

Group 1 Code Change Proposals - 2018
WSEC - Commercial

*eRule request or off cycle
 As of September 14, 2018

‡Short Form
 **Contested
 Returned for correction
[# See Supplemental Report](#)

| Date Received | Proponent | Code | Section | Log Number | Description | TAG Action/ Recommendation | Committee Action | Council Action | Economic Impact |
|---------------|------------------------|--------|---------------------------------|--|---|--|--|----------------|-----------------|
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C101.2 | EG001-2018 (R) | Scope - Group R sleeping units | Approve 6/15/18 | | | |
| 5/18/2018 | Robby Oylear | WSEC‡ | C103.6.1 | EG002-2018 | Record Documents | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C103.6.1 | EG003-2018 | Record Documents | Modified 6/15/18 | | | |
| 5/23/2018 | Mike Kennedy | WSEC | C403, C404, C406, C407 | EG004-2018 | Renewable energy/site energy requirements | Modified 8/10/18 | | | |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C104.2.2 | Env005-2018 | Thermal envelope in core & shell | Modified 6/15/18 | | | |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C202 Bldg Entrance | Env006-2018 | Def: building entrance | Modified 6/15/18 | | | |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C202 MTDS | Env007-2018 | Def: Mass transfer slab edge | Modified 6/15/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C202 Roof | Env008-2018 | Def: Single-rafter roof, roof assembly | Modified 6/15/18 | | | |
| 5/25/2018 | Duane Jonlin, Seattle | WSEC‡ | C202, CI | Env009-2018 | Def: continuous insulation | Modified 6/15/18 | | | |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C303.1.5 NEW | Env010-2018 | Defaults for spandrel panels | Approve 6/15 / Modified 6/29 | | | |
| 5/25/2018 | Eric Makela, NBI | WSEC | C402.1, C402.2 | Env011-2018 | Thermal bridging | Disapprove 6/15/18 | | | Increase |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC | C402.1.1 | Env012-2018 | Greenhouses: heating | Disapprove 7/13/18 | | | Increase |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC | C402.1.1 | Env-013-2018 | Greenhouses: envelope | Modified 7/13/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C402.1.1.2 | Env014-2018 (R) | Semi-heated bldg def/exception? | Modified 6/15/18 | | | Increase |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C402.1.2 | Env015-2018 | Equipment building - Heat pump | Approve 6/15/18 | | | |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C402.1.3 NEW | Env023-2018 | Adds new section for elevator hoistway insulation | Approve 6/15/18 | | | |
| 5/25/2018 | David Mann, ACC | WSEC | C402.1.3 | Env016-2018 | R-15+5 std framing | Approve 6/29/18 | | | |
| 5/25/2018 | David Mann, ACC | WSEC | C402.1.3 & C402.1.4 above grade | Env017-2018 | Add std framing values | Modified 6/29/18 | | | |
| 5/25/2018 | Eric Lacey, RECA | WSEC | C402.1.3 & C402.1.4 above grade | Env018-2018 (R) | Increased values for above grade walls | Modified 6/29/18 | | | |
| 5/25/2018 | David Mann, ACC | WSEC | C402.1.3 & C402.1.4 Mass | Env019-2018 | Increased to IECC levels | Disapprove 7/13/18 | | | |
| 5/25/2018 | David Mann, ACC | WSEC | C402.1.3 & C402.1.4 Mass 2 | Env020-2018 | Mod of Mass wall FN c | Modified 8/10/18 | Proposal is deemed incomplete and is disapproved due to Council policy | | |
| 5/25/2018 | Tom Young, NWCMA | WSEC | C402.1.3 fn c | Env021-2018 | Adds building types to FN c | Disapprove 6/129/18 | | | Increase |
| 5/25/2018 | Tom Young, NWCMA | WSEC | C402.1.3 fn h | Env022-2018 | Mod of FN h for stainless | Disapprove 6/29/18 | | | Increase |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C402.1.3/C402.1.4 | Env024-2018 | Adds values for transfer deck slab edge | Modified 6/29/18 | | | |
| 5/23/2018 | Mike Kennedy | WSEC*‡ | C402.1.5 | Env025-2018 | corrects 2015 equation | Approve for action 6/15/18 Modified 7/13/18 | | | |
| 5/23/2018 | Mike Kennedy | WSEC‡ | C402.1.5 | Env026-2018 | Modification of equations | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | Duane Jonlin, Seattle | WSEC‡ | C402.1.5 | Env027-2018 (R) | Modification of equations | Modified 7/13/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C402.1.5 | Env028-2018 | Adds Reference to C402.4.1.4, high performance mechanical | Approve for both 2015 and 2018 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C402.1.5.1 | Env029-2018 | Adds Reference to C402.1.4.1, steel-framed walls | Approve 6/29/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C402.2.1 | Env030-2018 | Roof drains | Modified 6/29/18 | | | |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C402.2.1.1 NEW | Env031-2018 | Rooftop HVAC curbs | Modified 6/29/18 | | | |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C402.4 T area w | Env032-2018 | Add FN for area weighted calculations | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C402.4 T orient | Env033-2018 | Add FN defining orientation | Modified 6/29/18 Modified 7/13/18 | | | |
| 5/25/2018 | Eric Lacey, RECA | WSEC | C402.4 Table | Env034-2018 | Only fixed and operable; deletes metal/nonmetal | Disapprove 6/29/18 | | | |

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| 5/25/2018 | Eric Makela, NBI | WSEC | C402.4 Table | Env035-2018 | Replaces current table; adds curtain wall & site built | Approve 6/29/18 | | | Increase |
| 5/25/2018 | Dave Baylon, Ecotope | WSEC‡ | C402.4.1.5 NEW | Env036-2018 | Unlimited glazing option | Disapprove 6/29/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C402.4.1 | Env037-2018 (R) | Addresses window to wall area | Approve 6/29/18 | | | |
| 5/23/2018 | Mike Kennedy | WSEC | C402.4.1.1 | Env038-2018 | Increase % within daylight zone to 50% | Modified 7/13/18 | | | Decrease |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C402.4.1.1 | Env039-2018 | Net floor area | Modified 7/13/18 | | | |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C402.4.1.1 | Env040-2018 | Visible transmittance | Approve 7/13/18 | | | |
| 5/25/2018 | Eric Lacey, RECA | WSEC | C402.4.1.3 | Env041-2018 | Removes framing types | Diapprove 7/13/18 | | | |
| 5/25/2018 | Jon Heller, Ecotope | WSEC‡ (Rev 6/22) | C402.4.1.4 | Env042-2018 | Deletes high perf mechanical fenestration allowance | Approve 7/13/18 | | | |
| 5/25/2018 | Neall Digert, Solatube | WSEC | C402.4.2 | Env043-2018 | Tubular daylight devices | Modified 6/15/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C402.4.2 | Env044-2018 (R) | Minimum skylight area exception mod | Modified 7/13/18 | | | |
| 5/25/2018 | Louis Starr, NEEA | WSEC | C402.5.1.2 | Env045-2018 | Tightens the air leakage testing | Modified 7/13/18 | | | |
| 5/25/2018 | Mike Fowler, PHNW | WSEC | C402.5.1.2, C406.9 | Env046-2018 | Reduces leakage rate to 0.25 | Modified 7/13/18 | | | Increase |
| 5/18/2018 | Robby Oylear | WSEC | C402.5.7 | Env047-2018 | Small building exception/vestibules | Disapprove 7/13/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C402.5.7 | Env048-2018 | Exc. 4, smaller building areas | Modified 7/13/18 | | | |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C202 Mech Cooling | EM049-2018 | Def: mech cooling & heating | Approve 7/13/18 | | | |
| 5/25/2018 | Louis Starr, NEEA | WSEC | C403.1.1 NEW | EM050-2018 | Total system performance ratio | Modified 8/10/18 | | | Increase |
| 5/25/2018 | Jeff Sloan, ASHRAE | WSEC | C403.1.3 NEW | EM051-2018 | ASHRAE for data centers | Modified 7/27/18 # | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.10.1 | EM052-2018 | Cleanup of outdoor air req | Modified 7/13/18 | | | |
| 5/18/2018 | Robby Oylear | WSEC | C403.10.3 | EM053-2018 | Pipe insulation | WITHDRAWN BY PROponent | | | |
| 5/23/2018 | Mike Kennedy | WSEC‡ | C403.2.1 | EM054-2018 | Zone isolation | Modified 7/13/18 | | | |
| 5/25/2018 | Jon Heller, Ecotope | WSEC (Rev. 6/22) | C403.2.2 | EM055-2018 | Ventilation with energy recovery | Approve 7/20/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.2.2 Ex 4 | EM056-2018 | Ventilation with energy recovery | WITHDRAWN BY PROponent | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.2.2 Ex 5 | EM057-2018 | Ventilation with chilled beams | Modified 7/20/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.2.2.2 | EM058-2018 | Exhaust rates | Modified 7/20/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.3.2 | EM059-2018 | Air to water heat pumps | Modified 7/20/18 | | | |
| 4/10/2018 | Keith Coursin, Desert Aire | WSEC | C403.3.5 | EM060-2018 | DOAS | Disapprove 7/20/18 | | | Increase |
| 5/24/2018 | Michael Baranick | WSEC‡ | C403.3.5 | EM061-2018 | DOAS building types | WITHDRAWN BY PROponent | | | |
| 5/25/2018 | Jon Heller, Ecotope | WSEC‡ | C403.3.5 | EM062-2018 | DOAS building types | Approve 7/20/18 # | | | |
| 5/25/2018 | Jon Heller, Ecotope | WSEC‡ | C403.3.5 | EM063-2018 | DOAS air delivery | Modified 7/20/18 | | | |
| 5/25/2018 | Duane Jonlin, Seattle | WSEC‡ | C403.3.5.1 | EM064-2018 | DOAS air flow rates | Modified 7/20/18 | | | |
| 5/25/2018 | Jon Heller, Ecotope | WSEC‡ | C403.3.5.1 | EM065-2018 (R) | DOAS Energy recovery | Modified 7/20/18 | | | |
| 5/25/2018 | Jon Heller, Ecotope | WSEC‡ | C403.3.5.4 | EM066-2018 | DOAS supply air heating | WITHDRAWN BY PROponent | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.4.1 | EM067-2018 | DOAS thermostat controls | Modified 7/20/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.4.1.4 | EM068-2018 | Conditioned vestibules | Modified 7/20/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.4.1.6 NEW | EM069-2018 | Door HVAC control | Modified 7/27/18 | | | |
| 5/25/2018 | Nick O'Neil | WSEC | C403.4.2.3 | EM070-2018 (R) | Auto start & stop controls | Modified 7/27/18 | | | Increase |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.4.2.4 NEW | EM071-2018 | Off hour controls - exhaust | Modified 7/27/18 | | | |
| 5/25/2018 | David Darse, Rushing | WSEC‡ | C403.4.3.3.2 | EM072-2018 (R) | Heat rejection - cooling towers | Modified 7/27/18 | | | |
| 5/18/2018 | Robby Oylear | WSEC | C403.4.6 | EM073-2018 | Variable flow control reset | WITHDRAWN BY PROponent | | | |
| 5/25/2018 | Barry Jostol | WSEC | C403.4.6 | EM074-2018 | Variable flow control reset | Modified 7/27/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC | C403.4.7.1 NEW | EM075-2018 | Controls, decorative appliances | Modified 7/27/18 | | | Increase |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.4.9, C403.4.10 | EM076-2018 | Deadband requirements | Approve 7/27/18 | | | |
| 5/24/2018 | Michael Baranick | WSEC‡ | C403.5 | EM077-2018 | Exc for natural ventilation | WITHDRAWN BY PROponent | | | |
| 5/24/2018 | Robby Oylear | WSEC | C403.5 | EM078-2018 | Rewrite exception 9 | Modified 7/27/18 | | | |
| 5/25/2018 | Reid Hart, PNNL | WSEC‡ | C403.5 | EM079-2018 | Revise economizer exceptions | Modified 8/10/18 | | | Increase |
| 5/25/2018 | Jon Heller, Ecotope | WSEC‡ | C403.5 | EM080-2018 | Revise DOAS exception | Modified 7/20/18 | | | |
| 5/25/2018 | Reid Hart, PNNL | WSEC‡ | C403.5.3.3 | EM081-2018 | High limit values for cycling fans | Approve 7/27/18 | | | |

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| 5/25/2018 | Jon Heller, Ecotope | WSEC‡ | C403.6.1 | EM082-2018 | VAV systems | Approve 7/27/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.6.10 | EM083-2018 | HE VAV systems | Modified 7/27/18 | | | |
| 5/25/2018 | Jon Heller, Ecotope | WSEC‡ | C403.7.1 | EM084-2018 | DCV & DOAS | Approve 7/20/18 | | | |
| 5/25/2018 | Michael Baranick | WSEC (Rev. 6/22) | C403.7.2 | EM085-2018 | Occupancy sensors & DOAS | Disapprove 7/20/18 | | | Decrease |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.7.2 | EM086-2018 | Occupancy sensor controls | Modified 7/20/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.7.2 Exc | EM087-2018 | Occ Sensors - exc to maintain ventilation during occupied hours | Modified 7/20/18 | | | |
| 5/7/2018 | Mike Moore HVI | WSEC | C403.7.7.1 | EM088-2018 | Energy recovery for all Group R | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.7.7.1 | EM089-2018 | ERV - remove ex 5 | Disapprove 7/27/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.7.8 | EM090-2018 | Transfer air | Modified 7/27/18 | | | |
| 5/18/2018 | Robby Oylear | WSEC | C403.7.9 | EM091-2018 | Shutoff dampers | Modified 8/03/18 | | | Increase |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C403.7.9 | EM092-2018 | Shutoff dampers | Modified 7/27/18 | | | |
| 5/18/2018 | Robby Oylear | WSEC‡ | C403.8.1 | EM093-2018 | Fan power in existing bldg mods | Modified 8/10/18 | | | |
| 5/22/2018 | Robby Oylear | WSEC | C403.8.1 | EM094-2018 | DOAS/Terminal units | Modified 7/20/18 | | | |
| 5/19/2018 | Robby Oylear | WSEC | C403.8.1(2) T | EM095-2018 | Static air mixers | Disapprove 7/27/18 | | | |
| 5/24/2018 | Michael Baranick | WSEC‡ | C403.8.1(2) T | EM096-2018 | Pressure drop adjustment | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | Eric Makela, NBI | WSEC | C403.8.4 | EM097-2018 | Res fan efficacy | Approve 7/27/18 | | | Increase |
| 5/25/2018 | Duane Jonlin, Seattle | WSEC | C403.8.5.1 T | EM098-2018 | DX cooling systems | Approve 7/27/18 | | | Increase |
| 5/25/2018 | Robby Oylear | WSEC | C403.9.8, C403.7.7, C403.5 | EM099-2018 | Heat recovery chillers | Modified 7/27/18 | | | Increase |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C404.13 NEW | EW100-2018 | Water pressure booster systems | Modified 8/03/18 | | | |
| 5/25/2018 | Eric Makela, NBI | WSEC | C404.2.1 | EW101-2018 | Service water heating | Modified 8/10/18 | | | Increase |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C202 Public Lav | EW102-2018 | Def: Public lavatory | Approve 8/03/18 | | | |
| 5/25/2018 | Eric Makela, NBI | WSEC‡ | C404.3.1 T | EW103-2018 | Pipe Length | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C404.4 | EW104-2018 | Heat traps | Approve 8/03/18 | | | |
| 4/4/2018 | Eric Vander Mey | WSEC*‡ | C404.6 | EW105-2018 | Final pipe run exception | Approve for action 6/15/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C404.6 (Duplicate-- see 008) | EW107-2018 | Final pipe run exception | Approve | | | |
| 5/25/2018 | Susanne Brown, Ecotope | WSEC | C404.6 | EW106-2018 | Thermal bridging/pipe insulation | Approve 7/27/18 | | | |
| 5/25/2018 | Susanne Brown, Ecotope | WSEC | C404.7.1 | EW108-2018 | Demand based water recirculation systems | Disapprove 7/27/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C404.7.1 | EW109-2018 | Heated water circulation systems | Modified 8/10/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C404.9 | EW110-2018 | Hot water meters | Modified 8/03/18 | | | |
| 5/25/2018 | Eric Makela, NBI | WSEC | C405.1 | EL111-2018 | High efficacy lamps - residential | Modified 7/27/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C405.1 | EL112-2018 | Residential lighting | Modified 7/27/18 | | | |
| 5/25/2018 | Mike Kennedy | WSEC | C405.2 | EL113-2018 | Lighting controls - 90.1 | Modified 7/27/18 | | | Decrease |
| 5/22/2018 | Andrew Pultorak, PSE | WSEC | C405.2 C202‡ | EL114-2018 | LLLC | Modified 7/27/18 | | | |
| 5/25/2018 | Duane Jonlin, Seattle | WSEC‡ | C405.2.2.1 | EL115-2018 | Controls correction | WITHDRAWN BY PROPONENT | | | |
| 5/25/2015 | Duane Jonlin, Seattle | WSEC‡ | C405.2.4 | EL116-2015 | Daylight responsive controls | Approve 7/27/18 | | | |
| 5/25/2018 | CJ Brockway | WSEC | C405.2.7.2 | EL117-2018 | Decorative lighting | Modified 7/27/18 | | | |
| 5/25/2018 | CJ Brockway | WSEC | C405.4.1 | EL118-2018 | Total connected lighting power | Approve 7/27/18 | | | Decrease |
| 5/25/2018 | Mike Kennedy | WSEC | C405.4.2 | EL119-2018 | Interior lighting power | Modified 8/10/18 | | | Decrease |
| 5/21/2018 | Maris Avots | WSEC | C405.4.2(2) T | EL120-2018 | Space by space - hair & beauty salons | Disapprove 8/03/18 | | | |
| 5/25/2018 | Duane Jonlin, Seattle | WSEC‡ | C405.4.2(2) T | EL121-2018 | Interior lighting power allowance | Approve 8/03/18 | | | |
| 5/25/2018 | Eric Makela, NBI | WSEC | C405.5.1 | EL122-2018 | High efficacy lamps - exterior | Modified 8/03/18 | | | Increase |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C405.7 | EL123-2018 | Dwelling unit meters | Approve 8/03/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C405.8 | EL124-2018 | Electric motor efficiency | Approve 8/03/18 | | | |
| 5/25/2018 | Eric Makela, NBI | WSEC | C406 | EO125-2018 | Options package table | Modified 8/10/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC (Rev. 6/25) | C406.1 | EO126-2018 | Options package clarifications | Modified 8/10/18 | | | |

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| 5/25/2018 | Nick O'Neil | WSEC | C406.10 NEW | EO127-2018 | Enhanced kitchen equipment | Modified 8/10/18 | | | Increase |
| 5/25/2018 | Jon Heller, Ecotope | WSEC‡ | C406.10 NEW | EO128-2018 (R) | High performance DOAS | Modified 8/10/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC | C406.10 NEW | EO129-2018 | Additional metering | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | Jon Heller, Ecotope | WSEC‡ | C406.11 NEW | EO130-2018 (R) | High performance service water heating - multifamily | Modified 8/10/18 | | | Increase |
| 5/25/2018 | Ronald Blasser | WSEC | C406.11 NEW | EO131-2018 | Smart monitoring | Disapprove 8/10/18 | | | Increase |
| 5/25/2018 | Susanne Brown, Ecotope | WSEC | C406.12 NEW | EO132-2018 (R) | Water system loss reduction | Disapprove 8/10/18 | | | Increase |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C406.2 | EO133-2018 | HVAC & fan performance | Modified 8/10/18 | | | |
| 5/25/2018 | Barry Jostol | WSEC | C406.2.2 | EO134-2018 | Min. efficiency - boilers | Disapprove 8/10/18 # | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C406.3.2 | EO135-2018 | Lamp fraction | Modified 8/10/18 | | | |
| 5/25/2018 | Reid Hart, PNNL | WSEC‡ | C406.4 | EO136-2018 | Enhanced controls - daylighting | Disapprove 8/10/18 | | | |
| 5/25/2018 | Reid Hart, PNNL | WSEC‡ | C406.4 | EO137-2018 | Enhanced controls - LLLC | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | Jon Heller, Ecotope | WSEC‡ | C406.6 | EO138-2018 | Eliminates DOAS option for those required to meet DOAS | Disapprove 8/10/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C406.7 | EO139-2018 | Clarification of water heating option | Modified 8/10/18 | | | |
| 5/25/2018 | Tom Young, NWCMA | WSEC | C401.2 | EP140-2018 | Add ASHRAE App G as alt compliance path | Disapprove 8/10/18 | | | |
| 5/25/2018 | Michael Rosenburg, PNNL | WSEC (Rev. 2/28) | C407 | EP141-2018 | Adopt App G in place of C407 | Modified 7/13/18 | | | Increase |
| 5/25/2018 | Nathan Miller, Rushing | WSEC‡ | C407 | EP142-2018 | Placeholder C407 | WITHDRAWN BY PROPONENT | | | |
| 5/23/2018 | Mike Kennedy | WSEC | C407.3 | EP143-2018 | Limits envelope reduction | Approve 6/29/18 | | | |
| 5/25/2018 | Eric Lacey, RECA | WSEC | C407.3 | EP144-2018 | Limitation on amount of on-site production credit | Modified 6/29/18 | | | |
| 5/25/2018 | David Mann, ACC | WSEC | C407.4.2 | EP145-2018 | Limitation on amount of on-site production credit | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | Treasa Sweek | WSEC | C202 | EC146-2018 | Modifies def. of bldg cx & certified cx professional | Approve 8/03/18 | | | |
| 5/25/2018 | Treasa Sweek | WSEC | C403, C404, C405, C409 | EC147-2018 | Reinstates pointer sections | Modified 8/03/18 | | | |
| 5/25/2018 | Treasa Sweek | WSEC | C408, C103.6.2 | EC148-2018 | Process changes | Modified 8/03/18 # | | | |
| 5/25/2018 | Treasa Sweek | WSEC | C408, C104.2.6 | EC149-2018 | Enforcement modifications | Modified 8/03/18 | | | |
| 5/25/2018 | Treasa Sweek | WSEC | C408.1, C410, C501.7 | EC150-2018 | Increases scope of requirements | Modified 8/03/18 | | | Increase |
| 5/25/2018 | David Derse, Rushing | WSEC‡ | C408.1.4.2 | EC151-2018 | Phased acceptance | Modified 8/03/18 | | | |
| 5/18/2018 | Robby Oylear | WSEC‡ | C408.2 | EC152-2018 | Mechanical equip capacity clarification | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | David Derse, Rushing | WSEC‡ | C408.2.2 | EC153-2018 | Balancing & adjusting certification | Disapprove 8/03/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C409.1.3 NEW | E154-2018 | Reference to dwelling meter requirements | Approve 8/03/18 | | | |
| 5/25/2018 | Michael Baranick | WSEC (Rev 6/22) | C409.3 | E155-2018 | Add requirements from seattle code | Disapprove 8/03/18 # | | | Increase |
| 5/25/2018 | Eric Vander Mey | WSEC‡ | C409.3, C409.4.3 | E156-2018 | Minor load exclusion | Approve 8/03/18 | | | |
| 5/25/2018 | Eric Vander Mey | WSEC | C409.3.3 NEW | E157-2018 | Vehicle charging stations | Modified 8/03/18 | | | |
| 5/25/2018 | Duane Jonlin, Seattle | WSEC‡ | C410.2.1 | E158-2018 | Glass insulation - walk-ins | Modified 8/03/18 | | | |
| 5/25/2018 | Amy Wheelless | WSEC | C411 NEW | E159-2018 | solar readiness | Approve 8/03/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C501.4.1 | E160-2018 (R) | Calculation of loads | Modified 8/10/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC (Rev. 6/27) | C501.4.2 | E161-2018 | Envelope compliance | Modified 8/10/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C502.2, C503.2, C505.1 | E162-2018 | Envelope compliance | Modified 8/10/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C502.2.2 | E163-2018 | Skylight area | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | Michael Baranick | WSEC (Rev 6/22) | C502.2.3 | E164-2018 | Small additions exempt from DOAS | Disapprove 8/10/18 | | | Decrease |

| Date Received | Proponent | Code | Section | Log Number | Description | TAG Action/ Recommendation | Committee Action | Council Action | Economic Impact |
|---------------|--------------------|-------|--------------------|---------------------------|---------------------------|---|------------------|----------------|-----------------|
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C503.1, C503.4 | E165-2018 | Mechanical alterations | Modified 8/10/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C503.3.2.1, C504.2 | E166-2018 | Replacement fenestration | Disapprove 8/10/18 | | | |
| 5/18/2018 | Robby Oylear | WSEC‡ | C503.4 | E167-2018 | Mechanical alteration fix | WITHDRAWN BY PROPONENT | | | |
| 5/25/2018 | Michael Baranick | WSEC | C503.4 | E168-2018 | Fan power exception | Disapprove 8/10/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C503.4 T | E169-2018 | Update Economizer table | Disapprove 8/10/18 Modified 9/6/18 | | | |
| 5/25/2018 | Lisa Rosenow, NEEC | WSEC‡ | C503.6 | E170-2018 | Lighting alterations | Approve 8/10/18 | | | |
| 5/25/2018 | Mike Fowler | WSEC | App E NEW | E171-2018 | Outcome based compliance | Modified 8/10/18 # | | | |

Totals:
20 Withdrawn by Proponent
27 Recommend Disapproval
35 Recommend Approval
89 Recommend Approval as Modified



STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

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October 8, 2018

TO: State Building Code Council Members and All Interested Parties

FROM: Energy Code Technical Advisory Group

SUBJECT: Supplemental Energy Code TAG Report

The Energy Code TAG held an additional meeting on October 5 to review several items that have arisen since the initial report on proposals from September 10.

- EM051-2018, ASHRAE 90.4 for data centers: The TAG is recommending some minor editorial changes to what was previously approved.
- EM062-2018, DOAS building types: The TAG is recommending a modification to this proposal originally recommended as approve as submitted. The modification is intended to coordinate changes between the increased requirements for DOAS with the requirements for variable air volume and demand control ventilation for assembly spaces.
- EO134-2018, Minimum efficiency for gas-fired boilers: In reviewing the minority report submitted on this issue, the TAG concurred that there should be some modifications to the gas fired boiler efficiency requirement. This reverses their previous recommendation for disapproval.
- EC148-2018, Commissioning process changes: The TAG concurred with the proponent of the original proposal that the requirements for submittal documents should be modified to not specifically name the commissioning agent.
- E155-2018, Additional requirements for end-use metering: The TAG is recommending the proposal as revised at the October 5 meeting go forward for public hearing. This reverses their previous recommendation for disapproval.
- E171-2018, Outcome based compliance: The TAG agreed to modify the language to specify the lighting power allowance for parking garages must still be met, and that the values for non-refrigerated warehouses were valid only for heated warehouses.
- Table C406.1, Efficiency options changed to point system: Several of the newer proposals to the Efficiency Package options did not carry a point value based on the changes from EO125. The TAG assigned values to those proposals and corrected others that were modified by proposals.

For specific language related to these modifications, see attached.

The TAG also looked at the issue of using carbon emissions as a metric in lieu of energy use, as was proposed and was moved forward in several proposals. The majority of those present expressed support with continuing forward with this change, as long as it referenced source carbon and not site carbon. There was a failed motion to change the rate for electricity, seeking to move it from the current recommendation of 0.55 lb/kWh to somewhere between 0.91 to 0.97

The TAG also attempted to discuss some editorial changes to the recommendation for using ASHRAE Appendix G in place of the current C407 for the Total Building Performance method, but due to technical difficulties, the source documents were unavailable, so the TAG has no further recommendations at this time.

The final TAG discussion looked at the new Table C407.2, which was recommended as a part of the Integrated Draft as a simplified method to determine which base measures in the code must be complied with. The discussion centered on the inclusion of the Lighting Power Allowance values in Section C405. The TAG felt there was no reason to modify the new table and felt it was correct as published.

EM051-2018:

COMPUTER ROOM. A room whose primary function is to house equipment for the processing and storage of electronic data and that has a design total information technology equipment (IET) equipment power density exceeding less than or equal to 20 watts per square foot of conditioned area and a design *ITE* equipment load less than or equal to 10 kW.

DATA CENTER SYSTEMS. HVAC systems, electrical systems, equipment, or portions thereof used to condition *ITE* or electrical systems in a *data center*. ~~Data center systems may also be shared, serving other data center additions or non-data center loads.~~

C403.1 General. Mechanical systems and equipment serving heating, cooling, ventilating, and other needs shall comply with this section.

Exceptions:

1. Energy using equipment used by a manufacturing, industrial or commercial process other than for conditioning spaces or maintaining comfort and amenities for the occupants and not otherwise regulated by C403.3.2, Tables C403.3.2(1) through (10) inclusive, C403.11.2, C403.11.3, C403.2.4.7, C403.4.X, C403.9.5, C404.2, Table C404.2, C405.8, and C410. Data center and computer room HVAC equipment is not covered by this exception.
2. ~~Essential portions of Data center systems meeting Section C403.1.3~~ are exempt from Sections ~~C403.3, C403.4 and C403.5.~~

C403.1.3 Data centers. ~~Data center systems in data centers~~ shall comply with Sections 6 and 8 of ASHRAE Standard 90.4, ~~including appendices a, b, c and d with the following changes:-~~

1. ~~Use the following Replace design MLC design values per climate zone, rather than those of Table 6.2.1.1 in ASHRAE Standard 90.4: Table 6.2.1.1 “Maximum Design Mechanical Load Component (Design MLC)” with the following per applicable climate zone:~~

Zone 4C Design MLC = 0.22

Zone 5B Design MLC = 0.24

~~(Design MLC is defined as the sum of all active cooling system power inputs at the design condition divided by the design power into the ITE being cooled, and is evaluated at 50 percent and 100 percent ITE load.)~~

2. ~~Or, comply with Sections 6 and 8 of ASHRAE 90.4 using the following Replace annualized MLC values rather than those of Table 6.2.1.2 “Maximum Annualized Mechanical Load Component (Annualized MLC)” in ASHRAE Standard 90.4 with the following per applicable climate zone:~~

Zone 4C Annual MLC = 0.18

Zone 5B Annual MLC = 0.17

~~(Annual MLC is defined as the sum of all intended energy for cooling system operation over a typical year, minus any recovered ITE energy taken from heating, all divided by the total annual energy flowing into the ITE being cooled, and is evaluated at 50 percent and 100 percent ITE load.)~~

C403.6.10 High efficiency variable air volume (VAV) systems. For HVAC systems subject to the requirements of Section C403.3.5 but utilizing Exception 2 of that section, a high efficiency multiple-zone VAV system may be provided without a separate parallel DOAS when the system is designed, installed, and configured to comply with all of the following criteria (this exception shall not be used as a substitution for a DOAS per Section C406.6:

14. Dedicated ~~server rooms data centers, computer rooms,~~ electronic equipment rooms, telecom rooms, or other similar spaces with cooling loads greater than 5 watts/ft² shall be provided with separate, independent HVAC cooling systems to allow the VAV air handlers to turn off during unoccupied hours in the office space and to allow the supply air temperature reset to occur.

Exception: The VAV air handling unit and VAV terminal units may be used for secondary backup cooling when there is a failure of the primary HVAC system.

Additionally, ~~server rooms~~computer rooms, electronic equipment rooms, telecom rooms, or other similar spaces shall be provided with airside economizer per Section C403.5 without using the exceptions to Section C403.5.

Exception: Heat recovery per exception 9 of Section C403.5 may be in lieu of airside economizer for the separate, independent HVAC system.

C405.1 General. This section covers lighting system controls, the maximum lighting power for interior and exterior applications, electrical energy consumption, vertical and horizontal transportation systems, and minimum efficiencies for motors and transformers.

Dwelling units within multi-family residential occupancies shall comply with this section. All other dwelling units in dormitory, hotel and other residential occupancies that are not classified as multi-family residential occupancies shall comply with Section C405.2.5 and with this section or Section C405.4. No less than 90 percent of the permanently installed lighting serving dwelling units or sleeping units shall be provided by lamps with an efficacy of not less than 60 lumens per watt or *luminaire* with an efficacy of not less than 55 lumens per watt.

Lighting installed in walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with the lighting requirements of Section C410.2.

Transformers, uninterruptable power supplies, motors and electrical power processing equipment in data center systems shall comply with Section 8 of ASHRAE Standard 90.4, ~~including appendices a, b, c and d~~ in addition to this code.

TABLE C403.3.2(9)
MINIMUM EFFICIENCY REQUIREMENTS: AIR CONDITIONERS AND CONDENSING UNITS
SERVING COMPUTER ROOMS AND DATA CENTERS

TABLE C405.4.2(2)
INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

| COMMON SPACE-BY-SPACE TYPES ^a | LPD ^d (w/ft ²) |
|---|--|
| Computer room, <u>data center</u> | 1.33 |

EM062-2018:

C403.3.5 Dedicated outdoor air systems (DOAS). For buildings with occupancies as shown in Table C403.3.5, outdoor air shall be provided to each occupied space by a dedicated outdoor air system (DOAS) which delivers 100 percent outdoor air without requiring operation of the heating and cooling system fans for ventilation air delivery. The DOAS supply air shall be delivered directly to the occupied space or downstream of the terminal heating and/or cooling coils.

Exceptions:

1. Occupied spaces that are not ventilated by a mechanical ventilation system and are only ventilated by a natural ventilation system per Section 402 of the *International Mechanical Code*.
2. High efficiency variable air volume (VAV) systems complying with Section C403.6.10 for occupancy classifications other than A-1, A-2 and A-3 in accordance with Table C403.3.5, and high efficiency VAV systems complying with Section C403.12 for occupancy classifications A-1, A-2 and A-3 in accordance with Table C403.3.5. This exception shall not be used as a substitution for a DOAS per Section C406.6.

C403.7.1 Demand control ventilation. Demand control ventilation (DCV) shall be provided for spaces larger than 500 square feet (50 m²) and with an occupant load greater than or equal to 25 people per 1000 square feet (93 m²) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) and served by systems with one or more of the following:

1. An air-side economizer.
2. Automatic modulating control of the outdoor air damper.
3. A design outdoor airflow greater than 3,000 cfm (1416 L/s).

Exception: Demand control ventilation is not required for systems and spaces as follows:

1. Systems with energy recovery complying with Section C403.7.7.1 or Section C403.3.5.1 (Energy recovery with DOAS). This exception is not available for space types located within the “inclusions” column of Groups A-1 and A-3 occupancy classifications in accordance with Table C403.3.5.
2. Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.
3. System with a design outdoor airflow less than 750 cfm (354 L/s).
4. Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1,200 cfm (566 L/s).
5. Ventilation provided for process loads only.
6. Spaces with one of the following occupancy categories (as defined by the *International Mechanical Code*): Correctional cells, daycare sickrooms, science labs, barbers, beauty and nail salons, and bowling alley seating.

C403.12 High efficiency single-zone variable air volume (VAV) systems. For HVAC systems subject to the requirements of Section C403.3.5 but utilizing Exception 2 of that section, a high efficiency single-zone VAV system may be provided without a separate parallel DOAS when the system is designed, installed, and configured to comply with all of the following criteria (this exception shall not be used as a substitution for a DOAS per Section C406.6 or as a modification to the requirements for the Standard Reference Design per Section C407):

1. The single-zone VAV system is provided with airside economizer per Section 403.3 without exceptions.
2. A direct-digital control (DDC) system is provided to control the system as a single zone per Section C403.4.11 regardless of sizing thresholds of Table C403.4.11.1.

3. Single-zone VAV systems with a minimum outdoor air requirement of 1,000 cfm (472 L/s) or greater shall be equipped with a device capable of measuring outdoor airflow intake under all load conditions. The system shall be capable of increasing or reducing the outdoor airflow intake based on Section C403.7.1 demand controlled ventilation.
4. Allowable fan motor horsepower shall not exceed 90% of the allowable HVAC fan system bhp (Option 2) as defined by Section C403.8.1.1.
5. Each single-zone VAV system shall be designed to vary the supply fan airflow as a function of heating and cooling load and minimum fan speed shall not be more than the greater of:
 - 5.1. 30 percent of peak design airflow, or
 - 5.2. The required ventilation flow assuming no occupants.
6. Spaces that are larger than 150 square feet (14 m²) and with an occupant load greater than or equal to 25 people per 1000 square feet (93 m²) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) shall be provided with all of the following features:
 - 6.1. Demand control ventilation (DCV) shall be provided that utilizes a carbon dioxide sensor to reset the ventilation setpoint of the single-zone VAV system from the design minimum to design maximum ventilation rate as required by Chapter 4 of the *International Mechanical Code*.
 - 6.2. Occupancy sensors shall be provided that are configured to reduce the minimum ventilation rate to zero and setback room temperature setpoints by a minimum of 5°F, for both cooling and heating, when the space is unoccupied.
7. Single-zone VAV systems shall comply with one of the following options:
 - 7.1. Single-zone VAV air handling units with a hydronic heating coil connected to systems with hot water generation equipment limited to the following types of equipment: gas-fired hydronic boilers with a thermal efficiency, Et, of not less than 92 percent, air-to-water heat pumps or heat recovery chillers. Hydronic heating coils shall be sized for a maximum entering hot water temperature of 120°F for peak anticipated heating load conditions.
 - 7.2. Single-zone VAV air handling units with a chilled water coil connected to systems with chilled water generation equipment with IPLV values more than 25 percent higher than the minimum part load efficiencies listed in Table C403.3.2(7), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify. The smallest chiller or compressor in the central plant shall not exceed 20% of the total central plant cooling capacity or the chilled water system shall include thermal storage sized for a minimum of 20% of the total central cooling plant capacity.
 - 7.3. Single-zone VAV air handling units with DX cooling, heat pump heating or gas-fired furnace shall comply with the following requirements as applicable:
 - 7.3.1. Have a DX cooling coil with cooling part load efficiency that are a minimum of 15% higher than the minimum SEER or IEER listed in Tables C403.3.2(1) and C403.3.2(2).
 - 7.3.2. Have a gas-fired furnace with a thermal efficiency, Et, of not less than 90% or heat pump with a minimum heating HSPF or COP efficiency that are a minimum of 10% higher than the minimum heating efficiency in Tables C403.3.2(1) and C403.3.2(2).
 - 7.3.3. Heating coils or burner output shall be modulating or have a minimum of 2 stages with the first stage being less than 50% of total heating capacity. Cooling coils shall be modulating or have a minimum of 2 stages with the first stage being less than 50% of the total cooling capacity.
8. The DDC system shall include a fault detection and diagnostics (FDD) system complying with the following:
 - 8.1. The following temperature sensors shall be permanently installed to monitor system operation:

- 8.1.1. Outside air.
- 8.1.2. Supply air.
- 8.1.3. Return air.
- 8.2. Temperature sensors shall have an accuracy of $\pm 2^{\circ}\text{F}$ (1.1°C) over the range of 40°F to 80°F (4°C to 26.7°C).
- 8.3. The single-zone VAV air handling unit controller shall be configured to provide system status by indicating the following:
 - 8.3.1. Free cooling available.
 - 8.3.2. Economizer enabled.
 - 8.3.3. Compressor enabled.
 - 8.3.4. Heating enabled.
 - 8.3.5. Mixed air low limit cycle active.
 - 8.3.6. The current value of each sensor.
- 8.4. The single-zone VAV air handling unit controller shall be capable of manually initiating each operating mode so that the operation of compressors, economizers, fans and the heating system can be independently tested and verified.
- 8.5. The single-zone VAV air handling unit shall be configured to report faults to a fault management application accessible by day-to-day operating or service personnel or annunciated locally on zone thermostats.
- 8.6. The FDD system shall be configured to detect the following faults:
 - 8.6.1. Air temperature sensor failure/fault.
 - 8.6.2. Not economizing when the unit should be economizing.
 - 8.6.3. Economizing when the unit should not be economizing.
 - 8.6.4. Outdoor air or return air damper not modulating.
 - 8.6.5. Excess outdoor air.

EO134-2018:

C406.2.2 Minimum equipment efficiency. Equipment shall exceed the minimum efficiency requirements listed in Tables C403.2.3(1) through C403.2.3(9) by 15 percent, in addition to the requirements of Section C403. Where multiple performance requirements are provided, the equipment shall exceed all requirements by 15 percent.

Exceptions:

1. Equipment that is larger than the maximum capacity range indicated in Tables C403.2.3(1) through C403.2.3(9) shall utilize the values listed for the largest capacity equipment for the associated equipment type shown in the table.
 2. Equipment complying with the exception to Section C406.2.1 is not required to comply with the minimum equipment efficiency requirement.
 3. Compliance may be demonstrated by calculating a total weighted average percentage for all heating and cooling equipment combined. All equipment shall have efficiency that is no less than 5% better than the minimum required efficiency in Table C403.2.3(1) through C403.2.3(9), and the resulting weighted average percentage for all equipment performance requirements shall exceed 15 percent. Calculation shall include heating and cooling capacities for all equipment, percentage better or worse than minimum required efficiency per Tables C403.2.3(1) through C403.2.3(9) for to each performance requirement (SEER, EER/IEER, COP, HSPF, E_t, E_c and AFUE), and the total weighted average efficiency percentage.
 - 3.4. Hot water boilers with input capacity greater than 2,500,000 Btu/h shall be considered to comply with this section with a minimum thermal efficiency of 95.5 E_t per test procedure 10 CFR Part 431.
-

EC148-2018:

C408.1.1 Commissioning in construction documents. Construction documents shall clearly indicate provisions for commissioning process. The construction documents shall minimally include the following:

1. A narrative description of the activities that will be accomplished during the commissioning process. At a minimum, the commissioning process is required to include:
 - 1.1. Development and execution of the commissioning plan, including all subsections of Section C408.1.2;
 - 1.2. The *certified commissioning professional's* review of the building documentation and close out submittals in accordance with Section C103.6; and
 - 1.3. The commissioning report in accordance with Section C408.1.3.
2. ~~Name and company for~~ Roles, responsibilities and required qualifications of the certified commissioning professional.
3. A listing of the specific equipment, appliances or systems to be tested.

E155-2018:

C409.3 End-use metering. Meters shall be provided to collect energy use data for each end-use category listed in Sections C409.3.1 through ~~C409.3.3~~C409.3.7. These meters shall collect data for the whole building or for each separately metered portion of the building where not exempted by the exception to Section C409.1. Not more than 10 percent of the total connected load of any of the end-use metering categories in Sections C409.3.1 through ~~C409.3.5~~C409.3.6 is permitted to be excluded from that end-use data collection. Not more than 10 percent of the total connected load of any of the end-use metering categories in Sections C409.3.1 through ~~C409.3.5~~C409.3.6 is permitted to consist of loads not part of that category. Multiple meters may be used for any end-use category, provided that the data acquisition system totals all of the energy used by that category. Full-floor tenant space submetering data shall be provided to the tenant in accordance with Section C409.7 and the data shall not be required to be included in other end-use categories.

Exceptions:

1. HVAC and service water heating equipment serving only an individual dwelling unit or sleeping unit does not require end-use metering.
2. Separate metering is not required for fire pumps, stairwell pressurization fans or other life safety systems that operate only during testing or emergency.
3. End use metering is not required for individual tenant spaces not exceeding 2,500 square feet in floor area when a dedicated source meter meeting the requirements of Section C409.4.1 is provided for the tenant space.
4. Healthcare facilities with loads in excess of 150 kVA are permitted to have submetering that measures electrical energy usage in accordance with the normal and essential electrical systems except that submetering is required for the following load categories:
 - 4.1. HVAC system energy use in accordance with the requirements of Section C409.3.1.
 - 4.2. Service water heating energy use in accordance with the requirements of Section C409.3.2.
 - 4.3. Process load system energy in accordance with the requirements of Section C409.3.5 for each significant facility not used in direct patient care, including but not limited to food service, laundry and sterile processing facilities, where the total connected load of the facility exceeds 100 kVA.
- 3.5. End use metering is not required for electrical circuits serving only sleeping rooms and guest suites within Group R-1 occupancies. This exception does not apply to common areas or to equipment serving multiple sleeping rooms.

C409.3.1 HVAC system energy use. This category shall include all energy including electrical, gas, liquid fuel, district steam and district chilled water that is used by boilers, chillers, pumps, fans and other equipment used to provide space heating, space cooling, dehumidification and ventilation to the building, but not including energy that serves process loads, service water heating or miscellaneous loads as defined in Section C409.3. Multiple HVAC energy sources, such as gas, electric and steam, are not required to be summed together.

Exceptions:

1. ~~AH~~ 120 volt equipment.
2. ~~208/120 volt equipment in a building where the main service is 480/277 volt power~~An HVAC branch circuit where the total MCA of equipment served equates to less than 10 kVA..
3. ~~Electrical energy fed through variable frequency drives that are connected to the energy metering data acquisition center~~Individual fans or pumps that are not on a variable frequency drive.

C409.3.2 Service water heating energy use. This category shall include all energy used for heating of domestic and service hot water, but not energy used for space heating.

Exception: Service water heating energy use less than 50 ~~kW~~kVA does not require end-use metering.

C409.3.3 Lighting system energy use. This category shall include all energy used by interior and exterior lighting, including lighting in parking structures and lots, but not including plug-in task lighting.

C409.3.4 Electric vehicle charging energy use. This category shall include all energy used for electrical vehicle charging. For buildings exempt from data collection systems, the data from these meters is permitted to either be stored locally using a manual totalizing meter or other means at the meter or fed into a central data collection system.

C409.3.5 Plug load system energy use. This category shall include all energy used by appliances, computers, plug-in task lighting, and other equipment or equipment covered by other end-use metering categories listed in Section C409.3. In a building where the main service is 480/277 volt, each 208/120 volt panel is permitted to be assumed to serve only plug load for the purpose of Section C409, unless it serves nonresidential refrigeration or cooking equipment.

Exception: Where the total connected load of all plug load circuits is less than 50 kVA end-use metering is not required.

C409.3.6 Process load system energy use. This category shall include all energy used by any non-building process load, including but not limited to nonresidential refrigeration and cooking equipment, laundry equipment, industrial equipment and stage lighting.

Exception: Where the process load energy use is less than 50 kVA end-use metering is not required.

C409.3.7 Full-floor tenant space electrical submetering. In a multi-tenant building where more than 90 percent of the leasable area of a floor is occupied by a single tenant, an electrical energy use display shall be provided to the tenant in accordance with the requirements Section C409.4.3. Electrical loads from areas outside of the tenant space or from equipment that serves areas outside of the tenant space shall not be included in the tenant space sub-metering. A single display is permitted to serve multiple floors occupied by the same tenant.

C409.4 Measurement devices, data acquisition system and energy display.

C409.4.1 Meters. Meters and other measurement devices required by this section shall have local displays or be configured to automatically communicate energy data to a data acquisition system. Source meters may be any digital-type meters. Current sensors or flow meters are allowed for end use metering, provided that they have an accuracy of +/- 5%. All required metering systems and equipment shall provide at least hourly data that is fully integrated into the data acquisition and display system per the requirements of Section C409.

C409.4.2 Data acquisition system. The data acquisition system shall store the data from the required meters and other sensing devices in a single database for a minimum of 36 months. For each energy supply and end use category required by C409.2 and C409.3, it shall provide real-time energy consumption data and logged data for any hour, day, month or year.

C409.4.3 Energy display. For each building subject to Section C409.2 and C409.3, either a visible display in a location with *ready access*, or a single web page or other electronic document available to building management or to a third-party energy data analysis service for *access* shall be provided in the building available for access by building operation and management personnel. The display shall graphically provide the current energy consumption rate for each whole building energy source, plus each end use category, as well as the total and peak values for any day, week, month and year.

The display shall be capable of and configured to graphically display the energy use data for any source or end use category or any combination of sources and end uses for any selected daily, weekly, monthly or annual time period, and to view the selected time period simultaneously with another selected time period or a reference benchmark period. The display shall be capable of weather-normalizing data in the comparison time periods, and facilitate display of energy use trends and identification of anomalies.

E171-2018:

**TABLE F101.3.2
WASHINGTON STATE OUTCOME-BASED ENERGY BUDGET**

Zone 4C:

| Building Occupancy/ Use | Site EUI ft ² /year | Base | Current | Future | | | |
|---|-----------------------------------|------|---------|--------|------|------|------|
| | | 2003 | 2018 | 2021 | 2024 | 2027 | 2030 |
| S-1 Parking | kWh | 3.8 | 2.3 | 2.0 | 1.7 | 1.4 | 1.1 |
| | | kBtu | 13.0 | 8.0 | 7.0 | 5.9 | 4.9 |
| | kWh | 2.3 | 1.4 | 1.2 | 1.0 | 0.9 | 0.7 |
| | | kBtu | 7.8 | 4.8 | 4.2 | 3.6 | 3.0 |
| S-2 Non-Refrigerated Distribution/Shipping ^b | kWh | 8.6 | 4.1 | 3.7 | 3.3 | 3.0 | 2.6 |

Zone 5B:

| Building Occupancy/ Use | Site EUI ft ² /year | Base | Current | Future | | | |
|---|-----------------------------------|------|---------|--------|------|------|------|
| | | 2003 | 2018 | 2021 | 2024 | 2027 | 2030 |
| S-1 Parking | kWh | 3.8 | 2.3 | 2.0 | 1.7 | 1.4 | 1.1 |
| | | kBtu | 13.0 | 8.0 | 7.0 | 5.9 | 4.9 |
| | kWh | 2.3 | 1.4 | 1.2 | 1.0 | 0.9 | 0.7 |
| | | kBtu | 7.8 | 4.8 | 4.2 | 3.6 | 3.0 |
| S-2 Non-Refrigerated Distribution/Shipping ^b | kWh | 10.5 | 5.0 | 4.6 | 4.1 | 3.6 | 3.1 |

a. Lighting Power Allowance must still comply with Table C405.4.2 (2).

b. Applicable to heated warehouses only.

Table C406.1:

**TABLE C406.1
EFFICIENCY PACKAGE CREDITS**

| Code Section | Commercial Building Occupancy | | | | | |
|---|-------------------------------|---------------------------|------------|-------------------|-------------------|------------|
| | Group R-1 | Group R-2 | Group B | Group E | Group M | All Other |
| Additional Efficiency Credits | | | | | | |
| 1. More efficient HVAC performance in accordance with Section C406.2 | 2.0 | 3.0 | 3.0 | 2.0 | 1.0 | 2.0 |
| 2. Reduced lighting power: Option 1 in accordance with Section C406.3.1 | 1.0 | 1.0 | 2.0 | 2.0 | 3.0 | 2.0 |
| 3. Reduced lighting power: Option 2 in accordance with Section C406.3.2 ^a | 2.0 | 3.0 | 4.0 | 4.0 | 6.0 | 4.0 |
| 4. Enhanced lighting controls in accordance with Section C406.4 | NA | NA | 1.0 | 1.0 | 1.0 | 1.0 |
| 5. On-site supply of renewable energy in accordance with C406.5 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| 6. Dedicated outdoor air system in accordance with Section C406.6 ^b | 4.0 | 4.0 | 4.0 | 4.0 NA | 4.0 NA | 4.0 |
| 7. High performance dedicated outdoor air system in accordance with Section C406.7 | <u>4.0</u> | <u>4.0</u> | <u>4.0</u> | <u>4.0</u> | <u>4.0</u> | <u>4.0</u> |
| 8. High-efficiency service water heating in accordance with Sections C406.8.1 and C406.8.2 | 7.0 <u>4.0</u> | 8.0 <u>5.0</u> | NA | NA | NA | 8.0 |
| 9. High performance service water heating in multi-family buildings in accordance with Section C406.9 | NA <u>7.0</u> | <u>8.0</u> | NA | NA | NA | NA |

| | | | | | | |
|--|-----|-----|-----|-----|-----|-------------------------|
| 10. Enhanced envelope performance in accordance with Section C406.10 | 3.0 | 6.0 | 3.0 | 3.0 | 3.0 | 4.0 |
| 11. Reduced air infiltration in accordance with Section C406.11 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| 12. Enhanced commercial kitchen equipment in accordance with Section C406.12 | 5.0 | NA | NA | NA | 5.0 | 5.0 (Group A-2 only) |

- a. Projects using this option may not use Item 2.
- b. This option is not available to buildings subject to the prescriptive requirements of Section C403.3.5.