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2021 OREGON RESIDENTIAL SPECIALTY CODE GENERAL NOTES AND SUPPLEMENTAL INFORMATION FOR RESIDENTIAL ALTERATIONS

Date: May 1, 2023 **Permit number: 22-197446-000-00-RS**
Project Address: 12714 SW BOONES FERRY RD

The following "General Notes and Supplemental Information" are now **part of your approved plans**.

- It is the **responsibility of the builder to comply** with these requirements during construction.
- Where there is a conflict between a general note and the plans, **the more restrictive shall apply**.

FRAMING

R302.11 **FIREBLOCKING.** In combustible construction fireblocking shall be provided to cut off all concealed draft openings (both horizontal and vertical) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided in wood-framed construction in the following locations:

- Concealed spaces of wall studs and partitions, including furred spaces and parallel rows of studs or staggered studs vertically at the ceiling and floor levels and horizontally at intervals not to exceed 10'.
- All interconnections of vertical and horizontal spaces (i.e., soffits, drop ceilings, cove ceilings).
- Concealed spaces between stair stringers at the top and bottom of the run.
- Openings around vents, pipes, ducts, cables, and wires at ceiling and floor level with an approved material to resist free passage of flame and products of combustion.

R302.11.1 **FIREBLOCKING MATERIAL.** Fireblocking shall consist of one of the following (except at openings around vents, pipes, ducts, cables, and wires at ceiling and floor level):

- One layer of 2" nominal lumber
- Two thicknesses of 1" nominal lumber with broken lap joints
- One thickness of 23/32" wood structural panels with joints backed by 23/32" wood structural panels
- One thickness of 3/4" particleboard with joints backed by 3/4" particleboard
- One layer of 1/2" gypsum board
- One layer of 1/4" cement-based millboard
- Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place.
- Cellulose insulation installed as tested in accordance with ASTM E119 or UL 263, for the specific application.

R302.12 **DRAFTSTOPPING.** Draftstopping shall be installed in concealed floor-ceiling construction parallel to the framing members so that the area does not exceed 1,000 square feet

R317.3 **FASTENERS AND CONNECTORS IN CONTACT WITH TREATED WOOD.** Fasteners and connectors in contact with treated wood shall comply with one of the following:

- **Preservative-treated wood:** Fasteners shall be hot dipped zinc-coated galvanized steel, stainless steel, silicone bronze or copper. Connectors shall be in accordance with the connector's manufacturer's specifications (ASTM A653 type G185 zinc-coated galvanized steel or equivalent shall be used in the absence of manufacturer's specifications (minimum)).
- **Fire-retardant-treated wood used in exterior applications or wet or damp locations:** Fasteners shall be hot dipped zinc-coated galvanized steel, stainless steel, silicone bronze or copper. Fasteners other than nails and timber rivets shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.
- **Fire-retardant-treated wood used in interior applications:** Fasteners shall be in accordance with the manufacturer's recommendations or per ORSC Section R317.3.3 in the absence of manufacturer's specifications.

R502.8.1 **DRILLING AND NOTCHING OF SAWN LUMBER.** Drilling and notching of sawn lumber joists, rafters and beams shall comply with the following requirements

- Notches shall not exceed 1/6 of the depth of the member
- Notches shall not be longer than 1/3 the depth of the member
- Notches shall not be located in the middle 1/3 of the member's span
- Notches at ends shall not exceed 1/4 of the member's depth
- Tension side of members 4" or greater in nominal thickness shall not be notched except at the ends
- Hole diameters shall not exceed 1/3 of the member's depth
- Holes shall not be closer than 2" to the top or bottom of the member, or to any other hole or notch

R502.8.2 **DRILLING AND NOTCHING OF ENGINEERED WOOD PRODUCTS.** Cuts, notches and holes bored in trusses, structural composite lumber, structural glu-laminated members, cross-laminated timber members, or I-joists are prohibited except where permitted by the manufacturer's recommendations or where the effects of such alterations are specifically considered in the design of the member by a registered design professional.

R602.6.1 **DRILLING AND NOTCHING OF TOP PLATES.** When the top plate of an exterior wall or interior load-bearing wall requires cutting, drilling or notching by more than 50% of its width, a galvanized metal tie not less than 0.054" thick (16 gauge) and 1-1/2" wide shall be fastened across and to the top plate at each side of the opening with not less than (8) 10d nails having a minimum length of 1-1/2" at each side or equivalent. The metal tie must extend a minimum of 6" past the opening.

R807.1 **ATTIC ACCESS OPENING.** 22" x 30" minimum attic access is required to all attic areas > 30 square foot in area and with 30" or more clear height and shall be located in a hallway of other location with ready access.

GARAGES

R302.5.1.1 **DWELLING / GARAGE OPENING PROTECTION.** Openings shall be equipped with solid wood doors not less than 1-3/8" in thickness, solid or honeycomb core steel doors not less than 1-3/8" thick or 20-minute fire rated doors.

R302.5.2 **DUCT PENETRATION.** Ducts in the garage and ducts penetrating the walls or ceiling separating the dwelling from the garage shall be constructed of a minimum 26 gauge sheet steel or other approved material and shall have no openings into the garage.

R302.5.3 **OTHER PENETRATIONS.** Penetrations through the dwelling / garage fire separation required by Section R302.6, shall be protected by filling openings with an approved material to resist free passage of flame and products of combustion (per R302.11 item 4).

R302.6 **DWELLING / GARAGE FIRE SEPARATION.** The garage shall be separated from the dwelling as follows:

- **From the residence and attics:** Minimum 1/2" gypsum board or equivalent applied to the garage side.
- **From all habitable rooms above the garage:** Not less than 5/8" type-X gypsum board or equivalent, attached per Table R702.3.5.

M1307.2 **ANCHORAGE OF APPLIANCES.** Water heaters shall be anchored and strapped to resist displacement caused by earthquake motion. Strapping shall be at points within the upper one-third and lower one-third of the appliance's vertical dimensions. At the lower point, the strapping shall maintain a minimum distance of 4" above the controls.

M1307.3 **ELEVATION OF IGNITION SOURCE.** Appliances having an ignition source (generate a glow, spark or flame) shall be elevated such that the source of ignition is not less than 18" above the floor in garages.

M1307.3.1 **PROTECTION FROM IMPACT.** Appliances shall not be installed in a location subject to vehicle damage except where protected by approved barriers. Code approved barrier examples include:

1. Minimum 2" diameter schedule 40 iron pipe filled with concrete extending 36" minimum above the finished slab and embedded 12" minimum below the finished slab in a minimum 6" diameter concrete filled hole.
2. Minimum 6" high wheel barrier bolted to the slab per Figure M1307.3.1
3. Minimum 2" diameter schedule 40 iron pipe with a steel base plate secured to the slab with anchors defined within Figure M1307.3.1.

DWELLING UNIT

R303.1
M1505.4 **HABITABLE ROOM LIGHT AND VENTILATION.** All habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of the room with a minimum natural ventilation operable area of 4 percent of the floor area of the room. Code defined exceptions allow provisions via artificial light and mechanical ventilation.

R303.3.1
M1505.2
M1505.5
M1504.2

VENTILATION OF ROOMS WITH BATHING OR SPA FACILITIES. Any room with a bathtub, shower or spa facility shall be provided with mechanical ventilation meeting all of the following criteria:

- Controlled by a de-humidistat, timer, or other approved means of automatic control; and
- Minimum 80 cfm intermittent or 20 cfm continuous exhaust rate; and
- Use of 4" diameter, smooth ducts are limited to 20' in length with 3 elbows maximum; and
- Exhaust directly to the outdoors (may not terminate in an attic or crawl space).

R303.3.2
M1505.2
M1505.5

VENTILATION OF ROOMS WITHOUT BATHING OR SPA FACILITIES. Water closet compartments or toilet rooms without bathtub, shower or spa facilities shall be provided with ventilation meeting one of the following:

- Aggregate glazing of not less than 3 square feet, one half of which must be operable; or
- Mechanical ventilation meeting all of the following:
  - Minimum 50 cfm exhaust rate
  - Exhaust directly to the outdoors (may not terminate in an attic or crawl space).

R303.4
M1505.4

MECHANICAL VENTILATION. When a new dwelling unit is added, the new dwelling unit shall be provided with continuously-operating, whole-house mechanical ventilation that is balanced.

M1503
M1505.5

VENTILATION OF KITCHEN RANGE HOODS. Domestic kitchen cooking appliances shall be equipped with a ducted range hood or down-draft exhaust system meeting all of the following criteria:

- Minimum 150 cfm intermittent exhaust rate (>400 cfm exhaust rate requires makeup air); and
- Single-wall ducting with a smooth interior surface; and
- Air-tight ducting equipped with a backdraft damper; and
- Exhaust directly to the outdoors (may not terminate in an attic or crawl space).

M1502

CLOTHES DRYER EXHAUST. Dryer exhaust systems shall be independent of all other systems and shall meet all of the following criteria:

- Convey the moisture to the outdoors
- Nominal 4" diameter, minimum 0.0157" thick (No. 28 gage) ducting, supported and secured at 4' intervals
- Duct length shall meet one of the following:
  - Maximum of 35' from dryer to exhaust with fitting reductions per Table M1502.4.5.1; or
  - As determined by the dryer manufacturer's installation instructions. The code official shall be provided with a copy of the installation instructions for the make and model of the dryer at the concealment inspection.
- Makeup air shall be provided for exhaust rates greater than 200 cfm. Where a closet is designed for the installation of a clothes dryer, an opening having an area not less than 100 square inches shall be provided in the closet enclosure.

R308.4

SAFETY GLAZING. Safety glazing shall be provided at hazardous locations such as:

- When the sill is less than 60" above the floor or walking surface and it meets either of the following:
  - Within 24" of either side of the door in the plane of the door in a closed position; or
  - Is on a wall less than 180 degrees from the plane of the door in a closed position and within 24" of the hinge side of an in-swinging door.
- When all of the following conditions are met:
  - Exposed area of an individual pane is larger than 9 square feet; and
  - The bottom edge is less than 18" above the floor; and
  - The top edge is more than 36" above the floor; and
  - One or more walking surfaces are within 36", measured horizontally and in a straight line, of the glazing.
- **Glazing and wet surfaces.** Glazing in walls, enclosures or fences containing or facing hot tubs, spas, whirlpools, saunas, steam rooms, bathtubs, showers and indoor or outdoor swimming pools where the bottom exposed edge of the glazing is less than 60" measured vertically above any standing or walking surface and within 60" measured horizontally and in a straight line from the water's edge shall be considered to be a hazardous location. This shall apply to single glazing and each pane in multiple glazing.
- **Glazing adjacent to stairs and ramps.** Glazing where the bottom exposed edge of the glazing is less than 36" above the plane of the adjacent walking surface and less than 36" measured horizontally from the walking surface of stairways, landings between flights of stairs and ramps shall be considered to be a hazardous location.
- **Glazing adjacent to the bottom stair landing.** Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than 36" above the landing and within a 60" horizontal arc less than 180 degrees from the bottom tread nosing shall be considered to be a hazardous location unless the glazing is protected by a guard complying with Section R312 and the plane of the glass is more than 18" from the guard.

R310.1
R310.2

EMERGENCY ESCAPE AND RESCUE OPENINGS. Basements and every sleeping room shall have not less than one operable emergency escape and rescue opening meeting all of the following criteria:

- Net clear opening of 5.7 square feet (5 square feet for grade floor windows); and
- Minimum clear opening height of 24"; and
- Minimum clear opening width of 20"; and
- Maximum sill height of 44" measured from the finished floor to the bottom of the clear opening.

R312.2
R310.2.1

WINDOW FALL PROTECTION. In dwelling units, where the top of the sill of an operable window opening is located less than 24" above the finished floor and the finished grade or flat surface not less than 36" in width below on the exterior of the building, the operable window shall comply with one of the following:

- Operable windows with openings that will not allow a 4" diameter sphere to pass through the opening where the opening is in its largest opened position.
- Operable windows are provided with window fall prevention devices that comply with ASTM F2090.
- Operable windows are provided with window opening control devices that comply with R312.2.2.
- Where an operable window serves as an emergency escape and rescue opening, a window opening control device, after operation to release the control device or fall prevention device allowing the window to fully open, shall not reduce the net clear opening of the window unit to less than the area required by Sections R310.2.1.

R311.3

FLOOR ELEVATIONS AT EXTERIOR DOORS. There shall be a landing or floor on each side of each exterior door. The width of each landing shall not be less than the door served and a minimum dimension of 36" in the direction of travel. Landings or floors at the required egress door shall not be more that 1-1/2" lower than the top of the threshold, except the exterior landing may be not more than 8" below the top of the threshold where the door does not swing over the landing or floor (except exterior storm or screen doors).

R314

SMOKE ALARMS. Where alterations, repairs or additions requiring a permit occur, the individual dwelling unit shall be equipped with smoke alarms located as required for new dwellings. Smoke alarms shall comply with NFPA 72 and be listed in accordance with UL 217, and be installed as follows:

Required locations. Within dwelling units, smoke alarms shall be installed in each sleeping room, outside each separate sleeping area, within 21' of any door to a sleeping room measured along the path of travel, and on each additional story of the dwelling, including basements.

Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit in accordance with Section R314.3, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual dwelling unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

Installation near cooking appliances. Smoke alarms shall not be installed in the following locations unless this would prevent placement of a smoke alarm in a location required by Section R314.3:

- **Ionization smoke alarms** shall not be installed less than 20' horizontally from a permanently installed cooking appliance.
- **Ionization smoke alarms** with an alarm-silencing switch shall not be installed less than 10' horizontally from a permanently installed cooking appliance.
- **Photoelectric smoke alarms** shall not be installed less than 6' horizontally from a permanently installed cooking appliance.

Combination alarms. Combination smoke and carbon monoxide alarms shall be permitted to be used in lieu of smoke alarms. Combination smoke alarms shall be listed in accordance with UL 268 and UL 2075.

Power source. Smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and, where primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

Exception: Smoke alarms shall be permitted to be battery operated where installed in buildings without commercial power.

Fire alarm systems. Fire alarm systems shall be permitted to be used in lieu of smoke alarms and shall comply with Sections R314.7.1 through R314.7.4.

R315

CARBON MONOXIDE ALARMS. Where a new carbon monoxide source is introduced or work requiring a structural permit occurs in existing dwellings, carbon monoxide alarms shall be provided in accordance with this section. Carbon monoxide alarms shall be listed in accordance with UL 2034, and be installed as follows:

Required locations. Within dwelling units, carbon monoxide alarms shall be located in each sleeping room or within 15' outside of each sleeping room door. Sleeping rooms on separate floor levels in a structure consisting of two or more stories shall have separate carbon monoxide alarms serving each story. Where a fuel-burning appliance is located within a sleeping room or its attached bathroom, a carbon monoxide alarm shall be installed within the sleeping room.

Combination alarms. Combination carbon monoxide and smoke alarms shall be permitted to be used in lieu of carbon monoxide alarms. Combination carbon monoxide and smoke alarms shall be listed in accordance with UL 2034 and UL 217.

Power source. Carbon monoxide alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and, where primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

Exception: Carbon monoxide alarms shall be permitted to be battery operated where installed in buildings without commercial power.

Carbon monoxide detection systems. Carbon monoxide detection systems shall be permitted to be used in lieu of carbon monoxide alarms and shall comply with Sections R315.7.1 through R315.7.4.

2021 OPSC P408.6

SHOWERS. The clear opening width at shower doors shall be at least 22". Showers shall have a minimum finished interior of 1,024 square inches and shall also be capable of encompassing a 30" diameter circle measured at the top of the threshold maintained to a height of 70" above the drain outlet.

R703.1.1

EXTERIOR WALL ENVELOPE. The exterior wall envelope shall be installed in a manner such that water entering the assembly can drain to the exterior. The envelope shall consist of an exterior veneer, a water-resistant barrier per R703.2, a minimum 1/8" space between the water-resistive barrier and the exterior veneer, and integrated flashings per R703.4. The 1/8" space is not required where the exterior wall covering is installed over a water-resistive barrier per R703.2 and complies with ASTM E2273, or the drawings include details of pan flashings that drain to the exterior surface of the wall covering in a through wall fashion. Self-adhering membrane flashing shall be covered by trim or other measures to protect from sunlight.

OESC 210.12(A) & 210.12(B)

ARC-FAULT CIRCUIT INTERRUPTER PROTECTION. Arc-Fault Circuit Interrupter circuits are required for all 120 Volt 15-20 amp circuits supplying outlets or devices in dwelling unit kitchens, family rooms, dining rooms, living rooms, parlors, libraries, sunrooms, recreation rooms, closets, hallways, alcoves, laundry areas, or similar rooms or areas.

Exceptions:

- GFCI protected receptacles in dining rooms
- Optional receptacles on dedicated circuits that supply equipment known to cause unwanted tripping
- Branch circuits supplying receptacles or appliances in hallway, kitchens, laundry areas
- Branch circuit extensions / modifications
- Panel replacements

STAIRS & GUARDRAILS

R303.7
R303.8
N1107.3

STAIRWAY ILLUMINATION. All interior and exterior stairways shall be provided with illumination as follows:

Interior stairway illumination. Interior stairways shall be provided with an artificial light source to illuminate the landings and treads. The light source shall be capable of illuminating treads and landings to levels of not less than 1 foot-candle as measured at the center of treads and landings. There shall be a wall switch at each floor level to control the light source where the stairway has six or more risers. A switch is not required where remote, central or automatic control of lighting is provided.

Exterior stairway illumination. Exterior stairways shall be provided with an artificial light source located at the top landing of the stairway. Exterior stairways providing access to a basement from the outdoor grade level shall be provided with an artificial light source located at the bottom landing of the stairway. All exterior lighting fixtures affixed to the exterior of the building shall be high-efficiency light sources.

R302.7

UNDER-STAIR PROTECTION. Enclosed space under stairs that is accessible 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.

R311.7

STAIRWAYS. Stairs must comply with the following dimensions:

- Minimum 36" clear width at all points above the permitted handrail height
- Minimum 6'-8" headroom height measured vertically from the sloped line adjoining the tread nosing
- Maximum 8" riser height with 3/8" maximum variation between the smallest and largest
- Minimum 9" tread depth, with 3/8" maximum variation between the smallest and largest

R311.7.6 **LANDINGS FOR STAIRWAYS.** There shall be a floor or landing at the top and bottom of each stairway. The width perpendicular to the direction of travel shall be not less than the width of the flight served. For landings of shapes other than square or rectangular, the depth at the walk line and the total area shall be not less than that of a quarter circle with a radius equal to the required landing width. Where the stairway has a straight run, the depth in the direction of travel shall be not less than 36".

Exception: A floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided that a door does not swing over the stairs.

R311.7.8 **HANDRAILS.** Stairways with 4 or more risers shall have handrails meeting the following criteria:

- **Height** of not less than 30" and not more than 38" above the sloped plane adjoining tread nosing
- **Continuity** maintained along at least one side of the stairway, shall be returned or shall terminate in newel posts or safety terminals, and if adjacent to a wall shall have not less than a 1-1/2" space between the handrail and the wall. The handrail required for winders shall be located on the side of the stairway where the treads are narrower.
- **Grip-size** shall meet <u>one</u> of the following types or provide equivalent graspability:
  - <u>Type I.</u> Handrails with a circular cross section with an outside diameter not less than 1-1/4" and not greater than 2". If handrail is not circular, it shall have a perimeter dimension of not less than 4" and not greater than 6-1/4" with a maximum cross section of dimension of not more than 2-1/4".
  - <u>Type II.</u> Handrails with a perimeter greater than 6-1/4" with minimum 5/16" deep graspable finger recess areas on both sides of the profile. The finger recesses shall start not more than 3/4" below the top of the rail. The width of the handrail above the recess shall be 1-1/4" minimum and not more than 2-3/4".

R301.5
R312.1 **GUARDS.** Guards shall be located along open-sided walking surfaces, including stairs, ramps, and landings, that are located more than 30" measured vertically to the floor or grade below at any point within 36" horizontally to the edge of the open side. Insect screening shall not be considered as a guard. Guards shall comply with the following:

- **Height** shall not be less than 36" high measured vertically above the adjacent walking surface or the line connecting the nosings.
- **Opening limitations** along required guards shall prevent passage of a 4" diameter sphere. Along stairs, the triangular opening formed by the riser, tread and bottom of the guard shall prevent passage of a 6" diameter sphere. Guards along the open sides of stairs shall prevent passage of a 5" diameter sphere (applicable above the second riser of the stair).
- **Resistance** of a 200# concentrated point load applied in any direction at any point along the top shall be provided.

<u>ENERGY EFFICIENCY</u>

N1107.2 **HIGH-EFFICIENCY INTERIOR LIGHTING.** All permanently installed lighting fixtures shall be high efficiency light sources. Screw-in compact fluorescent and LED lamps comply with this requirement, see ORSC definition of "high-efficiency light source" for more options.

Table N1101.2

<u>EXISTING BUILDING COMPONENT REQUIREMENTS</u>

Wall insulation: R-15
Flat ceiling: R-49
Vaulted ceiling > 10" nominal rafter depth: R-25
Vaulted ceiling > 8" nominal rafter depth: R-21
Underfloor > 10" nominal joist depth: R-30
Underfloor > 8" nominal joist depth: R-25

Slab-edge perimeter: R-15
Windows: U-0.30
Skylights: U-0.50
Exterior doors: R-5
Exterior doors with > 2.5 sq. ft. of glazing: R-2.5
Forced air ducts: R-8

N1101.2.3.1 **CHANGE OF USE.** Changes of use that are greater than 30% of the existing building heated floor area or more than 400 square feet in area, whichever is less, shall be required to select one measure from Table N1101.3.

Table N1101.3

SMALL ADDITION ADDITIONAL MEASURES (select one):

	1) Increase the ceiling insulation of the existing portion of the home as specified in Table N1101.2.
	2) Replace all existing single-pane wood or aluminum windows to the U-factor as specified in Table N1101.2**.**
	3) Insulate the existing floor, crawl space or basement wall systems as specified in Table N1101.2 and install 100% of permanently installed lighting fixtures as CFL, LED or linear fluorescent, or a minimum efficacy of 40 lumens per watt as specified in Section N1107.2.
	4) Test the entire dwelling with a blower door and exhibit no more than 4.5 air changes per hour @ 50 Pascals.
	5) Seal and performance test the duct system.
	6) Replace existing 80% AFUE or less gas furnace with a 92% AFUE or greater system.
	7) Replace existing electric radiant space heaters with a ductless minim split system with a minimum HSPF of 10.0.
	8) Replace existing electric forced air furnace with an air source heat pump with a minimum HSPF of 9.5.
	9) Replace existing water heater with a water heater meeting: • Natural gas / propane water heater with minimum UEF 0.90, **OR** • Electric heat pump water heater with minimum 2.0 COP

N1101.2.3.2 **CHANGE OF OCCUPANCY.** Alteration and repair of conditioned nonresidential buildings, such as a small church or school, that are changing occupancy to residential dwellings shall use Table N1101.2 to the greatest extent practical and select one measure from Table N1101.1(2) or N1101.3.

Exception. The minimum component requirements shall be disregarded when thermal performance calculations are completed for change of use to Group R-3 occupancy, when such calculations demonstrate similar performance to the requirements of Table N1101.2.

Table N1101.1(2)

Additional Measures (select one):

	1) HIGH EFFICIENCY HVAC SYSTEM a. Gas-fired furnace or boiler AUE 94%, **OR** b. Air source heat pump HSPF 10.0 / 14.0 SEER cooling, **OR** c. Ground source heat pump COP 3.5 or Energy Star rated
	2) HIGH EFFICIENCY WATER HEATING SYSTEM a. Natural gas / propane water heater with UEF 0.90, **OR** b. Electric heat pump water heater with minimum 2.0 COP, **OR** c. Natural gas / propane tankless / instantaneous heater with minimum 0.80 UEF and Drain Water Heat Recovery Unit installed on minimum of one shower / tub-shower
	3) WALL INSULATION UPGRADE Exterior walls: U-0.045 / R-21 conventional framing + R-5 continuous insulation
	4) ADVANCED ENVELOPE • Windows: U-0.21 (Area weighted average), **AND** • Flat ceiling: U-0.017 / R-60, **AND** • Framed floors: U-0.026 / R-38 or Slab Edge Insulation: F-0.48 or less (R-10 for 48"; R-15 for 36" or R-5 fully insulated slab)
	5) DUCTLESS HEAT PUMP For dwelling units with all-electric heat provide: • Ductless heat pump HSPF 10.0 in primary zone replaces zonal electric heat sources, **AND** • Programmable thermostat for all heaters in bedrooms
	6) HIGH EFFICIENCY THERMAL ENVELOPE UA Proposed UA is 8% lower than the code UA in accordance with Table N1104.1(1)
	7) GLAZING AREA Glazing area, measured as the total of framed openings, is less than 12% of conditioned floor area.
	8) ACH AIR LEAKAGE CONTROL AND EFFICIENT VENTILATION Achieve a maximum of 3.0 ACH50 whole-house air leakage when third-party tested and provide a whole-house ventilation system including heat recovery with a minimum sensible heat recovery efficiency of not less than 66%.