



MEMO

TO: Alex Shifflett, CSI, CCCA - KGD Architecture
FROM: Jennifer Mitarotonda, PE, LEED AP
SUBJECT: 223 23rd Street – Preliminary Energy Model
DATE: August 15, 2022

EXECUTIVE SUMMARY

This memo is to inform that WSP has performed the preliminary energy analysis to estimate the % cost savings over ASHRAE 90.1-2010 Appendix G. The analysis was performed in eQuest. A baseline model was created and compared against the proposed design and multiple Energy Conservation Measures (ECM). The baseline model was created according to the standards laid out in ASHRAE 90.1-2010 App. G.

The results of the energy analysis are shown in the table below.

Model Name	Description	Annual Cost	Cost Savings
Baseline	LEED Baseline ASHRAE 90.1-2010 Appendix G	\$ 743,439	-
Proposed	Initial Proposed Design	\$ 659,745	11.3%
ECM 1	Window to Wall Ratio 55%	\$ 648,785	12.7%
ECM 2	Increased Insulation for Precast Concrete Wall	\$ 657,179	11.6%
ECM 3	Low-e Argon for Fixed Window	\$ 634,678	14.6%
Bundle	ECM 1 and ECM 3	\$ 625,487	15.9%

Per the results, a savings of 15% over the baseline can be achieved by selecting all (3) proposed ECMs.

ASSUMPTIONS

Key assumptions made in the proposed design are listed below:

- Lighting Power Density
 - Corridor - 0.66 W/sf
 - Elec/Mech - 0.95 W/sf
 - Garage – 0.19 W/sf
 - Lobby – 0.64 W/sf
 - Stairs – 0.69 W/sf
 - Restrooms – 0.98 W/sf
 - Laundry – 0.6 W/sf



- Storage – 0.63 W/sf
- HVAC System
 - Water Source Heat Pump (residential units)
 - EER – 15, COP – 5
 - DOAS
 - EER – 15, COP – 4.8
 - Boiler: condensing boiler
 - 90% efficiency
- Envelope
 - Window wall ratio – 0.6
 - Opaque wall overall assembly U-value: not worse than U-0.064
 - Glazing:
 - Fixed (80% of glazing area): assembly U-0.38, SHGC-0.275
 - Operable (20% of glazing area): assembly U-0.45, SHGC-0.287
- Roof: U-0.032 (R-30 c.i.)



LEED v4 for BD+C New Construction

223 23rd St

8/15/22



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

14	2	0	Location and Transportation	Possible Points:	16
Y	?	N			
		16	Credit 1 LEED for Neighborhood Development	PATH 1	16
1			Credit 2 Sensitive Land Protection	PATH 2	1
1	1		Credit 3 High Priority Site		2
5			Credit 4 Surrounding Density & Diverse Uses		5
5			Credit 5 Access to Quality Transit (v4.1)		5
	1		Credit 6 Bicycle Facilities (v4.1)		1
1			Credit 7 Reduced Parking Footprint (v4.1)		1
1			Credit 8 Electric Vehicles (v4.1)		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 (v4.1)		2
	1		Credit 3 Open Space		1
3			Credit 4 Rainwater Management		3
1	1		Credit 5 Heat Island Reduction		2
	1		Credit 6 Light Pollution Reduction		1

6	2	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	1	2	Credit 2 Indoor Water Use Reduction		6
1		1	Credit 3 Cooling Tower Water Use (v4.1)		2
1			Credit 4 Water Metering		1

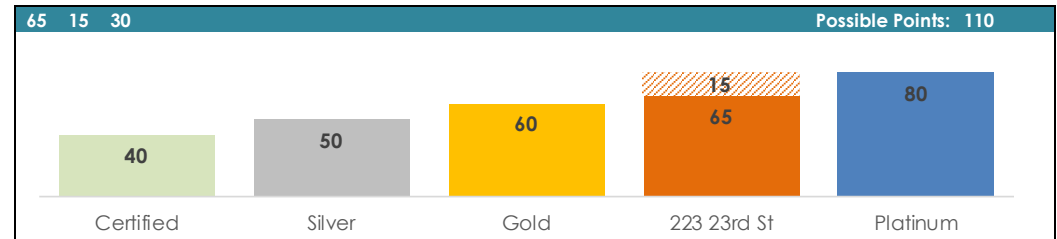
13	4	16	Energy and Atmosphere	Possible Points:	33
Y	?	N			
Y			Prereq 1 Fundamental Commissioning and Verification		Required
Y			Prereq 2 Minimum Energy Performance		Required
Y			Prereq 3 Building-Level Energy Metering		Required
Y			Prereq 4 Fundamental Refrigerant Management		Required
3		3	Credit 1 Enhanced Commissioning		6
5	3	10	Credit 2 Optimize Energy Performance		18
		1	Credit 3 Advanced Energy Metering		1
		2	Credit 4 Demand Response (v4.1)		2
5			Credit 5 Renewable Energy Production (on+offsite) (v4.1)		5
	1		Credit 6 Enhanced Refrigerant Management		1

7	1	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 (v4.1)		5
1	1		Credit 2 Product Disclosure & Optimization - EPDs (v4.1)		2
		2	Credit 3 Product Disclosure & Optimization - Sourcing of Raw Materials (v4.1)		2
1		1	Credit 4 Product Disclosure & Optimization - Material Ingredients (v4.1)		2
2			Credit 5 Construction and Demolition Waste Management (v4.1)		2

9	2	5	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 (v4.1)		3
1			Credit 8 Quality Views		1
		1	Credit 9 Acoustic Performance (v4.1)		1

6	0	0	Innovation	Possible Points:	6
Y	?	N			
1			Credit 1.1 Innovation Credit: TBD		1
1			Credit 1.2 Innovation Credit: TBD		1
1			Credit 1.3 Innovation Credit: TBD		1
1			Credit 1.4 Pilot Credit		1
1			Credit 1.5 Pilot Credit		1
1			Credit 2 LEED Accredited Professional		1

4	0	0	Regional Priority Credits	Possible Points:	4
Y	?	N			
1			Credit 1 Regional Priority: Rainwater Management (Threshold: 3 pts)		1
1			Credit 2 Regional Priority: Access to Quality Transit (Threshold: 4 pt)		1
1			Credit 3 Regional Priority: Electric Vehicles		1
1			Credit 4 Regional Priority: Reduced Parking Footprint		1





LEED v4 for BD+C New Construction

223 23rd St

August 15, 2022

Detailed Checklist



Credit	Requirement & Comments	Responsible Party	Action	Drawing Reference
Integrative Process				
Credit 1	Integrative Process <u>Required:</u> 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)	JBGS	IP analysis completed in SDs. No Further Action Required	--
		KGD		
		WSP		
		Bowman		
Location and Transportation				
Credit 2	Sensitive Land Protection <u>Required Option 1:</u> Locate the development footprint on land that has been previously developed.		Land is previously developed. No Action Required	--
Credit 3	High Priority Site <u>Required Option 2:</u> (1 pt) Priority Designation	JBGS	Project is located in a Difficult Development Area per HUD database. No Action Required	'Web Research
Credit 4	Surrounding Density and Diverse Uses <u>Required Option 1:</u> (2-3 pts) Surrounding Density	SBP	Project is within 1/2 mi walking distance of 10 diverse uses. No Action Required	Web Research
	<u>Required Option 2:</u> (1-2 pts) Diverse Uses			
Credit 5	Access to Quality Transit <u>Required:</u> 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	SBP	Project is served by sufficient quality transit within a 1/4-mi and 1/2-mi radius. No Action Required	Web Research
Credit 7	Reduced Parking Footprint <u>Required Option 2:</u> 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 (1.65 spaces/unit). v4.1 credit substitution	KGD	Parking meets threshold. No Action Required	A1002A
Credit 8	Electric Vehicles <u>Required:</u> Provide electric charging spaces for 5% of parking capacity OR provide electric vehicle ready spaces for 10% of parking capacity. 9 EV charging space - OR - 18 EV-ready spaces v4.1 credit substitution	WSP	Include electrical infrastructure for EV chargers within drawings.	
Sustainable Sites				
Prereq 1	Construction Activity Pollution Prevention <u>Required:</u> Erosion and Sediment Control Plan must conform to 2012 EPA Construction General Permit (CGP) or more stringent local regulations.	Bowman	ESC plans provided in drawings. No Action Required	C14.00, C14.01, C14.10, C14.11
	<u>Required:</u> Provide documentation explaining if/how the following site features influences the project design: - Topography - Hydrology			



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 Detailed Checklist



Credit	Requirement & Comments	Responsible Party	Action	Drawing Reference
Credit 1	Site Assessment - Climate - Vegetation - Soils - Human Use - Human Health Effects	SBP	SBP to complete site assessment credit documentation.	
Credit 4	Rainwater Management v4.1 credit substitution <u>Required:</u> Treat on-site runoff for the following percentile rainfall events by using low impact development (LID) practices. - 80th Percentile (1 pt) - 85th Percentile (2 pts) - 90th Percentile (3 pts)	Bowman	Bioretention and Green roof provided in Civil plans. Complete the Rainfall events calculator.	C15.00 C15.10
Credit 5	Heat Island Reduction <u>Required:</u> Option 2 (1 pt) - 75% of parking is undercover	KGD	Parking underground. No action required	--
Water Efficiency				
Prereq 1	Outdoor Water Use Reduction <u>Required Prereq:</u> Reduce irrigation by 30% (Prereq)	OJB	Complete the EPA Water Budget Tool by end of DDs	--
Credit 1	Outdoor Water Use Reduction <u>Required Option 2: 50% Reduction (1 pt)</u> , 100% Reduction (2 pts) Strategies include drought tolerant plantings, drip irrigation, moisture control sensors, or cisterns.			L-1011 L-6000
Prereq 2 Credit 2	Indoor Water Use Reduction <u>Required (Prerequisite):</u> 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 <u>Required:</u> Reduce demonstrate a water use reduction from UPC/IPC baseline and EPA Act 1992 standards. 25% (1 pt), 30% (2 pts), 35% (3 pts) , 40% (4 pts), 45% (5 pts), 50% (6 pts)	KGD	Recommended plumbing fixture flow rates provided to achieve a water use reduction of 35-40%.	SD MEP Narrative
Prereq 3	Building-Level Water Metering <u>Required:</u> Design to include whole building water meter and provide meter data to USGBC for 5 years.	JBGS	Sign and add company letterhead to the Owner Letter of Commitment provided by SBP.	--
		WSP	Meter included in riser diagram. No Action	P-5000
Credit 3	Cooling Tower Water Use <u>Option 1</u> (1 pt): Maximum number of cycles is achieved without exceeding any filtration levels or affecting operation of the condenser (max 10 cycles)	WSP	Include Cooling Tower Water Use requirements in project specs limiting the number of cycles.	M-0002 M-5000
Credit 4	Water Metering <u>Required:</u> 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	WSP	Provide drawings with >80% of the total water for the reclaimed water system and the irrigation system will be captured by these sub meters .	M-8004
Energy and Atmosphere				



LEED v4 for BD+C New Construction

223 23rd St
 August 15, 2022
 Detailed Checklist



Credit	Requirement & Comments	Responsible Party	Action	Drawing Reference
Prereq 1 Credit 1	Fundamental & Enhanced Commissioning and Verification <u>Required:</u> Contract Commissioning Agent to commission energy systems in the building. 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.	JBGS	Hire CxA by DDs	--
Prereq 2 / Credit 2	Minimum / Optimize Energy Performance <u>Required:</u> 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	WSP	Project targeting 15% energy improvement. Prepare energy model for analysis during DDs.	--
Prereq 3	Building-Level Energy Metering <u>Required:</u> Install building energy meters to encompass all energy used by the building and provide meter data to the USGBC for 5 years.	JBGS	Sign & add letterhead on Energy Sharing Commitment letter provided by SBP.	--
		WSP	Add electricity and gas meter to plans.	E-5000
Prereq 4	Fundamental Refrigerant Management <u>Required:</u> Do not use CFC based refrigerants	WSP	SD Narrative indicates R410a used. Provide mechanical schedule with refrigerants.	SD MEP narrative M-0002
Credit 5	Renewable Energy Production <u>Required:</u> Meet credit 7 for full 5 points total. <i>v4.1 credit substitution</i>	JBGS		--
Credit 7	Renewable Energy <u>Required:</u> Purchase RECs for the threshold of annual building energy use for 1 year. 1pt - 10%, 2 pts - 20%, 3 pts - 30%, 4pts - 40%, 5pts - 50% <i>v4.1 credit substitution</i>	JBGS	No Action Required. JBGS purchases RECs for Sustainability commitment.	--
Materials and Resources				
Prereq 1	Storage/Collection of Recyclables <u>Required:</u> 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	KGD	Label the trash rooms "trash and recycling" rooms	A2251 A2253
Prereq 2	Construction and Demolition Waste Management Planning <u>Required:</u> Develop and implement a Construction Waste Management plan that identifies 5 main materials targeted for recycling during construction.	KGD	No action required at this time.	--
		GC	No action required at this time.	--
	<u>Option 4 Whole Building LCA</u> (3-4 pts) Path 1 (1 pt): Conduct an LCA. Path 2 (2 pts): Conduct an LCA that demonstrates a 5% reduction in 3 of 6 impact categories, one of which must be Global Warming Potential (GWP).			



LEED v4 for BD+C New Construction

223 23rd St
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 Detailed Checklist



Credit	Requirement & Comments	Responsible Party	Action	Drawing Reference
Credit 1 Building Life-Cycle Impact Reduction v4.1 credit substitution	Path 3 (3 pts): Conduct an LCA that demonstrates a 10% reduction in 3 of 6 impact categories, one of which must be GWP.	LCA modeler	LCA analysis required	--
	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 2/3/4: No impact category may increase more than 5% compared to the baseline building.			
Credit 2 Building Product Disclose and Optimization (BPDO): EPDs v4.1 credit substitution	Required Option 1: Use 20 different permanently installed products, sourced from at least 5 different manufacturers, with EPDs. <ul style="list-style-type: none"> - Critically reviewed LCA - 1 product - Industry-Wide EPD - 1 product - Product-Specific Type III EPD - 1.5 products 	KGD	Include requirements in Specs	--
				--
				--
Credit 4 Building Product Disclose and Optimization (BPDO): Material Ingredients v4.1 credit substitution	Option 1 Material Ingredient Reporting (1 pt) - Use at least 20 products, from 5 different manufacturers, with certifications indicating their material ingredients have been reported and their environmental and health impacts are minimal. Compliant certifications: <ul style="list-style-type: none"> - Health Product Declaration - Cradle to Cradle w/ Material Health Certificate (v3 Bronze or higher) - Declare (Declared, Red List Free, LBC Compliant w/ inventory to 0.1%) - Living Product Challenge - UL Product Lens Certification - ANSI/BIFMA e3 Furniture Sustainability Standard (3 points or higher) 	KGD	Include requirements in Specs	--
				--
				--
Credit 5 Construction and Demolition Waste Management v4.1 credit substitution	Option 1 Diversion Path 1: Divert 50% and 2 Material Streams (1 pt) Path 2: Divert 50% using Certified Commingled Recycling Facility (1 pt) Path 3: Divert 75% and 3 Material Streams (2 pts) Path 4: Divert 75% using Certified Commingled Recycling Facility (2 pts)	KGD	No action required at this time.	--
		GC	No action required at this time.	--
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).	WSP	1. Provide LEED IEQp1 calculator with ASHRAE 62.1-2010 ventilation calculations (https://www.usgbc.org/resources/minimum-indoor-air-quality-performance-calculator). 2. Show CO sensors in all units.	M-0002 M-4002 M-8002
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.	KGD	Provide exhibit with locations and detail of no smoking signage at main building entrances.	--
		JBGS	Provide building specific no smoking policy.	



LEED v4 for BD+C New Construction

223 23rd St
 August 15, 2022
 Detailed Checklist



Credit	Requirement & Comments	Responsible Party	Action	Drawing Reference
Credit 1	Enhanced Indoor Air Quality Strategies	KGD	<u>Option 1:</u> 1. Show 10' long walk-off mats inside all building entrances (not required at egress-only doors). 2. Ensure housekeeping rooms and any rooms with chemicals have deck-to-deck partitions, hard lid ceiling, and/or self closing doors.	MEP narrative
		WSP	<u>Option 1:</u> 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	WSP	<u>Option 2:</u> Show CO2 sensors in spaces (any space with the occupancy ratio of 25 people per 1,000 sf)	
Credit 2	Low-Emitting Materials v4.1 credit substitution	KGD	Select 4 categories with compliant products for 3 points. Include Section 018113 in the Specifications.	--
Credit 3	Construction Indoor Air Quality Management Plan	GC	No action required at this time	--
Credit 5	Thermal Comfort	WSP	1. Provide calculations demonstrating compliance with ASHRAE 55-2010. 2. Provide thermal controls in all units, amenity spaces, and multi-occupant spaces and in 50% of individual offices.	--
Credit 6	Interior Lighting	WSP	Show multi-level/dimmable lighting controls in all unit kitchens, living rooms, and bedrooms. Provide multi-level/dimmable lighting in all regularly-occupied amenity spaces and office space.	--
Credit 8	Quality Views	KGD	Provide line of sight diagram from a seated position through the vision glazing throughout all the regularly occupied spaces.	--

Innovation



LEED v4 for BD+C New Construction

223 23rd St
 August 15, 2022
 Detailed Checklist



Credit		Requirement & Comments	Responsible Party	Action	Drawing Reference
Credit 1.1	Innovation Points	1.1 Low Mercury Lamps	KGD	Team to coordinate approach.	--
Credit 1.2		1.1 O+M Starter Kit			
Credit 1.3		1.3 Exemplary Performance			
Credit 1.4		1.4 Pilot Credit			
Credit 1.5		1.5 Pilot Credit			
Credit 2	LEED Accredited Professional	At least one principal participant of the project team must be a LEED Accredited Professional (AP) with a specialty appropriate for the project.	SBP	No action required	--
Regional Priority					
Credit 1	Regional Priority: Rainwater Management (Threshold: 3 pts)		SBP	No action required	--
Credit 2	Regional Priority: Access to Quality Transit (Threshold: 4 pt)		SBP	No action required	--
Credit 3	Regional Priority: Electric Vehicles		SBP	No action required	--
Credit 4	Regional Priority: Reduced Parking Footprint		SBP	No action required	--



MEMO

TO: Sylvia Schnackenburg – SCB
Michele Jasper – SCB

FROM: Jennifer Mitarotonda, PE, LEED AP

SUBJECT: 2250 Crystal Dr – Preliminary Energy Model

DATE: August 15, 2022

EXECUTIVE SUMMARY

This memo is to inform that WSP has performed the preliminary energy analysis to estimate the % cost savings over ASHRAE 90.1-2010 Appendix G. The analysis was performed in eQuest. A baseline model was created and compared against the proposed design and multiple Energy Conservation Measures (ECM). The baseline model was created according to the standards laid out in ASHRAE 90.1-2010 App. G.

The results of the energy analysis are shown in the table below.

Model Name	Description	Annual Cost	Cost Savings
Baseline	LEED Baseline ASHRAE 90.1-2010 Appendix G	\$ 1,257,904	-
Proposed	Initial Proposed Design	\$ 1,102,198	12.4%
ECM 1	Reduced LPD in BOH and Common Area	\$ 1,096,569	12.8%
ECM 2	Energy Star Equipment (Dishwasher, Refrigerator, in Unit Washer/Dryer)	\$ 1,082,121	14.0%
ECM 3	High Performance WSHP (EER-16.5, COP-5.2)	\$ 1,092,265	13.2%
Bundle	ECM 1 to ECM 3	\$ 1,066,845	15.2%

Per the results, a savings of 15% over the baseline can be achieved by selecting all (3) proposed ECMs.

ASSUMPTIONS

Key assumptions made in the proposed design are listed below:

- Lighting Power Density
 - Corridor - 0.66 W/sf
 - Elec/Mech - 0.95 W/sf
 - Garage – 0.19 W/sf
 - Lobby – 0.64 W/sf



- Stairs – 0.69 W/sf
- Restrooms – 0.98 W/sf
- Laundry – 0.6 W/sf
- Storage – 0.63 W/sf
- HVAC System
 - Water Source Heat Pump (residential units)
 - EER – 15, COP – 5
 - DOAS
 - EER – 15, COP – 4.8
 - Boiler: condensing boiler
 - 90% efficiency
 - Heat pipe
 - 50% effectiveness
- Envelope
 - Window wall ratio: South: 50.2%; North: 55.0%; West: 48.6%; East: 49.4%, overall: 50.9%
 - Opaque wall overall assembly U-value: not worse than U-0.064
 - Glazing:
 - Fixed (80% of glazing area): assembly U-0.38, SHGC-0.275
 - Operable (20% of glazing area): assembly U-0.45, SHGC-0.287
 - Roof: U-0.032 (R-30 c.i.)



LEED v4 for BD+C New Construction

2250 Crystal Drive

August 15, 2022



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

14	2	0	Location and Transportation		Possible Points:	16
Y	?	N				
		16	Credit 1	LEED for Neighborhood Development	PATH 1	16
1			Credit 2	Sensitive Land Protection	PATH 2	1
1	1		Credit 3	High Priority Site		2
5			Credit 4	Surrounding Density & Diverse Uses		5
5			Credit 5	Access to Quality Transit (v4.1)		5
	1		Credit 6	Bicycle Facilities (v4.1)		1
1			Credit 7	Reduced Parking Footprint (v4.1)		1
1			Credit 8	Electric Vehicles (v4.1)		1

6	3	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 (v4.1)		2
1			Credit 3	Open Space		1
3			Credit 4	Rainwater Management (v4.1)		3
1	1		Credit 5	Heat Island Reduction		2
	1		Credit 6	Light Pollution Reduction		1

6	2	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	1	2	Credit 2	Indoor Water Use Reduction		6
1		1	Credit 3	Cooling Tower Water Use (v4.1)		2
1			Credit 4	Water Metering		1

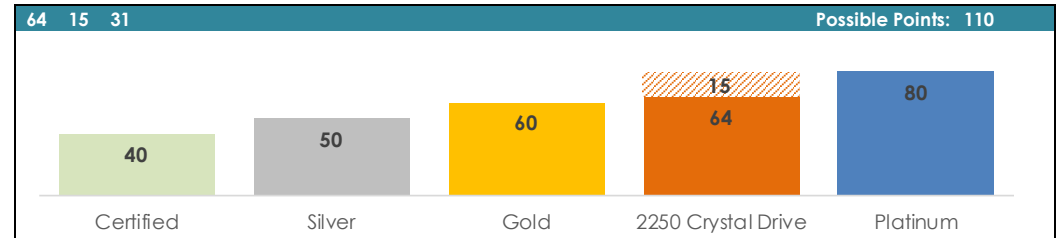
13	4	16	Energy and Atmosphere		Possible Points:	33
Y	?	N				
Y			Prereq 1	Fundamental Commissioning and Verification		Required
Y			Prereq 2	Minimum Energy Performance		Required
Y			Prereq 3	Building-Level Energy Metering		Required
Y			Prereq 4	Fundamental Refrigerant Management		Required
3		3	Credit 1	Enhanced Commissioning		6
5	3	10	Credit 2	Optimize Energy Performance		18
		1	Credit 3	Advanced Energy Metering		1
		2	Credit 4	Demand Response (v4.1)		2
5			Credit 5	Renewable Energy Production (on+offsite) (v4.1)		5
	1		Credit 6	Enhanced Refrigerant Management		1

7	1	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 (v4.1)		5
1	1		Credit 2	Product Disclosure & Optimization - EPDs (v4.1)		2
		2	Credit 3	Product Disclosure & Optimization - Sourcing of Raw Materials (v4.1)		2
1		1	Credit 4	Product Disclosure & Optimization - Material Ingredients (v4.1)		2
2			Credit 5	Construction and Demolition Waste Management (v4.1)		2

8	3	5	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 (v4.1)		3
	1		Credit 8	Quality Views		1
		1	Credit 9	Acoustic Performance (v4.1)		1

6	0	0	Innovation		Possible Points:	6
Y	?	N				
1			Credit 1.1	Innovation Credit: TBD		1
1			Credit 1.2	Innovation Credit: TBD		1
1			Credit 1.3	Innovation Credit: TBD		1
1			Credit 1.4	Pilot Credit		1
1			Credit 1.5	Pilot Credit		1
1			Credit 2	LEED Accredited Professional		1

4	0	0	Regional Priority Credits		Possible Points:	4
Y	?	N				
1			Credit 1	Regional Priority: Rainwater Management (Threshold: 3 pts)		1
1			Credit 2	Regional Priority: Access to Quality Transit (Threshold: 4 pt)		1
1			Credit 3	Regional Priority: Electric Vehicles		1
1			Credit 4	Regional Priority: Reduced Parking Footprint		1





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Credit		Requirement & Comments	Responsible Party	Action	Drawing Reference
Location and Transportation					
Credit 2	Sensitive Land Protection	<u>Required Option 1:</u> Locate the development footprint on land that has been previously developed.		Land is previously developed. No Action Required	
Credit 3	High Priority Site	<u>Required Option 2:</u> (1 pt) Priority Designation		Project is located in a Difficult Development Area per HUD database. No Action Required	
Credit 4	Surrounding Density and Diverse Uses	<u>Required Option 1:</u> (2-3 pts) Surrounding Density		Project is within 1/2 mi walking distance of 10 diverse uses. No Action Required	
		<u>Required Option 2:</u> (1-2 pts) Diverse Uses			
Credit 5	Access to Quality Transit	<u>Required:</u> 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	SBP	Project is served by sufficient quality transit within a 1/4-mi and 1/2-mi radius. No Action Required	
Credit 7	Reduced Parking Footprint v4.1 credit substitution	<u>Required Option 2:</u> 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 (1.65 spaces/unit).	SCB	Parking meets threshold. No Action Required	
Credit 8	Electric Vehicles v4.1 credit substitution	<u>Required:</u> Provide electric charging spaces for 5% of parking capacity OR provide electric vehicle ready spaces for 10% of parking capacity. 9 EV charging space - OR - 18 EV-ready spaces	WSP	Include electrical infrastructure for EV chargers within drawings.	
Sustainable Sites					
Prereq 1	Construction Activity Pollution Prevention	<u>Required:</u> Erosion and Sediment Control Plan must conform to 2012 EPA Construction General Permit (CGP) or more stringent local regulations.	Bowman	ESC plans provided in drawings. No Action Required	
Credit 1	Site Assessment	<u>Required:</u> Provide documentation explaining if/how the following site features influences the project design: - Topography - Hydrology - Climate - Vegetation - Soils - Human Use - Human Health Effects	SBP	SBP to complete site assessment credit documentation.	
Credit 4	Rainwater Management v4.1 credit substitution	<u>Required:</u> Treat on-site runoff for the following percentile rainfall events by using low impact development (LID) practices. - 80th Percentile (1 pt) - 85th Percentile (2 pts) - 90th Percentile (3 pts)	Bowman	Bioretention and Green roof provided in Civil plans. Complete the Rainfall events calculator.	



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Credit	Requirement & Comments	Responsible Party	Action	Drawing Reference
Credit 5	Heat Island Reduction <u>Required:</u> Option 2 (1 pt) - 75% of parking is undercover	SCB	Parking underground. No action required	--
Water Efficiency				
Prereq 1	Outdoor Water Use Reduction <u>Required Prereq:</u> Reduce irrigation by 30% (Prereq)	Bowman	Complete the EPA Water Budget Tool by end of DDs	
Credit 1	Outdoor Water Use Reduction <u>Required Option 2: 50% Reduction (1 pt)</u> , 100% Reduction (2 pts) Strategies include drought tolerant plantings, drip irrigation, moisture control sensors, or cisterns.			
Prereq 2 Credit 2	Indoor Water Use Reduction <u>Required</u> (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 <u>Required:</u> Reduce demonstrate a water use reduction from UPC/IPC baseline and EPA Act 1992 standards. 25% (1 pt), 30% (2 pts), 35% (3 pts) , 40% (4 pts), 45% (5 pts), 50% (6 pts)	SCB	Recommended plumbing fixture flow rates provided to achieve a water use reduction of 35-40%.	
Prereq 3	Building-Level Water Metering <u>Required:</u> Design to include whole building water meter and provide meter data to USGBC for 5 years.	JBGS	Sign and add company letterhead to the Owner Letter of Commitment provided by SBP.	
		WSP	Include Meter in riser diagram	
Credit 3	Cooling Tower Water Use <u>Option 1</u> (1 pt): Maximum number of cycles is achieved without exceeding any filtration levels or affecting operation of the condenser (max 10 cycles)	WSP	Include Cooling Tower Water Use requirements in project specs limiting the number of cycles.	
Credit 4	Water Metering <u>Required:</u> 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	WSP	Provide drawings with >80% of the total water for the reclaimed water system and the irrigation system will be captured by these sub meters .	
Energy and Atmosphere				
Prereq 1 Credit 1	Fundamental & Enhanced Commissioning and Verification <u>Required:</u> Contract Commissioning Agent to commission energy systems in the building. 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.	JBGS	Hire CxA by DDs	--
Prereq 2 / Credit 2	Minimum / Optimize Energy Performance <u>Required:</u> 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	WSP	Project targeting 15% energy improvement. Prepare energy model for analysis during DDs.	



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Credit	Requirement & Comments	Responsible Party	Action	Drawing Reference
Prereq 3	Building-Level Energy Metering <u>Required:</u> Install building energy meters to encompass all energy used by the building and provide meter data to the USGBC for 5 years.	JBGS	Sign & add letterhead on Energy Sharing Commitment letter provided by SBP.	
		WSP	Add electricity and gas meter to plans.	
Prereq 4	Fundamental Refrigerant Management <u>Required:</u> Do not use CFC based refrigerants	WSP	SD Narrative indicates R410a used. Provide mechanical schedule with refrigerants.	
Credit 5	Renewable Energy Production v4.1 credit substitution <u>Required:</u> Meet credit 7 for full 5 points total.	JBGS		--
Credit 7	Renewable Energy v4.1 credit substitution <u>Required:</u> Purchase RECs for the threshold of annual building energy use for 1 year. 1pt - 10%, 2 pts - 20%, 3 pts - 30%, 4pts - 40%, 5pts - 50%	JBGS	No Action Required. JBGS purchases RECs for Sustainability commitment.	--
Materials and Resources				
Prereq 1	Storage/Collection of Recyclables <u>Required:</u> 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	SCB	Label the trash rooms "trash and recycling" rooms	A2251 A2253
Prereq 2	Construction and Demolition Waste Management Planning <u>Required:</u> Develop and implement a Construction Waste Management plan that identifies 5 main materials targeted for recycling during construction.	SCB	No action required at this time.	--
		GC	No action required at this time.	--
Credit 1	Building Life-Cycle Impact Reduction v4.1 credit substitution <u>Option 4 Whole Building LCA</u> (3-4 pts) Path 1 (1 pt): Conduct an LCA. Path 2 (2 pts): Conduct an LCA that demonstrates a 5% reduction in 3 of 6 impact categories, one of which must be Global Warming Potential (GWP). Path 3 (3 pts): Conduct an LCA that demonstrates a 10% reduction in 3 of 6 impact categories, one of which must be GWP. 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 2/3/4: No impact category may increase more than 5% compared to the baseline building.	LCA modeler	LCA analysis required	--
Credit 2	Building Product Disclose and Optimization (BPDO): EPDs v4.1 credit substitution <u>Required Option 1:</u> Use 20 different permanently installed products, sourced from at least 5 different manufacturers, with EPDs. - Critically reviewed LCA - 1 product - Industry-Wide EPD - 1 product - Product-Specific Type III EPD - 1.5 products	SCB	Include requirements in Specs	--
				--
				--



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Credit		Requirement & Comments	Responsible Party	Action	Drawing Reference
Credit 4	Building Product Disclose and Optimization (BPDO): Material Ingredients v4.1 credit substitution	<u>Option 1 Material Ingredient Reporting</u> (1 pt) - Use at least 20 products, from 5 different manufacturers, with certifications indicating their material ingredients have been reported and their environmental and health impacts are minimal. Compliant certifications: - Health Product Declaration - Cradle to Cradle w/ Material Health Certificate (v3 Bronze or higher) - Declare (Declared, Red List Free, LBC Compliant w/ inventory to 0.1%) - Living Product Challenge - UL Product Lens Certification - ANSI/BIFMA e3 Furniture Sustainability Standard (3 points or higher)	SCB	Include requirements in Specs	--
					--
					--
Credit 5	Construction and Demolition Waste Management v4.1 credit substitution	<u>Option 1 Diversion</u> Path 1: Divert 50% and 2 Material Streams (1 pt) Path 2: Divert 50% using Certified Commingled Recycling Facility (1 pt) Path 3: Divert 75% and 3 Material Streams (2 pts) Path 4: Divert 75% using Certified Commingled Recycling Facility (2 pts)	SCB	No action required at this time.	--
			GC	No action required at this time.	--
Indoor Environmental Quality					
Prereq 1	Minimum Indoor Air Quality Performance	<u>Required for Mechanically-Ventilated Buildings:</u> 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).	WSP	1. Provide LEED IEQp1 calculator with ASHRAE 62.1-2010 ventilation calculations (https://www.usgbc.org/resources/minimum-indoor-air-quality-performance-calculator). 2. Show CO sensors in all units.	M-0002 M-4002 M-8002
Prereq 2	Environmental Tobacco Smoke (ETS) Control v4.1 credit substitution	<u>Required:</u> 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.	SCB	Provide exhibit with locations and detail of no smoking signage at main building entrances.	--
			JBGS	Provide building specific no smoking policy.	
Credit 1	Enhanced Indoor Air Quality Strategies	<u>Required Option 1:</u> Enhanced IAQ Strategy (1 pt) - For mechanically ventilated implement <u>all</u> 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	SCB	<u>Option 1:</u> 1. Show 10' long walk-off mats inside all building entrances (not required at egress-only doors). 2. Ensure housekeeping rooms and any rooms with chemicals have deck-to-deck partitions, hard lid ceiling, and/or self closing doors.	MEP narrative
			WSP	<u>Option 1:</u> 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	



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Credit		Requirement & Comments	Responsible Party	Action	Drawing Reference
Credit 1	Enhanced Indoor Air Quality Strategies	<p><u>Required Option 2:</u> Additional enhanced IAQ strategies(1pt)- Select one of the following:</p> <ul style="list-style-type: none"> 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. 	WSP	<p><u>Option 2:</u> Show CO2 sensors in spaces (any space with the occupancy ratio of 25 people per 1,000 sf)</p>	
Credit 2	Low-Emitting Materials v4.1 credit substitution	<p><u>Required:</u> 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, 4 categories-3 pts, 5 categories-3pts+EP):</p> <ul style="list-style-type: none"> - Interior paints and coatings - Flooring - Insulation - Composite Wood (ULEF) - Ceilings - Wall Panels - Interior adhesives and sealants - Furniture 	SCB	<p>Select 4 categories with compliant products for 3 points. Include Section 018113 in the Specifications.</p>	--
Credit 3	Construction Indoor Air Quality Management Plan	<p><u>Required:</u></p> <ol style="list-style-type: none"> 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. 	GC	No action required at this time	--
Credit 5	Thermal Comfort	<p><u>Required:</u></p> <ol style="list-style-type: none"> 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. 	WSP	<ol style="list-style-type: none"> 1. Provide calculations demonstrating compliance with ASHRAE 55-2010. 2. Provide thermal controls in all units, amenity spaces, and multi-occupant spaces and in 50% of individual offices. 	--
Credit 6	Interior Lighting	<p><u>Required Option 1:</u> 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.</p>	WSP	Show multi-level/dimmable lighting controls in all unit kitchens, living rooms, and bedrooms. Provide multi-level/dimmable lighting in all regularly-occupied amenity spaces and office space.	--
Innovation					
Credit 1.1 Credit 1.2 Credit 1.3 Credit 1.4 Credit 1.5	Innovation Points	<ol style="list-style-type: none"> 1.1 Low Mercury Lamps 1.1 O+M Starter Kit 1.3 Exemplary Performance 1.4 Pilot Credit 1.5 Pilot Credit 	SCB	Team to coordinate approach.	--
Credit 2	LEED Accredited Professional	At least one principal participant of the project team must be a LEED Accredited Professional (AP) with a specialty appropriate for the project.	SBP	No action required	--
Regional Priority					
Credit 1	Regional Priority: Rainwater Management (Threshold: 3 pts)		SBP	No action required	--
Credit 2	Regional Priority: Access to Quality Transit (Threshold: 4 pt)		SBP	No action required	--
Credit 3	Regional Priority: Electric Vehicles		SBP	No action required	--
Credit 4	Regional Priority: Reduced Parking Footprint		SBP	No action required	--