

DATE: 11/15/89

3022-032-071
3022-032-071
3022-032-071

3022-032-071
3022-032-071
3022-032-071

PERMIT NUMBER: 89060266
DATE ISSUED: 5/ 4/89
DATE EXPIRES: 5/ 3/90
WORK CLASS: ADDITION
USE TYPE: SINGLE FAMILY
PERMIT TYPE: BUILDING

FINALED:

405

purged 2-9-90

P.G.E. Notified:

Plot Plans: *with plans*

Health Dept. I.D. finalized:

Permit released:

60266

10-19-89

LS

PURGED

EL DORADO COUNTY

COMMUNITY DEVELOPMENT DEPARTMENT 621-5315
BUILDING DIVISION 628-2511
360 FAIR LANE, PLACERVILLE, CA 95667

BUILDING PERMIT
PERMIT NUMBER:

89060266

DATE ISSUED: 5/ 4/89
DATE EXPIRES: 5/3/91

APR: 082-062-07 TACH: 100-014

SEC.: 3 TWP: 9 RNB: 9

PARCEL MAP#:

INSPECT. AREA: 405

COUNTY ROAD?: YES

WATER SOURCE: EID

SEWER SERVICE: EID

JOB ADDRESS: 3591 FAIRWAY DR

SUB: CAMERON PARK NORTH

LOT: 379 BLK: 5

DRIVING: HWY 50 TO CAMERON PARK DR 1 MILE TO EL

EL DORADO ROYALE. 2 BLKS TO FAIRWAY RT

ON FAIRWAY. 2ND HOUSE ON RT

* SPECIFIC USE	TYPE	AREA	COST	VALUE	* WORK CLASS:	ADDITION
* DWELLING	VN	123	\$47.80	\$ 5.879	* USE TYPE:	SINGLE FAMILY
					* OCCUP. GRP.:	R3
* PORCH	VN	116	\$12.20	\$ 1.415	* CLIMATE ZONE:	12
					* SNOW LOAD:	30
					* HEATING TYPE:	
TOTAL:				\$ 7.294		

REMARKS-

FRONT ENTRY ADDTN & COVERED PORCH

LOT SIZE: ZONE: R1
SETBACKS-F: 20 LG: 5 RS: 5 R: 15
SUPER. DIST.: 1 CT: 308
SCHOOL DIST.: RESIDE
FIRE DIST.: CAMERON PARK

APPLICANT
WILDERMUTH ALLEN/KATHLEEN
3591 FAIRWAY DR
SHINGLE SPRINGS CA 95682
(916) 677-2896

OWNER
WILDERMUTH ALLEN/KATHLEEN
3591 FAIRWAY DR
SHINGLE SPRINGS CA 95682
(916) 677-2896

PERMIT FEE \$ 50

PRE-PAID PLAN CHECK ()

SUBTOTAL \$ 50

TOTAL: \$ 50

RECEIPT NUMBER: 95395

METHOD OF PAYMENT:

PREPAID RECEIPT NO.:

I hereby affirm that I am exempt from the Contractor's License Law for the following reason: I, as owner, am contracting with local contractors to construct the project (Section 7044).

I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Worker's Compensation Laws of California.

I certify that I have read this document and state that the above information is correct. I agree to comply with all local ordinances and state laws relating to building construction, and hereby authorize representatives of this county to enter upon the above mentioned property for inspection purposes.

* PERMIT WILL BE VOIDED IF NO INSPECTION FOR 180 DAYS

N/A SIGNATURE ON APPL

Permittee Signature

ISSUED BY

Building Official

STRUCTURAL	DATE	INSP.	ELECTRICAL	DATE	INSP.	PLUMBING	DATE	INSP.	MECHANICAL	DATE	INSP.
Setback	6/16/89	L.S.	Underground	7/28/89	L.S.	Sanity			Heat/Furnace		
Footings			Rough			Grounding			Firepl/Chim.		
Slab	5/25/89	L.S.	Wiring Panel			Tap-Out			Woodstove		
Winders			Sub Panel			Gas Pipe			Flues		
Frame	7/28/89	L.S.	Radio			INSULATION			Underfltr. Ducts		
Lath/Sheetrock	8/1/89	L.S.	Grid-Electrode			Underfloor			Duct		
Roof Deck	8/2/89	L.S.				Wall	8/1/89	L.S.			
						Ceiling	8/1/89	L.S.			

MOBILE HOME

Support Structure			Podestal			Plumbing			Gas Line		
Site Work										DATE	INSP.
FINAL INSPECTION						UTILITIES					
Bldg.	10/11/89	L.S.	Woodstove			Temporary Power					
Elec.			Swim Pool/Spa			Permanent Power					
Plumbing			Grading			Gas Service					
Mech.			Encroachment			Bond Posted					
Solar			Septic Sys.			Bond Released					
M/H											

CERTIFICATE OF OCCUPANCY ISSUED/FINAL

DATE: 10/19/89 INSP: L. STEPHEN

7-12-89 SHOWN NAIL OK RR

ROUTED TO	DATE
HEALTH DEPT.	
ROAD DEPT.	
FIRE DEPT.	
WATER DEPT.	
PLANS RETURNED	

**EL DORADO COUNTY
COMMUNITY DEVELOPMENT DEPT.
BUILDING DIVISION
APPLICATION FOR CONSTRUCTION PERMIT**

REC. BY 62266
PLAN CHECK # 62266
PERM. NUMBER 5715

APPLICANT TO COMPLETE

Owner Allen Wildermuth
Mailing Address 3591 Fairway Dr
City & State Shingle Springs, CA
Zip 95682 Telephone 677-2896
Contractor [Signature]
Address [Signature]
City & State _____
Zip _____ Telephone _____
Class & Lic. # _____ W. Comp. _____
Arch/Eng. _____
License # _____
Lending Agency _____
Branch _____

A.P. # 082-082-07 TAC# 100014
Sec. 3 & 9N R 95 Public Sewer YES
Parcel Map # Lot 379 Co. Road YES
No. of Bedrooms 3 Perc. Test _____
Water Source EID Supplier _____

PLANNING DEPARTMENT USE			
Lot Size	Zone <u>R1</u>		
Min Setbacks:	FR <u>20</u>	RS <u>5</u>	LS <u>5</u> Rear <u>15</u>
House No.	<u>3591 Fairway Dr.</u>		
School Dist.	<u>0</u>		
Super. Dist.	<u>308</u>	C.T. <u>308</u>	
Variance or Spec. Use No.	_____	Date	<u>1/1</u>
Road Imp. Dist.	<u>N/A</u>	Fire Dist.	_____
Special District	_____		

DRIVING DIRECTIONS: Hwy 50 Cameron Park Off Ramp. North on CP DRIVE
1 mile to El Dorado Royale 2 blks to Fairway. Rt on
Fairway. 2nd house on Right - 2 story Green. (PN) # 3
Front only addn + covered

DESCRIPTION OF WORK 1405
Building Use: Residential Addition Mobile Home Make _____
Electric _____ Amps _____ Size _____ State Mfg. _____ Year _____
Plumbing _____ Serial # _____
Type of Heating _____ License # _____
Sewage public Temporary _____ Permanent _____ Other "

OWNER / CONTRACTOR / AGENT -- SIGN ON REVERSE SIDE OF APPLICATION

95395 **FOR OFFICE USE ONLY**

APPROVALS	APP. BY	DATE	OCC.	TYPE	SQ. FT.	COST	VALUATION
Health			R-3	VN	123	4780	2091
Planning	GPA	4/24/99	Porch	-	116	1200	1415
Fire Dist.							
Sewer							
Water							
Road Dept.							
Total Valuation \$						<u>5506</u>	

FEES 58-

Construction _____
M.H. Site _____
Sewage _____
Encroachment _____
Penalty _____
SUB TOTAL 58-
High School _____
Elementary School _____
Special Dist. _____
Road Imp. Dist. _____
Fire Dist. _____
TOTAL FEES 58-

Plans Approved By [Signature] Date 4/24/99 Fee 58.00 P.C. Fee _____ Rec. No. _____

CONTRACTORS-OWNER/BUILDER

I hereby certify that I have read this application and that the information is correct. I agree to comply with all County Ordinances and State Laws relating to building construction.

1. LICENSED CONTRACTORS DECLARATION — I certify that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.

Date _____ Contractor _____

License Class & No. _____

2. OWNER-BUILDER DECLARATION — I hereby affirm that I am exempt from the Contractors' License Law, Business and Professions Code, (Section 7031.5) by one of the following:

(a) I, as owner of the property, will do the work myself without hiring any employees, and the building or structure is not intended or offered for sale. (Proof of sale or offering for sale of the structure by the owner-builder within one year is presumptive evidence that such structure was undertaken for the purpose of sale). Complete Section #4 below. (Section 7031.5)

(b) I, as owner, am contracting with local contractors to construct the project. (Section 7044)

(c) I, as owner of the property, will employ workers with wages as their sole compensation. Complete Section #3 below.

(d) I am exempt under Section _____ Reason _____

Date 3/28/89 Owner Allen Waldenmuth H0411504

3. WORKMEN'S COMPENSATION INSURANCE — I hereby affirm that I have a certificate of Workmen's Compensation Insurance, and or a certified copy thereof.

Policy No. _____ Company _____ Exp. Date _____

____ Certified copy is hereby furnished.

____ Certified copy is on file with the Building Department.

Date _____ Applicant _____

I you do not intend to employ any person so as to become subject to the Workmen's Compensation Law, complete the following:

4. CERTIFICATE OF EXEMPTION FROM WORKMEN'S COMPENSATION INSURANCE — I certify that in the performance of the work for which this permit is issued I shall not employ any person in any manner so as to become subject to the Workmen's Compensation Laws of California.

Date 4/1/89 Applicant Allen Waldenmuth H0411504

NOTE: If, after making this Certificate, you should become subject to Workmen's Compensation provisions of the Labor Code, you must forthwith comply or the permit shall be deemed revoked.

DEED RESTRICTION CERTIFICATE

EL DORADO COUNTY

The undersigned declares that he has read and understands the deed restrictions/CC&R's applicable to the subject property, and that the improvement herein applied for does not violate any such restrictions. I also certify that I have submitted plans to the Architectural Control Committee (ACC) or to the local homeowners association, where required by said CC&R's or deed restrictions, and have obtained approval for said improvement.

Dated: 3/28/89

Signed:

Allen Wildermuth

Print:

Allen Wildermuth

COUNTY OF
EL DORADO

COMMUNITY DEVELOPMENT DEPARTMENT
BUILDING DIVISION



MAIN OFFICE:
380 FAIR LANE
PLACERVILLE, CA 95687

(916) 821-5315

SOUTH LAKE TAHOE OFFICE:
1359 JOHNSON BLVD.
P.O. BOX 14508
SOUTH LAKE TAHOE, CA 95702
(916) 573-3145

OWNER-BUILDER VERIFICATION

ATTENTION: **PROPERTY OWNER**

PLAN CHECK# 60266

An "owner-builder" building permit has been applied for in your name and bearing your signature.

Please complete and return this information at your earliest opportunity to avoid unnecessary delay in processing and issuing your building permit. No building permit will be issued until this verification is received.

1. I personally plan to provide the major labor and materials for construction of the proposed property improvement (yes or no) _____.
2. I (have/have not) _____ signed an application for a building permit for the proposed work.
3. I have contracted with the following person (firm) to provide the proposed construction:

Name: _____

Address: _____

City: _____ Phone: _____ Cont. Lic. # _____

4. I plan to provide portions of the work, but I have hired the following person to coordinate, supervise and provide the major work:

Name: _____

Address: _____

City: _____ Phone: _____ Cont. Lic. # _____

5. I will provide some of the work, but I have contracted (hired) the following persons to provide the work indicated:

Name	Address	Phone	Type of Work
------	---------	-------	--------------

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Property Owner's Signature: _____

Date: _____

7/1/80

COUNTY OF
EL DORADO

COMMUNITY DEVELOPMENT DEPARTMENT
BUILDING DIVISION



MAIN OFFICE:
360 FAIR LANE
PLACERVILLE, CA 95667

(916) 621-5315

SOUTH LAKE TAHOE OFFICE:
1359 JOHNSON BLVD.
P.O. BOX 14506
SOUTH LAKE TAHOE, CA 95702
(916) 573-3145

Dear Property Owner:

An application for a building permit has been submitted in your name listing you as the builder of the property improvements specified.

For your protection you should be aware that as "owner-builder" you are the responsible party of record on said permit. Building permits are not required to be signed by property owners unless they are personally performing their own work. If your work is being performed by someone other than yourself, you may protect yourself from possible liability if that person applies for the proper permit in his or her name.

Contractors are required by law to be licensed and bonded by the State of California and to have a business license from the city or County. They are also required by law to put their license number on all permits for which they apply.

If you plan to do your own work, with the exception of various trades that you plan to subcontract, you should be aware of the following information for your benefit and protection:

If you employ or otherwise engage any persons other than your immediate family, and the work (including materials and other costs) is \$200 or more for the entire project, and such persons are not licensed as contractors or subcontractors, then you may be an employer.

If you are an employer, you must register with the State and Federal government as an employer and you are subject to several obligations including State and Federal income tax withholding, federal social security taxes, worker's compensation insurance, disability insurance costs, and unemployment compensation contributions.

There may be financial risks if you do not carry out these obligations and these risks are especially serious with respect to worker's compensation insurance.

For more specific information about your obligations under Federal law, contact the Internal Revenue Service (and, if you wish, the US Small Business Administration). For more specific information about your obligations under State law, contact the Department of Benefit Payments and the Division of Industrial Accidents.

If the structure is intended for sale, property owners who are not licensed contractors are allowed to perform their work personally and through their employees, without a licensed contractor or subcontractor, only under limited conditions.

A frequent practice of unlicensed persons professing to be a contractor is to secure an "owner-builder" building permit, erroneously implying that the property owner is providing his or her own labor and materials personally. Building permits are not required to be signed by property owners unless they are performing their own work personally.

Information about licensed contractors may be obtained by contacting the Contractor's State License Board at (916) 445-3458 or at 1020 N Street, Sacramento, CA 95814.

Please complete the owner-builder verification form on the reverse side and return it so we can confirm that you are aware of these matters. The building permit will not be issued until the verification is returned

(8/88)

Certificate of Compliance: Residential

(Page 1 of 2)

CF-1R

Project Title: Residential Addition
 Project Address: 3591 Fairway Dr
 Documentation Author: Allen Wildermuth Telephone: 677-2896

Date: 3/28/89

Building Permit #

Checked By / Date

Enforcement Agency Use Only

Compliance Method (Package, Point System or Computer)

Climate Zone

GENERAL INFORMATION

Total Conditioned Floor Area: 2185 ft^2

Building Type: ☒ Single Family ☒ Hotel/Motel Addition
 (check one or more) ☐ Multi-Family (less than 4 stories) ☐ Existing-Plus-Addition
☐ Multi-Family (4 or more stories)

Front Entry Orientation: North / East / South / West / All Orientations (circle one or more)

Number of Dwelling Units:

Floor Construction Type: Slab / Raised Floor (circle one or both)

Infiltration Control: Standard/Tight (circle one)

BUILDING SHELL INSULATION

Component Type	Insulation R-Value	Location/Comments (attic, to garage, typical, etc.)
Wall.....	<u>R-11</u>	<u>Existing</u>
Wall.....	<u>R-11</u>	<u>Addition</u>
Roof.....	<u>R-19</u>	<u>Addition</u>
Roof.....	<u>R-32</u>	<u>Existing</u>
Floor.....		
Floor.....		
Slab Edge.....		

GLAZING

Glazing Orientation	Area (sf)	Glass Type (single, double)	Shading Devices		Overhang (yes/no)	Framing Type (metal/wood)
			Interior (roller blind, etc.)	Exterior (shadescreen, etc.)		
Front.... (1)	<u>68</u>	<u>Single</u>	<u>Drapes</u>	<u>Window Film</u>	<u>NO</u>	<u>WOOD</u>
Front.... (2)	<u>42</u>			<u>None</u>		
Left.... (1)	<u>36</u>			<u>None</u>		
Left.... (2)	<u>18</u>			<u>Window Film</u>		
Rear.... (1)	<u>86</u>	<u>366) 0/20</u>		<u>None</u>		
Rear.... (2)	<u>33</u>	<u>Single</u>		<u>None</u>		
Right.... (1)	<u>48.5</u>	<u>Double</u>		<u>Awning</u>		
Right.... (2)	<u>36</u>	<u>Single</u>				
Skylight.....						
Skylight.....						

THERMAL MASS

Type/Covering (slab/exposed, tile, etc.)	Area (sf)	Thickness (inches)	Location/Description (kitchen, bath, etc.)

Certificate of Compliance: Residential

(Page 2 of 2)

CF-1RResidential Addition

Project Title

3/28/89

Date

HVAC SYSTEMS

Type (furnace, air conditioner, heat pump)	Minimum Efficiency (SE, SEER, HSPF)	Duct Location (attic, etc.)	Duct R-Value	Output (Btu/h)	Manufacturer / Model # (or approved equal)

Maximum Furnace Heating Output: _____ Btu/h

HOT WATER SYSTEMS

System Type (storage gas, etc.)	Tank Capacity	Manufacturer/Model # (or approved equal)	Special Feature(s)

SPECIAL FEATURES/REMARKS (Add extra sheets if necessary)**COMPLIANCE STATEMENT**

This certificate of compliance lists the building features and performance specifications needed to comply with Title 24, Chapter 2-53 and Title 20, Chapter 2, Subchapter 4, Article 1 of the California Administrative code. This certificate has been signed by the individual with overall design responsibility and the building owner, who shall retain a copy of it and transmit the certificate to any subsequent purchaser of the building. When this certificate of compliance is submitted for a single building plan to be built in multiple orientations, all building conservation features which vary are indicated in the Special Features/Remarks section.

Designer

Name: _____
Title/Firm: _____
Address: _____
Telephone: _____
Lic. #: _____

(signature)

(date)

Building Owner

Name: _____
Title/Firm: _____
Address: _____
Telephone: _____

(signature)

(date)

Documentation Author

Name: _____
Title/Firm: _____
Address: _____
Telephone: _____

(signature)

(date)

Enforcement Agency

Name: _____
Agency: _____
Telephone: _____

(signature or stamp)

(date)

Mandatory Measures Checklist: Residential

MF-1R

NOTE: Lowrise residential buildings subject to the Standards must contain these measures regardless of the compliance approach used. Items marked with an asterisk (*) may be superseded by more stringent compliance requirements listed on the Certificate of Compliance. When this checklist is incorporated into the permit documents, the features noted shall be considered by all parties as binding minimum component performance specifications for the mandatory measures whether they are shown elsewhere in the documents or on this checklist only.

DESCRIPTION	DESIGNER	ENFORCEMENT
Building Envelope Measures		
* §2-5352(a): Minimum ceiling insulation R-19 weighted average.		
§2-5352(b): Loose fill insulation manufacturer's labeled R-Value.		
* §2-5352(c): Minimum wall insulation in framed walls R-11 weighted average (does not apply to exterior mass walls).		
§2-5352(k): Slab edge insulation - water absorption rate no greater than 0.3%, water vapor transmission rate no greater than 2.0 perm/inch.		
§2-5311: Insulation specified or installed meets California Energy Commission (CEC) quality standards. Indicate type and form.		
§2-5352(f): Vapor barriers mandatory in Climate Zones 14 and 16 only.		
§2-5317: Infiltration/Exfiltration Controls		
a. Doors and windows between conditioned and unconditioned spaces designed to limit air leakage.		
b. Doors and windows certified.		
c. Doors and windows weatherstripped; all joints and penetrations caulked and sealed.		
§2-5352(c): Special infiltration barrier installed to comply with §2-5351 meets CEC quality standards.		
§2-5352(d): Installation of Fireplaces		
1. Masonry and factory-built fireplaces have:		
a. Tight fitting, closeable metal or glass door		
b. Outside air intake with damper and control		
c. Flue damper and control		
2. No continuous burning gas pilots allowed.		
HVAC and Plumbing System Measures		
§2-5352(g) and 2-5303: Space conditioning equipment sizing; attach calculations.		
§2-5352(h) and 2-5315: Setback thermostat on all applicable heating systems.		
* §2-5316(a): Ducts constructed, installed and insulated per Chapter 10, 1976 UMC.		
§2-5316(b): Exhaust systems have damper controls.		
§2-5314(c): Gas-fired space heating equipment has intermittent ignition devices.		
§2-5314: HVAC equipment, water heaters, showerheads and faucets certified by the CEC.		
§2-5352(j): Water heating insulation blanket (R-12 or greater) or combined interior/exterior insulation (R-16 or greater); first 5 feet of pipes closest to tank insulated (R-3 or greater).		
§2-5312(Exception 1): Pipe insulation on steam and steam condensate return & recirculating piping.		
§2-5318(d): Swimming Pool Heating		
1. System has:		
a. On/off switch on heater.		
b. Weatherproof instruction plate on heater.		
c. Plumbed to allow for solar.		
2. 75 percent thermal efficiency.		
3. Pool cover.		
4. Time clock.		
5. Directional water inlet.		
Lighting and Appliance Measures		
§2-5352(j): Lighting - 25 lumens/watt or greater for general lighting in kitchens and bathrooms.		
§2-5314(c): Gas fired appliances equipped with intermittent ignition devices.		
§2-5314(a): Refrigerators, refrigerator-freezers, freezers and fluorescent lamp ballasts certified by the CEC. Indicate make and model number.		

Proposed Construction Assembly: Residential

Form 3R

Project Title

Date

Project Address

Building Permit #

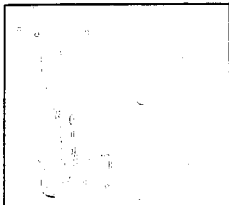
Documentation Author

Telephone

Checked By / Date

Assembly Name

Enforcement Agency Use Only



Sketch of Construction Assembly

Assembly Type:
 (check one)

☐ Floor
☐ Wall
☐ Ceiling/Roof
Framing Material:**Framing Size:** × **Framing Spacing:** " o.c.
Framing Percentage:
 (check one)

 Wall: ☐ 15% (16" o.c.)
 ☐ 12% (24" o.c.)
 Floor/Ceiling: ☐ 10% (16" o.c.)
 ☐ 7% (24" o.c.)

Wall Weight / sf:
 (Packages only)
List of Construction Components**R-Value**

	Cavity(R_c)	Frame(R_f)
Outside Surface Air Film		
1. _____		
2. _____		
3. _____		
4. _____		
5. _____		
6. _____		
7. _____		
Inside Surface Air Film		
Total Unadjusted R-Values:	R_c	R_f

Framing Adjustment Calculation (if applicable):

$$\left(\frac{1}{R_c} \times \frac{Fr\%}{100} \right) + \left(\frac{1}{R_f} \times \frac{Fr\%}{100} \right) = \frac{\text{Total U-Value}}{1/\text{Total U-Value}}$$

Shading Coefficient (SC) Worksheet

Form S

Items 1 - 9a and 10a must be completed for glazing/shading combinations not found in Table G-9 of the ECM by using documented manufacturers' data for the specific conditions indicated (#2, #8 and #11). For instructions on filling out the worksheet, see *Shading* in the ECM Glossary. For overhang SC values (#14 and #15), see Section 4.2 in the ECM.

General Information

1. Glazing Type: _____
2. SC_{glazing alone}: _____
3. Framing Type (metal/wood): _____
4. Mullions (yes/no): _____
5. Framing/Mullion Factor: _____
(from Table G-10)

6. Interior Shade Type: _____
7. SC_{shade open}: 1.00
8. SC_{shade closed}: _____
(SC of shade w/ clear single glass)

Glazing, Interior Shade & Framing

$$9a. \left[\left(\frac{\text{SC}_{\text{max}}}{\text{SC}_{\text{max}}} \times 0.25 \right) + 0.75 \right] \times \text{SC}_{\text{min}} \times \text{FMF (\#5)} = \text{SC Shade Open}$$

or 9b. _____ (from Table G-9)

$$10a. \left[\left(\frac{\text{SC}_{\text{max}}}{\text{SC}_{\text{max}}} \times 0.25 \right) + 0.75 \right] \times \text{SC}_{\text{min}} \times \text{FMF (\#5)} = \text{SC Shade Closed}$$

or 10b. _____ (from Table G-9)
SC Shade Closed

Where:
SC_{max} = larger of #2 and #7
SC_{min} = smaller of #2 and #7

Where:
SC_{max} = larger of #2 and #8
SC_{min} = smaller of #2 and #8

Exterior Shade

Exterior Shade Type: _____

11. SC_{exterior shade}: _____
(from Table G-11) or manufacturer's data w/ clear single glass

$$12. \left[\left(\frac{\text{SC}_{\text{max}}}{\text{SC}_{\text{max}}} \times 0.25 \right) + 0.75 \right] \times \text{SC}_{\text{min}} = \boxed{\text{SC Shade Open}}$$

Where:
SC_{max} = larger of #9a or #9b and #11
SC_{min} = smaller of #9a or #9b and #11

$$13. \left[\left(\frac{\text{SC}_{\text{max}}}{\text{SC}_{\text{max}}} \times 0.25 \right) + 0.75 \right] \times \text{SC}_{\text{min}} = \boxed{\text{SC Shade Closed}}$$

Where:
SC_{max} = larger of #10a or #10b and #11
SC_{min} = smaller of #10a or #10b and #11

Overhang (Point System Only)

Projection Ratio: _____

$$14. \frac{\text{Overhang Factor (Shade Open)}}{\text{Overhang Factor (Shade Open)}} \times \text{SC Shade Open (\#12)} = \boxed{\text{SC Shade Open (with Overhang)}}$$

$$15. \frac{\text{Overhang Factor (Shade Closed)}}{\text{Overhang Factor (Shade Closed)}} \times \text{SC Shade Closed (\#13)} = \boxed{\text{SC Shade Closed (with Overhang)}}$$

Insulation Certificate

Number and Street _____ City _____
County _____ Subdivision _____ Lot Number _____

Description of Installation

ROOF

Material _____ Brand Name _____
Thickness (inches) _____ Thermal Resistance (R-Value) _____

EXTERIOR WALL

Material _____ Brand Name _____
Thickness (inches) _____ Thermal Resistance (R-Value) _____

CEILING

Batt or Blanket Type _____ Brand Name _____
Thickness (inches) _____ Thermal Resistance (R-Value) _____
Loose Fill Type _____ Brand Name _____
Contractor's minimum installed weight/ft² _____ lb Minimum thickness _____ inches
Manufacturer's installed weight per square foot to achieve Thermal Resistance (R-Value) _____

RAISED FLOOR

Material _____ Brand Name _____
Thickness (inches) _____ Thermal Resistance (R-Value) _____

SLAB FLOOR

Material _____ Brand Name _____
Thickness (inches) _____ Thermal Resistance (R-Value) _____
Width (inches) _____

FOUNDATION WALL

Material _____ Brand Name _____
Thickness (inches) _____ Thermal Resistance (R-Value) _____

Declaration

I hereby certify that the above insulation was installed in the building at the above location in conformance with the current Building Energy Efficiency Standards for new residential buildings contained in Title 24 of the California Administrative Code.

General Contractor (Builder)	License Number
Signature and Title	Date
Sub-Contractor (Insulation Installer)	License Number
Signature and Title	Date

Point System Summary: Climate Zone 12

P-2R

Project Title _____

Date _____

BUILDING DATA

Conditioned Floor Area _____ Number of Stories _____
Slab/Raised Floor _____

Check all applicable Unit Type condition(s):

- ☐ Single Family Detached (SFD) ☐ Addition Alone
☐ Single Family Attached (SFA) ☐ Existing Building
☐ Multi-Family (MF) ☐ Existing-Plus-Addition

	Glass Area	% Glass
North	_____	_____
East	_____	_____
South	_____	_____
West	_____	_____
Skylight	_____	_____
Total	_____	_____

SCORE CARD

Measures

Point Scores

1. Ceiling Insulation

R-value [38] or U-value [0.030]

2. Wall Insulation

R-value [11] or U-value [0.098]

3. Raised Floor Insulation

R-value [19] or U-value [0.037]

4. Slab Edge Insulation

R-value [0] or F2 factor [0.77]

5. Infiltration

Standard

0

6. Glass Heat Loss

Type [double] U-value [0.65] % Total Glass [16]

Sum 1-6

7. Shading (Shade Open)

% Glass SC Eff. % Glass

a. North

_____ x _____ = _____

b. East

_____ x _____ = _____

c. South

_____ x _____ = _____

d. West

_____ x _____ = _____

e. Skylight

_____ x _____ = _____

8. Shading (Shade Closed)

% Glass SC Eff. % Glass

a. North

_____ x _____ = _____

b. East

_____ x _____ = _____

c. South

_____ x _____ = _____

d. West

_____ x _____ = _____

e. Skylight

_____ x _____ = _____

9. Interior Thermal Mass

Inter. Thermal Mass

10. Exterior Wall Mass

Exterior Wall Mass

Sum 7-10

11. Heating System

Zonal Control? (Y/N)

SE or HSPF [0.72/6.6] x Duct Efficiency [0.78] = Effective SE or HSPF [0.58/5.15]

12. Cooling System

Zonal Control? (Y/N)

SEER [9.3] x Duct Efficiency [0.74] = Effective SEER [7.00]

13. Water Heating

Type [SG] Credits [none]

Point Total:

Climate Zone 12

1. Ceiling Insulation

R-value	One	Number of stories Two	Three
R-0	-48	-42	-28
R-10	-7	4	0
R-20	-2	0	0
R-38	0	0	0
U-value			
0.50	-151	-71	-48
0.20	-85	-41	-28
0.10	-22	-19	-8
0.08	-18	-9	-4
0.06	-10	-6	-3
0.04	-4	-2	-1
0.02	4	1	1
0.00	10	4	3

2. Wall Insulation

R-value	Single-Family Detached	Single-Family Attached	Multi-Family
R-0	-58	-43	-30
R-11	0	0	0
R-13	2	1	1
R-19	7	5	4
U-value			
0.60	-124	-92	-63
0.50	-74	-57	-40
0.35	-30	-31	-21
0.30	0	0	0
0.08	4	3	2
0.06	8	6	4
0.04	13	10	6
0.02	17	13	8
0.00	21	15	10

3. Raised Floor Insulation

Insulation in Floor

R-value	One	Number of stories Two	Three
R-0	-15	-7	-5
R-11	-3	-1	-1
R-19	0	0	0
R-30	3	1	1
U-value			
0.60	-121	-59	-39
0.50	-100	-49	-33
0.40	-80	-39	-26
0.30	-59	-29	-19
0.20	-37	-18	-12
0.10	-15	-7	-5
0.08	-10	-5	-3
0.06	-5	-3	-2
0.04	-1	0	0
0.02	4	2	1
0.00	8	4	3

Controlled Ventilation Crawlspace

R-value	One	Number of stories Two	Three
R-0	-5	-4	-3
R-5	0	-1	-1
R-11	2	0	-1
R-19	3	0	0

4. Slab Edge Insulation

R-value	One	Number of stories Two	Three
R-0	0	0	0
R-5	7	4	2
R-7	7	5	2
F2 factor			
0.80	-4	-2	-1
0.80	-1	-1	0
0.70	2	1	1
0.60	5	2	2
0.50	8	5	2
0.40	11	7	3

5. Infiltration (Air Leakage)

Specification	Points
Standard	0

7. Shading (Shade Open)

Effective Percent Glass (percent glass x SC)	North	East	South	West	Skylight
18	2	2	2	-2	—
16	1	2	2	3	—
14	1	2	3	0	—
12	1	2	4	1	—
10	1	2	4	1	-5
9	1	1	4	1	-5
8	0	1	4	2	-4
6	0	0	3	2	-2
4	0	0	3	1	-1
3	0	0	2	1	0
2	0	0	1	0	0
1	0	0	-1	-1	0
0	-1	-1	-5	-2	0

8. Shading (Shade Closed)

Effective Percent Glass (percent glass x SC)	North	East	South	West	Skylight
18	-10	-38	-57	-58	—
16	-9	-38	-49	-49	—
14	-7	-28	-40	-41	—
12	-6	-23	-30	-30	—
10	-5	-21	-20	-20	—
9	-4	-16	-22	-22	-70
8	-3	-14	-19	-19	-51
6	-2	-10	-13	-13	-34
5	-2	-7	-10	-10	-26
4	-1	-4	-7	-8	-19
3	0	-2	-4	-5	-13
2	0	-1	-1	-2	-8
1	1	0	1	2	-5
0	2	1	2	5	0

6. Glass Heat Loss

Total Percent Glass	Single	Double	.51 to .60	.61 to .70	U-value .31 to 0.30 or less
50	-100	-48	-33	-20	-8
40	-77	-32	-22	-12	-2
35	-65	-25	-16	-8	1
30	-52	-18	-11	-4	4
29	-49	-17	-10	-3	4
28	-47	-16	-9	-2	5
27	-44	-14	-8	-1	5
26	-42	-13	-7	0	6
25	-39	-12	-6	0	6
24	-37	-10	-5	1	7
23	-34	-9	-4	2	8
22	-32	-8	-3	3	8
21	-30	-6	-1	4	9
20	-27	-5	0	4	9
19	-25	-4	1	5	10
18	-22	-3	2	6	10
17	-20	-1	3	7	11
16	-17	0	4	8	11
15	-15	1	5	8	12
14	-13	3	6	9	12
13	-10	4	7	10	13
12	-8	5	8	11	13
11	-5	6	9	11	14
10	-3	8	10	12	14
9	-1	9	11	13	15
8	2	10	12	14	15

Thermal Mass Attachment

Interior Thermal Mass. Use one of the two following methods for calculating the interior thermal mass: Method A or Method B. In some situations Method A will result in less credit than Method B. Method B must be used to receive credit for mass elements that have a unit interior mass capacity less than 1.7.

Method A. The first way to determine the interior thermal mass per conditioned floor area is to look up a value from the following table. "Type-one" mass is any mass with a unit interior mass capacity equal to or greater than 4.2. "Type-two" mass is any mass with a unit interior mass capacity equal to or greater than 1.7 and less than 4.2. The percent mass is the mass area divided by the conditioned floor area. For mass elements exposed on two sides to conditioned space, use the area of only one side to calculate the percentage.

Percent Type-Size	Percent Type-Size																											
	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%	105%	110%	115%	120%	125%		
0% 0	0.2	0.4	0.8	0.8	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8
10% 0.2	0.2	0.4	0.8	0.8	1.2	1.4	1.6	1.8	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8
20% 0.4	0.2	0.4	0.8	1.2	1.4	1.6	1.8	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8	6
30% 0.6	0.8	0.8	1.1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8	6
40% 0.7	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8	6	6.2	6.4
50% 0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8	6	6.2	6.4	6.6
60% 1.1	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8	6	6.2	6.4	6.6	6.8
70% 1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8	6	6.2	6.4	6.6	6.8
80% 1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8	6	6.2	6.4	6.6	6.8	7
90% 1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8	6	6.2	6.4	6.6	6.8	7	7.2
100% 1.7	1.9	2.1	2.3	2.5	2.7	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8	6	6.2	6.4	6.6	6.8	7	7.2	7.4
105% 1.8	2	2.2	2.4	2.6	2.8	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8	6	6.2	6.4	6.6	6.8	7	7.2	7.4
110% 1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.5	5.7	5.9	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.5
115% 2	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.5	5.7	5.9	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.5	7.7
120% 2.1	2.5	2.8	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5	5.2	5.4	5.6	5.8	6	6.2	6.4	6.6	6.8	7	7.2	7.4	7.6	7.8	8

Method B. The second way to determine the interior mass per CFA is to use the worksheet below. Look up the unit interior mass capacity for each mass surface on the back side of this Attachment. A mass surface may be included only once in the worksheet. Include mass exterior walls in this calculation. For mass elements exposed on two sides to conditioned space, enter the surface area of only one side.

[illegible]

Exterior Wall Thermal Mass. Exterior thermal mass is a weighted average of all exterior walls in the building. Look up the exterior mass for each opaque wall element from the back side of this Attachment. Only mass exterior walls may be included in this calculation.

Description	Opaque Wall Area	Exterior Mass Factor		
_____	x	_____	=	_____
_____	x	_____	=	_____
_____	x	_____	=	_____
Conventional Walls	x	0	=	_____
0%				
			Total	Total Opaque Wall Area = Exterior Wall Mass

9. Interior Thermal Mass

Interior Mass C/F	Slab Floor Stories			Raised Floor Stories		
	One	Two	Three	One	Two	Three
0.0	-13	-7	-5	-2	-1	-1
0.1	-12	-7	-4	-2	-1	-1
0.3	-11	-5	-3	-1	0	1
0.5	-8	-4	-2	1	2	2
0.7	-6	-3	-1	2	3	3
0.9	-7	-2	0	3	4	5
1.1	-4	-1	1	4	5	6
1.3	-3	0	2	5	6	7
1.5	-2	1	3	6	7	8
2.0	-2	3	5	8	9	10
2.5	0	5	8	10	11	12
3.0	2	7	9	12	13	15
3.5	3	8	11	13	15	17
4.0	5	10	12	15	18	19
4.5	6	11	13	16	18	20
5.0	7	12	14	17	19	21
5.5	7	13	15	18	20	22
6.0	8	14	16	19	21	23
6.5	9	14	16	19	21	23
7.0	9	15	17	20	21	23
7.5	10	15	17	20	21	22
8.0	10	16	18	21	22	22
8.5	11	16	18	21	22	22

10. Exterior Wall Thermal Mass

Exterior Wall Mass	Single-Family Detached	Single-Family Attached	Multifamily
0.00	0	0	0
0.20	4	3	2
0.40	8	6	5
0.60	11	9	8
0.80	15	12	9
1.00	18	14	10
1.20	22	17	12
1.40	25	20	14
1.60	28	22	16
1.80	29	23	17
2.00	29	27	19

11. Heating System

SE or HSPFF	SE or HSPFF	SE or HSPFF	SE or HSPFF	SE or HSPFF	SE or HSPFF	SE or HSPFF	SE or HSPFF	SE or HSPFF	SE or HSPFF
(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)
SE	HSPFF	SE	HSPFF	SE	HSPFF	SE	HSPFF	SE	HSPFF
0.72	6.60	0	0	0	0	0	0	0	0
0.75	6.88	3	3	2	2	1	1	1	1
0.80	7.33	7	7	6	6	4	4	3	3
0.85	7.78	12	10	9	7	6	4	3	3
0.90	8.25	15	13	11	9	7	5	4	3
0.95	8.71	19	16	14	11	9	6	5	4

continued..

11. Heating System (continued)

Effective SE or HSPFF	Effective SE or HSPFF	Effective SE or HSPFF	Effective SE or HSPFF	Effective SE or HSPFF	Effective SE or HSPFF	Effective SE or HSPFF	Effective SE or HSPFF	Effective SE or HSPFF	Effective SE or HSPFF
(SE or HSPFF x duct efficiency)	(SE or HSPFF x duct efficiency)	(SE or HSPFF x duct efficiency)	(SE or HSPFF x duct efficiency)	(SE or HSPFF x duct efficiency)	(SE or HSPFF x duct efficiency)	(SE or HSPFF x duct efficiency)	(SE or HSPFF x duct efficiency)	(SE or HSPFF x duct efficiency)	(SE or HSPFF x duct efficiency)
SE	HSPFF	SE	HSPFF	SE	HSPFF	SE	HSPFF	SE	HSPFF
0.30	2.75	-47	-58	-49	-41	-32	-23	-15	-11
0.40	3.67	-31	-27	-23	-19	-15	-11	-8	-6
0.50	4.58	-8	-6	-7	-6	-4	-3	-2	-1
0.55	5.15	0	0	0	0	0	0	0	0
0.60	5.50	5	4	4	3	2	2	1	1
0.70	6.42	15	13	11	9	7	5	4	3
0.80	7.33	23	20	17	14	11	8	6	5
0.90	8.25	29	25	21	17	14	10	8	6
1.00	9.17	34	29	25	20	16	12	9	7

Zonal Control Adjustment

System Type	Resistance	Other	Resistance	Other	Resistance	Other	Resistance	Other	Resistance	Other
0	6	6	4	3	1	1	1	1	1	1

12. Cooling System

SEER	SEER	SEER	SEER	SEER	SEER	SEER	SEER	SEER	SEER
(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)	(assumes ducts in attic)
SEER	SEER	SEER	SEER	SEER	SEER	SEER	SEER	SEER	SEER
8.0	-10	-8	-6	-4	-2	0	0	0	0
8.5	-6	-5	-4	-3	-1	0	0	0	0
8.9	-3	-3	-2	-1	-1	0	0	0	0
9.0	-3	-2	-2	-1	-1	0	0	0	0
9.5	0	0	0	0	0	0	0	0	0
10.0	3	2	2	1	1	0	0	0	0
10.5	5	4	3	2	1	0	0	0	0
11.0	7	6	4	3	2	0	0	0	0
12.0	11	9	7	5	3	1	1	1	1
13.0	14	11	9	6	3	1	1	1	1

Effective SEER

(SEER x duct efficiency)

Effective SEER	Effective SEER	Effective SEER	Effective SEER	Effective SEER	Effective SEER	Effective SEER	Effective SEER	Effective SEER	Effective SEER
(SEER x duct efficiency)	(SEER x duct efficiency)	(SEER x duct efficiency)	(SEER x duct efficiency)	(SEER x duct efficiency)	(SEER x duct efficiency)	(SEER x duct efficiency)	(SEER x duct efficiency)	(SEER x duct efficiency)	(SEER x duct efficiency)
SEER	SEER	SEER	SEER	SEER	SEER	SEER	SEER	SEER	SEER
5.0	-21	-17	-13	-9	-5	-1	-1	-1	-1
5.5	-9	-7	-5	-4	-2	0	0	0	0
5.8	-3	-3	-2	-1	-1	0	0	0	0
7.0	0	0	0	0	0	0	0	0	0
8.0	5	4	3	1	0	0	0	0	0
9.0	11	9	7	5	3	0	0	0	0
10.0	15	12	9	7	4	1	1	1	1
11.0	19	15	12	8	4	1	1	1	1
12.0	22	17	13	9	5	1	1	1	1
13.0	24	19	15	10	5	1	1	1	1

Zonal Control Adjustment

10	9	7	5	3	1
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No Cooling System Installed

Series	One	Two	Three	Four	Five	Six	Seven	Eight	Nine	Ten
0	-3	-3	-2	-1	-1	0	0	0	0	0
Two	2	2	2	1	0	0	0	0	0	0

13. Water Heating

Single-Family Detached and Attached

Water Heater Type	Credit Type	Unit Size (ft)	1100 to 1500	1200 to 1600	1700 to 2100	2200 to 2500	2700 or more
SG	None	0	0	0	0	0	0
or	Solar	12	8	6	5	4	3
HP	HWR	8	5	4	3	3	3
	WSB	8	5	4	3	3	3
	POU	8	5	4	3	3	3
SE	None	-37	-24	-18	-15	-12	-9
	Solar	-1	-1	0	0	0	0
	HWR	-18	-12	-9	-7	-6	-4
	WSB	-18	-12	-9	-7	-6	-4
	POU	-18	-12	-9	-7	-6	-4
IG	None	-5	-3	-2	-2	-2	-2
	Solar	7	5	4	3	2	2
	POU	3	2	2	1	1	1
E	None	-28	-19	-14	-11	-9	-6
	Solar	9	6	4	3	3	3
	POU	-8	-5	-4	-3	-3	-3

Multi-Family (Individual units)

Water Heater Type	Credit Type	Unit Size (ft)	600 to 1100	700 to 1200	1200 to 1600	1700 to 2100	2200 or more
SG	None	0	0	0	0	0	0
or	Solar	14	7	5	4	3	3
HP	HWR	9	5	3	2	2	2
	WSB	13	6	4	3	3	3
	POU	9	5	3	2	2	2
SE	None	-45	-22	-15	-11	-9	-6
	Solar	2	1	1	1	0	0
	HWR	-23	-11	-8	-6	-5	-4
	WSB	-15	-7	-5	-4	-3	-3
	POU	-23	-11	-8	-6	-5	-4
IG	None	-7	-4	-2	-2	-2	-2
	Solar	6	3	2	2	1	1
	POU	2	1	1	0	0	0
E	None	-30	-15	-10	-7	-6	-4
	Solar	19	9	6	5	4	3
	POU	-7	-3	-2	-2	-1	-1

General Instructions

Default Values. The zero score or default value for each measure is listed in brackets on the scorecard.

Documentation of U-Values. The insulation point tables for ceiling surfaces enable the use of either the measured R-value of the insulation or the U-value of the entire construction assembly. When the U-value is used to determine points, a Form 3R must be attached.

Interpolation. Interpolation is permitted, but the point score must be rounded off to the nearest whole point. A side calculation may be provided when interpolation is required. Users may not extrapolate below the point score ranges. As an alternative to interpolation, users may use the conservative value; interpolation is not permitted between values in scorecard columns.

Weighted Averages. When more than one type of wall, window, roof or floor is used in a building, the point score may be based on a weighted average U-value, storage coefficient, etc. Weighted average U-values may not be used. Instructions for making weighted average calculations are contained in the Glossary of the Energy Conservation Manual under "U-values" and "Weighted averages".

Building Data

Conditioned Floor Area (CFA). The CFA is measured to the outside surface of exterior walls. It includes conditioned space on all levels, but not on levels on upper floors such as stairs.

Slab/Raised Floor. Indicate the predominant type of floor construction for the building. See the Glossary of the Energy Conservation Manual under "condemned basement" when more than one type of floor construction exists in a building.

Number of Stories. The number of stories is defined in the Uniform Building Code.

Unit Type Condition. Three unit types are recognized by the standards: single family detached (SFD), single family attached (SFA) and multi-family (MF). For apartments, three additional entries are possible: "apartment alone," "existing building" or "existing plus addition."

Glass Area and Percent. Glass area is measured to include the rough frame opening. Orientation is determined by the closest proximity to one of the cardinal orientations. Glazing within a 10° field is included; glazing is considered horizontal glazing. The percent glazing is given by the following equation:

$$\text{Percent Glass} = (\text{Glass Area} \div \text{CFA}) \times 100$$

Point Scores

1. Ceiling Insulation. Enter the installed R-value (or U-value) on the scorecard and look up the point score based on the number of stories.

2. Wall Insulation. Enter the R-value (or U-value) on the scorecard and look up the point score based on the unit type.

3. Raised Floor Insulation. Two floor insulation tables are provided. The first table is used when the insulation is installed in the floor assembly. The point score may be determined based on the installed R-value of the U-value. Only the installed R-value should be used with the first table (the point score is adjusted for the following effect of a crawnspace).

The R-value may only be used when the floor is over a crawnspace. An R-6 may be included to approximate the crawnspace when calculating the U-value for use with the second part of the table when the floor is over a crawnspace (see Energy Conservation Manual for details).

The second table is used for controlled ventilation crawnspace — insulation in the perimeter wall of the crawnspace. There are several slightly easier, but must be included the second table may be used in the Glossary of the Energy Conservation Manual under "Controlled Ventilation Crawnspace" for details. Enter the installed R-value on the scorecard and look up the point score based on the number of stories.

4. Slab Edge Insulation. Enter the R-value (or U-value) on the scorecard and look up the point score based on the number of stories. There may be a benefit in using the R-2 factor table when perimeter buildings have an attached garage because the R-2 edge of the attached garage may be counted as insulated. The R-2 factor may be determined from Chapter 4 of the Energy Conservation Manual.

5. Infiltration (Air Leakage). Enter zero.

6. Glass Heat Loss. Enter the glass type (single or double) on the window U-value for the entire rough frame opening and look up the point score based on the percent of total glazing. When more than one type of glass is used in the building, look up the point score separately for each glass type based on the total percent glazing and then use a weighted average of the point scores.

Sum 1-6. Add the point score for the first six items and enter in the space at the right. This is used later to determine the heating system point score.

7. Shading (Shade Open). Point scores must always be determined for two conditions: with the window shade or blind in place (Tables 7a and 7b) and closed (Table 8). Both tables must always be used. The effect of external shading devices are ignored when calculating the shading coefficient (SC) for use with Table 7, but the effect is included for Table 8. External shading devices must be considered in calculating the SC for both Tables 7 and 8.

The point table is based on effective percent glass, which is the percent glass times the SC with the window shade or blind in place and the SC without the shade or blind in place. The Energy Conservation Manual under "Shading" and "SC" may be used to determine the SC for a given window or glazing assembly. A SC of 0.80 may be used for double-pane windows with low-e coatings. A SC of 0.80 may be used for double-pane windows with low-e coatings. A SC of 0.80 may be used for double-pane windows with low-e coatings. A SC of 0.80 may be used for double-pane windows with low-e coatings.

8. Shading (Shade Closed). The point score is based on effective percent glass, which is the percent glass times the SC with the shade or blind in place and the SC without the shade or blind in place. The Energy Conservation Manual under "Shading" and "SC" may be used to determine the SC for a given window or glazing assembly. A SC of 0.80 may be used for double-pane windows with low-e coatings. A SC of 0.80 may be used for double-pane windows with low-e coatings. A SC of 0.80 may be used for double-pane windows with low-e coatings.

9. Interior Thermal Mass. Interior thermal mass is a mass exposed to interior conditions and having exterior portions at or below-grade. Solid concrete floors, masonry located inside attached exterior surfaces, etc., are included.

The interior thermal mass point score is based on the floor area of the CFA. The interior mass CFA is calculated in the Thermal Mass Attachment. Enter the floor area of the CFA on the scorecard and look up the point score on the floor construction and the number of stories.

10. Exterior Wall Thermal Mass. Exterior wall thermal mass is located in the exterior wall of a building. The exterior wall thermal mass point score is based on the exterior wall area of the building. Enter the exterior wall area on the scorecard and look up the point score on the exterior wall construction and the number of stories. Note that exterior wall mass is also included in the interior thermal mass calculation.

Sum 7-10. Add the point score for items 7 through 10 and enter in the space at the right. This is used later to determine the cooling system point score.

11. Heating System. The subtotal of items 1 through 6 is used to determine the column for the heating system table.

The first point table should be used when HVAC does not meet the minimum insulation requirements and structural standards. In this case, the score is based only on the seasonal efficiency (SE) for gas equipment or the heating season performance factor (HSPF) for electric equipment. The SE or HSPF may be taken from the Federal Energy Commission's (FEC) tables.

The second point table is based on the effective SE or HSPF. The effective SE or HSPF is the SE or HSPF multiplied by the efficiency factor. The efficiency factor is determined in the Glossary of the Energy Conservation Manual under "HVAC".

The third table is used when the heating system has the minimum insulation requirements in the Energy Conservation Manual under "HVAC". The first row of this table is used for electric resistance heat. The second row is used for other types of heating systems. The point score in the first row is added to the score chosen from the last row of the table.

12. Cooling System. The subtotal of items 7 through 10 is used to determine the column for determining the cooling system table.

The first point table should be used when HVAC does not meet the minimum insulation requirements and structural standards. In this case, the score is based on the seasonal energy efficiency ratio (SEER) which is taken from the FEC and state directives.

The second table is based on the effective SEER. The effective SEER is the SEER multiplied times the efficiency factor. The efficiency factor is explained in the Glossary of the Energy Conservation Manual under "HVAC".

The third table is used when the cooling system has the minimum insulation requirements in the Glossary of the Energy Conservation Manual under "HVAC". The first row of this table is used for electric resistance heat. The second row is used for other types of heating systems. The point score in the first row is added to the score chosen from the last row of the table.

13. Water Heating. Two tables are provided for water heating. The first table is used for a tank water heater. The second table is used for a tankless water heater. The point score is based on the water heating capacity and the water heating efficiency.

The water heating capacity depends on the water heating capacity, the energy credit and the average water temperature. The water heating capacity is used for water heaters with a storage tank. The average water temperature is used for tankless water heaters. The water heating efficiency is used for tankless water heaters. The water heating efficiency is used for tankless water heaters. The water heating efficiency is used for tankless water heaters.

The water heating point tables may not be used for storage type water heaters that exceed 50 gallons of water capacity, for tankless water heaters and attached to a gas furnace. The Energy Conservation Manual under "Water Heating" may be used to determine the water heating capacity and the water heating efficiency.

Point Total. The point total is calculated by adding the heating and cooling point scores. In order to show a net score, a zero or positive score must be achieved.

Point System Summary: Climate Zone 16

P-2R

Project Title _____

Date _____

BUILDING DATA

Conditioned Floor Area _____

Number of Stories _____

Slab/Raised Floor _____

Check all applicable Unit Type condition(s):

- | | |
|---|---|
| ☐ Single Family Detached (SFD) | ☐ Addition Alone |
| ☐ Single Family Attached (SFA) | ☐ Existing Building |
| ☐ Multi-Family (MF) | ☐ Existing-Plus-Addition |

	Glass Area	% Glass
North	_____	_____
East	_____	_____
South	_____	_____
West	_____	_____
Skylight	_____	_____
Total	_____	_____

SCORE CARD

Measures

Point Scores

1. Ceiling Insulation

R-value [38] or U-value [0.030]

2. Wall Insulation

R-value [19] or U-value [0.066]

3. Raised Floor Insulation

R-value [19] or U-value [0.037]

4. Slab Edge Insulation

R-value [7] or P2 factor [0.31]

5. Infiltration

Standard

6. Glass Heat Loss

Type (double) U-value [0.65] % Total Glass [16]

Sum 1-6

7. Shading (Shade Open)

% Glass SC Eff. % Glass

a. North	_____ x _____ = _____
b. East	_____ x _____ = _____
c. South	_____ x _____ = _____
d. West	_____ x _____ = _____
e. Skylight	_____ x _____ = _____

8. Shading (Shade Closed)

% Glass SC Eff. % Glass

a. North	_____ x _____ = _____
b. East	_____ x _____ = _____
c. South	_____ x _____ = _____
d. West	_____ x _____ = _____
e. Skylight	_____ x _____ = _____

9. Interior Thermal Mass

Interior Mass/CFA

10. Exterior Wall Mass

Exterior Wall Mass

Sum 7-10

11. Heating System

Zonal Control? (Y/N)

SE or HSPF [0.72/6.6] x Duct Efficiency [0.78] = Effective SE or HSPF [0.34/3.15]

12. Cooling System

Zonal Control? (Y/N)

SEER [8.9] x Duct Efficiency [0.78] = Effective SEER [6.99]

13. Water Heating

Type [SG] Credit [none]

Point Total:

Climate Zone 16

Residential Point System

1. Ceiling Insulation

R-value	Number of stories		
	One	Two	Three
R-0	-120	-59	-40
R-10	-10	-8	-3
R-20	-2	-1	-1
R-30	0	0	0
U-value			
0.50	-200	-98	-66
0.20	-118	-58	-38
0.10	-32	-18	-11
0.08	-23	-11	-8
0.06	-14	-7	-5
0.04	-5	-2	-2
0.02	5	2	2
0.00	14	7	4

2. Wall Insulation

R-value	Single-Family Detached		Multi-Family Attached
	One	Two	
R-0	-102	-77	-51
R-11	-11	-8	-5
R-13	-8	-6	-4
R-19	0	0	0
U-value			
0.80	-212	-150	-107
0.50	-132	-100	-67
0.30	-74	-56	-37
0.10	-11	-8	-4
0.08	-5	-3	-2
0.06	2	1	1
0.04	9	6	4
0.02	15	11	8
0.00	22	15	11

3. Raised Floor Insulation

Insulation in Floor

R-value	Number of stories		
	One	Two	Three
R-0	-24	-12	-8
R-11	-5	-2	-1
R-19	0	0	0
R-30	4	2	1
U-value			
0.50	-218	-103	-67
0.20	-185	-85	-55
0.10	-142	-67	-44
0.08	-109	-49	-32
0.06	-84	-31	-20
0.04	-24	-12	-8
0.02	-17	-8	-5
0.00	-9	-4	-3
0.04	-1	-1	0
0.02	6	3	2
0.00	14	7	5

Controlled Ventilation Crawlspace

R-value	Number of stories		
	One	Two	Three
R-0	-15	-10	-7
R-5	-4	-3	-2
R-11	-1	-1	-1
R-19	0	0	0

4. Slab Edge Insulation

R-value	Number of stories		
	One	Two	Three
R-0	-13	-8	-4
R-5	-1	-1	0
R-7	0	0	0
F2 factor			
0.80	-19	-13	-8
0.20	-14	-9	-5
0.10	-9	-6	-3
0.08	-4	-3	-1
0.06	0	0	0
0.04	5	3	2

5. Infiltration (Air Leakage)

Specification	Points
Standard	0

7. Shading (Shade Open)

Effective Percent Glass (percent glass x SC)						
Effective % Glass	North	East	South	West	Skylight	
18	10	6	12	4	—	
16	9	6	11	4	—	
14	7	6	10	4	—	
12	6	6	9	4	—	
11	5	5	8	4	—	
10	4	5	8	4	4	
9	4	4	7	4	5	
8	3	4	6	4	6	
6	2	3	4	3	6	
4	1	2	3	2	6	
3	0	0	0	0	5	
2	-1	-2	-3	-3	3	
1	-1	-4	-6	-3	3	
0	-2	-6	-11	-6	0	

6. Glass Heat Loss

Total Percent Glass	U-value				
	Single	Double	.51 to .60	.41 to .50	.21 to 0.30 or less
50	-100	-85	-63	-41	-20
40	-141	-59	-42	-25	-4
35	-117	-48	-31	-17	-2
30	-93	-34	-21	-9	3
25	-68	-31	-19	-7	8
20	-64	-29	-17	-6	17
17	-79	-26	-15	-4	7
16	-75	-24	-13	-3	8
15	-70	-22	-11	-1	9
14	-65	-19	-9	1	10
13	-61	-17	-7	2	11
12	-56	-14	-5	4	12
11	-52	-12	-3	5	13
10	-47	-9	-1	7	15
9	-43	-7	1	8	16
8	-39	-5	3	10	17
7	-34	-2	4	11	18
6	-30	0	6	13	19
5	-25	2	8	14	20
4	-21	5	10	16	21
3	-17	7	12	17	22
2	-12	9	14	19	23
1	-8	12	16	20	24
0	-4	14	18	21	25
0	0	16	19	23	26
0	4	18	21	24	27

8. Shading (Shade Closed)

Effective Percent Glass (percent glass x SC)						
Effective % Glass	North	East	South	West	Skylight	
18	0	-32	-48	-45	—	
16	-8	-27	-39	-38	—	
14	-6	-23	-32	-31	—	
12	-5	-18	-25	-24	—	
10	-4	-14	-19	-18	—	
9	-4	-13	-18	-15	-43	
8	-3	-10	-14	-13	-46	
6	-2	-8	-8	-8	-30	
5	-1	-4	-5	-5	-23	
4	-1	-2	-3	-3	-17	
3	0	-1	-1	-1	-11	
2	0	1	1	2	-7	
1	1	2	3	4	-3	
0	1	4	4	6	0	

Thermal Mass Attachment

Residential Point System

Interior Thermal Mass. Use one of the two following methods for calculating the interior thermal mass: Method A or Method B. In some situations Method A will result in less credit than Method B. Method B must be used to receive credit for mass elements that have a unit interior mass capacity less than 1.7.

Method A. The first way to determine the interior thermal mass per conditioned floor area is to look up a value from the following table. "Type-one" mass is any mass with a unit interior mass capacity equal to or greater than 4.2. "Type-two" mass is any mass with a unit interior mass capacity equal to or greater than 1.7 and less than 4.2. The percent mass is the mass area divided by the conditioned floor area. For mass elements exposed on two sides to conditioned space, use the area of only one side to calculate the percentage.

Percent Type-Two Mass	Percent Type-One Mass															
	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%
0%	0	0.2	0.4	0.6	0.8	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1
10%	0.2	0.4	0.6	0.8	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3
20%	0.4	0.6	0.8	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5
30%	0.6	0.8	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7
40%	0.8	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9
50%	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1
60%	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3
70%	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5
80%	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7
90%	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9
100%	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1
105%	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2
110%	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3
115%	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4
120%	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.5
125%	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6

Method B. The second way to determine the interior mass per CFA is to use the worksheet below. Look up the unit interior mass capacity for each mass surface on the back side of this Attachment. A mass surface may be included only once in the worksheet. Include mass exterior walls in this calculation. For mass elements exposed on two sides to conditioned space, enter the surface area of only one side.

Description	Mass Area	Unit Interior Mass Capacity	Interior Mass Capacity
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Total			CFA
			Interior Mass/CFA

Exterior Wall Thermal Mass. Exterior thermal mass is a weighted average of all exterior walls in the building. Look up the exterior mass for each opaque wall element from the back side of this Attachment. Only mass exterior walls may be included in this calculation.

Description	Opaque Wall Area	Exterior Mass Factor	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Conventional Walls	_____	0	_____
Total			Total Opaque Wall Area
			Exterior Wall Mass

9. Interior Thermal Mass

Interior Mass ACF	Slab Floor Series			Ratified Floor Series		
	One	Two	Three	One	Two	Three
0.0	-10	-8	-4	-2	-1	-1
0.1	-9	-5	-3	-1	0	0
0.2	-8	-4	-2	0	1	1
0.3	-7	-3	-1	1	2	2
0.4	-6	-2	-1	1	2	3
0.5	-5	-1	0	2	3	4
0.6	-4	0	1	3	4	5
0.7	-3	1	2	4	5	6
0.8	-2	2	3	5	6	7
0.9	-1	3	4	6	7	8
1.0	0	4	5	7	8	9
1.1	1	5	6	8	9	10
1.2	2	6	7	9	10	11
1.3	3	7	8	10	11	12
1.4	4	8	9	11	12	13
1.5	5	9	10	12	13	14
1.6	6	10	11	13	14	15
1.7	7	11	12	14	15	16
1.8	8	12	13	15	16	17
1.9	9	13	14	16	17	18
2.0	10	14	15	17	18	19
2.1	11	15	16	18	19	20
2.2	12	16	17	19	20	21
2.3	13	17	18	20	21	22
2.4	14	18	19	21	22	23
2.5	15	19	20	22	23	24
2.6	16	20	21	23	24	25
2.7	17	21	22	24	25	26
2.8	18	22	23	25	26	27
2.9	19	23	24	26	27	28
3.0	20	24	25	27	28	29
3.1	21	25	26	28	29	30
3.2	22	26	27	29	30	31
3.3	23	27	28	30	31	32
3.4	24	28	29	31	32	33
3.5	25	29	30	32	33	34
3.6	26	30	31	33	34	35
3.7	27	31	32	34	35	36
3.8	28	32	33	35	36	37
3.9	29	33	34	36	37	38
4.0	30	34	35	37	38	39
4.1	31	35	36	38	39	40
4.2	32	36	37	39	40	41
4.3	33	37	38	40	41	42
4.4	34	38	39	41	42	43
4.5	35	39	40	42	43	44
4.6	36	40	41	43	44	45
4.7	37	41	42	44	45	46
4.8	38	42	43	45	46	47
4.9	39	43	44	46	47	48
5.0	40	44	45	47	48	49
5.1	41	45	46	48	49	50
5.2	42	46	47	49	50	51
5.3	43	47	48	50	51	52
5.4	44	48	49	51	52	53
5.5	45	49	50	52	53	54
5.6	46	50	51	53	54	55
5.7	47	51	52	54	55	56
5.8	48	52	53	55	56	57
5.9	49	53	54	56	57	58
6.0	50	54	55	57	58	59
6.1	51	55	56	58	59	60
6.2	52	56	57	59	60	61
6.3	53	57	58	60	61	62
6.4	54	58	59	61	62	63
6.5	55	59	60	62	63	64
6.6	56	60	61	63	64	65
6.7	57	61	62	64	65	66
6.8	58	62	63	65	66	67
6.9	59	63	64	66	67	68
7.0	60	64	65	67	68	69
7.1	61	65	66	68	69	70
7.2	62	66	67	69	70	71
7.3	63	67	68	70	71	72
7.4	64	68	69	71	72	73
7.5	65	69	70	72	73	74
7.6	66	70	71	73	74	75
7.7	67	71	72	74	75	76
7.8	68	72	73	75	76	77
7.9	69	73	74	76	77	78
8.0	70	74	75	77	78	79
8.1	71	75	76	78	79	80
8.2	72	76	77	79	80	81
8.3	73	77	78	80	81	82
8.4	74	78	79	81	82	83
8.5	75	79	80	82	83	84
8.6	76	80	81	83	84	85
8.7	77	81	82	84	85	86
8.8	78	82	83	85	86	87
8.9	79	83	84	86	87	88
9.0	80	84	85	87	88	89
9.1	81	85	86	88	89	90
9.2	82	86	87	89	90	91
9.3	83	87	88	90	91	92
9.4	84	88	89	91	92	93
9.5	85	89	90	92	93	94
9.6	86	90	91	93	94	95
9.7	87	91	92	94	95	96
9.8	88	92	93	95	96	97
9.9	89	93	94	96	97	98
10.0	90	94	95	97	98	99
10.1	91	95	96	98	99	100
10.2	92	96	97	99	100	101
10.3	93	97	98	100	101	102
10.4	94	98	99	101	102	103
10.5	95	99	100	102	103	104
10.6	96	100	101	103	104	105
10.7	97	101	102	104	105	106
10.8	98	102	103	105	106	107
10.9	99	103	104	106	107	108
11.0	100	104	105	107	108	109
11.1	101	105	106	108	109	110
11.2	102	106	107	109	110	111
11.3	103	107	108	110	111	112
11.4	104	108	109	111	112	113
11.5	105	109	110	112	113	114
11.6	106	110	111	113	114	115
11.7	107	111	112	114	115	116
11.8	108	112	113	115	116	117
11.9	109	113	114	116	117	118
12.0	110	114	115	117	118	119
12.1	111	115	116	118	119	120
12.2	112	116	117	119	120	121
12.3	113	117	118	120	121	122
12.4	114	118	119	121	122	123
12.5	115	119	120	122	123	124
12.6	116	120	121	123	124	125
12.7	117	121	122	124	125	126
12.8	118	122	123	125	126	127
12.9	119	123	124	126	127	128
13.0	120	124	125	127	128	129
13.1	121	125	126	128	129	130
13.2	122	126	127	129	130	131
13.3	123	127	128	130	131	132
13.4	124	128	129	131	132	133
13.5	125	129	130	132	133	134
13.6	126	130	131	133	134	135
13.7	127	131	132	134	135	136
13.8	128	132	133	135	136	137
13.9	129	133	134	136	137	138
14.0	130	134	135	137	138	139
14.1	131	135	136	138	139	140
14.2	132	136	137	139	140	141
14.3	133	137	138	140	141	142
14.4	134	138	139	141	142	143
14.5	135	139	140	142	143	144
14.6	136	140	141	143	144	145
14.7	137	141	142	144	145	146
14.8	138	142	143	145	146	147
14.9	139	143	144	146	147	148
15.0	140	144	145	147	148	149
15.1	141	145	146	148	149	150
15.2	142	146	147	149	150	151
15.3	143	147	148	150	151	152
15.4	144	148	149	151	152	153
15.5	145	149	150	152	153	154
15.6	146	150	151	153	154	155
15.7	147	151	152	154	155	156
15.8	148	152	153	155	156	157
15.9	149	153	154	156	157	158
16.0	150	154	155	157	158	159
16.1	151	155	156	158	159	160
16.2	152	156	157	159	160	161
16.3	153	157	158	160	161	162
16.4	154	158	159	161	162	163
16.5	155	159	160	162	163	164
16.6	156	160	161	163	164	165
16.7	157	161	162	164	165	166
16.8	158	162	163	165	166	167
16.9	159	163	164	166	167	168
17.0	160	164	165	167	168	169
17.1	161	165	166	168	169	170
17.2	162	166	167	169	170	171
17.3	163	167	168	170	171	172
17.4	164	168	169	171	172	173
17.5	165	169	170	172	173	174
17.6	166	170	171	173	174	175
17.7	167	171	172	174	175	176
17.8	168	172	173	175	176	177
17.9	169	173	174	176	177	178
18.0	170	174	175	177	178	179
18.1	171	175	176	178	179	180
18.2	172	176	177	179	180	181
18.3	173	177	178	180	181	182
18.4	174	178	179	181	182	183
18.5	175	179	180	182	183	184
18.6	176	180	181	183	184	185
18.7	177	181	182	184	185	186
18.8	178	182	183	185	186	187
18.9	179	183	184	186	187	188
19.0	180	184	185	187	188	189
19.1	181	185	186	188	189	190
19.2	182	186	187	189	190	191
19.3	183	187	188	190	191	192
19.4	184	188	189	191	192	193
19.5	185	189	190	192	193	194
19.6	186	190	191	193	194	195
19.7	187	191	192	194	195	196
19.8	188	192	193	195	196	197
19.9	189	193	194	196	197	198
20.0	190	194	195	197	198	199
20.1	191	195	196	198	199	200
20.2	192	196	197	199	200	201
20.3	193	197	198	200	201	202
20.4	194	198	199	201	202	203
20.5	195	199	200	202	203	204
20.6	196	200	201	203	204	205
20.7	197	201	202	204	205	206
20.8						

Residential Point System

Instructions

General Instructions

Default Values. The zero score or default value for each measure is listed in brackets on the scorecard.

Documentation of U-Value. The insulation point score for opaque surfaces enables the use of either the installed R-value of the insulation or the U-value of the entire construction assembly. When the U-value is used to determine points, a Form 3R must be attached.

Interpolation. Interpolation is permitted, but the point score must be rounded off to the nearest whole point. A side calculation may be provided when interpolation is required. Users may not extrapolate beyond the point score ranges. As an alternative to interpolation, users may use the conservative value. Interpolation is not permitted between values in separate columns.

Weighted Averages. When more than one type of wall, window, roof or floor is used in a building, the point score may be based on a weighted average U-value, shading coefficient, etc. Weighted average U-values must not be used. Instructions for making weighted average calculations are contained in the Glossary of the Energy Conservation Manual under "R-values" and "weighted averages".

Building Data

Conditioned Floor Area (CFA). The CFA is measured to the outside surface of exterior walls. It includes conditioned space on all levels, but not coverings on upper floors such as stairs.

Slab/Reinforced Floor. Indicate the predominant type of floor construction for the building. See the Glossary of the Energy Conservation Manual under "conditioned footprint" when more than one type of floor construction exists in a building.

Number of Stories. The number of stories is defined in the Uniform Building Code.

Unit Type/Condition. Three unit types are recognized by the standards: single-family detached (SFD), single-family attached (SFA) and multi-family (MF). For additions, three additional entries are possible: "addition alone", "existing building" or "existing plus addition".

Glass Area and Percent. Glass area is measured to include the rough frame opening. Orientation is determined by the closest proximity to one of the cardinal orientations. Glazing with a tilt less than 60 degrees is considered horizontal glazing. The percent glazing is given by the following equation:

$$\text{Percent Glass} = (\text{Glass Area} \div \text{CFA}) \times 100$$

Point Scores

1. Ceiling Insulation. Enter the installed R-value (or U-value) on the scorecard and look up the point score based on the number of stories.

2. Wall Insulation. Enter the R-value (or U-value) on the scorecard and look up the point score based on the unit type.

3. Rafted Floor Insulation. Two floor insulation areas are provided. The first table is used when the insulation is installed in the floor assembly. The point score may be determined based on the installed R-value or the U-value. Only the insulation R-value should be used with the first part (the point scores account for the building effect of a crawlspace). The R-value table may only be used when the floor is over a crawlspace. An R-6 may be indicated to account for the crawlspace when calculating the U-value for use with the second part of the table when the floor is over a crawlspace (see Energy Conservation Manual for details).

The second table is used for controlled ventilation crawlspaces — insulation in the perimeter wall of the crawlspace. There are several eligibility criteria that must be met before the second table may be used (see the Glossary of the Energy Conservation Manual under "Controlled Ventilation Crawlspaces" for details). Enter the installed R-value on the scorecard and look up the point score based on the number of stories.

4. Slab Edge Insulation. Enter the R-value (or F2 factor) on the scorecard and look up the point score based on the number of stories. There may be a benefit in using the F2 factor table when proposed buildings have an attached garage because the slab edge at the attached garage may be counted as insulated. The F2 factor may be determined from Chapter 4 of the Energy Conservation Manual.

5. Infiltration (Air Leakage). Enter zero.

6. Glass Heat Loss. Enter the glass type (single or double) or the window U-value for the entire rough frame opening and look up the point score based on the total percent glazing. When more than one type of glass is used in the building, look up the point score separately for each glass type based on the total percent glazing and do an area weighted average of the point scores.

Sum 1-6. Add the point score for the first six items and enter in the space at the right. This is used later to determine the heating system point score.

7. Shading (Shade Open). Point scores must always be determined for two conditions: when the interior shade or blind is open (Table 7) and when it is closed (Table 8). Both tables must always be used. The effects of internal shading devices are ignored when calculating the shading coefficient (SC) for use with Table 7, but the effects are included for Table 8. Exterior sunscreens must be accounted for in calculating the SC for both Tables 7 and 8.

The points table is based on effective percent glass, which is the percent glass times the SC with the interior shade open. Calculation of the SC is explained in the Glossary of the Energy Conservation Manual under "Shading". A SC of 0.77 may be used for double glazing in a metal window and no sunscreens. A SC of 0.40 may be used for double glazing in a metal window with a sunscreen meeting the package requirements, when applicable.

8. Shading (Shade Closed). The points table is based on effective percent glass, which is the percent glass times the SC with the drapes or internal device closed. Shading coefficient is explained in the Glossary of the Energy Conservation Manual under "Shading". A SC of 0.66 may be used for double glazing in a metal window and no sunscreens. A SC of 0.36 may be used for double glazing in a metal window with a sunscreen meeting the package requirements, when applicable.

9. Interior Thermal Mass. Interior thermal mass is all mass exposed to interior conditioned air, including interior partitions, slab-on-grade, raised concrete floors, mass located inside insulated exterior surfaces, and exterior wall mass.

The interior thermal mass point score is based on the interior mass per CFA. The interior mass per CFA is calculated on the Thermal Mass Attachment. Enter the interior mass per CFA on the scorecard and look up the points based on the floor construction and the number of stories.

10. Exterior Wall Thermal Mass. Exterior wall mass is mass located in the exterior walls of buildings. The exterior wall thermal mass point score is based on the exterior wall mass per CFA for the opaque walls of the building. The exterior wall mass is calculated on the Thermal Mass Attachment. Enter the exterior wall mass on the scorecard and look up the points based on the unit type. Note that exterior wall mass is also calculated in the interior thermal mass calculation.

Sum 7-10. Add the point score for items 7 through 10 and enter in the column at the right. This is used later to determine the cooling system point score.

11. Heating System. The subtotal of items 1 through 6 is used to determine the column for the heating system points.

The first point table should be used when HVAC ducts meet the minimum insulation requirements and are located in an attic. In this case, the score is based on only one seasonal efficiency (SE) for gas equipment or the heating season performance factor (HSPF) for electric equipment. The SE or HSPF may be taken from the CEC appliance directories.

The second point table is based on an effective SE or HSPF. The effective SE or HSPF is the SE or HSPF multiplied times the duct efficiency. The duct efficiency is explained in the Glossary of the Energy Conservation Manual under "HVAC".

The third table is used when the heating system has the capability for total control (see requirements in the Glossary of the Energy Conservation Manual under "Total Control"). The first row of this table is used for electric resistance heat. The second row is used for other types of heating systems. The point score in this table is added to the value chosen from the first or second table.

12. Cooling System. The subtotal of items 7 through 10 is used to determine the column for determining the cooling system points.

The first point table should be used when HVAC ducts meet the minimum insulation requirements and are located in an attic. In this case, the score is based on the seasonal energy efficiency rating (SEER), which is taken from the CEC appliance directories.

The second table is based on the minimum SEER. The effective SEER is the SEER multiplied times the duct efficiency. The duct efficiency is explained in the Glossary of the Energy Conservation Manual under "HVAC".

A third table is used when the cooling system has the capability for zonal control (see requirements in the Glossary of the Energy Conservation Manual under "Zonal Control"). The point score in this table is added to the value chosen from the first or second table.

When no cooling system is installed, points should be taken from the fourth table. In this case, duct efficiency factors are not applicable.

13. Water Heating. Two tables are provided for water heating. The first table is used for single-family detached and attached houses. The second table is used for multi-family housing with water heaters for each unit. The point tables may not be used with central multi-family water heaters.

In each table, the point score depends on the water heater type, possible energy credits and the average dwelling unit size. The following codes are used for water heater types: SO, storage tank; SE, storage electric; IG, instantaneous gas; IE, instantaneous electric; HP, heat pump water heater. The following codes are used for the energy credits: None, no credit; SC, active or passive solar system with a net solar savings of at least 60%; HWH, hot water recovery; WSB, wood stove boiler; and PCU, point of use design. The Energy Conservation Manual contains eligibility criteria related to each of the water heating methods; some may require special documentation (Chapter 6).

The water heating point tables may not be used for storage type water heaters that exceed 50 gallons of tank capacity for single-family detached and attached or 40 gallons for multi-family. The CEC water heating worksheets contained in Chapter 6 of the Energy Conservation Manual may be used to calculate the point score for water heaters that exceed these limits.

Points Total. The points total is calculated by adding items 11 through 13 to the previous subtotals. In order to show compliance, a zero or positive score must be achieved.

Table 3-212: Prescriptive Packages for Climate Zone 12

Component	SPECIAL Package A	Package B	Package C	Package D	Package E
BUILDING ENVELOPE					
Insulation Minimums:					
Ceiling	R-30	R-30	R-30	R-38	R-38
Wall ¹	R-11	R-19	R-11	R-11	R-11
"Heavy" Wall	(R-3.5)	(R-3.5)	(R-2.5)	N/A	N/A
"Light Mass" Wall	(R-5.0)	(R-5.5)	(R-4.5)	N/A	N/A
Slab Floor Perimeter	NR	R-7	R-7	NR	N/A
Raised Floor	R-11	R-19	R-11	N/A	R-19
GLAZING					
Maximum U-Value	0.65	0.65	0.65	0.65	0.65
Maximum Total Area	NR	14%	16%	16%	16%
Maximum Total Nonsouth Facing Area	0.6%	N/A	N/A	N/A	N/A
Minimum South Facing Area	6.4%	NR	NR	NR	NR
SHADING COEFFICIENT					
South Facing Glazing	0.36/Opt.Ov.	0.36/Opt.Ov.	0.36/Opt.Ov.	0.36	0.36
West Facing Glazing	0.36	0.36	0.36	0.36	0.36
East Facing Glazing	NR	NR	0.36	0.36	0.36
North Facing Glazing	NR	NR	NR	0.66 ²	0.66 ²
THERMAL MASS³					
	REQ	NR	NR	25%	10%
INFILTRATION CONTROL					
Continuous Barrier	NR	NR	NR	NR	NR
Air-to-Air Heat Exchanger	NR	NR	NR	NR	NR
SPACE HEATING SYSTEM⁴					
If Gas, Seasonal Efficiency=	71%	71%	71%	72%	72%
If Heat Pump ⁵ , ACOP=	MIN	MIN	MIN	2.5	2.5
SPACE COOLING SYSTEM					
If Air Conditioner ⁶ , SEER=	MIN	MIN	MIN	9.5	9.5
DOMESTIC WATER HEATING TYPE					
System must meet budget, see §2-5351(b) and 2-5351(f)(8)	ANY	ANY	Solar w/ Any Backup	ANY	ANY

LEGEND: NR = Not Required; N/A = Not Applicable; REQ = Required

- The value in parentheses is the minimum R-value for the entire wall assembly excluding interior and exterior air films if the wall weight exceeds 40 pounds per square foot. The value in brackets is the minimum R-value for the entire assembly if the heat capacity of the wall meets or exceeds the result of multiplying the bracketed minimum R-value by 0.65. The insulation must be integral with or installed on the outside of the exterior mass. The inside surface of the thermal mass, including plaster or gypsum board in direct contact with the masonry wall, shall be exposed to the room air. The exterior wall used to meet the R-value in parentheses cannot also be used to meet the above thermal mass requirement.
- No specific shading must be installed with double glazing to meet the 0.66 shading coefficient requirement which is named light drapery.
- To calculate the amount of thermal mass required for Package A, use the method set forth in §2-5351(f)(4). Package D (for slab floor buildings) requires 25 percent of the ground floor area directly exposed to the conditioned space. Un carpeted (e.g., linoleum or tiled) ground floor area, such as entry ways, kitchens, bathrooms, and conditioned utility rooms or closets may be counted towards this requirement. Package E (for raised floor buildings) requires a thermal mass area equal to 10 percent of the ground floor area. To qualify for thermal mass, the material used must have a performance equivalent to a two inch thick mass element with a volumetric heat capacity of 28 Btu/ft³·°F, a thermal conductivity of 0.51 Btu/ft·°F, and a surface area directly exposed to the room air of the required percentage of the ground floor.
- The 71% SE requirements are superseded by the Appliance Efficiency Standards which require that all new water-gated central gas furnaces of less than 175,000 Btu/hr manufactured on or after January 1, 1988 have a rating of 72% SE or higher. Anomalous setback thermostats must be installed in conjunction with all space heating systems except those noted in Section 2.3.
- Heat pumps must meet the minimum 6.6 HSPF (Heating Seasonal Performance Factor) value specified in the Appliance Efficiency Standards as well as the ACOP (Adjusted Coefficient of Performance) listed in the Table.
- Both air conditioners and the cooling cycle of heat pumps must meet the listed SEER (Seasonal Energy Efficiency Ratio) listed in the Table. Any equipment which meets the Appliance Efficiency Standards also meets the "MIN" package requirement for cooling.

Table 3-216: Prescriptive Packages for Climate Zone 16

Component	Package A	Package B	Package C	Package D	Package E
BUILDING ENVELOPE					
Insulation Minimums:					
Ceiling	R-38	R-38	R-30	R-38	R-38
Wall	R-19	R-19	R-19	R-19	R-19
"Heavy" Wall	(R-9.5)	(R-7.0)	(R-7.5)	N/A	N/A
"Light Mass" Wall	[R-9.5]	[R-7.5]	[R-8.0]	N/A	N/A
Slab Floor Perimeter	R-7	R-7	R-7	R-7	N/A
Raised Floor	R-19	R-19	R-19	N/A	R-19
GLAZING					
Maximum U-Value	0.65	0.65	0.65	0.65	0.65
Maximum Total Area	NR	16%	14%	16%	16%
Maximum Total Nonsouth Facing Area	9.6%	N/A	N/A	N/A	N/A
Minimum South Facing Area	6.4%	NR	NR	NR	NR
SHADING COEFFICIENT					
South Facing Glazing	NR	NR	NR	0.66 ²	0.66 ²
West Facing Glazing	NR	NR	NR	0.65	0.65
East Facing Glazing	NR	NR	NR	0.65	0.65
North Facing Glazing	NR	NR	NR	0.65	0.65
THERMAL MASS ³	REQ	NR	NR	25%	10%
INFILTRATION CONTROL					
Continuous Barrier	NR	REQ	NR	NR	NR
Air-to-Air Heat Exchanger	NR	REQ	NR	NR	NR
SPACE HEATING SYSTEM⁴					
If Gas, Seasonal Efficiency=	71%	71%	71%	72%	72%
If Heat Pump ⁵ , ACOF=	MIN	MIN	MIN	2.5	2.5
SPACE COOLING SYSTEM					
If Air Conditioner ⁶ , SEER=	MIN	MIN	MIN	8.9	8.9
DOMESTIC WATER HEATING TYPE					
System must meet budget, see §2-5351(b) and 2-5351(f)(8)	ANY	ANY	Solar w/ Any Backup	ANY	ANY

LEGEND: NR = Not Required; N/A = Not Applicable; REQ = Required

- The value in parentheses is the minimum R-value for the entire wall assembly excluding interior and exterior air films if the wall weight exceeds 40 pounds per square foot. The value in brackets is the minimum R-value for the entire assembly if the heat capacity of the wall meets or exceeds the result of multiplying the bracketed minimum R-value by 0.61. The insulation must be integral with or installed on the outside of the exterior mass. The inside surface of the thermal mass, including plaster or gypsum board in direct contact with the masonry wall, shall be exposed to the room air. The exterior wall used to meet the R-value in parentheses cannot also be used to meet the above thermal mass requirement.
- No specific shading must be installed with double glazing to meet the 0.66 shading coefficient requirement which assumes light drapery.
- To calculate the amount of thermal mass required for Package A, use the method set forth in §2-5351(f)(4). Package D (for slab floor buildings) requires 25 percent of the ground floor area directly exposed to the conditioned space. Uncarpeted (e.g., tile or wood) ground floor area, such as entry ways, kitchens, bathrooms, and conditioned utility rooms or closets may all be counted toward this requirement. Package E (for raised floor buildings) requires a thermal mass area equal to 10 percent of the ground floor area. To qualify for thermal mass, the material used must have a performance equivalent to a two inch thick mass element with a volumetric heat capacity of 28 Btu/ft³·°F, a thermal conductivity of 0.93 Btu/ft·°F, and a surface area directly exposed to the room air of the required percentage of the ground floor.
- The 71% SE requirements are superseded by the Appliance Efficiency Standards which require that all new water-gas fired central gas furnaces of less than 175,000 Btu/hr manufactured on or after January 1, 1988 have a rating of 72% SE or higher. Automatic setback thermostats must be installed in conjunction with all space heating systems except those noted in Section 2.3.
- Heat pumps must meet the minimum 6.6 HSPF (Heating Seasonal Performance Factor) value specified in the Appliance Efficiency Standards as well as the ACOF (Adjusted Coefficient of Performance) listed in the Table.
- Both air conditioners and the cooling cycle of heat pumps must meet the listed SEER (Seasonal Energy Efficiency Ratio) listed in the Table. Any equipment which meets the Appliance Efficiency Standards also meets the "MIN" package requirement for cooling.

