

BUILDING ENERGY ANALYSIS REPORT

PROJECT:

Large Retail
South Mall Shopping Center
Rohnert Park, CA 92344

Project Designer:

Architecture for All
123 5th St.
Santa Rosa, CA 95433
(707) 222-1212

Report Prepared by:

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EnergySoft, LLC
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Novato, CA 94945
(415) 897-6400

Job Number:

05221

Date:

10/25/2016

The EnergyPro computer program has been used to perform the calculations summarized in this compliance report. This program has approval and is authorized by the California Energy Commission for use with both the Residential and Nonresidential 2016 Building Energy Efficiency Standards.

This program developed by EnergySoft Software – www.energysoft.com.

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ENVELOPE COMPONENT APPROACH

CEC-NRCC-ENV-01-E (Revised 01/16)



CALIFORNIA ENERGY COMMISSION

| | |
|--|----------------------------------|
| CERTIFICATE OF COMPLIANCE | NRCC-ENV-01-E |
| Envelope Component Approach (Page 1 of 4) | |
| Project Name: Large Retail | Date Prepared: 10/25/2016 |

| A. GENERAL INFORMATION | | | | | |
|------------------------|-------------------------------|---|----|---|---|
| 01 | Project Location: | South Mall Shopping Center | 06 | Compliance Method: | <input checked="" type="checkbox"/> Component <input type="checkbox"/> Unconditioned (file Affidavit) |
| 02 | CA City and Zip Code: | Rohnert Park, 92344 | 07 | Building Front Orientation (deg or cardinal): | 0 deg |
| 03 | Climate Zone: | 12 | 08 | Phase of Construction: | <input checked="" type="checkbox"/> New Construction <input type="checkbox"/> Addition <input type="checkbox"/> Alteration |
| 04 | Total Conditioned Floor Area: | 50,000 | 09 | Building Occupancy: | <input checked="" type="checkbox"/> Nonresidential <input type="checkbox"/> High-Rise Residential <input type="checkbox"/> Hotel/Motel Guest Room |
| 05 | Building Type: | <input type="checkbox"/> Schools (Public School) <input type="checkbox"/> Relocatable Public School Bldg. <input checked="" type="checkbox"/> Conditioned Spaces <input type="checkbox"/> Unconditioned Spaces <input checked="" type="checkbox"/> Skylight Area for Large Enclosed Space > 5000 ft ² (If checked include the NRCC-ENV-04-E with submittal) | | | |

| B. ENVELOPE DETAILS – FRAMED | | | | | | | | | | | |
|------------------------------|---------------|----------------|-------------|---------------|----------------|-------------------------------|-------------------------|------|----------|--------------------------------------|---------------------------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | | 09 | 10 | 11 |
| Tag/ID | Assembly Type | Frame Material | Frame Depth | Frame Spacing | Cavity R-value | Continuous Insulation R-value | Appendix JA 4 Reference | | Proposed | Required | Field Inspection Comments |
| | | | | | | | Table | Cell | U-Factor | U-Factor from Tables 140.3-B, C or D | |
| 1 | Wall | Wood | 2x4 @ 16 | | 4.3.1-A3 | 13 | 0.0 | | 0.102 | 0.102 | R-13 Wall |
| 2 | Wall | Metal | 2x6 @ 16 | | 4.3.3-A6 | 19 | 0.0 | | 0.183 | 0.062 | R-19 Wall Metal Stud |
| 3 | Wall | Metal | 2x4 @ 16 | | 4.3.3-A4 | 13 | 0.0 | | 0.217 | 0.217 | R-13 Wall Metal Stud |

| C. ENVELOPE DETAILS – NON-FRAMED | | | | | | | | | | |
|----------------------------------|---------------|--------------------|--------------------|-------------------------------------|-------------------------------|------------------------|------|----------|--------------------------------------|---------------------------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | | 08 | 09 | 10 |
| Tag/ID | Assembly Type | Assembly Materials | Thickness (inches) | Interior or Core Insulation R-value | Continuous Insulation R-value | Appendix JA4 Reference | | Proposed | Required | Field Inspection Comments |
| | | | | | | Table | Cell | U-Factor | U-Factor from Tables 140.3-B, C or D | |
| 1 | Door | Wood, 1-3/4 in. | | 0 | 0.0 | 4.5.1-A4 | | 0.500 | 0.700 | Wood Door |
| | | | | | | | | | | |
| | | | | | | | | | | |

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CEC-NRCC-ENV-01-E (Revised 01/16)



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| CERTIFICATE OF COMPLIANCE | NRCC-ENV-01-E |
| Envelope Component Approach (Page 1 of 4) | |
| Project Name: Large Retail | Date Prepared: 10/25/2016 |

| A. GENERAL INFORMATION | | | | | |
|------------------------|-------------------------------|---|----|---|---|
| 01 | Project Location: | South Mall Shopping Center | 06 | Compliance Method: | <input checked="" type="checkbox"/> Component <input type="checkbox"/> Unconditioned (file Affidavit) |
| 02 | CA City and Zip Code: | Rohnert Park, 92344 | 07 | Building Front Orientation (deg or cardinal): | 0 deg |
| 03 | Climate Zone: | 12 | 08 | Phase of Construction: | <input checked="" type="checkbox"/> New Construction <input type="checkbox"/> Addition <input type="checkbox"/> Alteration |
| 04 | Total Conditioned Floor Area: | 50,000 | 09 | Building Occupancy: | <input checked="" type="checkbox"/> Nonresidential <input type="checkbox"/> High-Rise Residential <input type="checkbox"/> Hotel/Motel Guest Room |
| 05 | Building Type: | <input type="checkbox"/> Schools (Public School) <input type="checkbox"/> Relocatable Public School Bldg. <input checked="" type="checkbox"/> Conditioned Spaces <input type="checkbox"/> Unconditioned Spaces <input checked="" type="checkbox"/> Skylight Area for Large Enclosed Space > 5000 ft ² (If checked include the NRCC-ENV-04-E with submittal) | | | |

| B. ENVELOPE DETAILS – FRAMED | | | | | | | | | | | |
|------------------------------|---------------|----------------|-------------|---------------|----------------|-------------------------------|-------------------------|------|----------|--------------------------------------|---------------------------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | | 09 | 10 | 11 |
| Tag/ID | Assembly Type | Frame Material | Frame Depth | Frame Spacing | Cavity R-value | Continuous Insulation R-value | Appendix JA 4 Reference | | Proposed | Required | Field Inspection Comments |
| | | | | | | | Table | Cell | U-Factor | U-Factor from Tables 140.3-B, C or D | |
| 4 | Roof | None | No Fireprc | | 4.2.6-A7 | 0 | 16.0 | | 0.054 | 0.055 | R-16 Metal Deck Roof |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| C. ENVELOPE DETAILS – NON-FRAMED | | | | | | | | | | |
|----------------------------------|---------------|--------------------|--------------------|-------------------------------------|-------------------------------|------------------------|------|----------|--------------------------------------|---------------------------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | | 08 | 09 | 10 |
| Tag/ID | Assembly Type | Assembly Materials | Thickness (inches) | Interior or Core Insulation R-value | Continuous Insulation R-value | Appendix JA4 Reference | | Proposed | Required | Field Inspection Comments |
| | | | | | | Table | Cell | U-Factor | U-Factor from Tables 140.3-B, C or D | |
| | | | | | | | | | | |
| | | | | | | | | | | |
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| CERTIFICATE OF COMPLIANCE | NRCC-ENV-01-E |
| Envelope Component Approach | |
| Project Name: Large Retail | Date Prepared: 10/25/2016 |
| (Page 2 of 4) | |

| D. ENVELOPE DETAILS – MASS | | | | | | | | | | | |
|-----------------------------------|-----------|----------------------------------|-------------------------------|--|-----------------------------------|-----------------------------------|---------------------------|------|----------|---|---------------------------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | | 09 | 10 | 11 |
| Tag/ID | Mass Type | Density (lb/ft ³) | Mass Thickness (inches) | Furring Strip Thickness (inches) | Interior Insulation R-value | Exterior Insulation R-value | Appendix JA4 Reference | | Proposed | Required | Field Inspection Comments |
| | | | | | | | Table | Cell | U-factor | U-Factor from Tables 140.3-B, C or D | |
| | | | | | | | | | | | |

| E. ROOFING PRODUCTS (COOL ROOF) | | | | | | | | | | | |
|---|------------|---------------------------|--------------|---------------------------|----------------------|--------------------------------|---------------------------|----------------------|-------------------|----------|----|
| 01 | 02 | 03 | 04 | 05 | | | 06 | | | 10 | 11 |
| Mass Roof 25 lb/ft ² or Greater | Roof Pitch | CRRC Product ID Number | Product Type | Proposed | | | Minimum Required | | | Comments | |
| | | | | Aged Solar Reflectance | Thermal Emittance | SRI ² (Optional) | Aged Solar Reflectance | Thermal Emittance | SRI (optional) | | |
| <input type="checkbox"/> | | | | <input type="checkbox"/> | | | | | | | |
| <input type="checkbox"/> | | | | <input type="checkbox"/> | | | | | | | |
| <input type="checkbox"/> | | | | <input type="checkbox"/> | | | | | | | |
| <input type="checkbox"/> An aged solar reflectance less than 0.63 is allowed provided the maximum roof / ceiling U-factor in TABLE 140.3 is not exceeded | | | | | | | | | | | |
| <input type="checkbox"/> High-rise residential buildings and Hotels and Motels with low-sloped roofs in Climate Zones 1 through 8, 12 and 16 are exempted from aged Solar Reflectance and thermal emittance requirements. | | | | | | | | | | | |
| <input type="checkbox"/> High-rise residential buildings and Hotels/Motels with steep-sloped roofs in Climate Zones 1 and 16 are exempt from aged Solar Reflectance and thermal emittance requirements. | | | | | | | | | | | |
| <input type="checkbox"/> The roof area covered by building integrated photovoltaic panels and building integrated solar thermal panels are exempt from aged Solar Reflectance and thermal emittance requirements | | | | | | | | | | | |
| To apply Liquid Field Applied Coatings, the coating must be applied across the entire roof surface and meet the dry mil thickness or coverage recommended by the coatings manufacturer and meet minimum performance requirements listed in §110.8(i)4. Select the applicable coating: | | | | | | | | | | | |
| <input type="checkbox"/> Aluminum-Pigmented Asphalt Roof Coating <input type="checkbox"/> Cement-Based Roof Coating <input type="checkbox"/> Other _____ | | | | | | | | | | | |

NOTES:

1. Check the box if the aged Solar reflectance was not available in the Cool Roof Rating Council's Rated Product Directory, Then use the equation in Section 110.8(i)2 where the Initial Reflectance value from the same directory and use the equation $(0.2+B(\rho_{initial} - 0.2))$ to obtain a calculated aged solar reflectance value. Where ρ is the Initial Solar Reflectance and B is either set to 0.65 for Field-Applied Coatings or it is set to 0.70 for all other roofing products other than Field-Applied Coating.
2. Calculate the SRI Value by using the SRI Calculator Worksheet at (http://energy.ca.gov/title24/2016standards/documents/solar_reflectance/) and enter the resulting value in the SRI column above and attach a copy of the SRI-Worksheet (NRCC-ENV-03-E) to the to this compliance document.

ENVELOPE COMPONENT APPROACH

CEC-NRCC-ENV-01-E (Revised 01/16)



CALIFORNIA ENERGY COMMISSION

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| CERTIFICATE OF COMPLIANCE | | NRCC-ENV-01-E |
| Envelope Component Approach | | (Page 3 of 4) |
| Project Name: Large Retail | Date Prepared: 10/25/2016 | |

| F. AIR BARRIER | | | | |
|----------------|---------------------------|---------------------------|------------------------------------|----------|
| 01 | 02 | 03 | 04 | 05 |
| Name | Air Barrier Material Type | Air Barrier Assembly Type | Whole Building Air Leakage Testing | Comments |
| | | | | |
| | | | | |

| G. FENESTRATION PROPOSED AREAS AND EFFICIENCIES | | | | | | | | | | | |
|---|------------------------------|--------------|--------------------------------------|------------|--------------|--------------|--------|-------|----------|------------------|----------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| Tag/ID | Fenestration Type | Surface Area | Orientation N, S, W, E or Roof | # of Panes | Proposed | | | | Overhang | Condition Status | Comments |
| | | | | | Max U-Factor | Max (R) SHGC | Min VT | Label | | | |
| 1 | WC 5300 Vinyl/Low-E | 1,600 | N | 1 | 0.37 | No | 0.30 | 0.50 | NFRC | Altered | |
| 2 | Loewen Dbl/Wd Mtlclad Low-E | 1,600 | E | 1 | 0.34 | No | 0.25 | 0.40 | NFRC | New | |
| 3 | Loewen Dbl/Wd Mtlclad Low-E | 1,600 | W | 1 | 0.34 | No | 0.25 | 0.40 | NFRC | New | |
| 4 | Velux Comfort+(74) Lowe2/Arg | 900 | Roof | 1 | 0.39 | No | 0.29 | 0.50 | NFRC | New | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| H. ENVELOPE MANDATORY MEASURES | |
|--|---|
| Indicate location on building plans of Mandatory Envelope Measures Note Block: <u>ENV-MM</u> | |
| INSTRUCTIONS TO APPLICANT ENVELOPE COMPLIANCE & WORKSHEETS (check box if worksheet are included) | |
| <i>For detailed instructions on the use of this and all Energy Efficiency Standards compliance documents, please refer to the Energy Commission website.</i> | |
| <input checked="" type="checkbox"/> | NRCC-ENV-01-E Certificate of Compliance. Required on plans for all submittals. |
| <input checked="" type="checkbox"/> | NRCC-ENV-04-E Use when minimum skylight requirements for large enclosed spaces are required in climate zones 2 through 15. Optional on plans. |


ENVELOPE COMPONENT APPROACH

CEC-NRCC-ENV-01-E (Revised MM/YY)

CALIFORNIA ENERGY COMMISSION



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|-----------------------------|---------------------------|---------------|
| CERTIFICATE OF COMPLIANCE | | NRCC-ENV-01-E |
| Envelope Component Approach | | (Page 4 of 4) |
| Project Name: Large Retail | Date Prepared: 10/25/2016 | |

| | |
|--|---|
| DOCUMENTATION AUTHOR'S DECLARATION STATEMENT | |
| 1. I certify that this Certificate of Compliance documentation is accurate and complete. | |
| Documentation Author Name: Martyn C. Dodd | Documentation Author Signature:  |
| Company: EnergySoft, LLC | Signature Date: 10/25/2016 |
| Address: 1025 5th St. Suite A | CEA/ HERS Certification Identification (if applicable): |
| City/State/Zip: Novato, CA 94945 | Phone: (415) 897-6400 |

| | |
|--|---------------------------------|
| RESPONSIBLE PERSON'S DECLARATION STATEMENT | |
| I certify the following under penalty of perjury, under the laws of the State of California: | |
| <ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. | |
| Responsible Designer Name: Bill Architect | Responsible Designer Signature: |
| Company: Architecture for All | Date Signed: |
| Address: 123 5th St. | License: |
| City/State/Zip: Santa Rosa, CA 95433 | Phone: (707) 222-1212 |

FENESTRATION WORKSHEET

CEC-NRCC-ENV-02-E (Revised 07/16)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE

NRCC-ENV-02-E

Fenestration Worksheet

(Page 1 of 3)

Project Name:
Large RetailDate Prepared:
10/25/2016**A. WINDOWS DETAILS Worksheet - §140.3(a)6B, C and D**

NOTE: Newly installed fenestration shall have a certified NFRC Label Certificate or use the CEC default tables found in Table 110.6-A and Table 110.6-B. Site-built fenestration less than 1,000 ft², or more than or equal to 1,000 ft² see Reference Nonresidential Appendix NA6. Prescriptively, skylights shall have a glazing material or diffuser that has a measured haze value greater than 90%, determined according to ASTM D1003, or other test method approved by the Energy Commission.

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
|--------|---------------------------------|-----------------|--------------|---------|----------|---------|----------|---------|------------|----|-----|---------------------|---------------------------|
| Tag/ID | Window Type (e.g., Window-1) | Surface Area | Fenestration | | | | | | Overhang | | | | |
| | | | U-Factor | | SHGC | | VT | | Dimensions | | | Calculated | |
| | | | Proposed | Allowed | Proposed | Allowed | Proposed | Allowed | H | V | H/V | (R)SHGC Proposed | Max (R)SHGC Allowed |
| 1 | Window | 1,600 | 0.370 | 0.470 | 0.300 | 0.310 | 0.500 | 0.42 | | | | | |
| 2 | Window | 1,600 | 0.340 | 0.360 | 0.250 | 0.250 | 0.400 | 0.42 | | | | | |
| 3 | Window | 1,600 | 0.340 | 0.360 | 0.250 | 0.250 | 0.400 | 0.42 | | | | | |
| 4 | Skylight | 900 | 0.390 | 0.460 | 0.290 | 0.250 | 0.500 | 0.49 | | | | | |

B. WEST WINDOW AREA CALCULATION - See §140.3(a)5A

| | | | | |
|--|-------|-----------------------------------|---------------------|--|
| 01. Gross West Exterior Wall Area | 4,025 | $\text{ft}^2 \times 0.40 =$ | 1,610 ft^2 | 40% of Gross West Facing Exterior Wall Area; or |
| 02. West Display Linear Perimeter | 0 | $\text{FT} \times 6 \text{ ft} =$ | 0 ft^2 | West Display Perimeter Area |
| 03. Enter Larger of 1 or 2 | | | 1,610 ft^2 | Maximum Standard West Area |
| 04. Enter Proposed West Window Area | | | 1,600 ft^2 | Proposed West Window Area |
| <i>Note: If the PROPOSED WEST WINDOW AREA is greater than the MAXIMUM STANDARD WEST AREA then the envelope component approach may not be used.</i> | | | | |

C. WINDOW AREA CALCULATION - See §140.3(a)5A

| | | | | |
|--|--------|-----------------------------------|---------------------|------------------------------------|
| 01. Gross Exterior Wall Area | 16,100 | $\text{ft}^2 \times 0.40 =$ | 6,440 ft^2 | 40% of Gross Exterior Wall Area or |
| 02. Linear Display Perimeter | 0 | $\text{FT} \times 6 \text{ ft} =$ | 0 ft^2 | Display Perimeter Area |
| 03. Enter The Larger of 1 or 2 | | | 6,440 ft^2 | Maximum Standard Area |
| 04. Enter Proposed Window Area | | | 4,800 ft^2 | Proposed Window Area |
| <i>Note: If the PROPOSED WINDOW AREA is greater than the MAXIMUM STANDARD AREA then the envelope component approach may not be used.</i> | | | | |

FENESTRATION WORKSHEET

CEC-NRCC-ENV-02-E (Revised 07/16)

CALIFORNIA ENERGY COMMISSION



| | | |
|-----------------------------------|----------------|----------------------|
| CERTIFICATE OF COMPLIANCE | | NRCC-ENV-02-E |
| Fenestration Worksheet | | (Page 2 of 3) |
| Project Name: Large Retail | Date Prepared: | |

D. SKYLIGHT AREA CALCULATION - See §143(a)6A

| | ACTUAL GROSS ROOF AREA | | STANDARD ALLOWED SKYLIGHT AREA |
|--|--------------------------|-----------------------------|--------------------------------|
| 01. IF Atrium/Skylight Height is \leq 55 ft; or | 50,000 | $\text{ft}^2 \times 0.05 =$ | 2,500 ft^2 |
| 2. IF Atrium/Skylight Height is $>$ 55 ft | | $\text{ft}^2 \times 0.10 =$ | ft^2 |
| 03. Proposed Skylight Area (from plans) | | 900 ft^2 | |
| 04. Skylight SSR % ^{1,2} = Proposed Skylight Area <u>Divided</u> by Actual Gross Roof Area = | | 1.8 % | |
| 05. Haze material value greater than 90% according to ASTM D1003, or other approved method by the Energy Commission | Yes / No | | |
| | <input type="checkbox"/> | <input type="checkbox"/> | |
| <p>1. If the SKYLIGHT SSR % is less than or equal to 5% then choose the appropriate column in Table 140.3-B and C and row in Table 140.3-D.</p> <p>2. If the SKYLIGHT SSR % is greater than 5% then the Envelope Component Approach may not be used.</p> | | | |

E. RELOCATABLE PUBLIC SCHOOL BUILDINGS - See Section 140.3(a)8

| | |
|--|--|
| Option 1 | |
| <input type="checkbox"/> For Specific Climate Zone, use Table 140.3-B - Prescriptive Envelope Criteria. | <input type="checkbox"/> Specific Climate Zone Metal Identification Label – Place two labels on each relocatable school building and indicate on the building plans. Indicate location from the building plans: |
| Option 2 | |
| <input type="checkbox"/> For Any (All) Climate Zone, use Table 140.3-D - Prescriptive Envelope Criteria. | <input type="checkbox"/> Any (All) Climate Zone Metal Identification Label - Place two labels on each relocatable school building and indicate on the building plans. Indicate location from the building plans: |

FENESTRATION WORKSHEET

CEC-NRCC-ENV-02-E (Revised 07/16)

CALIFORNIA ENERGY COMMISSION



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| CERTIFICATE OF COMPLIANCE | | NRCC-ENV-02-E |
| Fenestration Worksheet | | (Page 3 of 3) |
| Project Name: Large Retail | Date Prepared: 10/25/2016 | |

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Martyn C. Dodd

Documentation Author Signature: 

Company: EnergySoft, LLC

Signature Date: 10/25/2016

Address: 1025 5th St. Suite A

CEA/ HERS Certification Identification (if applicable):

City/State/Zip: Novato, CA 94945

Phone: (415) 897-6400

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

- The information provided on this Certificate of Compliance is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
- The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
- The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
- I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:

Responsible Designer Signature:

Company : Architecture for All

Date Signed:

Address: 123 5th St.

License:

City/State/Zip: Santa Rosa, CA 95433

Phone: (707) 222-1212

ENVELOPE – DAYLIT ZONE WORKSHEET

CEC-NRCC-ENV-04-E (Revised 04/16)

CALIFORNIA ENERGY COMMISSION



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| CERTIFICATE OF COMPLIANCE | | NRCC-ENV-04-E |
| Envelope - Daylit Zone Worksheet | | (Page 1 of 3) |
| Project Name: Large Retail | Date Prepared: 10/25/2016 | |

*NOTE: This worksheet applies only to buildings with three or fewer stories, climate zones 2 through 15, having an enclosed conditioned or unconditioned space > 5,000 ft² that is directly under a roof with a ceiling height > 15 ft and ≥ 0.5 W/ft², unless exempted by the **EXCEPTIONS** in §140.3(c).*

| A. MINIMUM SKYLIGHT AREA FOR LARGE ENCLOSED SPACES (requirements in §140.3(c)) | |
|--|---|
| 01 | Enter building plan reference page(s) for large enclosed space _____; and |
| 02 | Enter building plan reference page(s) for daylit zone plans for enclosed space _____ or attach a separate daylit zone design plan with this form; then Go to Step 1 below. |

| B. SKYLIGHT INFORMATION | | | | | | |
|-------------------------|---------------|---------------------|----------|-------|-------------------|--|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Tag/ID | Skylight Type | Number of Skylights | U-factor | SHGC | VT _{avg} | Haze Material Value > 90% (Yes / No) |
| 1 | Skylight | 900 | 0.390 | 0.290 | 0.500 | <input checked="" type="checkbox"/> / <input type="checkbox"/> |
| | | | | | | <input type="checkbox"/> / <input type="checkbox"/> |
| | | | | | | <input type="checkbox"/> / <input type="checkbox"/> |

| C. CALCULATE DAYLIT AREA (§140.3(c)1) | | | |
|---|---|----------|---|
| <i>The minimum Skylit Zone requirements can be met by using either Skylit Daylit Zones or Primary Sidelit Daylit Zones or Combinations.</i> | | | |
| Step 1 Calculate the minimum prescriptively required Total Daylit Zone Area, per §140.3(c)1 | | | |
| 01 | Floor area of enclosed space | A | 50,000 ft ² Floor area |
| 02 | Minimum Prescriptively Required Total Daylit Area is (0.75 x floor area (A) – the area of any permanent obstructions), see §140.3(c)1 & §130.1(d)1A for additional details. | B | 37,500 ft ² Minimum prescriptively required Total Daylit Zone Area |
| Step 2 Calculate Total Daylit Zone Area | | | |
| 03. | Skylit Daylit Zone Area ignoring obstructions, determined in accordance with §130.1(d)1A and as shown on the building plans (0.7 x average ceiling height from edge of rough opening of skylight).. | C | 40,000 ft ² Skylit Daylit Zone Area |
| 04 | Primary Sidelit Daylit Zone Area determined in accordance with §130.1(d)1B and as shown on the building plans ((window head height x (window width + window head height)) – areas beyond obstructions). | D | 0 ft ² Primary Sidelit Daylit Zone Area |
| 05 | Areas of Primary Sidelit Daylit Zone Area that overlap with the Skylit Daylit Zone Area | E | 0 ft ² Overlapping Zone Area |
| 06 | Total Daylit Zone Area (F = C+D-E) | F | 40,000 ft ² Total Daylit Zone Area |

| D. COMPARE TOTAL DAYLIT ZONE AREA TO PRESCRIPTIVE MINIMUM | |
|---|---|
| Step 1 Compare | |
| 01 | Check if Total Daylit Zone Area (F) is equal to or greater than Minimum Prescriptively Required Daylit Zone Area (B). Space PASSES if F ≥ B. |

ENVELOPE – DAYLIT ZONE WORKSHEET

CEC-NRCC-ENV-04-E (Revised 04/16)

CALIFORNIA ENERGY COMMISSION



| | | |
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| CERTIFICATE OF COMPLIANCE | | NRCC-ENV-04-E |
| Envelope - Daylit Zone Worksheet | | (Page 2 of 3) |
| Project Name: Large Retail | Date Prepared: 10/25/2016 | |

| | | | | | |
|---|---|----------|--------|-----------------|----------------------------|
| E. CALCULATE TOTAL SKYLIGHT AREA (§140.3(c)4) | | | | | |
| The Total Skylight Area can be met by using either Equation 1 or Equation 2 below. | | | | | |
| <input checked="" type="checkbox"/> Equation 1: Total Skylight Area = (Skylight Area)/(Daylit Zone under Skylights) ≥ 3% | | | | | |
| Step 1 Calculate the Daylit Zone under Skylights | | | | | |
| 01 | Average Ceiling Height | A | 9.0 | ft | Average Ceiling Height |
| 02 | Total floor area in the space within a horizontal distance of 0.7 times the average ceiling height from the edge of the rough opening | B | 40,000 | ft ² | Daylit Zone under Skylight |
| Step 2 Calculate the Total Skylight Area | | | | | |
| 03 | Area of Skylight | C | 900 | ft ² | Skylight Area |
| 04 | Total Skylight Area (D = (C/B) * 100) | D | 1.80 | % | Total Skylight Area |
| <input checked="" type="checkbox"/> Equation 2: Total Skylight Area = (Skylight Area) * (VT_{avg}) ≥ 1.5% | | | | | |
| Step 1 Calculate the Daylit Zone under Skylights | | | | | |
| 05 | Average Ceiling Height | E | 9.0 | | Average Ceiling Height |
| 06 | Total floor area in the space within a horizontal distance of 0.7 times the average ceiling height from the edge of the rough opening | F | 40,000 | | Daylit Zone under Skylight |
| Step 2 Calculate the Total Skylight Area | | | | | |
| 07 | Area of Skylight | G | 900 | ft ² | Skylight Area |
| 08 | Average Visible Transmittance (VT _{avg}) | H | 0.500 | | Visible Transmittance |
| 09 | Total Skylight Area (I = (G / F) * H * 100) | I | 0.90 | % | Total Skylight Area |

| | |
|-----------------------|---|
| F. COMPARE | |
| Step 1 Compare | |
| 01 | Check if Total Skylight Area (D or H) is equal to or greater than 3% of the total floor area (Equation 1); or 1.5% of the total floor area (Equation 2) Space Passes if D ≥ 3% using Equation 1; or H ≥ 1.5% using Equation 2. |

ENVELOPE – DAYLIT ZONE WORKSHEET

CEC-NRCC-ENV-04-E (Revised 04/16)

CALIFORNIA ENERGY COMMISSION



| | | |
|-----------------------------------|----------------------------------|---------------|
| CERTIFICATE OF COMPLIANCE | | NRCC-ENV-04-E |
| Envelope - Daylit Zone Worksheet | | (Page 3 of 3) |
| Project Name: Large Retail | Date Prepared: 10/25/2016 | |

| DOCUMENTATION AUTHOR'S DECLARATION STATEMENT | |
|--|---|
| 1. I certify that this Certificate of Compliance documentation is accurate and complete. | |
| Documentation Author Name: Martyn C. Dodd | Documentation Author Signature:  |
| Company: EnergySoft, LLC | Signature Date: 10/25/2016 |
| Address: 1025 5th St. Suite A | CEA/ HERS Certification Identification (if applicable): |
| City/State/Zip: Novato, CA 94945 | Phone: (415) 897-6400 |
| RESPONSIBLE PERSON'S DECLARATION STATEMENT | |
| I certify the following under penalty of perjury, under the laws of the State of California: | |
| <ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. | |
| Responsible Designer Name: | Responsible Designer Signature: |
| Company : Architecture for All | Date Signed: |
| Address: 123 5th St. | License: |
| City/State/Zip: Santa Rosa, CA 95433 | Phone: (707) 222-1212 |

AREA WEIGHTED AVERAGE CALCULATION WORKSHEET



| | | |
|---|----------------------------------|----------------------|
| CERTIFICATE OF COMPLIANCE | | NRCC-ENV-06-E |
| Area Weighted Average Calculation Worksheet | | (Page 1 of 5) |
| Project Name: Large Retail | Date Prepared: 10/25/2016 | |

The Area-Weighted Average Worksheet can be used to meet the Mandatory Requirements of Section §120.7, or the Prescriptive Requirements of Section §140.3. In meeting the Mandatory Requirements, the user may not area-weight mass walls (light or heavy) or F-factor. In meeting the Prescriptive Requirements, user must meet the requirements of Table 140.3-B, C or D.

Weighted averaging is used when there is more than one level of insulation or more than one type of fenestration which would not otherwise meet mandatory and/or prescriptive compliance requirements. When a window has an overhang, calculate the RSHGC first (see Equation 140.3-A), then determine the weighted averaged if need be. Weighted averaging is not allowed for chromogenic glazing, and should never be used for R-values. Only U-factors, SHGC, RSHGC, or VT can be area-weighted.

| | | | | | | |
|--------------------------|-------------------------------------|------------------------|-------------------------------------|--|-------------------------------------|----------------------------|
| Property Being Averaged: | <input type="checkbox"/> | Opaque Surface - Roofs | <input checked="" type="checkbox"/> | Opaque Surface - Walls | <input type="checkbox"/> | Opaque Surface - Floors |
| | <input checked="" type="checkbox"/> | Fenestration U-factor | <input checked="" type="checkbox"/> | Relative Solar Heat Gain Coefficient (RSHGC) | <input checked="" type="checkbox"/> | Visible Transmittance (VT) |

| A. Envelope Area-Weighted Average Calculation – Roofs | | | | | | |
|--|-----------|---|---|----------------------------|-------------------|----------------------------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Tag /Identification | Roof Type | Surface Feature Area (ft ²) | Required U-factor (Table 140.3-B, C or D) | Required (Area * U-factor) | Proposed U-factor | Proposed (Area * U-factor) |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | | | | | |
| Required Area-Weighted Average U-factor | | | | | | |
| Proposed Area-Weighted Average U-factor = | | | | | | |
| <ol style="list-style-type: none"> 1. Area weighting is only allowable for like surfaces. You may for example area weight two roof assemblies but not a roof and a wall. 2. "Area" can be replaced throughout the formula by "Length" or any other unit of measure used for the value being averaged. Mixture of different units not allowed. 3. Enter the above Weighted Average Value on the NRCC-ENV-01-E and NRCC-ENV-02-E compliance document and attach this sheet. | | | | | | |

AREA WEIGHTED AVERAGE CALCULATION WORKSHEET



| | |
|--|---------------------------|
| CERTIFICATE OF COMPLIANCE | NRCC-ENV-06-E |
| Area Weighted Average Calculation Worksheet (Page 2 of 5) | |
| Project Name: Large Retail | Date Prepared: 10/25/2016 |

| B. Envelope Area-Weighted Average Calculation – Walls | | | | | | |
|--|-----------|---|---|----------------------------|-------------------|----------------------------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Tag /Identification | Wall Type | Surface Feature Area (ft ²) | Required U-factor (Table 140.3-B, C or D) | Required (Area * U-factor) | Proposed U-factor | Proposed (Area * U-factor) |
| New Left Wall | | 6,370 | 0.062 | 394.9 | 0.183 | 1,165.7 |
| Altered Right Wall | | 2,425 | 0.217 | 526.2 | 0.217 | 526.2 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | 8,795 | | 921 | | 1,692 |
| Required Area-Weighted Average U-factor | | | | | | 0.105 |
| Proposed Area-Weighted Average U-factor = | | | | | | 0.192 |
| <ol style="list-style-type: none"> 1. Area weighting is only allowable for like surfaces. You may for example area weight two roof assemblies but not a roof and a wall. 2. "Area" can be replaced throughout the formula by "Length" or any other unit of measure used for the value being averaged. Mixture of different units not allowed. 3. Enter the above Weighted Average Value on the NRCC-ENV-01-E and NRCC-ENV-02-E compliance document and attach this sheet. | | | | | | |

| C. Envelope Area-Weighted Average Calculation – Floors | | | | | | |
|--|------------|---|---|----------------------------|-------------------|----------------------------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Tag /Identification | Floor Type | Surface Feature Area (ft ²) | Required U-factor (Table 140.3-B, C or D) | Required (Area * U-factor) | Proposed U-factor | Proposed (Area * U-factor) |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | | | | | |
| Required Area-Weighted Average U-factor | | | | | | |
| Proposed Area-Weighted Average U-factor = | | | | | | |
| <ol style="list-style-type: none"> 1. Area weighting is only allowable for like surfaces. You may for example area weight two roof assemblies but not a roof and a wall. 2. "Area" can be replaced throughout the formula by "Length" or any other unit of measure used for the value being averaged. Mixture of different units not allowed. 3. Enter the above Weighted Average Value on the NRCC-ENV-01-E and NRCC-ENV-02-E compliance document and attach this sheet. | | | | | | |

AREA WEIGHTED AVERAGE CALCULATION WORKSHEET



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| CERTIFICATE OF COMPLIANCE | NRCC-ENV-06-E |
| Area Weighted Average Calculation Worksheet (Page 3 of 5) | |
| Project Name: Large Retail | Date Prepared: 10/25/2016 |

| D. Fenestration Area-Weighted Average - U-factor | | | | | | |
|--|----------------------|--|--|-------------------------------|----------------------|-------------------------------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Tag/ Identification | Fenestration Type | Surface Feature Area (ft ²) | Required U-Factor (Table 140.3-B, C or D) | Required (Area * U-Factor) | Proposed U-factor | Proposed (Area * U-factor) |
| Replacement Win | Window | 1,600 | 0.470 | 752.0 | 0.370 | 592.0 |
| Window | Window | 3,200 | 0.360 | 1,152.0 | 0.340 | 1,088.0 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | 4,800 | | 1,904 | | 1,680 |
| Required Area-Weighted Average U-factor = | | | | | | 0.397 |
| Proposed Area-Weighted Average U-factor = | | | | | | 0.350 |
| <i>Note: If the proposed U-factor is less than or equal to the required U-factor, then the windows meet the prescriptive U-factor requirement.</i> | | | | | | |

| E. Fenestration Area-Weighted Average - Relative Solar Heat Gain Coefficient (RSHGC) | | | | | | |
|--|----------------------|--|---|---------------------------|---------------|---------------------------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Tag/ Identification | Fenestration Type | Surface Feature Area (ft ²) | Required SHGC (Table 140.3-B, C or D) | Required (Area * SHGC) | Proposed SHGC | Proposed (Area * SHGC) |
| Replacement Win | Window | 1,600 | 0.310 | 496.0 | 0.300 | 480.0 |
| Window | Window | 3,200 | 0.250 | 800.0 | 0.250 | 800.0 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | 4,800 | | 1,296 | | 1,280 |
| Required Area-Weighted Average SHGC = | | | | | | 0.270 |
| Proposed Area-Weighted Average SHGC = | | | | | | 0.267 |
| <i>Note: If the proposed SHGC is less than or equal to the required SHGC, then the windows meet the prescriptive SHGC requirement.</i> | | | | | | |

AREA WEIGHTED AVERAGE CALCULATION WORKSHEET

CEC-NRCC-ENV-06-E (Revised 07/16)

CALIFORNIA ENERGY COMMISSION



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| CERTIFICATE OF COMPLIANCE | | NRCC-ENV-06-E |
| Area Weighted Average Calculation Worksheet | | (Page 4 of 5) |
| Project Name: Large Retail | Date Prepared: 10/25/2016 | |

| F. Fenestration Area-Weighted Average – Visible Transmittance (VT) | | | | | | |
|--|----------------------|--|---|-------------------------|-------------|-------------------------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
| Tag/ Identification | Fenestration Type | Surface Feature Area (ft ²) | Required VT (Table 140.3-B, C or D) | Required (Area * VT) | Proposed VT | Proposed (Area * VT) |
| Replacement Win | Window | 1,600 | 0.420 | 672.0 | 0.500 | 800.0 |
| Window | Window | 3,200 | 0.420 | 1,344.0 | 0.400 | 1,280.0 |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| Total | | 4,800 | | 2,016 | | 2,080 |
| Required Area-Weighted Average VT = | | | | | | 0.420 |
| Proposed Area-Weighted Average VT = | | | | | | 0.433 |
| <i>Note: If the proposed VT is greater than or equal to the required VT, then the windows meet the prescriptive VT requirement.</i> | | | | | | |


AREA WEIGHTED AVERAGE CALCULATION WORKSHEET

CEC-NRCC-ENV-06-E (Revised 07/16)

CALIFORNIA ENERGY COMMISSION



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| CERTIFICATE OF COMPLIANCE | | NRCC-ENV-06-E |
| Area Weighted Average Calculation Worksheet | | (Page 5 of 5) |
| Project Name: Large Retail | Date Prepared: 10/25/2016 | |

| | |
|--|---|
| DOCUMENTATION AUTHOR'S DECLARATION STATEMENT | |
| 1. I certify that this Certificate of Compliance documentation is accurate and complete. | |
| Documentation Author Name: Martyn C. Dodd | Documentation Author Signature:  |
| Company: EnergySoft, LLC | Signature Date: 10/25/2016 |
| Address: 1025 5th St. Suite A | CEA/ HERS Certification Identification (if applicable): |
| City/State/Zip: Novato, CA 94945 | Phone: (415) 897-6400 |

| | |
|--|---------------------------------|
| RESPONSIBLE PERSON'S DECLARATION STATEMENT | |
| I certify the following under penalty of perjury, under the laws of the State of California: | |
| <ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. | |
| Responsible Designer Name: Bill Architect | Responsible Designer Signature: |
| Company: Architecture for All | Date Signed: |
| Address: 123 5th St. | License: |
| City/State/Zip: Santa Rosa, CA 95433 | Phone: (707) 222-1212 |