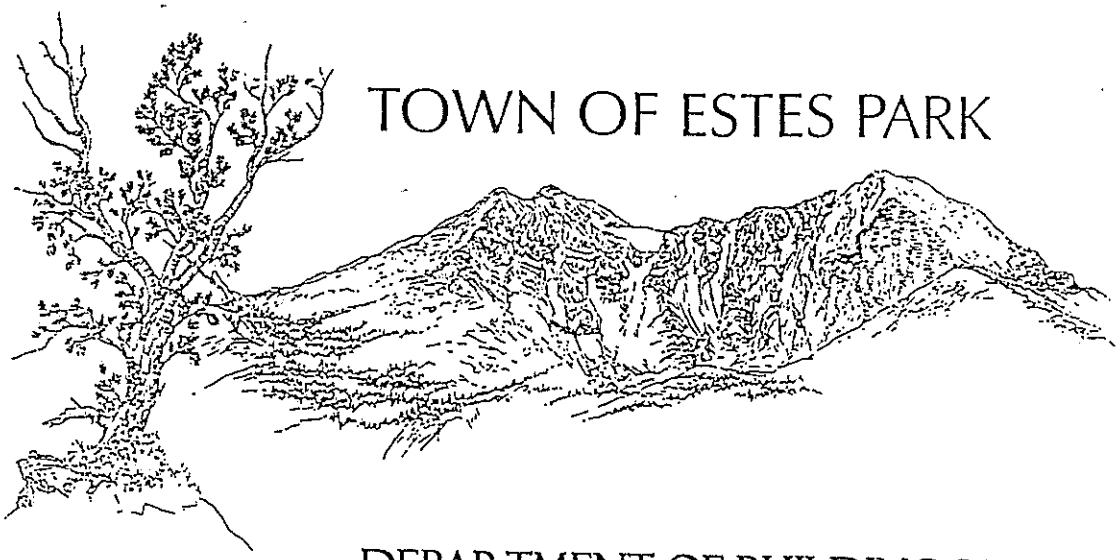


TOWN OF ESTES PARK

DEPARTMENT OF BUILDING SAFETY

All heated structures will have one of four options to comply with the Energy Code requirements.

ENERGY CODE COMPLIANCE OPTIONS

Prescriptive	Trade Off	Energy Analysis	Accessory Exemption
Applicant marks one option on the Estes Park Energy Conservation Handout & attaches to the structural plans.	Applicant supplies ResCheck Compliance Sheet and attaches to structural plans **www.energycodes.gov**	Applicant provides a Certified Home Energy Rater Form - performed by a professional energy inspection service and attaches to structural plans or Colorado Design Professional submits energy analysis for a passive heated home and attaches to sealed plans	Applicant marks one option on Accessory Exemption Handout and attaches to structural plans

970-577-3731 - 970-577-3735 - http://www.estesnet.com
P.O. Box 1200 - 170 MacGregor Avenue - Estes Park, CO 80517

TOWN OF ESTES PARK
ENERGY CONSERVATION HANDOUT

IRC (Table N1102.1) Estes Park Single-Family Prescriptive Package Options

Maximum	Maximum	Maximum	Minimum	Min.	Min.	Min.	Min.	Min.	Min.	Min.
Glazing are window to wall %	Penetration U-Factor	Skylight U-Factor	Ceilings R-Value	Frame Wall R-Value	Mass Wall R-Value wall %	Floor R-Value over unheated space	Basement Wall R-Value Depth	Slab Perimeter R-Value Depth	Crawl Space R-Value Cont./ cavity	Heating/ Cooling effeciency Rating (AFUE)
NA	0.5	0.65	38	13	8	19	13-Oct	10/2 ft.	10/2 ft.	90/12
NA	0.35	0.6	38	19 or 13 + 5	13	25	13-Oct	10/2 ft.		80/10
NA	0.35	0.6	49	21	15	30	13-Oct	10/4 ft.	13-Oct	Elect. Heat
8%	0.41	0.5	38	13	8	25	13-Nov	10/2 ft.	13-Nov	80/100
10%	0.38	0.5	38	13	8	25	13-Nov	10/2 ft.	13-Nov	80/100
12%	0.35	0.5	49	15	11	25	13-Nov	10/2 ft.	13-Nov	80/100
14%	0.35	0.5	49	15	11	25	13/15	10/2 ft.	13/15	80/100
16%	0.32	0.5	49	15	11	25	15/17	10/2 ft.	15/17	80/100

(a) R-values are minimums. U-factors Solar heat Gain Coefficient (SHGC) are maximum. R-19 shall be permitted to be compressed into a 2X6 cavity.
(b) The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
(c) The first R-value applies to continuous insulation, the second to framing cavity insulation; either insulation meets the requirement.
(d) The R-5 shall be added to the required slab edge R-values for heated slabs.
(e) Or insulation sufficient to fill the framing cavity, R-19 minimum.
(f) "13+5 means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing cover 25% or less of the exterior, R-5 sheathing is not required where structural sheathing is used. If structural cover more than 25% of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2".
(g) Nominal log thickness of 6 inches has a mass wall R-value (8.3), and 8 inch log is (11.3), a 10 inch log is (13.9), and a 12 inch log is (16.5).
(h) In addition the Town of Estes Park will accept any Zone 13 Family Prescriptive Packages (see reverse side) in the 2003 IECC, any trade off ResCheck Compliance Report that passes using 6368 Heating Degree Days, and any Performance Rating, such as E-Star, of 82% & higher.

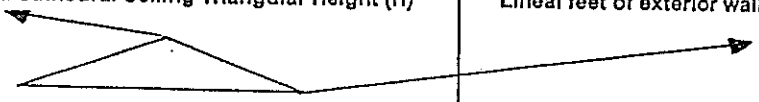
Please highlight which option you are building this permit under.

Total Gross Window Area including patio doors and basement windows

Window Type	Quantity(Q)	Width (W)	Height (H)	Unit Area A= W X H	Total Area Q x A	U-factor	SHGC
First Floor							
Second							
Third Floor							
Basement							
Total Gross	Window	Area			Sum		

Continued on Page 2

Total Exterior Insulated Perimeter Wall Area not including basement walls

Rectangular Wall Height (H)	Lineal feet of exterior wall (L)	Rectangular Area H x L
Insulated Cathedral Ceiling Triangular Height (H) 	Lineal feet of exterior wall (L)	Triangular Area 1/2 H x L
Total Gross Exterior Wall Area		Sum

Percent of Gross Window Area to Gross Exterior Wall Area

Gross Window Area	Gross Exterior Wall Area	Window Area Divided by Wall Area
		%

Equipment Sized to ACCA Manual J, 8th Edition by HVAC Contractor

Furnace Make & Model	Efficiency Rating	BTUH of Furnace	AC Make & Model	Efficiency Rating	Size of AC	Name of HVAC Contractor

(a) The following thermal design parameters shall be used for calculations required under this code: Winter Outdoor Design Dry-bulb (1 degree F); winter Indoor Design Dry-bulb (72 degree F); Summer Outdoor Design Dry-bulb (91 degree F); Summer Indoor Design Dry-bulb (75 degree F); Summer Design Wet-bulb (59 degree F); 6368 Heating Degree Days.

(b) All heating and cooling equipment shall be sized such that the total sensible capacity of the cooling equipment does not exceed the total sensible load by more than 7% for cooling-only applications; or by more that 25% for cold-climate applications in accordance with the procedures in ACCA Manual J, 8th Edition, using the above thermal design parameters. All ducted air-distribution heating and cooling systems shall be sized using cooling loads or whichever has the higher demand cfm. All heating and cooling equipment shall be tested to ensure such equipment is operating within the manufacturers' recommended parameters and standards according to the applicable protocols established by the building code official and in accordance with the mechanical code adopted.

ZONE 13

Single-Family Prescriptive Packages
1998/2000/2003 IECC

Step by Step Instructions

Step 1: Determine the glazing area %.

Step 2: The glazing area percentage is a maximum, so long as any buildings built with the selected package have less than or equal to the listed glazing area percentage, the buildings will comply with the selected code. Each component requirement must be met within the selected package, otherwise select another package or use the MEC-check software, which can calculate trade-offs for compliance.

Step 3: Complete the Prescriptive Package Worksheet available online at: www.energycodes.gov/meccheck/prescriptive.stm

Package	MAXIMUM		MINIMUM						Heating/Cooling Equipment Efficiency
	Glazing Area %	Glazing U-Factor	Ceiling R-Value	Wall R-Value	Floor R-Value	Basement Wall R-Value	Slab Perimeter R-Value	Crawl Space Wall R-Value	
1	8%	0.45	R-38	R-16	R-19	R-10	R-7	R-16	Normal
2	12%	0.45	R-49	R-18	R-21	R-10	R-9	R-19	Normal
3	12%	0.4	R-38	R-18	R-19	R-10	R-6	R-16	Normal
4	15%	0.45	R-49	R-19	R-30	R-14	~	~	Normal
5	15%	0.35	R-38	R-18	R-21	R-10	R-9	R-20	Normal
6	18%	0.34	R-49	R-22	R-19	R-10	R-8	R-17	Normal
7	20%	0.31	R-49	R-24	R-19	R-10	R-7	R-17	Normal
8	22%	0.35	R-49	R-26	R-30	R-14	~	~	Normal
9	25%	0.25	R-49	R-19	R-21	R-10	R-9	R-20	Normal
10	12%	0.6	R-30	R-13	R-26	R-11	R-8	~	High Heating
11	12%	0.45	R-26	R-13	R-15	R-8	R-2	R-14	High Heating
12	15%	0.55	R-38	R-16	R-19	R-8	R-3	R-18	High Heating
13	15%	0.45	R-30	R-13	R-19	R-9	R-4	R-22	High Heating
14	18%	0.5	R-38	R-18	R-19	R-9	R-4	R-22	High Heating
15	18%	0.4	R-38	R-13	R-19	R-9	R-3	R-19	High Heating
16	22%	0.45	R-49	R-18	R-21	R-10	R-6	R-30	High Heating
17	22%	0.35	R-38	R-13	R-19	R-9	R-4	R-22	High Heating
18	12%	0.65	R-38	R-16	R-15	R-8	R-2	R-14	High Heat/Cool
19	12%	0.5	R-30	R-11	R-19	R-9	R-3	R-20	High Heat/Cool
20	15%	0.6	R-38	R-18	R-19	R-9	R-3	R-22	High Heat/Cool
21	15%	0.45	R-30	R-13	R-19	R-9	R-3	R-20	High Heat/Cool
22	18%	0.55	R-38	R-17	R-26	R-11	R-9	~	High Heat/Cool
23	18%	0.45	R-38	R-13	R-26	R-10	R-6	~	High Heat/Cool
24	22%	0.45	R-49	R-19	R-19	R-9	R-4	R-22	High Heat/Cool
25	22%	0.35	R-38	R-11	R-21	R-10	R-5	R-30	High Heat/Cool

Footnotes

1. Glazing Area is the ratio of the area of the glazing assemblies (including sliding glass doors, skylights, and basement windows but excluding opaque doors) to the gross wall area, expressed as a percentage. Up to 1% of the total allowed glazing area may be excluded from the U-value requirement. For example, 3 ft^2 of decorative glass may be excluded from a building design with 300 sq. ft^2 of glazing area.
2. Glazing u-factors must be tested and documented by the manufacturer in accordance with the National Fenestration Rating Council (NFRC) test procedure or taken from the glazing U-factor table in Appendix B of the Prescriptive Packages User's Guide located at www.energycodes.gov. Center of glass U-factors cannot be used.
3. The Ceiling R-values do not assume a raised or oversize truss construction. If the insulation achieves the full insulation thickness over the plate lines of exterior walls, R-30 Insulation may be substituted for R-38 and R-38 insulation may be substituted for R-49 insulation. Ceiling R-values represent the sum of cavity insulation plus insulating sheathing (if used). For ventilated ceilings, Insulating sheathing must be placed between the conditioned space and the ventilated portion of the roof.
4. Wall R-values represent the sum of the wall-cavity insulation plus insulating sheathing (if used). Do not include exterior siding, structural sheathing, or interior drywall. For example, an R-19 requirement could be met EITHER by R-19 cavity insulation OR R-13 cavity insulation plus R-6 insulating sheathing. Wall requirements apply to wood-frame wall constructions. Metal-frame wall or mass (concrete, masonry, log) wall equivalent R-values can be found in the Prescriptive Packages User's Guide located at www.energycodes.gov.
5. The Floor R-value requirements apply to floors over unconditioned spaces (such as unconditioned crawlspaces, basements, or garages). Floors over outside air (such as cantilevers, bay windows, etc.) must meet the ceiling requirements.
6. Walls of conditioned basements below un-insulated floors must be insulated from the top of the basement wall to a depth of 10 ft. below ground level or to the level of the basement floor, whichever is less. The entire opaque portion of any individual basement wall with an average depth less than 50% below grade must meet the same R-value requirement as above-grade walls. Windows and sliding glass doors of conditioned basements must be included with the other glazing. Basement doors must meet the door U-factor requirement described in Note b.
7. R-value requirements are for unheated slabs. Add an additional R-2 for heated slabs. For packages with a slab insulation requirement, the insulation must extend a total linear distance of at least 24 in. in Zones 2-12 and 48 in. in Zones 13-17. The insulation must extend: 1) down from the top of the slab, or 2) down from the top of the slab to the bottom of the slab and then horizontally underneath the slab, or 3) down from the top of the slab to the bottom of the slab and then horizontally away from the slab, with pavement at least 10 in. of soil covering the horizontal insulation.
8. The Crawl Space Wall R-value requirements are for walls of unventilated crawl spaces. The crawl space wall insulation must extend from the top of the wall (including the sill plate) to at least 12 in below the outside finished grade. If the distance from the outside finished grade to the top of the footing is less that 12 in., the insulation must extend a total vertical plus horizontal distance of 24 in. from the outside finished grade.
9. *High Heating* means a furnace AFUE of 90% or more, or a heat pump HSPF of 7.8 or more. *High Heat/Cool* means both heating and cooling equipment must meet these minimum efficiencies If you plan to install more than one piece of heating equipment or more than one piece of cooling equipment, the equipment with the lowest efficiency must meet or exceed the efficiency required by the selected package.

See: "Notes" Page 2

Notes:

a) Glazing areas and U-factors are maximum acceptable levels. Insulation R-values are minimum acceptable levels. R-value requirements are for insulation only and do not include structural components.
b) Opaque doors in the building envelope must have a u-factor no greater than 0.35. Door U-values must be tested and documented by the manufacturer in accordance with the NFRC test procedure or taken from the door U-factor table in Appendix B. If a door contains glass and an aggregate U-factor rating for that door is not available, include the glass area of the door with your windows and use the opaque door U-factor to determine compliance of the door. One door may be excluded from this requirement (i.e. may have a U-factor greater than 0.35)
c) If a ceiling, wall floor basement wall, slab-edge, or crawl space wall component includes two or more areas with different insulation levels, the component complies if the area-weighted average R-value is greater than or equal to the R-value requirement for that component. Glazing or door components comply if the area-weighted average U-factor of all windows or doors is less than or equal to the U-factor requirement (0.35 for doors). Use the *R-Value/U-factor Weighted Average Worksheet* for these computations.
d) Hyphen (~) in any foundation column Indicate that the package which contains the hyphens cannot be used with the indicated foundation type.
e) In Zones 1-7, the area-weighted average SHGC value of all glazing cannot exceed 0.4. SHGC values must be determined in accordance with the NFRC test procedure or taken from the default SHGC table in Appendix B.