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179D Energy Tax Benefits - General Pre-Qualification Checklist

System/Category	Results	Building	Key Factors	
Square footage / Type of Building			> 20,000 Square Feet	
Lighting(Interior / Parking Garages) • Watts per square foot • Type of bi-level switching used (motion sensors, Occupancy controls on separate lighting circuits, split ballasts, dimmers etc.)* • Type of lighting*** * Bi-level switching under interim rules not required for parking garages, restrooms, storerooms, lobbies, hotel / motel guestrooms. ** Except for warehouses which must show a 50% reduction in Lighting Power Density (LPD). *** Fixtures / ballasts must be new to qualify.		Sample LPD Reductions vs. ASHRAE 90.1 – 2001**	25% ($.30/sf)	40% ($.60/sf)
		Automotive	1.125	.900
		Convention Ctr.	1.050	.840
		Hospital	1.200	.960
		Hotel	1.275	1.020
		Office	.975	.780
		Parking Garage	.225	.180
		Retail	1.425	1.140
		Sports Arena	1.125	.900
		Warehouse*	.600	.600
		School/University	1.125	.900
HVAC • SEER/EER ratings of systems • Controls: VFDs, VFDs on pumps, Economizers, CO2 Sensors, Energy Recovery Units, etc. • VAV System • Boiler / chiller systems		</= 3 floors and <75,000 sf --- 4 to 5 floors and <75,000 sf, or <5 floors and 75 to 150,000 sf --- >/= 5 floors and / or >150,000 sf	• 11.0 EER • Controls --- • 11.0 EER • Heat pumps • VAV systems • Controls --- • 11.0EER • VAV System • Chiller / Boiler System • Controls	
Envelope • Insulation R-value of roof • Insulation R-value of walls • Windows / glazing: U-values, SHGC, ratio to walls		• Roof • Insulation • Glazing	• Roof: R-30+ Value • Walls: R-19+ Value • SHGC = .30 or less • < 40% Glazing to Walls	
Mandatory Plans/Specs Index page (drawings list) Code Analysis (square footage breakdown) Mechanical Plans and Schedules Lighting Plans, Fixture Schedules and Evidence of Bi-level Switching Architectural: Exterior Elevations (all sides), Floor Plans, Building Sections, and Wall Sections Glazing Specs (SHGC and U Values) –Must have Manufacturer's Cut Sheets or Submittals Insulation Specs of Walls and Roof (R Values) – Must have Manufacturer's Cut Sheets or Submittals		Yes/No	Important: All relevant plans and specs are needed to model the building or undertake Interim Lighting Rule calculations. See "Mandatory Plans and Specs"chart to understand which items are needed for which systems, i.e. architectural plans are needed for an HVAC certification.	

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Lighting

Bi-Level Switching	Bi-level switching is defined as manual or automatic control (or a combination thereof) that provides two levels of lighting power in a space (not including off). A space is defined as an area enclosed by four (or more) floor-to-ceiling walls. Dimming or dual switching would satisfy this definition.
Motion Sensors	Systems that turn lights on only when they detect movement in the area, thus saving energy by not lighting areas that are unoccupied. Bathrooms are typical places for such lights.
Occupancy Sensors/Controls	An optical, ultrasonic, or infrared sensor that turns room lights on when they detect a person's presence and off after the space is vacated.
Split Ballasts	A piece of equipment required to control the starting and operating voltages of electrical gas discharge lights. Examples of gas discharge light sources include fluorescent lights and high-intensity discharge (HID) lamps. Split ballasts allow for partial usage through the use of lighting controls.
Dimmers	A rheostat or other device used to vary the intensity of an electric light.

HVAC

SEER/EER Rating	Seasonal Energy Efficiency Rating the SEER rating of a unit is the cooling output in BTU(British thermal unit) during a typical cooling-season divided by the total electric energy input in watt-hours during the same period. The higher the unit's SEER rating the more energy efficient it is.
VFD	Variable-frequency drives are widely used. In ventilation systems for large buildings, variable-frequency motors on fans save energy by allowing the volume of air moved to match the system demand. They are also used on pumps, elevator, conveyor and machine tool drives.
VAV	Variable Air Volume-An HVAC system that has a stable supply-air temperature, and varies the air flow rate to meet the temperature requirements. Compared to Constant Air Volume (CAV) systems, these systems waste less energy through unnecessarily-high fan speeds. Most new commercial buildings have VAV systems.
Economizers	An economizer is a mechanical device used to reduce energy consumption. Economizers recycle energy produced within a system or leverage environmental temperature differences to achieve efficiency improvements.
CO2 Sensors	A sensor for the measurement of gaseous carbon dioxide. Used in combination with energy recovery units or demand controlled ventilation to promote energy efficiency. Used to maintain appropriate indoor carbon dioxide levels.
Energy Recovery Units	Mechanisms that extract energy from the indoor air (warm air in winter, cool air in summer) and transfer it to the fresh incoming air.
Chillers	Chillers are industrial- and commercial-grade refrigerating systems used in cooling applications (i.e. buildings, raw materials, chemicals, medical equipment and industrial equipment). The system includes a compressor, evaporator, condenser, reservoir, thermal expansion valve and stabilization assembly. HVAC chillers use water, oils and other liquid compounds as refrigerants.

Envelope

Roof R-values	The R-value of a ***roofing***material is a measure of its insulation capability, which tells you how quickly heat moves through the material. A material with a higher R-value is a better insulator than a material with a lower R-value.
Wall R-values	The R-value is a measure of thermal resistance used in the building and constructionindustry. The higher the rating, the more effective the insulation.
Window Glazing/ low-E	Low-emittance (low-E) coatings are microscopically thin, virtually invisible, metal or metallic oxide layers deposited on a window or skylight glazing surface primarily to reduce the U-factor by suppressing radiative heat flow. Coating a glass surface with a low-emittance material and facing that coating into the gap between the glass layers blocks a significant amount of this radiant heat transfer, thus lowering the total heat flow through the window. Different types of low-E coatings have been designed to allow for high solar gain, moderate solar gain, or low solar gain
SHGC	Solar Heat Gain Coefficent-It's a measure of how much of the sun's heat is transmitted through those fixtures, expressed in a number from zero to one. A window that has a SHGC of .3 will allow 30 percent of the sun's heat to pass through. Whether you want a higher or lower number will depend on your goal: A product with a low SHGC will help to block heat and reduce cooling loads in hot weather; a product with a high SHGC will be more effective at harnessing solar heat in cold weather.