

Baltimore City Green Building Standards

Applicants Coversheet - Standards Verification Package

Project Name:				Contact Person:			
Project Address:				Permit No.:			
				Date:			
				Telephone:			
				Fax:			
				Cell (Optional):			
Designer of Record:				Other:			
Developer or Owner				BCGBS Anticipated Rating:			
Name:				BCGBS Anticipated Program:			
Firm:				Total Credit Points estimated:			
Title:				Zoning District:			
Address:				Permit Application date:			
				Estimated Start Construction			
				Est Time for construction			
				Est Date of Occupancy			
Phone:				Project Type: [describe]			
Fax:				Size of the project:			
Email:				No. Stories			
LEED AP Cert.				Lot area (Gross sf):			
LEED Coordinator:				Commissioning Agent			
Name:				Name:			
Firm:				Firm:			
Title:				Title:			
Address:				Address:			
Phone:				Phone:			
Fax:				Fax:			
Email:				Email:			
LEED AP Cert.				Other:			
Contractor/Builder				BCGBS/LEED Coord. for Contractor/Builder			
Name:				Name:			
Firm:				Firm:			
Address:				Address:			
Phone:				Phone:			
Fax:				Fax:			
Email:				Email:			
Other:							

Applicants Coversheet - Standards Verification Package

Is this a LEED Pathway Project? <input type="checkbox"/> <input type="checkbox"/> <i>yes no</i>		Standards Verification Package (SVP) Checklist	
If Yes, submit the following information:		BCGBS Applicant's Scorecard: completed print out with all references included The following template forms are included: BCGBS WR.1 to W.3 Water Calculation Form for Base case and Design Case BCGBS E.R1 Basic Commissioning Form Outline of Commissioning Plan ✓ BCGBS ER.1 & E.1 BCGBS Energy Analysis Forms and ASHRAE 90.1-2007 Envelope, HVAC, Lighting and Service Water Compliance forms Project Energy Model BCGBS E.4 Advanced Ozone Protection (Opt.) BCGBS E.6 Green Power Contract & Supply (Opt.) BCGBS HB.R1 Healthy Buildings - Basic Air Quality ASHRAE 62.1-2007 Minimum Indoor Air Quality Spreadsheet (Optional) Credit Narratives Notes:	
<input type="checkbox"/>	LEED project		
<input type="checkbox"/>	Applicants LEED Scorecard		
<input type="checkbox"/>	Copy of all LEED Documentation		
<input type="checkbox"/>	Project Energy Model		
<input type="checkbox"/>	Outline of Commissioning Plan		
<input type="checkbox"/>	Other: [describe]		
Note: Applicants will be required to submit to HCD the LEED Construction Report OR confirmation of award of a LEED Silver rating for the project in order to comply with the BCGBS.			
Is this a Net-Zero Energy Project? <input type="checkbox"/> <input type="checkbox"/> <i>yes no</i>			
If Yes, HCD to check project, assign rating and add 2 Green Stars to the overall project score.			
Is this project seeking to use an Alternative Compliance Path? <input type="checkbox"/> <input type="checkbox"/> <i>yes no</i>			
Name of ACP:			

This space can be used for any additional notes or commentary by the project team or to present information directly to the Plans Examining Reviewer.

Credit Narrative Form

Project Name:		Permit No.:	
BCGBS Coordinator:		Date:	
Address:			
Phone:			
Email:			

Green Star Rating:	
BCGBS Program:	
Credit Name:	
Credit Summary The project team will do the following to meet the criteria of the credit:	

Documents: See Reference Posting in Online Credit Scorecard Worksheet

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This area for calculations, supporting documentation, etc.

BCGBS Templates & Forms Instructions for: BCGBS W.R1 City Water Supply – Basic Conservation 20% BCGBS W.3.1 to W3.3 City Water Supply – Reduce Domestic Use

The Baltimore City Green Building Standards prerequisite W.R1 City Water Supply – Basic Conservation 20%, requires project applicants to document that their projects potable water use for water closets, urinals, lavatory faucets, showers, kitchen sink faucets and pre-rinse spray valves, in aggregate, will be 20% less than the water use baseline calculated for the building.

The attached form, *W.R1 City Water Supply – Basic Conservation 20%*, should be used to complete the calculations required for this credit. The Applicant is required to determine the baseline water use per the LEED Reference Guide for Green Building Design and Construction, 2009 Edition. These calculations are based on estimated occupant usage and must include the fixtures and fittings as described in the Reference Guide. The calculation of full-time equivalents (FTE's) must be calculated per the Reference Guide. If the Applicant has determined that their building project's occupant fixture use rate is different than the default values listed in Table 3 of WE Prerequisite 1 of the LEED Reference Guide for Green Building Design and Construction, 2009 Edition, a narrative must be provided to explain the justification for the change with this form.

The attached form *W.R1 City Water Supply – Basic Conservation 20%/W.3 City Water Supply – Reduce Domestic Use* should be completed by the Applicant. The form requires that the Applicant provide the flow rates in Gallons per Minute for faucets, showers and other plumbing devices, as well as the Gallons per Flush for water closets, urinals, etc., used in the project. The Applicant should total the total water usage listed in the spreadsheet for each plumbing fixture and the total for both the proposed and baseline cases. The form only provides a record of the calculations performed to meet the Green Building Design and Construction 2009 Edition for Credit WPr1 and WEc3 Water Use Reduction. See the LEED Reference Guide for more information.

W.R.1. City Water Supply - Basic Conservation - 20%
W.3. City Water Supply - Reduce Domestic Use

Project Name: **Date:**

	FTE	Visitors	Students	Other	Number of Days:
Male					
Female					
Total					

Flow Fixture Base Line Case- Daily									
Fixture Type	Flow Rate (GPM)	Duration (minutes)	Total Flow	Daily Uses Per Person				Total Water Usage	
				FTE	Visitor	Student	Other		
Conventional Lavatory									
Conventional Lavatory - Basin									
Conventional Shower									
Kitchen Sink									
Janitor Sink									
Janitor Sink - Mop Basin									
Flow Fixture Total									

Flush Fixture Base Line Case- Daily										
Fixture Type	Flow Rate (GPF)	Daily Uses Per Person								Total Water Usage
		FTE Male	FTE Female	Visitor Male	Visitor Female	Student Male	Student Female	Other Male	Other Female	
Conventional Water Closet										
Conventional Urinal										
Flow Fixture Total										

Flow Fixture Design Line Case- Daily									
Fixture Type	Flow Rate (GPM)	Duration (minutes)	Total Flow	Daily Uses Per Person				Total Water Usage	
				FTE	Visitor	Student	Other		
Conventional Lavatory									
Conventional Lavatory - Basin									
Conventional Shower									
Kitchen Sink									
Janitor Sink									
Janitor Sink - Mop Basin									
Flow Fixture Total									

Flush Fixture Design Line Case- Daily										
		Daily Uses Per Person								
Fixture Type	Flow Rate (GPF)	FTE Male	FTE Female	Visitor Male	Visitor Female	Student Male	Student Female	Other Male	Other Female	Total Water Usage
Conventional Water Closet										
Dual Flush - Low										
Dual Flush - Full										
Conventional Urinal										
Ultra Low-Flow Urinal										
Flow Fixture Total										

Non-Potable Source Water		
Water Source		Annual Quantity (gal)
Grey Water Re-Use		
Rainwater Re-Use		
Non-Potable Total		
Total Baseline Case Water Usage		
Total Design Case Water Usage		
Total Annual Non-Potable Water Usage		
Water Reduction %		

BCGBS Templates & Forms Instructions for: BCGBS E.R1 Basic Project Commissioning Form

The Baltimore City Green Building Standards requires project applicants to retain the services of a commissioning authority (CxA) to verify that the project’s energy-related systems are installed, calibrated and perform according to both the Owner’s project requirements, but also the manufacturer of the equipment in order to satisfy the prerequisite *E.R1 Basic Project Commissioning*. Applicants are required also to submit a copy of a Commissioning Plan, prepared by the CxA with the Standards application checklist.

Required Commissioning Plan Components
Brief overview of commissioning process.
List of all systems and assemblies included in commissioning authority’s scope of work.
Identification of commissioning team and individual members roles and responsibilities.
Description of management, communication, and reporting of commissioning process.
Overview of commissioning process activities for pre-design, design, construction, and occupancy and operations phases, including development of owner’s project requirements, review of basis of design, schematic design, construction documents and submittals, construction phases verification, functional performance test development and Implementation, and 10-month warranty review.
List of expected work products.
List of commissioning process milestones.

Project teams pursuing *E.3.1 Advanced Project Commissioning* will need to also include the following components in the Commissioning Plan:

- Documenting the commissioning review process.
- Reviewing contractor submittals.
- Developing the systems manual.
- Verifying the training of operations personnel.
- Reviewing building operation after final acceptance.

Energy- Basic Project Commissioning - E.R1

Project Name:

The OPR includes the following elements:

<input type="checkbox"/>	Owner & User Requirements
<input type="checkbox"/>	Environmental and Sustainability Goals
<input type="checkbox"/>	Energy Efficiency Goals
<input type="checkbox"/>	Indoor Environmental Quality Requirements
<input type="checkbox"/>	Equipment and System Expectations
<input type="checkbox"/>	Building Occupant O&M Personnel Requirements
<input type="checkbox"/>	

The following systems were commissioned (as applicable to the LEED project scope):

<input type="checkbox"/>	HVAC&R systems (mechanical and passive) and associated controls
<input type="checkbox"/>	Lighting and daylighting controls
<input type="checkbox"/>	Domestic hot water systems
<input type="checkbox"/>	Renewable energy systems
<input type="checkbox"/>	

<input type="checkbox"/>	The CxA has reviewed the Basis of Design (BOD) & Owner's Project requirements (OPR). The owner's project requirements are complete, feasible, and well-documented, and the design team's solutions adequately address the owner's requirements
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General Project Information

Performance Rating Method Compliance Report

Project Name:			
Project Address:		Date:	
Designer of Record		Telephone:	
Contact Person:		Telephone:	
Address:		Principle Heating Source <input type="checkbox"/> Fossil Fuel <input type="checkbox"/> Electricity <input type="checkbox"/> Solar/Site Recovered <input type="checkbox"/> Other	
Weather Data			
Climate Zone			

Space Summary

Building Use	Conditioned Area (sf)	Unconditioned Area (sf)	Total (sf)
Total			

Advisory Messages

	Proposed Building Design	Budget Building	Difference (Proposed Budget)
Number of hours heating loads not met (system / plant)			
Number of hours cooling loads not met (system / plant)			
Number of warnings			
Number of errors			
Number of defaults overridden			

Description of differences between the budget building and proposed design not documented on other forms: Not Applicable Attached

Additional Building Information

Quantity of Floors	
Quantity of People	
Occupancy Schedule	
Simulation Program	
Utility Rate Structure: Electricity	
Utility Rate: Electricity	
Utility Rate Structure: Natural Gas	
Utility Rate: Natural Gas	
Utility Rate: Steam or Hot Water	
Utility Rate: Chilled Water	
Utility Rate: Other	

Proposed and Baseline Summary Table - E.1.1. and E.1.2.

Comparison of Budget Design versus Design Energy Case			
Project Name:			
Building Element:	Building Design (Design Case)	ASHRAE 90.1-2007 Appendix G (Baseline Case).	
BUILDING ENVELOPE			
Above Grade Wall Construction			
Below Grade Wall Construction			
Exterior Floor Construction			
Slab-on-grade Construction			
Window-to-wall ratio			
Fenestration, including Glass Doors	<ul style="list-style-type: none"> Framing U-Value = SHGC_{north} = SHGC_{other} = TVis = 		<ul style="list-style-type: none"> U-value = SHGC_{other} = SHGC_{north} = TVis =
Fixed Shading Devices			
Automated Movable Shading Devices			
Floor			
Roof			

ELECTRICAL SYSTEMS		
Lighting Power Density		
Lighting Occupant Sensor Controls		
Daylighting Controls		
Equipment Power Density		
Exterior lighting (tradable surfaces)		
Exterior lighting (non-tradable surfaces)		
Elevators and Escalators		
Refrigeration Equipment		
Other Process Loads		
SCHEDULES		
Occupancy, Lighting and Equipment		
HVAC		

MECHANICAL & PLUMBING SYSTEMS		
HVAC System Type		
Design Supply Air Temperature Differential		
Fan Control		
Fan Power		
Demand Control Ventilation		
Unitary Equipment Cooling Efficiency		
Unitary Equipment Heating Efficiency		
Chiller		
Chilled Water Loop & Pumps		
Condenser Water Loop & Pumps		
Heat Recovery		
Air-side Economizer Controls		
Boiler Efficiency		
Hot Water Loop & Pumps		
Domestic Water Heating		
Utility Rates		
Electrical rate		
Natural Gas rate		

Performance Rating Method Compliance Report - E.1.1. and E.1.2.

Baseline Building Performance Table
 Baseline Building Energy Summary by End Use

Project Name:

End Use	Process?	Energy Type	0° Rotation		90° Rotation		180° Rotation		270° Rotation		Average	
			Energy [10 ⁶ Btu]	Peak [10 ⁶ Btuh]	Energy [10 ⁶ Btu]	Peak [10 ⁶ Btuh]	Energy [10 ⁶ Btu]	Peak [10 ⁶ Btuh]	Energy [10 ⁶ Btu]	Peak [10 ⁶ Btuh]	Energy [10 ⁶ Btu]	Peak [10 ⁶ Btuh]
Interior Lighting		Electricity										
Interior Lighting (Process)		Electricity										
Exterior Lighting		Electricity										
Space Heating (fuel 1)		Natural Gas										
Space Heating (fuel 2)		Electricity										
Space Cooling (fuel 1)		Electricity										
Space Heating (fuel 3)		Remote HW										
Space Cooling (fuel 2)		Remote CHW										
Heat Rejection		Electricity										
Fans Interior		Electricity										
Fans - Parking Garage		Electricity										
Pumps		Electricity										
Service Water Heating (fuel 1)		Natural Gas										
Service Water Heating (fuel 2)		Electricity										
Receptacle Equipment		Electricity										
Space Cooling (Process)		Electricity										
Refrigeration (Food, etc.)		Electricity										
Cooking (commercial, fuel 1)		Natural Gas										
Cooking (commercial, fuel 2)		Electricity										
Elevators and Escalators		Electricity										
Misc.		Electricity										
Total Building Consumption/Demand												
Total Process Energy												

Note: Energy Consumption is listed in units of site energy [10³ Btu = kWh x 3.413 and 10³ Btu = therms/100]

Baseline Building Energy Cost and Consumption by Fuel Type

Energy Type	0° Rotation		90° Rotation		180° Rotation		270° Rotation		Average	
	Energy Consumption [10 ⁶ Btu]	Energy Cost [\$/YR]	Energy Consumption [10 ⁶ Btu]	Energy Cost [\$/YR]	Energy Consumption [10 ⁶ Btu]	Energy Cost [\$/YR]	Energy Consumption [10 ⁶ Btu]	Energy Cost [\$/YR]	Energy Consumption [10 ⁶ Btu]	Energy Cost [\$/YR]
Electricity										
Natural Gas										
Remote Steam/Hot Water										
Remote Chilled Water										
Total										

The process energy cost is 13.6% of the Baseline Building Performance. This DOES NOT meet the requirements of LEED EA1 which is at least 25% of the Baseline Building Performance

Performance Rating Method Compliance Summary Report - E.1.1. and E.1.2.

**Performance Rating Table
Energy Summary by End Use**

Project Name:							
End Use	Process?	Energy Type	Proposed Building		Baseline Building		Energy [%]
			Energy [10 ⁶ Btu]	Peak [10 ⁶ Btuh]	Energy [10 ⁶ Btu]	Peak [10 ⁶ Btuh]	Energy [%]
Interior Lighting		Electricity					
Interior Lighting (Process)		Electricity					
Exterior Lighting		Electricity					
Space Heating (fuel 1)		Natural Gas					
Space Heating (fuel 2)		Electricity					
Space Cooling (fuel 1)		Electricity					
Space Heating (fuel 3)		Remote HW					
Space Cooling (fuel 2)		Remote CHW					
Fans Interior		Electricity					
Pumps		Electricity					
Service Water Heating (fuel 1)		Natural Gas					
Service Water Heating (fuel 2)		Electricity					
Receptacle Equipment		Electricity					
Space Cooling (Process)		Electricity					
Cooking (commercial, fuel 1)		Natural Gas					
Cooking (commercial, fuel 2)		Electricity					
Elevators and Escalators		Electricity					
Misc.		Electricity					
Total Building Consumption							

Note: Energy Consumption is listed in units of site energy [10³ Btu = kWh x 3.413 1 therm = 100 MBH]

Energy Type		Proposed Building		Baseline Building		Percentage Improvement	
		Energy Consumption [10 ⁶ Btu]	Energy Cost [\$ / YR]	Energy Consumption [10 ⁶ Btu]	Energy Cost [\$ / YR]	Energy %	Energy Cost %
Nonrenewable (Regulated & Unregulated)							
Electricity							
Natural Gas							
Remote Steam/Hot Water							
Remote Chilled Water							
Other							
Total Nonrenewable (regulated & Unregulated)							

Exceptional Calculation Method Savings (savings indicted as negative numbers)		Proposed Building		Baseline Building		Percentage Improvement	
		Energy Consumption [10 ⁶ Btu]	Energy Cost [\$ / YR]	Energy Consumption [10 ⁶ Btu]	Energy Cost [\$ / YR]	Energy %	Energy Cost %
Site generated Renewable (REC)							
Site Recovered							
Exceptional Calculation #1 Savings							
Exceptional Calculation #2 Savings							
Exceptional Calculation #3 Savings							
Total Including Exceptional Calculations							

Percentage Improvement = 100 x [1 - (Proposed Building Performance / Baseline Building Performance)] =
 Percent Renewable = REC / (Proposed Building Performance + REC) =

BCGBS Templates & Forms Instructions for: BCGBS E.R2 – Basic Project Conservation & Minimum Performance 10% Savings BCGBS E.1.1 to E.1.8 - High Performance & Efficiency BCGBS E.2.1 to E.2.4 - Energy – On-Site Renewable Energy Generation

The Baltimore City Green Building Standards requires applicants whose commercial buildings and multi-family structures of 3 habitable stories or more above grade calculate the energy performance of the proposed building project using a computer simulation model in accordance with the performance rating method in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007 (without errata but without addenda). Appendix G of the Standard 90.1-2007 requires the applicant develop a baseline model that reflects most of the building operational features of the proposed building but with changes in minimum performance criteria and mandatory provisions listed in the 90.1-2007 Standard. The reduction in energy consumption is based on the reduction of overall energy costs of the design case model from the Standard 90.1-2007 compliant baseline energy model. The project must also demonstrate that the project will also meet the mandatory ASHRAE 90.1-2007 requirements listed in Sections of 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4 the Standard (with errata but without addenda).

For the E.R2 *Basic Project Conservation & Minimum Performance 10% Savings*, Applicants of covered buildings must demonstrate a 10% improvement in the proposed building energy performance for new buildings, or a 5% improvement for major renovations to existing buildings. Documentation supporting compliance with EA Prerequisite 1: Minimum Energy Performance includes the following forms listed in Table 1. The ANSI/ASHRAE/IESNA Standard 90.1-2007 Envelope, HVAC, Lighting and Service Water Compliance Forms must be submitted for this Prerequisite.

Table 1: ASHRAE 90.1-2007 Compliance Forms
Mandatory Measures: All Projects
Building envelope compliance documentation (Part 1), mandatory provisions checklist
HVAC compliance documentation (Part II), mandatory provisions checklist
Service water heating compliance documentation (Part I), mandatory provisions checklist
Lighting Compliance Documentation (Part I), mandatory provisions checklist
Prescriptive Requirements: Projects Using Prescriptive Compliance Approach
Building envelope compliance documentation (Part II)
HVAC compliance documentation (Part I. for buildings less than 25,000 square feet using simplified approach, and Part III, for all other buildings), mandatory provisions checklist
Prescriptive Requirements: Projects Using Performance Compliance Approach
Performance analysis report (for EA Credit 1, Optimize Energy Performance)
Table documenting energy-related features included in the design and including all energy features that differ between the baseline design and proposed design models (Performance Rating method Compliance Report form)

For the Credits E.1.1 – High Performance & Efficiency through E.1.8 Energy Efficiency Reduction, Applicants of covered buildings must demonstrate a percentage improvement in the proposed building energy performance compared with the baseline building performance. Documentation supporting compliance with E.R.2 *Basic Project Conservation & Minimum Performance* 10% the following forms listed in Table 2, BCGBS Energy Analysis Forms.

Table 2: BCGBS Energy Analysis Forms
Mandatory Forms: All Projects
E1.1 – E1.2 General Project Information
E1.1 – E1.2 Performance Rating Method Compliance Report
E1.1 – E1.2 Performance Rating Method Compliance Summary Report
E1.1 – E1.2 Proposed and Baseline Summary Table
Output Summary performance reports for energy simulation program:
Must include simulated energy consumption by end use as well as total building energy consumption and cost by energy type used in the building

The forms only provide a record of the calculations performed to meet the Green Building Design and Construction 2009 Edition for Credits E.1.1 – *High Performance & Efficiency* and E.1.2 to E.1.8 *Energy Efficiency Reduction*. The forms do not automatically perform the calculations required for the final documentation of the credits. All forms fields must be completed by the Applicant. If a field does not apply to the project, please type “NA” for *not applicable*.

The General Project Information Report includes information about general information regarding the project, including the type of weather data used in the energy simulation, as well as

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the ASHRAE 90.1-2007 climate zone in which the project resides. This report also includes a summary of spaces and other building information. It also includes a record of the Advisory Messages that should be generated by the complying energy simulation program.

The Performance Rating Method Compliance Report form documents the Baseline and Proposed design energy model inputs for your project. The Applicant must include descriptions for:

- § Exterior wall, underground wall, roof, floor, and slab assemblies including framing type, assembly R-values, assembly U-factors, and roof reflectivity.
- § Fenestration types, assembly U-factors (including the impact of the frame on the assembly), SHGCs, and visual light transmittances, overall window-to-gross wall ratio, fixed shading devices, and automated movable shading devices.
- § Interior lighting power densities, exterior lighting power, process lighting power, and lighting controls modeled for credit.
- § Receptacle equipment, elevators or escalators, refrigeration equipment, and other process loads.
- § HVAC system information including types and efficiencies, fan control, fan supply air volume, fan power, economizer control, demand control ventilation, exhaust heat recovery, pump power and controls, and any other pertinent system information. (Include the ASHRAE 90.1-2007 Table G.3.1.1B Baseline System Number).
- § Domestic hot water system type, efficiency and storage tank volume.
- § General schedule information.

The Performance Rating Method Compliance Summary report includes a summary of the energy usage estimated by the energy simulation program for each End Use as described in the LEED 2009 Reference Guide for Green Building Design and Construction, 2009. Please see the Reference Guide for more information of documenting compliance with the credit.

The Proposed and Baseline Summary Table includes information generated by the energy simulation program that compares the baseline building to the proposed building. This form lists the overall percentage improvement of the Proposed Building over the Baseline Building.

Project teams have also two other compliance paths with E.R2 *Basic Project Conservation & Minimum Performance 10%* and E.1.1 – *High Performance & Efficiency* and E.1.2 *Energy Efficiency Reduction*, that are acceptable for the BCGBS Application. The other options include: Option 2, Prescriptive Compliance Path: *ASHRAE Advanced Energy Design Guides*; and, Option 3, Prescriptive Compliance Path: *Advanced Buildings™ Core Performance™ Guide*. Applicants are directed to refer to the LEED 2009 Reference Guide for Green Building Design and Construction, 2009 edition for more information of documenting compliance with these two options.

Building Envelope Compliance Documentation

Project Name:				
Contact Person:				Telephone:
Space Category	§ 5.5.4.4.1 Exceptions	Window-Wall Ratio	Total	
<input type="checkbox"/> Nonresidential	<input type="checkbox"/>	Gross Wall Area (ft ²):		
<input type="checkbox"/> Residential	<input type="checkbox"/> Overhangs	Window Area (ft ²):		
<input type="checkbox"/> Semiheated	<input type="checkbox"/> Street Level Windows	Window-Wall Ratio:		
			Skylight-Roof Ratio	
			Gross Roof Area (ft ²):	
			Skylight Area:	
			Skylight-Roof Ratio	

Opaque Surfaces

Description/ Name	Class (Pick one)											High Reflectance/Emissance Roof	Proposed Insulation R-Value, U-Factor, C-Factor or F-Factor	Criteria Insulation R-Value, U-Factor, C-Factor or F-Factor	Surface Area (ft ²) (optional)							
	Roof			Wall			Floor		Slab		Door					Pick one	Pick one					
	Insulation Above Deck	Metal Building	Attic and Other	Mass	Metal Building	Steel-Framed	Wood-Framed / Other	Below-Grade Wall	Mass	Steel Joist	Wood-Framed / Other							Unheated	Heated	Swinging	Non-Swinging	R-value Option
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>			
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>			
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>			
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>			
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>			
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>			
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>			
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Building Envelope Compliance Documentation

Project Name:	
Contact Person:	Telephone:

Fenestration

Description/ Name	Frame Class (Pick one)						NFC Rating Appendix A Defaults	Proposed Fenestration						Criteria		
	Nonmetal (all)	Metal (curtain/storefront)	Metal (entrance door)	Metal (all other)	Skylight, Curb, Glass	Skylight, Curb, Plastic		Skylight, No Curb	Area	U-Factor	Solar Heat Gain Coefficient (SHGC)	Overhang	Projection Factor	Overhang Multiplier	Adjusted Solar Heat Gain Coefficient (SHGC)	U-Factor
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HVAC Simplified Approach Option

Part I

Project Name:	
Project Address:	Date:
City:	Zip:
HVAC System Designer of Record:	Telephone:
Contact Person:	Telephone:

Qualification

- ☐ The building is 2 stories or less in height and has a gross floor area is less than 25,000 ft².

Requirements

- ☐ (a) All systems serve a single HVAC zone.
- ☐ (b) Cooling (if any) is provided by a unitary packaged or split-system air conditioner that is either air-cooled or evaporatively cooled and meets the efficiency requirements shown in Table 6.8.1. List equipment in the table below.
- ☐ (c) The system has an air economizer as required by Table 6.5.1, with controls as required in Tables 6.5.1.1.3A and 6.5.1.1.3B. The economizer has either barometric or powered relief sized to prevent overpressurization of the building. Outdoor air dampers for the economizer use are provided with blade and jamb seals.
 - ☐ Exception: The cooling efficiency meets or exceeds the efficiency requirement in Table 6.3.2. Document in table below.
- ☐ (d) Heating (if any) shall be provided by a unitary packaged or split-system heat pump, a fuel-fired furnace, an electric resistance heater or a baseboard system connected to a boiler. All heating equipment meets the efficiency requirements of the Standard. List equipment in table below.
- ☐ (e) The outdoor air quantity is less than or equal to 3,000 cfm and less than or 70% of the supply air quantity at minimum outdoor air design conditions.
 - ☐ Exception: An energy recovery ventilation system is provided in accordance with the requirements in § 6.5.6.
- ☐ (f) The system shall be controlled by a manual changeover or dual setpoint thermostat.
- ☐ (g) Heat pumps equipped with auxiliary internal electric resistance heaters (if any) have controls to prevent supplemental heater operation when the heating load can be met by the heat pump alone.
- ☐ (h) The system controls do not permit reheat or any other form of simultaneous heating and cooling for humidity control.
- ☐ (i) Systems are provided with a time switch that (1) can start and stop the system under different schedules for seven different day-types per week; (2) is capable of retaining programming and time setting during a loss of power for a period of at least 10 h; (3) includes an accessible manual override that allows temporary operation of the system for up to 2 h; (4) is capable of temperature setback down to 55°F during off hours; and (5) is capable of temperature setup to 90°F during off hours.
 - ☐ Exception: System serves hotel/motel guest rooms.
 - ☐ Exception: System operates continuously.
 - ☐ Exception: System has both a cooling or heating capacity less than 15,000 Btu/h and a supply fan motor power greater than 3/4 hp.
- ☐ (j) Piping is insulated in accordance with Table 6.8.3. Insulation exposed to weather is suitable for outdoor service. Cellular foam insulation is protected from water and solar radiation.
 - ☐ Exception: Piping is located within manufactured HVAC units.
- ☐ (k) Ductwork and plenums are insulated in accordance with Tables 6.8.2A and 6.8.2B and sealed in accordance with Tables 6.4.4.2A and 6.4.4.2B.
- ☐ (l) Construction documents require air systems to be balanced in accordance with industry-accepted procedures to within 10% of design airflow rates.
- ☐ (m) Where separate heating and cooling equipment serve the same temperature zone, thermostats are interlocked to prevent simultaneous heating and cooling.
- ☐ (n) Exhausts are equipped with gravity or motorized dampers that will automatically shut when systems are not in use.
 - ☐ Exception: Design capacity is less than 300 cfm.
 - ☐ Exception: System operates continuously.
- ☐ (o) Systems have optimum start controls.
 - ☐ Exception: Supply air capacity is less than 10,000 cfm.

Equipment Efficiency

System Tag(s)	Mfg. & Model No.	Equipment Type	Heating			Cooling			
			Rated Capacity	Rated Efficiency	Minimum Efficiency	Rated Capacity	Rated Efficiency	Minimum Efficiency	Econ. Min. Efficiency



Project Name:			
Project Address:		Date:	
HVAC System Designer of Record:		Telephone:	
Contact Person:		Telephone:	
City:	Climate Zone:		
Zip:	1% Summer DB Temp:	1% Summer WB Temp:	99.6% Winter Temp:

Mandatory Equipment Efficiency Worksheet (§ 6.4.1.1)

System Tag	Equipment Type (Tables 6.8.1A through G)	Size Category (Tables 6.8.1A through G)	Sub-Category or Rating Condition (Tables 6.8.1A through G)	Units of Efficiency (Tables 6.8.1A through G)	Minimum Efficiency (Tables 6.8.1A through G)		
					Rated	≥	Required
						≥	
						≥	
						≥	
						≥	
						≥	
						≥	
						≥	
						≥	

Mandatory Non-Standard Centrifugal Chiller Worksheet (§ 6.4.1.1)

System Tag	Leaving CHW Temperature (°F)	Entering CW Temperature (°F)	Condenser Flow Rate (gpm/ton)	Size Category (Tables 6.8.1H through J)	Minimum Efficiency (Tables 6.8.1H through J)		
					Rated	≥	Required
						≥	
						≥	
						≥	
						≥	

General Mandatory Requirements

- Load calculations are provided for selection of all equipment and systems (§ 6.4.2).
- Stair vents, elevator shaft vents, gravity hoods, gravity vents and gravity ventilations are provided with motorized dampers.
 - Exception: Gravity dampers are used since the building is less than 3 stories or in climate zones 1–3.
 - Exception: No vents are required as these systems ventilate unconditioned zones.

- Piping insulation meets or exceeds the requirements of the Standard (§ 6.4.4.1.3).
- Construction documents require record drawings (§ 6.7.2.1), manuals (§ 6.7.2.2), system balancing (§ 6.7.2.3) and system commissioning (§ 6.7.2.4).

Special Mandatory Requirements

- Freeze protection or snow/ice melting systems (if any) have controls to prevent operation in warm weather (§ 6.4.3.7).
- Independent perimeter heating systems (if any) comply with the control requirements of § 6.4.3.1.1 and § 6.4.3.2.
- Independent heating and cooling thermostatic controls (if any) are interlocked to prevent crossover of set points (§ 6.4.3.2).



Project Name:	
Contact Person:	Telephone:

Systems Worksheet (§ 6.4)

System Tag					
Supply CFM				This space	
Supply ESP (in. w.c.)					
Fan System HP					
OA CFM (i.e. Outdoor Air CFM)					
Automatic Shutdown (§ 6.4.3.2.1)					
Deadband (§ 6.4.3.1.2)					
Setback Controls (§ 6.4.3.2.2)					
Setup Controls (§ 6.4.3.2.2)					
Optimum Start (§ 6.4.3.1.3)					
Zone Isolation (§ 6.4.3.1.4)					
Shutoff Dampers (§ 6.4.3.3.3)					
Heat Pump Aux Heat (§ 6.4.3.4)					
Humidifier Preheat (§ 6.4.3.5)					
Humidification/Dehumidification Deadband (§ 6.4.3.6)					
Ventilation Control (§ 6.4.3.8)					
Duct/Plenum Insulation (§ 6.4.4.2.1)					
Duct Sealing Levels (§ 6.4.4.2.1) Supply/Return					
Duct Leakage Test (§ 6.4.4.2.2)					

In the table above, enter the appropriate codes from this list:

Shutdown

- C1 Complying nonresidential time switch with override
- C2 Complying residential time switch with override
- N1 N/A continuous operation
- N2 N/A ≤15 kbtu/h or ≤3/4 hp
- N3 N/A hotel/motel guestroom

Dead Band

- C1 Dual setpoint control
- C2 Manual change over control
- N1 N/A special occupancy (requires approval)
- N2 N/A heating or cooling only

Setback Controls

- C1 Setback provided (down to 55F)
- N1 N/A continuous operation
- N2 N/A ≤15 kbtu/h or ≤3/4 hp
- N3 N/A 99.6% Win DB>40F
- N4 N/A radiant heating
- N5 N/A no heating

Setup Controls

- C1 Setup provided (up to 90F)
- N1 N/A continuous operation
- N2 N/A ≤15 kbtu/h or ≤3/4 hp
- N3 N/A 1% Sum DB≤100F
- N4 N/A no cooling

Optimum Start

- C1 Optimum start provided
- N1 N/A continuous operation
- N2 N/A ≤15 kbtu/h or ≤3/4 hp
- N3 N/A supply≤10,000 cfm

Shutoff Dampers

- C1 Motorized shutoff dampers on OA and Exh
- C2 Gravity shutoff dampers on OA and Exh
- N1 N/A continuous operation
- N2 N/A ≤15 kbtu/h or ≤3/4 hp
- N3 N/A OA/EA ≤300 cfm

Zone Isolation

- C1 Isolation zones provided
- N1 N/A continuous operation
- N2 N/A ≤15 kbtu/h or ≤3/4 hp
- N3 N/A all zones on same schedule
- N4 N/A OA/EA ≤5,000 cfm

Heat Pump Aux Heat

- C1 Complying controls provided
- N1 N/A system is not a heat pump
- N2 N/A auxiliary is not electric or is not provided
- N3 N/A heat pump covered by NAECA

Humidifier Preheat

- C1 Complying controls provided
- N1 N/A no humidifier

Humidification/Dehumidification Dead Band

- C1 Complying controls provided
- N1 N/A no humidification and/or dehumidification

Duct/Plenum Insulation

- C1 Complying insulation provided
- N1 N/A all ducts located in conditioned space

Duct Sealing

- Enter highest seal level (A, B or C) for supply and return

Duct Leakage Test

- Y Ducts will be tested for leakage
- N Ducts will not be tested for leakage



Project Name:

Contact Person:

Telephone:

Prescriptive Checklist

Prescriptive Economizers (§ 6.5.1)

- Systems employ airside economizers (§ 6.5.1.1).
- Economizer provides up to 100% design airflow in outdoor air (§ 6.5.1.1.1).
- Economizer is integrated with the mechanical cooling system (§ 6.5.1.1.2 and § 6.5.1.3).
- Economizer high limit shutoff complies with § 6.5.1.1.3.
- Economizer dampers meet or exceed leakage requirements (§ 6.5.1.1.4).
- System provides relief for up to 100% design airflow in outdoor air (§ 6.5.1.1.5).
- Economizer complies with the heating system impact requirements (§ 6.5.1.4).
- Systems employ waterside economizers.
- Economizer can provide 100% of the load at either the outdoor conditions of 50°F db/45°F wb or 45°F db/40°F wb where required for dehumidification purposes (§ 6.5.1.2.1).
- Precooling coils and heat exchangers have either a ≤ 15 ft of WC pressure drop or are bypassed when economizer is not in use (§ 6.5.1.2.2).
- Economizer is integrated with the mechanical cooling system (§ 6.5.1.3).
- Economizer complies with the heating system impact requirements (§ 6.5.1.4).
- Systems are exempt from the economizer requirements.

Specify economizer exemptions: _____

Prescriptive Air-System Requirements

- Simultaneous Heating and Cooling (§ 6.5.2.3).
- Zone minimums were set to meet the requirements of *Standard 62*.
- Zone minimums were set to ≤ 0.4 cfm/ft² of zone conditioned floor area.
- Zone minimums are less than 300 cfm.
- Other (requires special documentation and approval).
- Humidity controls (if any) comply with the requirements of § 6.5.2.3.
- Systems that employ hydronic cooling and have humidification (if any) use a waterside economizer that complies with § 6.5.1.
- Variable air volume fan controls comply with the requirements of § 6.5.3.2.

Prescriptive Water-System Requirements

- Three-pipe systems are not used (§ 6.5.2.2.1).
- Two-pipe changeover heating/cooling systems (if any) comply with the requirements of § 6.5.2.2.2.
- Hydronic (ground- or water-loop) heat pump systems that have equipment for both loop

heat addition and loop heat rejection (if any) comply with the requirements of § 6.5.2.2.3.

- System pumps greater than 10 hp employ variable flow controls (§ 6.5.4.1), pump isolation (§ 6.5.4.2) and temperature reset (§ 6.5.4.3).

Prescriptive Special System Requirements

- All heat rejection equipment with motors ≥ 7.5 hp employ controls that comply with § 6.5.5.
- Exhaust Air Energy Recovery: all fan systems that have both a design supply capacity of $\geq 5,000$ cfm and a minimum outdoor air supply of $\geq 70\%$ of the design supply air employ an energy recovery system that complies with § 6.5.6.1.
- Heat recovery for service water heating is provided for facilities that operate continuously, have a total water-cooled heat rejection capacity exceeding 6,000,000 btu/h, and have a design service water heating load exceeding 1,000,000 btu/h. The heat recovery system (if any) complies with § 6.5.6.2.
- Kitchen hoods with exhaust flows > 5000 cfm comply with the requirements of § 6.5.7.1.
- Fume hoods with a total exhaust system flow $> 15,000$ cfm comply with the requirements of § 6.5.7.2.
- Radiant heaters complying with § 6.5.8.1 are used to heat unenclosed spaces (if any).
- The cooling equipment with hot-gas bypass controls (if any) meets the unloading requirements of § 6.5.9.

HVAC Prescriptive Requirements

Project Name:	
Contact Person:	Telephone:

Option 1 – Nameplate Horsepower

Installed Nameplate Horsepower

Tag	Description	Supply	Return	Exhaust	Series FPB	Other	Nameplate Horsepower
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Allowed Nameplate Horsepower

Design Supply Airflow Rate (CFM _s)	
Fan Nameplate Horsepower Allowance from Table 6.5.3.1.1A	
Total Allowed Nameplate Horsepower	

Option 2 – Brake Horsepower

Allowed Fan Brake Horsepower

Design Supply Airflow Rate (CFM _s)	
Fan Brake Horsepower Allowance from Table 6.5.3.1.1A	
Base Allowance (Line1 x Line 2)	
Additional Brake Horsepower Allowance	
Total Allowed Brake Horsepower	

Pressure Drop Adjustments for Qualifying Devices

Tag	Device Description	Pressure Drop from Table 6.5.3.1.1B	CFM through Device	Additional Brake Horsepower Allowance

Installed Brake Horsepower

Tag	Description	Supply	Return	Exhaust	Series FPB	Other	CFM	Pressure Drop (PD)	η_{Fan}	η_{Drive}	η_{Motor}	Brake Horsepower
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						

Lighting Compliance Documentation

Project Name:	
Project Address:	Date:
Designer of Record:	Telephone:
Contact Person:	Telephone:
City:	

Mandatory Provisions Checklist

Automatic lighting shutoff controls are provided based on either a scheduling device or an occupant sensor.

- Exception: Space is intended for 24-hour operation.
- Exception: Space is smaller than 5,000 ft².
- Exception: Space for patient care.
- Exception: Space where automatic lighting shutoff would endanger safety or security.

- Each space enclosed by ceiling-height partitions has an independent, accessible control that operates general lighting in the space.
 - Exception: The control is located in a remote location for safety or security reasons.
- For spaces less than or equal to 10,000 ft², a separate space control is provided for each 2,500 ft² of area.
- For spaces more than 10,000 ft², a separate space control is provided for each 10,000 ft² of area.
- Either a photosensor or an astronomical time switch controls exterior lighting applications.
 - Exception: Lights must remain on for safety, security or eye adaptation reasons.

- Two-lamp tandem-wired ballasts.
- Display lighting has a separate control.
- Case lighting has a separate control.
- Hotel/motel guest rooms have a master switch at the main entry.
- Task lighting has a separate control.
- Nonvisual lighting has a separate control.
- Demonstration lighting has a separate control.
- Exit signs do not exceed 5 W per face.
- Exterior building grounds luminaires greater than 100 W have lamps with minimum efficacy of 60 lumens/W.
 - Exception: Luminaire is activated with a motion sensor.

Interior Lighting Power Allowance (Building Area Method)

Building Type	Lighting Power Density (W/ft ²)	Building Area (ft ²)	Lighting Power Allowance (W)
Total			

Interior Lighting Power Allowance (Space-by-Space Method)

Building Type	Common/Specific Space Type	Lighting Power Density (W/ft ²)	Space Area (ft ²)	Lighting Power Allowance (W)
Total				



Lighting Compliance Documentation

Project Name:	
Contact Person:	Telephone:

Additional Interior Connected Lighting Power

ID	Luminaire Description (including number of lamps per fixture, watts per lamp, type of ballast, type of fixture)	Type						Number of Luminaires	Watts/ Luminaire	Total Watts
		Incandescent	Fluorescent	HID	Line-Voltage Track	Low-Voltage Track	Other			
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Exterior Building Lighting Power Allowance (Tradable Lighting Applications)

Application	Allowance	Area or Length (ft ² or ft)	Tradable Power Allowance
Tradable Power Allowance			

Exterior Building Lighting Power Allowance (Non-Tradable Lighting Applications)

ID	Application	Allowance per Unit	Area or Length or Quantity	Non-Tradable Power Allowance
Non-Tradable Power Allowance				

Additional Unrestricted Exterior Lighting Power Allowance

Tradable Power Allowance (Watts)	Non-Tradable Power Allowance (Watts)	Additional Unrestricted Lighting Power Allowance (Watts)
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		X 0.05
		= <input type="text"/>

Exterior Connected Lighting Power (Tradable Applications)

ID	Luminaire Description (including number of lamps per fixture, watts per lamp, type of ballast, type of fixture)	Number of Luminaires	Watts/Luminaire	Total Watts
Total				

Exterior Connected Lighting Power (Non-Tradable Applications)

ID	Non-Tradable Application	Luminaire Description (including number of lamps per fixture, watts per lamp, type of ballast, type of fixture)	Number of Luminaires	Watts/Luminaire	Total Watts

Exterior Lighting Compliance Test

Non-Tradable Application	Tradable Power Allowance (Watts)	+	Additional Unrestricted Lighting Allowance to be Applied (Watts)	≥	Tradable Connected Lighting Power (Watts)
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	Non-Tradable Power Allowance (Watts)	+		≥	Non-Tradable Connected Lighting Power (Watts)
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	<input type="text"/>	+	<input type="text"/>	≥	<input type="text"/>
			Total Additional Allowance Applied (sum of above) (Watts)	≤	Additional Unrestricted Lighting Power Allowance (Watts)
			<input type="text"/>		<input type="text"/>



Service Water Heating Compliance Documentation

Project Name:	
Project Address:	Date:
Designer of Record:	Telephone:
Contact Person:	Telephone:
City:	

Mandatory Provisions Checklist

- | | | |
|--|---|---|
| <input type="checkbox"/> Load calculations have been provided for sizing of systems and equipment (§ 7.4.1). | <input checked="" type="checkbox"/> Tanks with remote heaters have circulation pump controls (§ 7.4.4.4). | <input type="checkbox"/> Public lavatories have outlet temperature controls that limit the discharge temperature to 110°F (§ 7.4.4.3). |
| <input type="checkbox"/> Equipment efficiencies meet or exceed the requirements of Table 7.8 (§ 7.4.2). | <input type="checkbox"/> All water-heating systems have temperature controls that are adjustable down to 120°F or lower (§ 7.4.4.1). | <input type="checkbox"/> Pool heaters have readily accessible controls and gas-fired heaters do not have standing pilot lights (§ 7.4.5.1). |
| <input type="checkbox"/> Circulating systems are fully insulated (per Table 6.8.3) and have automatic pump controls (§ 7.4.3 and § 7.4.4.2). | <input type="checkbox"/> Systems designed with pipe heating systems such as heat trace have temperature or time controls (§ 7.4.4.2). | <input type="checkbox"/> Heated swimming pools have vapor retardant covers (§ 7.4.5.2). |
| <input type="checkbox"/> Non-circulating systems have insulated heat traps and outlet piping insulated (per Table 6.8.3) for 8 ft from the storage tank (§ 7.4.6). | | <input type="checkbox"/> Pool heaters and circulation pumps have time switches (§ 7.4.5.3). |

Equipment Efficiency Worksheet (§ 7.4.1)

System Tag	Equipment Type (From Table 7.8)	Sub-Category or Rating Condition (From Table 7.8)	Input Rating (Btu/h or kW)	Volume (gal)	Energy Factor or Et		Standby Loss	
					Rated	≥ Required	Rated	≤ Required
			This space			≥		≤
						≥		≤
						≥		≤
						≥		≤

Combination Space and Water Heating Worksheet (§ 7.5.1)

System Tag	Standby Loss Method		or Energy Use Exception (attach calculations)		or Size Exception	
	Equipment	≤ Requirement	Equipment	< Requirement	Equipment	< Requirement
		≤		<		< 150,000 Btu/h
		≤		<		< 150,000 Btu/h
		≤		<		< 150,000 Btu/h
		≤		<		< 150,000 Btu/h



BCGBS Templates & Forms Instructions for: BCGBS E.4: Energy – Advanced Ozone Protection

The Baltimore City Green Building Standards allows Applicants to achieve a point for selecting refrigerants and heating, ventilation, air conditioning and refrigeration (HVAC&R) equipment that minimize or eliminate the emission of compounds that contribute to ozone depletion and climate change. The Applicant will use the equations and refrigerant properties listed in LEED Reference Guide for Green Building Design and Construction 2009 Edition for Credit EAc Enhanced Refrigerant Management.

The attached form *E.4 Energy – Advanced Ozone Protection* should be completed. The form however, does not automatically perform the calculations at this time. The form only provides a record of the calculations performed to meet the Green Building Design and Construction 2009 Edition for Credit EAc4: Enhanced Refrigerant Management. See the LEED Reference Guide for more information.

The following information is required for each unit of the building project's HVAC&R equipment:

Gross cooling in tons, Qunit (tons)

Refrigerant charge (Rc) in pounds of refrigerant per ton of gross cooling capacity.

Refrigerant type (used to determine ODP and GWP).

Equipment type (used to determine Life).

Refrigerant leakage rate (Lr): Applicant must assume average refrigerant leak rates of 2% per year

End-of-life refrigerant loss (Mr): The Applicant must assume 10% end-of-life losses

Service Life of the equipment (yrs)

BCGBS Templates & Forms Instructions for: BCGBS E.6.1 & E.6.2 Green Power Provide Summary

The Baltimore City Green Building Standards provides additional credits for purchasing additional green power credits in 2-year increments.

The attached form, E.6.1 & E.6.2 *Green Power* Provide Summary should be used to summarize the contracts and duration of contracts for this credit. The form however, does not automatically perform any calculations at this time. The form only provides a record of the calculations performed to meet the Green Building Design and Construction 2009 Edition for Credit EAc6: Green Power. See the LEED Reference Guide for more information.

Green Power Provider Summary - E.6.1. and E.6.2.

Project Name:				
Purchase Type	Green Power / Green-e Tradable Renewable Certificate Provider Name	Annual Green Power Purchased	Units	Contract Term (yrs)
Total green power purchased(kWh):				
<input type="checkbox"/> The Applicant has proof of a contract to purchase off-site renewable energy for a minimum of two years.				

BCGBS Templates & Forms Instructions for: BCGBS M.1.1-M.1.5: Materials Conservation – Re-Use Buildings

The Baltimore City Green Building Standards allows Applicants to achieve points for re-using existing systems, materials and equipment from building renovations in new construction. The Applicant will use the equations and properties listed in LEED Reference Guide for Green Building Design and Construction 2009 Edition for Credits MRc1.1 and MRc1.2.

The attached form M.1.1 – M.1.5 *Materials Conservation – Re-Use Buildings* should be completed. The form requires that the Applicant provide the cost of materials for all recycled-content products used in the project. For each product, the percentage of post-consumer and/or pre-consumer content by weight. The information source for each product should also be listed. The Applicant should determine the total cost of materials by multiplying the total construction hard costs of the project by the standard LEED quantity of 45%. The Applicant may also list the actual material hard costs for all products used in the project under the specification divisions 03-10, and 31.60.00 (Foundations), 32 (Sections 32.10.00, Paving, 32.30.00 Site Improvements and 32.90.00 Planting) for CSI MasterFormat – 2004 Edition. The Applicant should total the combined value of the post-consumer and one half (1/2) the pre-consumer content for all materials listed in the spreadsheet. The Applicant should also determine the percentage of the combined value with regards to the Default Total Material Cost. The form only provides a record of the calculations performed to meet the Green Building Design and Construction 2009 Edition for Credit MRc4: Recycled Content, as well as other LEED credits. See the LEED Reference Guide for more information

BCGBS Templates & Forms Instructions for: BCGBS HB.R1: Healthy Buildings – Basic Air Quality ASHRAE 62.1-2007 Spreadsheet

The Baltimore City Green Building Standards requires Applicants to document that the project meets the minimum requirements of Section 4 through 7 of ASHRAE Standard 62.1-2007, Ventilation for Acceptable Indoor Air Quality (with errata but without addenda) in order to satisfy HB.R1 Healthy Buildings – Basic Air Quality. The mechanical ventilation system must be designed to meet the ventilation rate procedure of the Standard. A naturally ventilated building must comply with ASHRAE Standard 62.1-2007, Paragraph 5.1 (with errata but without addenda). The ventilation rate procedure is described in Section 6.2 of the Standard. The Applicant is required in the BCGBS to use the 62MZCalc Microsoft Excel™ spreadsheet is provided free of charge from ASHRAE, or the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (www.ashrae.org). The GBCI website also provides a free copy of the ASHRAE 62.1-2007 Users Guide and spreadsheet with registration of a LEED project. The GBCI website for the 62MZCalc spreadsheet is: <https://www.leedonline.com/irj/portal/anonymous>