

(Effective July 1, 2023)

WAC 51-11C-40630 Section C406.3—Load management credits.

C406.3 Load management credits. Load management measures installed in the building that meet the requirements in Sections C406.3.1 through C406.3.7 shall achieve the credits listed for the occupancy group in Table C406.3 or where calculations required by Sections C406.3.1 through C406.3.7 create or modify the table credits the credits achieved will be based upon the section calculations.

Each load management measure shall require automatic controls activated by either utility demand response, utility price response signal, peak price period time control, or local building demand monitoring. Controls shall be capable of and configured to provide the required load management sequences. As used in this section, "peak period" shall be either the coincident peak building load period, the peak price period, the peak utility load period, or the peak building demand period. The following additional requirements apply to these measures:

1. Where credit is taken for C406.3.6, service water heating energy storage, the equipment shall be provided with controls that comply with ANSI/CTA 2045-B.

2. For load management measures in Sections C406.3.1 through C406.3.5:

2.1. Where the serving utility has a real-time demand response or pricing program, an interface compliant with serving utility requirements shall be installed.

2.2. Where the serving utility does not have a real-time demand response or pricing program, a digital input to the system to support future utility programs shall be installed and building demand monitoring shall be installed and integrated into the load management sequence.

2.3. All equipment involved in the required load management sequence shall have controls connected to a central DDC system.

**Table C406.3
Load Management Measure Credits**

Measure Title	Applicable Section	Occupancy Group					
		Group R-1	Group R-2	Group B	Group E	Group M	All Other
1. Lighting load management	C406.3.1	12	15	27	15	NA	NA
2. HVAC load management	C406.3.2	29	24	42	23	13	26
3. Automated shading	C406.3.3	NA	7	12	16	NA	NA
4. Electric energy storage	C406.3.4	41	50	126	72	37	65
5. Cooling energy storage	C406.3.5	13	10	14	19	NA	14
6. Service hot water energy storage	C406.3.6	31	248	59	8	5	70
7. Building thermal mass	C406.3.7	NA	NA	50	95	96	80

C406.3.1 Lighting load management. Automatic controls shall be capable of gradually reducing general lighting power with continuous dimming in 75 percent of the building area by at least 20 percent during peak demand periods. Where less than 75 percent, but at least 50 percent, of the building area lighting is controlled, the credits from Table C406.3 shall be prorated as follows:

$$\frac{\text{[Area of building with lighting load management, \%]} \times \text{[Table credits for C406.3.1]}}{\text{[Total credits for C406.3.1]}}$$

EXCEPTION: Warehouse or retail storage building areas shall be permitted to achieve this credit by switching off at least 25 percent of lighting power in 75 percent of the building area without dimming.

C406.3.2 HVAC load management. Automatic controls shall:

1. Where electric cooling is used, be configured to gradually increase, over a minimum of three hours, the cooling setpoint by at least 3°F during the summer peak periods.

2. Where electric heating is used, be configured to gradually reduce, over a minimum of three hours, the heating setpoint by at least 3°F during winter peak periods.

C406.3.3 Automated shading load management. Where fenestration on south and west exposures exceeds 20 percent of the wall area, automatic controls shall be configured to operate movable exterior shading devices or dynamic glazing to reduce solar gain through sunlit fenestration on southern and western exposures by at least 50 percent during summer peak periods.

Informative Note: This credit can be met by exterior roller, movable blind or movable shutter shading devices; however, fixed overhang, screen or shutter shading will not meet the requirement. Roller shades that reject solar gain but still allow a view are allowed as long as they provide an effective 50 percent reduction in net solar gain (e.g., have a shading coefficient of less than 0.5 for the shading material itself). Interior shading devices will not meet the requirement. Electrochromatic windows that achieve 50 percent of SHGC would qualify.

C406.3.4 Electric energy storage. Automatic controls shall store electricity in electric storage devices during nonpeak periods and use stored energy during peak periods. Electric storage devices shall have a minimum capacity of 5 Wh/ft² (58 Wh/m²) of gross building area. For greater storage capacity up to 15 Wh/ft² (160 Wh/m²), credits shall be prorated as follows:

$$[\text{Installed electric storage capacity, Wh/ft}^2] \times [\text{C406.3.4 credits from Table C406.3}]$$

C406.3.5 Cooling energy storage. Automatic controls shall be capable of activating ice or chilled water storage to reduce peak period electric demand. Credits shown in Table C406.3 are based on storage capacity of 2 ton-hours per design day ton of cooling load (2 kWh per design day kW) with a 1.15 sizing factor. Credits shall be prorated for installed storage systems sized between 0.5 and 3.5 ton-hours per design day ton (kWh per design day kW) of cooling load rounded to the nearest whole credit. The storage tank shall have no more than 1.5 percent of storage capacity standby loss per day.

C406.3.6 Service hot water energy storage. To achieve this credit, where service hot water is heated by electricity, automatic controls shall preheat stored service hot water before the peak period and suspend electric water heating during the peak period. Storage capacity shall be provided by either:

1. Preheating water above 140°F (60°C) delivery temperature with at least 1.34 kWh of energy storage per kW of water heating capacity. Tempering valves shall be provided at the water heater delivery location.

2. Providing additional heated water tank storage capacity above peak service hot water demand with equivalent peak storage capacity to item 1.

C406.3.7 Building thermal mass. To achieve this credit, the building shall have both additional passive interior mass and a night-flush control of the HVAC system.

1. Interior to the *building thermal envelope* insulation, provide 15 pounds of passive thermal mass per square foot of building floor area. Mass construction shall be in the building interior and the indoor facing portion of the exterior wall, and interior floor construction. Mass construction shall have mass surfaces in direct contact with the air in conditioned spaces with directly attached wall board or hard surface flooring allowed. Mass with carpet or furred wallboard shall not be counted toward the building mass required. For integral insulated concrete block walls complying with ASTM C90, only the mass of the interior face shall be counted toward the building mass required.

2. When summer mode is active and indoor average temperature is 5°F (3°C) or more above outdoor temperature and between 10:00 p.m. and 6:00 a.m., *automatic* night flush controls shall operate outdoor air economizers at low fan speed less than 66 percent during the unoccupied period until the average indoor air temperature falls to the occupied heating setpoint. Summer mode shall be activated when outdoor air exceeds 70°F (21°C) and continues until deactivated when outdoor air falls below 45°F (7°C). Another night flush strategy shall be permitted where demonstrated to be effective, avoids added morning heating and is *approved* by the *code official*.

Informative Note: The simplified night flush sequence described will operate in "summer mode" below the 70°F outdoor air trigger temperature down until outdoor air of 45°F is hit when the "summer mode" is deactivated until the outdoor air temperature rises above 70°F again. Other strategies may be implemented that cool the space below the heating setpoint and adjust the morning heating setpoint to avoid morning reheating.

[Statutory Authority: RCW 19.27A.020, 19.27A.025, 19.27A.160 and chapters 19.27A and 19.27 RCW. WSR 22-14-091, § 51-11C-40630, filed 7/1/22, effective 7/1/23.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.