

# Instructions for Electronic Forms

2009 Washington State Energy Code Compliance Forms for Nonresidential and Multifamily Residential

Revised December 2010

<b>Intro</b>	<p>Chapters 11-15 of the 2009 Washington State Energy Code apply to all nonresidential occupancies and to all multifamily residential occupancies except those within the scope of the IRC (single family residential, duplexes, attached townhouses).</p> <p>This file, LTG09.XLS, has electronic compliance forms for Chapter 15 (lighting system, motors, and transformers). There are three companion templates to this file: MTR09.XLS (Chapter 12 metering requirements); ENV09.XLS (envelope requirements); MECH09.XLS (Chapter 14 mechanical systems requirements).</p> <p>This form is a compliance aid and is not a substitute for the full energy code text or specific jurisdiction compliance requirements. Users should refer to the code text and contact the local jurisdiction for complete information. The full 2009 WSEC code text is available for download from:  <a href="http://www.neec.net/sites/default/files/neec_codes/WA-EnergyCodes2009.pdf">Download 2009 WSEC from http://www.neec.net/sites/default/files/neec_codes/WA-EnergyCodes2009.pdf</a></p>
<b>Start-up</b>	<p>Open a working copy of this file and be sure to use Save As to save it to a new file name. Alternatively, you can save the file as a template in the XLSTART subdirectory in the EXCEL directory, and open new copies with the "File New" menu command. Look for "LTG09".</p>
<b>Overview</b>	<p>This workbook file contains multiple worksheets. Each worksheet is indicated by a tab at the bottom of the screen. (If you don't see the tabs, visit menu option "Tools-Options-View-Sheet Tabs".) You may visit each form by clicking on its tab.</p> <p>Most calculations are automated. The spaces which display the results of calculations are not editable. Some adjustments to formatting have been made to facilitate electronic filling and calculation of the forms.</p>
<b>Save Files</b>	<p>Each time you open this file and start filling forms, you must save it under a new filename of your choosing using File Save As. The original template file cannot be altered. You may also save your own versions of the forms this way.</p>
<b>Getting Around</b>	<p>Each form has two pages (front and back). Both pages are available on screen when you click the tab for a form. Use the scroll bars to find the second page. It is either to the right, below, or sometimes to the right and below the first page.</p>
<b>Filling Fields</b>	<p>All project info and the date for all forms is entered once on "PRJ-SUM" and automatically reproduced on the other forms. Always fill in the heading of PRJ-SUM, even if you will not be using that form. The other forms have a reminder to do this.</p> <p>Only fillable fields are accessible. If you try to edit any other field, you'll get an error message. You may use the TAB key to move to the next fillable field. If the TAB doesn't take you where you want to go, use the mouse.</p> <p>Avoid excessively long text strings when entering information. In some cases, text that extends beyond the available space will simply not be seen. In most cases, the text will wrap within the cell. This may force part of the form onto a new page.</p> <p>To enter the date, use this format: mm/dd/yyyy. For example, you would enter 7/1/2006 or 12/15/2007.</p> <p>Check boxes can be either blank, or checked-off with an "x" shown in the box. To toggle between cases, click the box with your mouse. Radio buttons (circles) are either filled or unfilled. Only one in a set may be filled.</p> <p>Drop-down lists have an arrow at the right side of the space. Click the arrow with your mouse and select the appropriate option. One of the options is a blank.</p> <p>When a form has a space for notes or explanation, click anywhere in the space to edit. Your cursor will become a text editing insertion bar and you can edit as with a word processor.</p>
<b>Personalizing</b>	<p>You can personalize the forms with your company name, address, phone, or any other information. This is done by editing the footer using File Page Setup Header/Footer. You can then save the file under a new template name and re-use it again.</p>
<b>Adding Lines and Removing</b>	<p>Many tables, such as for listing equipment types, have a certain number of lines for entering data. There may not always be enough lines for all the entries you need to make. With this electronic version, you can add additional lines to the table.</p> <p>To add additional lines where this feature is available, click on the "+" button with your mouse. This button is located to the right of the sheet. If you can't see it, scroll right (or change the View Zoom setting to 83%).</p> <p>To remove lines that you have added, click on the "-" button with your mouse. You cannot remove lines that were not added; an error appears if you try.</p> <p>If you add additional lines with this method, the pagination will usually be affected. The forms will be forced to carry additional lines over to other pages. Be sure to submit all pages to the plans examiner.</p>
<b>Printing</b>	<p>The forms should print on any printer supported by Windows. You will need to have the following TrueType fonts installed under Windows: Arial, Times New Roman, Courier New and Wingdings. These are all standard Windows fonts.</p> <p>If you are losing form or flowchart details when printing, you may have a shortage of printer memory. Try printing problem pages individually.</p> <p>By default, only selected forms are printed. To select one or more forms, hold down the Ctrl key and click the tabs of the worksheets you need. Issue the File Print Selected Sheets command. To print the entire set, use File Print Entire Workbook.</p>
<b>Clean Forms</b>	<p>It is possible to print clean, blank versions of these forms for hand filling. To do so, delete all of the heading information at the beginning of PRJ-SUM, and make sure that all fillable cells in the forms are empty. Then print the clean forms.</p> <p>For each radio button group, there is a button labeled "Clear". Clicking this button will clear the other buttons so that they will print as empty circles. The "Clear" button will not print.</p>
<b>Partial Form Sets</b>	<p>Forms in a workbook may not be deleted, because the file is locked, B3but you need not print all the forms, as explained in "Printing" above.</p>
<b>Re-Calculation</b>	<p>As this is a large file, it may respond slowly to changes if it is set to automatically re-calculate after every action. To set calculation to manual, visit the "Tools-Options-Calculation" menu item. Then manually recalculate using the F9 key.</p>

# Project Summary

# PRJ-SUM

<b>Project Info</b>	Project Address	Date
		For Building Department Use
	Applicant Name:	
	Applicant Address:	
Applicant Phone:		

# Interior Lighting Summary

# LTG-INT

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<b>Project Info</b>	Project Address	Date
		For Building Department Use
	Applicant Name:	
	Applicant Address:	
	Applicant Phone:	

<b>Project Description</b>	<input type="radio"/> New Building <input type="radio"/> Addition <input type="radio"/> Alteration <input type="checkbox"/> Plans Included Refer to WSEC Section 1513 for controls and commissioning requirements.
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<b>Compliance Option</b>	<input type="radio"/> Prescriptive <input type="radio"/> Lighting Power Allowance <input type="radio"/> Systems Analysis (See Qualification Checklist (over). Indicate Prescriptive & LPA spaces clearly on plans.)
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<b>Alteration Exceptions</b> (check appropriate box - sec. 1132.3)	<input type="checkbox"/> No changes are being made to the lighting and space use not changed <input type="checkbox"/> Less than 60% of the fixtures new, installed wattage not increased, & space use not changed.
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## Maximum Allowed Lighting Wattage

Location (floor plan/room #)	Occupancy Description	Allowed Watts per ft <sup>2</sup> **	Gross Interior Area in ft <sup>2</sup>	Allowed x Area
** From Table 15-1 (over) - document all exceptions on form LTG-LPA			Total Allowed Watts	

## Proposed Lighting Wattage

Location (floor plan/room #)	Fixture Description	Number of Fixtures	Watts/ Fixture	Watts Proposed
Total Proposed Watts may not exceed Total Allowed Watts for Interior			Total Proposed Watts	

- Notes:
1. For proposed Fixture Description, indicate fixture type, lamp type (e.g. T-8), number of lamps in the fixture, and ballast type (if included). For track lighting, list the length of the track (in feet) in addition to the fixture, lamp, and ballast information.
  2. For proposed Watts/Fixture, use manufacturer's listed maximum input wattage of the fixture (not simply the lamp wattage) and other criteria as specified in Section 1530. For line voltage track lighting, list the greater of actual luminaire wattage or length of track multiplied by 50, or as applicable, the wattage of current limiting devices or of the transformer. For low voltage track lighting list the transformer rated wattage.
  3. List all fixtures. For exempt lighting, note section and exception number, and leave Watts/Fixture blank.

**Interior Lighting Summary (back)****LTG-INT**

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<b>Prescriptive Spaces</b>	Occupancy: <input type="radio"/> Warehouse or Parking Garage <input type="radio"/> Other
<b>Qualification Checklist</b> Note: If occupancy type is "Other" and fixture answer is checked, the number of fixtures in the space is not limited by Code. Clearly indicate these spaces on plans. If not qualified, do LPA Calculations.	Lighting Fixtures: (Section 1521) <input type="checkbox"/> Check if 95% or more of fixtures comply with 1,2 or 3 and rest are ballasted. 1. Fluorescent fixtures with a) 1 or 2 two lamps, b) reflector or louvers, c) 5-60 watt T-1, T-2, T-4, T-5, T-8, or CFL lamps, and d) hard-wired electronic dimming ballasts. Screw-in CFL fixtures and tracking lighting do not qualify. 2. Metal Halide with a) reflector b) ceramic MH lamps <=150w c) electronic ballasts 3. LED lights.

**TABLE 15-1 Unit Lighting Power Allowance (LPA)**

Use <sup>1</sup>	LPA <sup>2</sup> (W/ft <sup>2</sup> )	Use <sup>1</sup>	LPA <sup>2</sup> (W/ft <sup>2</sup> )
Automotive facility	0.85	Office buildings, office/administrative areas in facilities of other use types (including but not limited to schools, hospitals, institutions, museums, banks, churches) <sup>5</sup>	0.91
Convention center	1.10	Parking garages	0.20
Courthouse	1.10	Penitentiary and other Group I-3 Occupancies	0.90
Cafeterias, fast food establishments <sup>5</sup> , restaurants/bars <sup>5</sup>	1.20	Police and fire stations	0.90
Dormitory	0.85	Post office	1.00
Dwelling Units	1.00	Retail <sup>10</sup> , retail banking, mall concourses, wholesale stores (pallet rack shelving)	1.33
Exercise center	0.95	School buildings (Group E Occupancy only), school classrooms, day care centers	1.00
Gymnasias, assembly spaces	0.95	Theater, motion picture	0.97
Health care clinic	1.00	Theater, performing arts	1.25
Hospital, nursing homes, and other Group I-1 and I-2 Occupancies	1.20	Transportation	0.80
Hotel/motel	1.00	Warehouses	0.50
Laboratory spaces (all spaces not classified "laboratory" shall meet office and other appropriate categories)	1.62	Workshops	1.20
Laundries	1.20		
Libraries <sup>9</sup>	1.20	<b>Plans Submitted for Common Areas Only<sup>7</sup></b>	
Manufacturing facility	1.20	Main floor building lobbies <sup>3</sup> (except mall concourses)	1.10
Museum	1.00	Common areas, corridors, toilet facilities and washrooms, elevator lobbies	0.80

**Footnotes for Table 15-1**

- In cases in which a general use and a specific use are listed, the specific use shall apply. In cases in which a use is not mentioned specifically, the Unit Power Allowance shall be determined by the building official. This determination shall be based upon the most comparable use specified in the table. See Section 1512 for exempt areas.
- The watts per square foot may be increased, by 2% per foot of ceiling height above 20 feet, unless specifically directed otherwise by subsequent footnotes.
- Watts per square foot of room may be increased by 2% per foot of ceiling height above 12 feet.
- For all other spaces, such as seating and common areas, use the Unit Light Power Allowance for assembly.
- Watts per square foot of room may be increased by 2% per foot of ceiling height above 9 feet.
- Reserved.
- For conference rooms and offices less than 150ft<sup>2</sup> with full height partitions, a Unit Lighting Power Allowance of 1.1 w/ft<sup>2</sup> may be used.
- Reserved.
- For indoor sport tournament courts with adjacent spectator seating over 5,000, the *Unit Lighting Power Allowance* for the court area is 2.60 W/ft<sup>2</sup>.
- Display window illumination installed within 2 feet of the window, provided that the display window is separated from the retail space by walls or at least three-quarter-height partitions (transparent or opaque) and lighting for free-standing display where the lighting moves with the display are exempt.

An additional lighting power allowance is allowed for merchandise display luminaires installed in retail sales areas that are specifically designed and directed to highlight merchandise. The following additional wattages apply:

- 0.6 watts per square foot of sales floor area not listed in items ii and iii below;
- 1.4 watts per square foot of furniture, clothing, cosmetics or artwork floor area; or
- 2.5 watts per square foot of jewelry, crystal or china floor area.

The specified floor area for items i, ii, or iii above, and the adjoining circulation paths shall be identified and specified on building plans. Calculate the additional power allowance by multiplying the above LPDs by the sales floor area for each department excluding major circulation paths. The total additional lighting power allowance is the sum of allowances for sales categories i, ii, or iii plus an additional 1,000 watts for each separate tenant larger than 250 square feet in area.

The additional wattage is allowed only if the merchandise display luminaires comply with all of the following:

- Located on ceiling-mounted track or directly on or recessed into the ceiling itself (not on the wall).
- Adjustable in both the horizontal and vertical axes (vertical axis only is acceptable for fluorescent and other fixtures with two points of track attachment).

This additional lighting power is allowed only if the lighting is actually installed and automatically controlled, separately from the general lighting, to be turned off during nonbusiness hours. This additional power shall be used only for the specified luminaires and shall not be used for any other purpose.

This additional lighting power is allowed only if the lighting is actually installed.

- Provided that a floor plan, indicating rack location and height, is submitted, the square footage for a warehouse may be defined, for computing the interior Unit Lighting Power Allowance, as the floor area not covered by racks plus the vertical face area (access side only) of the racks. The height allowance defined in footnote 2 applies only to the floor area not covered by racks.

# Exterior Lighting Summary

# LTG-EXT

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<b>Project Info</b>	Proj Address	Date
		For Building Department Use
	Name:	
	Appl. Name	
	Appl. Phone	

<b>Project Description</b>	<input type="checkbox"/> New <input type="checkbox"/> Addition <input type="checkbox"/> Alteration <input type="checkbox"/> Plans Included
Refer to WSEC Section 1513 for controls and commissioning requirements.	

<b>Lighting Zone</b> (as specified by Jurisdiction)	<input type="radio"/> Zone 1 <input type="radio"/> Zone 2 <input type="radio"/> Zone 3 <input type="radio"/> Zone 4
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<b>Compliance Option</b>	<input type="radio"/> Lighting Power Allowance <input type="radio"/> Systems Analysis
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<b>Building Grounds</b> (luminaires > 100 Watts)	<input type="checkbox"/> Efficacy > 60 lumens/W <input type="checkbox"/> Controlled by motion sensor
	<input type="checkbox"/> Exemption (list) _____

<b>Alteration Exceptions</b> (check appropriate box - sec. 1132.3)	<input type="checkbox"/> No changes are being made to the lighting and space use not changed.
	<input type="checkbox"/> Less than 60% of fixtures are new, installed wattage not increased, & space use not changed.

**Tradable Maximum Allowed Lighting Wattage** Base Site Allowance: \_\_\_\_\_

Tradable Surfaces	Description	Allowed Watts per ft <sup>2</sup> or per lf	Area (ft <sup>2</sup> ), perimeter (lf) or # of items	Allowed Watts x ft <sup>2</sup> (or x lf)

Total Allowed Tradable Watts: \_\_\_\_\_

**Tradable Proposed Lighting Wattage** (use mfg listed maximum input wattage for luminaire.)

Surface	Fixture Description	Number of Fixtures	Watts/ Fixture	Watts Proposed

Total proposed tradable watts may not exceed the sum of total allowed tradable watts plus the base site allowance. Any base site allowance not needed to make tradable watts comply can be applied to individual non-tradable categories. Total Proposed Tradable Watts: \_\_\_\_\_

**Non-Tradable Maximum Allowed Lighting Wattage**

Base Site Allowance Remaining: \_\_\_\_\_

Non-Tradable Surfaces	Description	Allowed Watts per ft <sup>2</sup> or per lf	Area (ft <sup>2</sup> ), perimeter (lf) or # of items	Allowed Watts x ft <sup>2</sup> (or x lf)

**Non-Tradable Proposed Lighting Wattage**

Surface	Fixture Description	Number of Fixtures	Watts/ Fixture	Watts Proposed

Non-tradable proposed watts may not exceed allowed watts for any individual surface unless the total excess watts for all non-tradable surfaces are less than the remaining site allowance.

Total excess Non-Tradable watts: \_\_\_\_\_

Site Allowance Balance: \_\_\_\_\_

**Exterior Lighting Summary (back)****LTG-EXT****TABLE 15-2B  
LIGHTING POWER DENSITIES FOR BUILDING EXTERIORS**

Specific area description		Zone 1	Zone 2	Zone 3	Zone 4	
<b>Base site allowance<sup>1</sup></b>		500 W	600 W	750 W	1300 W	
<b>Tradable Surfaces<sup>2</sup></b>						
<b>Uncovered Parking Areas</b>		Parking lots and drives	0.04 W/ft <sup>2</sup>	0.06 W/ft <sup>2</sup>	0.10 W/ft <sup>2</sup>	0.13 W/ft <sup>2</sup>
<b>Building Grounds</b>	Walkways less than 10 ft wide	0.7 W/linear foot	0.7 W/linear foot	0.8 W/linear foot	1.0 W/linear foot	
	Walkways 10 ft wide or greater Plaza areas Special feature areas	0.14 W/ft <sup>2</sup>	0.14 W/ft <sup>2</sup>	0.16 W/ft <sup>2</sup>	0.2 W/ft <sup>2</sup>	
	Exterior Stairways	0.75 W/ft <sup>2</sup>	1.0 W/ft <sup>2</sup>	1.0 W/ft <sup>2</sup>	1.0 W/ft <sup>2</sup>	
	Pedestrian tunnel	0.15 W/ft <sup>2</sup>	0.15 W/ft <sup>2</sup>	0.2 W/ft <sup>2</sup>	0.3 W/ft <sup>2</sup>	
	Landscaping	0.04 W/ft <sup>2</sup>	0.05 W/ft <sup>2</sup>	0.05 W/ft <sup>2</sup>	0.05 W/ft <sup>2</sup>	
<b>Building Entrances and Exits</b>	Main entries	20 W/linear foot of door width	20 W/linear foot of door width	30 W/linear foot of door width	30 W/linear foot of door width	
	Other doors	20 W/linear foot of door width	20 W/linear foot of door width	20 W/linear foot of door width	20 W/linear foot of door width	
	Entry canopies	0.25 W/ft <sup>2</sup>	0.25 W/ft <sup>2</sup>	0.4 W/ft <sup>2</sup>	0.4 W/ft <sup>2</sup>	
<b>Sales Canopies</b>	Free standing and attached	0.6 W/ft <sup>2</sup>	0.6 W/ft <sup>2</sup>	0.8 W/ft <sup>2</sup>	1.0 W/ft <sup>2</sup>	
<b>Outdoor Sales</b>	Open areas <sup>3</sup>	0.25 W/ft <sup>2</sup>	0.25 W/ft <sup>2</sup>	0.5 W/ft <sup>2</sup>	0.7 W/ft <sup>2</sup>	
	Street frontage for vehicle sales lots in addition to "open area" allowance	No Allowance	10 W/linear foot	10 W/linear foot	30 W/linear foot	
<b>Non-Tradable Surfaces<sup>4</sup></b>						
<b>Building Facades</b>		No Allowance	0.1 W/ft <sup>2</sup> for each illuminated wall or surface <sup>5</sup>	0.15 W/ft <sup>2</sup> for each illuminated wall or surface <sup>6</sup>	0.2 W/ft <sup>2</sup> for each illuminated wall or surface <sup>7</sup>	
<b>Automated teller machines and night depositories</b>		270 W per location <sup>8</sup>	270 W per location <sup>8</sup>	270 W per location <sup>8</sup>	270 W per location <sup>8</sup>	
<b>Entrances and gatehouse inspection stations at guarded facilities</b>		0.75 W/ft <sup>2</sup> of covered & uncovered area				
<b>Loading areas for law enforcement, fire, ambulance and other emergency service vehicles</b>		0.5 W/ft <sup>2</sup> of covered & uncovered area				
<b>Material handling and associated storage</b>		No Allowance	No Allowance	No Allowance	0.5 W/ft <sup>2</sup>	
<b>Drive-up Windows &amp; Doors</b>		400W per drive-through				
<b>Parking near 24-hour retail entrances</b>		800 W per main entry				

## FOOTNOTES FOR TABLE 15-2B:

1. Base site allowance may be used in tradable or nontradable surfaces.
2. Lighting power densities for uncovered parking areas, building grounds, building entrances and exits, canopies and overhangs and outdoor sales areas may be traded.
3. Including vehicle sales lots.
4. Lighting power density calculations for the following applications can be used only for the specific application and cannot be traded between surfaces or with other exterior lighting. The following allowances are in addition to any allowance otherwise permitted in the "Tradable Surfaces" section of this table.
5. May alternately use 2.5 watts per linear foot for each wall or surface length.
6. May alternately use 3.75 watts per linear foot for each wall or surface length.
7. May alternately use 5 watts per linear foot for each wall or surface length.
8. An additional 90 watts is allowed per additional ATM location.



# Lighting, Motor, and Transformer Permit Plans Checklist LTG-CHK

2009 Washington State Energy Code Compliance Forms for Nonresidential and Multifamily Residential Revised December 2010

Project Address	Date
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The following information is necessary to check a permit application for compliance with the lighting, motor, and transformer requirements in the 2009 Washington State Nonresidential Energy Code.

Applicability (yes, no, n.a.)	Code Section	Component	Information Required	Location on Plans	Building Department Notes
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**LIGHTING CONTROLS (Section 1513)**

	1513.1	Local control/access	Schedule with type, indicate locations		
	1513.2	Area controls	Maximum limit per switch		
	1513.3	Daylight zone control	Schedule with type and features, indicate locations		
		vertical glazing	Indicate vertical glazing on plans		
		overhead glazing	Indicate overhead glazing on plans		
	1513.4	Display/exhib/special	Indicate separate controls		
	1513.5	Exterior shut-off	Schedule with type and features, indicate location		
		(a) timer w/backup	Indicate location		
		(b) photocell.	Indicate location		
	1513.6	Inter. auto shut-off	Indicate location		
	1513.6.1	(a) occup. sensors	Schedule with type and locations		
	1513.6.2	(b) auto. switches	Schedule with type and features (back-up, override capability); Indicate size of zone on plans		
	1513.7	Hotel/motel controls	Indicate location of room master controls		
	1513.8	Commissioning	Indicate requirements for lighting controls commissioning		

**EXIT SIGNS (Section 1514)**

	1514	Max. watts	Indicate watts for each exit sign		
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**LIGHTING POWER ALLOWANCE (Section 1530-1532)**

	1531	Interior Lighting Summary Form	Completed and attached. Schedule with fixture types, lamps, ballasts, watts per fixture		
	1532	Exterior Lighting Summary Form	Completed and attached. Schedule with fixture types, lamps, ballasts, watts per fixture		

**MOTORS (Section 1511)**

	1511	Elec motor efficiency	MECH-MOT or Equipment Schedule with hp, rpm, efficiency		
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**TRANSFORMERS (Section 1540)**

	1540	Transformers	Indicate size and efficiency		
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**If "no" is circled for any question, provide explanation:**