MASON COUNTY
DEPARTMENT OF COMMUNITY SERVICES
BUILDING DIVISION

615 W Alder Street, **Shelton, WA** 98584 www.co.mason.wa.us

(360)427-9670 ext. 352 Belfair (360)275-4467 ext. 352 Elma (360)482-5269 ext. 352

Owner:_____Contractor:_____

Permit Number: _____ Site Address:_____

Plans Examiner: _____ Date: _____

Current Codes:
- 2018 International Residential Code (IRC) WAC 51-51
- 2018 International Building Code (IBC) WAC 51-50
- 2018 International Mechanical Code (IMC) WAC 51-52
- 2018 Uniform Plumbing Code (UPC) WAC 51-56
- 2018 International Energy Conservation Code (IECC), WAC 51-11R & 51-11C
- 2018 International Fire Code WAC 51-54A
- 2018 International Existing Building Code WAC 51-50

Design Criteria:
- Seismic Zone D2, Wind load 85 mph, Exposure _____ (as determined in R301.2.1.4)
- Roof snow load _____ lbs. Per square foot. Floor live load varies, see R301.5.

The numbered items on the following pages are associated with the above referenced codes, as adopted by Mason County Building Department. Each number identifies an item in the attached checklist, as noted on the approved plans. This checklist shall remain attached to the approved plans and be available during inspections by Mason County Building Inspectors. This checklist is submitted as information only and shall not be construed as an all-inclusive list of code requirements. Errors or omissions in the plans and specifications shall not prevent the Building Official, or his authorized agents, from requiring revisions or corrections to these plans and stopping the progress of the project under permit.

Office hours are from 8:00 a.m. until 4:30 p.m. Monday through Thursday and 8:00 a.m. to Noon on Fridays.

Inspections may be scheduled via the Mason County website www.co.mason.wa.us . While on the home page under Online Services, located on the side bar, click the link Request a Building Inspection. You may also call 360-427-9670 ext. 352 & From Belfair call (360) 275-4467 ext. 352.

Inspections are conducted between 8:30 AM and 4:00 PM

When scheduling an inspection, the following information will be needed: Permit number, site address, name of owner, type inspection requested, preferred day of inspection, and the telephone number Mason County staff should use when they call to confirm the inspection.

Plan Review Checklist-2018 International Residential Code

Updated 1/29/21 (Not final)

1. **CONSTRUCTION DOCUMENTS & COMPLIANCE TO APPROVED PLANS :** IRC Section R106.
(1) Approved site plans shall be attached to the approved building plans during inspection. (2) Property lines shall be marked. (3) **Setback distances will be measured from the furthest projection of the permitted structure**.
(3) Manufacturer's installation instructions shall be available on the job site at the time of inspection. (4) All work shall be installed in accordance with the approved construction documents. (5) Any changes made during construction that are not in compliance with the approved construction documents shall be resubmitted for approval as an amended set of construction documents. To request approval of revisions, complete a "Request to Revise Approved Plan" application and submit to the Mason County Permit Center **along with approved plans and documents detailing the proposed changes.**

2. **EGRESS WINDOWS: .** IRC Section R311. All sleeping rooms and basements with habitable space shall have at least one open able emergency escape and rescue opening. Such opening shall open directly into a public street, public alley, yard or court. Emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet. Except that grade floor openings shall have a minimum net clear opening of 5 square feet *(see definition below).* The minimum net clear opening height dimension shall be 24". The minimum net clear opening width dimension shall be 20". **The openings shall have a maximum height of not more than 44" measured from the finished floor to the bottom of the clear opening.** Emergency escape and rescue openings shall be operational from the inside of the room without use of keys or tools or special knowledge. Window wells shall be provided when egress windows have a finished sill height below adjacent ground elevation. The well shall allow the window to be fully opened and provide a minimum horizontal area of 9 sq. ft, with a minimum horizontal projection and width of 36-inches. Window wells with a vertical depth of more than 44" shall be equipped with a permanent ladder. *Grade floor opening definition: A window or other opening located such that the sill height of the opening is not more than 44" above or below the finished ground level adjacent to the opening.* ***Refer to handout for additional information***

3. **SMOKE & CARBON MONOXIDE ALARMS:**
IRC Section R314 & R315. All smoke alarms shall be listed in accordance with UL217 and installed in accordance with the provisions of the International Residential Code and the household warning equipment provisions of NFPA 72. Smoke alarms shall be installed in each sleeping room, outside each separate sleeping area in the immediate vicinity of the bedrooms, in napping areas of family child daycare homes, on each additional story of the dwelling including basements and habitable attics. Each story including basements and habitable attics shall have at least one detector. When more than one smoke alarm is required to be installed 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 unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed. Required smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source and when primary power is interrupted, shall receive power from a battery. Additions, interior alterations, and repairs shall be provided with smoke alarms as required for new dwellings; the smoke alarms shall be interconnected and hard wired. *Exception: Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, the addition or replacement of windows or doors, or the addition of a porch or deck are exempt. Smoke alarms and alarms installed to satisfy Section R314.4.1 shall not be required to be interconnected to existing smoke alarms where such existing smoke alarms are not interconnected or where such new smoke alarm or alarm is not capable of being interconnected to the existing smoke alarms.*

Carbon monoxide alarms are required in new residential construction, where dwelling has **either or both** of the following conditions exist (1) the dwelling unit contains a fuel-fired appliance. (2) the dwelling unit has an attached garage with an opening that communicates with the residence. Carbon monoxide alarms shall be listed in accordance with UL 2034. Combination carbon monoxide and smoke alarms shall be listed in accordance with UL 2034 and UL 217. Detectors shall be installed outside of each separate sleeping room in the immediate vicinity outside of the bedroom in the dwelling and on each level of the dwelling in accordance with manufacturer's specifications. **Where a fuel burning appliance is located within a bedroom or its attached bathroom, a carbon monoxide alarm shall be installed within the bedroom.**

4. **SAFETY GLAZING :** R308. Each pane of glazing installed in a hazardous location shall be provided with a manufacturer's designation specifying who applied the designation, designating the type of glass and the safety glazing standard. The designation shall be visible in the final installation and shall be acid etched, sand-blasted, ceramic fired, laser etched, embossed or on that cannot be removed without being destroyed.
R308.4.1 Hazardous locations. The following shall be considered specific hazardous locations for the purposes of glazing:

Glazing in all fixed and operable panels of swinging, sliding and bi-fold doors.

Exceptions:

- *Glazed openings of a size through which a 3-inch diameter (76 mm) sphere is unable to pass.*

- *Decorative glazing.*

R308.4.2. Glazing in an individual fixed or operable panel adjacent to a door shall be considered to be a hazardous location where the bottom exposed edge of the glazing is less then 60 inches above the floor or walking surface and it meets either of the following conditions: (1) Where the glazing is within 24 inches of either side of the door in the plane of the door in a closed position. (2) Where the glazing is on a wall perpendicular to the plane of the door in a closed position and within 24 inches of the hinge side of an in-swinging door.

Exceptions:

1. *Decorative glazing.*
2. *When there is an intervening wall or other permanent barrier between the door and the glazing.*
3. *Glazing where access through the door is to a closet or storage area 3-ft or less in depth.*
4. *Glazing that is adjacent to the fixed panel of patio doors.*

R308.4.3. Glazing in an individual fixed or operable panel that meets all of the following conditions:

1. The exposed area of an individual pane is larger than 9 square feet; and
2. The bottom edge of the glazing is less than 18 inches above the floor; and
3. The top edge of the glazing is more than 36 inches above the floor; and
4. One or more walking surfaces are within 36 inches, measured horizontally and in a straight line, of the glazing.

Exceptions:

1. *Decorative glazing.*
2. *Where glazing is adjacent to a walking surface and a horizontal rail is installed 34 to 38 inches above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot without contacting the glass and have a cross-sectional height of not less than 1½ inches.*
3. *Outboard panes in insulating glass units and other multiple glazed panels when the bottom edge of the glass is 25 feet or more above grade, a roof, walking surfaces or other horizontal [within 45 degrees of horizontal] surface adjacent to the glass exterior.*

R308.4.4. Glazing in guards and railings, including structural baluster panels and nonstructural in-fill panels, regardless of area or height above a walking surface shall be considered a hazardous location. Glass used as a handrail assembly or a *guard* section shall be firmly supported on all edges. Where one or more sides of any pane of glass are not firmly supported, detailed construction documents, detailed shop drawings, and analysis or test data assuring safe performance for the specific installation prepared by a registered design. *(ref IBC2403)*

R308.4.4.1 Structural glass baluster panels. Guards with structural glass baluster panels shall be installed with an attached top rail or handrail. The top rail or handrail shall be supported by not less than three glass baluster panels or shall be otherwise supported to remain in place should one glass baluster panel fail.

Exception: An attached top rail or handrail is not required where the glass baluster panes are laminated glass with tow or more glass plies of equal thickness and of the same glass type.

R308.4.5. 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 inches measured vertically above any standing or walking surface shall be considered to be a hazardous location. This shall apply to single glazing and each pane in multiple glazing.

R308.4.6. Glazing adjacent to stairs and ramps. Glazing where the bottom exposed edge of the glazing is less than 36 inches above the plane of the adjacent walking surface of stairways, landings between flights of stairs and ramps shall be considered to be a hazardous location.

Exceptions:

1. Where glazing is adjacent to a walking surface and a horizontal rail is installed at 34 to 38 inches above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot without contacting the glass and have a cross-sectional height of not less than 1½ inches.

2. Glazing 36-inches or more measured horizontally from the walking surface.

R308.4.7. 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 inches above the landing and within a 60-inch horizontal arc less than 180 degrees from the bottom tread nosing shall be considered to be a hazardous location.

Exceptions:

1. Where the glazing is protected by a guard complying with Section R312 and the plane of the glass is more than 18 inches from the guard.

5. **<u>WINDOW OPENINGS:</u>**

IRC 312.1.1 FALL PROTECTION: In dwelling units, where the top of the sill of an operable window opening is located less than 24 inches above the finished floor and greater than 72 inches above the finished grade or other surface below on the exterior of the building, the operable window shall comply with one of the following:

1. Operable windows whose openings will not allow a 4-inch diameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. Operable windows that are provided with window fall prevention devices that comply with ASTM F-2090.
3. Operable windows that are provided with window opening control devices that comply with

Section R312.2.2.

IRC R303 NATURAL LIGHT & VENTILATION:
Habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural ventilation shall be through windows, skylights, doors, louvers or other approved openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The openable area to the outdoors shall not be less than 4 percent of the floor area being ventilated.

Exceptions:

1. *The glazed area need not be openable where the opening is not required by R310 (egress) and a whole-house mechanical ventilation system is installed in accordance with*
2. *The glazed areas need not be provided in rooms where Exception 1 is satisfied, and artificial light is provided that is capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches above the floor level.*
3. *Use of sunroom and patio covers, as defined in Section R202, shall be permitted for natural ventilation if in excess of 40 percent of the exterior's sunroom walls are open, or are enclosed only by insect screening.*

6. **EXHAUST FANS:** IRC R303.3, Section M1501, M1507. Exhaust fans are required in each kitchen, bathroom, water closet room, laundry facility, indoor swimming pool, spa and other rooms where excess water vapor or cooking odor is produced. The air removed by every mechanical exhaust system shall be discharged outdoors at a point where it will not cause a nuisance and not less than the distances specified in IMC Section 501.3.1. The air shall be discharged to a location from which it cannot again be readily drawn in by a ventilating system. Dryer exhaust ducts shall **not** be exhausted into an attic or crawl space. **The termination point shall be located at least 3-feet from property lines, 3-feet in any direction from openings into the buildings and 10-feet from mechanical air intakes. See energy section of this checklist for more specific requirements.**

7. **CLOTHES DRYERS:** IRC Section M1502, G2439, & IMC Section 504. Exhaust ducts, not less than 4-inch diameter, shall have a smooth interior finish and shall be constructed of metal not less than 0.0157 inch in thickness. Exhaust ducts joints shall be sealed and shall be mechanically fastened. Ducts shall not be joined with screws or similar fasteners that protrude more than 1/8 inch into the inside of the duct. Where dryer exhaust ducts are enclosed in wall or ceiling cavities, such cavities shall allow the installation of the duct without deformation. **Ducts must be supported at intervals not to exceed 12-ft and shall be secured in place**. Transition ducts shall not be greater than 8 feet in length and shall not be concealed within construction. Exhaust duct terminations shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination. The maximum length of a clothes dryer exhaust duct shall be in accordance with manufacturer specifications or shall not exceed 35 feet from the dryer location to the wall or roof termination. If the manufacturer's instructions do not specify a termination location, the exhaust duct shall terminate not less than 3 feet in any direction from openings into buildings. When fittings are used the maximum length of the duct shall be reduced in accordance to Table M1502.4.4.1. The maximum length of the exhaust duct does not include the transition duct.

8. **DOMESTIC COOKING EXHAUST EQUIPMENT:** IRC Section M1501, M1503, M1504, M1505, M1901& M1306. Where Domestic cooking exhaust equipment is provided, it shall comply with one of the following:
   1. The fan for overhead range hoods and downdraft exhaust equipment not integral with the cooking appliance shall be listed and labeled in accordance with UL 507.
   2. Overhead range hoods and downdraft exhaust equipment with integral fans shall comply with UL 507.
   3. Domestic cooking appliances with integral downdraft exhaust equipment shall be listed and labeled in accordance with ANSI Z21.1 or UL 858.
   4. Microwave ovens with integral exhaust for installation over the cooking surface shall be listed and labeled in accordance with UL 923.

M1503.2.1 OPEN-TOP BROILER EXHAUST:
Domestic open-top broiler units shall be provided with a metal exhaust hood, having a minimum thickness of 0.0157-inch. Such hoods shall be installed with a clearance of not less than ¼ inch between the hood and the underside of combustible material or cabinets. **A clearance of not less than 24 inches shall be maintained between the cooking surface and the combustible material or cabinets**. The hood width shall not be less than the width of the broiler unit and shall extend over the entire unit.

Exceptions:

1. *Broiler units that incorporate an integral exhaust system, and that are listed and labeled for use without an exhaust hood, shall not be required to have an exhaust hood.*
2. *Broiler units permanently installed outside the building envelope and having the cooking surface at least 5 feet below a 1-hour fire resistance rated ceiling shall not be required to have an exhaust hood.*

M1503.3 EXHAUST DISCHARGE:
Domestic cooking exhaust equipment shall discharge to the outdoors through a duct. The duct shall have a smooth interior surface, shall be airtight, shall be equipped with a backdraft damper and shall be independent of all other exhaust systems. Ducts serving domestic cooking exhaust equipment shall not terminate in an attic or crawl space or areas inside the building.

Exception:

Where installed in accordance with the manufacturer's instruction, and where mechanical or natural ventilation is

otherwise provided listed and labeled duct-less range hoods shall not be required to discharge to the outdoors.

M1503.4 DUCT MATERIAL:
Ducts serving domestic cooking exhaust equipment shall be constructed of galvanized steel, stainless steel or copper.

Exception: Ducts for domestic kitchen cooking appliances equipped with down-draft exhaust systems shall be permitted to be constructed of schedule 40 PVC pipe and fittings provided that the installation complies with all of the following:

1. *The duct is installed under a concrete slab poured on grade.*
2. *The underfloor trench in which the duct is installed is completely backfilled with sand or gravel.*
3. *The PVC duct extends not more than 1 inch above the indoor concrete floor surface.*
4. *The PVC duct extends not more than 1 inch above grade outside of the building.*
5. *The PVC ducts are solvent cemented.*

M1503.5 KITCHEN EXHAUST RATES:
Where domestic kitchen cooking appliances are equipped with ducted range hoods or down-draft exhaust systems, the fans shall be sized in accordance with Section M1505.4.4: a minimum exhaust rate of 100 CFM at .25 inches water gauge. Exhaust systems capable of exhausting in excess of 400 CFM shall be provided with make-up air at a rate approximately equal to the exhaust air rate. Such makeup air system shall be equipped with not less than one damper; each damper shall be a gravity damper or an electrically operated that automatically opens when the exhaust system operates. Dampers shall be accessible for inspection, service, repair and replacement without removing permanent construction or any other ducts not connected to the damper being inspected, serviced, repaired or replaced. Clearance of at least **30-inches** shall be maintained between the cooking surface and the combustible material or cabinet. Reduced clearances are permitted in accordance with the listing and labeling of the range hoods or appliances. Clearances to combustibles shall include such considerations as door swing, drawer pull, overhead projections or shelving and window swing, coverings and drapes.

9. **WATER CLOSET:** IRC Section R307, UPC Section 408, 402. Fixtures shall be set level and in proper alignment with reference to adjacent walls. No water closet or bidet shall be set closer than 15 inches from its center to any side wall or obstruction nor closer than 30 inches center to center to any similar fixture. The clear space in front of any water closet, lavatory or bidet shall be not less than 24 inches from its center to any side wall or partition, nor closer than 24 inches center to center. Water closet shall be located in a clear space not less than 30 inches in width. The clear space in front shall not be less than 24-inches. Water closet seats shall be of smooth, non-absorbent material. The maximum water use allowed in gallons per flush (gpf) shall not exceed 1.6 gpf. (UPC 411.2)

10. **SHOWER and BATHTUB AREAS:** IRC Section R307, and UPC Sections 408, and 418. Bathtub and shower floors and walls above bathtubs with installed showerheads and in shower compartments shall be finished with non-absorbent surfaces that extend to a height of not less than 6-feet above the floor. The clear space in front of the shower opening shall not be less than 24-inches. All showers shall have a minimum finished interior floor area of 900 square inches and shall be capable of encompassing a 30-inch circle. The minimum area and dimensions shall be maintained to a point 70" above the shower drain outlet. Shower receptors shall have curbs not less than 2-inches and not more than 9- inches deep. The finished floor shall slope uniformly toward the drain not less than ¼-inch vertical per foot horizontal (2% slope) nor more than ½" per foot, and floor drains shall be flanged to provide watertight joint in the floor. On-site built-up shower receptors shall be lined in accordance to UPC Section 408.7 **Shower receptors shall be tested for water tightness by filling with water to the level of the rough threshold.** A removable panel shall be provided to access and remove whirlpool pumps. Whirlpool pump access located in the crawl space shall be located no more than 20-feet from an access door. Showers and tub-shower combinations shall be provided with individual control valves that provide scald and thermal shock protection and shall conform to ASSE 1016. Hot water supplied to bathtubs, whirlpool bathtubs and showers shall be limited to a maximum temperature of 120°F. The water heater thermostat shall not be considered a suitable control for meeting this provision.

11. **CHIMNEYS & FIREPLACES:** IRC Chapter 10, R903.2.2, R905. After January 1, 1997 no new or used factory-built fireplace, and new masonry or concrete fireplace shall be installed in Washington State unless certified and labeled in accordance with the procedures and criteria specified ASTM E2558, Standard Test Method for Determining Particulate Matter Emissions from Fires in Los Mass Wood Burning Fireplaces. Contact the Olympic Region Clean Air Agency (*www.ORCAA.org*) to obtain a list of approved fireplaces and stoves.
FACTORY BUILT CHIMNEYS & FIREPLACES: shall be labeled and installed in accordance with the conditions of the listing. Factory built chimneys installed in dwelling units with solid-fuel-burning appliances shall comply with the HT requirements of UL 103 and shall be marked "Type HT and Residential Type and Building Heating Appliance Chimney."

MASONRY FIREPLACES/CHIMNEYS: IRC Chapter 10 Masonry and concrete chimneys shall be designed and reviewed in accordance with Chapter 10 of IRC. R1001 Masonry and concrete chimneys shall be anchored **at each floor, ceiling or roofline more than 6 feet above grade except where constructed completely within exterior walls**. Chimneys shall be provided with crickets where the dimension parallel to the ridgeline is greater than 30 inches and does not intersect the ridgeline. The

intersection of the cricket and the chimney shall be flashed and counter flashed in the same manner as normal roof-chimney intersections. Crickets shall be constructed in compliance with Figure R1003.20 and Table R1003.20. Chimney flashing shall be applied according to the asphalt shingle manufacturer printed instructions.

12. **TIGHT-FITTING DOORS (FIREPLACE):** R1006.6 (WAC). Solid fuel burning appliances and fireplaces shall be provided with tight-fitting metal or ceramic glass doors and an outside source for combustion air shall be ducted to the firebox.

13. **FIREPLACE HEARTH EXTENSION:** IRC Sections R1004.2, R1001.9. R1001.10 and M1414.2. Hearth extensions of approved factory-built fireplaces shall be installed in accordance with the listing of the fireplace. The hearth extension shall be readily distinguishable from the surrounding floor area. Masonry fireplace hearths and hearth extensions shall be constructed of concrete or masonry, supported by noncombustible materials. Fireplace hearths shall be at least 4" thick and hearth extensions shall be at least 2" thick. The fireplace extension shall extend at least 16" in front of, and at least 8" beyond each side of the fireplace opening. Where the fireplace opening is 6 square feet or larger, the hearth extension shall extend at least 20" in front of, and at least 12" beyond each side of the fireplace opening. Hearth extensions for fireplace stoves shall be installed in accordance to the listing of the fireplace stove.

14. **CLEARANCE TO COMBUSTIBLES & FIREPLACE FIREBLOCKING:** IRC Sections R302.14, R1001.11, 1003.18, 1003.19, and M1306.2.1. Combustible insulation shall be separated a minimum of 3" from heat producing appliances. *Exception: Insulation shall be separated in accordance with conditions stipulated in manufacturer's listing*. When masonry chimneys are built within a structure, minimum 2" air space clearance to combustible material is required. When the chimney is placed on the exterior of the structure, a 1" clearance is allowed. The air space shall not be filled, except to provide noncombustible fireblocking. All wood beams, joists, studs and other combustible material shall have a clearance of not less than 2" from the front faces and sides of masonry fireplaces and not less than 4" from the back faces of masonry fireplaces. The fireblocking of spaces between chimneys and wood beams, joists, or headers shall be self-supporting or be placed on strips of metal or metal lath laid across the spaces between combustible material and the chimney. Woodwork or other combustible materials shall not be placed within 6" of a fireplace opening. Combustible material placed within 12" of the fireplace opening (such as mantles or decorative fireplace surrounds) shall not project more than 1/8" for each 1" clearance from the opening.

15. **COMBUSTION AIR/EXTERIOR AIR SUPPLY:** IRC R1001.7.1 (WAC), AND R1006. (WAC), M1701 and G2407. Masonry fireplaces shall be equipped with a ferrous metal damper located at least 8 inches above the top of the fireplace opening. Dampers shall be installed in the fireplace or the chimney venting the fireplace, and shall be operable from the room containing the fireplace. Fireplaces shall be provided with each of the following: (1) Tightly fitting flue dampers, operated by a readily accessible manual or approved automatic control; exception: Fireplaces with gas logs shall be installed in accordance with the IMC section 901, except that the standards for Liquefied Petroleum Gas Code and NFPA 54 (National Fuel Gas Code). (2) An outside source for combustion air ducted into the firebox. The duct shall be at least 6 square inches, and shall be provided with an operable outside air duct damper. (3) Site built fireplaces shall have tight fitting glass or metal doors, or a flue draft induction fan or as approved for minimizing back-drafting. Factory built fireplaces shall use doors listed for the installed appliance. Direct vent appliances or equipment that does not draw combustion air from inside of the building shall be provided with combustion ventilation and dilution air in accordance to the manufacturer's specifications. Fuel gas dryers shall be provided with make-up air as directed by manufacturer specifications. Solid-fuel-burning appliances shall be provided with combustion air in accordance with the manufacturers' installation instructions. Oil-fired appliances shall be provided with combustion air in accordance to NFPA 31. Where required, outdoor combustion air shall be provided in accordance to IRC G2407.6. The minimum dimension of air openings shall be not less than 3 inches. *Two-permanent-openings method:* Two permanent openings, one commencing within 12 inches of the top and one commencing within 12 in. of the bottom of the enclosure, shall be provided. The openings shall communicate directly, or by ducts, with the outdoors or spaces that freely communicate with the outdoors and have an opening of 1 sq- inch per 4,000 *Btu*/h of total input rating of all *appliances* in the enclosure. Where communicating with the outdoors through horizontal ducts, each opening shall have a minimum free area of not less than 1 square inch per 2,000 *Btu*/h of total input rating of all *appliances* in the enclosure. *One-permanent-opening method:* One permanent opening, commencing within 12 inches of the top of the enclosure, shall be provided. The *appliance* shall have *clearances* of at least 1 inch from the sides and back and 6 inches from the front of the *appliance*. The opening shall directly communicate with the outdoors or through a vertical or horizontal duct to the outdoors, or spaces that freely communicate with the outdoors and shall have a minimum free area of 1 square inch per 3,000 *Btu*/h of the total input rating of all *appliances* located in the enclosure and not less than the sum of the areas of all *vent connectors* in the space. Outside combustion air openings shall be corrosion resistant screen or equivalent protection having not less than ¼-inch openings and not greater than ½" openings. Unless otherwise specified by the manufacturer or determined by actual measurement, the free area shall be considered 75% of the gross area for metal louvers and 25% of the gross area for wood louvers. Volume dampers (manual dampers) shall not be

installed in combustion air openings. Openings shall be covered with corrosion-resistant screen, not less than ¼-inch openings and not greater than ½-inch openings. Outdoor air openings for fuel-burning appliances are permitted to connect spaces such as ventilated crawl spaces or ventilated attic spaces, provided those spaces can provide unobstructed openings to the outdoors. The exterior air intake shall not be located within the garage or basement of the dwelling nor shall the air intake be located at an elevation higher than the firebox. Mechanical and gravity outside air intake openings shall be located a minimum of 10' from any hazardous or noxious contaminant, such as vents, chimneys, plumbing vents, streets, alleys, parking lots and loading docks. Where a source of contaminant is located within 10' of an intake opening, such opening shall be located a min. of 2' below the contaminant source. Exhaust from dwelling units, toilet rooms, bathrooms and kitchens shall not be considered as hazardous or noxious.

16. **APPLIANCE INSTALLATION:** IRC Chapter M-12, Chapter M-13, M2005, G2406. Installation of appliances shall conform to the conditions of their listing and label and the manufacturer's instructions. A permanent factory-applied nameplate shall be affixed to appliances with information listed in accordance to M1303. **NOTE:** The standards for liquefied petroleum gas installations shall be in accordance with NFPA 58 (Liquefied Petroleum Gas Code) and the International Fuel Gas Code. **The manufacturer's operating and installation instructions shall remain attached to the appliance**. Fuel-fired appliances shall not be located in sleeping rooms, bathrooms, toilet rooms, or storage closets. *Exception: 1) direct vent appliances that obtain all combustion air from the outdoors.* Where combustion air is obtained from a dedicated enclosure in which combustion air is taken directly from the outdoor in accordance to G2407, a*ccess to such enclosure shall be through a WSEC approved solid door, weather-stripped and equipped with an approved self-closing device.* Appliances shall be accessible for inspection, service, repair, and replacement without removing permanent construction, other appliances, or other piping or ducts not connected to the appliance. Appliances shall not be installed in a location where subject to mechanical damage unless protected by approved barriers. Appliances designed to be in fixed positions shall be anchored or strapped to resist horizontal displacement caused by earthquake motion in an approved manner. Strapping shall be at points within the upper 1/3 and lower 1/3 of the appliance's vertical dimensions. At the lower point the strapping shall maintain a minimum distance of 4-inches above the controls. Fuel-fired furnaces and boilers installed in closets and alcoves shall be listed for such installation. Equipment installed in outdoor locations shall be either listed for outdoor installation or provided with protection from outdoor environment factors that influence operability, durability and safety of the equipment. Appliances installed in a compartment, alcove, basement or similar space shall be accessed by an opening or door and an unobstructed passageway measuring not less than 24-inches wide and large enough to allow removal of the largest appliance in the space, provided there is a level service space of not less than 30-inches deep and the height of the appliance, but not less than 30-inches, at the front or service side of the appliance with the door open. Attics containing appliances requiring access shall have an opening and a clear unobstructed passageway large enough to allow removal of the largest appliance, but not less than 30-inches high and 22-inches wide and not more than 20-feet long when measure from the opening to the appliance. The passageway shall have continuous solid flooring not less than 24-inches wide. A level service space at least 30-inches x 30-inches along all sides. Appliances located in under floor spaces shall have an unobstructed passageway large enough to remove the largest appliance, but not less than 30-inches high and 22- inches wide, nor more than 20-feet long, measured from the opening to the appliance. A level service space at least 30-inches x 30-inches along all sides. If the service space exceeds 12-inches below the adjoining grade, the walls on the passageway shall be lined with concrete or masonry extending 4-inches above the adjoining grade. Appliance supported from the ground shall be level and firmly supported on a concrete slab. Appliances suspended from the floor shall have a clearance of not less than 3-inches from the ground in stalled in accordance to manufacturer specifications. Luminaries, controlled by a switch at the passageway opening shall be installed near under floor and attic appliances and a receptacle outlet shall be installed at or near the appliance location.

17. **APPLIANCES LOCATED IN GARAGE:** IRC Section M1307, IBC 1607.8.3. Appliances located in a garage, carport or other location where subject to vehicle damage shall be protected with approved barriers. Vehicle barrier systems for passenger cars shall be designed to resist a single load of 6,000 lbs. Applied horizontally in any direction to the barrier system and shall have anchorage or attachment capable of transmitting this load to the structure. For design of the system, the load shall be assumed to act at a minimum height of 1'6" above the floor or ramp surface on an area not to exceed 1 sq. ft. Equipment and appliances having an ignition source shall be elevated such that the source of ignition is not less than least 18" above the floor surface on which the equipment or appliance stands unless the appliance is listed as flammable vapor ignition resistant. Rooms or spaces that are not part of the living space of a dwelling unit and that communicate with the private garage through openings shall be considered to be part of the garage and appliances located in the space shall be elevated as specified above.

18. **WATER HEATERS:** UPC Chapter 5 & 608, IRC Section M1307.2, M2005 & IECC/WSEC R403.4. When water heaters or hot water storage tanks are installed in locations where leakage of the tanks or connections will cause damage, the tank or water heater shall be installed in a watertight pan of corrosion resistant material. The pan shall be at least 1.5" deep and with a ¾"diameter drain to the exterior of the building not less than 6" and not more

than 24" above the adjacent ground surface. Temperature and pressure relief valves shall be drained to the outside of the building. Drains may not be trapped. Pressure relieve drains must terminate not more than 2' nor less than 6" above the ground or the flood level of the area receiving the discharge and pointing downward. Water heaters shall be anchored or strapped to resist horizontal displacement due to earthquake motion. *Twenty-two (22) gage x ¾"*straps shall be used and be placed at points within the upper one-third (1/3) and lower one-third (1/3) of its vertical dimensions. At the lower point, a minimum distance of 4" shall be maintained above the controls. Lag screws not less than ¼" in diameter must be used to anchor the restraints to the wall and each lag screw must have at least 1-½" thread penetration into a stud wall. A flat washer must be installed between each lag screw and the strap for reinforcement. When the water supply system is provided with a pressure regulating device or check valve a properly sized expansion tank shall be installed per manufacturer specifications. Check with your water purveyor. Water heaters used to supply both potable hot water and hot water for space heating shall be installed in accordance with manufacturer's installation instructions. In accordance with WSEC R403.2 Hot water boilers that supply heat to the building through one or two pipe heating systems shall have an outdoor temperature setback control that shall have on outdoor temperature setback control that lowers the boiler water temperature based on the outdoor temperature. Service water heater shall be equipped with automatic temperature controls and shall be set to 120oF. WSEC Section 403.5.5 requires that all electric water heaters shall be placed on an incompressible, insulated surface with a minimum thermal resistance of R-10, when located in an unheated space or on a concrete floor.

19. **LPG (PROPANE) APPLIANCES & TANKS:** IFGC 303, NFPA 58, IRC M1301, IRC Chapter G24, & IMC Section 303.7 and IFGC303.7. Appliances shall be installed in accordance with the manufacturer listing. Fuel-gas appliances shall not be located in sleeping rooms, bathrooms, toilet rooms, storage closets or in a space that opens only into such rooms unless allowed in accordance with IRC G2406.2 & IMC 303.3. Appliances installed in pits or excavations shall not come in direct contact with the surrounding soil. The sides of the pit or excavation shall be held back a minimum of 12" from the appliance. Where the depth exceeds 12" below the adjoining grade, the walls of the pit or excavation shall be lined with concrete or masonry. Such concrete or masonry shall extend not less than 4 inches above adjoining grade and shall have sufficient lateral load-bearing capacity to resist collapse. The appliance shall be protected from flooding in an approved manner.

20. **MANUFACTURER'S SPECS:** IRC Section M1302, M1303.1, M1307, and IMC 304.1. All appliances shall be listed and bear a permanent factory applied nameplate(s) affixed to the appliances with manufacturer's name or trademark, model number, serial number, and seal or mark of testing agency. The installer shall leave the manufacturer's installation and operating instructions attached to the appliance.

21. **VACUUM BREAKERS:** UPC Sections 603.5.7 Potable water outlets with hose attachments, other than water heater drains, boiler drains, and clothes washer connections shall be protected by a listed non-removable hose bibb backflow preventer, a non-removable hose bibb vacuum breaker, or an atmospheric vacuum breaker installed at least 6" above the highest point of usage located on the discharge side of the last valve. In climates where freezing temperatures occur, a listed self-draining frost-proof hose bibb with an integral backflow preventer or vacuum breaker shall be used.

22. **TRAP PRIMERS, DISHWASHER AIRGAP:** UPC Section 1007, 807.3, & 909.1. Floor drain or similar traps connected to the drainage system and subject to infrequent use shall be protected with a trap seal primer and shall be accessible for maintenance. No domestic **dishwashing machine** shall be directly connected to a drainage system or food waste disposer without the use of an **approved dishwasher air gap fitting** on the discharge side of the dishwashing machine. Listed air gaps shall be installed with the flood-level marking at or above the flood level of the sink or drainboard, whichever higher. For island sink venting see detail attached.

23. **GARAGE/DWELLING DOOR/OPENINGS:** IRC Section R302.5.1. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with solid wood doors not less than 1-3/8 inches in thickness, solid or honeycomb core steel doors not less than 1-3/8 inches thick, or 20-minute fire-rated doors, equipped with a self-closing or automatic-closing device.

24. **GARAGE/DWELLING SEPARATION:** IRC Section R302.5 and R302.6,. The garage shall be separated from the residence and its attic area by not less than ½" gypsum board or equivalent 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 ½" gypsum board or equivalent. Garages located less than 3-feet from a dwelling unit on the same lot shall be protected with not less than ½-inch gypsum board applied to the interior side of the exterior walls that are within this area. Ducts in the garage and ducts penetrating the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum 26-gage sheet metal or other approved material and shall have no openings into the garage. Penetrations shall be protected by filling the opening around the penetrating item with approved material to resist the free passage of flame and products of combustion. Openings shall meet the same protection as required in R302.5.

25. **SEPARATION BETWEEN DWELLING UNITS:**

IRC Section R302.3.1. Dwelling units in two-family dwellings shall be separated from each other by wall and floor assemblies having not less than a 1-hour fire-resistance rating. **NOTE:** Must be tested in accordance with ASTM E119, UL 263, or Section 703.3 of the IBC.

26. **FIRE-RESISTANCE OF EXTERIOR WALLS:** IRC R302.1, Tables R302.1(1) Exterior walls with a fire separation distance less than 5-feet shall have not less than a 1-hour fire-resistive rating with exposure from both sides. Openings are not permitted at less than 3-ft and limited when located between 3-ft to 5-ft. Projections shall not extend to a point closer than 2-feet from the line used to determine the fire separation distance. **When a structure is equipped with an automatic fire-sprinkler system installed in accordance with P2904 fire-resistive ratings may be reduced in accordance with Table R302.1(2).** *Exception: Detached garages accessory to a dwelling located within 2-ft of a lot line may have roof eave projections not exceeding 4". Projections extending into the fire separation distance shall have not less than one-hour fire-resistive construction on the underside. These provisions shall not apply to walls perpendicular to the line used to determine the fire separation distance. Exception: Tool and storage shed, playhouses and similar structures exempted from permits by R105.2 or Mason County ordinance are not required to provide wall protection based on location on the lot. Projections beyond the wall line shall not extend over the lot line. Exception: Foundation vents installed in compliance with this code are permitted.*

27. **FLOOR AREA:** IRC Section R304, R306. Every dwelling unit shall have at least one habitable room with not less than 70 square feet of gross floor area. Habitable rooms shall not be less than 7-feet in any horizontal dimension. *Exception: Kitchens.* Every dwelling unit shall be provided with a water closet, lavatory, bathtub or shower, kitchen area with a separate sink, be connected to an approved sewage disposal system, and shall be connected to an approved water supply with hot and cold water.

28. **MINIMUM CEILING HEIGHTS:** IRC R305. Habitable space, hallways, and portions of basements containing these spaces shall have a ceiling height of not less than 7 feet. Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 8 inches. *Exceptions: 1) For rooms with sloped ceilings, at least 50% of the required floor area of the room must have a ceiling height of at least 7-feet and no portion of the required floor area may have a ceiling height of less than 5-feet. 2) The ceiling height above bathroom and toilet room fixtures shall be such that the fixture is capable of being used for its intended purpose. A shower head equipped with a showerhead shall have a ceiling height of not less than 6 feet 8 inches above the area of not less than 30-inches x 30-inches at the showerhead. 3) Beams, girders, ducts or other obstructions in basements containing habitable space shall be permitted to project to within 6 feet 4 inches of the finished floor.*

R305.1.1 Basements. Portions of basements that do not contain habitable space, hallways shall have a ceiling height of not less than 6 feet 8 inches.
Exception: At beams, girders, ducts or other obstructions, the ceiling height shall be not less than 6 feet 4 inches from the finished floor.

29. **ATTIC ACCESS:** IRC R807.1. Buildings with combustible ceiling or roof construction shall have an attic access opening to attic areas that have a vertical height of 30 inches or greater over an area of not less than 30 square feet. Minimum access openings shall not be less than 22" x 30" and shall be located in a hallway or other location with ready access. Where the access is located in a ceiling, minimum unobstructed headroom in the attic space shall be 30 inches at some point above the access measured vertically from the bottom of ceiling framing members. The vertical height shall be measured from the top of the ceiling framing members to the underside of the roof framing members.

30. **EXTERIOR DOORS/EXITS:** IRC R311. Not less than one egress door shall be provided to each dwelling. The egress door shall be side-hinged and with a min. clear width of 32-inches in width and not less than 78-inches in height, measured from the top of the threshold to the bottom of the stop. The exit door shall provide direct access from the habitable portions of the dwelling to the exterior without requiring travel through a garage. Egress from habitable levels including habitable attics and basements not provided with an egress door shall be by a ramp or a stairway in accordance to applicable IRC sections 311.8 or 311.7. Egress doors shall be readily open able from the side from which egress is to be made without the use of a key or special knowledge or effort. The required egress door shall provide a continuous and unobstructed path of egress travel from all portions of the dwelling without travel through a garage. **The egress door shall open directly into a public way or to a yard or court that opens to a public way.**

31. **LANDINGS AT DOORS AND STAIRWAYS & CONSTRUCTION**: IRC R311. Landings or finished floors at the required egress door shall not be more than 1-1/2" lower than the top of the threshold. *Exception: The landing on the exterior side shall not be more than 7-3/4" below the top of the threshold provided the door does not swing over the landing or floor.* There shall be a floor or landing on each side of all other exterior doors. Floor elevations for the doors shall be provided with landings no more than 7-3/4" below the top of the threshold.
Exception: A top landing is not required where a stairway of not more than two risers is located on the exterior side of the door, provided the door does not swing over the stairway. Storm and screen doors shall be permitted to swing over exterior stairs and landings. When exterior landings or floors serving the required egress door are not at grade, they shall be provided with access to grade by means of a ramp or stairway. The width of each landing

shall not be less than the door served and shall have a dimension of 36-inches measured in the direction of travel. The slope at exterior landings shall not exceed ¼ unit vertical in 12 units horizontal (2 percent). A flight of stairs shall **not** have a vertical rise greater than 12 feet between floor levels or landings. Landings shall be the same width of the stairway served and at least 36 inches measured in the direction of travel. Exterior landings, decks, balconies, stairs, and similar facilities shall be positively anchored to the primary structure to resist both vertical and lateral forces or shall be designed to be self-supporting. Attachments shall not be accomplished by use of toenails or nails subject to withdrawal. See also item #69 for deck attachment info.

32. **GUARDS:** IRC Section R312. Table R301.5 Guards shall be provided for open sided walking surfaces including, stairs, ramps, landings, porches, balconies, or raised floor surfaces located more than 30 inches above grade or a floor below. Grade shall be measured 36-inches horizontally to the edge of the open side. Required guards at open-sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than 36 inches in height as measured vertically above the adjacent walking surface or the line connecting the nosings.
Exception:
1) Guards on the open sides of stairs shall have a height of not less than 34 inches measured vertically from a line connecting the nosings.
2) Where the top of the guard serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34" and not more than 38" as measured vertically from a line connecting the nosings.
Required guards shall be designed such that a sphere 4" in diameter cannot pass through. *Exceptions:*
1) The triangular openings at the open side of a stair, formed by the riser, tread and bottom rail of a guard are permitted to be of such size that 6-inch diameter sphere cannot pass through.
2) Guards on the open sides of stairs shall not have openings which allow passage of a sphere 4- 3/8" in diameter.
Handrail assemblies and guards shall be able to resist a single concentrated load of 200 lbs., applied in any direction at any point along the top, and have attachment devices and supporting structure to transfer this loading to appropriate structural elements of the building. Intermediate rails (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 lbs. on an area equal to 1 sq. ft., including openings and space between rails.

33. **HANDRAILS:** IRC Section R311.7.8, R311.8.3 Handrail shall be provided on not less than one side of each flight of stairs with four or more risers. Such handrails shall be placed not less than 34" and not more than 38" above the nosing of the treads. Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser to a point directly above the lowest riser. Handrail ends shall be returned or terminate in newel posts or safety terminals. Handrails adjacent to the wall shall have a space not less than 1 ½" between the wall and the handrail. TYPE I: Circular handrails shall have an outside diameter of at least 1 ¼" and not greater than 2". If the handrail is not circular, it shall have a perimeter dimension of at least 4" and not greater than 6 ¼" with a maximum cross-section dimension of 2 ¼". TYPE II: Handrails with a perimeter greater than 6 ¼" shall have a graspable finger recess area on both sides of the profile. The finger recess shall begin a distance of ¾" measured vertically from the tallest portion of the profile and achieve a depth of at least 5/16" within 7/8" below the widest portion of the profile. This required depth shall continue for at least 3/8" to a level that is not less than 1 ¾" below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 ¼" to a maximum of 2 ¾". Edges shall have a minimum radius of .01". See item #34, stairway width, for additional information. Also refer to deck detail information attached to this checklist.

34. **STAIR WIDTH:** IRC Section R311.7.1 Stairways shall not be less than 36" in clear width at all points above the handrail height and below the required headroom height. Handrails shall not project more than 4 ½" on either side of the stairway and the minimum clear width of the stairway at and below the handrail height, including treads and landings, shall not be less than 31 ½" where the handrail is installed on one side and 27" where handrails are installed on both sides. Width of spiral stairways shall be in accordance with Section R311.7.9.1. See item #39.

35. **STAIR TREADS & RISERS and RAMP SLOPE:** IRC Section R311.7.5 & R311.8.1 The riser height shall be not more than 7-3/4 inches. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8". The minimum tread depth shall be 10". The tread depth within any flight of stairs shall not exceed the smallest by more than 3/8". A nosing not less than ¾" but not more than 1 ¼" shall be provided on stairways with solid risers. Open risers are permitted, provided that the openings located more that 30 inches, as measured vertically, to the floor or grade below, does not permit the passage of a 4" diameter sphere. Ramps shall have a maximum slope of 1 unit vertical in 12 units horizontal. *Exception: Nosing is not required where the tread depth is at least 11". The opening between adjacent treads is not limited on stairs with a total rise of 30" or less*

36. **STAIR HEADROOM CLEARANCE:** IRC R311.7.2 All parts of the stairway shall not be less than 6'8" measured vertically from the sloped plane adjoining the tread nosing or from the floor surface of the landing or platform. *See exception for spiral stairways.*

37. **UNDER STAIR PROTECTION:** IRC Section R302.7 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-inch

gypsum board.

38. **ILLUMINATION:** IRC Section R303.7. All interior and exterior stairways shall be provided with a means to illuminate the stairs, including landings and treads. Interior stairways shall be provided with an artificial light source located in the immediate vicinity of each landing of the stairway. Where lighting outlets are installed in the interior stairways, there shall be a wall switch at each floor level to control the lighting outlet where the stairway has 6 or more risers. Exterior stairways shall be provided with a light source located at the top of the landing of the stairway. Exterior stairways providing access to a basement from the outside grade level shall be provided with an artificial light source located in the immediate vicinity of the bottom landing of the stairway. **Stairway illumination shall receive primary power from the building wiring.** The illumination of exterior stairways shall be controlled from inside the dwelling.

Exception: A switch is not required where remote, central or automatic control of lighting is provided.

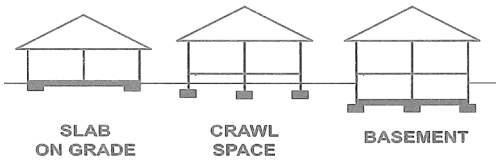
39. **SPECIAL STAIRWAYS:** IRC Section R311.4, R311.7.10, R311.7.5.2.1, Spiral stairways and bulkhead enclosure stairways shall comply with all requirements of stairways. Spiral stairways are permitted, provided the minimum width at and below the handrail shall be not less than 26 inches and the walkline radius is not greater than 24 ½ inches. Each tread having a 6-3/4 inch at the walkline. Treads shall be identical, and the rise shall be no more than 9 ½". Headroom shall be not less than 6 feet 6 inches. Stairways serving bulkhead enclosures see IRC Section R311.7.10.2.

Note: Washington State Amendment to IRC R311.4: Stairs and ladders are permitted within an individual dwelling unit used for access to areas of 200 sq. ft. or less, and not containing the primary bathroom or kitchen. See R311.7.11 & R311.7.12

40. **FOUNDATION FOOTING SIZE:** IRC Section R403. Assume load-bearing value of soil 1500 PSF unless proven otherwise. Snow load is designated by area, when snow load is between designated loads, use the higher snow load.

Table R403.1(3) -Min. Width & Thickness for Concrete

Snow Load	Light Frame Story/type of structure	Footing Size
30 psf	1 story—slab-on-grade	12 × 6
	1 story—with crawl space	13 × 6
	1 story—plus basement	19 × 6
	2 story—slab-on-grade	12 × 6
	2 story—with crawl space	17 × 6
	2 story—plus basement	23 × 6
	3 story—slab-on-grade	15 × 6
	3 story—with crawl space	20 × 6
	3 story—plus basement	26 × 8
50 psf	1 story—slab-on-grade	12 × 6
	1 story—with crawl space	16 × 6
	1 story—plus basement	21 × 6
	2 story—slab-on-grade	14 × 6
	2 story—with crawl space	19 × 6
	2 story—plus basement	25 × 7
	3 story—slab-on-grade	17 × 6
	3 story—with crawl space	22 × 6
	3 story—plus basement	28 × 9
70 psf	1 story—slab-on-grade	12 × 6
	1 story—with crawl space	18 × 6
	1 story—plus basement	24 × 7
	2 story—slab-on-grade	16 × 6
	2 story—with crawl space	21 × 6
	2 story—plus basement	27 × 9
	3 story—slab-on-grade	19 × 6
	3 story—with crawl space	25 × 7
	3 story—plus basement	30 × 10



R403.1.1 Minimum width, (W), and thickness (T), for concrete footings shall be in accordance with Tables R403.1(1) through R403.1(3) and figure R403.1(1) or R403.1.3, as applicable. *(See Attached)*. Footing projections (P), shall not be less than 2" and shall not exceed the thickness of the footing. All exterior walls shall be supported on continuous footings placed on undisturbed natural soils or engineered fill. In accordance with R403.1.3.6 in detached one- and two-family dwellings that are three stories, or less in height and construct with stud bearing walls, isolated plain concrete footing supporting column or pedestals are permitted. **R402.1.2 All required interior braced wall panels shall be supported on footings at intervals not exceeding 50-ft.**

41. **FOOTING REINFORCEMENT:** IRC Section R403.1.3, R403.1.3.3, R403.1.3.5. Steel reinforcement in concrete cast against the earth shall have a minimum cover of 3 inches. Where a construction joint is created between a concrete footing and stem wall, a min. No. 4, grade 60, vertical bar shall be provided at not more than 4-feet on center. The vertical bar shall have a standard hook and extend to the bottom of the footing and shall have support and cover as specified in Section R403.1.3.5.3 and extend not less than 14 inches into the stem wall. Not fewer than

one NO. 4 horizontal bar shall be installed within 12 inches of the top of the stem wall and one No. 4 horizontal bar shall be located 3-4 inches from the bottom of the footing. The vertical bar shall be tied in place at inspection. As a minimum standard, **refer to the attached handouts:** *Foundation Reinforcement Requirements.*

42. **FOUNDATION WALL SIZE:** IRC R403.1.3.1, R404, Tables R404.1.1(1) through R404.1.1(4), & Section 404.1.4 *See attached handouts*.
Masonry Foundation Walls. In buildings assigned to Seismic Design Category D2, as established in Table R301.2(1), masonry foundation walls shall comply with the R404.1.1(1): ***1)****Wall height shall not exceed 8 feet.* ***2)*** *Unbalanced backfill height shall not exceed 4 feet.* ***3)*** *Minimum nominal thickness for plain masonry foundation walls shall be 8 inches.* ***4)*** *Masonry stem walls shall have a minimum vertical reinforcement of one No. 4 bar located a maximum of 4 feet on center in grouted cells. Vertical reinforcement shall be tied to the horizontal reinforcement in the footings.* Foundation walls supporting more than 4' of unbalanced backfill or exceeding 8' in height shall have two No. 4 horizontal bars located in the upper 12 inches of the wall.

43. **STEPPED FOUNDATIONS IN SEISMIC DESIGN D2:** IRC Section 602.11.2. Where the height of a required braced wall line that extends from the foundation to floor above varies more than 4', the braced wall panel shall be constructed in accordance to figure R602.11.2 and as follows: *See attached details*. **1)** Where the lowest floor framing rests directly on a sill bolted to a foundation not less than 8' in length along a line of bracing, the line shall be considered as braced. The double plate of the cripple stud wall beyond the segment of footing that extends to the lowest framed floor shall be spliced by extending the upper top plate a minimum of 4' along the foundation. Anchor bolts shall be located a maximum of 1' and 3' from the step foundation. **2)** Where cripple walls occur between the top of the foundation and the lowest floor framing, the bracing requirements for a story shall apply, *see R602.10.9 and R602.10.9.1.* **3)** Where only the bottom of the foundation is stepped and the lowest floor framing rests directly on a sill bolted to the foundations, the requirements of *R403.1.6 and R602.11.1 shall apply*.

44. **FOOTING DEPTH:** IRC Section R403.1.4, R403.1.3.4 All exterior footings shall be placed at least 12" below undisturbed ground. Interior footings supporting bearing or bracing walls and cast monolithically with a slab on grade shall extend to a depth of less than 12" below the top of slab. Interior footings bearing supporting braced wall panel bearing wall panels (D2 seismic category) and cast monolithically with a slab at grade, shall extend to a depth of not less than 12 inches below the top of the slab.

45. **FOUNDATION ANCHORAGE:** IRC Section 403.1.6, R602.11. Braced wall panels shall be supported directly on continuous foundations. The wood sole plates at all exterior walls on monolithic slabs, wood sole plates of brace wall panels at building interiors on monolithic slabs and all **wood sill plates shall be anchored to the foundation with ½" diameter anchor bolts spaced a maximum of 6' o.c.** or approved anchors or anchor straps spaced as required to provide equivalent anchorage to ½ in diameter anchor bolts. Bolts shall extend less than 7" into concrete or grouted cells of concrete masonry units. The bolts shall be located in the middle third of the width of the plate. A nut and washer shall be tightened on each anchor bolt. The maximum anchor bolt spacing shall be 4-ft for buildings over two stories in height. There shall be 2 bolts per plate section with one bolt located not more than 12" or less than 7 bolt diameters (3 ½" typical) from each end of the plate section. Where interior braced wall lines are required (seismic zones D1 & D2) to be supported by continuous foundations in Section 403.1.2, ½" anchor bolts shall be spaced not more than 6' o.c. and located within 12" from the ends of each plate section. Interior bearing wall sole plates on monolithic slab foundations shall be positively anchored with approved fasteners. **A nut and washer shall be tightened on each bolt to the mudsill plate using ¼" x 3" x 3" plate washers except where approved anchor straps are used.**

46. **DAMP-PROOF FOUNDATION WALLS:** IRC Section R406. Except where required by section R406.2 to be waterproofed, foundation walls that retain earth and enclose interior or usable spaces located below grade shall be dampproofed from (a) the top of the footing or (b) 6 inches below the top of the basement floor, to the finished grade. R406.2: In areas where a high water table or other severe soil-water conditions are known to exist, exterior foundation walls that retain earth and enclose usable spaces located below grade shall be waterproofed with a membrane extending from the a) top of the footing to the finished grade b) 6 inches below the top of the basement floor, to the finish grade. The membrane shall consist of one of the following: 2-ply hot mopped felts, 55-pound roll roofing, 6-mil polyvinyl chloride, 6-mil polyethylene, 40-mil polymer-modified asphalt, 60-mil flexible polymer cement, one-eighth inch cement based, fiber reinforced waterproof coating or 60-mil solvent-free liquid-applied synthetic rubber. All joints in membrane waterproofing shall be lapped and sealed with an adhesive compatible with the membrane. See exceptions for additional information.

47. **FOUNDATION DRAINAGE:** IRC Section R401.3, R405. Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection that does not create a hazard. Lots shall be graded to drain surface water away from foundation walls. The grade shall fall not fewer than 6 inches within the first 10 feet. *Exception: Where lot lines, walls, slopes or other physical barriers prohibit 6" of fall within 10' drains or swales shall be provided to ensure drainage away from the structure. Impervious surfaces within 10-ft of the building foundation shall be sloped a min. 2% away from the building.*
Drains shall be provided around all concrete or masonry foundations that retain earth and enclose habitable spaces located below grade. Drainage tiles, gravel, or crushed

stone drains, perforated pipe or other approved systems or materials shall be installed at or below the area to be protected and shall discharge by gravity or mechanical means into an approved drainage system. Gravel or crushed stone drains shall extend not less than 1-foot beyond the outside edge of the footing and 6 inches above the top of the footing and be covered with an approved filter membrane material. The top of open joints of drain tiles shall be protected with strips of building paper. Drainage tiles or perforated pipe shall be placed on not less than 2 inches of washed gravel or crushed rock not less than one sieve larger than the tile joint opening or perforation and covered with not less than 6 inches of the same material.

48. **FOOTING/PIERS ON OR ADJACENT TO SLOPES:** IRC Section 403.1.7. The placement of buildings and structures on or adjacent to slopes steeper than 1 unit vertical in 3 units horizontal (33.3-percent slope) shall conform to Sections R403.1.7.1 through R403.1.7.4. Buildings below slopes shall be set a sufficient distance from the slope to provide protection from slope drainage, erosion and shallow failures. Where the existing slope is steeper than one unit vertical in one unit horizontal (100% slope), the toe of the slope shall be assumed to be at the intersection of the horizontal plane drawn from the top of the foundation and a plane drawn tangent to the slope at an angle 45 degrees to the horizontal. Where a retaining wall is constructed at the toe of the slope, the height of the slope shall be measured from the top of the wall to the top of the slope. Footings on or adjacent to slopes shall be founded in material with an embedment and setback from the slope surface to provide vertical and lateral support for the footing without detrimental settlement. Except as provided for in Section R403.1.7.4 and Figure R403.1.7.1, the following setback is deemed adequate to meet the criteria. Where the slope is steeper than one unit vertical in one unit horizontal (100% slope), the required setback shall be measured from an imaginary plane 45 degrees to the horizontal, projected upward from the toe of the slope. On graded sites, the top of an exterior foundation shall extend above the elevation of the street gutter at point of discharge or the inlet of an approved drainage device not less than 12 inches plus 2 percent. Alternate elevations are permitted subject to the approval of the building official, provided that it can be demonstrated that required drainage to the point of discharge and away from the structure is provide at all locations on the site.

49. **BRACED WALL PANEL SUPPORT/CRIPPLE WALL BRACING: IRC Definition, Sections R602.9, R602.10.9.1, R602.10.11,** One story buildings in seismic design category D2 shall be supported on continuous foundations at intervals not to exceed 50- ft. **In two-story buildings ALL interior braced wall panels shall be supported by continuous foundation**. Foundation cripple walls shall be framed of studs not smaller than the studding above. When exceeding 4 feet in height, such walls shall be framed of stud having the size required for an additional story. Cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in Section R403.12 and R602.10.9.1 with a stud height less than 14 inches shall be continuously sheathed on one side with wood structural panels fastened to both the top and bottom plates in accordance with Table R602.3(1) or the cripple walls shall be constructed of solid blocking. All cripple walls footings or foundation. *Exception: Footing supporting cripple walls used to support interior braced wall panels as required in Section R403.1.2 and R602.10.0.1 shall be continuous for the required length of the cripple wall and constructed beyond the cripple wall for minimum distance of 4 inches and maximum distance of the footing thickness. The footing extension is not required at intersections with other footings*. Cripple walls defined as the framed wall extending from the top of the foundation to the underside of the floor framing of the story above. **Cripple walls below brace walls shall be constructed with wood structural panels with the length and method specified in Table R602.10.3(3) and R602.10.3(4).** Adhesive attachment of wall sheathing shall not be permitted in Seismic Design Categories D2.

50. **CHIMNEY FOUNDATION & SEISMIC REINFORCING:** IRC Sections 1001, R1001.2, When an approved design is not provided, footings for masonry and concrete fireplaces and their chimneys shall be constructed of concrete or solid masonry not less than 12" thick, and shall not extend 6-inches beyond the face of the fireplace or foundation wall on all sides. Footings shall be founded on natural, undisturbed earth or engineered fill below the frost depth, at least 12" below finished grade. Masonry or concrete chimneys shall be anchored at each floor, ceiling, or roof line more than 6-ft. above grade, except where constructed completely within the exterior walls. Unless designed otherwise, masonry and concrete chimneys shall be reinforced and anchored in accordance to Chapter 1001.

51. **UNDER-FLOOR VENTILATION:** WAC amendment to IRC Section R408.1 and R408.2. The under-floor space between the bottom of the floor joists and the earth under any building (except space occupied by a basement or cellar) shall be provided with ventilation openings through foundation walls or exterior walls having a net area of not less than 1 square foot for each 300 square feet of under-floor space area. In addition, a ground cover of 6 mil polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped six inches minimum at the joints and shall extend toe the foundation wall. *Exception: The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab floor with minimum thickness of two inches.* One ventilating opening shall be within 3-feet of each corner of the building, except one side of the building shall be permitted to have no ventilation openings. Ventilation openings shall be covered for their height and width with any of the following materials provided that the least dimension of the covering shall not exceed ¼":
1) perforated sheet metal plates not less than .070" thick,

2) Expanded sheet metal plates not less than .047" thick, **3)** Cast iron grills or grating, **4)**Extruded load-bearing brick vents, **5)** Hardware cloth of .035" wire or heavier, **6)** Corrosion-resistant wire mesh, with the least dimension being 1/8". See exceptions for additional options.

52. **WOOD IN CONTACT WITH CONCRETE & MASONRY:** IRC Section R317.1 #2. All wood framing members that rest on concrete or masonry exterior foundation walls and are less than **8"** from the exposed ground require the use of naturally durable wood or wood that is preservative treated accordance with AWPA U1 for the species, product, preservative, and end use. Preservatives shall be listed in Section 4 of AWPA U1.

53. **COLUMNS AND POSTS:** IRC Section R317.1.2, R317.1.4 & R407.3. All wood in contact with the ground, embedded in concrete in direct contact with the ground or embedded in concrete exposed to the weather that supports permanent structures intended for human occupancy shall be approved pressure-preservative-treated wood suitable for ground contact use, except that untreated wood used entirely below groundwater level or continuously submerged in fresh water shall not be required to be pressure-preservative treated. Wood columns shall be approved wood of natural decay resistance or approved pressure preservative treated wood. *Exceptions:* **1)** Posts or columns which are exposed to the weather or located in basements or cellars, supported by concrete piers or metal pedestals projecting 1" above the floor or finished grade and 6" above exposed earth, and are separated by an approved impervious moisture barrier. **2)** Posts or columns in enclosed crawl spaces or unexcavated areas located within the periphery of the building, supported by a concrete pier or metal pedestal at a height greater than 8" from the exposed earth and the earth is covered by an impervious moisture barrier. **3)** Deck posts supported by concrete piers or metal pedestals projecting not less than 1 inch above a concrete floor or 6 inches above exposed earth (See Section R317.1.3) Columns shall be restrained to prevent lateral displacement at the bottom end. Wood columns shall not be less in nominal size than 4" x 4" or approved equivalent. Carport/Covered deck detail

54. **GIRDERS ENTERING MASONRY OR CONCRETE WALLS:** IRC Section R317.1 #4. The ends of wood girders entering exterior masonry or concrete walls having clearances of less than ½ inch on tops, sides, and ends unless an approved species and grade of lumber specified in Sections R317.1 & R317.2 and listed in #56 of this checklist is used.

55. **POST-BEAM CONNECTIONS/FASTENING:** IRC Section R502.9, R301.1, R602.3(1). Where post and beam or girder construction is used to support floor framing, positive connections shall be provided to ensure against uplift and lateral displacement. The construction of buildings and structures shall result in a system that provides a complete load path that meets all requirements for the transfer of all loads from their point of origin through their load resisting elements to the foundation.

56. **MINIMUM STANDARDS & PROTECTION AGAINST DECAY:** IRC Sections R317.1, R317.2, & R317.3, R502.1, R602.1, R802.1. In areas subject to decay and where required, the use of a naturally durable wood and grade of lumber shall be required, including wood pressure treated in accordance with AWPA U1, listed in Section 4, or naturally durable wood such as decay resistant redwood, black locust, black walnut or cedar. Pressure-preservative-treated wood shall bear the quality mark of an approved agency in accordance to R317.2. Field cut ends, notches and drilled holes of preservative-treated wood shall be treated in the field in accordance to AWPA M4. **All wood embedded in concrete exposed to weather that supports permanent structures intended for human occupancy shall be approved pressure-preservative-treated wood suitable for ground contact use**, *except untreated wood may be used entirely below groundwater level or continuously submerged in fresh water.* Approved naturally durable or pressure-preservative-treated wood shall be used for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances when they are exposed to weather without adequate protection from a roof, eave, overhang or other covering that would prevent moisture or water accumulation on the surface or at joins between members. Load bearing dimension lumber used for joists, beams, girders, studs, plates, headers, rafters, trusses, and ceiling joists, including, end-jointed lumber, pre-fabricated I-joists, structural glue-laminated timber, structural log members, wood structural panels, fiberboard sheathing (when used structurally), hardboard siding (when used structurally), particleboard, preservative treated wood, fire-retardant-treated wood, hardwood plywood, shall be identified by a grade mark of a lumber grading or inspection agency that has been approved by an accreditation body that complies with DOC PS 20 (R602.1). In lieu of a grade mark, a certification of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted. **FASTENERS:** Fasteners for pressure preservative and fasteners for pressure-preservative and fire-retardant- treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. The coating weights for zinc-coated fasteners shall be in accordance with manufacturer recommendations or in accordance to ASTM A653 type G185. See also manufacturer specifications or distributor specific installation instructions or recommendations.
Exception: ***1)*** *½" diameter or larger steel bolts (where required by location).* ***2)*** *Fasteners other than nails and timber rivets shall be permitted to be mechanically deposited zinc- coated steel with coating weights in accordance with ASTM B 695, Class 55, minimum. Sill plate need not be pressure treated if sill plate installed over an approved moisture barrier such as 30 lb. Felt or equivalent and the sill plate is 8" or more above grade.*

57. **FLOOR FRAMING:** IRC Chapter 5, Section R502.6, R502.7, The ends of each joist, beam or girder shall have not less than 1- ½" bearing on wood or metal, have not less than 3" on masonry or concrete except where supported by approved joint hangers. Alternatively, the ends of joists shall be supported on a 1-inch by 4-inch ribbon strip and shall be nailed to the adjacent stud. The bearing on masonry or concrete shall be direct, or a sill plate of 2-inch-minimum nominal thickness shall be provided under the joist, beam or girder. Joist framing from opposite sides of a beam or partition shall lap a minimum of 3" and shall be nailed together with three 10d-face nails. A wood or metal splice with strength equal to or greater than that provided by the nailed lap is permitted. Joists framing into the side of a wood girder shall be supported by approved framing anchors or on ledger strips not less than 2-inches x 2-inches. Joists shall be supported laterally at the ends and at each intermediate support by full depth solid blocking not less than 2" nominal thickness; or by attachment to a full-depth header, band or rim joist, or to an adjoining stud; or shall be otherwise provided with lateral support to prevent rotation. *Exception:* ***1)*** *Trusses, structural composite lumber, structural glued-laminated member and I-Joist shall be supported laterally as required by the manufacture's recommendations.* ***2)*** *In a D2 seismic design category lateral restraint shall be provided at each intermediate support.*
Joists exceeding a nominal 2" x 12" shall be supported laterally by solid blocking, diagonal bridging (wood or metal), or a continuous 1" x 3" strip nailed across the bottom of joists perpendicular to joists at intervals not exceeding 8'0". See Figure R502.2 for floor framing information and Tables 502.3.1(1), R502.3.1(2), R502.3.3(1) and R502.3.3(2) for allowable spans. Structural floor members shall not be cut, bored or notched in excess of that Section R502.8. **Notches:** in solid lumber joists, rafters and beams shall not exceed 1/6 of the depth of the member, shall not be longer than 1/3 of the depth of the member and shall not be located in the middle 1/3 of the span. Notches at the ends of the member shall not exceed 1/4 the depth of the member. The tension side of members 4 inches or greater in nominal thickness shall not be notched except at the ends of the members. The diameter of holes bored or cut into members shall not exceed 1/3 the depth of the member. Holes shall not be closer than 2 inches to the top or bottom of the member, or to any other hole located in the member. Where the member is also notched, the hole shall not be closer than 2 inches to the notch.
Engineered wood products: Cuts, notches and holes bored in trusses, structural composite lumber, structural glue-laminated 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*. Floor framing shall be **Fastened** in accordance with Table R602.3(1). Posts and beams used to support floor framing shall be provided with positive connections to ensure against uplift and lateral displacement. Floor assemblies, where the space below is used for storage or fuel-fired appliances shall be protected from fire in accordance with R302.13. *Exception: dimensional or structural composite wood floor assemblies with a cross-sectional area equal to or greater than 2x10 or other floor assemblies demonstrating equivalent fire performance.*

58. **JOISTS UNDER BEARING PARTITIONS:** IRC Section R502.4. Joists under parallel bearing partitions shall be of adequate size to support the load. Double joists, sized to adequately support the load, that are separated to permit the installation of piping or vents shall be full depth **solid blocked with lumber not less than 2" in nominal thickness spaced not more than 4' O.C.** Bearing partitions perpendicular to joists shall not be offset from supporting girders, walls or partitions more than the joist depth unless joists are of sufficient size to carry the additional load.

59. **UNDER-FLOOR CLEARANCE / REMOVAL OF DEBRIS:** IRC Section R317.1 #1, R408.5. When floor joists or the bottom of a wood structural floor are located within 18" or wood girders are located within 12" to the exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation, all components of the floor assembly shall be wood approved in areas subject to decay as identified in #56 of this checklist. Included are the posts, beams or girders, joists and sub-floor. The under-floor grade shall be cleaned of all vegetation and organic material. All wood forms used for placing concrete and construction materials shall be removed before the building is occupied or used for any purpose.

60. **UNDER-FLOOR ACCESS:** IRC Section R408.4, M1305.1.4. Access shall be provided to all under-floor spaces. Access openings through the **floor** shall be a minimum of 18" x 24". Openings through a **perimeter wall** shall be at least 16" x 24". When any portion of the through wall access is below grade, an areaway not less than 16" x 24" shall be provided. The bottom of the areaway shall be below the threshold of the access opening. Through wall access openings shall not be located under a door to the residence. Where appliances are located under floors a rough-framed access shall be provided with an opening or door and an unobstructed passageway not less than 22 inches wide **and** large enough to allow the removal of the largest appliance in the space. Access shall be unobstructed by pipes, ducts or similar construction.

61. **WALL FRAMING:** IRC Section R602 including R602.3.1, R602.3.2, R602.3.3, R 602.3.4, R602.6 & R602.9. The size, height, and spacing of all other wood-framing studs shall be in accordance with Table R602.3(5). *Exception: 1) Utility grade studs shall not be spaced more than 16" on center, support more than a roof and ceiling, and shall not exceed 8-feet in height for exterior and load bearing walls or 10' for interior non-bearing walls. 2) Where snow loads are less than or equal*

to 25 pounds per square foot, and the ultimate wind speed is less than or equal to 130 mph, 2x6 studs supporting a roof load with not more than 6 feet of tributary length shall have a maximum height of 18 feet where spaced at 16 inches on center, or 20 feet where spaced at 12 inches on center. Stud shall be a minimum No. 2 grade lumber. In accordance with Table R602.3.1. Studs shall be placed with their wide dimension perpendicular to the wall. Wood stud walls shall be capped with a double top plate installed to provide overlapping at corners and intersections with bearing partitions. End joints in top plates shall be offset not less than 24". Joints in plates need not occur over studs. Plates shall be a nominal 2" in depth and have a width at least equal to the width of studs. Where joists, trusses, or rafters are spaced more than 16" o.c. and the bearing studs are spaced 24" o.c. such members shall bear within 5" of the studs beneath. Studs shall have full bearing on a 2-inch nominal or larger plate or sill having a width at least equal to the width of the studs.

Drilling & notching – studs (R602.6): *Notching:* Any stud in an exterior wall or bearing partition may be cut or notched to a depth not exceeding 25% of the stud width. Studs in non-bearing partitions may be notched to a depth not to exceed 40% of a single stud width. ***Drilling:*** Any stud may be bored or drilled, provided that the diameter of the resulting hole is not more than 60% of the stud width, the edge of the hole is no closer than 5/8 of an inch to the edge of the stud, and the hole is not located in the same section as a cut or notch. Studs located in exterior walls or bearing partitions drilled over 40% and up to 60% shall be doubled with no more than 2-successive doubled studs bored (See Figure R602.6.(1) and R602.6(2). *Exception: Use of approved stud shoes is permitted when they are installed in accordance with the manufacturer's recommendations and R602.6 for additional details.*

Drilling and notching of top plate: Where piping or ductwork is placed in or partly in an exterior wall or interior load bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50% of its width, a galvanized metal tie of not less than .054-inch thick and 1½ inches wide shall be fastened across the plate at each side of the opening with not less than 8-10d nails at each side having a min. length of 1½" each side or equivalent. The metal tie must extend a min. of 6" past the opening. *(See figure R602.6.1).* **Foundation cripple walls** (WAC R602.9) shall be framed of studs not less in size than the studding above. When exceeding 4'0 feet in height, such walls shall be framed of studs having the size required for an additional story. Cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in Section R403.1.2 and R602.10.9.1 with a stud height less than 14 inches shall be continuously sheathed on at least one side with a wood structural panel that is fastened to both the top and bottom plates in accordance with Table R602.3(1) or the cripple walls shall be constructed of solid blocking. All cripple walls shall be supported on continuous foundations. *Exception: Footings supporting cripple walls used to support interior braced wall panels as required in Sections R403.1.2 and R602.10.9.1 shall be continuous for the required length of the cripple wall and constructed beyond the cripple wall for a min. distance of 4 inches and a maximum distance of the footing thickness. The footings extension is not required at intersections with other footings.*

62. **WALL BRACING:** IRC 602.10. **Mason County is located in Seismic Design Category (SDC) D2.** All braced walls and cripple wall bracing in Seismic Design Category D2 shall be constructed in accordance with IRC Tables R602.10.1.3(1) & (3) and Sections R602.10 and R602.11.

- Standard braced wall panels require nailing patterns of 6" o.c. along all panel edges and 12" in the field. All sheathing joints must be over studs (vertically) or solid block of min. 1 ½ inches thickness, at joints (horizontally).

- R602.10.2.2.1 Braced wall panels shall be located at each end of a braced wall line. In accordance with the *exception* listed in R602.10.2.2.1; *states no brace wall shall begin more than 10' 0" from each end of a braced wall line and be no more than 20-ft apart. If the braced wall panel is not located at the corner, a 24" panel shall be required at the corner return panel, in addition to the required BWP within 10', as an option an 1800 pound hold down device shall be fastened to the brace wall panel closest to the corner and to the foundation or framing below as shown in Figure R602.10.7.*

- Spacing of interior braced wall lines shall not exceed 25' apart. An increase up to 35' apart for a single room within the structure is not to exceed 900 sq. ft., is permitted provided the braced wall length is adjusted in accordance with IRC Table R602.10.3(4). *(Ref Table R602.10.1.3)*

- Braced wall lines may have offsets, out of plane of up to 4'0".

- In one-story buildings, braced wall panels shall be supported on continuous foundations at intervals not exceeding 50'. In two-story buildings all interior braced wall panels shall be supported on continuous foundations.

- Brace wall panels shall be fastened to required foundations in accordance with R602.10.8.1 & R602.10.8.2. See Figure R602.10.8(1), Figure R602.10.8(2), R602.10.8.2(1), R602.8.2.(2) & Figure R602.10.8(3). See Attached

- Cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in IRC R403.1.2 shall be braced length and method of bracing used for the wall above in accordance with Tables R602.10.3(1) & (3) and applicable adjustment factors in Table R602.10.3(2) or R602.10.3(4) . Cripple wall does note exceed 4' in height shall be designated as the first story wall for purposes of designating the wall bracing requirements (R602.11.3).

- Where "stepped foundations" occur, See IRC

R602.11.2 for additional requirements such as plate strapping, cripple wall height limitations, etc.

- Adhesive attachment is not permitted.
- 1st floor braced panels supported by double joists, continuous blocking or floor beams.

See attached "Braced Wall Panel" and "Alternate Braced Wall Panel" details for typical construction requirements.

63. **OPENINGS IN EXTERIOR & INTERIOR WALLS (HEADERS):** IRC Section R602.7, R502.5 & R502.6. Headers shall be provided over each opening in exterior-bearing walls. Headers shall be of two pieces of nominal 2-inch framing lumber set on edge as permitted in tables R602.7(1) and R602.7(2) and nailed together in accordance with Table R602.3(1) or of solid lumber of equivalent size. Exterior headers not listed in the tables shall be designed to support the loads specified in Table R301.5. The ends of each joist, beam or girder shall not have less than 1½ inches of bearing wood or metal, have not less than 3 inches of bearing on masonry or concrete or be supported by approved joist hangers. A single flat 2"x4" member shall be permitted as a header in interior or exterior nonbearing walls for openings up to 8-ft in width if the vertical distance to the parallel nailing surface above is not more than 24- inches. Headers shall be supported on each end with one or more jack studs or with approved framing anchors in accordance with Table R602.7(1). A full height stud adjacent to each end of the header shall be end nailed to each end of the header with four 16d nails.

64. **FIREBLOCKING & DRAFTSTOPPING:** IRC R302.11, R302.12, R1001.12, R1003.19. ***FIREBLOCKING*** shall be installed to cut off both horizontal and vertical concealed draft openings and to form an effective fire barrier between stories, and between a top story and the roof space. Fire-blocking shall be provided in wood-frame construction in the following locations: **1)** In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs, as follows: a) Vertically at the ceiling and floor levels. b) Horizontally at intervals not exceeding 10 feet. **2)** At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings. 3) In concealed spaces at stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R302.7. **4)** At openings around vents, pipes and ducts, cables and wires at ceiling and floor level, with an approved material to resist the free passage of flame and products of combustion. **5)** For the fire-blocking of chimneys and fireplaces, see Section R1003.19. **6)** Fire-blocking of cornices of a two-family dwelling is required at the line of dwelling unit separation. **7)** 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. **8)** Cellulose insulation installed as tested in accordance with ASTM E 119 or UL 263, for the specific application. Fire blocking materials shall consist of material listed in Section R302.11.1. Loose-fill insulation material shall not be used as a fire-block unless specifically tested in the form and manner intended. The integrity of all fire-blocks shall be maintained. ***DRAFTSTOPPING*** *R302.12:* Where the assembly is enclosed by a floor membrane above and a ceiling membrane below, draftsopping shall be provided in floor-ceiling assemblies under the following circumstances: **1)** Ceiling is suspended under the floor framing; and **2)** Floor framing is constructed of truss-type open-web or perforated members. Draftstopping materials shall be not less than ½ inch gypsum board, 3/8" wood structural panels, or other approved materials adequately supported. Draftstopping shall be installed parallel to the floor framing members unless otherwise approved. The integrity of draftstops shall be maintained.

CHIMNEY FIREBLOCKING: All spaces between chimneys and floors and ceilings through which chimneys pass shall be fire-blocked with noncombustible material securely fastened in place. The fire-blocking of spaces between chimneys and wood joists, beams, or headers shall be self-supporting or be placed on strips of metal or metal lath laid across the spaces between combustible material and the chimney.

65. **EXTERIOR COVERING & ATTACHMENTS:** IRC Section R701.2, 703.1-703.11.
Exterior walls shall provide the building with a weather-resistant exterior wall envelope. *Exception: Log walls designed and constructed in accordance with the provisions of ICC 400.* The exterior wall envelope shall include flashing as described in Section R703.8. The exterior wall envelope shall be designed and constructed in a manner that prevents accumulation of water within the wall assembly by providing a water-resistant barrier behind the exterior veneer, as specified R703.2, and a means draining water that enters the assembly to the exterior. The requirement for a means of drainage shall not be construed to mean an air space cavity under the exterior cladding for an exterior wall clad with panel or lapped siding made of plywood, engineered wood, hardboard, or fiber cement. A water-resistive barrier as required by Section R703.2 will be required on exterior walls. Protection against condensation in the exterior wall assembly shall be provided in accordance with section R702.7 of this code and the Washington State Energy Code (WSEC) as described in item #95. Exterior wall coverings and roof overhangs shall be securely fastened with aluminum, galvanized, stainless steel or rust-preventative coated nails or staples in accordance with Table R703.3(1) or with other approved corrosion-resistance fasteners in accordance with the wall coverings manufacturer's installation instructions. In accordance with Table R703.3(1) wood siding may not be less than 3/8" thick; to ensure proper fastening for type used see Table R703.3(1). Approved corrosion-resistant fasteners shall be provided in the exterior wall envelope in such a manner as to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Minimum fastener length and penetration shall have the greater of the minimum length specified in

Table R703.3(1) or as required to provide a minimum penetration into framing as follows: 1. Fasteners for horizontal aluminum siding, steel siding, particleboard panel siding, wood structural panel siding in accordance with ANSI/APA-PRP 210, fiber-cement panel siding installed over foam plastic sheathing shall penetrate not less than 1 ½ inches into framing or shall be in accordance with the manufacturer's installation instructions. 2) Fasteners for hardboard panel and lap siding shall penetrate not less than 1 ½ inches into framing. 3) Fasteners for vinyl siding and insulated vinyl siding installed over wood structural panel sheathing shall penetrate not less than 1 ¼ inches into sheathing and framing combined. Vinyl siding and insulated vinyl siding shall be permitted to be installed with fasteners penetrating into or through wood or wood structural sheathing of minimum thickness as specified by the manufacturer's instruction or test report, with or penetration into the framing See Section R703.3.3 for more detail. For information related to masonry and anchored stone wall coverings. See #67

66. **WEATHER RESISTANT SHEATHING PAPER and FLASHING:** IRC Section R703.2 and R703.8. Not fewer than one layer of water-resistive barrier shall be applied over studs or sheathing with flashing as indicated in Section R703.4, in such a manner as to provide a continuous water resistive barrier behind the exterior wall veneer. Water-resistive barrier materials shall comply with one of the following: a) No. 15 felt complying with ASTM D226 Type 1. b) ASTM E2556, Type 1 or 2. c) ASTM E331 in accordance with Section R703.1.1; or 4. Other approved materials in accordance with the manufacturer's installation instructions. Such felt or material shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2". Where joints occur felt shall be lapped not less than 6-inches. The felt or other approved material shall be continuous to the top of walls and terminated at penetrations and building appendages in a manner to meet the requirements of the exterior envelope as described in item #65, *Exception: The water-resistive barrier is not required for detached accessory buildings*. Section R703.3 The nominal thickness and attachment of exterior wall covering shall be in accordance with Table R703.3(1), the wall covering material requirements of this section and the wall covering manufacturer's installation instructions. Table R703.3(1) are based on a maximum stud spacing of 16 inches on center. *Exception: Log walls designed and constructed in accordance with the provisions of ICC 400. R703.* ***FLASHING*** *(R703.4):* Approved corrosion resistant flashing shall be applied shingle-fashion in such a manner to prevent entry of water into the building cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. The flashing shall extend to the surface of the exterior wall finish. Approved corrosion resistant flashing shall be installed at all of the following locations:
1) Exterior window and door openings. Flashing at exterior window and door openings shall extent to the surface of the exterior wall finish or to the water resistive barrier complying with Section 703.2 for subsequent drainage. Mechanically attached flexible flashings shall comply with AAMA 712. 2) At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings. 3) Under and at the ends of masonry, wood or metal copings and sills. 4) Continuously above all projecting wood trim. 5) Where exterior porches, decks or stairs attach to a wall or floor assembly of wood construction. 6) At wall and roof intersections. 7) At built-in gutters.

67. **STONE AND MASONRY VENEER, GENERAL:** IRC Section R703.7. Anchored stone and masonry veneer shall be installed in accordance with IRC Chapter 7, Table R703.3(1) and Figure R703.8. These veneers installed over backing of wood or cold-formed steel shall be limited to the first story above grade and shall not exceed 5 inches in thickness. *Exception: For detached one- or two- family dwellings in a Seismic Design Category D-2, exterior stone or masonry veneer, as specified in Table R703.8(2) with a backing of wood framing shall be permitted to the height specified in Table R703.8(2) above a non-combustible foundation.* Wall bracing and hold downs at exterior and interior braced wall lines shall be in accordance with section R602.10 and R602.11. In accordance with Footnote *a* of Table R703.8(2), cripple walls shall not be permitted due to D2 seismic design category. Required interior braced wall lines shall be supported on continuous foundations. Anchored veneer shall be supported on footings, foundations or other noncombustible support. Wall ties shall be corrosion resistant.

68. **SIDING/EARTH SEPARATION:** IRC Section R317.1- #5. Wood siding, sheathing and wall framing on the exterior of the building used within 6" of ground or less than 2 inches measured vertically from concrete steps, porch slabs, patio slabs and similar horizontal surfaces exposed to the weather; shall be natural durable wood or wood that is preservative treated in accordance that specified in item #56 of this checklist. Wood or other products shall conform to the most restrictive of either manufacturer specifications or code requirements.

69. **DECKS & EXTERIOR STAIRS:** IRC R507, R317.1.3 All wood in contact with the ground, embedded in concrete in direct contact with the ground or embedded in concrete exposed to the weather that supports permanent structures intended for human occupancy shall be naturally durable wood as specified in item #56 or approved pressure-preservative-treated wood suitable for ground contact use. In addition, naturally durable wood or pressure preservative treated wood shall be used in those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances when those members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering that would prevent moisture or water accumulation on the surface or at joints between members. Such members may include: 1) Horizontal members such as girders, joists and decking. 2) Vertical members such as posts, poles and columns. 3) Both

horizontal and vertical members (*R317.1.3*). Field applied treatment is not an approved method. Treatment must be applied by manufacturer, see item #56 of this checklist. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. Decks connected to the structure shall be provided with an approved deck ledger connected with hot-dipped galvanized or stainless-steel lag screws, bolts, and washers in accordance with the detail attached, "Deck Ledger Attachment Details and Specifications." Girders supporting deck joists shall not be supported on deck ledgers or band joists. Deck lateral load connections shall be provided in accordance with R507.2.3. Decks more than 30-inches above grade, shall be provided with hold-down tension devices, or be self-supporting. Hold-down devices shall be installed in accordance with manufacturer specifications, in not less than two (2) locations per deck, within 24 inches of the end of the deck with not less than 1,500 lb design stress capacity. **As an option, where a deck is being added to an existing structure, 750 pound capacity hold down devices may be installed at 4 locations, evenly distributed, within 2-ft of each end of the ledger and shall fully engage the deck joist. See IRC Figure R507.2.3(2) (handout needs label) , "Deck attachment for lateral loads." See Deck Handout**

70. **WOOD TRUSSES:** IRC Section R502.11, R602.10.6.2, R802.10. Wood trusses shall be designed in accordance with approved engineering practice. Engineering data and installation specifications, including the type of roofing to be used, shall be available on site **at framing inspection**. Roof trusses shall be supported laterally at points of bearing by solid blocking to prevent rotation and lateral displacement.

71. **RAFTERS:** IRC Sections R802.3, R802.8. Rafters shall be framed to ridge board or to each other with a gusset plate as a tie. Ridge board shall be framed not more than 1½ inch offset from each other to ridge board or directly opposite from each other with a gusset plate as a collar tie, gusset plate, or ridge strap. Ridge board shall be not less than 1-inch nominal thickness and not less in depth than the cut end of the rafter. Hip and valley rafters shall be not less than 2" nominal thickness and not less in depth than the cut end of the rafter. Hip and valley rafters shall be supported at the ridge by a brace to a bearing partition or be designed to carry and distribute the specific load at that point. Where the roof pitch is less than 3:12 (25-percent slope), structural members that support rafters and ceiling joists, such as ridges, hips and valleys, shall be designed as beams. Ceiling joists and rafters shall be nailed to each other in accordance with Tables R802.5.1(9), and the rafter shall be nailed to the top wall plate in accordance with Table R602.3(1). Ceiling joists shall be continuous or securely joined in accordance with Table R802.5.1(9) where they meet over interior partitions and nailed to adjacent rafters to provide a continuous tie across the building when such joists are parallel to the rafters. Where ceiling joists are not connected to the rafters at the top wall plate, joists connected higher in the attic shall be installed as rafter ties, or rafter ties shall be installed to provide a continuous tie. Where ceiling joists are not parallel to the rafters, rafter ties shall be installed. Rafter ties shall be min. 2"x4", installed in accordance with connection requirements in Table R802.5.1(9), or connections of equivalent capacities shall be provided, the ridge formed by these rafters shall be supported by a wall or girder designed in accordance with engineering practice. Collar ties or ridge straps to resist wind uplift shall be connected in the upper third of the attic space in accordance with Table R602.3.1. Collar ties shall be minimum of 1"x4" spaced not more than 4-ft o.c. Rafters and ceiling joists having a depth-to-thickness ratio exceeding 5 to 1 based on nominal dimensions shall be provided with lateral support at points of bearing to prevent rotation.

72. **RAFTER OPENINGS:** IRC Section R802.9. Openings in roof and ceiling framing shall be framed with header and trimmer joists. Where the header joist span does not exceed 4', the header joist may be a single member the same size as the ceiling joist or rafter. Single trimmer joists may be used to carry a single header joist that is located within 3' of the trimmer joist bearing. When the header joist span exceeds 4', the trimmer joists and the header joist shall be doubled and sufficient cross section to support the ceiling joists or rafter framing into the header. Approved hangers shall be used for the header joist to trimmer joist connections when the header joist span exceeds 6-ft. Tail joists over 12-ft long shall be supported at the header by framing anchors or on ledger strips not less than 2"x2."

73. **CEILING JOISTS LATERAL SUPPORT /BRIDGING:** IRC Section R802.8, R802.8.1. Roof framing members and ceiling joists having a depth-to-thickness ratio exceeding 5 to 1 based upon nominal dimensions shall be provided with lateral support at points of bearing to prevent rotation. Rafters and ceiling joists having a depth-to-thickness ratio exceeding 6 to 1 based upon nominal dimensions shall be supported laterally by solid blocking, diagonal bridging (wood or metal) or continuous 1" x 3" wood strip nailed across the rafter or ceiling joists at intervals not exceeding 8'.

74. **ROOF DRAINAGE:** UPC 1101.12.1. Roof areas of a building shall be drained by roof drains or gutters. Gutters and downspouts are to be installed on structures to conform to the provisions of Mason County Code, Title 14 chapter 14.48 (Stormwater Management), and IRC R401.3. If a stormwater plan is not required, or an alternative method is proposed, measures must be put in place to protect the structure from excessive splash, divert the water away from the foundation per IRC R401.3, R405 & R405.1, and protect the parcel (and adjacent parcels) from erosion. IRC Section R903.4.

Unless roofs are sloped to drain over roof edges, roof drains shall be installed at each low point of the roof. Where required for roof drainage, scuppers shall be placed level with the roof surface in a wall or parapet. Overflow drains shall discharge to an approved location and shall not be connected to roof drain lines.

75. **ROOF MATERIALS:** IRC Section R904 & R905. Roof covering materials shall be delivered in packages bearing the manufacturer's identifying marks and approved testing agency labels when required. Roof coverings shall be applied and installed in accordance with Section R905 and the manufacturer's installation instructions. In accordance with Table R905.2.4.1 Asphalt shingles classified using ASTM D 3161 with shingle classification of A, D, or F are acceptable for use in Mason County and other areas where wind zones less than 110 mph.

76. **ATTIC VENTILATION:** IRC Section R806. Enclosed attics and rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow. Ventilating openings shall have a least dimension of 1/16 inch minimum and ¼ inch maximum opening. Openings in roof framing members shall conform to the requirements of Section R802.7. Required ventilation openings shall open directly to the outside air. Ventilation openings must be provided with corrosion- resistant wire cloth screening, hardware cloth or similar material. The total net free ventilating area shall not be less than 1 to 150 of the area of the space ventilated. *Exception: The minimum net free ventilation area shall be 1 to 300 of the vented space provided one or more of the following conditions are met: 1. In Climate Zones 6,7 and 8, a Class I or Class II vapor retarder is installed on the warm-in-winter side of the ceiling. 2. Not less than 40% and not more than 50% of the required ventilating area is provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located not more than 3 feet below ridge or highest point of the space, measured vertically, with the balance of the required ventilation provided by eave or cornice vents by eave or cornice vents. Where the location of wall or roof framing members conflicts with the installation upper ventilators, installation more than 3 feet below the ridge or highest point of the space, shall be permitted.*
Where eave or cornice vents are installed, insulation shall not block the free flow of air. A minimum of a 1" space shall be provided between the insulation and the roof sheathing at the location of the vent. Unvented attic assemblies may be permitted provided all the conditions of Section R806.5 are met **AND** such installation allows warranty to be maintained by the roofing manufacturer.

77. **CHIMNEY HEIGHT/CHIMNEY CRICKETS:** IRC, R1003.9, R1003.20, R1005, R905.2.8.3. Chimneys shall extend not less than 2 feet higher than any portion of a building within 10 feet, but shall not be less than 3 feet above the highest point where the chimney passes through the roof. Masonry chimneys shall be provided with crickets when the dimension parallel to the ridgeline is greater than 30" and does not intersect the ridgeline. The cricket and chimney shall be flashed and counterflashed in the same manner as normal roof-chimney intersection. Crickets shall be constructed in compliance with Figure R1003.20 and Table R1003.20. Factory-built chimneys shall be listed and labeled and shall be installed and terminated in accordance with the manufacturer's installation instructions. A cricket or saddle shall be installed on the ridge side of any chimney or penetration of roof more than 30-inches wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

GENERAL

78. **PREMISE IDENTIFICATION:** IRC Section R319, IFC Section 505, and Mason County Code Title 14.28. (see also checklist item 108). Approved numbers or addresses shall be a minimum of 4" high with a stroke of ½" and shall be provided for all new buildings in such a position as to be plainly visible and legible from the street or road fronting the property and shall be a minimum of 4" high with a minimum width of ½". Approved numbers or addresses shall be placed on all buildings, at the beginning of long driveways when the address is not clearly visible from the access road, or in any other areas deemed necessary by the local fire district or Fire Marshal. They shall be placed in such a position as to be plainly visible and legible from the street or road fronting the property. Said numbers shall contrast with their background. See address posting and private road signage requirement information attached.

79. **APPROVED PLANS:** IRC Sections R106.3.1, R106.4. When the building official issues a permit, the construction documents shall be approved in writing or by stamp. One set of the construction documents so reviewed shall be retained by the building official. The other set shall be returned to the applicant, shall be kept at the site of work and shall be open to inspection by the building official or the duly authorized representative. The work shall be installed in accordance with the approved construction documents, and any changes made during construction that are not in compliance with the approved construction documents shall be resubmitted for approval as an amended set of construction documents.

80. **HEATING:** IRC Section R303.10 & WA State Amendment to R303.10. A dwelling unit shall be provided with heating facilities capable of maintaining a minimum room temperature of 68^0 F at a point 3' above the floor and 2' from exterior walls in all habitable rooms at the design temperature. The installation of one or more portable heaters shall not be used to achieve compliance with this section.

    Primary heating sources in all new and substantially remodeled buildings shall not be dependent upon wood stoves. No new or used solid fuel-burning device shall be installed in new or existing buildings unless such device is U.S. EPA certified or a pellet stove either certified or exempt from certification by the U.S. EPA. *Exception: Antique wood cook stoves and heaters manufactured prior to 1940.*

81. **SKYLIGHTS:** IRC Section R308.6.2. The following types of glazing may be used: 1) Laminated glass with a minimum .015" polyvinyl butyl interlayer for glass panes 16 sq. ft. or less in area located such that the highest point of the glass is not more than 12' above a walking surface or other accessible area; for higher or larger sizes, the minimum interlayer thickness shall be .030". 2) Fully tempered glass. 3) Heat-strengthened glass. 4) Wired glass. 5) Approved rigid plastics. Installed skylights shall comply with Washington State Energy Code requirements.

82. **INTERIOR FINISHES:** IRC Sections R302.9, R316 and R702.5 Wood veneer paneling and hardboard paneling shall be placed on wood or cold-formed steel framing spaced not more than 16-inches o.c. Wood veneer and hardboard paneling less than ¼" nominal thickness shall have not less than 3/8-inch gypsum board backer. Wood veneer paneling not less than ¼" nominal thickness shall conform to ANSI/HPVA HP-1. Hardboard paneling shall conform to ANSI/AHA A135.5. All structural panel components within the conditioned space such as plywood, particle board, wafer board and oriented strand board shall be identified as "EXPOSURE 1," "EXTERIOR" or "HUD-APPROVED." When using **foam plastic insulation** the interior of the building shall be separated by a thermal barrier of at least ½" gypsum wallboard. The ½" gypsum wallboard is not required when the foam plastic in a roof assembly or under a roof covering is installed in accordance with the manufacturer's installation instructions and is separated from the interior of the building by tongue-and-groove wood planks not less than 15/32 inch (11.9 mm) thick bonded with exterior glue and identified as Exposure 1, with edges supported by blocking or tongue-and-groove joints. The smoke-developed index for roof applications shall be maintained.

83. **GYPSUM WALLBOARD & GYPSUM WALLBOARD FASTENING:** IRC Section R702.3, and Table R702.3.5. All wood framing supporting gypsum board shall not be less than 2-inches nominal thickness in the least dimension except that furring strips, not less than 1"x 2" may be used over solid backing or framing spaced not more than 24-inches o.c. When gypsum is used as a base or backer for adhesive application of ceramic tile or other required nonabsorbent material shall conform with ASTM 1396, C1178 or C1278. Use of water-resistant gypsum backing board shall be permitted to be used on ceilings. Water resistant gypsum wallboard shall not be installed over a class I or II vapor retarder, in a shower or tub compartment. Cut or exposed edges, including those at wall intersections, shall be sealed as recommended by the manufacturer. *Limitations: Water- resistant gypsum backing board shall not be used where there will be direct exposure to water, or in areas subject to continuous high humidity.* Screws for attaching gypsum board to wood framing shall be type W or Type S in accordance with ASTM C 1002 and shall penetrate the wood not less than 5/8".
    - 3/8" min. Thickness of gypsum board or gypsum panel product.
    - Fastening **(nails)**: 7" o.c. max.on ceiling & 8" o.c. max on walls when framing is 16" o.c.
    - Fastening **(screws)**: 12" o.c. max ceiling & 16" o.c. max

on walls when framing is 16" o.c.

- Size of Nail: 13 gage, 1 ¼ inch long, 19/64 inch head; 0.098 inch diameter, 1 ¼ long, annular-ringed; or 4d cooler nail, .080 inch diameter, 1 3/8 inch long, 7/32 head.
- See Table R702.3.5 for more information

84. **STORY/STORY ABOVE GRADE:** IRC Section R202. Any story having it finished floor surface entirely above grade plane or in which the finished surface of the floor next above is either of the following; 1) Is more than 6' above grade plane. 2) Is more than 12' above the finished ground level at any point?

85. **HEIGHT OF BUILDING/GRADE PLANE:** IRC Section R202. The vertical distance from top to top of two successive tiers of beams or finished floor surfaces; and, for the topmost story, from the top of the floor finished to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters. The grade plane: A reference plane representing the average of the finished ground level adjoining the building at all exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points with in the area between the building and the lot line or, where the lot line is more than 6' from the building between the structure and a point 6' from the building.

86. **RETAINING WALLS:** IRC Section R105.2, R404.4. Retaining walls that are not laterally supported at the top and that retain in excess of 48 inches of unbalanced fill, or retaining walls exceeding 24 inches in height that resist lateral loads in addition to soil, shall be designed in accordance with accepted engineering practice to ensure stability against overturning, sliding, excessive foundation pressure and water uplift. Retaining walls shall be designed for a safety factor of 1.5 against lateral sliding and overturning. Retaining walls that are not over 4' in height measured from the bottom of the footing to the top of the wall **not supporting a surcharge, is exempt from permits.** *Retaining Wall Surcharge; loading on a retaining wall is a vertical load imposed on the retained soil that may impose a lateral force against the retaining wall in addition to the lateral earth pressure of the retained soil.*

ENERGY CODE/VENTILATION (IECC/WSEC & IRC CHAPTER 15

MASON COUNTY CLIMATE ZONE: 4C (MARINE)

87. **FOUNDATION INSULATION:** IECC/WSEC R303, R402.2.8, R402.2.9, R402.2.9.1 & Table R402.1.1. Slab-on-grade insulation, installed inside the foundation wall, shall extend downward from the top of the slab for a minimum distance of 24" or downward and then horizontally beneath the slab for a minimum combined distance of 24". Insulation installed outside the foundation shall extend downward to a minimum of 24"or to the frostline. Above grade insulation shall be protected. For monolithic slabs, the insulation shall extend downward from the top of the slab to the bottom of the footing. Unless approved for other than prescriptive approach the typical R-Value for slab insulation shall be R-10. Insulation used for this application shall be rated & labeled for such use. The entire area of a **radiant slab** shall be thermally isolated from the soil with min. R-10 insulation approved by the listing for it's intended use.

88. **UNDER-FLOOR INSULATION:** . IECC/WSEC R303, R402.2.7. Table R402.1.1 & Table R402.4.1.1. Floor insulation shall be installed in a permanent contact with the surface being insulated and shall include areas over unconditioned spaces, such as vented crawl spaces, unheated basements and garages. The nominal R-value shall not be less than that approved for floors over unconditioned spaces on the approved building plan. Unless approved for other than prescriptive approach the typical R-Value for floors shall be R-30. **Insulation shall be installed in substantial contact with the sub-floor and supported not less than 24" o.c.** Foundation vents shall be placed so that the top of the vent is below the lower surface of the floor insulation.

89. **WALL INSULATION:** IECC/WSEC R303, R402.2.8 & Table R402.1.1, Table R402.4.1.1. Above grade exterior walls shall be insulated to not less than the nominal R-value specified on the approved building plans. Unless approved for other than prescriptive approach the typical R-Value for wall insulation shall be **R-21**. All exterior wall insulation shall fill the entire framed cavity. Faced batts shall be face-stapled to avoid compression (*not inset-stapled)*.

90. **ATTIC INSULATION:** IRC R806, IECC/WSEC R303.1, R402.2.1 & Table R402.4.1.1. Ceilings below vented attics shall be insulated to not less than the nominal R- value specified on the approved building plans. Unless approved for other than prescriptive approach the typical R-Value for attic insulation shall be R-49 installed in a standard manner or R-38 where the full R-Value extends over the wall top plate at the eaves. The thickness of blown-in or sprayed roof/ceiling insulation shall be written by inches of thickness, density and R-Value markers shall be installed at least one for every 300 sq. ft. throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness and the minimum settle thickness with number at least 1" in height. Each marker shall face the attic access.

Loose-fill insulation may be used in attic spaces where the slope of the ceiling is not more than 3' in 12 and there is at least 30" of clear distance from the top of the bottom cord. Eave vents shall be provided with baffles to deflect incoming air above the surface of the insulation. The baffles shall be rigid material, resistant to wind driven moisture. The vertical joints shall be staggered when two or more layers of rigid board insulation are used. The minimum ventilation requirements in IRC Section R806.3, R806.4 & R806.5; shall be maintained. *See item #76*. Baffles shall be installed so that 1" is maintained between the roof sheathing and the baffle. The baffles shall be installed from the top of the outside wall, extending inward, to a point 6" vertically above the height of non-compressed insulation, and 12" vertically above loose fill insulation.

91. **VAULTED CEILING INSULATION:** WSEC R402.2, Tables R402.1.1 and R402.4.1.1. Vaulted ceiling insulation shall be installed where an enclosed joist or rafter space is formed by ceilings applied directly to the underside of roof joists or rafters. This requirement applies where both the distance between the top of the ceiling and the underside of the roof sheathing is less than 12-inches and there is a minimum 1-inch vented air space above the insulation. Where a single rafter or joist-vaulted ceiling is 13-inches or more the space shall be insulated as a ceiling, typically R-38, described in item #90 of this checklist. Vaulted ceilings shall be insulated to not less than the nominal R-value specified on the approved building plans. Unless approved for other than prescriptive approach the typical R-Value for non- trussed, vaulted ceiling insulation shall be R-38. Faced batts shall be face-stapled *(not inset- stapled)*.

92. **ACCESS HATCHES AND DOORS:** WSEC R402.2.4. Access doors from conditioned to unconditioned spaces (attics and crawl spaces) shall be weather-stripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer must be provided when loose fill insulation is installed the purpose of which is to prevent insulation from spilling into the living space when the attic access opened and/or to provide a permanent means of maintaining the installed R-value of loose-fill insulation. Exception: Vertical doors that provide access from conditioned to unconditioned spaces shall be permitted to meet the fenestration requirements of Table R402.1.1

93. **DUCT INSULATION/DUCT LEAKAGE:**. IECC/WSEC R401.3, R403.2., R403.3.3. IRC chapter M16, & IMC Chapter 6. Ducts shall be insulated to R-8, sealed in accordance with R403.2.2, and leak tested. Ducts or building cavities used for air distribution that are located entirely within the conditioned space do not require sealing.
Duct Tightness Testing: The duct system shall be leak tested in accordance with WSU RS-33, using the maximum duct leakage rates specified. Duct tightness shall be verified in accordance to IECC/WSEC R403.3.3 using the post-construction test or rough-in test methods. Duct leakage tests are not required when ducts and air handlers located entirely within the building thermal envelope. Leak test shall be required when ducts are located in the crawl space. **Duct leakage test results shall be posted on the permanent certificate posted in accordance with R401.3.** See also item #98

94. **PIPE INSULATION:** WSEC R403.4 & 403.5.3. Mechanical system piping capable of carrying fluids above 105°F or below 55°F shall be insulated to a minimum of R-6. Insulation for hot water pipe, both within the outside of conditioned space, shall have a minimum thermal resistance of R-3.

95. **VAPOR RETARDER/MOISTURE CONTROL:** IRC R702.7 Class I, II, or III, vapor retarders shall be installed on the interior side of the framed walls. Sheet polyethylene, imperforated aluminum foil, kraft-faced fiberglass batts, latex or enamel paints installed in accordance with manufacturer specifications are deemed to meet class I, II, or III. Kraft-faced batts shall be face stapled over studs.

96. **GROUND COVER IN CRAWL SPACE:** IRC R406.3.2, IECC/WSEC Table R402.4.1.1. A 6-mil thick polyethylene film ground cover shall be laid over the ground within crawl spaces. **The ground cover shall be lapped 6" minimum at the joints and sealed with adhesive** and shall extend to the foundation wall and be bonded to the sheathing to form a seal. The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab with a minimum thickness of 2 inches.

97. **WINDOWS & EXTERIOR DOORS:** R402.3., R402.1.1. U-Factors for glazing and doors (fenestration) shall be not more than the U-factor specified on the approved building plans. Unless approved for other than prescriptive approach the maximum typical U-factor for fenestration shall be dependant upon the compliance method. **Typically, the max. U-factor for prescriptively approved structures is U-.30.** Any change in windows or doors must be approved by the Building Department before installation. NFRC compliance stickers shall remain on the windows until the insulation inspection has been approved by the Building Department. Doors with a glazed area more than 50%, such as half-lite and full-light doors, shall be considered windows for the purposes of energy code requirements.

98. **AIR LEAKAGE INCLUDING RECESSED LIGHTING FIXTURES:** IECC/WSEC R401.3, R402.4. The building or dwelling shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour. Testing shall be conducted with a blower door in accordance with IECC/WSEC R402.4.1.2. A written report of the results of the test shall be signed by the party conducting the test and **provided to the building inspector during the final inspection**. Provisions to limit air leakage shall be provided to those locations separating

outdoor ambient conditions from interior spaces that are heated or mechanically cold. *Table R402.4.1.1: Air Barrier and Insulation Installation* a) Exterior joints around windows and door frames, openings between walls and foundation, between walls and roof and wall panels; openings at penetrations of utility services through walls, floors, and roofs; and at all other openings in the building envelope, and between dwelling units shall be sealed, caulked, a gasket or weather-stripping to limit air leakage. Other exterior joints and seams and seams shall be similarly treated or taped, or covered with moisture vapor permeable house wrap. b) All exterior doors or doors serving as access to an enclosed unheated area shall be weather-stripped to limit air leakage around the perimeter when in a closed position. c) Site built windows are exempt from testing but shall be made tight fitting. *RECESSED LIGHTING FIXTURES:* Recessed luminaires installed in the building thermal envelope shall be Type IC-rated and certified under ASTM E283 as having an air leakage rate not more than 2.0 cfm when tested at 1.57 psf (75 Pa) pressure differential and shall have a label attached showing compliance with this test method.

99. **EXHAUST FANS:**, R303.5, M1505.4.4:
Source specific exhaust ventilation is required in each kitchen, bathroom, water closet, laundry room, indoor swimming pool, spa, and other rooms where excess water vapor or cooking odor is produced as follows:

MINIMUM SOURCE SPECIFIC VENTILATION CAPACITY REQUIREMENTS - TABLE M1505.4.4

AREA TO BE EXHAUSTED	EXHAUST RATES
Kitchens or where cooking appliances are located	100 cfm intermittent or 25 cfm continuous
Bathrooms-toilet rooms Laundry rooms Indoor swimming pools & spas	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous.

NOTE: All exhaust fans providing local exhaust shall have a minimum fan flow rating not less than 50 cfm at .25 water gauge for bathrooms, laundries, or similar rooms and 100 cfm at .25 water gauge for kitchens. Ventilation ducts shall terminate outside the building. Ventilation ducts located in unconditioned spaces shall be insulated a minimum of R-4.

100. **WHOLE HOUSE VENTILATION SYSTEM Continuous or Intermittent) :** IRC R303.4, M1505.4.3. Each dwelling unit or guest room shall be equipped with a whole house ventilation system that shall be capable of providing the volume of outdoor air designed in accordance with IRC M1505. Compliance may also be demonstrated through the International Mechanical Code or ASHRAE Standard 62.2. Whole house ventilation systems shall have a flow rating of .25 inches water gauge as specified in Table M1507.3.3(1). A Sone rating of 1.0 or less measured at 0.1 inches water gauge. The whole house fan shall be controlled by a 24-hour clock timer with the capability of continuous operation, manual and automatic control. At the time of final inspection, the automatic control timer shall be set to operate the whole house fan according to the schedule used to calculate the whole-house fan sizing (Table M1507.3.3(1) & (2). The clock timer shall be readily accessible and be capable of operating the whole house ventilation fan without energizing other energy consuming appliances. A label shall be affixed to the controls that reads; "Whole House Ventilation (see operating instructions)."

101. **VENTILATION DUCTS:** IRC M1601 & WSEC R403.3. All Ventilation ducts shall terminate outside the building and be equipped with a back-draft damper. Terminal elements shall have at least the equivalent net free area of the ductwork. Terminal elements for exhaust fan duct systems shall be screened or otherwise protected from entry by leaves or other material. Ducts shall have a minimum R-value of R-8 when located in a conditioned space. Ducts shall not be less than 4 inches separation from earth except where they meet the requirements of Section M1601.1.2.

Exhaust Ducts shall be sized in accordance to IRC M1505.4.4(2) and shall not be less than 4-inch diameter.

Fan tested CFM @.25 WG	Min. Flex Diameter	Max. Length in Feet	Min. Smooth Diameter	Max. Length Feet	Max. Elbows [1]
50	4-inch	25	4-inch	70	3
50	5-inch	90	5-inch	100	3
50	6-inch	No Limit	6-inch	No Limit	3
80	4-inch[2]	NA	4-inch	20	3
80	5-inch	15	5-inch	100	3
80	6-inch	90	6-inch	No Limit	3
100	5-inch[2]	NA	5-inch	50	3
100	6-inch	45	6-inch	No Limit	3
125	6-inch	15	6-inch	No Limit	3
125	7-inch	70	7-inch	No Limit	3

1. For each dwelling elbow subtract 10 feet from length Flex ducts of this diameter are not permitted with fans of this size.
2. Flex ducts of this diameter are not permitted with fans of this size.

102. **MECHANICAL VENTILATION SYSTEM:** IRC M1505. Each dwelling unit and guest room shall be provided with a whole house mechanical ventilation system designed in accordance with M1505.4 through M1505.4.4 or in accordance with specifications allowed in the IMC.

Controls and Operation (M1505.4.2):
The whole-house mechanical ventilation system shall be provided with controls that comply with the following:

1. *The whole house ventilation system shall be controlled with manual switches, timers or other means that provide for automatic operation of the ventilation system with ready access by the occupant.*
2. *Whole-house mechanical ventilation system shall be*

provided with controls that enable manual override off of the system by the occupant during periods of poor outdoor air quality. Controls shall include permanent text or a symbol indicating their function. Recommended control permanent labeling to include text similar to the following: "Leave on unless outdoor air quality is very poor." Manual controls shall be readily accessible by the occupant.

3. *Whole house ventilation systems shall be configured to operate continuously except where intermittent off controls and sizing are provided per Section M1505.4.3.2.*

Operating Instructions and a whole-house ventilation operation description shall be provided by installers. The whole-house ventilation system shall provide outdoor air to each habitable space at a continuous rate not less than that specified in Table M1505.4.3(1). The system may operate intermittently when the system has controls that enable operation for not less than 25% of each 4-hour segment and the ventilation rate prescribed in Table M1505.4.3(1).

Outdoor air shall be distributed to each habitable room by means such as individual inlets, separate duct systems, or integrated with a forced air system. Where outdoor air supplies are separated from exhaust points by doors, provisions shall be made to ensure air flow by installation of distribution ducts, undercutting doors, installation of grilles, transoms or other similar means. Doors shall be undercut to a minimum ½" above of the surface of the finish floor.

Table M1505.4.3(1)

DWELLING UNIT FLOOR AREA (square feet)	Number of Bedrooms		
	0-1	2-3	4-5
	Airflow in CFM		
< 1,500	30	45	60
1,501- 3,000	45	60	75
3,001 - 4,500	60	75	90
4,501 - 6,000	75	90	105
6,001 – 7,500	90	105	120
> 7,500	105	120	135

Table M1505.4.3(2)

Continuous Whole-house ventilation rate factors

Run-time % in each 4-hour	25%	33%	50%	66%	75 %	100%
Factor	4	3	2	1.5	1.3	1.0

Intermittent mechanical fan shall operate not less than one hour every 4-hours. Where the system has controls that enable operation for not less than 25% every four hours the ventilation rate shall be multiplied by the factor in Table M1505.4.3(2)

103. **WHOLE-HOUSE VENTILATION SYSTEM USING EXHAUST FANS:** IRC M1505.4.1.1. Exhaust fans required shall be ducted directly to the outside. Exhaust air outlets shall be designed to limit the pressure difference to the outside and equipped with backdraft dampers or motorized dampers in accordance with the Washington State Energy Code. Exhaust fans shall be tested and rated in accordance with the airflow and sound rating procedures of the Home Ventilating Institute (see M1505.4.1.2 for details). Exhaust fans required in this section may be used to provide local ventilation. Bathroom exhaust fans that are designed for intermittent exhaust airflow rates higher than the continuous exhaust airflow rates in Table 1505.4.3(3) shall be provided with occupancy sensors or humidity sensors to automatically override the fan to the high-speed airflow rate. The exhaust fans shall be tested, and the testing results shall be submitted and posted in accordance with Section M1505.4.1.6. Outdoor air inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas: a) closer than 10' from an appliance vent outlet unless such vent outlet is 3' above the outdoor air inlet. b) Where it will pick-up objectionable odors, fumes or other flammable vapors. c) A hazardous or unsanitary location. d) A room or space having and fuel-burning appliances therein. e) closer than 10' from any vent opening of a plumbing drainage system unless the vent is located at least 3' above the air inlet. f) Attic, crawl spaces, or garages. g) Asphalt roofs unless it is shown that no other location is permissible. In such case the inlet opening shall be located a min. of 2 feet from the nearest surface of the asphalt roofing, measured from the intake opening.

104. **INTERMITTENT WHOLE HOUSE VENTILATION INTEGRATED WITH A FORCED-AIR SYSTEM. *(Make-up air through the furnace)*:** IRC M1505.4.1.5. Systems using space heating and/or cooling air handler fans for outdoor air supply distribution are not permitted. *Exception: Air handler fans shall have multispeed or variable speed supply airflow control capability with a low-speed operation not greater than 25 percent of the rated supply airflow capacity during ventilation only operation. Outdoor air intake openings must meet the provisions of Sections R303.5 and R303.6 and must include a motorized damper that is activated by the whole house ventilation system controller. The motorized damper must be controlled to maintain the outdoor airflow intake airflow within 10 percent of the whole house mechanical exhaust airflow rate. The flow rate for the outdoor air intake must be tested and verified at the minimum ventilation fan speed and the maximum heating or cooling fan speed. The results of the test shall be submitted and posted in accordance with Section 1505.4.17.*

105. **Intermittent Whole House Ventilation Using a Supply Fan.** IRC M1504.1.3. Supply fans used in meeting the requirements of this section shall supply outdoor air from intake openings in accordance with IMC Sections 401.4 and 401.5. When designed for

intermittent off operation, supply systems shall be equipped with motorized dampers in accordance with the Washington State Energy Code. Supply fans shall be tested and rated in accordance with the airflow and sound rating procedures of the Home Ventilating Institute. Where outdoor air is provided by supply fan systems, the outdoor air shall be filtered. The filter shall have a Minimum Efficiency Rating Value of at least 8.

106. **Whole House Ventilation using Heat Recovery Ventilation:** Section? Heat Recovery ventilation systems shall be sized and installed in accordance to manufacturer's instructions and in accordance to WAC 403.4.6. Minimum flow rating shall not be less than that specified in TABLE?

107. **LIGHTING:** IECC/WSEC R404 & Chapter 2. **Not less than 90% of permanently installed lamps in lighting fixtures shall be high-efficacy lamps. Fuel gas lighting systems shall not have continuously burning pilot lights.** High efficiency lamps are defined in Chapter 2. Compact fluorescent lamps, T-8 or smaller diameter linear fluorescent lamps or other lamps with a minimum efficacy of 65 lumens per watt.

108. **FIRE ACCESS:** Mason County Title 14, Chapter 14.17 *Standards for Fire Apparatus Access Roads*. All roads, driveways, or other means of access serving structures, facilities, buildings or portions of buildings hereafter constructed, altered, moved into, or within, the jurisdiction and developed under permit from Mason County shall meet the requirements of the fire apparatus access road standards. (detail pages contained within this check