Based upon the:
2021 International Residential Code
2023 National Electrical Code
2018 International Energy Conservation Code

OWNER'S NAME_____PERMIT #_____

This guide is to assist you with the successful completion of your project. It is not intended to be all inclusive. Other requirements may apply.
During the course of our plan review, notes will be displayed on the plan where code items are incorrect, unclear or not shown on your plan.

Please take note of the displayed items so corrections can be made prior to construction.

This set of reviewed plans (stamped "reviewed," dated & initialed) shall be available to the building inspector on the site when inspections are made, including truss plans.

Approval of plans and specifications does not permit the violation of any part of the International Residential Code as amended or any other ordinance or law.

For more information, please visit our website www.douglas.co.us or call 303-660-7497.

Failure to have these approved plans on the job site may result in:

1) No inspection being performed
2) No inspection approval
3) No approval to proceed with the construction
4) Payment of a $47.00 reinspection fee at the Building Division before the inspection is rescheduled.

Per Colorado law (CRS 12-58-101 et seq & 12-23-01 et seq, respectively), persons performing plumbing or electrical work for hire must be licensed by the State Plumbing or Electrical board. They must be working under the supervision of persons licensed by the state as a plumber, but must also either hold a Master Plumber's license or be working under the direct supervision of a Master Plumber. For electrical work, the person doing the work must not only be licensed, but must also either hold a Master Electrician's license and an Electrical Contractor's license or be working under the direct supervision of an individual licensed as such. The only exception to these laws is that individuals may perform electrical or plumbing work within their own home (CRS 12-58-113(2) and 12-23-111(2), respectively for details).

Building

1. Foundations supporting wood shall extend above the adjacent finished grade a minimum of 4" where masonry veneer is used and minimum of 6" elsewhere. (R404.1.6)

2. Footing and foundation systems shall extend a minimum of 36" below finished grade in order to be below the frost line (R403.1.4.1 as amended).

3. All load-bearing lumber shall be identified by the grade mark of a lumber grading or inspection agency. In lieu of a grade mark, a certificate of inspection issued by a lumber grading or inspection agency may be accepted (R404.2.1).

4. Extend 1/2" sill bolts 7" minimum into poured concrete and reinforced masonry block foundations. Spacing not to exceed 6' o.c. with a minimum of 2 bolts for each sill plate and bolts located within 12" of all ends and splices. A properly sized nut and washer shall be tightened on each bolt to the plate. Sills & sole plates shall be protected against decay (R403.1.6).

5. Wood joists closer than 18" or wood girders closer than 12", to exposed ground within a crawl space shall be treated lumber or wood of natural resistance to decay. (R317) Access shall be provided to all under-floor spaces with a minimum 18" x 24" unobstructed access opening or 16" x 24" if through a perimeter wall (R408.4). All organic material and construction debris must be removed prior to sheathing (R408.5).

6. Under floor vents shall have a net area of not less than 1 sq. ft. for each 150 sq. ft. of under floor area. One such ventilating opening shall be within 3 feet of each corner of the building. Required net area of openings may be reduced to 1/1500 when under floor ground surface is covered with an approved Class I vapor retarder material and the required openings are placed to provide cross ventilation of the space. (R408.2 exception)

7. Provisions shall be made for the control and drainage of surface water around buildings as required by the Douglas County DESC manual. Drainage away from the foundation must also meet the requirements of the engineered soil report.

8. All lumber, plywood, fiberboard and structural glued laminated timber must be identified by a grade mark or certificate of inspection issued by an approved agency. (R502.1) Layouts for "I" joist type floor systems must be on the job site at the time of rough inspections. Provide structural stamped plans by a Colorado Engineer.

9. All trusses and/or rafters shall be attached to exterior walls with approved connections to resist uplift forces specified in Table R802.11. Exterior wall sheathing shall be applied in such a manner as to tie top plates to exterior wall studs and exterior wall studs to the floor system in order to resist wind uplift.

10. Ridge boards shall not be less in depth than the cut end of the rafters and shall be installed in accordance with Section R802.3. The ridge shall be supported by a wall or ridge beam designed in accordance with accepted engineering practice.

11. Provide a minimum 22" x 30" attic access opening with 30" clear headroom at a point above the opening. (R807.1) Provide attic cross ventilation equal to 1 sq. ft. per 150-sq ft. of attic

area. The opening may be 1/300 if at least 40% and not more than 50% of required ventilating area is provided by ventilators located in the upper portion of the attic or rafter space. The balance of the required ventilation provided shall be located in the bottom 1/3 of the attic space (R806.2).

12. Basements with habitable space and every sleeping room shall have at least one openable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, emergency egress shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Sill heights shall not be more than 44" measured from the finish floor to the top of the sill. The net clear opening dimensions must be provided by the normal operation of the escape opening from the inside. Emergency escape openings with a finished sill height below the adjacent ground elevation shall be provided with a minimum 9 sq. ft. window well with a minimum horizontal projection and width of 36". Window wells with a vertical depth greater than 44" shall be equipped with a permanently affixed ladder or steps complying with section R310.2.1. Emergency escape openings shall have a minimum net clear opening of 5.7 sq. ft., with the exception of grade floor openings, which shall have a minimum clear opening of 5 sq. ft. The minimum opening height shall be 24" and the minimum width shall be 20". Window wells shall be designed for proper drainage by connecting to the building's foundation drainage system (R310).

13. Smoke alarms shall be installed in each sleeping room and on the ceiling or wall outside each sleeping area in the immediate vicinity of the bedrooms and not less than 36" from door or opening to a bathroom with bathtub or shower. In multistory dwellings an alarm shall be installed on each story and in the basement. In dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less that one full story below the upper level. The alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the dwelling. All smoke alarms shall be listed and installed in accordance with their listing, NFPA72 (R314). Smoke alarms near cooking appliances shall comply with Section R314.3.1.

14. Carbon Monoxide Alarms are required in all dwellings with an attached garage or a fuel-fired appliance. All single-station Carbon Monoxide Alarms shall be listed as complying with UL 2034 and installed in accordance with the manufacturer's installation instructions. When alterations, repairs and additions requiring a permit for interior work occur; the individual dwelling unit shall be equipped with Carbon Monoxide Alarms located as required for new dwellings (R315). Carbon Monoxide Alarms shall be installed outside each separate sleeping area within 15 feet of a bedroom's entrance (House Bill 09-1091).

15. All non-bearing slab-on-grade basement walls are required to have an approved float. Unless the owner/contractor can present a soil engineer's report for the property specifying a different float requirement, a minimum 3" float is required.

16. Enclosed space under stairs that is accessed by a door or access panel shall have walls, under -stair surface and any soffits protected on the enclosed side with 1/2" gypsum board (R302.7). Fireblock stair framing at stringers (R302.11).

17. Skylights shall comply with R308.6.

18. Glazing in certain doors and windows including, but not limited to, windows at or near showers and tub enclosures located less than 60" above the floor and within 60" horizontally of water edge, and shower doors must be impact resistant, safety glazing or tempered glass. When glass block is used it shall be installed per code. Glazing in fixed or operable panels adjacent to a door where the nearest exposed edge of the glazing is within a 24" arc of either vertical edge of the door in a closed position and where the bottom edge of the glazing is less than 60" above the walking surface. Glazing in enclosed stairway landings or within 60" of the bottom of stairways where the bottom edge of the glass is less than 36" above a walking surface (Sec R308.4).

19. Bathtub and shower floors and walls above bathtubs installed with shower heads and in shower compartments shall be finished with a non-absorbent surface to a height of 6' above the floor (R307.2).

20. Water closet space – minimum width-30", minimum clear space in front-21" (See Fig. R307.1 for other fixture clearances). Lavatories require 21"and showers require 24" of clear space.

21. Showers and tub-shower combinations shall be provided with individual control valves of the pressure balance or thermostatic mixing or the combination pressure balance/thermostatic mixing valve types with high limit stops in accordance with ASSE 1016. The high limit stops shall be set to limit water temperature to a maximum 120 degrees F. (P2708.4).

22. The garage shall be separated from the residence and its attic area by not less than 1/2" gypsum board applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than 5/8" Type X gypsum board or equivalent. Where the separation is a floor-ceiling assembly, the structure supporting the separation shall also be protected by not less than 1/2" gypsum board. Doors shall be 1 3/8" thick solid wood or have a fire-resistive rating of not less than 20 minutes equipped with a self-closing device. (Sec R302.5.1).

23. Ducts in the garage and ducts penetrating the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum No. 26 gage sheet steel or other approved material and shall have no openings into the garage (R302.5.2).

24. Approved address identification shall be provided for all new buildings in such a position as to be plainly visible from the road fronting the property at its driveway location (R319.1).

25. Lumber used in the construction of decks must be painted, stained, treated or otherwise protected from decay. Cantilevered floor joists shall be mechanically fastened and solid blocked at the bearing point over the wall or beam. Flashing is required at ledger and house connection. Comply with rim joist policy (attached). Wood framing members, including wood sheathing, which rest on exterior foundation wall and are less than 8" from exposed earth shall be of naturally durable or preservative-treated wood. (R317) Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top landing of the stairway.

26. Maintain a separation between concrete patios or porches and wood siding or the structures foundation with minimum 26 gauge flashing or equivalent.

27. Synthetic stucco systems shall be installed in accordance with the manufacturer's specifications. Installation instructions or an ICC Evaluation Services report must be on the job site at time of inspections. All flashing shall be in place and weep screed shall be a minimum 4" above finished grade and 2" above any impervious surface.

28. Existing and added vegetation shall be modified or placed to comply with the requirements of the Douglas County Wildfire Mitigation standards.

29. When an engineer makes a perimeter drain recommendation such recommendation shall become mandatory. Inspection report of the perimeter drain installation is required to be submitted to our office before a Certificate of Occupancy can be issued.

Roofing

1. All roofing shall be installed in accordance with Chapter 9.

2. Roof coverings shall be a minimum of Class "C". Subdivision covenants, conditions and restrictions shall not require the use of roof covering materials that do not meet Class "C" requirements.

3. Wood Shakes and Wood Shingles are prohibited in the wildfire hazard areas of Douglas County.

4. Gutters and downspouts are required on all habitable structures within Douglas County. (R801.3).

Electrical

NOTE: See page 1 and Colorado Revised Statutes (12-23-101 et. seq.) or contact the State Electrical Board at (303)894-2300 for state licensing requirements for persons performing electrical work.

The following article references are from the 2023 National Electrical Code

1. The ground fault circuit interrupter shall be installed in a readily accessible location per Art-210.8. All 125 volt 15 and 20 ampere receptacles installed in the locations specified in 210.8(A)1-10 shall have ground fault circuit interrupter protection for personnel. 1. Bathrooms 2. Garages and accessory buildings that have a floor located at or below grade level. 3. Outdoors 4. Crawl spaces at or below grade level 5. Unfinished basements 6. Kitchens where the receptacles are installed to serve the countertop surfaces. 7. Sinks where receptacles are installed within 6' of the outside edge of the sink. 8. Boathouses. 9. Bathtubs or shower stalls where the receptacles are installed within 6' of the outside edge of the bathtub or shower stall. 10. Laundry areas.

2. Kitchen dishwasher branch circuit, GFCI protection shall be provided for outlets that supply dishwashers installed in dwelling unit locations (Art-210.8(D)).

3. Crawlspace lighting outlets: GFCI protection shall be provided for lighting outlets not exceeding 120 volts (Art-210.8(C)).

4. Arc-fault circuit interrupter protection shall be provided to all 125 volt, 15 and 20 ampere branch circuits supplying outlets or devices installed in dwelling unit kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreational rooms, closets, hallways, laundry areas, or similar rooms or areas by any of the means described in Art-210.12 (A)(1–6).

5. Bathroom branch circuit; At least one 125 volt 20 ampere branch circuit shall be provided to supply a bathroom receptacle outlet(s). Such circuits shall have no other outlets (Art-210.11(C)(3)). *Exception: Where the 20 ampere circuit supplies a single bathroom, outlets for other equipment within the same bathroom shall be permitted to be supplied in accordance 210.23(B)(1) and (A)(2).*

6. At least one 120 volt, 20 Amp branch circuit shall be installed to supply receptacle outlets in attached and detached garages (Art-210.11(C)(4).

7. Balconies, decks and porches; that are attached to the dwelling unit and are accessible from the inside the dwelling unit shall have at least one receptacle outlet accessible from the balcony, deck or porch. The receptacle outlet shall not be located more than 6 1/2" above the walking surface (Art- 210.52(E)(3)).

8. In every kitchen, family room, dining room, living room, parlor, library, den, sunroom, bedroom, recreation room, or similar room or area of a dwelling, receptacles shall be installed such that no point measured horizontally along the floor line of any wall space is more than 6’ from a receptacle outlet (Art-210.52(A)(1)).

9. Wall space shall include the following, any space 2’ or more in width (including space measured around corners) and unbroken along the floor line by doorways and similar openings, fireplaces and fixed cabinets. The space occupied by fixed panels in the exterior walls, excluding sliding panels. The space afforded by fixed room dividers, such as freestanding bar-type counters or railings (Art-210.52(A)(2)1-3).

10. Receptacles installed in a kitchen to serve the countertop surfaces shall comply with Art-210.52(C)(1-3).

11. Receptacles in dwelling unit bathrooms; shall be installed within 3’ of the outside edge of each basin. The receptacle outlet shall be located on a wall or partition that is adjacent to the basin or basin countertop, located on the countertop, or installed on the side or face of the basin cabinet. In no case shall the receptacle be located more than 12” below the top of the basin. Receptacle assemblies listed for the application shall be permitted to be installed in the countertop (Art-210.52(D)).

12. Garages; In each attached garage and in each detached garage with electric power. The branch circuit supplying this receptacle(s) shall not supply outlets outside of the garage. At least one receptacle outlet shall be installed for each car space (Art-210.52(G)(1)).

13. In dwelling units, at least one wall switch-controlled lighting outlet shall be installed in every habitable room, kitchen and bathrooms. *Exception*: In other than kitchens and bathrooms, one or more receptacles controlled by a wall switch shall be permitted in lieu of lighting outlets Art-210.70(A)(1-2).

14. Additional lighting outlets; at least one wall switch-controlled lighting outlet shall be installed in hallways, stairways, attached garages and detached garages with electric power (Art-210.70(A)2(1)). For dwelling units, attached garages and detached garages with electric power. At least one wall switched controlled lighting outlet shall be installed to provide illumination on the exterior side of outdoor entrances or exits with grade level access (Art-210.70(A)2(2)). Where one or more lighting outlet(s) are installed for interior stairways, there shall be a wall switch at each floor level and landing level that includes an entryway, to control the lighting outlet(s) where the stairway between floor levels has six risers or more (Art-210.70(A)2(3)).

15. For attics, underfloor spaces, utility rooms and basements, at least one lighting outlet containing a switch or controlled by a wall switch shall be installed where these spaces are used for storage or contains equipment requiring servicing. At least one point of control shall be at the usual point of entry to those spaces. The lighting outlet shall be provided at or near the equipment requiring servicing (Art- 210.70(C).

16. All grounding electrodes as described in Art-250.52(A)(1) through (A) (7) that are present at each building or structure served shall be bonded together to form the grounding electrode system. Where none of these grounding electrodes exist, one or more of the grounding electrodes specified in 250.52(A)(4) through (A)(8) shall be installed and used (Art-250.50).

17. Metal water piping system(s) installed in or attached to a building or structure shall be bonded to the service equipment enclosure, the grounded conductor at the service, the grounding electrode conductor where of sufficient size, or to one or more grounding electrodes used. The bonding jumpers shall be sized in accordance with table 250.102(C)(1) except as permitted in table 250.104(A)(2) and (A)(3). Art-250.104(A)(1)

18. Frames of ranges and clothes dryers; frames of electric ranges, wall-mounted ovens, counter mounted cooking units, clothes dryers and outlet and junction boxes that are part of the circuit for these appliances shall be connected to the equipment grounding conductor in a manner specified by 250.134 or 250.138(A) and (B). (Art-250.140(A) and (B)).

19. All 15 and 20 Amp 125 and 250 volt non-locking receptacles installed per 406.12 shall be listed tamper resistant receptacles (406.12(1)). All areas specified in Art-210.52 shall include; kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, sunrooms, bedrooms, recreation rooms, bathrooms, outdoors, laundries, garages, accessory buildings or similar rooms or area of the dwelling unit (Art-406.12).

20. Lighting in clothes closets- Only luminaries of the following type shall be permitted in closets; 1. Surface mounted or recessed incandescent or LED luminaries with a completely enclosed light source. 2. Surface mounted or recessed fluorescent luminaries. 3. Surface mounted fluorescent or LED luminaries identified as suitable for installations within the closet storage space (Art-410.16(B)).
21. Luminaries not permitted; Incandescent luminaries with open or partially enclosed lamps and pendant luminaires or lampholders shall not be permitted (Art-410.16(C)).

22. Location; the minimum clearance between luminaires installed in clothes closets and the nearest point of a closet storage space shall comply with 410.16(C)1-4.

23. General purpose circuits 125 volt 15 ampere circuit shall have no more than 10 openings and a 125 volt 20 ampere circuit no more than 12 openings. Lights and receptacles are each considered an opening. Small appliance circuits 125 volt 20 ampere circuit serving the countertop shall have no more than 4 openings. Lighting only circuits can have more that 10 or 12 openings if they use a maximum of 80% of the maximum circuit ampacity using the maximum wattage of the fixtures. (Douglas County Amendment)

Mechanical

1. Where local exhaust or whole-house mechanical ventilation is provided, the equipment shall be designed in accordance with Section M1505.

2. Provide rigid vent to the outside for the clothes dryer. Clothes dryer exhaust shall be in accordance with Section M1502. Cooking appliances require make up air for exhaust in excess of 400 cubic feet per minute (M1503.6).

3. All habitable rooms shall be provided with heating facilities capable of maintaining a room temperature of 68^{o} F at 3’ above the floor and 2’ from exterior walls (R303.10).

4. Venting of appliances shall be in accordance with their listing and Section G2427.2 through G2427.16.

5. Where appliances are located in an attic and/or under floor area the access opening shall be of a height and width sufficient to allow the removal of the largest piece of equipment, but not less than 30” high x 22” wide. Distance from the access to the centerline of the workspace in front of the burner shall not exceed 20’ (M1305.1.2 and M1305.1.3).

6. Provide 30”x30” working space, or as required by the manufacturer, in front of all heating controls. Gas appliance room door must be minimum 24” width, but not less than required for the removal of the largest piece of equipment.

7. Solid fuel, oil and gas fired appliances require adequate combustion air (M1402.3 and G2407).

8. Wood burning stoves and zero clearance/factory built fireplaces must be installed in accordance with the manufacturer’s instructions. All Fireplaces and Stoves Shall Have A Label From An Approved Testing Agency And A Label Specifying That They Meet The State Of Colorado Air Quality Standards (Phase III) Or EPA Standards (Phase II)**.** Masonry fireplace shall have permanently installed approved gas logs or an approved certified (not qualified) fireplace insert which meets the EPA Phase II or Colorado III emissions tests. Hearth extensions on masonry fireplaces must conform to requirements in R1001.10. Gas logs installed in solid fuel burning fireplaces shall be installed per the manufacturer’s installation instructions. Fireplaces located in bedrooms or bathrooms must be direct vent. Unvented gas room heaters are not allowed (G2406. Exceptions 3 and 4 have been deleted by adopted amendments).

9. Location of furnace or boiler shall be shown on plans. All furnaces shall have a minimum AFUE rating of 78% and all boilers shall have a minimum AFUE rating of 80%.

10. Liquid propane storage tanks and heating oil storage tanks shall be installed per the requirements of NFPA or the International Fire Code.

11. Appliances are required to be listed and labeled for household use.

Plumbing

NOTE: See page 1 and the Colorado Revised Statutes (12-58-101 et. seq.) or contact the State Plumbing Board at (303)894-2300 for licensing requirements for persons performing plumbing work.

1. Atmospheric vacuum breakers are required on all hose bibb connections and faucets with hose attachments (P2902.4.3).

2. Location of water heater must be shown on plans. Floor drain must be located within 5 feet of the water heater (per policy 95-14).

3. Liquid propane storage tanks and heating oil storage tanks shall be installed per the requirements of NFPA or the International Fire Code.

4. Installation of plumbing within a crawl space shall comply with the requirements of the site-specific soil report for wall floats.

5. Provide and install a means of controlling increased pressure caused by thermal expansion (P2903.4).

2018 IECC Compliance Guide for Homes in Colorado

The 2018 International Energy Conservation Code

The 2018 IECC was developed by the International Code Council (ICC) and is currently available to states for adoption. The IECC is the national model standard for energy-efficient residential construction recognized by federal law. Users of this guide are strongly recommended to obtain a copy of the IECC and refer to it for any questions and further details on compliance. To obtain a copy of the 2018 IECC, contact the IECC or visit, www.iccsafe.org. IECC compliance training is also available from many sources.

Limitations

This guide is an energy code compliance aid for Colorado based upon the simple prescriptive option of the 2018 IECC. It does not provide a guarantee for meeting the IECC. This guide is not designed to reflect the actual energy code, with amendments, if any, adopted in Colorado and does not, therefore, provide a guarantee for meeting the state energy code. For details on the energy code adopted by Colorado, including how it may differ from the IECC, please contact your local building code official. Additional copies of this guide are available on www.reca-codes.com.

Douglas County is located within IECC Climate Zone 5

	Windows			Insulation				Foundation		
	Fenestration U-Factor	Skylight U-Factor	Glazed Fenestration SHGG	Ceiling R-Value	Wood Frame Wall R-factor	Mass Wall R-Value	Floor R-Value	Basement Wall R-Value	Slab R-Value & Depth	Crawlspace Wall R-Value
Climate Zone 5	0.30	0.55	No Requirement	49	20 or 13+5	13/17	30	15/19	10, 2 ft.	15/19

Outline of 2018 IECC Requirements for Colorado Homes

The simplified table of building envelope requirements (above) applies to new residential buildings, as defined in the IECC, with wood framing and /or mass walls. For steel-framed buildings, the same window requirements apply, however, refer to IECC section R402.2.6 for specific insulation R-value requirements. The table also applies to all additions, alterations and replacement windows. The table is based upon the thermal envelope requirements in the 2018 IECC's prescriptive compliance option for the appropriate climate zones (Table R402.12) and does not reflect any state-specific amendments to the IECC.

Fenestration (IECC Sections R303.1.3, R402.3, R402.5)

- Fenestration (including all windows and doors) and skylight U-factors are maximum acceptable levels. The Glazed fenestration SHGC maximums apply to all windows, skylights and glazed doors. An area-weighted average of fenestration products is permitted to satisfy these requirements. (See IECC section R402.3.)
- Window, door and skylight U-factors and SHGCs must be determined by an accredited, independent laboratory, and labeled and certified by the manufacturer, in accordance with a National Fenestration Rating Council (NFRC) rating. Products without an NFRC label must use the default values in IECC section R303.1.3. See www.nfrc.org for more details on the NFRC rating system.
- Windows, skylights and sliding glass doors must also be labeled in a manner to show they meet the IECC's air infiltration requirements.
- Up to 15 square feet of glazed fenestration is permitted to be exempt from the U-factor and the SHGC requirements. One side-hinged opaque door assembly up to 24 square feet is exempted from the Fenestration U-factor requirement. Special exceptions may apply for Fenestration U-factor requirements in thermally isolated sunrooms. (See IECC section R402.3.5)

Insulation (IECC Sections R303.1.4 and R402.2)

- Insulation R-values are minimum acceptable levels and must be determined according to Federal Trade Commission rule.
- R-values for walls represent the sum of cavity insulation plus insulated sheathing, if any. The second R-value for mass walls applies when more than half the insulation is on the interior of the mass wall.
- The insulation for basement walls must be from the top of the wall down 10 feet below grade or to the basement

floor, whichever is less. Basement wall insulation is not required in warm-humid locations as defined in IECC Figure R301.0 and Table R301.3(1). Insulation requirements for crawl space walls are further specified in IECC section R402.2.11.

- Floor insulation must be installed to maintain contact with the underside of the subfloor decking. Refer to the code for details allowing insulation to be installed on the lower side of the ceiling cavity.
- Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weather-stripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Vertical access doors are permitted to meet the fenestration requirement in Table R402.1.1.
- Insulation requirements for slab on grade floors are further specified in IECC section R402.2.10. R-5 insulation shall be provided under the full slab area for heated slabs, in addition to slab edge insulation R-values.
- Special insulation exceptions related to ceilings with or without attic spaces, masonry veneer and thermally isolated sunrooms are set forth in IECC section R402.

Ducts (IECC Section R403.3)

- Ducts must be tested and verified to have total leakage of no more than 4cfm/100 sq. ft. (or 3cfm if air handler is not installed), except where air handler and all ducts are located inside conditioned space. Air handlers and filter boxes must also be properly sealed.
- Supply and return ducts shall be sealed and insulated as follows:

Duct Location	<3" diameter	≥ 3" diameter
Attic	R-6	R-8
Other portions of the building	R-4.2	R-6
Completely inside conditioned space	Exempt	Exempt

- Special provisions apply to ducts buried within ceiling insulations. (see IECC section R403.3.6.)

Air Sealing (IECC Section R402.4)

- The building envelope is required to be properly sealed and tested and verified as having an air leakage rate no higher than 3 ACH at 0.2 inch w.g. (50 Pascals) in climate zones 4 through 7. Recessed lighting must also be sealed to limit air leakage.

D**ocumentation (IECC Sections R103, R303.3, R401.3)**

- The appropriate construction documents and preventative maintenance information must be provided, along with a permanent certificate listing certain insulation, window and HVAC performance information.

Systems (IECC Section R403)

- HVAC system must be properly sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved methodologies. New or replacement heating and cooling equipment must meet or exceed federal minimum efficiency requirements for geographic location in which it is installed.
- Temperature controls must be installed, including a programmable thermostat where required.
- Mechanical system piping must be insulated to a minimum of R-3. Hot water piping must be insulated to R-3, with certain exceptions.
- Specific requirements apply to circulating hot water systems, mechanical ventilation, snow melt systems, and pools.

Lighting (IECC Sections R202 and R404.1)

- A minimum of 90% of permanently installed fixtures must contain only high-efficacy lamps as defined by the IECC.

Taken from IECC Compliance Guide for Homes in Colorado; Responsible Energy Codes Alliance, RECA

Sequence of Inspections

These are the most common inspections that are required for a typical single-family residence. Some of the listed inspections may not be applicable to your project. Other inspections not listed may be required for less typical projects. Please refer to your inspection signature card for a complete list of inspections.

Preliminary Driveway
Performed when a driveway permit is required. This inspection reviews the location of the proposed driveway, including grade, drainage, and land ownership (easements, etc.) issues. A listing of requirements accompanies the driveway permit. These parameters must be met by the time of the final driveway inspection.

Preliminary Defensible Space
This inspection determines if the proposed structure, whether a residential or accessory structure, is subject to risk from wildfire. If so, a detailed assessment is written giving minimum fuel modification requirements that must be performed prior to Final Defensible Space inspection approval.

Concrete-Encased Electrode
(Ufer Ground) This inspection is performed by the Building Division or by the foundation engineer prior to the concrete being placed. If the foundation engineer performs the inspection the specifics of the installation must be provided on the Douglas County Concrete-Encased Electrode Form is available on our website.

Caisson/Footer
Except for accessory structures and deck piers not part of an engineered foundation design, this inspection shall be performed by a Colorado Registered Professional Engineer. You shall provide the approved Engineering Inspection letter to the Building Division 24 hours prior to requesting any Rough Inspections. Foundation Compliance Form is available on our website.

Foundation Insulation Inspection (Insp. # 114)
For insulation that will be covered by backfill or structural floors. The monolithic slab and post-tension slab insulation shall be inspected before the placement of concrete.

Foundation Steel
This inspection shall be performed by your engineer prior to any concrete being placed. A Colorado Registered Professional Engineer shall perform this inspection. You shall provide the approved Engineering Inspection letter to the County 24 hours, prior to requesting any Rough Inspections. Foundation Compliance Form is available on our website.

Foundation Drain
The installation of a foundation drain may be required according to your soils report. If a drain is recommended in the report, it becomes a requirement by code. This inspection is to be performed by your engineer. Foundation Compliance Form is available on our website.

Construction Meter
This inspection is performed when the builder/owner or licensed electrician has set the temporary service to be used during the construction of the residence. Ground-fault circuit-interrupter (GFCI)

protection of all 125 volt 15, 20 and 30 amp receptacles must be provided on all job sites. Receptacles of higher amperage and voltage will also need GFCI protection or assured equipment grounding conductor program, per NEC 590.6 (B) (2). Only the use of approved extension cords is acceptable. Use of illegal extension cords may result in the removal of the electrical meter.

Underground Plumbing (or under floor
This inspection is performed when the base plumbing drainage system is in place. The inspection must be approved prior to placement of concrete or floor sheathing. The system shall be on test at the time of the inspection by either a 10-foot head of water, or five pounds of air shown on a 30 psi gauge. All plumbing under floors shall be suspended a minimum of 3" above the ground to allow for soil expansion.

Structural Floor
This inspection is performed at the same time as the Underground Plumbing inspection on all basement wood or steel joist floor-framing systems prior to installation of the floor sheathing. Permittee shall provide an acceptance letter from a Professional Engineer for all concrete-over-steel floor systems, to be provided on site to the inspector at the time of County inspection.

Electrical Trench
This inspection is to be performed while the trench is open with the proper wire or conduit in place. A warning ribbon shall be placed 12" above the underground installation.

Electrical Slab
This inspection is required when electrical conduits are installed under any concrete prior to placement of concrete. This inspection is for electrical in-floor heating cables under concrete or tile.

Exterior Underground Gas Line
This inspection is to be performed when the gas pipe is factory coated for use underground with all joints and or fittings wrapped and installed in the trench. Steel gas pipe (galvanized or black iron) shall be of an approved material. Burial depth for steel pipe shall be no less than 18" below grade. The test for such piping shall be 10 psi on a 30 psi gauge for no less than 15 minutes, with no perceptible drop in pressure. Approved Polyethylene (PE) pipe may be used in exterior buried piping systems. The test for such piping shall be 10 psi on a 30 psi gauge for no less than 30 minutes with no perceptible drop in pressure. The burial depth for PE pipe shall be no less than 18" below grade with approved metallic risers on each end. An electrically continuous number 18 AWG yellow tracer wire or other approved material shall be installed with and attached to underground non-metallic gas piping and shall terminate above grade at each end. CSST shall be installed and bonded in accordance with the code and the manufacturer's specifications. These tests shall be made using air, CO2, or nitrogen pressure only. For installation and testing gas pipe materials other than those listed above consult the piping manufacturer and the Building Division for approved methods.

Exterior Sheathing
Inspection of exterior wall sheathing and fasteners, Including shear walls, prior to the installation of building paper, weather resistive barrier, or any other exterior finish.

Weather Resistive Barrier (also known as Exterior House Wrap
All house wrap, air barrier or suitable film shall be installed in accordance manufacturer's recommendations, including overlapping, inside corners and taping. All penetrations through the

building wrap have been sealed. Window and door flashing have been installed in accordance with manufacturer's specifications.

Exterior Lath
Exterior Lath inspections are performed prior to the installation of stucco or synthetic stucco material. Weather resistive barrier, lath and all flashing (including weep screed) shall be installed prior to this inspection.

Moisture Barrier
Moisture Barrier inspections are performed prior to the application of masonry or stone veneer. All flashing is in place and the weather resistive barrier must be properly lapped and sealed at all penetrations including windows and doors. Diamond lath or equivalent shall be installed for stone. Brick ties shall be installed for masonry.

Roof Truss
Stamped Engineered roof truss drawings including the master layout sheet, shall be available on site at the time of inspection. All roof trusses shall be installed with the roof sheathing in place, including all associated hardware and bracing.

Rough Energy Compliance
All joints, seams and penetrations shall be caulked, foamed, or otherwise gasketed to prevent air leakage. Factory labels must remain on the glazing to show fenestration, solar heat gain and air leakage. Air tight recessed lighting in attic spaces, required dampers (mechanical or gravity) and insulation behind junction boxes in exterior walls and all air barriers shall be in place for this inspection.

Drip Edge
Drip edge flashing is required on both eaves and rakes of asphalt shingle roof assemblies. These flashings shall be fastened at 12" on center with approved roofing nails. Underlayment shall be installed over the drip edge flashing at eaves. Rake flashing shall be installed over the drip edge flashing and underlayment.

BEFORE ANY ROUGH INSPECTIONS MAY BE REQUESTED, COPIES OF THE FOUNDATION INSPECTION REPORTS AND A PROFESSIONAL SURVEY, NOT AN IMPROVEMENT LOCATION CERTIFICATE, SHALL BE SUBMITTED TO THE COUNTY 24 HOURS BEFORE SCHEDULING.

Rough Electric
This inspection is to be performed when all the wire and boxes have been installed. Grounds and neutrals shall be "made up" at the boxes and home runs completed to the panel location. All low voltage systems (specialty lighting, telephone, data, cable, security, etc.) must be installed at the time of the Rough Electric Inspection.
The structure must be "dried-in" (policy 95-09) at the time of the rough electrical inspections. All the framing, plumbing and mechanical work must be completed before calling for a rough electric inspection.

Electric Service Equipment
This inspection is typically performed at the same time as the Rough Electric. This inspection is for the

electrical panel, main disconnect, meter box and grounding electrode system. In addition, two circuits are required to be complete and ready for power, the furnace circuit and a circuit that is GFCI protected to provide temporary power. The electrical meter shall be installed before the Final Electric inspection.

Rough Frame
This inspection is performed once all the framing, plumbing, and mechanical rough-ins are completed. This inspection may be requested on the same day as the Rough Electric but cannot be requested before requesting a Rough Electric inspection.

Interior Gas Line
This inspection is typically performed at the same time as the Rough Frame inspection. The piping system must be completed and tested with a 10 pound air test on a maximum 30 pound gauge, unless alternative piping is used.

Insulation-Mechanical Systems
This inspection shall be requested after Rough Frame Inspection has been approved. This inspection is to verify that all supply and return air ducts outside the conditioned space are insulated in accordance with IECC Section R403.3 All Mechanical and Circulation hot water systems shall be insulated in accordance with Section R403.4 and R403.5.

Insulation
This inspection is performed after the structure is insulated and vapor retarders and air barriers are installed where required. This inspection includes all cavity or continuous (blanket) insulation that will be concealed. For blown in attic insulation, baffles at soffit vents and inch markers every 300 sq. ft. shall be installed at the time of this inspection.

Shower Pan
"Built in place" shower bases shall be lined in accordance with the code and filled with water. This inspection is typically requested at the same time as the drywall inspection.

Drywall
This inspection is performed after all the drywall is in place and fastened per code, prior to beginning drywall tape and finishing. Metal trim (corner bead) may be installed prior to inspection but is not required for the inspection.

Form Inspection (Driveway
This inspection is required when asphalt or concrete is used for the driveway surface. The scope of the inspection includes only the portion of the driveway that is located within the County right-of-way or the connection to the private road.

Final Driveway
The final inspection addresses all the criteria specified in the Preliminary Driveway. This final inspection must be approved prior to the issuance of a Certificate of Occupancy (CO).

Final Defensible Space
This final inspection is also known as the final wildfire mitigation inspection. This inspection determines if the requirements stated in the Preliminary Defensible Space inspection have been completed. This inspection must be approved to receive a Certificate of Occupancy (CO). This

inspection applies to all structures located in a wildfire hazard area.

Final Grade
This inspection must be scheduled through the Engineering Division. A Drainage Certificate is required for this inspection and must be approved prior to the issuance of a Certificate of Occupancy.

Final Electric
This inspection is performed when all electrical outlets, lights and switches with cover plates are installed. The electrical panel must be complete, and circuits properly labeled and appliances that are required to be hardwired need to be installed.

Final Energy Compliance
A permanent certificate shall be posted in the area housing the mechanical equipment. The certificate shall be completed by the builder or registered design professional. The certificate shall list the R-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace wall and or floor) and ducts outside conditioned spaces; U-factors for fenestration. The certificate shall list the type and efficiency rating of heating, cooling and service water heating equipment. Crawl space and unfinished basement walls blanket insulation may be inspected at this time.

For Performance Path submittals, a signed certificate shall also be provided showing the home complies with the originally approved design plans.
A ladder shall be provided by the permit holder for access to attic spaces containing blown in insulation and or mechanical equipment.

Final Building (Final Frame)
This inspection is performed when all life/safety items have been completed and the structure is ready to be occupied.

May 27, 2009

CARBON MONOXIDE ALARMS

For all open permits that are completed on or after July 1, 2009, Douglas County will be enforcing the "Lofgren and Johnson Families Carbon Monoxide Safety Act" (CRS 38-45). This is a state law involving the installation of carbon monoxide alarms.

For the purpose of Building Code enforcement, this law addresses both Single Family and Multi-Family Dwellings for New Construction, Interior Alterations, Permitted Repairs, Fuel-Fired Appliance Replacement, and Additions (of one or more rooms).

It states that approved carbon monoxide alarms shall be located within fifteen feet of the entrance to all rooms used lawfully for sleeping purposes. In addition, if the permit is for a multi-family rental unit, a carbon monoxide alarm shall be located within twenty-five feet of any fuel-fired heater, fuel-fired appliance, fireplace or garage.

If the electrical wiring is exposed, these alarms shall be hard wired with a battery backup to provide power, if this is impractical then a plug mounted unit with a battery backup is acceptable.