C406.10 Controlled Receptacles

IECC: SECTION C406, C406.10 (New), C406.1(1) (New), C406.1(3) (New), C406.1(4) (New)

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2018 International Energy Conservation Code

SECTION C406
ADDITIONAL EFFICIENCY PACKAGE OPTIONS

Add new text as follows:

C406.10 Controlled Receptacles At least 50 percent of all 125 volt 15- and 20-ampere receptacles installed in private offices, open offices, conference rooms, breakrooms, individual workstations, and classrooms, including those installed in modular partitions and modular office workstation systems, shall be controlled as required by this section. Either split receptacles shall be provided, with the top receptacle(s) controlled, or a controlled receptacle shall be located within 12 inches (0.3 M) of each uncontrolled receptacle. Alternatively, non-controlled receptacles in a single modular workstation located not more than 72 inches from a controlled receptacle serving that workstation. Controlled receptacles shall be visibly differentiated from standard receptacles and shall be controlled by one of the following automatic control devices:

1. An occupant sensor that turns receptacle power off when no occupants have been detected for a maximum of 20 minutes, or
2. A time-of-day operated control device that turns receptacle power off at specific programmed times and can be programmed separately for each day of the week. The control device shall be capable of providing an independent schedule for each portion of the building not to exceed 5,000 square feet (2,300 m^2) and not to exceed one full floor. The device shall be capable of being overridden for periods of up to two hours by an override switch accessible to occupants. Any individual override switch shall control the controlled receptacles for a maximum area of 5,000 square feet (460 m^2).

Exception : Receptacles designated for specific equipment requiring 24-hour operation, for building maintenance functions, or for specific safety or security equipment.

C406.1(1)
Table C406.1(1) Additional Energy Efficiency Credits for Group B Occupancies

Climate Zone:	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.10: Plug Load Ctrl	15	14	15	15	14	15	17	12	15	13	11	13	13	10	12	10	9

C406.1(3)

Table C406.1(3) Additional Energy Efficiency Credits for Group E Occupancies

Climate Zone:	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.10: Plug Load Ctrl	20	19	20	20	20	21	22	20	21	21	20	20	21	18	19	17	15

C406.1(4)

Table C406.1(4) Additional Energy Efficiency Credits for Other Group Occupancies

Climate Zone:	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.10: Plug Load Ctrl	18	17	18	18	17	18	20	16	18	17	16	17	17	14	16	14	12

Reason Statement: The code change proposal would provide a credit if occupancy sensor or a time-of-day control devices. are placed on 50% of receptacles installed in private offices, open offices, conference rooms, rooms used primarily for printing and/or copying functions, breakrooms, individual workstations, and classrooms, including those installed in modular partitions and modular office workstation systems. This proposed option is designed to be consistent with the C406 Points Option submitted by the Northwest Energy Codes Group and is based on the PNNL Technical Brief “Relative Credits for Extra Efficiency Code Measures” which can be accessed at http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-28370.pdf.

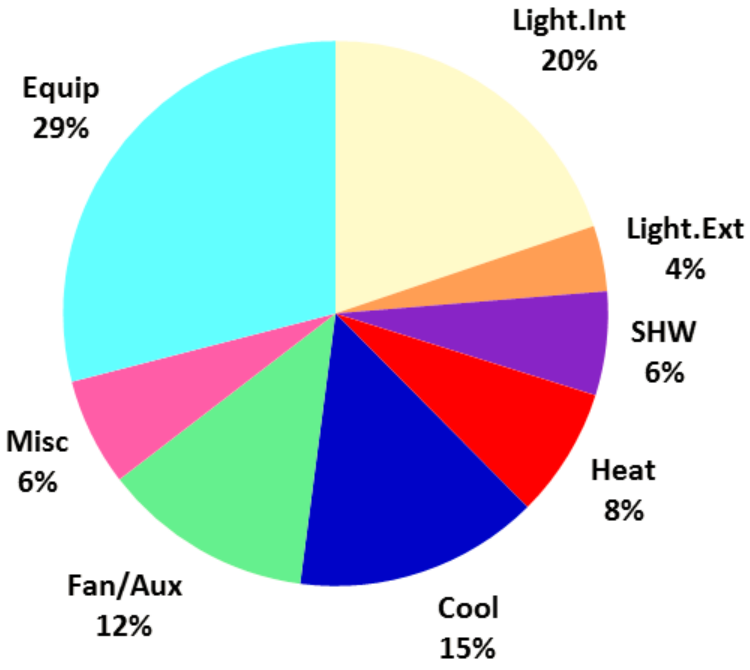
This option can also be included as an Option in the current C406 Option Packages approach if the Points Option is disapproved.

This measure provides more flexibility to building designers when it is added to the energy efficiency credit choices. The recommended language requires location of controlled receptacles adjacent to non-controlled receptacles. That requirement would avoid “daisy chained” power strips and extension cords from the non-controlled receptacles to their office equipment to avoid their equipment from being automatically turned off. The recommended language was adopted by the Seattle Nonresidential Energy Code and would require that either a split receptacle be installed that would contain both a controlled and uncontrolled receptacle, or the uncontrolled receptacle be located no more than 12” from the controlled receptacle.

Savings Estimate

Controlled receptacles saves energy by turning off unneeded equipment during unoccupied hours. As shown in Figure 3, office equipment is one of the highest energy costs in typical buildings representing 29% of the total cost on a building (Hart and Xie 2014). While the efficiency of office equipment is increasing it still represents a proportionally higher percentage of energy usage in buildings today.

The estimated savings are estimated to be 0.49 kWh/ft2 in small office and 0.61 kWh/ft2 in large office spaces through reduced equipment run times and other plug loads that are connected to the receptacle. These requirements are currently in ASHRAE Standard 90.1-2016, in the Washington State Nonresidential Energy Code and the Seattle Energy Code.



Bibliography: Hart R and Y Xie. 2014. *End-Use Opportunity Analysis from Progress Indicator Results for ASHRAE Standard 90.1-2013.* PNNL-24043, Pacific Northwest National Laboratory, Richland, WA. http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-24043.pdf

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Because Controlled Recetacles are an option as part of either the Options Packages or proposed Points Option there is no requirement to comply with this provision. Designers and code users will have the option to use this credit based on project need and cost.