

# Project Summary, pg 1

# PROJ-SUM

2015 WSEC Compliance Forms for Commercial Buildings including R2, R3, & R4 over 3 stories and all R1

Revised Dec 2019

<b>General Info</b>  <i>PROJ-SUM form shall be provided as a cover sheet for all compliance form submittals. Project Title shall match project plans title block.</i>	<b>Project Title:</b> Cascade Christian School - Lobby Addition	<b>Date:</b> 4/27/2020
	<b>Project Street Address:</b> 815 21st Street SE	For Building Department Use
	<b>Project City, County, Zip:</b> Puyallup, WA 98372	
	<b>Project Owner or Rep:</b> Cascade Christian School	
	<b>Jurisdiction:</b> Puyallup, WA 98372	

<b>Project Description</b>  Select all that apply to the scope of project.  Select Addition + Existing or Alteration + Existing if the existing building will be combined with the addition or alteration to demonstrate compliance per Section C502.1 or C503.1.	<input checked="" type="checkbox"/> New Construction and Additions		THE APPROVED CONSTRUCTION PLANS, DOCUMENTS AND ALL ENGINEERING MUST BE POSTED ON THE JOB AT ALL INSPECTIONS IN A VISIBLE AND READILY ACCESSIBLE LOCATION.  FULL SIZED LEDGIBLE COLOR PLANS ARE REQUIRED TO BE PROVIDED BY THE PERMITEE ON SITE FOR INSPECTION
	<input type="checkbox"/> New Building	<input checked="" type="checkbox"/> Building Addition	
	<input type="checkbox"/> Existing Building Retrofit		
	<input type="checkbox"/> Alteration	<input type="checkbox"/> Change of Occupancy	<input type="checkbox"/> Change in Space Conditioning
	<input type="checkbox"/> Historic Building		
	Building Elements Scope - Select all that apply		
	<input checked="" type="checkbox"/> All	<input type="checkbox"/> Building Envelope	<input type="checkbox"/> Mechanical Systems
	<input type="checkbox"/> Service Hot Water Systems	<input type="checkbox"/> Lighting Systems	<input type="checkbox"/> Electrical Systems

<b>Occupancy Type</b>	<input checked="" type="radio"/> All Commercial	<input type="radio"/> Group R - R2, R3, & R4 over 3 stories and all R1	<input type="radio"/> Mixed Use
	<i>Mixed Use - Building is greater than three stories above grade and it has both Commercial and Group R occupancies.</i> <i>Mixed Occupancy - Building is three stories or less above grade and it has both Commercial and Group R2, R3 or R4 occupancies. Select All Commercial to document compliance for the commercial areas of the building. The residential spaces shall comply with the WSEC Residential Provisions.</i>		

<b>Space Conditioning Categories</b>	Select all that apply to the scope of project		
	<input checked="" type="checkbox"/> Fully Conditioned	<input type="checkbox"/> Semi-heated <sup>2</sup>	<input type="checkbox"/> Refrigerated Spaces (Warehouse and/or Walk-in <sup>1</sup> )
	Low Energy Space Category <sup>3</sup>		
	Eligible Low Energy Spaces		
	<input type="checkbox"/> Unconditioned	<input type="checkbox"/> Low energy heating/cooling capacity	
	<input type="checkbox"/> Wireless service equipment shelter	<input type="checkbox"/> Greenhouse <sup>4</sup>	<input type="checkbox"/> Equipment building

<b>Floor Area and Stories</b>	Floors Above Grade	Building Gross Conditioned Floor Area	Project Gross Conditioned Floor Area
	3146.5	3,147	3,147

<b>General Compliance Path</b>	<input checked="" type="radio"/> Compliance Method 1 - General	<input type="radio"/> Compliance Method 2 - Total Building
	<i><b>Compliance Method 1</b> - Projects shall demonstrate compliance with all applicable mandatory and prescriptive requirements of this code. Refer to C401.2, Item 1 for more information. Compliance forms to include with a Prescriptive submittal: All applicable ENV, LTG, and MECH.</i> <i><b>Compliance Method 2</b> - Projects complying via total building performance (TBP) shall include a summary of results from a whole building energy model per Section C407 and shall demonstrate compliance with all applicable mandatory provisions in this Code. Refer to Section C401.2, Item 2 for more information. Compliance forms to include with a TBP submittal: PROJ-SUM, ENV-CHK, LTG-EXT, LTG-CHK, and all MECH forms except MECH-ECONO and MECH-VENT (pending).</i>	

Note 1 - Refrigerated Spaces - They shall comply with the envelope and refrigeration equipment requirements in Section C410. Warehouse coolers and freezers shall also comply with the envelope requirements in C402. C410 takes precedent for overlapping requirements.

Note 2 - Semi-heated Spaces - If heated with equipment other than electric resistance may take an exemption for wall insulation. All other envelope assemblies shall comply with the thermal envelope provisions.

Note 3 - Exemptions For Low Energy Spaces - Low Energy spaces are exempt from all provisions in WSEC Section C402 Building Envelope, however all other applicable provisions in the Code do apply including lighting, mechanical, service water heating, etc.

Note 4 - Eligible Space Conditioning For Low Energy Greenhouses - Greenhouses are defined as spaces that maintain a specialized sunlit environment that is used exclusively for cultivation, protection and maintenance of plants. Cooling with outside air and/or evaporative cooling, and any form of heating equipment, are allowed under the Low Energy Greenhouse category. Greenhouses with cooling equipment that requires a condensing unit are NOT eligible.

**Project Summary, pg 2****PROJ-SUM**

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Revised Dec 2019

General Info	Project Title: Cascade Christian School - Lobby Addition	Date: 4/27/2020	
<p><b>C406 Additional Efficiency Package Options Summary</b></p> <p><i>A minimum of two Options are required for new construction, and change in space conditioning or occupancy</i></p> <p><i>Select all Options included in the current project scope. Also select Options complied with under previous projects (shell and core, other tenant)</i></p> <p><i>Buildings with multiple tenant spaces may comply with different options (mix &amp; match)</i></p> <p><i>Options are required for all space conditioning categories. Include discipline specific information for C406 options in ENV-SUM, LTG-SUM and</i></p> <p><i>Refer to SBCC website for official interpretations regarding C406 provisions.</i></p>	Building level efficiency options:	Current Scope	Previous Projects
	C406.8 Enhanced envelope performance	<input type="checkbox"/>	<input type="checkbox"/>
	C406.9 Reduced air infiltration	<input type="checkbox"/>	<input type="checkbox"/>
	C406.5 On-site renewable energy	<input type="checkbox"/>	<input type="checkbox"/>
	Building area level efficiency options		
	C406.2 More efficient HVAC equipment	<input type="checkbox"/>	<input type="checkbox"/>
	C406.6 Dedicated outside air systems (DOAS)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	C406.7 Reduced energy use in service water heating	<input type="checkbox"/>	<input type="checkbox"/>
	C406.3 Reduced lighting power	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	C406.4 Enhanced digital lighting controls	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>C406 Comments:</b></p>			

**Envelope Summary****ENV-SUM**

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Revised Dec 2019

<b>Project Info</b> <i>Applicant Info. Provide contact information for individual who can respond to inquiries about information provided.</i>	<b>Project Title:</b> Cascade Christian School - Lobby Addition	Date: 04/27/2020
	Company Name: Jeff Brown Architecture	For Building Department Use
	Company Address: 12181 C St S   Tacoma, WA 98444	
	Applicant Name: Jeff Brown	
	Applicant Phone: 253.606.8324	
	Applicant Email: jeff@jeffbrowarchitecture.com	

<b>Project Description</b>	<input type="checkbox"/> New Building <input checked="" type="checkbox"/> Addition <input type="checkbox"/> Alteration <input type="checkbox"/> No Envelope Scope
<b>Envelope Project Scope</b> <i>Select all that apply.</i>	<input checked="" type="checkbox"/> All Commercial <input type="checkbox"/> Group R - Commercial <input type="checkbox"/> Mixed Use - Commercial + Group R <input type="checkbox"/> Semi-heated <input type="checkbox"/> Refrigerated Cooler <input type="checkbox"/> Refrigerated Freezer <input type="checkbox"/> Equipment Building

<b>Envelope Description</b> <i>Provide brief description of the project and relevant supporting documentation.  If project includes multiple Target Insulation Allowance areas, and/or is demonstrating compliance as an Addition + Existing, Alteration + Existing, or Addition + Alteration + Existing project, provide a brief summary of the approach to</i>	Add Lobby space North side to existing gym
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<b>Air Barrier Testing</b> <i>Air barrier testing is required for all new construction projects. Testing criteria is 0.40 cfm/ft<sup>2</sup> under test pressure of 0.3 inch w.g. To comply with C406.9, demonstrate that measured air leakage of building envelope</i>	<input checked="" type="checkbox"/> Air barrier testing per Section C402.5.1.2 included in project scope <input type="checkbox"/> Additional Efficiency Package Option - C406.9 Reduced Air Infiltration  Testing not required. Explanation: _____
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**Compliance Documentation Scope and Method**

<b>Scope of This Calculation</b>	<input type="checkbox"/> New Building <input checked="" type="checkbox"/> Addition <input type="checkbox"/> Alteration <input type="checkbox"/> No Envelope Scope
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<b>Target Insulation Allowance</b> <i>Sets the title and calculations in the compliance forms. Selection required to enable forms.</i>	<input checked="" type="radio"/> Fully Conditioned - Commercial, Group R, Mixed Use <input type="radio"/> Semi-heated <input type="radio"/> Refrigerated Cooler <input type="radio"/> Refrigerated Freezer  <i>If project includes more than one Target Insulation Allowance area, and/or if project includes addition and alteration areas complying independently, for each area complete an ENV-SUM form Rows 16-46 and either an ENV-PRESCRIPTIVE form, or ENV-UA + ENV-SHGC forms if demonstrating compliance via component performance.</i>
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<b>Envelope Compliance Path</b> <i>Selection required to enable forms.</i>	<input checked="" type="radio"/> Prescriptive <input type="radio"/> Component Performance
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<b>Component Performance Calculation Adjustments</b>	<input type="checkbox"/> Change of Occupancy (C503.2) / Conditioning (C505) - 10% higher UA allowed <input type="checkbox"/> Additional Efficiency Package Option - C406.8 Enhanced Envelope - 15% lower UA required
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<b>Additions</b>	<input type="radio"/> Addition stand alone <input type="radio"/> Addition + Existing  <i><b>Addition stand alone</b> - Complete Vertical Fenestration and Skylight Area Calculation. Enter total existing-to-remain wall, roof, vertical fenestration and skylight areas as EXISTING. Enter total addition envelope assembly areas as NEW. If resulting total building WWR exceeds 30% and/or SSR exceeds 5%, refer to C502.2.1 and C502.2.2 for prescriptive compliance alternatives. If complying via component performance, complete ENV-UA per instructions for addition stand alone projects. <b>Addition + existing</b> - Complete ENV-UA per instructions for addition + existing projects.</i>
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<b>Alterations - Fenestration and Skylight</b>	<input type="checkbox"/> Replacement windows only, or resulting total building WWR ≤ original WWR <input type="checkbox"/> Total building WWR increased by alteration <input type="checkbox"/> Replacement skylights only, or resulting total building SRR ≤ original SRR <input type="checkbox"/> Total building SRR increased by alteration  <i><b>WWR and SRR not increased</b> - Vertical Fenestration and Skylight Area Calculation not required. <b>WWR and/or SRR increased</b> - Complete Vertical Fenestration and Skylight Area Calculation. Enter total existing-to-remain wall, roof, vertical fenestration and skylight areas as EXISTING. Enter total altered envelope assembly areas as NEW. If resulting total building WWR exceeds 30% and/or SSR exceeds 5%, refer to C503.3.2 and C503.3.3 for prescriptive compliance alternatives. If complying via component performance, complete ENV-UA per instructions for alteration + existing projects.</i>
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# Envelope Summary, pg. 2

# ENV-SUM

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<b>Project Title:</b> Cascade Christian School - Lobby Addition			<b>Date:</b> 04/27/2020		
<b>Vertical Fenestration and Skylight Area Calculation</b> <i>Prescriptive Path - Enter envelope sf values directly into this section of ENV-SUM for vertical fenestration, skylights, net walls and roof. For Additions and Alterations, refer to these sections in ENV-SUM for further</i>  <i>Component Performance - When this Envelope Compliance Path is selected, write-protection of this section is enabled. Enter envelope sf values for all assemblies into the ENV-UA form. Envelope information from ENV-UA will auto-fill into this section of ENV-</i>		Total Vertical Fenestration Area (rough opening)	NET Exterior Above Grade Wall Area	Total Skylight Area (rough opening)	NET Exterior Roof Area
	New	875	4,188		
	Existing				
	Total	875	4,188		
		Vertical Fenestration-to-Wall Ratio (WWR)	17.3%	Skylight-to-Roof Ratio (SRR)	
<b>Vertical Fenestration Area Compliance</b>	<b>VERTICAL FENESTRATION AREA COMPLIES WITH MAXIMUM ALLOWANCE</b>				
<b>Skylight Area Compliance</b>					
<b>Vertical Fenestration Alternates</b>  <i>Show locations of qualifying daylight zone (DLZ) areas and ft<sup>2</sup> on project plans.</i>  <i>For Daylight Zone Area Calculations -</i> <i>a) Sidelight areas include primary + secondary daylight zone areas.</i> <i>b) Include overlapping toplight and sidelight daylight zone areas under Toplight.</i> <i>c) Net floor area definition in Chapter 2.</i>	<input type="radio"/> High performance fenestration U-factors and SHGC per C402.4.1.3 Dedicated outdoor air system per C402.4.1.4 and C403.6  <input type="radio"/> In buildings ≥ 3 stories, 25% or more of NET floor area is in DLZ per C402.4.1.1 <input type="radio"/> In buildings < 3 stories, 50% or more of CONDITIONED floor area is within DLZ per C402.4.1.1				
	<b>Daylight Zone Calculations</b>				
	Daylight Zone Fenestration Alternate Not Selected. No Calculations Required	Sidelight Daylight Zone Area	Toplight Daylight Zone Area	Percent Daylight Zone Area	
<b>Spaces in Single Story Building Requiring Skylights</b>  <i>In these spaces a minimum of 50% of the floor area shall be within a skylight daylight zone (DLZ). Refer to C402.4.2 for requirements.</i>  SRR = Skylight to roof ratio	List all enclosed spaces that exceed 2,500 ft <sup>2</sup> , have ceiling height greater than 15 ft, and are space types required to comply with this provision. Indicate aperture with "AP" prefix (AP 1.1%)				
	Space	Space Area (ft <sup>2</sup> )	DLZ Area (ft <sup>2</sup> )	SRR or Aperture	Exception
<b>Envelope Exemptions</b>					
<b>Low Energy and Semi-heated Spaces</b>	Low energy spaces per C402.1.1 Item 1 are exempt from the thermal envelope provisions. Semi-heated spaces heated by systems other than electric resistance are exempt from wall insulation provision only per C402.1.1.1.  Complete Low Energy and Semi-Heated Spaces table in MECH-SUM to verify eligibility based on installed peak heating and cooling capacity per sf.				
<b>Equipment Buildings</b>  <i>Equipment buildings are exempt from the thermal envelope provisions per C402.1.2.</i> <i>The following shall be met to be eligible: building size ≤ 500 sf, average wall/roof U-factor ≤ U-0.20, electronic equipment load ≥ 7 watts/sf, heating system output capacity ≤ 17,000 btu/h. Cooling system capacity not</i>		Wall Insulation R-Value	Roof Insulation R-Value	Overall Average U-Factor	
	Equipment Building Envelope				
			Electronic equipment power (watts/sf)		
			Heating system output capacity (Btu/hr)		
		Cooling capacity (Yes/No)			

# Prescriptive Path, pg. 1

# ENV-PRESCRIPTIVE

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<b>Project Title:</b>	<b>Cascade Christian School - Lobby Addition</b>	<b>Date</b>	<b>04/27/2020</b>
<b>Target Insulation Allowance</b>		For Building Department Use	
Fully Conditioned Space - Commercial, Group R, Mixed Use			
<b>Fenestration Area</b> as % gross above-grade wall area	<b>17.3%</b>	Max. Target:	<b>30.0%</b>
<b>Skylight Area</b> as % gross roof area		Max. Target:	<b>5.0%</b>
<b>Vertical Fenestration Alternates:</b>	<b>None Selected on ENV-SUM</b>	User Note	

Prescriptive compliance of envelope assemblies may be accomplished by providing insulation R-values per Table C402.1.3 or U-factors / F-factors per Tables C402.1.4 and C402.4. A single project may comply via R-values for some envelope assemblies and U-factors / F-factors for others. Note compliance method taken for each assembly in spaces provided.

Building Component		R-Value Method for Prescriptive Compliance			U-Factor/F-Factor Method for Prescriptive Compliance	
		Cavity Ins. R-Value	Continuous Ins. (CI) R-Value <sup>1</sup>	% Area of Metal Penetrations in CI <sup>2</sup>	Assembly U-Factor	U-Factor Source <sup>3</sup>
Provide plan/detail # of assembly and description						
Roofs	Deck					
	Mtl Bid <sup>4</sup>					
	Roof Assembly   A4.1		38.0			
	Attic/Oth					
Opaque Walls - Above Grade <sup>15</sup>	Steel					
	Mtl Bid.					
	Wood/Oth <sup>5</sup>	Wall Assembly   A4.1	21.0			
	Mass <sup>6</sup>					
	Transfer <sup>7</sup>					
Group R Walls <sup>15</sup>	Steel					
	Mass					
Below Grade Walls	Comm					
	Group R <sup>1</sup>					
Floors	Mass					
	Framed <sup>8</sup>					

**Prescriptive Path, pg. 2****ENV-PRESCRIPTIVE**

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Revised Dec 2019

Project Title:	<b>Cascade Christian School - Lobby Addition</b>	Date	<b>04/27/2020</b>
<b>Fenestration Area</b> as % gross above-grade wall area	<b>17.3%</b>	Max. Target:	<b>30.0%</b>
<b>Skylight Area</b> as % gross roof area		Max. Target:	<b>5.0%</b>
<i>If vertical fenestration or skylight area exceeds maximum allowed per C402.4.1, then the project must comply via Component Performance and provide ENV-UA and ENV-SHGC forms.</i>			

Building Component		R-Value Method for Prescriptive Compliance			U-Factor/F-Factor Method for Prescriptive Compliance	
		Perim. Ins. R-Value	Full Slab CI R-Value		F-Factor	F-Factor Source <sup>10</sup>
Slab-on-grade <sup>6</sup>	Unheated	Slab on Grade & Insulation @ Slab note   A4.1	10.0			
	Heated					
Provide plan/detail # of assembly and description		Ins. R-Value			Assembly U-Factor	U-Factor Source <sup>11</sup>
Opaque Doors	Swingin	A2.4				
	Other					
Provide ID from door schedule and description		Solar Heat Gain Coefficient (SHGC)			U-Factor for Prescriptive Compliance	
Provide ID from window schedule and description		Projection Factor (PF) if applicable <sup>12</sup>	Orientation (N or SEW) <sup>13</sup>	Assembly SHGC <sup>14</sup>	Assembly U-Factor	U-Factor Source <sup>14</sup>
Vertical Fenestration	Non-Metal					
	Metal, fixed	A2.4 (Fixed Storefront Window) A2.4 Fixed Storefront Window		N SEW	0.53 0.40	0.38 0.38
	Metal					
	With entry	A2.4 (Storefront Exterior Entry)		N	0.53	0.60
dem with a slab-on-grade or exposed floor, this floor shall be thermally broken from the surrounding floor area with the same amount of insulation as requ						
Skylights	All Types					

**Miscellaneous - Refrigerated Spaces**

Provide plan/detail # of assembly and description		Ins. R-Value			Assembly U-Factor	U-Factor Source
Freezer Floor <sup>17</sup>						
Provide ID from window schedule and description		Cooler / Freezer	Double Pane Glass	Triple Pane Glass	Inert Gas Filled	Heat Reflective Treated Glass
Glazing <sup>16,17</sup>	In Door					
	Reach					

- Note 1** - Insulation that is continuous except for fasteners may be entered here if the cross-sectional area of metal penetration through otherwise continuous insulation is less than 0.12%.
- Note 2** - Alternate prescriptive continuous insulation R-values per Table C402.1.4, Footnote F may be used if the cross sectional area of metal penetrations exceeds 0.04% but is less than 0.12%. Calculations are required to use these alternate R-values.
- Note 3** - Opaque assembly U-factors shall come from Appendix A or calculated per approved method as specified in C402.1.5.1. Specify the table number or calculation page number.
- Note 4** - Thermal spacer blocking and liner system are required for prescriptive R-Value compliance in metal building roof assemblies. Note thermal spacer thickness and R-value in roof assembly description.
- Note 5** - Intermediate framing is required for prescriptive R-Value compliance in wood-framed wall assemblies.
- Note 6** - Proposed CMU mass walls in non-Group R that meet Table C402.1.4 Footnote C requirements can enter the target prescriptive U-value of 0.104.
- Note 7** - Mass transfer slab edges must be covered with an assembly having an overall U-factor of 0.2.
- Note 8** - Refer to Table C402.1.3, Footnote E for prescriptive R-Value requirement for steel floor joist assemblies.
- Note 9** - Prescriptive slab-on-grade insulation shall extend from top of slab to minimum length per an approved method as defined in C402.2.6.
- Note 10** - Slab-on-grade F-Factors shall come from Appendix A or calculated per approved method as specified in C402.1.5.1.
- Note 11** - Opaque door U-factors shall come from Appendix A or calculated per approved method as specified in C402.1.5.1. A door is defined as opaque if less than 50% of the door area has glazing.
- Note 12** - Refer to Equation C4-6 Projection Factor Calculation.
- Note 13** - N = Oriented within 45 degrees of true north, SEW = All other orientations.
- Note 14** - Fenestration assembly U-Factor and SHGC shall be the manufacturer's NFRC product rating, which includes the glazing and frame, or shall be the default value per Section C303.1.3.
- Note 15** - List all above-grade Group R mass walls and steel frame walls in Group R Walls section. List commercial above grade walls and all other Group R above grade walls in Opaque Walls - Above Grade.
- Note 16** - Refrigerated Coolers - All cooler roof, wall and door assemblies shall comply with the prescriptive R-values or U-factors per C410. Enter proposed information under the most similar assembly type. Slab edge insulation for slab-on-grade floors shall comply with C402. Floors that separate a cooler from a non-cooler space (unconditioned and conditioned) shall be insulated per C402. Vertical fenestration (not within cooler doors) shall comply with the prescriptive R-values or U-factors per C402. Enter only the opaque portion of refrigerated space doors. Windows within doors and reach-in display case doors shall comply with C410 prescriptive requirements.
- Note 17** - Refrigerated Freezers - All freezer roof, wall and door assemblies shall comply with the prescriptive R-values or U-factors per C410. Enter proposed information under the most similar assembly type. Freezer floor insulation shall comply with C410. Insulation is required under the entire freezer floor. If the freezer floor assembly rests on top of a standard floor, the vertical edge of the freezer floor shall be entered as and comply with the requirements for a freezer wall. If freezer floor insulation is installed as integral to or applied underneath a slab-on-grade or exposed floor, this floor shall be thermally broken from the surrounding floor area with the same amount of insulation as required for a freezer

**Building Permit Plans Checklist, pg. 1****ENV-CHK**

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The following information is necessary to check a building permit application for compliance with the building envelope requirements in the Washington State Energy Code, Commercial Provisions.

Applicability (yes,no,na)	Code Section	Component	Compliance information required in permit documents	Location in Documents	Building Department Notes
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**SCOPE**

na	C402.1.1	Low energy spaces	Identify low energy spaces on plans; include project information, and calculations if applicable, that demonstrate spaces are eligible for envelope provisions exemption		
na	C402.1.1.1	Semi-heated spaces	Identify semi-heated spaces on plans, include calculations that demonstrate spaces are eligible for wall insulation exemption		
na	C402.1.2	Equipment Buildings	Provide building area, average wall and roof U-factor, and installed equipment information that demonstrates equipment building is eligible for envelope provision exemption		
na	C410.2	Walk-in and warehouse cooler and freezer spaces	Identify walk-in and warehouse cooler and freezer spaces on plans		
na	C101.4.1	Mixed occupancy	Identify spaces with different occupancy requirements on plans		
na	C503.2	Change of space conditioning	Identify on plans existing unconditioned spaces changing to semi-heated or conditioned space, and existing semi-heated spaces changing to conditioned space; provide calculations for existing and final level of space conditioning, and calculations that demonstrate alteration complies with current WSEC		
na	C505.1	Change of occupancy	Identify on plans existing F, S and U-occupancy spaces undergoing a change in occupancy; provide calculations that demonstrate alteration complies with the current WSEC Identify on plans pre-2002 Group R spaces undergoing a change to a commercial occupancy; provide calculations that demonstrate alteration complies with the current WSEC Identify on plans non-Group R occupancy spaces undergoing a change to Group R; provide calculations that demonstrate alteration complies with the current WSEC		

**ENVELOPE PROVISIONS**

Yes	C103.2 C103.6.3	Compliance documentation	Indicate envelope insulation compliance path and provide applicable forms; ENV-PRESCRIPTIVE or ENV-UA / ENV-SHGC for component performance If complying via total building performance, provide a list of all proposed envelope component types, areas and U-values	A2.4, A4.1	
Yes	C303.1.1 C303.1.2	Insulation identification	Indicate identification mark shall be applied to all insulation materials and insulation installed such that the mark is readily observable during inspection	A4.1	
Yes	C303.1.3 C402.4.3	Fenestration product rating	Fenestration products shall be labeled with rated U-factor, SHGC, VT, and leakage rating	A2.4	
Yes	C303.1.1 C402.2.1	General insulation installation	Indicate installation methods, thicknesses, densities and clearances to achieve the intended R-value of all insulation materials: Where two or more layers of rigid insulation will be used, indicate that edge joints between layers are staggered	A4.1	
Yes	C103.2 C402.2.2	Roof assembly insulation	Indicate R-value(s) of cavity/continuous insulation on roof sections; Indicate framing materials on roof sections; Indicate method of framing for ceilings below vented attics and vaulted ceilings per A102.2 (std, adv); Provide area weighted average U-factor calculation for insulation whose thickness varies by 1 inch or less; Indicate effective U-factors of tapered insulation entirely above deck per A102.2.6; include roof configuration and slope, maximum R-value at peak and minimum R-value at low point for all roof surfaces Indicate R-values for thermal spacers and each insulation layer, and liner system (LS) method for metal building roofs	A4.1	
na	C402.2.2	Skylight curb insulation	Indicate curb insulation R-value on roof section if not included in skylight NFRC rating		
Yes	C103.2 C402.2.3 C402.2.4 C303.2.1	Above/below grade wall insulation	Indicate R-value(s) of cavity/continuous insulation on wall sections; Indicate framing materials on wall sections; Indicate method of framing for wood construction per A103.2 (std, int, adv); Indicate material density category, wall weight and heat capacity for qualifying mass walls; For qualifying ASTM C90 masonry walls, indicate loose-fill core insulation material and percentage of cores filled including grouted cores, bond beams, vertical fills, headers and any other grouted cores; Indicate method of protection of exposed exterior basement/crawlspace wall insulation	A4.1	

# Building Permit Plans Checklist, pg. 2

# ENV-CHK

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Applicability (yes,no,na)	Code Section	Component	Compliance information required in permit documents	Location in Documents	Building Department Notes
Yes	C103.2 C402.4.4	Opaque doors	Indicate rated U-factor (swinging) or R-value (non-swinging - roll-up/sliding) on wall sections or in door schedules - applies to doors with less than 50% glazed area	A2.4	
na	C402.2.5	Floor over outdoor or unconditioned space insulation	Indicate R-value(s) of cavity/continuous insulation on floor sections; Indicate framing material on floor sections; Indicate material density category and weight of qualifying mass floors		
Yes	C402.2.6 C303.2.1	Slab-on-grade floor insulation	Indicate R-value of continuous insulation on wall section or foundation detail: Indicate insulation extends down vertically and/or horizontally the required distance from top of slab: Indicate method of protection of exposed exterior slab edge insulation	A4.1	
na	C402.2.6 C303.2.1	Radiantly heated slab on-grade floor insulation	Indicate R-value of continuous insulation on wall section or foundation detail: Indicate insulation extends down vertically from top of slab and then horizontally under the entire slab: Indicate method of protection of exposed exterior slab edge insulation		
na	C402.2.8	Radiant heating system insulation	Indicate insulation R-value behind radiant panels, U-bend/headers and bottom surface of radiantly heated floors (other than radiantly heated slab-on-grade)		
Yes	C402.4.1 C502.2.1 C503.3.2	Vertical fenestration maximum area	Provide calculation for total vertical fenestration area as a percentage of gross above grade wall area (WWR) for new construction, additions and alterations in ENV-SUM	ENV-SUM, PG 2	
na	C402.4.1.1 C405.2.4.1 C502.2.1 C503.3.2	Increased prescriptive maximum vertical fenestration area with daylight zones and controls	Provide calculations showing that the percentage of overall conditioned floor area within daylight zones is equal to or greater than 50% in 1 and 2 story buildings: OR Provide calculations showing that the percentage of overall net floor area within daylight zones is equal to or greater than 25% in buildings 3 stories or more; include the gross floor area and list of spaces omitted for the net floor area: Note in envelope plans that all lighting fixtures located within daylight zones shall be provided with daylight responsive controls per WSEC Section C405.2.4.1: indicate method of control in lighting fixture schedules Indicate that the VT of vertical fenestration is at least 1.1 times the rated SHGC		
na	C402.4.1.3 C502.2.1 C503.3.2	Increased prescriptive maximum vertical fenestration area with high performance	Indicate high performance U-factors and SHGC values in fenestration schedules: Indicate if an area-weighted U-factor is used for multiple fenestration elements within the same fenestration category per Table C402.3; provide U-factor calculations		
Yes	C402.4.1.4 C403.6	Increased prescriptive maximum vertical fenestration area with DOAS mechanical systems	Indicate that for eligibility, all occupied, conditioned spaces will be served by a dedicated outside air system (DOAS) that delivers ventilation air without requiring operation of the heating/cooling system per Section C403.6	MECHANICAL DRAWING	
na	C402.1.5	Wall/vertical fenestration target area adjustment	Indicate if component performance with target area adjustment will be used to account for vertical fenestration area in excess of the prescriptive maximum allowed		
na	C402.4.1 C502.2.2 C503.3.3	Skylight maximum area	Provide calculation for total skylight area as a percentage of gross roof area (SRR) for new construction, additions and alterations in ENV-SUM		
na	C402.1.5.2	Roof/skylight target area adjustment	Indicate if component performance with target area adjustment will be used to account for skylight area in excess of the prescriptive maximum allowed		
Yes	C402.4.3 C303.1.3	U-factors, SHGC and VT for all fenestration assemblies	Indicate U-factors, SHGC and VT values in fenestration schedules; Indicate if an area-weighted U-factor is used for multiple fenestration elements within the same fenestration category per Table C402.3; provide U-factor calculations Indicate if values are NFRC or default; if default then specify frame type, glazing layers, gap width, low-e coatings, gas-fill	ENV-PRESCRIPTIVE	
na	C402.4.3	Permanent shading devices	For windows with overhangs or permanent projection shading devices, provide projection factor calculations (Equation C4-6) and associated minimum SHGC for north and non-north orientations		

# Building Permit Plans Checklist, pg. 3

# ENV-CHK

2015 WSEC Compliance Forms for Commercial Buildings including R2, R3, &amp; R4 over 3 stories and all R1

Revised Dec 2019

Project Title: Cascade Christian School - Lobby Addition			Date	04/27/2020	
Applicability (yes,no,na)	Code Section	Component	Compliance information required in permit documents	Location in Documents	Building Department Notes
na	C402.4.2	Spaces in single story buildings requiring skylights	<p>In single story buildings, provide list of enclosed areas that exceed 2,500 sf; for each space identify the space use, floor area, floor to ceiling height, whether skylights are installed, and any exception taken:</p> <p>Provide calculations for percentage of conditioned floor area located within a daylight zone including skylight and eligible sidelight daylight zones;</p> <p>Provide calculations for percentage of skylight area in each space over 2,500 sf. OR:</p> <p>Provide calculations for skylight effective aperture (Equation C4-5) for each space over 2,500 sf;</p> <p>Indicate haze factor of skylight glazing material or diffuser</p>		
<b>ADDITIONAL EFFICIENCY PACKAGE OPTION - ENHANCED ENVELOPE PERFORMANCE</b>					
na	C406.8	Enhanced envelope performance	To comply with additional efficiency package option, demonstrate envelope insulation compliance via component performance; provide ENV-UA / ENV-SHGC compliance forms; verify that building total UA is 15% lower than the Code target UA		
<b>AIR LEAKAGE</b>					
Yes	C402.5.1.1	Air barrier construction and sealing	<p>Identify location and provide diagram of continuous air barrier in plans and sections:</p> <p>Provide details for all joints, transitions in materials, penetrations in air barrier and note method of sealing (caulked, gasketed, or other approved method)</p>	A4.1	
na	C402.5.3	Rooms containing open combustion fuel burning appliances used for space conditioning	<p>Indicate that room(s) containing non-direct vent appliances is isolated from conditioned space by the thermal envelope with a sealed air barrier, including doorway gasketing and sealing around ductwork and piping penetrations:</p> <p>Indicate insulation provided in wall, floor and ceiling of the room envelope, and insulation required on combustion air ductwork</p>		
na	C402.5.4	Access openings and doors to shafts, chutes, stairways and doors	<p>Indicate locations of all access openings and doors to shafts, chutes, stairways and elevators:</p> <p>Indicate method of gasketing, weatherstripping and sealing of these openings</p>		
na	C402.5.5 C403.2.4.3	Outdoor air intakes, exhausts and relief openings	<p>Indicate locations of all stairway enclosure, elevator shaft and building pressurization relief openings, outside air intakes and exhaust openings:</p> <p>Note in envelope plans that all relief, outside air intake and exhaust openings shall be provided with dampers in accordance with Mechanical Section C403.2.4.3</p>		
na	C402.5.8	Recessed lighting in building envelope	<p>Indicate method of sealing between light fixture housing and wall or ceiling;</p> <p>Note in envelope plans that all recessed lighting fixtures shall be IC rated and have an air leakage rating not greater than 2 cfm per ASTM E283 test; include these requirements in lighting fixture schedules</p>		
na	C402.5.6	Loading dock seals	Indicate weather seal at cargo and loading dock doors		
na	C402.5.7	Vestibules	<p>Indicate locations and dimensions of vestibules and air curtains;</p> <p>Indicate exception and criteria utilized for all building entrances and exits that do not have a vestibule or air curtain;</p> <p>Indicate required performance for air curtains installed per exception 7;</p> <p>For unconditioned vestibules, indicate which envelope assembly (interior or exterior) complies with the requirements for a conditioned space</p>		
na	C103.2 C402.5.1.2	Building air leakage test	<p>Indicate on plans the location of air barrier boundaries and area calculations on all six sides of the air barrier;</p> <p>Indicate air barrier test method in accordance with ASTM E779 or approved equivalent;</p> <p>Indicate required maximum leakage rate for compliance.</p> <p>Include the following requirements in project documents: (1) Submit air barrier test report to jurisdiction once test is completed; (2) If test results exceed 0.40 cfm/ft<sup>2</sup> (1.5 L/s*m<sup>2</sup>) at 0.3 in. wg (75 Pa), then visually inspect air barrier and seal noted sources of leakage; (3) Submit a follow-up report to jurisdiction noting corrective measures taken; (4) Include air barrier test report in compliance documentation provided to building owner.</p>		

**Building Permit Plans Checklist, pg. 4****ENV-CHK**

2015 WSEC Compliance Forms for Commercial Buildings including R2, R3, &amp; R4 over 3 stories and all R1

Revised Dec 2019

Project Title: <b>Cascade Christian School - Lobby Addition</b>			Date: <b>04/27/2020</b>
Applicability (yes,no,na)	Code Section	Component	Compliance information required in permit documents
			Location in Documents
			Building Department Notes

**ADDITIONAL EFFICIENCY PACKAGE OPTION - REDUCED AIR INFILTRATION**

<b>na</b>	C406.9	Reduced air infiltration	To comply with additional efficiency package option, indicate in project documents that the air barrier test results shall not exceed 0.25 cfm/ft <sup>2</sup> (0.94 L/s*m <sup>2</sup> ) at 0.3 in. wg (75 Pa); indicate air barrier test report shall be submitted to the jurisdiction and building owner once test is completed		
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**ALTERATIONS**

<b>na</b>	C503.1 C503.3.1	Roof alteration - insulation	For a roof alteration where existing ceiling cavities are exposed, indicate cavities are insulated to full depth at R-3 per inch For a roof covering replacement where insulation is installed entirely above the roof deck, indicate insulation complies with requirements for new construction per Tables C402.1.3 or C402.1.4		
<b>na</b>	C503.1	Wall and floor alteration - insulation	For a wall or floor alteration (floor over outdoor or unconditioned space) where existing envelope cavities are exposed, indicate cavities are insulated to full depth at R-3 per inch		
<b>na</b>	C503.3.2	Addition of vertical fenestration	Where the addition of new vertical fenestration results in total building window-to-wall ratio (WWR) exceeding the maximum allowed per C402.4.1, demonstrate method of compliance (vertical fenestration alternate per C503.3.2, or component performance compliance with target area adjustment for the total building)		
<b>na</b>	C503.3.3	Addition of skylights	Where the addition of new skylights results in total building skylight-to-roof ratio (SRR) exceeding the maximum allowed per C402.4.1, demonstrate component performance compliance with target area adjustment for the total building		

**PROJECT CLOSE OUT DOCUMENTATION**

<b>na</b>	C103.6.3	Project close out documentation requirements	Indicate in plans that project close out documentation is required including applicable WSEC envelope compliance forms and calculations, and fenestration NERC rating certificates		
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If "no" is selected for any question, provide explanation:

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End of Building Permit Plans Checklist

<b>Mechanical Summary</b>		<b>MECH-SUM</b>	
2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1		Revised January 2017	
<b>Project Information</b>	Project Title: <b>Cascade Christian Jr High School - Gym</b>	Date: <b>4/27/2020</b>	For Building Dept. Use
	Applicant Information. Provide contact information for individual who can respond to inquiries about compliance form information provided.		
	Company Name: <b>Air Systems Engineering Inc.</b>		
	Company Address: <b>3602 S Pine Street, Tacoma, WA 98409</b>		
	Applicant Name: <b>John Lee</b>		
	Applicant Phone: <b>877-671-9484</b>		
<b>Project Description</b> <i>Briefly describe mechanical systems in the text box provided</i>	<input checked="" type="checkbox"/> New Building <input type="checkbox"/> Building Addition <input type="checkbox"/> Tenant Improvement <input type="checkbox"/> System Retrofit <input type="checkbox"/> No System Changes Provide (2) indoor air handler for heating only the lobby area. Future phase will tie indoor air handlers to new VRF system. Provide DOAS w/ ERV for ventilation in lobby and restrooms.		
<input type="checkbox"/> Total Bldg Performance (TBP) <i>This path includes all mandatory provisions per C401.2 Option 2. MECH-SUM, MECH-CHK, and C407 Energy Analysis forms required.</i>			
<b>Design Load Calculations</b>	<input type="checkbox"/> Load calculation summary <input checked="" type="checkbox"/> MECH-LOAD-CALC Form <i>Provide design load calculations for all mechanical systems and equipment serving the building heating, cooling or ventilating needs. If a load calculation summary is provided with the permit documents that includes all applicable compliance information then the MECH-LOAD-CALC form is not required.</i>		
<b>Mechanical Schedules</b>	<input checked="" type="checkbox"/> Mechanical Plans <input type="checkbox"/> MECH-EQ Forms (TBD) <i>Indicate location of equipment compliance information. If provided on plans then MECH-EQ forms are not required, however, include on plans all applicable compliance information listed in MECH-EQ tables.</i>		
<b>Dedicated Outdoor Air System Requirements and High Efficiency VAV Alternate</b>	<input checked="" type="checkbox"/> DOAS is required per C403.6 effective July 1, 2017 (office, retail, education, library and fire station occupancies) <i>All occupied, conditioned areas shall be served by a DOAS that delivers required ventilation air in a manner that does not require space conditioning fan operation. Space conditioning fans cycled off when no heating or cooling is required.</i> <input type="checkbox"/> Ventilation provided via natural ventilation per 2015 IMC in lieu of DOAS (C403.6, Exception 1) <input type="checkbox"/> Ventilation and space conditioning provided by a HEVAV system per C403.7 in lieu of DOAS (C403.6, Exception 2) <input type="checkbox"/> DOAS included in project, although not required (occupancy not office, retail, education, library or fire station) <input checked="" type="checkbox"/> DOAS related allowances included in project: <input type="checkbox"/> Prescriptive vertical fenestration maximum area allowance increased to 40% per C402.4.1.4 with 100% of conditioned floor area in building served by DOAS. <input checked="" type="checkbox"/> Exception to air economizer per C403.3 Exception 1, include MECH-ECONO form.		
<b>Fan Power</b>	<input checked="" type="checkbox"/> Project includes HVAC air distribution systems that provide heating and/or cooling <i>If yes, provide a MECH-FANSYS -SUM form.</i> <input type="checkbox"/> For one or more systems, the total fan motor nameplate hp of all fans in HVAC system exceeds 5hp. <i>If yes, provide a separate MECH-FANSYS form for each HVAC system exceeding the 5 horsepower threshold. Refer to Section C403.2.11 and MECH-FANSYS-DOC for requirements and exceptions.</i>		
<b>HVAC Hydronic Systems</b>	<input type="checkbox"/> Hydronic chilled water <input type="checkbox"/> Water-loop heat pump <input checked="" type="checkbox"/> No hydronic systems <input type="checkbox"/> Hydronic heating water <input type="checkbox"/> Geothermal		
<b>C406 Additional Efficiency Options - Mechanical</b>	<input checked="" type="checkbox"/> C406.2 More efficient HVAC equipment and fan systems <i>Requires 90% of heating and cooling capacity to be equipment listed in tables C403.2.3(1)-(9) or air-to-water heat pumps and heat recovery chillers. All equipment listed in tables C403.2.3(1)-(7) must be 15% more efficient than minimum requirements. All stand alone supply, return, and exhaust fans over 1hp must have FEQ ≥ 71 and must be selected within 10% of maximum total or static pressure.</i> <input type="checkbox"/> C406.6 Dedicated outdoor air system (DOAS) <i>Requires 90% of conditioned floor area to be served by a DOAS per C403.6 that delivers required ventilation air in a manner that does not require space conditioning fan operation.</i> <input type="checkbox"/> C406.7 Reduced energy in service water heating <i>Requires 90% of floor area be in occupancy types listed in C406.7.1 and that 60% of annual hot water energy use be provided by heat pump, waste heat recovery or solar water-heating systems.</i>		

**Mechanical Summary, pg. 2**

**MECH-SUM**

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Revised January 2017

<b>Service Water Heating Systems</b>	<p>Equipment Type (s)</p> <p><input type="checkbox"/> Hot water heating tank(s)      <input type="checkbox"/> Instantaneous      <input checked="" type="checkbox"/> No service water systems</p> <p><input type="checkbox"/> Dedicated boiler      <input type="checkbox"/> Heat exchange from space heat boiler or central hot water/steam</p> <p>Distribution Type (s)</p> <p><input type="checkbox"/> Circulation System      <input type="checkbox"/> On-demand</p>
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<b>Commissioning</b>	<p>Commissioning is required for:</p> <p><input type="checkbox"/> Mechanical systems per C408.2      <input type="checkbox"/> Service water heating systems per C408.4</p> <p><i>If required, commissioning shall be performed for all applicable systems regardless of individual equipment capacity.</i></p> <p>Exceptions to commissioning requirements:</p> <p><input checked="" type="checkbox"/> Total output capacity of all mechanical space conditioning systems in the building do not exceed 240,000 Btu/h cooling or 300,000 Btu/h heating. Mechanical systems commissioning not required.</p> <p><input type="checkbox"/> Capacity of largest service water heating system in building does not exceed 200,000 Btu/h. Service water heating systems commissioning not required.</p>
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**Low Energy and Semi-Heated Spaces** (Note 6 and 7)

Space Type	Location in Plan(s)	Space(s) Served	Area Served, square feet	Heating Capacity, Btu/h (Note 4)	Cooling Capacity, Btu/h (Note 5)	Peak Space Conditioning Capacity, Btu/h-sf	Compliance Check	Notes

*Note 4 - Provide total installed heating output capacity of systems serving Low Energy or Semi-Heated space(s) in btuh.*  
*Note 5 - Provide total installed cooling capacity of system serving Low Energy space(s) in Btu/h. Not allowed for semi-heated spaces. Enter 0 if no cooling.*  
*Note 6 - Refer to Section C402.1.1 Low Energy Building. Installed peak space conditioning capacity, heating or cooling, may not exceed 3.4 Btu/h\*sf.*  
*Note 7 - Refer to Section C402.1.1.1 and Semi-Heated Space definition in Chapter 2. Total heating output capacity may not exceed 8 Btu/h\*sf. Only systems without electric resistance heating and no cooling are eligible for the wall insulation exception under semi-heated.*

# Mechanical Permit Plans Checklist

**MECH-CHK**

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Revised January 2017

<b>Project Title:</b> Cascade Christian Jr High School - Gym	<b>Date:</b> 4/27/2020
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The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - <i>Must be in permit documents</i>	Location in Documents	Building Department Notes
<b>Equipment - Sizing, Performance and Type</b>					
NA	C403.1	Exempt process equipment	Identify equipment to be used in manufacturing, industrial or commercial processes that do not provide space conditioning; identify provisions applicable to this equipment per C403.1 exception		
Yes	C403.2.1	Load calculations	Provide load calculations performed per ASHRAE Std 183 or equivalent, using design parameters per C302 and Appendix C; include load adjustments to account for energy recovery	Supplemental Calculation PDF	
Yes	C403.2.2	Equipment and system sizing	Indicate that output capacities of heating and cooling equipment and systems are no greater than the smallest available equipment size that exceeds the calculated loads; note exceptions taken	MECH-LOAD-CALC	
Yes	C403.2.3 C403.2.3.2 C403.2.13.1	HVAC equipment performance requirements (efficiency)	Provide equipment schedules on plans or complete MECH-EQ forms indicating type, capacity, rated and WSEC minimum efficiencies for all heating and cooling equipment; include supply and OSA cfm and operating hours for all air systems; identify heating and cooling equipment that does not have a corresponding WSEC minimum efficiency (manufacturer rated)	M-1	
NA	C405.8 C403.2.14	Electric motor efficiency	List all motors ≥ 1/12 hp (that are not integral to a rated piece of equipment) in the mechanical or electrical equipment schedules on plans; indicate hp, rpm, number of poles and rated efficiency, or exception applied For fractional hp motors (1/12 - 1 hp), indicate whether they are an electronically commutated motor, have rated efficiency of at least 70%, or exception taken		
Yes	C403.2.11.1	Fan power limitation	For all HVAC fan systems that provide heating and / or cooling, provide system total nameplate hp in MECH-FANSYS-SUM form For all applicable HVAC systems with total fan motor hp > 5hp, verify fan system motor hp or bhp complies with fan power limits per equations in Table C403.2.11.1(1), provide MECH-FANSYS form for each system	MECH-FANSYS-SUM	
NA	C403.2.11.2	Motor nameplate hp	For all applicable HVAC systems with total fan motor hp > 5hp, indicate fan motors specified are the smallest available motor hp size greater than fan bhp, note exceptions taken		
NA	C403.2.11.3	Fan efficiency	For all applicable HVAC systems with total fan motor hp > 5hp, identify in equipment schedule all fans required to comply with fan efficiency grade and indicate rated FEG is ≥ 67, or exception taken; indicate these fans are sized so total efficiency is within 15% of the fan maximum total efficiency		
NA	C403.2.11.4	Group R occupancy exhaust fan efficacy	For all exhaust fans < 400 cfm in Group R occupancies, indicate in equipment schedule the fan flow rate and efficacy (cfm/watt), or exception taken; refer to Table C403.2.11.4 (CE-57)		
NA	C403.2.13	Variable flow capacity - fans	For fan motors ≥ 7.5 hp, indicate method of variable flow control (VSD or equivalent method) in equipment schedule, or exception taken; for equivalent method for an HVAC system refer to HVAC System Controls for additional requirements		
NA	C403.2.3	Maximum air cooled chiller capacity	For chilled water plants and buildings with > 500 tons of cooling capacity, indicate air-cooled chiller capacity is ≤ 100 tons, or exception taken		
NA	C403.4	Large capacity cooling systems	For buildings with ≥ 300 tons of cooling capacity, indicate method of multi-stage or variable capacity control (VSD, multiple staged compressors, or max capacity of any single unit < 66% of the total)		
NA	C403.2.3.1	Non-standard water-cooled centrifugal chillers	For water-cooled centrifugal chillers not designed for operation at standard conditions, provide calculations documenting maximum full load and part load rated equipment performance requirements		
NA	C403.2.13.1 C403.4.3.2	Centrifugal fan open-circuit cooling towers	For open-circuit centrifugal fan cooling towers with ≥ 1,100 gpm capacity, indicate cooling towers comply with efficiency requirements for axial fan open circuit cooling towers		
NA	C403.4.2 C403.4.2.5	Large capacity boiler systems	For single boilers with > 500,000 Btu/h capacity, indicate multi-stage or modulating burner For boiler system (single or multiple) with > 1,000,000 Btu/h capacity, indicate turndown ratio per Table C403.4.2.5 and method (multiple single input boilers, modulating boilers, or combination)		
NA	C403.2.13	Variable flow capacity - pumps	For pump motors ≥ 7.5 hp, indicate method of variable flow control (VSD or equivalent method) in equipment schedule, or exception taken; for equivalent method for a hydronic system refer to Hydronic System Controls for additional requirements		
NA	C403.2.3	Gas and oil-fired forced air furnace and unit heaters	For forced air furnaces with capacity ≥ 225,000 Btu/h and all unit heaters, indicate in equipment schedule intermittent ignition or IID, flue or draft damper, and rated jacket loss		
NA	C403.2.4.8	Combustion heating equipment	For combustion heating equipment with output capacity > 225,000 Btu/h, indicate modulating or staged combustion control		
NA	C403.2.3.3	Packaged electric heating / cooling equipment	Verify all packaged electric equipment with > 6,000 Btu/h cooling capacity and any amount of heating is a heat pump; include in equipment schedules		
NA	C403.2.12	Heating outside a building	Indicate systems providing heating in non-enclosed outdoor occupied spaces are radiant systems; refer to HVAC System Controls for additional requirements		
NA	C403.2.7.1	Kitchen exhaust hoods	Indicate on plans the type, duty and exhaust air rate of each kitchen hood, refer to HVAC System Controls for additional requirements		
Yes	C403.2.4.3	Outdoor supply air, exhaust and relief dampers	Indicate locations of OSA intake, and exhaust and relief outlet dampers on plans; indicate whether dampers are Class 1 motorized, or gravity and exception taken (include leakage rating, cfm/sf); refer to HVAC System Controls for additional requirements for OSA dampers	M-1	

# Mechanical Permit Plans Checklist

**MECH-CHK**

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Revised January 2017

<b>Project Title:</b> Cascade Christian Jr High School - Gym	<b>Date:</b> 4/27/2020
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The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - <i>Must be in permit documents</i>	Location in Documents	Building Department Notes
NA	C403.2.4.3	Return air dampers	Indicate locations of return air dampers that are integral to economizer operation; verify dampers are motorized; indicate whether dampers are Class 1, or within packaged equipment eligible for leakage rating exception (include leakage rating, cfm/sf)		
NA	C403.2.4.3	Stairway and shaft vent dampers	Indicate location of stairway and shaft vent dampers on plans; verify dampers are Class 1 motorized; refer to HVAC System Controls for additional requirements		
NA	C403.2.4.4	Zone isolation dampers	For systems serving areas > 25,000 sf or spanning more than one floor, that include areas that are expected to be occupied non-simultaneously; identify isolation zone areas on plans and locations of associated isolation dampers in HVAC distribution system; refer to HVAC System Controls for additional requirements		
NA	C403.2.3.4	Humidification	For cooling systems with humidification equipment that are also required to have air economizer, indicate humidifier is adiabatic (direct evaporative or fog atomization), or exception taken		

**Additional Efficiency Package Option, More Efficient HVAC Equipment & Fan Performance -**

**Must comply with all 3 provisions to be eligible**

NA	C406.2.1 C403.2.3	HVAC system selection	To comply with additional efficiency package option, calculate the percentage of heating and cooling equipment in the project (based on output capacity) that do not have a corresponding WSEC listed efficiency; shall be less than 10% to comply		
NA	C406.2.2 C403.2.3	Minimum equipment efficiency	To comply with additional efficiency package option, indicate that all listed heating and cooling equipment have a rated efficiency that exceeds WSEC listed efficiency by at least 15%		
NA	C406.2.3 C403.2.11.3	Minimum fan efficiency	To comply with additional efficiency package option, indicate rated FEG of stand alone fans is ≥ 71; indicate these fans are sized so the fan efficiency at design conditions is within 10% of the maximum total or static efficiency		

**HVAC System Controls**

Yes	C403.2.4.1	Thermostatic controls (thermostats and humidistats)	Indicate locations of thermostatic and humidity control devices and the zones they serve on plans, including perimeter system zones  Where adjacent (neighboring) zones are controlled by separate thermostats (including perimeter systems used to offset heat gain or loss), and are connected by permanent openings > 10% of either zone sf area, indicate controls configured to prevent adjacent zones from operating in conflicting modes (one in heat, other in cool); applies to adjacent perimeter zones, adjacent nonperimeter zones, and adjacent perimeter and nonperimeter zones  If applying Exception 2 to nonperimeter zones adjacent to perimeter zones, indicate that setpoints and deadband settings in these zones are coordinated so cooling in a nonperimeter zone does not occur until the temperature in that zone is 5°F higher than the adjacent perimeter zone temperature in heating	M-2	
NA	C403.2.4.1.1	Heat pump supplementary heat	Indicate staged heating operation with compression as the first stage of heating and supplemental heating controlled with outdoor lock-out temperature set to 40°F or less		
Yes	C403.2.4.1.2	Deadband	Indicate zone thermostatic controls configured with 5°F minimum deadband for systems that control both heating and cooling	M-1	
NA	C403.2.4.1.3	Setpoint overlap restriction (thermostats)	If separate heating and cooling systems with separate thermostatic control devices are used to serve a zone, indicate locations of both thermostatic control devices and the zone they serve on plans  Indicate a limit switch, mechanical stop or DDC control with programming to prevent simultaneous heating and cooling		
Yes	C403.2.4.2 C403.2.4.2.1 C403.2.4.2.2	Automatic setback and shutdown	Indicate zone thermostatic controls configured with required automatic setback and manual override functions, setback temperatures, and control method (automatic time clock or programmable controls); note exceptions taken	M-1	
Yes	C403.2.4.2.3	Automatic (optimum) start	Indicate system controls that adjust equipment start time required to bring each area served up to design temperature just prior to scheduled occupancy	M-1	
Yes	C403.2.4.3	Outdoor supply air dampers	Indicate automatic controls configured to close OSA damper during unoccupied equipment operation; not including economizer cooling, night flush or IMC required OSA / exhaust	M-1	
NA	C403.2.4.3	Stairway and shaft vent dampers	Indicate method of activation of stairway and shaft vent dampers (fire alarm or interruption of power)		
NA	C403.2.4.4	Zone isolation controls	For systems serving areas > 25,000 sf or spanning more than one floor, that include areas that are expected to be occupied non-simultaneously; indicate controls that allow for independent space conditioning of isolation zones; or exception taken		
NA	C403.2.12	Heating outside a building	Indicate occupancy sensing or timer switch controls configured to automatically shut off heating system when area served is unoccupied		
NA	C403.2.4.5	Snow melt systems	Indicate automatic controls configured to shut off system when pavement temperature exceeds 50°F and no precipitation is falling, and when outdoor air temperature exceeds 40°F		
NA	C403.2.4.6	Freeze protection system controls	Indicate automatic controls to shut off system when outdoor temperature exceeds 40°F, or conditions protect fluid from freezing		
NA	C403.2.4.9	Group R1 hotel / motel guest rooms	For hotels and motels with over 50 guest rooms, indicate automatic controls serving guest rooms that are capable of setback (heating) and set-up (cooling) of temperature setpoint by at least 5°F; indicate control method - activated by room entry or occupancy sensor		

# Mechanical Permit Plans Checklist

**MECH-CHK**

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Revised January 2017

<b>Project Title:</b> Cascade Christian Jr High School - Gym	<b>Date:</b> 4/27/2020
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The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - <i>Must be in permit documents</i>	Location in Documents	Building Department Notes
NA	C403.2.4.10 C403.2.4.11	Group R2 / R3 dwelling units, Group R2 sleeping units	For primary space conditioning system, indicate 5-2 programmable thermostats capable of two setback periods per day; for all thermostats indicate purpose (heating only, cooling only, or both), required temperature range and at minimum a 10°F deadband; or exception taken		
Yes	C403.2.6 C403.2.11.4	Ventilation	Indicate method of ventilation air delivery (natural or mechanical) for each zone	Mechanical	
			If mechanically delivered, indicate that systems are configured to provide not more than 150% of, but at least the minimum required volume of outdoor air to each zone per IMC, ASHRAE 62.1 or other applicable code (WAC, OSHA, etc); or exception taken	M-1	
			If delivered via natural ventilation, identify required elements per IMC including minimum openable area to the outdoors or qualifying adjoining spaces		
NA	C403.2.6.2	Demand controlled ventilation	Identify spaces > 500 sf with occupant load > 25 people/1,000 sf per IMC; for each space indicate whether it is served by an HVAC system with total design OSA > 3,000 cfm, and / or the system has airside economizer or automatic modulating OSA damper; indicate OSA controls are configured to provide demand controlled ventilation or provide supporting documentation for applied exception		
NA	C403.2.6.3	Occupancy sensors	For gyms, classrooms, auditoriums and conference rooms > 500 sf, indicate occupancy-based OSA control when space is unoccupied and method (closes OSA damper or shuts-off equipment); or alternate means provided to automatically reduce OSA when space is partially occupied		
NA	C403.2.6.4 C403.2.6.4.1	Enclosed loading dock ventilation	For enclosed loading docks, indicate ventilation / exhaust system method of activation (gas detection system for CO and NO2, or occupancy sensors), and control method (staged or modulating)		
NA	C403.2.6.4 C403.2.6.4.2	Enclosed parking garage ventilation	For enclosed parking garages, indicate ventilation / exhaust system activated by gas detection system for CO and NO2, and control method (staged or modulating); or exception taken		
NA	C403.2.7.1	Kitchen exhaust hoods	Provide calculations that show a balanced accounting of total kitchen exhaust (include all hoods) with % of: supply air, transfer air from adjacent spaces, and make-up air; if applicable, indicate that direct make-up air to each hood does not exceed 10% of hood exhaust		
			For kitchens with total hood exhaust exceeding 2,000 cfm, indicate exhaust air rate per Table C403.2.7.1 and compliance method (DCV, energy recovery, or transfer air that would otherwise be exhausted)		
NA	C403.2.7.2	Laboratory exhaust systems	Refer to Systems Requiring Energy Recovery for requirements		
NA	C403.2.13	Variable flow capacity - HVAC system fans	For HVAC fan motors ≥ 7.5 hp, indicate method of variable flow control (VSD, or equivalent control method that reduces design air volume by 50% at 1/3 static design pressure); note exception taken		
NA	C403.3.1	DX air handler variable cooling control (Under Integrated Economizer)	For DX air handlers with economizer and cooling capacity ≥ 65,000 Btu/h, indicate number of cooling stages provided and method (multiple compressors and / or variable speed compressors); indicate minimum displacement (capacity reduction) as % of full load		
			Indicate control method (cooling capacity controlled in response to space temperature, space temperature controlled by modulating supply airflow, or both)		
NA	C403.2.11.5	Fan airflow control	For DX air handling units with cooling capacity ≥ 65,000 Btu/h and evaporative and chilled water air handling units with fan ≥ 0.25 hp, indicate whether system is single zone or multiple zone and related control method (cooling capacity controlled in response to space temperature, space temperature is controlled by modulating supply airflow, or both)		
			For mechanical cooling systems (includes DX and chilled water coils) that control cooling capacity in response to space temperature - Provide a minimum of two stages of fan control; indicate minimum fan speed is ≤ 66% of full speed drawing ≤ 40% of full speed fan power during periods of low cooling or ventilation only		
			For other mechanical cooling systems (includes DX and chilled water coils) that control space temperature by modulating airflow (in lieu of, or in addition to, controlling capacity in response to space temperature) - Provide fan controls for modulating supply airflow; indicate minimum fan speed is ≤ 50% of full speed drawing ≤ 30% of full speed fan power during periods of low cooling or ventilation only; or exception taken		
NA	C403.2.4.12	DDC system capabilities	Provide central and zone level DDC controls as required based on system application, capacity or size thresholds and other qualification per Table C403.2.4.12.1		
			Identify all DDC system input / output control points; indicate capability for trending and graphical display		

**Ducting Systems**

Yes	C403.2.8.1 C403.2.8.3	Duct construction	Indicate on plans that all ductwork is constructed and sealed per IMC	M-1	
			For OSA ductwork, also indicate on plans that ductwork meets air leakage requirements per C402.5 and vapor retarder requirements per the IBC		
Yes	C403.2.8.3	Duct pressure classifications	Identify location of low, medium and high pressure ductwork on plans	M-1	
NA	C403.2.8.3.3	High pressure duct leakage test	Indicate high pressure duct leakage testing requirements on plans; provide test results to jurisdiction when completed		

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NA	C403.2.8.1 C403.2.8.2	Duct insulation	For supply and return ductwork located in unconditioned space or outdoors, indicate R-value of insulation on ductwork on plans; identify climate zone; note exceptions taken		
			For supply ductwork located in conditioned space, identify if design supply temperature is < 55°F or > 105°F and indicate R-value of insulation on this ductwork on plans; note exception taken		
			For OSA ductwork, shafts and plenums, indicate R-value of insulation on these elements on plans per Table C402.1.3 for steel-framed walls; note exception taken		

**Piping Systems**

NA	C403.2.9	Piping insulation	Indicate design temperature range of fluid conveyed in piping and thickness of insulation (in inches) on hydronic piping plans; or exception taken		
NA	C403.2.9.1	Piping insulation exposed to weather	Indicate method of protection of pipe insulation from damage / degradation on hydronic piping plans		

**Economizers**

NA	C403.3	Air economizer required	Identify in equipment schedules on plans or in MECH-EQ forms all cooling systems requiring air economizer controls		
			Provide MECH-ECONO form indicating systems utilizing air economizer exceptions, including those with water-side economizer in lieu of air economizer; indicate on plans eligible exception(s) taken and measures to comply with exception(s)		
NA	C403.3.1	Integrated economizer operation - air and water	Indicate air and water-side economizers are configured for partial cooling operation even where additional mechanical cooling is required to meet the load		
NA	C403.3.2	Economizer heating system impact - air and water	Verify control method of HVAC systems with economizers does not increase building heating energy usage during normal operation		
NA	C403.3.3.1	Air economizer capacity	Indicate modulating OSA and return air dampers are configured to provide up to 100% OSA for cooling		
NA	C403.3.1 C403.3.3.2	Integrated air economizer	Verify mechanical cooling controls are interlocked with air economizer controls so the outside air damper remains in 100% open position when mechanical cooling is also required to meet the cooling load, until the leaving air temperature is < 45°F		
			For systems with cooling capacity ≥ 65,000 Btu/h, verify that control of economizer dampers is not based only on mixed air temperature; or exception taken		
NA	C403.3.3.3	Air economizer high limit controls	Indicate high limit shut-off control method and required high limit per Table C403.3.3.3		
NA	C403.3.4.1	Water economizer capacity	For eligible systems where water-side economizer may be provided in lieu of air economizer, indicate system is capable of 100% design cooling capacity at 50°F db / 45°F wb OSA temperatures		
NA	C403.3.4.2	Water economizer maximum pressure drop	Indicate pressure drop across precooling coils and heat exchangers in water economizer system do not exceed pressure drop limit		
NA	C403.3.1	DX air handling equipment control	For DX air handlers with economizer and cooling capacity ≥ 65,000 Btu/h, refer to HVAC System Controls for requirements		
NA	C403.2.4.7	DX equipment economizer fault detection and diagnostics	For DX air handlers with economizer and cooling capacity ≥ 54,000 Btu/h, provide a fault detection and diagnostics (FDD) system to monitor economizer system operation and report faults		

**Systems Requiring Energy Recovery**

Yes	C403.5.1	Energy recovery (ER) - ventilation / exhaust systems	For systems with design OSA > 5,000 cfm, or design supply air cfm and % OSA exceeding the values in Tables C403.5.1(1) or (2), indicate exhaust air ER method; or exception taken with supporting calculations		
			For rooms served by multiple systems with aggregate design OSA > 5,000 cfm, or aggregate design supply air cfm and % OSA exceeding the values in Tables C403.5.1(1) or (2), indicate exhaust air ER method; or exception taken with supporting calculations		
			Indicate ER rated effectiveness that increases OSA enthalpy by ≥ 50% based on delta between OSA and return air enthalpies at design conditions	M-1	
NA	C403.2.7.2	Laboratory exhaust systems (energy recovery)	For buildings with total lab exhaust > 5,000 cfm, indicate method of energy recovery used to pre-condition laboratory make-up air; ER effectiveness (min 25°F); or alternative method per exception (VAV exhaust, semi-conditioned makeup, or CERM calculation)		
NA	C404.10.4 (under C404.11)	Pools and permanent spas exhaust systems (energy recovery)	For buildings with pools or spas with water surface area > 200 sf, indicate exhaust air ER method and use of waste heat (preheat ventilation air, pool water or service hot water); or exception taken		
			Indicate ER system has the rated effectiveness and is configured to decrease the exhaust air temperature at design conditions by ≥ 36°F		
NA	C403.5.2	Energy recovery - steam condensate systems	For buildings with on-site steam heating systems, indicate condensate water ER		
			For buildings that use off-site generated steam where condensate is not returned to the source, indicate on-site condensate water ER		

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NA	C403.5.3	Energy recovery - cooler / freezer condensers	For buildings with food service, meat or deli departments that have ≥ 500,000 Btu/h of remote refrigeration capacity for coolers / freezers, indicate condenser ER and use of captured energy (service water heating, space heating, or dehumidification reheating)		
			For buildings with ≥ 40,000 sf conditioned floor area and with ≥ 1,000,000 Btu/h of remote refrigeration capacity for coolers / freezers, indicate condenser ER and use of captured energy for service water heating and also for space heating, or dehumidification reheating		
NA	C403.5.4	Energy recovery - condenser systems	For buildings with 24-hour operation and with > 1,500,000 Btu/h of heat rejection capacity and design service hot water load > 250,000 Btu/h, indicate condenser ER to pre-heat service water; or exception taken. Provide calculations showing the amount of recovered heat that is utilized (60% of peak heat rejection load or pre-heat service water to 85°F).		

**Hydronic System Controls**

NA	C403.2.13 C403.4.2.7	Variable flow control - hydronic system pumps	For hydronic system pump motors ≥ 7.5 hp, indicate method of variable flow control (VSD or equivalent method that requires ≥ 30% design wattage at 50% design fluid flow); note exception taken		
			Identify whether hydronic coils have DDC controls and associated manner of pump speed control (differential pressure, zone hydronic demand, etc)		
NA	C403.2.5 C403.4.2.4	Hydronic system setback and part load controls	For boilers that provide building heating, indicate controls that provide heating water temperature setback based on outdoor temperature		
			For heating and chilled water systems ≥ 300,000 Btu/h, indicate systems are configured to automatically reset supply water temperature based upon demand; or exception taken. If system pump motor hp ≥ 3 hp, also indicate controls automatically reduce flow by ≥ 50%.		
			For chilled water systems (≥ 300,000 Btu/h, pump motor hp ≥ 3 hp) that serve water-cooled unitary air conditioners, indicate VSD or staged pumps in chilled water system and heat rejection loop that reduce pump flow so that one control valve is nearly wide open, or to maintain a minimum differential pressure; or exception taken		
NA	C403.4.2	Boiler sequencing	Indicate automatic controls that sequence operation of multiple boilers		
NA	C403.4.6	Hot gas bypass limitation	For cooling equipment with hot gas bypass, provide either multiple step unloading or continuous capacity modulation; indicate bypass capacity per Table C403.4.6		
NA	C403.4.2.2	Two-pipe changeover systems	Indicate changeover deadband (min 15°F), heating / cooling mode scheduling and changeover temperature range (limit 30°F)		
NA	C403.4.2.6	Chiller / boiler plant pump isolation	Indicate controls are configured to automatically reduce overall plant flow and shut-off flow through individual chillers and boilers when not in use		
NA	C403.2.13.1.1 C403.4.3.1.1 C403.4.3.1.2	Heat rejection equipment - variable flow control	For cooling towers with fan motors ≥ 7.5 hp, indicate VSD and method to adjust fan speed (adjusted based on leaving fluid temperature or condenser temperature / pressure of heat rejection device)		
			For multiple-cell heat rejection equipment with VSD, indicate controls that ramp all fans in unison		
NA	C403.4.3.3	Heat rejection equipment - cooling tower flow turndown	Indicate open-circuit cooling towers with multiple pumps or VSD control are designed so all cells can be run in parallel		
NA	C403.4.2.3.1	Water loop heat pump - deadband	Indicate capability of central equipment to provide minimum 20°F water supply temperature deadband between heat rejection and heat addition modes; or exception taken		
NA	C403.4.2.3.2.1	Water loop heat pump - heat rejection equipment, Zone 4	Indicate type of cooling tower (open- or closed-circuit) in equipment schedule; indicate method used to limit system heat loss when heat rejection is not needed		
NA	C403.4.2.3.2.2	Water loop heat pump - heat rejection equipment, Zone 5	For open- or closed-circuit cooling towers, provide a heat exchanger that separates the cooling tower and heat pump loop		
NA	C403.4.2.3.3	Water loop heat pump - isolation valves	For hydronic heat pump systems with total system power > 10 hp, indicate 2-way isolation valves on each heat pump and variable flow system control		

**Dedicated Outdoor Air Systems (DOAS) - Optional through 6/30/16, Prescriptive 7/1/2016**

Yes	C403.6 C403.6.3	Dedicated outdoor air systems	For buildings with office, retail, education, library and fire station spaces, identify these spaces on plans; indicate that ventilation air in each occupied space is provided via a DOAS system; or document compliance with C403.6.3 Impracticality; or exception taken (buildings complying with C402.4.1.4 or C406.6 may not utilize exceptions)	M-1	
Yes	C403.6.1	Energy recovery ventilation with DOAS	For all DOAS systems, indicate exhaust air ER method; or exception taken with supporting calculations. Indicate ER rated effectiveness that increases OSA enthalpy by ≥ 50% based on delta between OSA and return air enthalpies at design conditions.	M-1	
Yes	C403.6.2	Heating / cooling system controls with DOAS	Indicate equipment associated with the delivery of zone level heating and cooling (fans, hydronic pumps, primary air dampers, etc) are configured to shut off, and central equipment is configured to turn down, when there is no call for heating or cooling in the zone they serve	M-1	
			If applying Exception to heating / cooling fans used for air mixing in the space during deadband periods, include fan watts per cfm in equipment schedule		

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NA	C402.4.1.4 C403.6	Increased prescriptive maximum vertical fenestration area with DOAS	Indicate that all occupied, conditioned spaces are served by a DOAS per C403.6		

**Additional Efficiency Package Option, Dedicated Outside Air Systems (DOAS)**

Yes	C406.6	Building provided with DOAS	To comply with additional efficiency package option, indicate that 90% or more of all occupied, conditioned spaces are served by a DOAS per C403.6	M-1	
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**Multiple Zone Air Systems**

NA	C403.4.4	Air systems serving multiple zones	Identify supply air systems serving multiple zones and the zones they serve on plans; indicate whether system is VAV and method of primary air control; or provide supporting documentation for applied exception to VAV		
NA	C403.4.4	VAV systems serving multiple zones	Provide equipment schedules on plans or MECH-EQ form that list all VAV air terminals and types For each air terminal include: maximum airflow rates for primary supply air during zone peak heating and zone peak cooling; maximum airflow during reheating, recooling or mixing; minimum airflow rate to maintain required ventilation, and the basis for these values; if IMC or ASHRAE 62.1 multiple zone equation is basis for minimum flow rates, provide calculation on plans		
NA	C403.4.4.1	Single duct VAV terminal units	Indicate single duct terminal units are configured to reduce primary supply air before reheating or recooling		
NA	C403.4.4.2	Dual duct systems - terminal units	For systems with separate warm air and cool air ducts, indicate terminal units are configured to reduce the flow from one duct to minimum before mixing with air from the other duct		
NA	C403.4.1.1 C403.4.1.2	VAV system static pressure sensors - sensors and DDC set points	Indicate locations of duct static pressure sensors on plans; include at least one sensor per major duct branch; verify controller setpoint pressure at each sensor is ≤ 1.2 inch w.g. For systems with zone level DDC, indicate controls are configured to monitor zone damper positions and reset static pressure setpoint based on the zone requiring most pressure; include control logic that automatically detects and generates an alarm if any zone excessively drives reset logic, and allows building operators to exclude zones from reset logic		
NA	C403.4.4.3	Multiple-zone VAV system ventilation optimization controls	For systems with zone level DDC controls, indicate controls are configured to automatically reduce outdoor airflow in response to changes in system ventilation efficiency; or exception taken		
NA	C403.4.4.4	VAV system supply air reset	Indicate controls automatically reset supply air temperature in response to building loads or outdoor air temperature; or exception taken		

**Multiple Zone HVAC Systems, High Efficiency VAV - Required for systems utilizing C403.6 DOAS Exception 2, must comply with all 16 provisions**

NA	C403.7, Item 1	Air economizer	Indicate system is configured for 100% air economizer operation and complies with all related economizer requirements per C403.3 (without economizer exceptions)		
NA	C403.7, Item 2	Direct digital controls (DDC)	Provide DDC controls for all components of system; identify all DDC system input / output control points; indicate capability for trending and graphical display		
NA	C403.7, Item 3	Outdoor airflow measurement and reduction	For systems with minimum OSA > 2,500 cfm, indicate outdoor airflow monitoring station that measures OSA intake under all load conditions; indicate control sequence that increases or reduces system OSA cfm based on VAV terminal feedback of ventilation efficiency (per C403.4.4.3 without exceptions) or DCV (per C403.2.6.2)		
NA	C403.7, Item 4	Supply airflow measurement	For systems with minimum OSA > 2,500 cfm, indicate supply airflow monitoring station capable of measuring supply air delivered to VAV terminals under all load conditions		
NA	C403.7, Item 5	Zone isolation and maximum area served	Verify maximum area served by a single HEVAV system is ≤ 50,000 sf, or one entire floor, whichever is greater; in addition if a system serves > 25,000 sf, that includes areas that are expected to be occupied non-simultaneously, indicate zone isolation controls per C403.2.4.4		
NA	C403.7, Item 6	Interior / exterior zone design supply air temperature	Verify that VAV terminals serving interior cooling driven loads are sized per design supply air temperature that is 5°F higher than VAV terminals serving exterior zones		
NA	C403.7, Item 7	Maximum air terminal inlet velocity	Identify air terminals with minimum primary airflow setpoints > 50% of maximum setpoint in equipment schedule or MECH-EQ form; indicate air terminal inlet velocity does not exceed 900 fpm		
NA	C403.7, Item 8	Sequence of operation	Indicate DDC system sequences of operation are designed and configured per ASHRAE GPC 36		
NA	C403.7, Item 9	Maximum allowable system brake horsepower	Verify fan system bhp is ≤ 90% of the bhp limit per Option 2 equation in Table C403.2.11.1(1), provide MECH-FANSYS form for each system		
NA	C403.7, Item 10	Fan-powered terminal unit motor and control	Indicate all series and parallel terminal fans have electronically commutated motors; indicate DDC control system is configured to vary air terminal fan speed as a function of the load; indicate fan speed during periods of low heating, low cooling, or ventilation only is ≤ 66% of peak design air flow or provide supporting documentation for applied exception		

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NA	C403.7, Item 11	Application of single duct and fan-powered terminal units	Indicate VAV terminal types on plans; verify fan-powered terminal units only serve perimeter zones with envelope loads; verify all other zones are served by single duct terminal units		
NA	C403.7, Item 12	Fan-powered terminal unit primary air reset	Indicate DDC controls are configured to automatically reset the primary supply air cfm setpoint of all fan-powered terminal units to the minimum required to maintain ventilation during occupied heating or deadband, based upon the VAV air handling unit OSA ventilation fraction		
NA	C403.7, Item 13	High occupancy space controls	For spaces > 150 sf with occupant density ≥ 25 people / 1000 sf, indicate space is served by a dedicated terminal unit with DCV control that resets terminal unit ventilation setpoint; also indicate occupancy sensor control that automatically reduces minimum ventilation to zero and sets back room heating and cooling setpoints by ≥ 5°F		
NA	C403.7, Item 14	Dedicated HVAC systems	For server, electronic equipment, telecom or similar spaces with cooling loads > 5 W/sf, indicate spaces are served by independent HVAC systems that are separate from HPVAV systems serving rest of building; indicate dedicated HVAC systems have air economizer controls or energy recovery per C403.3 Exception 9		
NA	C403.7, Item 15	Central plant efficiency	Indicate whether systems are served by a high efficiency heating water plant, or a high efficiency chilled water plant		
			If complying via high efficiency heating water plant: Indicate all VAV terminals have hydronic heating coils served by heating water system with either gas-fired boiler(s) with thermal efficiency ≥ 90%, air-to-water heat pumps, or heat recovery chillers		
			If complying via high efficiency chilled water plant: Indicate all VAV air handlers have cooling coils served by chillers with rated IPLV efficiency that exceeds WSEC listed IPLV by at least 25% per Table C403.2.3(7) (note water-cooled IPLV is max, all others are min); indicate smallest chiller or compressor in plant is ≤ 20% of total plant capacity, or provide thermal storage sized for ≤ 20% of total plant capacity		
NA	C403.7, Item 16	Fault detection and diagnostics	Indicate DDC system includes a fault detection and diagnostics (FDD) system configured to monitor operation and provide fault reporting of required parameters for all VAV air handlers and VAV air terminal units in the HPVAV system		

**HVAC Equipment Energy Use Metering**

NA	C409.3.1	HVAC equipment energy use metering	For new buildings > 50,000 sf and building additions > 25,000 sf, verify energy use metering of all equipment used to provide space heating and cooling, dehumidification and ventilation will be provided per C409; indicate equipment eligible for exception	M-1	M-1
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**Documentation and System Specific Requirement To Support Commissioning**

NA	C408.2	Scope of mechanical systems commissioning	Indicate that all mechanical systems, equipment, and controls for which the WSEC requires control functions and / or configuration to perform specific functions are required to be commissioned;		
			For buildings with ≥ 240,000 Btu/h total output cooling capacity or ≥ 300,000 Btu/h total output heating capacity, indicate that all mechanical systems regardless of individual capacity are required to be commissioned; or provide building heating / cooling capacity calculation demonstrating eligibility for exception		
NA	C403.2.10 C408.1.1 C408.1.2 C408.1.4.2 C103.6	Commissioning requirements in construction documents	Indicate in plans and specifications that Cx per C408 is required for all applicable mechanical systems;		
			Include general summary with at a minimum of Items 1 thru 4 of the Cx plan per C408.1.2 including: narrative description of activities, responsibilities of the Cx team, schedule of activities including verification of project close out documentation per C103.6, and conflict of interest plan (if required);		
			Include in general summary that a Cx project report or Compliance Checklist (Figure C408.1.4.2) shall be completed by the Certified Cx Professional and provided to the owner prior to the final mechanical inspection.		
Yes	C408.2.2	Air system and hydronic system balancing	Indicate in plans that air and fluid flow rates shall be tested and balanced within the tolerances defined in the specifications; indicate systems shall be balanced in a manner to first minimize throttling losses, then adjusted to meet design flow conditions	M-1	
Yes	C408.2.2.1	Air system balancing devices	Indicate devices that provide the capability to balance all supply air outlets, zone terminals and air handling equipment requiring system balancing	M-1	
NA	C408.2.2.2	Hydronic system balancing devices	Indicate devices that provide the capability to isolate, balance and measure flow across all hydronic equipment requiring system balancing including heating and cooling coils and pumps		
Yes	C408.2.3	Functional performance testing criteria	Identify in plans and specifications the intended operation of all equipment and controls during all modes of operation, including interfacing between new and existing-to-remain systems	M-1	

**Project Close Out Documentation**

Yes	C103.6	Documentation and project close out submittal requirements	Indicate in plans that project close out documentation and training of building operations personnel is required for all mechanical components, equipment and systems governed by this code; indicate close out documentation shall include: record documents, O&M manuals, applicable WSEC compliance forms and calculations	M-1	M-1
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# Economizer Exceptions

# MECH-ECONO

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All cooling systems shall be configured to provide air economizer operation, regardless of system capacity, for new construction and mechanical system alterations. Various exceptions to this requirement are available. Identify all systems that an economizer exception will be applied to and additional information as noted below.	
For Building Dept. Use	

<b>Economizer Exception Summary</b>  Refer to Section C403.3 for descriptions of economizer provisions and exceptions. For alterations refer to Section C503.4 and Table C503.4.	<b>ECONOMIZER EXCEPTIONS - NEW CONSTRUCTION AND ADDITIONS</b>			
	<b>Exp 1</b> <i>Cooling equipment serving spaces that are provided with a dedicated outdoor air system (DOAS) per C403.6. Spaces served shall have year-round design cooling loads from lights and equipment less than 5 watts per square foot.</i>	<b>System ID</b>	<b>Lighting + Equipment Loads (W/sf)</b>	
		AH-1	2	
		AH-2	2	
	<b>Exp 2</b> <i>Single zone unitary or package systems with dehumidification that affect other systems such that air economizer would increase energy consumption.</i>	<b>System ID</b>		
<b>Exp 3</b> <i>High efficiency single zone unitary or packaged systems. Equipment cooling efficiency shall be better than the WSEC required minimum efficiency by at least 64% in Climate Zone 4C and 59% in Climate Zone 5B per Table C403.3.</i>	<b>System ID</b>			
<b>Exp 4</b> <i>Equipment that provides hydronic chilled water for chilled beams and chilled ceiling systems that is served by a water economizer system per C403.3.4 in lieu of air economizer.</i>	<b>System ID</b>			
<b>Exp 5</b> <i>Water-source heat pumps with heat recovery. Heat pump efficiency shall be 15% better than WSEC required minimum efficiency. Provide at minimum 60% air economizer. Energy recovery to preheat OSA shall have at least 50% effectiveness. Additional system requirements apply.</i>	<b>System ID</b>			
<b>Exp 6</b> <i>Cooling equipment serving Group R occupancies. Per unit limit is less than 20,000 Btu/h cooling capacity for equipment installed outdoors or in a mech room adjacent to the outdoors. For cooling equipment installed in other locations the unit limit is less than 54,000 Btu/h. Efficiency shall be 15% better than WSEC required minimum efficiency.</i>	<b>System ID</b>	<b>Equipment Location</b>	<b>Cooling Capacity (Btu/h)</b>	
<b>Exp 7</b> <i>Variable refrigerant flow (VRF) systems with energy recovery. Outdoor unit shall be a reverse-cycle heat pump with variable speed compressor(s) and condenser fan(s). Outdoor unit cooling capacity shall be not less than 65,000 Btu/h. Energy recovery to preheat outdoor air shall have at least 50% rated effectiveness. System shall be capable of providing simultaneous heating and cooling by transferring recovered energy from zone(s) in cooling mode to other zone(s) that are in heating mode.</i>	<b>Outdoor Unit System ID</b>	<b>Cooling Capacity (Btu/h)</b>		
<b>Exp 8</b> <i>Cooling equipment serving Controlled Plant Growth Environments. Equipment cooling efficiency shall be better than WSEC required minimum efficiency by at least 20%. Not eligible: unitary and applied heat pumps.</i>	<b>System ID</b>	<b>SEER, EER, &amp; IEER</b>		
<b>Exp 9</b> <i>Cooling equipment with energy recovery. Spaces served shall have year-round design cooling loads from lights and equipment greater than 5 watts per square foot. Energy recovery system shall utilize recovered energy for on-site space heating or preheating of service hot water. Provide calculations to the code official that demonstrate the amount of recovered energy used for on-site heating purposes is equivalent to the annual energy that would be saved by the cooling system with air economizer per C403.3.</i>	<b>System ID</b>	<b>Lighting + Equipment Loads (W/sf)</b>		



**Mechanical Fan System Power Allowance** **MECH-FANSYS-SUM**

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 Revised January 2017

<b>Project Title:</b> Cascade Christian Jr High School - Gym	<b>Date:</b> 4/27/2020
	For Building Dept. Use

**HVAC Air Distribution System Schedule**  
*List all HVAC systems that have the capability to provide heating and/or cooling to the spaces they serve.*

System or Primary Supply Fan ID	Speed Control (Note 1)	Description (Note 2)	System Total Nameplate HP (Note 3)	Fan Power Calculation Required (Note 4)
ERV-1	CV	DOAS w/ ERV	0.21	No
ERV-2	CV	DOAS w/ ERV	0.47	No
AH-1	CV	VRF Indoor Unit	0.33	No
AH-2	CV	VRF Indoor Unit	0.33	No

*Note 1 - Constant Volume (CV), Variable Air Volume (VAV), or Hospital/Lab CV system that qualifies for VAV budget per C403.2.11.1 Exception 1. Single zone VAV systems shall comply as CV.*

*Note 2 - Describe system type and list all fans (or groups of fans) associated with the delivery and removal of conditioned air by the system. Include all supply, return/relief, exhaust and exhaust hoods (>1 hp), make-up air, dedicated outside air (DOAS), booster fans, and series fan-powered terminals. VAV parallel fan-powered terminals and economizer relief fans do not need to be included if the fans do not operate at peak conditions.*

*Note 3 - Enter the total nameplate hp of all fans associated with the delivery and removal of conditioned air by the system.*

*Note 4 - This form automatically identifies whether a MECH-FANSYS form is required to demonstrate compliance with the fan power allowance (Yes), or this information is not required because the system has a combined total nameplate motor hp that is 5 hp or less (No)*

**MECH-FANSYS Forms**  
*A MECH-FANSYS form shall be provided for each system with total nameplate hp greater than 5 hp. Select (Add Fan System Form) to generate an additional form. Added forms can be deleted with button in cell E32 of the added form.*



*Note 1 - Design load shall account for the building envelope, lighting, ventilation and occupancy loads of the space(s) served by the mechanical system. Heating and cooling loads shall be adjusted to account for load reduction achieved by an energy recovery system, if applicable.*

*Note 2 - Computer load calculation program, worksheet (identify source), or equivalent computation procedure in accordance with ASHRAE Standard 183.*

# Lighting Summary

# LGT-SUM

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2, R3, R4 over 3 stories and all R1

Revised July 2016

<b>Project Info</b>  <i>Compliance forms do not require a password to use. Instructional and calculating cells are write-protected.</i>	<b>Project Title:</b> CASCADE CHRISTIAN JR HIGH SCHOOL LOBBY ADDITION	<b>Date:</b> 4/20/2020
	<i>Applicant Information. Provide contact information for individual who can respond to inquiries about compliance form information provided.</i>	
	<b>Company Name:</b> Boone Electric	For Building Department Use
	<b>Company Address:</b> 11409 58th Ave E Puyallup, WA 98373	
	<b>Applicant Name:</b> Suzy Fontaine	
	<b>Applicant Phone:</b> 253-848-3036	
<b>Applicant Email:</b> SuzyF@boonenw.com		

<b>Project Description</b>	<input checked="" type="checkbox"/> New Building <input type="checkbox"/> Addition <input type="checkbox"/> Alteration <input type="checkbox"/> Plans Included Include PROJ-SUM form (included in envelope forms workbook) with lighting compliance forms.
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<b>Building Additions</b>  <i>Refer to Section C502.2.6 for additional requirements.</i>	<b>Compliance Method</b>		
		Interior lighting	Exterior lighting
	Lighting systems in addition area comply with all applicable provisions as a stand alone new construction project	<input type="checkbox"/>	<input type="checkbox"/>
	Lighting systems in addition are combined with existing building lighting systems to demonstrate compliance	<input type="checkbox"/>	<input type="checkbox"/>
<b>Addition is combined with existing:</b> <i>For interior lighting projects, include new + existing interior lighting fixture wattage in Proposed Lighting Wattage table in LTG-INT-BLD or LTG-INT-SPACE form.</i> <i>For exterior lighting projects, include new + existing exterior lighting fixture wattage in Proposed Tradable and Proposed Non-Tradable Lighting Wattage tables in LTG-EXT form.</i>			

<b>Interior and Exterior Lighting Alterations</b>  <i>Select all Lighting Power and Lighting Control elements that apply to the scope of the retrofit project. If project includes a combination of spaces where less than 50% of the existing fixtures are replaced in some spaces, and 50% or more of the fixtures are replaced in others, then provide separate lighting power compliance forms for the two retrofit conditions. Spaces undergoing the same type of retrofit may be combined into one lighting power compliance form.</i>  <i>Refer to Section C503.6 for additional requirements.</i>  <i>All alteration lighting controls shall be</i>  <input type="checkbox"/> <b>No changes are being made to the interior or exterior lighting systems and existing space uses and configuration are not changed.</b>	<b>Lighting Power</b>			
		Interior lighting	Parking garage	Exterior lighting
	50% or more of existing are replaced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Less than 50% of existing are replaced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Lamp and/or ballast replacement only – existing total wattage not increased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>50% or more replaced</b> - Total lighting power of new + existing-to-remain fixtures shall comply with total LPA per Sections C405.4.2 and C405.5.2. Include new + existing-to-remain fixtures in Proposed Lighting Wattage table in LTG-INT-BLD, LTG-INT-SPACE or LTG-EXT form. <b>Less than 50% replaced</b> - Total lighting power of new + existing-to-remain fixtures shall not exceed the total lighting power prior to alteration. Include new + existing-to-remain fixtures in the Proposed Lighting Wattage table in LTG-INT-BLD, LTG-INT-SPACE or LTG-EXT form. <b>50% threshold</b> applies to number of luminaires for interior spaces and parking garages, and total			
	<b>Lighting Controls</b>			
		Interior lighting	Parking garage	Exterior lighting
	New wiring installed to serve added fixtures and/or fixtures relocated to new circuit(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	New or moved lighting panel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interior space is reconfigured - luminaires unchanged or relocated only	<input type="checkbox"/>			
<b>New wiring or circuit</b> - For interior lighting, provide required manual controls per C405.2.3, occupancy sensor controls per C405.2.1, daylight responsive controls per C405.2.4 and application specific lighting controls per C405.2.5. For exterior lighting, provide required controls per C405.2.7. <b>New or moved panel</b> - Provide all applicable lighting controls as noted for New Wiring and automatic time switch controls per C405.2.2. <b>Reconfigured interior space</b> - Provide all required lighting controls that apply to a new interior space. Application specific lighting control provisions per C405.2.5 do not apply to reconfigured spaces.				

<b>Change of Space Use</b>	<input type="checkbox"/> Existing interior lighting systems in areas under-going a change in space use are upgraded to comply with LPAs for the new space types per Tables C405.4.2(1) or C405.4.2(2).  Identify interior spaces requiring LPD upgrade to the current Code in Proposed Lighting Wattage table in LTG-INT-BLD or LTG-INT-SPACE form.
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- a. *Lighting fixtures in a building addition may comply as a stand alone project, or they may be combined with the overall existing building lighting systems to demonstrate compliance. Refer to C502.1.*
- b. *For alterations and building additions, provide Space Types and gross interior areas in the Maximum Allowed Lighting Wattage table. If a building addition will comply as combined with the overall existing building lighting systems, include all applicable existing Space Types and gross interior areas.*
- c. *If less than 50% of existing lighting fixtures will be replaced, provide total existing lighting wattage (prior to alteration) in the space provided*

<b>Mechanical Summary</b>		<b>MECH-SUM</b>
<small>2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 &amp; R3 over 3 stories and all R1</small>		<small>Revised January 2017</small>
<b>Project Information</b>	Project Title: <b>Cascade Christian Jr High School - Gym</b> Date: <b>4/27/2020</b> Applicant Information. Provide contact information for individual who can respond to inquiries about compliance form information provided. Company Name: <b>Air Systems Engineering Inc.</b> Company Address: <b>3602 S Pine Street, Tacoma, WA 98409</b> Applicant Name: <b>John Lee</b> Applicant Phone: <b>877-671-9484</b>	For Building Dept. Use
<b>Project Description</b> <small>Briefly describe mechanical systems in the text box provided</small>  <input type="checkbox"/> Total Bldg Performance (TBP)  <small>This path includes all mandatory provisions per C401.2 Option 2. MECH-SUM, MECH-CHK, and C407 Energy Analysis forms required.</small>	<input checked="" type="checkbox"/> New Building <input type="checkbox"/> Building Addition <input type="checkbox"/> Tenant Improvement <input type="checkbox"/> System Retrofit <input type="checkbox"/> No System Changes Provide (2) indoor air handler for heating only the lobby area. Future phase will tie indoor air handlers to new VRF system. Provide DOAS w/ ERV for ventilation in lobby and restrooms.	
<b>Design Load Calculations</b>	<input type="checkbox"/> Load calculation summary <input checked="" type="checkbox"/> MECH-LOAD-CALC Form Provide design load calculations for all mechanical systems and equipment serving the building heating, cooling or ventilating needs. If a load calculation summary is provided with the permit documents that includes all applicable compliance information then the MECH-LOAD-CALC form is not required.	
<b>Mechanical Schedules</b>	<input checked="" type="checkbox"/> Mechanical Plans <input type="checkbox"/> MECH-EQ Forms (TBD) Indicate location of equipment compliance information. If provided on plans then MECH-EQ forms are not required, however, include on plans all applicable compliance information listed in MECH-EQ tables.	
<b>Dedicated Outdoor Air System Requirements and High Efficiency VAV Alternate</b>	<input checked="" type="checkbox"/> DOAS is required per C403.6 effective July 1, 2017 (office, retail, education, library and fire station occupancies) All occupied, conditioned areas shall be served by a DOAS that delivers required ventilation air in a manner that does not require space conditioning fan operation. Space conditioning fans cycled off when no heating or cooling is required. <input type="checkbox"/> Ventilation provided via natural ventilation per 2015 IMC in lieu of DOAS (C403.6, Exception 1) <input type="checkbox"/> Ventilation and space conditioning provided by a HEVAV system per C403.7 in lieu of DOAS (C403.6, Exception 2) <input type="checkbox"/> DOAS included in project, although not required (occupancy not office, retail, education, library or fire station) <input checked="" type="checkbox"/> DOAS related allowances included in project: <input type="checkbox"/> Prescriptive vertical fenestration maximum area allowance increased to 40% per C402.4.1.4 with 100% of conditioned floor area in building served by DOAS. <input checked="" type="checkbox"/> Exception to air economizer per C403.3 Exception 1, include MECH-ECONO form.	
<b>Fan Power</b>	<input checked="" type="checkbox"/> Project includes HVAC air distribution systems that provide heating and/or cooling If yes, provide a MECH-FANSYS -SUM form. <input type="checkbox"/> For one or more systems, the total fan motor nameplate hp of all fans in HVAC system exceeds 5hp. If yes, provide a separate MECH-FANSYS form for each HVAC system exceeding the 5 horsepower threshold. Refer to Section C403.2.11 and MECH-FANSYS-DOC for requirements and exceptions.	
<b>HVAC Hydronic Systems</b>	<input type="checkbox"/> Hydronic chilled water <input type="checkbox"/> Water-loop heat pump <input checked="" type="checkbox"/> No hydronic systems <input type="checkbox"/> Hydronic heating water <input type="checkbox"/> Geothermal	
<b>C406 Additional Efficiency Options - Mechanical</b>	<input checked="" type="checkbox"/> C406.2 More efficient HVAC equipment and fan systems Requires 90% of heating and cooling capacity to be equipment listed in tables C403.2.3(1)-(9) or air-to-water heat pumps and heat recovery chillers. All equipment listed in tables C403.2.3(1)-(7) must be 15% more efficient than minimum requirements. All stand alone supply, return, and exhaust fans over 1hp must have FEQ ≥ 71 and must be selected within 10% of maximum total or static pressure. <input type="checkbox"/> C406.6 Dedicated outdoor air system (DOAS) Requires 90% of conditioned floor area to be served by a DOAS per C403.6 that delivers required ventilation air in a manner that does not require space conditioning fan operation. <input type="checkbox"/> C406.7 Reduced energy in service water heating Requires 90% of floor area be in occupancy types listed in C406.7.1 and that 60% of annual hot water energy use be provided by heat pump, waste heat recovery or solar water-heating systems.	

**Mechanical Summary, pg. 2**

**MECH-SUM**

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Revised January 2017

<b>Service Water Heating Systems</b>	<p>Equipment Type (s)</p> <p><input type="checkbox"/> Hot water heating tank(s)      <input type="checkbox"/> Instantaneous      <input checked="" type="checkbox"/> No service water systems</p> <p><input type="checkbox"/> Dedicated boiler      <input type="checkbox"/> Heat exchange from space heat boiler or central hot water/steam</p> <p>Distribution Type (s)</p> <p><input type="checkbox"/> Circulation System      <input type="checkbox"/> On-demand</p>
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<b>Commissioning</b>	<p>Commissioning is required for:</p> <p><input type="checkbox"/> Mechanical systems per C408.2      <input type="checkbox"/> Service water heating systems per C408.4</p> <p><i>If required, commissioning shall be performed for all applicable systems regardless of individual equipment capacity.</i></p> <p>Exceptions to commissioning requirements:</p> <p><input checked="" type="checkbox"/> Total output capacity of all mechanical space conditioning systems in the building do not exceed 240,000 Btu/h cooling or 300,000 Btu/h heating. Mechanical systems commissioning not required.</p> <p><input type="checkbox"/> Capacity of largest service water heating system in building does not exceed 200,000 Btu/h. Service water heating systems commissioning not required.</p>
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**Low Energy and Semi-Heated Spaces** (Note 6 and 7)

Space Type	Location in Plan(s)	Space(s) Served	Area Served, square feet	Heating Capacity, Btu/h (Note 4)	Cooling Capacity, Btu/h (Note 5)	Peak Space Conditioning Capacity, Btu/h-sf	Compliance Check	Notes

*Note 4 - Provide total installed heating output capacity of systems serving Low Energy or Semi-Heated space(s) in btuh.*

*Note 5 - Provide total installed cooling capacity of system serving Low Energy space(s) in Btu/h. Not allowed for semi-heated spaces. Enter 0 if no cooling.*

*Note 6 - Refer to Section C402.1.1 Low Energy Building. Installed peak space conditioning capacity, heating or cooling, may not exceed 3.4 Btu/h\*sf.*

*Note 7 - Refer to Section C402.1.1.1 and Semi-Heated Space definition in Chapter 2. Total heating output capacity may not exceed 8 Btu/h\*sf. Only systems without electric resistance heating and no cooling are eligible for the wall insulation exception under semi-heated.*

# Mechanical Permit Plans Checklist

**MECH-CHK**

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Revised January 2017

<b>Project Title:</b> Cascade Christian Jr High School - Gym	<b>Date:</b> 4/27/2020
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The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - <i>Must be in permit documents</i>	Location in Documents	Building Department Notes
<b>Equipment - Sizing, Performance and Type</b>					
NA	C403.1	Exempt process equipment	Identify equipment to be used in manufacturing, industrial or commercial processes that do not provide space conditioning; identify provisions applicable to this equipment per C403.1 exception		
Yes	C403.2.1	Load calculations	Provide load calculations performed per ASHRAE Std 183 or equivalent, using design parameters per C302 and Appendix C; include load adjustments to account for energy recovery	Supplemental Calculation PDF	
Yes	C403.2.2	Equipment and system sizing	Indicate that output capacities of heating and cooling equipment and systems are no greater than the smallest available equipment size that exceeds the calculated loads; note exceptions taken	MECH-LOAD-CALC	
Yes	C403.2.3 C403.2.3.2 C403.2.13.1	HVAC equipment performance requirements (efficiency)	Provide equipment schedules on plans or complete MECH-EQ forms indicating type, capacity, rated and WSEC minimum efficiencies for all heating and cooling equipment; include supply and OSA cfm and operating hours for all air systems; identify heating and cooling equipment that does not have a corresponding WSEC minimum efficiency (manufacturer rated)	M-1	
NA	C405.8 C403.2.14	Electric motor efficiency	List all motors ≥ 1/12 hp (that are not integral to a rated piece of equipment) in the mechanical or electrical equipment schedules on plans; indicate hp, rpm, number of poles and rated efficiency, or exception applied For fractional hp motors (1/12 - 1 hp), indicate whether they are an electronically commutated motor, have rated efficiency of at least 70%, or exception taken		
Yes	C403.2.11.1	Fan power limitation	For all HVAC fan systems that provide heating and / or cooling, provide system total nameplate hp in MECH-FANSYS-SUM form For all applicable HVAC systems with total fan motor hp > 5hp, verify fan system motor hp or bhp complies with fan power limits per equations in Table C403.2.11.1(1), provide MECH-FANSYS form for each system	MECH-FANSYS-SUM	
NA	C403.2.11.2	Motor nameplate hp	For all applicable HVAC systems with total fan motor hp > 5hp, indicate fan motors specified are the smallest available motor hp size greater than fan bhp, note exceptions taken		
NA	C403.2.11.3	Fan efficiency	For all applicable HVAC systems with total fan motor hp > 5hp, identify in equipment schedule all fans required to comply with fan efficiency grade and indicate rated FEG is ≥ 67, or exception taken; indicate these fans are sized so total efficiency is within 15% of the fan maximum total efficiency		
NA	C403.2.11.4	Group R occupancy exhaust fan efficacy	For all exhaust fans < 400 cfm in Group R occupancies, indicate in equipment schedule the fan flow rate and efficacy (cfm/watt), or exception taken; refer to Table C403.2.11.4 (CE-57)		
NA	C403.2.13	Variable flow capacity - fans	For fan motors ≥ 7.5 hp, indicate method of variable flow control (VSD or equivalent method) in equipment schedule, or exception taken; for equivalent method for an HVAC system refer to HVAC System Controls for additional requirements		
NA	C403.2.3	Maximum air cooled chiller capacity	For chilled water plants and buildings with > 500 tons of cooling capacity, indicate air-cooled chiller capacity is ≤ 100 tons, or exception taken		
NA	C403.4	Large capacity cooling systems	For buildings with ≥ 300 tons of cooling capacity, indicate method of multi-stage or variable capacity control (VSD, multiple staged compressors, or max capacity of any single unit < 66% of the total)		
NA	C403.2.3.1	Non-standard water-cooled centrifugal chillers	For water-cooled centrifugal chillers not designed for operation at standard conditions, provide calculations documenting maximum full load and part load rated equipment performance requirements		
NA	C403.2.13.1 C403.4.3.2	Centrifugal fan open-circuit cooling towers	For open-circuit centrifugal fan cooling towers with ≥ 1,100 gpm capacity, indicate cooling towers comply with efficiency requirements for axial fan open circuit cooling towers		
NA	C403.4.2 C403.4.2.5	Large capacity boiler systems	For single boilers with > 500,000 Btu/h capacity, indicate multi-stage or modulating burner For boiler system (single or multiple) with > 1,000,000 Btu/h capacity, indicate turndown ratio per Table C403.4.2.5 and method (multiple single input boilers, modulating boilers, or combination)		
NA	C403.2.13	Variable flow capacity - pumps	For pump motors ≥ 7.5 hp, indicate method of variable flow control (VSD or equivalent method) in equipment schedule, or exception taken; for equivalent method for a hydronic system refer to Hydronic System Controls for additional requirements		
NA	C403.2.3	Gas and oil-fired forced air furnace and unit heaters	For forced air furnaces with capacity ≥ 225,000 Btu/h and all unit heaters, indicate in equipment schedule intermittent ignition or IID, flue or draft damper, and rated jacket loss		
NA	C403.2.4.8	Combustion heating equipment	For combustion heating equipment with output capacity > 225,000 Btu/h, indicate modulating or staged combustion control		
NA	C403.2.3.3	Packaged electric heating / cooling equipment	Verify all packaged electric equipment with > 6,000 Btu/h cooling capacity and any amount of heating is a heat pump; include in equipment schedules		
NA	C403.2.12	Heating outside a building	Indicate systems providing heating in non-enclosed outdoor occupied spaces are radiant systems; refer to HVAC System Controls for additional requirements		
NA	C403.2.7.1	Kitchen exhaust hoods	Indicate on plans the type, duty and exhaust air rate of each kitchen hood, refer to HVAC System Controls for additional requirements		
Yes	C403.2.4.3	Outdoor supply air, exhaust and relief dampers	Indicate locations of OSA intake, and exhaust and relief outlet dampers on plans; indicate whether dampers are Class 1 motorized, or gravity and exception taken (include leakage rating, cfm/sf); refer to HVAC System Controls for additional requirements for OSA dampers	M-1	

# Mechanical Permit Plans Checklist

**MECH-CHK**

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Revised January 2017

<b>Project Title:</b> Cascade Christian Jr High School - Gym	<b>Date:</b> 4/27/2020
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The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - <i>Must be in permit documents</i>	Location in Documents	Building Department Notes
NA	C403.2.4.3	Return air dampers	Indicate locations of return air dampers that are integral to economizer operation; verify dampers are motorized; indicate whether dampers are Class 1, or within packaged equipment eligible for leakage rating exception (include leakage rating, cfm/sf)		
NA	C403.2.4.3	Stairway and shaft vent dampers	Indicate location of stairway and shaft vent dampers on plans; verify dampers are Class 1 motorized; refer to HVAC System Controls for additional requirements		
NA	C403.2.4.4	Zone isolation dampers	For systems serving areas > 25,000 sf or spanning more than one floor, that include areas that are expected to be occupied non-simultaneously; identify isolation zone areas on plans and locations of associated isolation dampers in HVAC distribution system; refer to HVAC System Controls for additional requirements		
NA	C403.2.3.4	Humidification	For cooling systems with humidification equipment that are also required to have air economizer, indicate humidifier is adiabatic (direct evaporative or fog atomization), or exception taken		

**Additional Efficiency Package Option, More Efficient HVAC Equipment & Fan Performance -**

**Must comply with all 3 provisions to be eligible**

NA	C406.2.1 C403.2.3	HVAC system selection	To comply with additional efficiency package option, calculate the percentage of heating and cooling equipment in the project (based on output capacity) that do not have a corresponding WSEC listed efficiency; shall be less than 10% to comply		
NA	C406.2.2 C403.2.3	Minimum equipment efficiency	To comply with additional efficiency package option, indicate that all listed heating and cooling equipment have a rated efficiency that exceeds WSEC listed efficiency by at least 15%		
NA	C406.2.3 C403.2.11.3	Minimum fan efficiency	To comply with additional efficiency package option, indicate rated FEG of stand alone fans is ≥ 71; indicate these fans are sized so the fan efficiency at design conditions is within 10% of the maximum total or static efficiency		

**HVAC System Controls**

Yes	C403.2.4.1	Thermostatic controls (thermostats and humidistats)	Indicate locations of thermostatic and humidity control devices and the zones they serve on plans, including perimeter system zones	M-2	
			Where adjacent (neighboring) zones are controlled by separate thermostats (including perimeter systems used to offset heat gain or loss), and are connected by permanent openings > 10% of either zone sf area, indicate controls configured to prevent adjacent zones from operating in conflicting modes (one in heat, other in cool); applies to adjacent perimeter zones, adjacent nonperimeter zones, and adjacent perimeter and nonperimeter zones		
			If applying Exception 2 to nonperimeter zones adjacent to perimeter zones, indicate that setpoints and deadband settings in these zones are coordinated so cooling in a nonperimeter zone does not occur until the temperature in that zone is 5°F higher than the adjacent perimeter zone temperature in heating		
NA	C403.2.4.1.1	Heat pump supplementary heat	Indicate staged heating operation with compression as the first stage of heating and supplemental heating controlled with outdoor lock-out temperature set to 40°F or less		
Yes	C403.2.4.1.2	Deadband	Indicate zone thermostatic controls configured with 5°F minimum deadband for systems that control both heating and cooling	M-1	
NA	C403.2.4.1.3	Setpoint overlap restriction (thermostats)	If separate heating and cooling systems with separate thermostatic control devices are used to serve a zone, indicate locations of both thermostatic control devices and the zone they serve on plans		
			Indicate a limit switch, mechanical stop or DDC control with programming to prevent simultaneous heating and cooling		
Yes	C403.2.4.2 C403.2.4.2.1 C403.2.4.2.2	Automatic setback and shutdown	Indicate zone thermostatic controls configured with required automatic setback and manual override functions, setback temperatures, and control method (automatic time clock or programmable controls); note exceptions taken	M-1	
Yes	C403.2.4.2.3	Automatic (optimum) start	Indicate system controls that adjust equipment start time required to bring each area served up to design temperature just prior to scheduled occupancy	M-1	
Yes	C403.2.4.3	Outdoor supply air dampers	Indicate automatic controls configured to close OSA damper during unoccupied equipment operation; not including economizer cooling, night flush or IMC required OSA / exhaust	M-1	
NA	C403.2.4.3	Stairway and shaft vent dampers	Indicate method of activation of stairway and shaft vent dampers (fire alarm or interruption of power)		
NA	C403.2.4.4	Zone isolation controls	For systems serving areas > 25,000 sf or spanning more than one floor, that include areas that are expected to be occupied non-simultaneously; indicate controls that allow for independent space conditioning of isolation zones; or exception taken		
NA	C403.2.12	Heating outside a building	Indicate occupancy sensing or timer switch controls configured to automatically shut off heating system when area served is unoccupied		
NA	C403.2.4.5	Snow melt systems	Indicate automatic controls configured to shut off system when pavement temperature exceeds 50°F and no precipitation is falling, and when outdoor air temperature exceeds 40°F		
NA	C403.2.4.6	Freeze protection system controls	Indicate automatic controls to shut off system when outdoor temperature exceeds 40°F, or conditions protect fluid from freezing		
NA	C403.2.4.9	Group R1 hotel / motel guest rooms	For hotels and motels with over 50 guest rooms, indicate automatic controls serving guest rooms that are capable of setback (heating) and set-up (cooling) of temperature setpoint by at least 5°F; indicate control method - activated by room entry or occupancy sensor		

# Mechanical Permit Plans Checklist

**MECH-CHK**

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Revised January 2017

<b>Project Title:</b> Cascade Christian Jr High School - Gym	<b>Date:</b> 4/27/2020
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The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - <i>Must be in permit documents</i>	Location in Documents	Building Department Notes
NA	C403.2.4.10 C403.2.4.11	Group R2 / R3 dwelling units, Group R2 sleeping units	For primary space conditioning system, indicate 5-2 programmable thermostats capable of two setback periods per day; for all thermostats indicate purpose (heating only, cooling only, or both), required temperature range and at minimum a 10°F deadband; or exception taken		
Yes	C403.2.6 C403.2.11.4	Ventilation	Indicate method of ventilation air delivery (natural or mechanical) for each zone If mechanically delivered, indicate that systems are configured to provide not more than 150% of, but at least the minimum required volume of outdoor air to each zone per IMC, ASHRAE 62.1 or other applicable code (WAC, OSHA, etc); or exception taken If delivered via natural ventilation, identify required elements per IMC including minimum openable area to the outdoors or qualifying adjoining spaces	Mechanical M-1	
NA	C403.2.6.2	Demand controlled ventilation	Identify spaces > 500 sf with occupant load > 25 people/1,000 sf per IMC; for each space indicate whether it is served by an HVAC system with total design OSA > 3,000 cfm, and / or the system has airside economizer or automatic modulating OSA damper; indicate OSA controls are configured to provide demand controlled ventilation or provide supporting documentation for applied exception		
NA	C403.2.6.3	Occupancy sensors	For gyms, classrooms, auditoriums and conference rooms > 500 sf, indicate occupancy-based OSA control when space is unoccupied and method (closes OSA damper or shuts-off equipment); or alternate means provided to automatically reduce OSA when space is partially occupied		
NA	C403.2.6.4 C403.2.6.4.1	Enclosed loading dock ventilation	For enclosed loading docks, indicate ventilation / exhaust system method of activation (gas detection system for CO and NO2, or occupancy sensors), and control method (staged or modulating)		
NA	C403.2.6.4 C403.2.6.4.2	Enclosed parking garage ventilation	For enclosed parking garages, indicate ventilation / exhaust system activated by gas detection system for CO and NO2, and control method (staged or modulating); or exception taken		
NA	C403.2.7.1	Kitchen exhaust hoods	Provide calculations that show a balanced accounting of total kitchen exhaust (include all hoods) with % of: supply air, transfer air from adjacent spaces, and make-up air; if applicable, indicate that direct make-up air to each hood does not exceed 10% of hood exhaust For kitchens with total hood exhaust exceeding 2,000 cfm, indicate exhaust air rate per Table C403.2.7.1 and compliance method (DCV, energy recovery, or transfer air that would otherwise be exhausted)		
NA	C403.2.7.2	Laboratory exhaust systems	Refer to Systems Requiring Energy Recovery for requirements		
NA	C403.2.13	Variable flow capacity - HVAC system fans	For HVAC fan motors ≥ 7.5 hp, indicate method of variable flow control (VSD, or equivalent control method that reduces design air volume by 50% at 1/3 static design pressure); note exception taken		
NA	C403.3.1	DX air handler variable cooling control (Under Integrated Economizer)	For DX air handlers with economizer and cooling capacity ≥ 65,000 Btu/h, indicate number of cooling stages provided and method (multiple compressors and / or variable speed compressors); indicate minimum displacement (capacity reduction) as % of full load Indicate control method (cooling capacity controlled in response to space temperature, space temperature controlled by modulating supply airflow, or both)		
NA	C403.2.11.5	Fan airflow control	For DX air handling units with cooling capacity ≥ 65,000 Btu/h and evaporative and chilled water air handling units with fan ≥ 0.25 hp, indicate whether system is single zone or multiple zone and related control method (cooling capacity controlled in response to space temperature, space temperature is controlled by modulating supply airflow, or both) For mechanical cooling systems (includes DX and chilled water coils) that control cooling capacity in response to space temperature - Provide a minimum of two stages of fan control; indicate minimum fan speed is ≤ 66% of full speed drawing ≤ 40% of full speed fan power during periods of low cooling or ventilation only For other mechanical cooling systems (includes DX and chilled water coils) that control space temperature by modulating airflow (in lieu of, or in addition to, controlling capacity in response to space temperature) - Provide fan controls for modulating supply airflow; indicate minimum fan speed is ≤ 50% of full speed drawing ≤ 30% of full speed fan power during periods of low cooling or ventilation only; or exception taken		
NA	C403.2.4.12	DDC system capabilities	Provide central and zone level DDC controls as required based on system application, capacity or size thresholds and other qualification per Table C403.2.4.12.1 Identify all DDC system input / output control points; indicate capability for trending and graphical display		

**Ducting Systems**

Yes	C403.2.8.1 C403.2.8.3	Duct construction	Indicate on plans that all ductwork is constructed and sealed per IMC For OSA ductwork, also indicate on plans that ductwork meets air leakage requirements per C402.5 and vapor retarder requirements per the IBC	M-1	
Yes	C403.2.8.3	Duct pressure classifications	Identify location of low, medium and high pressure ductwork on plans	M-1	
NA	C403.2.8.3.3	High pressure duct leakage test	Indicate high pressure duct leakage testing requirements on plans; provide test results to jurisdiction when completed		

# Mechanical Permit Plans Checklist

**MECH-CHK**

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1

Revised January 2017

<b>Project Title:</b> Cascade Christian Jr High School - Gym	<b>Date:</b> 4/27/2020
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The following information is necessary to check a permit application for compliance with the mechanical systems and equipment requirements of the Washington State Energy Code, Commercial Provisions.

Applicable (yes,no,na)	Code Section	Code Provision	Information Required - <i>Must be in permit documents</i>	Location in Documents	Building Department Notes
NA	C403.2.8.1 C403.2.8.2	Duct insulation	For supply and return ductwork located in unconditioned space or outdoors, indicate R-value of insulation on ductwork on plans; identify climate zone; note exceptions taken		
			For supply ductwork located in conditioned space, identify if design supply temperature is < 55°F or > 105°F and indicate R-value of insulation on this ductwork on plans; note exception taken		
			For OSA ductwork, shafts and plenums, indicate R-value of insulation on these elements on plans per Table C402.1.3 for steel-framed walls; note exception taken		

**Piping Systems**

NA	C403.2.9	Piping insulation	Indicate design temperature range of fluid conveyed in piping and thickness of insulation (in inches) on hydronic piping plans; or exception taken		
NA	C403.2.9.1	Piping insulation exposed to weather	Indicate method of protection of pipe insulation from damage / degradation on hydronic piping plans		

**Economizers**

NA	C403.3	Air economizer required	Identify in equipment schedules on plans or in MECH-EQ forms all cooling systems requiring air economizer controls		
			Provide MECH-ECONO form indicating systems utilizing air economizer exceptions, including those with water-side economizer in lieu of air economizer; indicate on plans eligible exception(s) taken and measures to comply with exception(s)		
NA	C403.3.1	Integrated economizer operation - air and water	Indicate air and water-side economizers are configured for partial cooling operation even where additional mechanical cooling is required to meet the load		
NA	C403.3.2	Economizer heating system impact - air and water	Verify control method of HVAC systems with economizers does not increase building heating energy usage during normal operation		
NA	C403.3.3.1	Air economizer capacity	Indicate modulating OSA and return air dampers are configured to provide up to 100% OSA for cooling		
NA	C403.3.1 C403.3.3.2	Integrated air economizer	Verify mechanical cooling controls are interlocked with air economizer controls so the outside air damper remains in 100% open position when mechanical cooling is also required to meet the cooling load, until the leaving air temperature is < 45°F		
			For systems with cooling capacity ≥ 65,000 Btu/h, verify that control of economizer dampers is not based only on mixed air temperature; or exception taken		
NA	C403.3.3.3	Air economizer high limit controls	Indicate high limit shut-off control method and required high limit per Table C403.3.3.3		
NA	C403.3.4.1	Water economizer capacity	For eligible systems where water-side economizer may be provided in lieu of air economizer, indicate system is capable of 100% design cooling capacity at 50°F db / 45°F wb OSA temperatures		
NA	C403.3.4.2	Water economizer maximum pressure drop	Indicate pressure drop across precooling coils and heat exchangers in water economizer system do not exceed pressure drop limit		
NA	C403.3.1	DX air handling equipment control	For DX air handlers with economizer and cooling capacity ≥ 65,000 Btu/h, refer to HVAC System Controls for requirements		
NA	C403.2.4.7	DX equipment economizer fault detection and diagnostics	For DX air handlers with economizer and cooling capacity ≥ 54,000 Btu/h, provide a fault detection and diagnostics (FDD) system to monitor economizer system operation and report faults		

**Systems Requiring Energy Recovery**

Yes	C403.5.1	Energy recovery (ER) - ventilation / exhaust systems	For systems with design OSA > 5,000 cfm, or design supply air cfm and % OSA exceeding the values in Tables C403.5.1(1) or (2), indicate exhaust air ER method; or exception taken with supporting calculations		
			For rooms served by multiple systems with aggregate design OSA > 5,000 cfm, or aggregate design supply air cfm and % OSA exceeding the values in Tables C403.5.1(1) or (2), indicate exhaust air ER method; or exception taken with supporting calculations		
			Indicate ER rated effectiveness that increases OSA enthalpy by ≥ 50% based on delta between OSA and return air enthalpies at design conditions	M-1	
NA	C403.2.7.2	Laboratory exhaust systems (energy recovery)	For buildings with total lab exhaust > 5,000 cfm, indicate method of energy recovery used to pre-condition laboratory make-up air; ER effectiveness (min 25°F); or alternative method per exception (VAV exhaust, semi-conditioned makeup, or CERM calculation)		
NA	C404.10.4 (under C404.11)	Pools and permanent spas exhaust systems (energy recovery)	For buildings with pools or spas with water surface area > 200 sf, indicate exhaust air ER method and use of waste heat (preheat ventilation air, pool water or service hot water); or exception taken		
			Indicate ER system has the rated effectiveness and is configured to decrease the exhaust air temperature at design conditions by ≥ 36°F		
NA	C403.5.2	Energy recovery - steam condensate systems	For buildings with on-site steam heating systems, indicate condensate water ER		
			For buildings that use off-site generated steam where condensate is not returned to the source, indicate on-site condensate water ER		

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Revised January 2017

<b>Project Title:</b> Cascade Christian Jr High School - Gym	<b>Date:</b> 4/27/2020
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Applicable (yes,no,na)	Code Section	Code Provision	Information Required - <i>Must be in permit documents</i>	Location in Documents	Building Department Notes
NA	C403.5.3	Energy recovery - cooler / freezer condensers	For buildings with food service, meat or deli departments that have ≥ 500,000 Btu/h of remote refrigeration capacity for coolers / freezers, indicate condenser ER and use of captured energy (service water heating, space heating, or dehumidification reheating)		
			For buildings with ≥ 40,000 sf conditioned floor area and with ≥ 1,000,000 Btu/h of remote refrigeration capacity for coolers / freezers, indicate condenser ER and use of captured energy for service water heating and also for space heating, or dehumidification reheating		
NA	C403.5.4	Energy recovery - condenser systems	For buildings with 24-hour operation and with > 1,500,000 Btu/h of heat rejection capacity and design service hot water load > 250,000 Btu/h, indicate condenser ER to pre-heat service water; or exception taken. Provide calculations showing the amount of recovered heat that is utilized (60% of peak heat rejection load or pre-heat service water to 85°F).		

**Hydronic System Controls**

NA	C403.2.13 C403.4.2.7	Variable flow control - hydronic system pumps	For hydronic system pump motors ≥ 7.5 hp, indicate method of variable flow control (VSD or equivalent method that requires ≥ 30% design wattage at 50% design fluid flow); note exception taken Identify whether hydronic coils have DDC controls and associated manner of pump speed control (differential pressure, zone hydronic demand, etc)		
NA	C403.2.5 C403.4.2.4	Hydronic system setback and part load controls	For boilers that provide building heating, indicate controls that provide heating water temperature setback based on outdoor temperature For heating and chilled water systems ≥ 300,000 Btu/h, indicate systems are configured to automatically reset supply water temperature based upon demand; or exception taken. If system pump motor hp ≥ 3 hp, also indicate controls automatically reduce flow by ≥ 50%. For chilled water systems (≥ 300,000 Btu/h, pump motor hp ≥ 3 hp) that serve water-cooled unitary air conditioners, indicate VSD or staged pumps in chilled water system and heat rejection loop that reduce pump flow so that one control valve is nearly wide open, or to maintain a minimum differential pressure; or exception taken		
NA	C403.4.2	Boiler sequencing	Indicate automatic controls that sequence operation of multiple boilers		
NA	C403.4.6	Hot gas bypass limitation	For cooling equipment with hot gas bypass, provide either multiple step unloading or continuous capacity modulation; indicate bypass capacity per Table C403.4.6		
NA	C403.4.2.2	Two-pipe changeover systems	Indicate changeover deadband (min 15°F), heating / cooling mode scheduling and changeover temperature range (limit 30°F)		
NA	C403.4.2.6	Chiller / boiler plant pump isolation	Indicate controls are configured to automatically reduce overall plant flow and shut-off flow through individual chillers and boilers when not in use		
NA	C403.2.13.1.1 C403.4.3.1.1 C403.4.3.1.2	Heat rejection equipment - variable flow control	For cooling towers with fan motors ≥ 7.5 hp, indicate VSD and method to adjust fan speed (adjusted based on leaving fluid temperature or condenser temperature / pressure of heat rejection device) For multiple-cell heat rejection equipment with VSD, indicate controls that ramp all fans in unison		
NA	C403.4.3.3	Heat rejection equipment - cooling tower flow turndown	Indicate open-circuit cooling towers with multiple pumps or VSD control are designed so all cells can be run in parallel		
NA	C403.4.2.3.1	Water loop heat pump - deadband	Indicate capability of central equipment to provide minimum 20°F water supply temperature deadband between heat rejection and heat addition modes; or exception taken		
NA	C403.4.2.3.2.1	Water loop heat pump - heat rejection equipment, Zone 4	Indicate type of cooling tower (open- or closed-circuit) in equipment schedule; indicate method used to limit system heat loss when heat rejection is not needed		
NA	C403.4.2.3.2.2	Water loop heat pump - heat rejection equipment, Zone 5	For open- or closed-circuit cooling towers, provide a heat exchanger that separates the cooling tower and heat pump loop		
NA	C403.4.2.3.3	Water loop heat pump - isolation valves	For hydronic heat pump systems with total system power > 10 hp, indicate 2-way isolation valves on each heat pump and variable flow system control		

**Dedicated Outdoor Air Systems (DOAS) - Optional through 6/30/16, Prescriptive 7/1/2016**

Yes	C403.6 C403.6.3	Dedicated outdoor air systems	For buildings with office, retail, education, library and fire station spaces, identify these spaces on plans; indicate that ventilation air in each occupied space is provided via a DOAS system; or document compliance with C403.6.3 Impracticality; or exception taken (buildings complying with C402.4.1.4 or C406.6 may not utilize exceptions)	M-1	
Yes	C403.6.1	Energy recovery ventilation with DOAS	For all DOAS systems, indicate exhaust air ER method; or exception taken with supporting calculations. Indicate ER rated effectiveness that increases OSA enthalpy by ≥ 50% based on delta between OSA and return air enthalpies at design conditions.	M-1	
Yes	C403.6.2	Heating / cooling system controls with DOAS	Indicate equipment associated with the delivery of zone level heating and cooling (fans, hydronic pumps, primary air dampers, etc) are configured to shut off, and central equipment is configured to turn down, when there is no call for heating or cooling in the zone they serve	M-1	
			If applying Exception to heating / cooling fans used for air mixing in the space during deadband periods, include fan watts per cfm in equipment schedule		

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NA	C402.4.1.4 C403.6	Increased prescriptive maximum vertical fenestration area with DOAS	Indicate that all occupied, conditioned spaces are served by a DOAS per C403.6		

**Additional Efficiency Package Option, Dedicated Outside Air Systems (DOAS)**

Yes	C406.6	Building provided with DOAS	To comply with additional efficiency package option, indicate that 90% or more of all occupied, conditioned spaces are served by a DOAS per C403.6	M-1	
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**Multiple Zone Air Systems**

NA	C403.4.4	Air systems serving multiple zones	Identify supply air systems serving multiple zones and the zones they serve on plans; indicate whether system is VAV and method of primary air control; or provide supporting documentation for applied exception to VAV		
NA	C403.4.4	VAV systems serving multiple zones	Provide equipment schedules on plans or MECH-EQ form that list all VAV air terminals and types For each air terminal include: maximum airflow rates for primary supply air during zone peak heating and zone peak cooling; maximum airflow during reheating, recooling or mixing; minimum airflow rate to maintain required ventilation, and the basis for these values; if IMC or ASHRAE 62.1 multiple zone equation is basis for minimum flow rates, provide calculation on plans		
NA	C403.4.4.1	Single duct VAV terminal units	Indicate single duct terminal units are configured to reduce primary supply air before reheating or recooling		
NA	C403.4.4.2	Dual duct systems - terminal units	For systems with separate warm air and cool air ducts, indicate terminal units are configured to reduce the flow from one duct to minimum before mixing with air from the other duct		
NA	C403.4.1.1 C403.4.1.2	VAV system static pressure sensors - sensors and DDC set points	Indicate locations of duct static pressure sensors on plans; include at least one sensor per major duct branch; verify controller setpoint pressure at each sensor is ≤ 1.2 inch w.g. For systems with zone level DDC, indicate controls are configured to monitor zone damper positions and reset static pressure setpoint based on the zone requiring most pressure; include control logic that automatically detects and generates an alarm if any zone excessively drives reset logic, and allows building operators to exclude zones from reset logic		
NA	C403.4.4.3	Multiple-zone VAV system ventilation optimization controls	For systems with zone level DDC controls, indicate controls are configured to automatically reduce outdoor airflow in response to changes in system ventilation efficiency; or exception taken		
NA	C403.4.4.4	VAV system supply air reset	Indicate controls automatically reset supply air temperature in response to building loads or outdoor air temperature; or exception taken		

**Multiple Zone HVAC Systems, High Efficiency VAV - Required for systems utilizing C403.6 DOAS Exception 2, must comply with all 16 provisions**

NA	C403.7, Item 1	Air economizer	Indicate system is configured for 100% air economizer operation and complies with all related economizer requirements per C403.3 (without economizer exceptions)		
NA	C403.7, Item 2	Direct digital controls (DDC)	Provide DDC controls for all components of system; identify all DDC system input / output control points; indicate capability for trending and graphical display		
NA	C403.7, Item 3	Outdoor airflow measurement and reduction	For systems with minimum OSA > 2,500 cfm, indicate outdoor airflow monitoring station that measures OSA intake under all load conditions; indicate control sequence that increases or reduces system OSA cfm based on VAV terminal feedback of ventilation efficiency (per C403.4.4.3 without exceptions) or DCV (per C403.2.6.2)		
NA	C403.7, Item 4	Supply airflow measurement	For systems with minimum OSA > 2,500 cfm, indicate supply airflow monitoring station capable of measuring supply air delivered to VAV terminals under all load conditions		
NA	C403.7, Item 5	Zone isolation and maximum area served	Verify maximum area served by a single HEVAV system is ≤ 50,000 sf, or one entire floor, whichever is greater; in addition if a system serves > 25,000 sf, that includes areas that are expected to be occupied non-simultaneously, indicate zone isolation controls per C403.2.4.4		
NA	C403.7, Item 6	Interior / exterior zone design supply air temperature	Verify that VAV terminals serving interior cooling driven loads are sized per design supply air temperature that is 5°F higher than VAV terminals serving exterior zones		
NA	C403.7, Item 7	Maximum air terminal inlet velocity	Identify air terminals with minimum primary airflow setpoints > 50% of maximum setpoint in equipment schedule or MECH-EQ form; indicate air terminal inlet velocity does not exceed 900 fpm		
NA	C403.7, Item 8	Sequence of operation	Indicate DDC system sequences of operation are designed and configured per ASHRAE GPC 36		
NA	C403.7, Item 9	Maximum allowable system brake horsepower	Verify fan system bhp is ≤ 90% of the bhp limit per Option 2 equation in Table C403.2.11.1(1), provide MECH-FANSYS form for each system		
NA	C403.7, Item 10	Fan-powered terminal unit motor and control	Indicate all series and parallel terminal fans have electronically commutated motors; indicate DDC control system is configured to vary air terminal fan speed as a function of the load; indicate fan speed during periods of low heating, low cooling, or ventilation only is ≤ 66% of peak design air flow or provide supporting documentation for applied exception		

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Applicable (yes,no,na)	Code Section	Code Provision	Information Required - <i>Must be in permit documents</i>	Location in Documents	Building Department Notes
NA	C403.7, Item 11	Application of single duct and fan-powered terminal units	Indicate VAV terminal types on plans; verify fan-powered terminal units only serve perimeter zones with envelope loads; verify all other zones are served by single duct terminal units		
NA	C403.7, Item 12	Fan-powered terminal unit primary air reset	Indicate DDC controls are configured to automatically reset the primary supply air cfm setpoint of all fan-powered terminal units to the minimum required to maintain ventilation during occupied heating or deadband, based upon the VAV air handling unit OSA ventilation fraction		
NA	C403.7, Item 13	High occupancy space controls	For spaces > 150 sf with occupant density ≥ 25 people / 1000 sf, indicate space is served by a dedicated terminal unit with DCV control that resets terminal unit ventilation setpoint; also indicate occupancy sensor control that automatically reduces minimum ventilation to zero and sets back room heating and cooling setpoints by ≥ 5°F		
NA	C403.7, Item 14	Dedicated HVAC systems	For server, electronic equipment, telecom or similar spaces with cooling loads > 5 W/sf, indicate spaces are served by independent HVAC systems that are separate from HPVAV systems serving rest of building; indicate dedicated HVAC systems have air economizer controls or energy recovery per C403.3 Exception 9		
NA	C403.7, Item 15	Central plant efficiency	Indicate whether systems are served by a high efficiency heating water plant, or a high efficiency chilled water plant		
			If complying via high efficiency heating water plant: Indicate all VAV terminals have hydronic heating coils served by heating water system with either gas-fired boiler(s) with thermal efficiency ≥ 90%, air-to-water heat pumps, or heat recovery chillers		
			If complying via high efficiency chilled water plant: Indicate all VAV air handlers have cooling coils served by chillers with rated IPLV efficiency that exceeds WSEC listed IPLV by at least 25% per Table C403.2.3(7) (note water-cooled IPLV is max, all others are min); indicate smallest chiller or compressor in plant is ≤ 20% of total plant capacity, or provide thermal storage sized for ≤ 20% of total plant capacity		
NA	C403.7, Item 16	Fault detection and diagnostics	Indicate DDC system includes a fault detection and diagnostics (FDD) system configured to monitor operation and provide fault reporting of required parameters for all VAV air handlers and VAV air terminal units in the HPVAV system		

**HVAC Equipment Energy Use Metering**

NA	C409.3.1	HVAC equipment energy use metering	For new buildings > 50,000 sf and building additions > 25,000 sf, verify energy use metering of all equipment used to provide space heating and cooling, dehumidification and ventilation will be provided per C409; indicate equipment eligible for exception		
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**Documentation and System Specific Requirement To Support Commissioning**

NA	C408.2	Scope of mechanical systems commissioning	Indicate that all mechanical systems, equipment, and controls for which the WSEC requires control functions and / or configuration to perform specific functions are required to be commissioned;		
			For buildings with ≥ 240,000 Btu/h total output cooling capacity or ≥ 300,000 Btu/h total output heating capacity, indicate that all mechanical systems regardless of individual capacity are required to be commissioned; or provide building heating / cooling capacity calculation demonstrating eligibility for exception		
NA	C403.2.10 C408.1.1 C408.1.2 C408.1.4.2 C103.6	Commissioning requirements in construction documents	Indicate in plans and specifications that Cx per C408 is required for all applicable mechanical systems;		
			Include general summary with at a minimum of Items 1 thru 4 of the Cx plan per C408.1.2 including: narrative description of activities, responsibilities of the Cx team, schedule of activities including verification of project close out documentation per C103.6, and conflict of interest plan (if required);		
			Include in general summary that a Cx project report or Compliance Checklist (Figure C408.1.4.2) shall be completed by the Certified Cx Professional and provided to the owner prior to the final mechanical inspection.		
Yes	C408.2.2	Air system and hydronic system balancing	Indicate in plans that air and fluid flow rates shall be tested and balanced within the tolerances defined in the specifications; indicate systems shall be balanced in a manner to first minimize throttling losses, then adjusted to meet design flow conditions	M-1	
Yes	C408.2.2.1	Air system balancing devices	Indicate devices that provide the capability to balance all supply air outlets, zone terminals and air handling equipment requiring system balancing	M-1	
NA	C408.2.2.2	Hydronic system balancing devices	Indicate devices that provide the capability to isolate, balance and measure flow across all hydronic equipment requiring system balancing including heating and cooling coils and pumps		
Yes	C408.2.3	Functional performance testing criteria	Identify in plans and specifications the intended operation of all equipment and controls during all modes of operation, including interfacing between new and existing-to-remain systems	M-1	

**Project Close Out Documentation**

Yes	C103.6	Documentation and project close out submittal requirements	Indicate in plans that project close out documentation and training of building operations personnel is required for all mechanical components, equipment and systems governed by this code; indicate close out documentation shall include: record documents, O&M manuals, applicable WSEC compliance forms and calculations	M-1	
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# Economizer Exceptions

# MECH-ECONO

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 Revised January 2017

<b>Project Title:</b> Cascade Christian Jr High School - Gym	<b>Date:</b> 4/27/2020
All cooling systems shall be configured to provide air economizer operation, regardless of system capacity, for new construction and mechanical system alterations. Various exceptions to this requirement are available. Identify all systems that an economizer exception will be applied to and additional information as noted below.	
For Building Dept. Use	

<b>Economizer Exception Summary</b>  Refer to Section C403.3 for descriptions of economizer provisions and exceptions. For alterations refer to Section C503.4 and Table C503.4.	<b>ECONOMIZER EXCEPTIONS - NEW CONSTRUCTION AND ADDITIONS</b>			
	<b>Exp 1</b> <i>Cooling equipment serving spaces that are provided with a dedicated outdoor air system (DOAS) per C403.6. Spaces served shall have year-round design cooling loads from lights and equipment less than 5 watts per square foot.</i>	<b>System ID</b>	<b>Lighting + Equipment Loads (W/sf)</b>	
		AH-1	2	
		AH-2	2	
	<b>Exp 2</b> <i>Single zone unitary or package systems with dehumidification that affect other systems such that air economizer would increase energy consumption.</i>	<b>System ID</b>		
<b>Exp 3</b> <i>High efficiency single zone unitary or packaged systems. Equipment cooling efficiency shall be better than the WSEC required minimum efficiency by at least 64% in Climate Zone 4C and 59% in Climate Zone 5B per Table C403.3.</i>	<b>System ID</b>			
<b>Exp 4</b> <i>Equipment that provides hydronic chilled water for chilled beams and chilled ceiling systems that is served by a water economizer system per C403.3.4 in lieu of air economizer.</i>	<b>System ID</b>			
<b>Exp 5</b> <i>Water-source heat pumps with heat recovery. Heat pump efficiency shall be 15% better than WSEC required minimum efficiency. Provide at minimum 60% air economizer. Energy recovery to preheat OSA shall have at least 50% effectiveness. Additional system requirements apply.</i>	<b>System ID</b>			
<b>Exp 6</b> <i>Cooling equipment serving Group R occupancies. Per unit limit is less than 20,000 Btu/h cooling capacity for equipment installed outdoors or in a mech room adjacent to the outdoors. For cooling equipment installed in other locations the unit limit is less than 54,000 Btu/h. Efficiency shall be 15% better than WSEC required minimum efficiency.</i>	<b>System ID</b>	<b>Equipment Location</b>	<b>Cooling Capacity (Btu/h)</b>	
<b>Exp 7</b> <i>Variable refrigerant flow (VRF) systems with energy recovery. Outdoor unit shall be a reverse-cycle heat pump with variable speed compressor(s) and condenser fan(s). Outdoor unit cooling capacity shall be not less than 65,000 Btu/h. Energy recovery to preheat outdoor air shall have at least 50% rated effectiveness. System shall be capable of providing simultaneous heating and cooling by transferring recovered energy from zone(s) in cooling mode to other zone(s) that are in heating mode.</i>	<b>Outdoor Unit System ID</b>	<b>Cooling Capacity (Btu/h)</b>		
<b>Exp 8</b> <i>Cooling equipment serving Controlled Plant Growth Environments. Equipment cooling efficiency shall be better than WSEC required minimum efficiency by at least 20%. Not eligible: unitary and applied heat pumps.</i>	<b>System ID</b>	<b>SEER, EER, &amp; IEER</b>		
<b>Exp 9</b> <i>Cooling equipment with energy recovery. Spaces served shall have year-round design cooling loads from lights and equipment greater than 5 watts per square foot. Energy recovery system shall utilize recovered energy for on-site space heating or preheating of service hot water. Provide calculations to the code official that demonstrate the amount of recovered energy used for on-site heating purposes is equivalent to the annual energy that would be saved by the cooling system with air economizer per C403.3.</i>	<b>System ID</b>	<b>Lighting + Equipment Loads (W/sf)</b>		



# Mechanical Fan System Power Allowance MECH-FANSYS-SUM

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2 & R3 over 3 stories and all R1 Revised January 2017

<b>Project Title:</b> Cascade Christian Jr High School - Gym	<b>Date:</b> 4/27/2020
	For Building Dept. Use

## HVAC Air Distribution System Schedule

*List all HVAC systems that have the capability to provide heating and/or cooling to the spaces they serve.*

System or Primary Supply Fan ID	Speed Control (Note 1)	Description (Note 2)	System Total Nameplate HP (Note 3)	Fan Power Calculation Required (Note 4)
ERV-1	CV	DOAS w/ ERV	0.21	No
ERV-2	CV	DOAS w/ ERV	0.47	No
AH-1	CV	VRF Indoor Unit	0.33	No
AH-2	CV	VRF Indoor Unit	0.33	No

*Note 1 - Constant Volume (CV), Variable Air Volume (VAV), or Hospital/Lab CV system that qualifies for VAV budget per C403.2.11.1 Exception 1. Single zone VAV systems shall comply as CV.*

*Note 2 - Describe system type and list all fans (or groups of fans) associated with the delivery and removal of conditioned air by the system. Include all supply, return/relief, exhaust and exhaust hoods (>1 hp), make-up air, dedicated outside air (DOAS), booster fans, and series fan-powered terminals. VAV parallel fan-powered terminals and economizer relief fans do not need to be included if the fans do not operate at peak conditions.*

*Note 3 - Enter the total nameplate hp of all fans associated with the delivery and removal of conditioned air by the system.*

*Note 4 - This form automatically identifies whether a MECH-FANSYS form is required to demonstrate compliance with the fan power allowance (Yes), or this information is not required because the system has a combined total nameplate motor hp that is 5 hp or less (No)*

## MECH-FANSYS Forms

*A MECH-FANSYS form shall be provided for each system with total nameplate hp greater than 5 hp. Select (Add Fan System Form) to generate an additional form. Added forms can be deleted with button in cell E32 of the added form.*



*Note 1 - Design load shall account for the building envelope, lighting, ventilation and occupancy loads of the space(s) served by the mechanical system. Heating and cooling loads shall be adjusted to account for load reduction achieved by an energy recovery system, if applicable.*

*Note 2 - Computer load calculation program, worksheet (identify source), or equivalent computation procedure in accordance with ASHRAE Standard 183.*

# Lighting Summary

# LGT-SUM

2015 Washington State Energy Code Compliance Forms for Commercial Buildings including R2, R3, R4 over 3 stories and all R1

Revised July 2016

<b>Project Info</b>  <i>Compliance forms do not require a password to use. Instructional and calculating cells are write-protected.</i>	<b>Project Title:</b> <b>CASCADE CHRISTIAN JR HIGH SCHOOL LOBBY ADDITION</b>	<b>Date:</b> <b>4/20/2020</b>
	<i>Applicant Information. Provide contact information for individual who can respond to inquiries about compliance form information provided.</i>	
	<b>Company Name:</b> <b>Boone Electric</b>	
	<b>Company Address:</b> <b>11409 58th Ave E Puyallup, WA 98373</b>	
	<b>Applicant Name:</b> <b>Suzy Fontaine</b>	
	<b>Applicant Phone:</b> <b>253-848-3036</b>	
<b>Applicant Email:</b> <b>SuzyF@boonenw.com</b>		For Building Department Use

<b>Project Description</b>	<input type="checkbox"/> New Building <input checked="" type="checkbox"/> Addition <input type="checkbox"/> Alteration <input checked="" type="checkbox"/> Plans Included
Include PROJ-SUM form (included in envelope forms workbook) with lighting compliance forms.	

<b>Building Additions</b>  <i>Refer to Section C502.2.6 for additional requirements.</i>	<b>Compliance Method</b>	Interior lighting	Exterior lighting
	Lighting systems in addition area comply with all applicable provisions as a stand alone new construction project	<input type="checkbox"/>	<input type="checkbox"/>
	Lighting systems in addition are combined with existing building lighting systems to demonstrate compliance	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Addition is combined with existing:</b> <i>For interior lighting projects, include new + existing interior lighting fixture wattage in Proposed Lighting Wattage table in LTG-INT-BLD or LTG-INT-SPACE form.                  For exterior lighting projects, include new + existing exterior lighting fixture wattage in Proposed Tradable and Proposed Non-Tradable Lighting Wattage tables in LTG-EXT form.</i>			

<b>Interior and Exterior Lighting Alterations</b>  <i>Select all Lighting Power and Lighting Control elements that apply to the scope of the retrofit project. If project includes a combination of spaces where less than 50% of the existing fixtures are replaced in some spaces, and 50% or more of the fixtures are replaced in others, then provide separate lighting power compliance forms for the two retrofit conditions. Spaces undergoing the same type of retrofit may be combined into one lighting power compliance form.</i>  <i>Refer to Section C503.6 for additional requirements.</i>  <i>All alteration lighting controls shall be commissioned per C408.3.</i>	<b>Lighting Power</b>	Interior lighting	Parking garage	Exterior lighting
	50% or more of existing are replaced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Less than 50% of existing are replaced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Lamp and/or ballast replacement only – existing total wattage not increased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>50% or more replaced</b> - Total lighting power of new + existing-to-remain fixtures shall comply with total LPA per Sections C405.4.2 and C405.5.2. Include new + existing-to-remain fixtures in Proposed Lighting Wattage table in LTG-INT-BLD, LTG-INT-SPACE or LTG-EXT form. <b>Less than 50% replaced</b> - Total lighting power of new + existing-to-remain fixtures shall not exceed the total lighting power prior to alteration. Include new + existing-to-remain fixtures in the Proposed Lighting Wattage table in LTG-INT-BLD, LTG-INT-SPACE or LTG-EXT form. <b>50% threshold</b> applies to number of luminaires for interior spaces and parking garages, and total installed wattage for exterior luminaires.			

<input type="checkbox"/> <b>No changes are being made to the interior or exterior lighting systems and existing space uses and configuration are not changed.</b>	<b>Lighting Controls</b>	Interior lighting	Parking garage	Exterior lighting
	New wiring installed to serve added fixtures and/or fixtures relocated to new circuit(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	New or moved lighting panel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Interior space is reconfigured - luminaires unchanged or relocated	<input type="checkbox"/>		
	<b>New wiring or circuit</b> - For interior lighting, provide required manual controls per C405.2.3, occupancy sensor controls per C405.2.1, daylight responsive controls per C405.2.4 and application specific lighting controls per C405.2.5. For exterior lighting, provide required controls per C405.2.7. <b>New or moved panel</b> - Provide all applicable lighting controls as noted for New Wiring and automatic time switch controls per C405.2.2. <b>Reconfigured interior space</b> - Provide all required lighting controls that apply to a new interior space. Application specific lighting control provisions per C405.2.5 do not apply to reconfigured			

<b>Change of Space Use</b>	<input type="checkbox"/> Existing interior lighting systems in areas under-going a change in space use are upgraded to comply with LPAs for the new space types per Tables C405.4.2(1) or C405.4.2(2).  Identify interior spaces requiring LPD upgrade to the current Code in Proposed Lighting Wattage table in LTG-INT-BLD or LTG-INT-SPACE form.
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maximum load, or other the wattage limit or permanent current limiting device.

Note 8 - Lobby Art/Exhibit Display Allowance is independent of the Maximum Allowed Lighting Wattage.

Note 9 - Calculation Area Details:

- a. Lighting fixtures in a building addition may comply as a stand alone project, or they may be combined with the overall existing building lighting systems to demonstrate compliance. Refer to C502.1.