10 products. - Life Cycle Impact Reduction Action Plan - 50% cost or 1/2 product - Life Cycle Impact Reductions in Embodied Carbon - Any reduction in GWP - 100% cost or 1 products - 10% reduction in GWP - 150% cost or 1.5 products - 20% reduction in GWP - 200% cost or 2 products - Products also locally sourced (w/i 100 miles) - double their contribution up to 200% cost or 2 products	**1**		Arquitectonica	SBP to provide Spec 018113 and Spec Language at DD for inclusion in Project Manual.	--
					Interior Designer		--
Credit 4	Building Product Disclose and Optimization (BPDO): Material Ingredients v4 credit	Option 1 *Material Ingredient Reporting* (1 pt) - Use at least 20 products, from 5 different manufacturers, with one of the following certifications indicating that their material ingredients have been reported and their environmental and health impacts are minimal. - Health Product Declaration - Cradle to Cradle (v2 Basic / v3 Bronze or higher) - Cradle to Cradle Material Health Certificate (Bronze or higher) - Declare - UL Product Lens Certification - ANSI/BIFMA e3 Furniture Sustainability Standard (3 points or higher)	**1**		Arquitectonica	SBP to provide Spec 018113 and Spec Language at DD for inclusion in Project Manual.	--
					Interior Designer		--
Credit 5	Construction and Demolition Waste Management v4 credit	Option 1 *Diversion* Path 1: Divert 50% and 3 Material Streams (1 pt) Path 2: Divert 75% and 4 Material Streams (2 pts)	**2**		Arquitectonica	SBP to provide Spec 017419 at DD for inclusion in Project Manual.	--
Indoor Environmental Quality							
Prereq 1	Minimum Indoor Air Quality Performance	Required for Mechanically-Ventilated Buildings: 1. Meet the minimum requirements of ASHRAE 62.1-2010 and demonstrate with room-by-room calculations in USGBC Calculator (https://www.usgbc.org/resources/minimum-indoor-air-quality-performance-calculator). 2. Provide airflow monitoring with alarm capabilities (when/if OA varies by 15% or more) on VAV OA equipment. Constant volume: balance outdoor airflow as defined in 62.1–2010. Install a current transducer on the supply fan, an airflow switch, or similar monitoring device. 3. Install CO sensors in any closed combustion or power vented equipment (if applicable).	**Y**		Dewberry	1. Meet ASHARE 62.1-2010 ventilation requirement, but manage ventilation rates relative to energy performance implications. 2. Show airflow monitoring devices on all applicable OA equipment 3. Show CO sensors at combustion equipment (if applicable)	--

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Concept Drawings - 4/22/21 and 5/13/21

Scorecard

Credit		Requirement & Comments	Yes	Maybe	Responsible Party	Action	Drawing Reference
Prereq 2	Environmental Tobacco Smoke (ETS) Control v4.1 credit substitution	Required: Prohibit smoking in the building and within 25 feet of entries, outdoor air intakes and operable windows. Provide a robust no smoking policy highlighting communication and enforcement of no smoking policy. Observed:	**Y**		Arquitectonica	Provide exhibit with locations and detail of no smoking signage at main building entrances.	--
					Monument Realty	Provide building specific no smoking policy.	
Credit 1	Enhanced Indoor Air Quality Strategies	Required Option 1: Enhanced IAQ Strategy (1 pt) - For mechanically ventilated implement all of the following. a) Entryway Systems - 10ft in direction of travel b) Interior Cross contamination prevention - Exhaust hazardous gas areas c) Filtration - MERV 13 filtration on all OA	**1**		Arquitectonica	Option 1: 1. Show 10' long walk-off mats inside all building entrances (not required at egress-only doors). 2. Ensure housekeeping rooms, laundry rooms, and any rooms with chemicals have deck-to-deck partitions, hard lid ceiling, and/or self closing doors.	
					Dewberry	Option 1: 2. Ensure housekeeping rooms, laundry rooms, and any rooms with chemicals are directly exhausted to the outdoors. 3. Specify MERV 13 filters in mechanical schedule	--
Credit 1	Enhanced Indoor Air Quality Strategies	Required Option 2: Additional enhanced IAQ strategies(1pt)- Select one of the following: a) Exterior contaminant prevention - model contamination dispersion b) Increased ventilation - 30% over ASHRAE **c) Carbon dioxide monitoring - in all densely occupied spaces (25 people per 1,000 square feet or 1 person per 40 square feet)** d) Additional source control - for spaces where air contaminants are likely (besides CO2) evaluate potential sources of contaminants and alarm if unsafe conditions occur.	**1**		Dewberry	Option 2: Show CO2 sensors in the following spaces (any space with the occupancy ratio of 25 people per 1,000 sf):	
Credit 2	Low-Emitting Materials v4.1 credit substitution	Required: Perform Product Category Calculations for VOCs and Emissions limits for up to 5 of the following categories (2 categories-1 pt, 3 categories-2 pts, **3 categories meeting 90% compliance-3pts**, 4 categories-3 pts, 5 categories-3pts+EP): - Interior paints and coatings **- Flooring** **- Insulation** - Composite Wood (ULEF) **- Ceilings** - Wall Panels - Interior adhesives and sealants - Furniture	**3**		Arquitectonica	SBP to provide Spec 018113 and Spec Language at DD for inclusion in Project Manual. Note: SBP suggests a materials meeting with the Architect and Interior Designer around 50% DD.	--
Credit 3	Construction Indoor Air Quality Management Plan	Required: 1. Develop and Implement IAQ Management Plan during construction that meets updated SMACNA requirements. 2. Prohibit smoking inside the building and within 25 feet of entrances during construction.	**1**		Arquitectonica	SBP to provide Spec 018113 at DD for inclusion in Project Manual.	--
Credit 5	Thermal Comfort	Required: 1. Demonstrate system meets ASHRAE 55-2010 for each space type 2. Provide thermal comfort controls for at least 50% of individual occupant spaces. Provide group thermal comfort controls for all shared multioccupant spaces.	**1**		Dewberry	Include thermostats in 50% of single-occupant spaces (offices) and 100% of multi-occupant spaces.	--
Credit 6	Interior Lighting	Required Option 1: Lighting Control (1pt) Provide individual controls at 3 levels (on, off, midlevel) for 90% of individual spaces. Multioccupant spaces must have 3 levels or multizones, presentation lighting controlled separately, switches must be in same location as luminaires. Discussed 5/20/21: Monument will evaluate what is being done on other properties.		**1**	Monument Realty	Provide feedback as to whether credit will be pursued. Requires multi-level controls in rooms within units (kitchens, dining, living, dens, bedrooms), like switch-controlled outlet and switch-controlled light OR dimmers. Include dimmers or multi-level controls in all offices and multi-occupant spaces as well.	--

Scorecard

Credit		Requirement & Comments	Yes	Maybe	Responsible Party	Action	Drawing Reference
Credit 8	Quality Views	Required: Demonstrate 75% of regularly occupied floor area has at least two of the following: - Multiple lines of sight to vision glazing at least 90 degrees - Views that include at least 2 of the following: (1) flora, fauna, sky (2) movement, (3) objects at least 25 feet from glazing - Unobstructed views located within the distance of 3x head height of vision glazing - Views with a view factor of 3 or greater.	1		Arquitectonica	Calculations will be completed at CDs. Provide line of sight diagram from a seated position through the vision glazing throughout all the regularly occupied spaces.	--
Innovation							
Credit 1.1	Exemplary Performance: BPDO: EPDs	Option 1: Source at least 40 qualifying products from 5 manufacturers ; Option 2: Purchase 75%, by cost, of permanently installed building products that meet the required attributes.	1		Arquitectonica	On track.	--
Credit 1.2	Exemplary Performance: Heat Island Reduction	Achieve both Options 1 and 2. Locate 100% of parking under cover	1		Arquitectonica	On track.	--
Credit 1.3	Innovation Credit: Assessments for Planning and Resilience	Requirements: - Must complete Hazard Assessment - Must complete a Climate Related Risk Management Plan or Emergency Preparedness Plan	1		Monument Realty	Confirm resiliency assessment is desirable. SBP will lead a workshop to help achieve credit.	--
Credit 1.4	Innovation Credit: Green Education	Requirements: Include 2 of the following elements into the education program - Incorporate a comprehensive signage program to educate the occupants and visitors on the benefits of green building - Develop of a manual, guideline, or case study to inform the design of other buildings based on the success of this project - Create an educational outreach program (website or e-newsletter) or guided tour, focusing on sustainable living while using the project as an example	1		Monument Realty	Confirm website content and a case study are desirable.	--
Credit 1.5	Pilot Credit: Integrative Analysis of Building Materials	Requirements: - Use at least 3 different permanently installed products that have a documented LCA (life-cycle assessment) with a qualitative analysis of the potential health, safety, and environmental impacts.	1		Arquitectonica	Include Spec 018113 in Project Manual. SBP will provide at DDs and SBP will complete analysis during construction.	--
Credit 2	LEED Accredited Professional	LEED AP.	1		SBP	**No action required. Jennifer Wolf is LEED AP BD+C.**	--
Regional Priority							
Credit 1	Access to Quality Transit (thrsh: 4 pts)	Access to Quality Transit (thrsh: 4 pts)	1		SBP	**No action required.**	--
Credit 2	Green Vehicles	Green Vehicles	1		Dewberry	Of the 81 spaces, located at least 13 spaces with EV Charging Stations. Provide conduit and panel space for the remaining 68 spaces.	--
Credit 3	Reduced Parking Footprint	Reduced Parking Footprint	1		Arquitectonica	**No action required.**	--
Credit 4	Optimize En. Perf. (thrsh: 10 pts), Rainwater Mgmt	Optimize En. Perf. (thrsh: 10 pts), Rainwater Mgmt (thrsh: 3 pts)		1	Dewberry	Identify and present energy efficiency measures to achieve 25% (10 pts) energy cost savings.	--

Dewberry

1616 North Fort Myer Drive

Schematic Design
Energy Modeling Report

November 15, 2021

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1616 North Fort Myer Drive

SCHEMATIC DESIGN
ENERGY MODELING REPORT

LEED V4
LEED BD+C: CORE AND SHELL DEVELOPMENT

November 15, 2021

Prepared for
Arquitectonica
Monument Realty

Table of Contents

Page

Purpose of Document

1. Establish the ASHRAE Baseline Building Performance:

The baseline building is a theoretical building energy model compliant with the requirements of ASHRAE Standard 90.1-2010. The baseline building energy model establishes the minimum energy performance for use as a basis of comparison between the requirements of ASHRAE and the new Proposed Building.

2. Establish the Proposed Building Performance:

Also compliant with the requirements of ASHRAE 90.1-2010, the performance of the Proposed Building is compared to the performance of the Baseline Building to establish extent of energy saved and reduction in energy related operating costs. Please note, since the energy model for this project includes only purchased electricity and natural gas (no, oil, propane, etc.), and energy costs are calculated using estimated utility rates in the Northern Virginia area, percentage energy savings (consumption) and percentage of energy cost savings are equivalent.

3. Estimate USGBC LEED points for Optimization of Energy Performance:

LEED points will be determined under USGBC LEED v4, LEED BD+C: New Construction, Energy and Atmosphere (EA) Credit Optimize Energy Performance. With a rating scale of 1 to 18 points, LEED points earned increase in proportion to energy dollars savings compared to the Baseline Building.

4. Report the Status of the Energy Modeling effort to date:

This summary overview is intended to be a status report. Current energy model is based on the Architectural Drawings and MEP Design Criteria and System Description issued for 100% Schematic Design on June 4, 2021. The energy model will be updated as the design progresses through Construction Documents, in preparation for final LEED submission.

End of Section

Executive Summary

Based on the current energy modeling results, the Proposed Design represents a significant improvement over the ASHRAE 90.1-2010 Baseline Building in terms of energy consumption and energy related operating costs. Estimated range of energy values below are for a one year period.

1. Estimated Annual Energy Saved:

11,809 Million Btu/year (Electric + Natural Gas)

2. Estimated Annual Energy Cost Saved:

$337,271 (Electric + Natural Gas)

3. Estimated Energy Cost/Consumption Improvement:

22.5% (Energy Saved)
30.3% (Economic Cost Improvement)

4. Energy and Atmosphere Optimize Energy Performance - LEED Points anticipated:

9 Points

5. Energy Star Portfolio Manager - Projected Ranking on a scale of 100:

78

6. Site Energy Use Intensity (EUI) – Projected vs. Median Energy Star Office Building

Projected EUI: 45.0 vs. Median Property EUI: 55.5 (kBtu/ft^2)

End of Section

Methodology

The energy modeling simulation has been performed with Trane TRACE 700 (Version 6.3.5.N), a computer software that utilizes DOE-2.2 algorithms to simulate hourly energy consumption. To develop a model, the energy modeler creates a graphic representation of the building using floor plans, floor-to-floor heights, and envelope configurations. Then HVAC equipment systems are added into the model along with the operating parameters such as lighting/equipment power density and occupancy and building operating schedules.

Generate Baseline and Proposed Building Models - Generate and establish a DOE-2.2 energy model in compliance with ASHRAE 90.1-2010 and a model based on the current design of the building.

Evaluate Baseline Building – Ensure the baseline building meets the LEED and ASHRAE Standard 90.1-2010 requirements.

Evaluate Proposed Building and ECMs – Ensure the building systems and components shown on the design documents are appropriately reflected in the Proposed Building. Incorporate applicable energy conservation measures (ECM) to account for any associated savings that would result in increased energy savings which translate to LEED points in the Energy & Atmosphere category of the LEED Rating System.

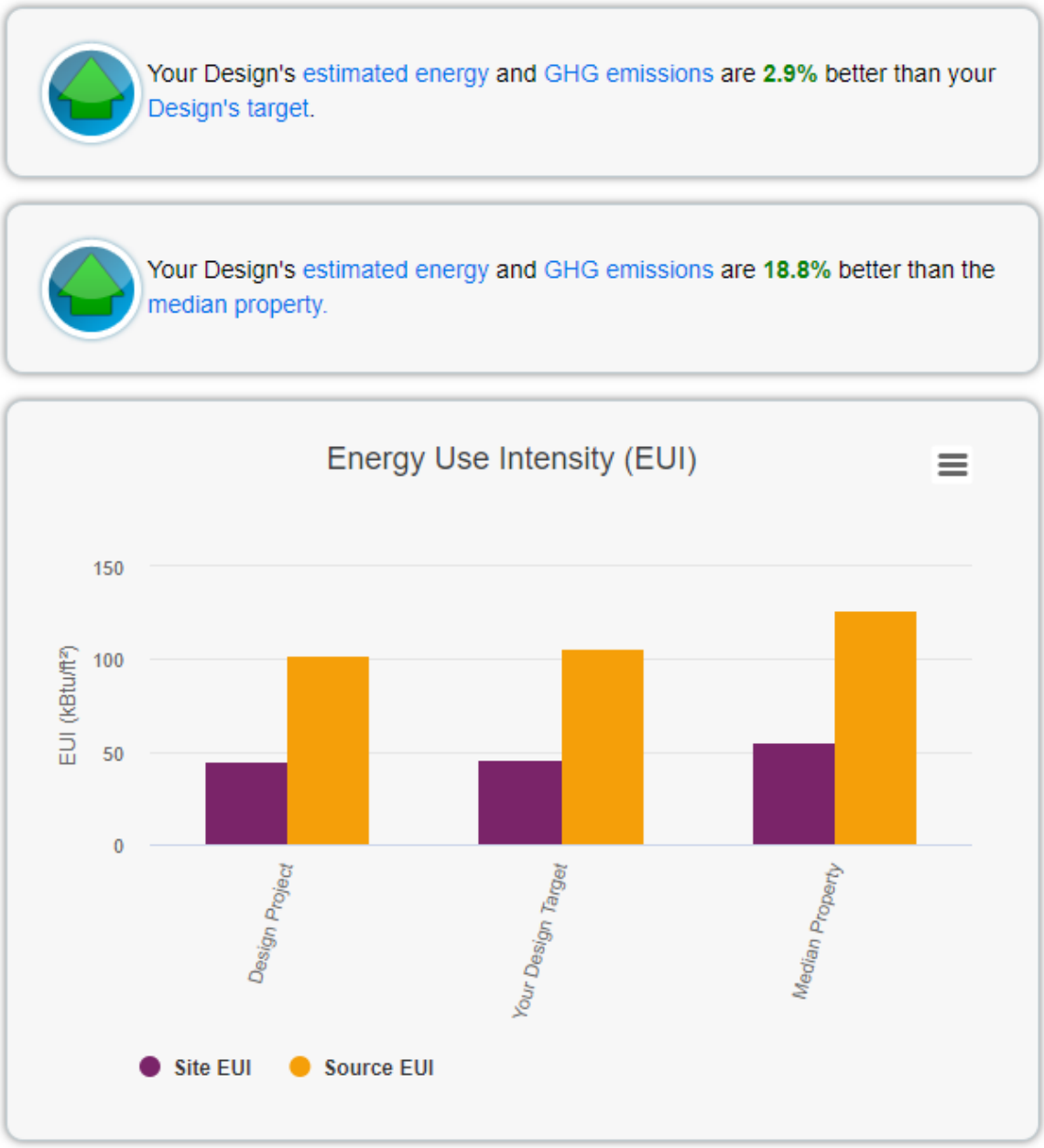
Final Design – Prepare and present the final energy model simulation results with relevant supporting data to USGBC/GBCI, highlighting the energy savings and the potential LEED points to be awarded. LEED points are awarded based on a savings in Energy Cost.

LEED Submission and Review – Communicate and address questions and comments that may arise during the LEED review process from a LEED reviewer.

End of Section

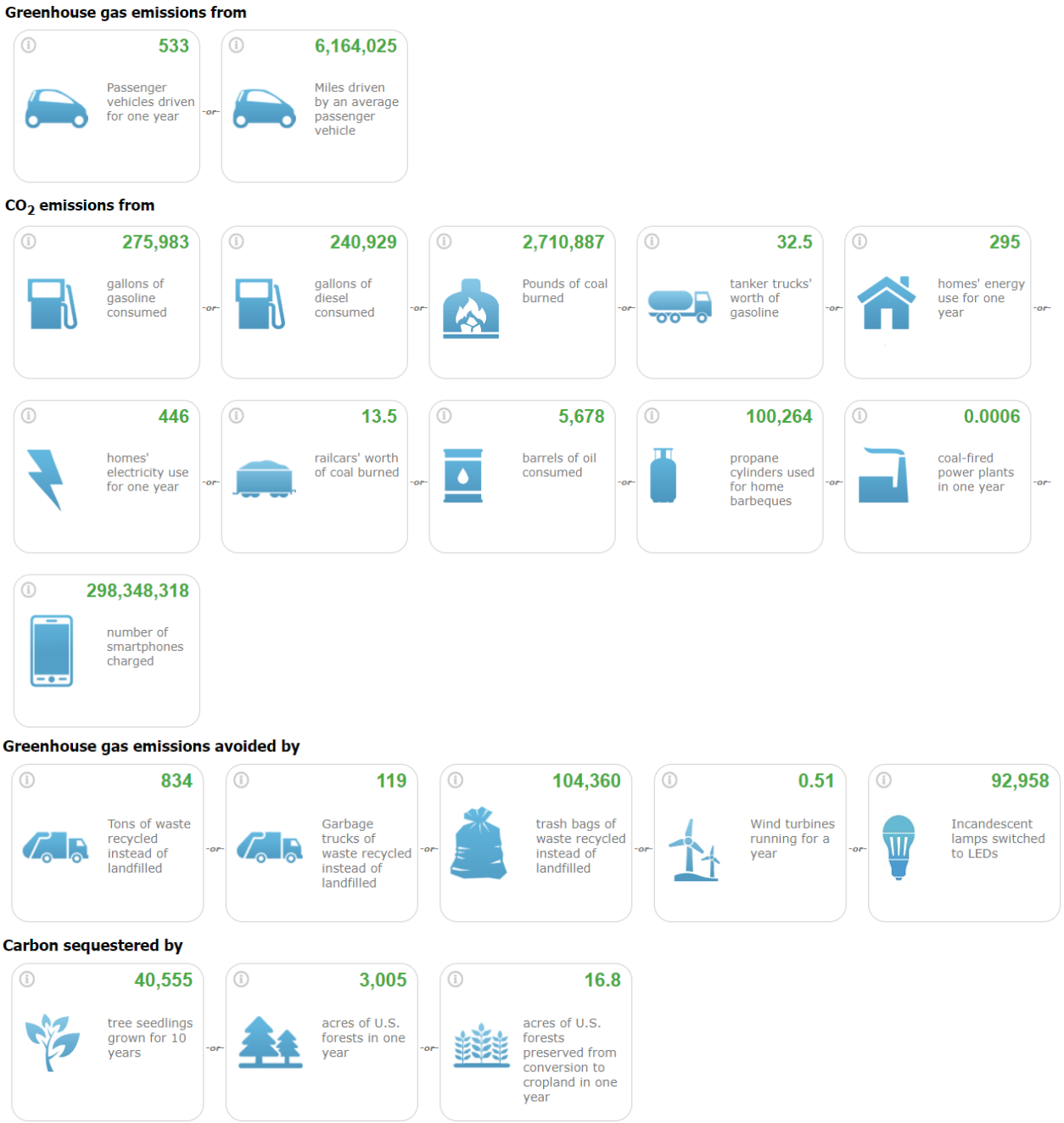
Energy Star Ranking – 78

Energy Star is a ranking system that benchmarks building energy usage. It is intended to be a continuous benchmarking system to help monitor energy usage changes over time. The minimum threshold for recognition as an Energy Star building is 75, meaning that a building performs within the top 25% of similar buildings nationwide. A rating of 78 puts 1616 N Ft Myer within this top 25% of similar buildings.



Energy Saving Equivalents and Comparisons

The 1616 North Ft Myer project will be an energy efficient, sustainable, and environmentally responsible building with a focus on the health, well-being, and comfort of the building occupants. Compared to the energy code compliant base-line building, energy savings of the proposed building is equivalent to:



Source - Environmental Protection Agency (EPA):
https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
Input: 3,460,876 kilowatt-hours of electricity

Energy Conservation Measures

1. **High performance building envelope system:** Low fenestration U-values and low Solar Heat Gain Coefficient as compared to the minimum requirements of ASHRAE 90.1-2010. The basis of design for this report will be a glass assembly with a shading coefficient of 0.225 and a U-value of 0.376.

2. **Outside Air Energy Recovery System:** The proposed building utilizes an air-to-air enthalpy heat recovery wheel to pre-condition the outside air at the penthouse level before entering into the building.

    a. In the summer, the enthalpy wheel lowers the entering dry bulb and wet bulb air temperatures from the outside air. This results in an overall outside air cooling tonnage reduction of approximately 40%. The reduced cooling tonnage reduces the size of the air-cooled outside air handling unit including internal compressors, condenser fans, etc.

    b. In the winter, the enthalpy wheel raises the entering dry bulb air temperature from the outside air, prior to reheating the outside air to room-neutral conditions for direct distribution to each dwelling unit. This results in an overall outside air heating reduction of approximately 75%. The reduced heating capacity reduces the amount of natural gas reheat required in the winter.

4. **High Efficiency Variable Refrigerant Flow (VRF) Mechanical System:** The Proposed Building has utilizes an air-cooled heat recovery VRF system (one system per half of two stacked floors). Condensing units located on the roof and within the garage reject heat from the building via refrigeration piping connected to indoor air handling units distributed throughout the building.

5. **High Efficiency Fan Systems:** Low fan energy usage for indoor VRF air handling units located at each dwelling unit is typical for this type of system, due to low internal pressure drop for each air handling unit.

6. **VRF Energy Recovery:** Under simultaneous heating and cooling modes of operation, usually during the spring and fall seasons, heat is recycled or transferred from one dwelling unit to another via the refrigerant piping system. This is an inherent energy saving features of this type of cooling/heating system.

7. **Pre-Conditioning of Outside Air:**

    a. **Pre-Conditioning of Outside Air:** The outside air HVAC (heating, ventilating, and air conditioning) system includes air conditioning units that pre-filter, pre-condition, and pre-heat the outside air before the outside air is distributed throughout the building. The intent of the outside air HVAC system is to deal with the IAQ, control, temperature, humidity, and moisture challenges associated with outside air before the outside air is introduced throughout the building. This should be compared to the conventional HVAC system that distributes "raw" outside air throughout a building's HVAC system.

    b. **Removal of Moisture:** The outside air system will pre-cool the air during the summer months. This pre-cooling reduces the air conditioning load on the remaining air conditioning systems throughout the building. The pre-cooling also removes moisture and humidity from the outside air. Removal of this moisture allows other air conditioning systems throughout the facility to run with minimal or no condensation with the internal surfaces effectively "dry". Minimizing moisture and eliminating condensate throughout the

HVAC system improves indoor air quality by removing a moisture source for microbiological growth. Minimizing moisture throughout the system also reduces the amount of maintenance required. Dry cooling coils on the typical floor air handling units decrease air pressure drop through the units, reduce fan speed, reduce noise, and lower energy consumption.

8. **Filtration Monitoring:** Outside air handling units will have a system that allows the building engineer to monitor pressure differential across the filter. In addition to regular visual inspection, the operating engineer can accurately determine pressure drop across the filter to aid in determining when dirty filters should be changed. The energy management and control system will provide an alarm when the filter needs to be changed. Improves indoor air quality and increases energy efficiency.

9. **Premium Efficiency Electric Motors:** Superior to standard “high efficiency” motors, all three phase motors are "premium efficiency" motors as defined in accordance with ASHRAE, NEMA, and ANSI/IEEE Standards.

10. **Energy Management and Control System:** All systems are controlled through a digital electronic building management system. This system allows the operators to remotely monitor, control, and automatically optimize the operation of the HVAC systems as well as control the various modes of operation.

11. **Commissioning:** LEED compliant commissioning procedures will be used to ensure compliance with the design criteria and LEED program requirements.

End of Section

Energy Cost Budget / PRM Summary

Energy Cost Budget / PRM Summary

By DEWBERRY

Project Name:	Date: November 15, 2021
City:	Weather Data: Washington DC Reagan

Note: The percentage displayed for the "Proposed/ Base %" column of the base case is actually the percentage of the total energy consumption.

* Denotes the base alternative for the ECB study.

		* Alt-2 ASHRAE Baseline 90.1-1			Alt-1 Zoned Exposures		
		Energy 10^6 Btu/yr	Proposed / Base %	Peak kBtuh	Energy 10^6 Btu/yr	Proposed / Base %	Peak kBtuh
Lighting - Conditioned	Electricity	6,200.5	12	1,818	4,901.4	79	1,436
Space Heating	Electricity	16,400.3	31	12,363	7,615.1	46	2,548
	Gas	0.0	0	0	5,580.6	0	1,770
Space Cooling	Electricity	8,895.0	17	5,093	3,724.2	42	2,038
Heat Rejection	Electricity	849.3	2	379	254.5	30	216
Fans - Conditioned	Electricity	3,439.9	7	416	6,248.2	182	785
Stand-alone Base Utilities	Electricity	8,595.9	16	1,424	5,641.0	66	1,086
	Gas	7,972.2	15	910	6,578.6	83	751
Total Building Consumption		**52,353.2**			**40,543.6**		

		* Alt-2 ASHRAE Baseline 90.1-1	Alt-1 Zoned Exposures
Total	**Number of hours heating load not met**	0	5
	Number of hours cooling load not met	0	1

	* Alt-2 ASHRAE Baseline 90.1-1		Alt-1 Zoned Exposures	
	Energy 10^6 Btu/yr	Cost/yr $/yr	Energy 10^6 Btu/yr	Cost/yr $/yr
Electricity	44,380.9	1,040,279	28,384.4	665,326
Gas	7,972.2	71,751	12,159.1	109,433
Total	**52,353**	**1,112,030**	**40,544**	**774,758**

Additional Information

1. Intended Use:

This report and all contents are prepared for the sole use of Arquitectonica and Monument Realty for the purpose of USGBC/GBCI LEED point documentation on the 1616 North Ft. Myer Drive project. This information is not intended for any other purpose or for any other entities.

2. Comparison Purposes:

The information provided in this paragraph is similar to the information found in ASHRAE Standard 90.1. The estimated energy costs indicated in this document are for comparison purposes only. The estimates contained herein are not predictions of the actual energy consumption or operating costs for the proposed systems due to variations in occupancy density, internal equipment loads, lighting loads, control system operation, building operation and maintenance procedures, actual vs. design equipment performance, weather, energy use not covered by this estimate, changes in utility rate schedules, changes in government regulations, escalation in fuel costs, varying partial load scenarios, and operating hours.

3. Differences in Energy Modeling Performance and Actual Building System Performance:

This energy model was prepared in accordance with the requirements of the applicable portions of the USGBC LEED program and ASHRAE Standard 90.1. These requirements do not necessarily reflect the accurate use, loading, and operation of the building by the actual tenant under future conditions unknown at this time. There will be differences between the predicted energy modeling performance vs. the actual building performance. For more accurate results, under a separate and future scope of work, the energy model can be modified to reflect input from the tenant(s), landlord, and building operating personnel including but not limited to the following: floor by floor tenant occupancy density, floor by floor operating schedule, room by room or zone by zone tenant interior loads, as-built tenant HVAC system zoning, zone by zone tenant room set point temperatures, floor by floor tenant ventilation rates, utility energy rates negotiated by the landlord, and the peak and part load performance of the equipment installed on this project.

4. Energy Code Compliance:

A Performance Rating Method (PRM) energy model performed in accordance with ASHRAE 90.1-2010 Informative Appendix G for the purposes of documenting LEED points under USGBC LEED v4, LEED BD+C: Core and Shell Development, Energy and Atmosphere (EA) Credit Optimize Energy Performance is not the same as an Energy Cost Budget (ECB) Method energy model performed in accordance with ASHRAE 90.1-2010 Chapter 11 for the purposes of demonstrating energy code compliance.

End of Section

Skip to Page Content: Alt+Shift+C Skip to Common Website Menu: Alt+Shift+M Skip to Public Website Menu: Alt+Shift+P

ENERGY STAR® Portfolio Manager®

Portfolio Manager

Help

Target Finder Results

Based on the information you have provided, we have calculated metrics to help you understand the energy efficiency associated with your current design and/or target (jump to the detailed table below). For a print out of this information, you can download your Statement of Energy Design Intent.

Your Design Score

58
Your design is not eligible for Designed to Earn the ENERGY STAR.

Did you know that property design projects can achieve Designed to Earn the ENERGY STAR for meeting energy efficient criteria? Learn more .

Download Your Statement of Energy Design Intent (SEDI)
This document provides an overview of your design and metrics. It is also used for Designed to Earn the ENERGY STAR applications.

Download & Print Statement

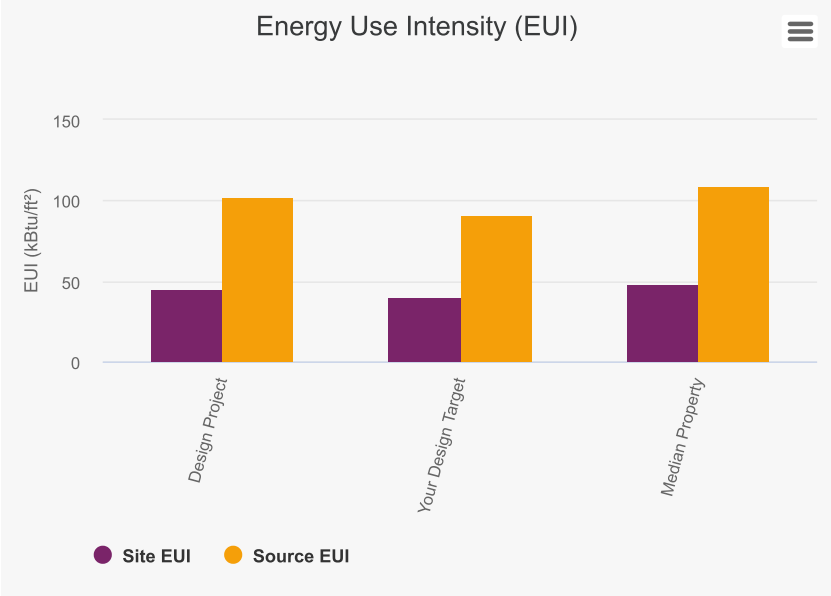
About this Property's Design

Target:	Target ENERGY STAR Score: 75
Uses:	Multifamily Housing (100.0%)
Energy Types:	Electric - Grid (70.0%) Natural Gas (30.0%)

Edit

Your Design's estimated energy and GHG emissions are 12.9% worse than your Design's target.

Your Design's estimated energy and GHG emissions are 5.5% better than the median property.



Metrics Comparison for Your Design and/or Target

Metric	Design Project	Design Target*	Median Property*
ENERGY STAR score (1-100)	58	75	50
Source EUI (kBtu/ft²)	102.5	90.7	108.4
Site EUI (kBtu/ft²)	45.0	39.9	47.7
Source Energy Use (kBtu)	92,243,374.5	81,672,186.7	97,603,107.3
Site Energy Use (kBtu)	40,543,499.2	35,897,172.1	42,899,249.8
Energy Cost ($)	774,951.36	686,141.16	819,979.13
Total GHG Emissions (Metric Tons CO2e)	3,208.4	2,840.7	3,394.8

* To perform calculations for your design target, we use the fuel mix that you've entered for your design energy estimates. If you have not entered estimated design energy, we'll use the average for your state. To perform calculations for the national median, we will assume the fuel mix and operational details of your property measurement in use, if available. Otherwise, we will use your design estimates.

Save Your Design?

By saving your design in Portfolio Manager, you can continue to work with your design and eventually track energy consumption after the property has been constructed and is in use.