LEED COMPLIANCE SUMMARY (Part 1 of 4) EAP-2

Project Name	Date
Nonresidential Sample Building	*10/31/2023*

GENERAL INFORMATION

Simulation Program:	*EnergyPro*	Weather File:	*CA_SACRAMENTO-EXECUTIVE_724830.binm*
Principal Heating Source:	*Natural Gas*	Climate Zone:	*DOE Climate Zone 3B*
Energy Code Used:	*ASHRAE 90.1-2019*	Latitude:	*39*
New Construction Percent:	*100*	Longitude:	*-122*

List the ASHRAE addenda used in the modeling assumptions for EAc1:

SPACE SUMMARY

Space Name / Description	Space Usage Type	Space Size	Regularly Occupied GSF	Unconditioned GSF	Operating Hours (per week)
Retail Zone	*Sales Area*	*1280*	*1280*		*85*
Parking Garage	*Parking Area, Interior*	*1200*		*1200*	*168*
Office Zone	*Office Open Plan*	*1920*	*1920*		*85*
Restaurant Zone	*Dining Area For All Other*	*1280*	*1280*		*85*
TOTAL:		*4,480*	*4,480*	*0*	

LEED COMPLIANCE SUMMARY (Part 2 of 4) EAP-2

Project Name	Date
Nonresidential Sample Building	*10/31/2023*

ENERGY TYPE SUMMARY

Energy Type	Utility Rate Description	Baseline Virtual Rate ($ per unit energy)	Proposed Virtual Rate ($ per unit energy)	Units of Energy	Units of Demand
Electricity	*PG&E A-6*	*0.26*	*0.25*	kWh	kW
Natural Gas	*PG&E G-NR1*	*1.10*	*1.08*	therms	MBH

RENEWABLE ENERGY SOURCE SUMMARY

Renewable Source	Backup Energy Type	Annual Energy Generated	Rated Capacity	Renewable Energy Cost
Renewables	*Electricity*	*-24.74*	*20*	*3727.31959920377*

EXCEPTIONAL CALCULATION MEASURE SHORT DESCRIPTION

Energy Type(s)	Annual Energy Savings by Energy Type	Annual Cost Savings	Exceptional Calculation Measure Narrative:

LEED COMPLIANCE SUMMARY (Part 3 of 4) EAP-2

Project Name	Date
Nonresidential Sample Building	*10/31/2023*

BASELINE PERFORMANCE – PERFORMANCE RATING METHOD COMPLIANCE

End Use	Process?	Baseline Design Energy Type	Units of Annual Energy & Peak Demand	Baseline (0 deg rotation)	Baseline (90 deg rotation)	Baseline (180 deg rotation)	Baseline (270 deg rotation)
Interior Lighting	☐	*Electricity*	*kWh*	*19365*	*19365*	*19365*	*19365*
			kW	*4.4*	*4.4*	*4.4*	*4.4*
Exterior Lighting	☐	*Electricity*	*kWh*	*7058*	*7058*	*7058*	*7058*
			kW	*1.8*	*1.8*	*1.8*	*1.8*
Space Heating	☐	*NaturalGas*	*therms*	*201*	*170*	*187*	*216*
			kBtu/hr	*151.2*	*150.0*	*151.2*	*150.9*
Space Heating	☐	*Electricity*	*kWh*	*0*	*0*	*0*	*0*
			kW	*0.0*	*0.0*	*0.0*	*0.0*
Space Cooling	☐	*Electricity*	*kWh*	*16207*	*16730*	*16100*	*16157*
			kW	*25.7*	*26.6*	*25.8*	*26.0*
Fans-Interior	☐	*Electricity*	*kWh*	*32876*	*34506*	*33203*	*33088*
			kW	*6.5*	*6.8*	*6.5*	*6.5*
Service Hot Water	☐	*Electricity*	*kWh*	*41194*	*41194*	*41194*	*41194*
			kW	*8.4*	*8.4*	*8.4*	*8.4*
Receptacle Equipment	☑	*Electricity*	*kWh*	*16112*	*16112*	*16112*	*16112*
			kW	*4.3*	*4.3*	*4.3*	*4.3*
Interior Lighting-Process	☑	*Electricity*	*kWh*	*12171*	*12171*	*12171*	*12171*
			kW	*2.2*	*2.2*	*2.2*	*2.2*
Process Energy	☑	*Electricity*	*kWh*	*15003*	*15003*	*15003*	*15003*
			kW	*3.6*	*3.6*	*3.6*	*3.6*
Exterior	☑	*NaturalGas*	*therms*	*323*	*323*	*323*	*323*
			kBtu/hr	*5.4*	*5.4*	*5.4*	*5.4*
Exterior	☑	*Electricity*	*kWh*	*1078*	*1078*	*1078*	*1078*
			kW	*0.2*	*0.2*	*0.2*	*0.2*
Renewables	☐	*Electricity*	*kWh*	*0*	*0*	*0*	*0*
			kW	*0.0*	*0.0*	*0.0*	*0.0*

BASELINE ENERGY COSTS

Energy Type	Baseline Cost (0 deg rotation)	Baseline Cost (90 deg rotation)	Baseline Cost (180 deg rotation)	Baseline Cost (270 deg rotation)	Baseline Building Performance
Electricity	*41749*	*42369*	*41806*	*41805*	*41932*
NaturalGas	*575*	*540*	*559*	*591*	*566*
Total Baseline Costs:	*42324*	*42909*	*42365*	*42396*	*42499*

LEED COMPLIANCE SUMMARY (Part 4 of 4) EAP-2

Project Name: *Nonresidential Sample Building*

Date: *10/31/2023*

PERFORMANCE RATING TABLE – PERFORMANCE RATING METHOD COMPLIANCE

End Use	Process?	Proposed Design Energy Type	Baseline Building Results	Proposed Design Units	Proposed Building Results	Percentage Savings
Interior Lighting	☐	*Electricity*	*19365*	*kWh*	*7895*	*59.2%*
			4.4	*kW*	*1.7*	*61.6%*
Exterior Lighting	☐	*Electricity*	*7058*	*kWh*	*2705*	*61.7%*
			1.8	*kW*	*0.7*	*61.7%*
Space Heating	☐	*NaturalGas*	*193*	*therms*	*0*	*100.0%*
			150.8	*kBtu/hr*	*0.0*	*100.0%*
Space Heating	☐	*Electricity*	*0*	*kWh*	*1038*	*0.0%*
			0.0	*kW*	*15.3*	*0.0%*
Space Cooling	☐	*Electricity*	*16299*	*kWh*	*9720*	*40.4%*
			26.0	*kW*	*13.5*	*48.0%*
Fans-Interior	☐	*Electricity*	*33418*	*kWh*	*25525*	*23.6%*
			6.6	*kW*	*4.9*	*26.3%*
Service Hot Water	☐	*Electricity*	*41194*	*kWh*	*9318*	*77.4%*
			8.4	*kW*	*2.1*	*74.9%*
Receptacle Equipment	☑	*Electricity*	*16112*	*kWh*	*16112*	*0.0%*
			4.3	*kW*	*4.3*	*0.0%*
Interior Lighting-Process	☑	*Electricity*	*12171*	*kWh*	*12171*	*0.0%*
			2.2	*kW*	*2.2*	*0.0%*
Process Energy	☑	*Electricity*	*15003*	*kWh*	*15003*	*0.0%*
			3.6	*kW*	*3.6*	*0.0%*
Exterior	☑	*NaturalGas*	*323*	*therms*	*323*	*0.0%*
			5.4	*kBtu/hr*		*0.0%*
Exterior	☑	*Electricity*	*1078*	*kWh*	*1078*	*0.0%*
			0.2	*kW*	*0.2*	*0.0%*
Renewables	☐	*Electricity*	*0*	*kWh*	*-32470*	*0.0%*
			0.0	*kW*	*0.0*	*0.0%*

ENERGY COST AND CONSUMPTION BY ENERGY TYPE

	Baseline Design			Proposed Design			Percent Savings	
Energy Type	Energy Use		Cost	Energy Use		Cost	Energy Use	Cost
Electricity	*161,698*	kWh	*41,932*	*68,095*	kWh	*16,971*	*57.9%*	*59.5%*
NaturalGas	*517*	therms	*566*	*323*	therms	*351*	*37.4%*	*38.0%*
Subtotal (Model Outputs):	*603,541*	(kBtu/year)	*$42,499*	*264,738*	(kBtu/year)	*$17,322*	*56.1%*	*59.2%*

Table 1.4.1 - Opaque Building Envelope

Instructions: *Complete the Opaque Building Envelope Requirements section, then de scribe each unique opaque building envelope construction on a separate row in the Opaque Building Envelope Constructions table (required inputs are green). Note that extra rows can be added using the button to the lower left of each construction type as necessary. An example of the expected level of detail has been provided for each type of construction. Please refer to the Helpful Notes for information about Appendix G modeling protocol. For any information not applicable to the project, simply enter "N/A". Baseline Case Information will autogenerate for New Construction Opaque Assemblies when the space conditioning category is selected.*

Opaque Building Envelope Requirements

For projects modeled using ASHRAE 90.1-2007 Appendix G, select the climate zone: DOE Climate Zone 3B

Select the appropriate description for the project:		☑ The project is 100% new Construction ☐ The project is 100% existing renovation ☐ The project is a Cobination of new construction and existing renovation
	For existing spaces, have there been any changes to the space conditioning category (for example, previously unconditioned spaces becoming fully conditioned)?	☑ No Changes to space conditioning categories ☐ Yes, and the associated constructions in the Baseline case have been modeled using the Appendix G requirements for new
Check the applicable space conditioning categories included in the project:		☑ Nonresidential ☐ Residential ☐ Semiheated ☑ Unconditioned
	All spaces qualifying as semiheated are not defined as heated per Table 3.1 or indirectly conditioned (see Section 3.2 definition of ***space***)	☐ Yes ☑ N/A (no semiheated spaces)
	Opaque envelope assemblies separating conditioned space from unconditioned or semiheated space are modeled using semiheated envelope assemblies per the *ASHRAE 90.1-2007 User's Manual* , Section 5.1.1, *Envelope Component Assemblies* (Page 5-2).	☑ Yes ☐ N/A (no opaque assemblies separating conditioned and semiheated / unconditioned space)

All ***Baseline new construction opaque envelope assemblies*** were modeled as required by Table 5.5 for the project's climate zone and Table G3.1#5(b) as delayed assemblies. See the Helpful Notes for each opaque assembly for more information.	Yes
All ***Proposed*** roofs, above-grade exterior walls, below-grade exterior walls, exposed floors, slab-on-grade floors, and opaque doors were modeled as-designed and with assembly U-factors / C-factors / F-factors consistent with Appendix A values	Yes
Infiltration rates and schedules have been modeled identically in the Baseline and Proposed case	Yes

For each item entered as "No" above, describe the applicable ASHRAE 90.1 Appendix G exception(s) that apply, or the circumstances preventing the opaque envelope parameters from being modeled as required. If the energy simulation software is not capable of modeling the required parameters, describe the adjustments that were made to provide a thermodynamically similar representation or provide a narrative justifying why the predicted energy performance results will not be influenced:

Opaque Building Envelope Constructions

Model Input Parameter	New / Existing	Space-Conditioning Category	Baseline Case		Proposed Case		Baseline Roof Reflectivity Modeled as 0.3?	Proposed Roof Reflectivity Modeled
			Description	Assembly U-factor/ C-factor/ F-factor	Description	Assembly U-factor/ C-factor/ F-factor		
Roof Constructions	Helpful Notes:		•New roofs: insulation entirely above deck with U-factor from appropriate Table 5.5 per Table G3.1#5(b). •Existing roofs: existing conditions per Table G3.1#5(f).		Proposed construction assembly U-factor should be as-designed and consistent with Appendix A of ASHRAE 90.1 (list Appendix A Table referenced)		0.3 per Table G3.1#5(e)	0.3 or 0.45 per Table G3.1#5(c)
	New	Cond	New	0.063	R-30 Roof Attic	0.044	0.30	0.10
Above-Grade Exterior Wall Constructions	Helpful Notes:		•New above-grade walls: steel-framed with U-factor from appropriate Table 5.5 per Table G3.1#5(b). •Existing above-grade walls: existing conditions per Table G3.1#5(f).		Proposed construction assembly U-factor should be as-designed and consistent with Appendix A of ASHRAE 90.1 (list Appendix A Table referenced)			
	New	Cond	New	0.124	R-13 Wall	0.108		
Below-Grade Exterior Wall Constructions	Helpful Notes:		•New below-grade walls: 8" medium weight concrete block with solid grouted cores as defined in A4.1 with C-factor from appropriate Table 5.5 per Table G3.1#5(b). •Existing below-grade walls: existing conditions per Table G3.1#5(f).		Proposed construction assembly C-factor should be as-designed and consistent with Appendix A of ASHRAE 90.1 (list Appendix A Table referenced)			
Exposed Floor Constructions	Helpful Notes:		•New floors: steel-joist with U-factor from appropriate Table 5.5 per Table G3.1#5(b). •Existing floors: existing conditions per Table G3.1#5(f). •For floor assemblies above unconditioned or semiheated space, select the space conditioning category as semiheated per 90.1-2007 User's Manual, Section 5.1.1-Envelope Component Types (Figure 5-C)		Proposed construction assembly U-factor should be as-designed and consistent with Appendix A of ASHRAE 90.1 (list Appendix A Table referenced)			
Slab-On-Grade Floors	Helpful Notes:		•New slab-on-grade floors: unheated 6" concrete slab with F-factor from appropriate Table 5.5 per Table G3.1#5(b). •Existing slab-on-grade floors: existing conditions per Table G3.1#5(f).		Proposed construction assembly F-factor should be as-designed and consistent with Appendix A of ASHRAE 90.1 (list Appendix A Table referenced)			
	New	Cond	New	0.730	Slab On Grade	0.730		
Opaque Doors	Helpful Notes:		•New opaque doors: U-factor from appropriate Table 5.5 per Table G3.1#5(b). •Existing opaque doors: existing conditions per Table G3.1#5(f).		Proposed construction assembly U-factor should be as-designed and consistent with A7.1 of ASHRAE 90.1 for unlabeled doors			
	New	Cond	New	0.700	Wood Door	0.500		

Additional notes:

Table 1.4.2A - Shading & Orientation

Instructions: *Provide the following shading and orientation information (required inputs are green). An example of the expected level of detail has been provided for each input. Please refer to the Helpful Notes for information about Appendix G modeling protocol. For any information not applicable to the project, simply enter "N/A".*

Model Input Parameter		Baseline Case			Proposed Case		
Helpful Notes:		•All vertical glazing flush with exterior wall and no shading projections per Table G3.1#5(c) •No manual shading devices such as blinds or shades per Table G3.1#5(c) •No self-shading per Table G3.1#5 •Total vertical fenestration areas for new construction equal to Proposed up to 40% maximum, and distributed on each face of the building in the same proportions as the Proposed design per Table G3.1#5(c) •Total skylight area for new construction equal to Proposed up to 5% maximum per Table G3.1#5(d)			•No manual shading devices such as blinds or shades per Table G3.1#5(d) •Permanent shading devices (such as fins, overhangs, and light shelves) and automatically controlled shades or blinds may be modeled per Table G3.1#5(d) •Shading by adjacent structures and terrain may be modeled, but must be modeled identically in the Baseline case		
Shading Devices		☑ No shading projections, manual shading devices, or self-shading have been modeled for the Baseline building ☐ Any shading by adjacent structures and terrain has been modeled identically to the Proposed case (if applicable)			Modeled with Overhangs,		
Building Shape & Orientation		☑ The Baseline building is modeled with the same shape and orientation as the Proposed building, and for new construction rotated 90°, 180°, and 270°					
Above-Grade Wall & Vertical Glazing Area by Orientation	Orientation	Above Grade Wall Area (ft^2)	Vertical Glazing Area (ft^2)	(%)	Above Grade Wall Area (ft^2)	Vertical Glazing Area (ft^2)	(%)
	North	800	320	40%	800	320	40%
	East	1,040	320	31%	1,040	320	31%
	South	2,000	260	13%	2,000	260	13%
	West	720	0	0%	720	0	0%
	Total	4,560	900	20%	4,560	900	20%
Roof & Skylight Area		Roof Area (ft^2)	Skylight Area (ft^2)	(%)	Roof Area (ft^2)	Skylight Area (ft^2)	(%)
		2,880	0	0%	2,880	0	0%

Table 1.4.2B - Fenestration

Instructions: *Describe each unique fenestration assembly on a separate row in the following table (required inputs are green). Note that additional rows can be expanded using the Add a Line button to the lower left of each fenestration type as necessary. An example of the expected level of detail has been provided for each type of fenestration. Please refer to the Helpful Notes for information about Appendix G modeling protocol. For any information not applicable to the project, simply enter "N/A". Baseline Case Information will autogenerate for New Construction Nonresidential or Residential Vertical Glazing and for New Construction Nonresidential skylights when the Baseline Description is selected from one of the items listed.*

Model Input Parameter	New / Existing	Space Conditioning Category	Baseline Case			Proposed Case			
			Description	Assembly U-factor	SHGC	Description	Assembly U-factor	SHGC	VLT
Vertical Glazing	Helpful Notes:		•New vertical glazing: assembly U-factor and SHGC from appropriate Table 5.5 per Table G3.1#5(c). •Existing vertical glazing: existing conditions per Table G3.1#5(f).			Proposed vertical glazing assembly U-factor should be as-designed and account for the impact of the frames on the whole assembly. Reference Table A8.2 of ASHRAE 90.1 as necessary.			
	New	Cond	Standard	0.57	0.25	Double Metal Tinted	0.71	0.60	0.72
Skylights	Helpful Notes:		•New skylights: assembly U-factor and SHGC from appropriate Table 5.5 per Table G3.1#5(d). •Existing skylights: existing conditions per Table G3.1#5(f).			Proposed skylight assembly U-factor should be as-designed and account for the impact of the frames on the whole assembly. Reference Tables A8.1A and A8.1B of ASHRAE 90.1 as necessary.			

How were the Proposed case framed assembly fenestration U-factors determined?

Additional notes:

Table 1.4.3A - Interior Lighting

Instructions: *Confirm that the energy model complies with the Interior lighting requirements listed, and provide a narrative explaining any discrepancies. Select the interior lighting categorization procedure, and then complete the corresponding lighting table (required inputs are green). An example of the expected level of detail has been provided for each input. Please refer to the Helpful Notes for information about Appendix G modeling protocol. For any information not applicable to the project, simply enter "N/A". For projects using California Title-24, the following Title-24 lighting compliance forms may be uploaded in lieu of this sheet (2008 - LTG-1C, LTG-2C, LTG-3C, LTG-5-C, OLTG-1C, OLTG-2C, SLTG-1C; 2005 - LTG-1C, LTG-2-C, LTG-3-C, LTG-4-C, LTG-5-C, LTG-9-C, OLTG-1-C, OLTG-2-C, OLTG-3-C, OLTG-4-C).*

Interior Lighting Requirements

All lighting schedules have been modeled identically in the Baseline and Proposed case and reflect the anticipated operating schedules of each space	☑ Yes ☐ No
The Proposed lighting power includes all lighting system components shown or provided for on the plans (including lamps and ballasts and task and furniture-mounted fixtures except where specifically exempted)	☑ Yes ☐ No
Per ASHRAE 90.1-2007, Section 9.1.4 (c), and (d): For all **line-voltage lighting track and plug-in busway**, designed to allow the addition and/or relocation of luminaires without altering the wiring of the system, the proposed case wattage is modeled as: (a) the specified wattage of the luminaires included in the sytem with a minimum of 30 W/lin ft, OR (b) the wattage limit of the system's circuit breaker, OR (c) the wattage limit of other permanent current-limiting device(s) For all **low-voltage lighting track, cable conductor, rail conductor,** and other flexible lighting systems that allow the addition and/or relocation of luminaires without altering the wiring of the system, the proposed case wattage is modeled as the wattage of the transformer supplying the	☐ Yes ☐ No ☑ N/A

For each item entered as "No" above, describe the applicable ASHRAE 90.1 Appendix G exception(s) that apply, or the circumstances preventing the lighting parameters from being modeled as required. If the energy simulation software is not capable of modeling the required parameters, describe the adjustments that were made to provide a similar representation or provide a narrative justifying why the predicted energy performance results will not be influenced:

Categorization Procedure

Select the categorization procedure (Building Area or Space by Space Method) used to determine the lighting power density (LPD) in the Proposed and Baseline case	☐ Building Area Method ☑ Space by Space Method

Space by Space Method

Table 9.6.1 Space Type	Total Area of Space Type (ft^2)	Baseline Case	Proposed Case				
		Modeled LPD (Excluding Section 9.6.2 Additional Lighting) (W/ft^2)	Design LPD (Excluding Section 9.6.2 Additional Lighting) (W/ft^2)	Automatic Lighting Controls and Space Types	Table G3.2 Power Adjust-ment	Modeled LPD (W/ft^2)	Daylighting Controls
Helpful Notes: Refer to 90.1 User's Manual for definitions of Active vs. Inactive Storage, General Low Bay vs. General High Bay Manufacturing, and Fine vs. Medium/Bulky Material Storage Warehouse		Modeled using the maximum allowance from Table 9.6.1 ***(values provided for reference - overwrite if modeled differently)***	•Lighting power should be modeled as designed (or installed) including all lighting system components (lamps and ballasts) •Credit for automatic lighting controls should be modeled using the appropriate power adjustment from Table G3.2, applied only to the controlled lighting power and not where required by 9.4.1.2 per Table G3.1#6(g) [conference rooms; meeting rooms; employee lunch and break rooms; classrooms excepting Pre-K through 12th grade, laboratory, or shop] •Automatic daylighting controls must either be modeled directly in the simulation, or modeled using schedule adjustments determined by a separate daylighting analysis per Table G3.1#6(f)				
Sales Area	1,280	1.700	0.438		0.000	0.438	
Parking Area, Interior	1,200	0.200	0.103		0.000	0.103	
Office Open Plan	1,920	1.100	0.394		0.000	0.394	
Dining Area For All Other	1,280	0.900	0.563		0.000	0.563	
Total	5,680	1.000	0.380			0.380	

Interior Process Lighting (if applicable)

Description	Section 9.2.2.3 Exemption	Total Process Lighting Power (Watts)	Modeled Identically In Baseline?
Helpful Notes:	Any lighting not regulated by ASHRAE 90.1 is considered process and must be modeled identically in the Proposed and Baseline case unless an Exceptional Calculation is submitted		
Process Lighting		2,560	☑ Yes ☐ No

Table 1.4.3B - Exterior Lighting

Instructions: Select the applicable exterior lighting categories and then complete the corresponding lighting table(s) (required inputs are green). An example of the expected level of detail has been provided for each input. Please refer to the Helpful Notes for information about Appendix G modeling protocol. For any information not applicable to the project, simply enter "N/A".

Exterior Lighting Requirements

The exterior lighting power values reported below are consistent with the SSc8 (Light Pollution Reduction Form)	☑ Yes ☐ N/A (SSc8 not submitted)
Additional lighting power allowance has not been claimed in the Baseline case for surfaces that are not provided with lighting in the actual design and lighting fixtures have not been double-counted for different exterior surfaces	☑ Yes ☐ No

Exterior Lighting Categories

Check all applicable exterior lighting categories (Tradable and/or Nontradable) included in the project (program takes a few seconds to generate input table)	☑ The Project includes Tradable Exterior Lighting ☐ The Project includes Nontradable Exterior Lighting

Tradable Surfaces

Table 9.4.5 Tradable Exterior Lighting Application	Required Input (Area or Length)	Total Area (ft^2) or Length (ft)	Baseline Case		Proposed Case
			Allowed LPD	Lighting Power Allowance (Watts)	Design Lighting Power (Watts)
Helpful Notes: •Only enter area or length of illuminated surface in the design •Fixtures cannot be double-counted for multiple exterior surface types			Allowance calculated using the maximum lighting power density from Table 9.4.5		Lighting power should be modeled as designed (or installed)
Automotive Hardscape	Area	12,000	0.150	1,800	690
Subtotal: Tradable surface lighting allowance				1,800	690
Total Tradable surface lighting allowance including 5% unrestricted allowance				1,890	

Nontradable Surfaces

Table 9.4.5 Nontradable Exterior Lighting Application	Required Input	Quantity of Required Input for Project	Baseline Case		Proposed Case
			Allowed LPD	Lighting Power Allowance (Watts)	Design Lighting Power (Watts)
Helpful Notes: •Only enter area or length of illuminated surface in the design •Fixtures cannot be double-counted for multiple exterior surface types			Total allowance calculated using the lesser of the design lighting power, or the lighting power allowance used, since no credit is permitted for nontradable surfaces		Lighting power should be modeled as designed (or installed)
Building facades	area	0	0	0	0
Building facades	length	0	5	0	0
ATMs and night depositories	Number of ATMs	0	270 + 90	0	0
Entrances and gatehouse inspection stations at guarded facilities	Uncovered Area	0	1	0	0
Loading areas for law enforcement, fire, ambulance, and other emergency service vehicles	Uncovered Area	0	1	0	0
Drive-through windows at fast food restaurants	Drive-throughs	0	400	0	0
Parking near 24-hour retail entrances	Main Entries	0	800	0	0
Subtotal: Nontradable surface lighting allowance				0	0
Total Nontradable surface lighting allowance including 5% unrestricted allowance				0	

Input Parameter	Baseline Case	Proposed Case
Total Exterior Lighting Power Calculated Above (Watts)	1,800	690
Total Exterior Lighting Power Modeled (Watts)	1,800	

Additional notes:

Table 1.4.4 - Process Equipment

Instructions: *Select the method used to model receptacle equipment, and then complete the corresponding receptacle equipment table (required inputs are green). Other process equipment should be reported in the bottom table. An example of the expected level of detail has been provided for each input. Please refer to the Helpful Notes for information about Appendix G modeling protocol. For any information not applicable to the project, simply enter "N/A".*

Process Equipment Requirements

All receptacle equipment and other process equipment designed or anticipated for the building have been accounted for in the energy models.	☑ Yes ☐ No
If process energy accounts for less than 25% of the total Baseline energy cost, an additional narrative justification for the low process cost has been provided in the supporting documentation. ***Note: process energy should not be arbitrarily set to 25% of the total Baseline cost, but should reflect the actual process loads anticipated for the building.***	☐ Yes ☐ No ☑ N/A(>25%)

If any of the process equipment requirements are indicated as "No" above, the project does not likely comply with LEED modeling requirements. It is recommended that the project team pursue a "Credit Interpretation Ruling" to justify the modeling approach. Please also provide any further information below to justify the modeling approach used.

Receptacle Equipment Modeling Method

Indicate whether the receptacle equipment was modeled using an average equipment power density for the building, equipment power densities by space type, or by entering the power associated with specific devices in each space (may select more than one)

- ☐ Building Average Equipment Power Density (W/sq.ft.)
- ☑ Space by Space Equipment Power Density (W/sq.ft.)
- ☐ Equipment Power by Device (Watts)

Space by Space Equipment Power Densities

Space Type	Total Area of Space Type	Equipment Power Density (W/ft^2)	Equipment Included in Power Density	Baseline Modeled Identically?
Helpful Notes:	•All receptacle loads must be modeled identically between the Proposed and Baseline case and included in the simulations per Table G3.1#12 •Any credit for improved receptacle equipment must be submitted using the Exceptional Calculation Method			
Sales Area	1,280	1.000		Yes
Parking Area, Interior	1,200	0.000		Yes
Office Open Plan	1,920	1.500		Yes
Dining Area For All Other	1,280	0.500		Yes
Total	5,680	0.845	***Total Power Modeled Using Space-by-Space Method (kW):***	4.8

Other Process Equipment

Equipment Type (Change/Add Labels as Necessary)	Energy Source	Energy Demand (kW)	Modeling Parameters	Baseline Modeled Identically?
Helpful Notes:	•All process loads must be modeled identically between the Proposed and Baseline case and included in the simulations per Table G3.1#12 •Any credit for improved process equipment must be submitted using the Exceptional Calculation Method •Exception: When the process or receptacle equipment includes components regulated by minimum efficiency requirements in ASHRAE 90.1, these components may be modeled in the Baseline Case using the minimum ASHRAE 90.1 efficiencies, and in the proposed case using actual proposed case efficiencies (e.g. Baseline may be modeled using furnace efficiencies from Table 6.8.1E, boiler efficiencies from Table 6.8.1G, chiller efficiencies from Table 6.8.1C or Section 6.4.1.2, or motor efficiency from Section 10.4).			
Elevators/Escalators				
Refrigeration Equipment				
Kitchen Equipment				
Data Center Equipment				
Process Loads	elec	5.1		Yes
Total			***Total Power for Other Process Equipment (kW):***	
			Total Power for Building Process/Receptacle Equipment(kW):	

Table 1.4.5 - Service Water Heating

Instructions: *Complete the Service Water Heaters table for each unique type of system in the project (required inputs are green). Use the Add a System Type button for more than one type of system. Complete the Service Hot Water Fixtures table if credit is modeled for low-flow fixtures in the Proposed case. If the project includes service hot water circulation pumps, complete the Service Hot Water Pumps table. An example of the expected level of detail has been provided for each input. Please refer to the Helpful Notes for information about Appendix G modeling protocol. For any information not applicable to the project, simply enter "N/A".*

Service Water Heaters

Model Input Parameter	Baseline Case	Proposed Case
Helpful Notes:	•New systems: minimum performance requirements from Table 7.8 per Table G3.1#11(b) •Existing systems: actual system inputs per Table G3.1#11(a) •Model separate service water heating system when design uses combined system with space heating per Table G3.1#11(e) •Condenser heat recovery as required by 6.5.6.2 per Table G3.1#11(f)	•Service water heaters modeled as designed (or installed) per Table G3.1#11(a&b) •Where no service hot water system exists or has been specified but the building will have service hot water loads, a service hot water system should be modeled identical to the Baseline per Table G3.1#11(c) •For buildings with no service hot water loads, no service hot water system should be modeled per Table G3.1#11(d)
System Type & Fuel	Electric Res	Heat Pump
Input Rating (kW, MBH, etc.)	75.000 Btu/hr	75.000 Btu/hr
Efficiency (EF, SL, %, etc.)	98.0% Efficiency	3.900 Energy Factor
Storage Volume (gal)	120.0 gallons	120.0 gallons
Storage Temperature (°F)	140 F	140 F
Peak Hot Water Demand (gpm)	0.603	0.603
Condenser heat recovery	None	None

Service Hot Water Fixtures

Note: *This table is only required to be completed if credit is modeled in the Proposed case for low-flow fixtures*

Fixture Type	Fixture Outlet Temp (°F)	% Hot Water	Baseline Case			Proposed Case		
			Flow Rate (gpm or gpc)	WEp1 Annual Total Water Consumption (kgal)	Annual Hot Water Consumption (kgal)	Flow Rate (gpm or gpc)	WEp1 Annual Total Water Consumption (kgal)	Annual Hot Water Consumption (kgal)
Helpful Notes:	•Refer to Table 3 in Chapter 50 of 2011 ASHRAE Handbook-HVAC Applications for fixture outlet temps used to determine % hot water •% Hot water should account for the DHW supply-to-fixture delta T, and for the percentage hot water versus cold water usage (e.g. residential lavatories would be expected to have cold water usage associated with brushing teeth)		•Fixtures included in the WEp1 calculations: values must be consistent with the WEp1 form •Additional fixtures not included in WEp1: use Proposed values or provide supporting documentation for Baseline assumption (example: Energy Star documentation of average hot water usage for residential dishwasher or clothes washer)			Values should be consistent with the design (or installed) fixtures and WEp1 (if applicable)		
Total								
			Annual Equivalent Full Load Hours of DHW Operation			Annual Equivalent Full Load Hours of DHW Operation		
			Calculated Peak Hourly Flow (gal/hour)			Calculated Peak Hourly Flow (gal/hour)		

Service Hot Water Pumps

Model Input Parameter	Baseline Case	Proposed Case
Helpful Notes:	•Service hot water pumps should be modeled identically between the Proposed and Baseline case •Any credit for improved service hot water pumps must be submitted using the Exceptional Calculation Method	Service hot water pumps modeled as designed (or installed)
Number of Pumps		
Total Pump Power (kW)		
Type of Pump (Constant/Variable)		
Pump Control		

Additional notes:

Table 1.4.6 - General HVAC

Instructions: *Complete the Special Circumstances section, the Proposed and Baseline HVAC System Type(s) tables, and the HVAC Modeling Requirements checklist below. An example of the expected level of detail has been provided for each input. Please refer to the Helpful Notes for information about Appendix G modeling protocol. For any information not applicable to the project, simply enter "N/A".*

Special Circumstances

	Yes	No
Is the project building connected to a district or campus thermal energy system where thermal energy is produced for or distributed to multiple buildings?	☐	☐

The district energy system includes (check all that apply):	☐ District Cooling ☐ District Heating ☐ CHP
Select how the district energy system has been modeled: *Note: "DES v2" refers to the document "Treatment of District or Campus Thermal Energy in LEED V2 and LEED 2009 – Design & Construction" dated August 10, 2010, which can be accessed at http://www.usgbc.org/ShowFile.aspx?DocumentID=7671*	☐ ASHRAE 90.1-2007 Appendix G without Addenda ☐ ASHRAE 90.1-2007 Appendix G Addenda ai ☐ California Title-24 Baseline default efficiencies ☐ DES v2 Option 1 (Building Stand-Aone) ☐ DES v2 Option 2 (Aggregate Building/DES)
For DES v2 Option 2, identify the method for evaluating the district plant average efficiency.	☐ Modeling Method ☐ Monitoring Method

Please indicate all relevant equipment located on the project site:	☐ Chillers ☐ Cooling Towers / Fluid Coolers ☐ Boilers for Space Heating / Backup Heat ☐ Ground Source / Geothermal Heat Pump ☐ Combined Heat & Power (CHP)

	Yes	No
Does the project building include tenant or other unfinished spaces whose systems (HVAC, lighting, etc.) are not included in the project's scope of work?	☐	☐

Select how the unfinished spaces have been modeled:	☐ All equipment in the unfinished spaces not included in the project scope of work has been modeled identically in the Baseline and Proposed case using the Baseline modeling requirements. ☐ Credit has been modeled in the Proposed case for energy efficiency measures that are specifically identified in signed tenant sales and lease agreements (LEED Core & Shell only. New Construction must be modeled

Proposed HVAC System Type(s)

		System Description	Spaces Modeled
	Helpful Notes:	•The HVAC system type and all related parameters, such as equipment capacities and efficiencies, must be modeled as designed (or installed) per Table G3.1#10(a&b) •Where no heating system exists or has been designed, the classification is assumed to be electric and the heating system is modeled identically to the Baseline case per Table G3.1#10(c) •Where no cooling system exists or has been designed, the cooling system is modeled identically to the Baseline case per Table G3.1#10(d)	
	Retail Mech. System		Retail Zone
	Office Mech System		Office Zone
	Restaurant Mech Sys.		Restaurant Zone
-			
-			
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Baseline HVAC System Type(s)

Model Input Parameter	Table G3.1.1A System Type (or Semiconditioned System Description)	G3.1.1 Exception (or Semiconditioned Capacity and Area)	Spaces Modeled
Helpful Notes:	•Refer to Section G3.1.1 and Table G3.1.1A (including footnotes) for Primary HVAC System selection		
Primary HVAC System	- Packaged (DX) Constant Volume Sin		Retail Zone
Primary HVAC System	- Packaged (DX) Constant Volume Sin		Office Zone
Primary HVAC System	- Packaged (DX) Constant Volume Sin		Restaurant Zone
Primary HVAC System	-		
Primary HVAC System	-		
Primary HVAC System	-		
Primary HVAC System	-		
Primary HVAC System	-		
Primary HVAC System	-		
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Primary HVAC System	-		
Primary HVAC System	-		
Primary HVAC System	-		
Primary HVAC System	-		
Other HVAC System(s)	-		
	-		

HVAC Modeling Requirements

Instructions: *After completing the information above, click "Refresh Modeling Requirements" to the left. All Proposed and Baseline HVAC system types must be entered above to to generate the correct modeling requirements below. After clicking "Refresh Modeling Requirements", identify each item as "Yes" or "No", and provide a further description for any items marked as "No".*

Proposed HVAC Requirements	All ***Proposed*** HVAC systems and related parameters, such as equipment capacities, efficiencies, airflows, fans, etc. have been modeled as designed and are consistent with supporting documentation uploaded in LEED Online	Yes
	Each ***Proposed*** HVAC thermal zone has been modeled as a separate thermal block except as allowed by Table G3.1#7	Yes
	All ***Proposed*** HVAC systems serving conditioned spaces have been modeled with heating and cooling as required by Table G3.1#1(b), with heating and/or cooling added as necessary identically to the Baseline case per Table G3.1#10(c&d) except where System types (9) or (10) have been modeled in accordance with Addendum dn	Yes
	All ***Proposed*** HVAC systems and related parameters can be modeled directly in the energy simulation program used	Yes
	All ***Proposed*** fan part-load efficiency curves for variable volume fans have been modeled identically to the Baseline curves for variable volume fans (if not, provide a description of the fan curves used in the space at the bottom of this table, and confirm that the proposed case curves are representative of the actual building design)	Yes

For each item entered as "No" above, describe the applicable ASHRAE 90.1 Appendix G exception(s)

Table 1.4.7A - Baseline Air-Side HVAC System Schedule

Instructions: *Enter all applicable input parameters for the Baseline air-side HVAC systems below. All systems included in the model should be entered. Each individual system may be entered separately, or multiple systems may be grouped together if all input parameters identified with an (*) are similar. The table is set up for two unique HVAC systems (or two groups of similar systems), and additional systems (or groups of similar systems) should be added as necessary using the Add a System button. An example of the expected level of detail has been provided for each input. Please refer to the Helpful Notes for information about Appendix G modeling protocol. For any information not applicable to the project,*

Note: All Baseline systems must be identified in the General HVAC Tab in order to display the relevant Baseline

Table 1.4.7A - Baseline Air-Side HVAC System Schedule

Model Input Parameter	Helpful Notes	HVAC System / Group		HVAC System / Group		HVAC System / Group		Totals
		Description	Units	Description	Units	Description	Units	
*System Type		(DX) Constant Volume S		(DX) Constant Volume S		(DX) Constant Volume S		
System Designation(s)	Consistent with designations used in model	Standard System-0		Standard System-1		Standard System-2		
Number of Similar Systems		1		1		1		
Total Cooling Capacity	Auto-sized with 15% oversizing per G3.1.2.2	89	kBtu/h	131	kBtu/h	165	kBtu/h	385
*Table 6.8.1 Unitary Cooling Capacity Range	•Systems 1 & 2: Table 6.8.1D •Systems 3, 5, & 6: Table 6.8.1A •System 4: Table 6.8.1B •Systems 7-10: N/A		kBtu/h		kBtu/h		kBtu/h	
*Unitary Cooling Efficiency (EER or SEER)	Units should be consistent with the ASHRAE 90.1 minimum efficiency rating requirements for this system type	10.1 EER		10.1 EER		9.5 EER		
*Unitary Cooling Part-load Efficiency (if applicable)	Enter N/A if not applicable	n/a		n/a		n/a		
Total Heating Capacity	Auto-sized with 25% oversizing per G3.1.2.2	51	kBtu/h	57	kBtu/h	68	kBtu/h	176
*Table 6.8.1 Unitary Heating Capacity Range	•System 2: Table 6.8.1D •Systems 3 & 9: Table 6.8.1E •System 4: Table 6.8.1B •Systems 1, 5-8, 10: N/A		kBtu/h		kBtu/h		kBtu/h	
*Unitary Heating Efficiency	List all relevant efficiencies (e.g. 3.2 COP at 47°F db/43°F wb, 2.0 COP at 17°F db/15°F wb outdoor air)	78% AFUE		78% AFUE		78% AFUE		
*Fan Control	•Systems 1-4, 9 & 10: Constant Volume •Systems 5-8: Variable Volume	Constant Volume		Constant Volume		Constant Volume		
Supply Airflow	•Systems 1-8: Auto-sized based on 20°F ΔT •Systems 9-10: Auto-sized based on 105°F SAT	1,594	cfm	2,888	cfm	3,611	cfm	8,093
Outdoor Airflow	•If DCV modeled in Proposed only: ASHRAE 62.1 minimum ventilation rates reported in IEQp1 •All other cases: identical to Proposed	640	cfm	576	cfm	750	cfm	1,966
Demand Control Ventilation	If required by Section 6.4.3.9 (spaces >500 sf with >40 people/1,000 sf)	No		No		Yes		
*Economizer High-Limit Shutoff (°F)	•Systems 1, 2, 9 & 10: N, A •Systems 3-8: as required by G3.1.2.6 & G3.1.2.7 by Climate Zone: • Not Required - 1a, 1b, 2a, 3a, 4a •75°F - 1b, 2b, 3b, 3c, 4b, 4c, 5b, 5c, 6b, 7b, 8 •70°F - 5a, 6a, 7a	Fixed Temp (Integrated) 75	°F	Fixed Temp (Integrated) 75	°F	Fixed Temp (Integrated) 75	°F	

Model Input Parameter	Helpful Notes	HVAC System / Group		HVAC System / Group		HVAC System / Group		Totals
		Description	Units	Description	Units	Description	Units	
*Supply Air Temperature Reset	Systems 5-8: Supply air temperature reset of 5°F under minimum cooling load conditions per G3.1.3.12 (e.g. from 55 °F to 60 °F)	Warmest Zone		Warmest Zone		Warmest Zone		
*Any individual systems with ≥5,000 cfm supply air and ≥70% outdoor air?	•Exhaust air energy recovery required for individual systems with ≥5,000 cfm supply air and ≥70% outdoor air per G3.1.2.10 unless any exceptions apply	None		None		None		
*Exhaust Air Energy Recovery Effectiveness or G3.1.2.10 Exception Claimed	•50% energy recovery effectiveness •Bypass or control to permit economizer							
Supply Fan Power	•Sum of fan power for all supply, return, relief, and exhaust fans cannot exceed G3.1.2.9 system fan power allowance calculated using supply cfm	1.29	kW	2.26	kW	2.83	kW	
Return/Relief Fan Power	•Report exhaust fans not interlocked with HVAC operation (such as parking garage ventilation fans, or unconditioned electrical room exhaust fans), and exhaust fans not required in the calculations (such as fume hoods applying Exception 6.5.3.1.1, or kitchen hoods operating independently of the building HVAC system) in Table 1.4.4	0.00	kW	0.00	kW	0.00	kW	
Exhaust Fan Power		0.04	kW	0.04	kW	0.04	kW	
System Fan Power		1.33	kW	2.30	kW	2.87	kW	6.5
Allowed Fan Power:	These values are calculated based on, system type, any pressure adjustments listed below, the total supply volume, and the ASHRAE 90.1 fan motor efficiency associated with the fan bhp.	1.33	kW	2.30	kW	2.87	kW	6.5
* Total Table 6.5.3.1.1B Pressure Drop Adjustments (A).		0.00	bhp	0.00	bhp	0.00	bhp	
Pressure Drop Adjustments: *(Systems 3 through 8)*	•For each pressure adjustment allowed, enter the Baseline cfm through each device (CFM_D)	cfm	in. w.c.	cfm	in. w.c.	cfm	in. w.c.	
* Fully ducted return and/or exhaust air systems	Adjustment = 0.5 in. w.c.							
* Return and/or exhaust airflow control devices	only where modulated to maintain relative negative or positive space pressure (e.g. lab, operating room)							
* Exhaust filters, scrubbers, or other exhaust treatment	Adjustment = Pressure drop of device calculated at fan system design condition							
* Particulate Filtration Credit: MERV 9 through 12	Adjustment = 0.5 in. w.c.							
* Particulate Filtration Credit: MERV 13 through 15	Adjustment = 0.9 in. w.c.							
* Particulate Filtration Credit: MERV 16 and greater and electronically enhanced filters	Adjustment = Pressure drop calculated at 2× clean filter pressure drop at fan system design condition							
* Carbon and other gas-phase air cleaners	Adjustment = Clean filter pressure drop at fan system design condition							
* Heat recovery device	•only if modeled in Baseline per G3.1.2.10 •Adjustment = Pressure drop of device at fan system design condition							
* Evaporative humidifier/cooler in series with another cooling coil	•only if modeled in Baseline • Adjustment = Clean filter pressure drop at fan system design condition							
* Sound Attenuation Section	Adjustment = 0.15 in. w.c.							
* Fume Hood Exhaust Exception	required if 6.5.3.1.1 Exception [c] is taken							
* Non-mechanical cooling fan volume	For system types #9 and #10, if present in the proposed design, increases the baseline fan power allowance by 0.054 Watts/cfm.		cfm		cfm		cfm	

See Instructions above

Table 1.4.7B - Proposed Air-Side HVAC System Schedule

Instructions: *Instructions: Enter all applicable input parameters for the Proposed air-side HVAC systems below. All systems included in the model should be entered. Each individual system may be entered separately, or multiple systems may be grouped together if all input parameters identified with an (*) are similar. The table is set up for two unique HVAC systems (or two groups of similar systems), and additional systems (or groups of similar systems) should be added as necessary using the Add a System button. An example of the expected level of detail has been provided for each input. Please refer to the Helpful Notes for information about Appendix G modeling protocol. For any information not applicable to the project, simply enter "N/A".*

Table 1.4.7B - Proposed Air-Side HVAC System Schedule

Model Input Parameter	Helpful Notes	HVAC System / Group		HVAC System / Group		HVAC System / Group		Totals
		Description	Units	Description	Units	Description	Units	
*System Type	All inputs should be consistent with the Proposed energy model and the mechanical drawings and equipment schedules submitted in LEED Online	aged (DX) VAV Single 1		aged (DX) VAV Single 1		aged (DX) VAV Single 2		
System Designation(s)		Retail Mech. System		Office Mech System		Restaurant Mech Sys.		
Number of Similar Systems		1		1		1		
Total Cooling Capacity		72	kBtu/h	72	kBtu/h	160	kBtu/h	304
*Unitary Cooling Efficiency	Units should be consistent with the ASHRAE 90.1 minimum efficiency rating requirements for this system type	13.0 EER		13.0 EER		13.0 EER		
*Unitary Cooling Part-load Efficiency	Indicate the part-load efficiency. Also describe the method for modeling part-load curves if the energy simulation does not have default curves for this equipment type. Enter N/A if not applicable.	n/a		n/a		n/a		
Total Heating Capacity	All inputs should be consistent with the Proposed energy model and the mechanical drawings and equipment schedules submitted in LEED Online	92	kBtu/h	61	kBtu/h	148	kBtu/h	301
*Unitary Heating Efficiency	List all relevant efficiencies (e.g. 3.2 COP at 47°F db/43°F wb, 2.0 COP at 17°F db/15°F wb outdoor air)	3.40 COP		3.40 COP		3.40 COP		
*Fan Control	e.g. Variable Speed Fans, 3-speed ECM fans with automated controls, constant speed, etc.	Variable Speed Drive		Variable Speed Drive		Variable Speed Drive		
Supply Airflow	Inputs should be consistent with the mechanical drawings and equipment schedules submitted in LEED Online	2,400	cfm	2,400	cfm	5,000	cfm	9,800
Outdoor Airflow	Actual minimum outdoor airflow rates consistent with Mechanical Schedule	640	cfm	576	cfm	750	cfm	1,966
Demand Control Ventilation	Briefly describe how demand control ventilation was modeled	Yes		No		Yes		
*Economizer Control	Describe the type of economizer control and the high limit shutoff. Also indicate if the economizer controls are for less than 100% of the design supply air.	Diff. Temp (Integrated) 75	°F	Diff. Temp (Integrated) 75	°F	Diff. Temp (Integrated) 75	°F	

Model Input Parameter	Helpful Notes	HVAC System / Group		HVAC System / Group		HVAC System / Group		Totals
		Description	Units	Description	Units	Description	Units	
*Supply Air Temperature Reset	e.g. - Supply air temperature reset from 55°F to 62°F based on worst case zone	Constant Temp		Constant Temp		Constant Temp		
*Exhaust Air Energy Recovery	If the system includes energy recovery, describe the type of energy recovery and recovery effectiveness (example: enthalpy wheel - 75% effective). Otherwise, enter "N/A".	None		None		None		
Supply Fan Power	•Report exhaust fans not interlocked with HVAC operation (such as parking garage ventilation fans, or unconditioned electrical room exhaust fans), and exhaust fans not required in the calculations (such as fume hoods applying Exception 6.5.3.1.1, or kitchen hoods operating independently of the building HVAC system) in Table 1.4.4	1.07	kW	1.01	kW	2.61	kW	
Return/Relief Fan Power		0.00	kW	0.00	kW	0.00	kW	
Exhaust Fan Power		0.04	kW	0.04	kW	0.04	kW	
System Fan Power		1.11	kW	1.05	kW	2.65	kW	4.8
Other (Describe)								
Other (Describe)								
Other (Describe)								
Other (Describe)								
Other (Describe)								
Other (Describe)								
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Other (Describe)								
Other (Describe)								

*__See Instructions above__

Table 1.4 - Air-Side HVAC System Schedule

Table 1.4.8 - Water-Side HVAC System Schedule

Instructions: *Enter all applicable input parameters for the Baseline and Proposed water-side HVAC systems below. All systems included in the model should be entered. An example of the expected level of detail has been provided for each input. Please refer to the Helpful Notes for information about Appendix G modeling protocol. For any information not applicable to the project, simply enter "N/A". If taking credit for a campus or district plant efficiency using the DES v2 Option 2 Guidance, please include all relevant information regarding the District Plant equipment in the Proposed Case. For projects using the DES v2 Option 2 Guidance Option 1, or ASHRAE 90.1 Addendum ai for district energy systems, it is recommended that the Proposed Case inputs be completed first, and the description for many Baseline Case inputs will be auto-generated based on the proposed case inputs. Baseline Helpful notes relevant to DES v2 Option 1 and ASHRAE 90.1 Addendum ai are abbreviated as "DESv2#1" and "ai" respectively.*

	Model Input Parameter	Baseline Helpful Notes	Baseline Case	Units	Proposed Case	Units
Chilled Water	Number and Type of Chillers *(and capacity per chiller if more than one type or size of chiller)*	•***≤300 tons building peak:*** 1 water-cooled screw chiller •***300-600 tons building peak:*** 2 equally-sized water-cooled screw chillers •***≥600 tons building peak:*** At least 2 water-cooled centrifugal chillers (800 tons max per chiller)				
	Total Chiller Capacity	Auto-sized with 15% oversizing (unless oversized at the system coil) per G3.1.2.2	0	tons	0	tons
	Chiller Efficiency - Full Load	Per Table 6.8.1C efficiencies		kW/Ton		kW/Ton
	Chiller Efficiency - Part Load					
	Chilled Water (CHW) Supply Temp	44°F per G3.1.3.8	44	°F	44	°F
	CHW ΔT	12°F per G3.1.3.8		°F		°F
	CHW Supply Temp Reset Parameters	44°F at outdoor temps 80°F and above, 54°F at outdoor temps 60°F and below, and ramped linearly between 44°F and 54°F at outdoor temps between 80°F and 60°F per G3.1.3.9	not a DOE-2 capability		not a DOE-2 capability	
	CHW Loop Configuration	Primary/secondary per G3.1.3.10	Primary Only		Primary Only	
	Number of Primary CHW Pumps	1 per chiller per G3.1.3.11	0	#	0	#
	Primary CHW Pump Power	22 W/gpm per G3.1.3.10		W/gpm		W/gpm
	Primary CHW Pump Flow	Auto-sized with a capacity ratio of 1.0 based on CHW temperatures		gpm		gpm
	Primary CHW Pump Control	Constant Flow - each primary pump interlocked to operate with associated chiller - G3.1.3.10, G3.1.3.11	Constant Flow		Constant Flow	
	Number of Secondary CHW Pumps	1 per G3.1.3.10		#	1	#
	Secondary CHW Pump Power	22 W/gpm per G3.1.3.10		W/gpm	0.00	W/gpm
	Secondary CHW Pump Flow	Auto-sized with a capacity ratio of 1.0 based on CHW temperatures		gpm	0	gpm

Model Input Parameter		Baseline Helpful Notes	Baseline Case	Units	Proposed Case	Units
	Secondary CHW Pump Control	***<300 tons:*** riding the pump curve ***≥300 tons:*** variable speed			One-Speed / 3 Way Valves	
	Water-Side Economizer	Not required	No		No	
	Water-Side Energy Recovery	Not required				
Cooling Tower & Condenser Water	Number of Cooling Towers / Fluid Coolers	1 per G3.1.3.11	0	#	0	#
	Cooling Tower Fan Power	Minimum 38.2 gpm/hp (maximum 0.0262 hp/gpm or 19.5 W/gpm) per Table 6.8.1G		gpm/Hp		gpm/Hp
	Cooling Tower Fan Control	Two-speed axial fans per G3.1.3.11				
	Condenser Water (CW) Leaving Temp	85°F or 10°F approaching design wet-bulb temperature, whichever is lower per G3.1.3.11		°F		°F
	CW ΔT	10°F per G3.1.3.11		°F		°F
	CW Loop Temp Reset Parameters	Maintain a 70°F leaving water temperature where weather permits, floating up to leaving water temperature at design conditions per G3.1.3.11				
	Number of CW Pumps	1 per chiller per G3.1.3.11	0	#	0	#
	CW Pump Power	19 W/gpm per G3.1.3.11		W/gpm		W/gpm
	CW Pump Flow	Auto-sized with a capacity ratio of 1.0 based on CW temperatures		gpm		gpm
	CW Pump Control	Riding the pump curve per G3.1.3.11				
Hot Water / Steam	Number and Type of Boilers	***≤15,000 sf:*** 1 natural draft hot water boiler ***>15,000 sf:*** 2 equally-sized natural draft hot water boilers staged as required by the load				
	Total Boiler Capacity	Auto-sized with 25% oversizing (unless oversized at the system coil) per G3.1.2.2				
	Boiler Efficiency	Per Table 6.8.1F minimum efficiencies				
	Hot Water or Steam (HHW) Supply Temp	180°F per G3.1.3.3		°F		°F
	HHW ΔT	50°F per G3.1.3.3		°F		°F
	HHW Temp Reset Parameters	180°F at outdoor temps 20°F and below, 150°F at outdoor temps 50°F and above, and ramped linearly between 180°F and 150°F at outdoor temps between 20°F and 50°F per G3.1.3.4			Primary Only	
	HHW Loop Configuration	Primary-only per G3.1.3.5			1	
	Number of Primary HHW Pumps	One pump per Boiler		#	0	#
	Primary HHW Pump Power	19 W/gpm per G3.1.3.5		W/gpm	0	W/gpm
	Primary HHW Pump Flow	Auto-sized with a capacity ratio of 1.0 based on HHW temperatures		gpm	One-Speed / 3 Way Valves	gpm
	Primary HHW Pump Control	***<120,000 sf:*** riding the pump curve ***≥120,000 sf:*** variable speed				