



"Building A Stronger Community
TOGETHER"

**CITY OF SHELTON
DEPARTMENT OF COMMUNITY DEVELOPMENT**

City of Shelton, 525 West Cota Street, Shelton, WA 98584

www.ci.shelton.wa.us (360)426-9731

**Inspection Request Line (360) 426-9731 (Inspections conducted between 1:30pm through 4:00pm)
No inspections on Thursdays**

RESIDENTIAL PLAN REVIEW CHECKLIST

Owner: _____ Contractor: _____

Permit Number: _____ Site Address: _____

Plans Examiner: _____ Date: _____

- 2009 International Residential Code (IRC) WAC 51-51
- 2009 International Building Code (IBC) WAC 51-50
- 2009 International Mechanical Code (IMC) WAC 51-52
- 2009 Uniform Plumbing Code (UPC) WAC 51-56 & 51-57
- 2006 Washington State Energy Code (WSEC), WAC 51-11
- 2009 International Fire Code WAC 51-54

- Seismic Zone **D-1**, Wind load **85 mph**, exposure **B**
- Roof snow load **25 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 the City of Shelton. The same number identifies items in the checklist and noted on the approved plans. This checklist shall remain attached to the approved plans and be available during inspections by the City of Shelton 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 1:00 p.m. Monday, Tuesday, Wednesday and Friday.
Office hours are from 8:00 am through 5:00 pm on Thursdays

Inspections can be scheduled by calling (360) 426-9731.

To schedule an inspection the following information will be needed: Permit number, site address, name of owner, type inspection requested, and the telephone number the City of Shelton staff should use when they call to confirm the inspection.

Floor Plan

1. **CONSTRUCTION DOCUMENTS & COMPLIANCE TO APPROVED PLANS:** IRC Section R106.

Approved site plans shall be attached to the approved building plans during inspection. Property lines shall be marked. Setback distances will be measured from the furthest projection of the permitted structure. Manufacturer's installation instructions shall be available on the job site at the time of inspection. All work shall be installed in accordance with the approved construction documents. 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 An Approved Plan" form and submit to the Mason County Permit Center along with approved plans and documents detailing the proposed changes. R106

2. **EGRESS WINDOWS:** IRC Section R310. All sleeping rooms and basements with habitable space shall have at least one openable 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 finished sill height not more than 44" above the floor. 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 & WAC 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: Smoke alarms are not required to be interconnected and hardwired where the alteration or repairs does not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space, or basement available which could provide access for hard wiring and interconnection without removal of hard finishes. Repairs to the exterior surfaces of dwellings are exempt from these requirements*).

Carbon monoxide alarms are required by 1/01/11 in all new residential construction. They shall be installed within the dwelling unit, in the immediate vicinity outside of the sleeping area, per the manufactured specifications. All existing homes not occupied prior to 7/1/10 shall be equipped with carbon monoxide alarms by 7/1/11.

4. **SAFETY GLAZING** R308.4 Hazardous locations. The following shall be considered specific hazardous locations for the purposes of glazing:

1. Glazing in all fixed and operable panels of swinging, sliding and bifold doors.

Exceptions:

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

2. Decorative glazing.

2. Glazing in an individual fixed or operable panel adjacent to a door where the nearest vertical edge is within a 24-inch (610 mm) arc of the door in a closed position and whose bottom edge is less than 60 inches

above the floor or walking surface.

Exceptions:

1. Decorative glazing.

2. When there is an intervening wall or other permanent barrier between the door and the glazing.

3. Glazing in walls on the latch side of and perpendicular to the plane of the door in a closed position.

4. Glazing adjacent to a door where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth.

5. Glazing that is adjacent to the fixed panel of patio doors.

3. Glazing in an individual fixed or operable panel that meets all of the following conditions:
- 3.1. The exposed area of an individual pane is larger than 9 square feet; and
 - 3.2. The bottom edge of the glazing is less than 18 inches above the floor; and
 - 3.3. The top edge of the glazing is more than 36 inches above the floor; and
 - 3.4. One or more walking surfaces are within 36 inches, measured horizontally and in a straight line, of the glazing.

Exceptions:

1. Decorative glazing.
 2. When a horizontal rail is installed on the accessible side(s) of the glazing 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 be a minimum of 1 1/2 inches (38 mm) in cross sectional height.
 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.
4. All glazing in railings regardless of area or height above a walking surface. Included are structural baluster panels and nonstructural infill panels.
5. Glazing in enclosures for or walls facing hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers where the bottom-exposed edge of the glazing is less than 60 inches measured vertically above any standing or walking surface.
Exception: Glazing that is more than 60 inches, measured horizontally and in a straight line, from the waters edge of a hot tub, whirlpool or bathtub.

6. Glazing in walls and fences adjacent to indoor and outdoor swimming pools, hot tubs and spas where the bottom edge of the glazing is less than 60 inches above a walking surface and within 60 inches, measured horizontally and in a straight line, of the water's edge. This shall apply to single glazing and all panes in multiple glazing.

7. Glazing adjacent to stairways, landings and ramps within 36 inches horizontally of a walking surface when the exposed surface of the glazing is less than 60 inches above the plane of the adjacent walking surface.

Exceptions:

1. When a rail is installed on the accessible side(s) of the glazing 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 be a minimum of 1 1/2 inches in cross sectional height.
2. The side of the stairway has a guardrail or handrail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glazing is more than 18 inches from the railing; or
3. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 inches to 36 inches above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a guard.

8. Glazing adjacent to stairways within 60 inches horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glazing is less than 60 inches above the nose of the tread.

Exceptions:

1. The side of the stairway has a guardrail or handrail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glass is more than 18 inches from the railing; or
2. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 inches to 36 inches above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a guard.

5. **WINDOW OPENINGS:**

PROTECTION: IRC 612.2 Windowsills. In dwelling units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished grade or surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4-inch diameter sphere where such openings are located within 24 inches of the finished floor.

Exceptions:

1. 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. Openings that are provided with window fall prevention devices that comply with Section R612.4.
3. Openings that are provided with fall prevention devices that comply with ASTM F 2090.
4. Windows that are provided with opening limiting devices that comply with Section R612.4.

NATURAL LIGHT & VENTILATION: IRC 303. All habitable rooms shall be provided aggregate-glazing area of not less than 8% of the area of such rooms. Natural ventilation shall be through windows, doors, louvers or other approved openings to the outdoor air. The minimum openable area to the outdoors shall be 4% of the floor area being ventilated. Exception: 1) The glazed area need not be openable where the opening is not

required by R310 (egress) and an approved mechanical ventilation system is provided capable of producing .35 ACH in the room or a Whole house mechanical ventilation system is installed capable of supplying outdoor ventilation air of 15 cfm per occupant computed on the basis of two occupants for the 1st bedroom and one occupant for each additional bedroom. 2) The glazed areas need not be provided in rooms where exception 1 is satisfied and artificial light is capable of producing an average illumination of 6 foot-candles over the area of the room at a height of 30 inches above the floor level.

6. **EXHAUST FANS:** IRC R303.4, Section M1501, M1507, IMC Section 501.2. 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 501.2.1. 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 shall be constructed of .016-inch-thick rigid metal ducts, having smooth interior surfaces with joints running in the direction of air flow. Exhaust ducts shall not be connected with sheet-metal screws or fastening means that extends into the duct. Transition ducts shall not be concealed within construction. Flexible transition ducts used to connect the dryer to the to the exhaust system shall be limited to single lengths, not to exceed 8-feet and shall be listed and labeled in accordance to UL 2158A. Exhaust ducts shall terminate outside the building not less than 3-feet in any direction from openings into buildings. Screens shall not be installed at the duct termination. Ducts shall be equipped with a backdraft damper. The minimum duct diameter shall be 4" and shall be supported and secured in place. The maximum length of a clothes dryer exhaust duct shall not exceed 25 feet from the dryer location to the wall or roof termination. 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. *Exception: Ducts installed in accordance with the dryer manufacturer's installation instructions.*
8. **RANGE HOOD:** IRC Section M1501, M1503, M1504, M1505, M1901& M1306. Overhead exhaust hoods, capable of exhausting 100 cfm at .25 inches water gauge, shall discharge to the outdoors through a single wall metal exhaust hood (galvanized steel, stainless steel, or copper). Such ducts shall have a smooth inner wall and be air tight and equipped with a backdraft damper. 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 a means of closure and be automatically controlled to start and operate with the exhaust system. 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. Water closet shall be located in a clear space not less than 30" in width. The clear space in front shall not be less than 21-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.
10. **SHOWER and BATHTUB AREAS:** IRC Section R307, and UPC Sections 411, 414, 415, 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 1024 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 411.8. 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 in the Washington State Building

Code Standard 13-1. Contact the Olympic Region Clean Air Agency (www.ORCAA.org) to obtain a list of approved fireplaces and stoves. Factory-built chimneys and 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 chimneys: 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. A cricket or saddle shall be installed on the ridge side of any chimney or penetration 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. Crickets shall be constructed in compliance with Figure R1003.20 and Table R1003.20. See also seismic anchorage requirements in IRC Section R1001.4. Chimney flashing shall be applied according to the asphalt shingle manufacturer printed instructions.

12. **TIGHT-FITTING DOORS (FIREPLACE): R1006.2.**

Solid fuel burning appliances and fireplaces shall be provided with tight-fitting glass or metal doors. 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 R1004.2, 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 R302.13, R602.8, 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 fire blocking. 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 air space shall not be filled, except to provide fireblocking in accordance to Section R602.8 (see item #64). All spaces between chimneys and floors and ceilings through which chimneys pass shall be fireblocked with noncombustible material securely fastened in place. 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.. The air space shall not be filled, except to provide fire blocking in accordance with sections R1003.19. 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 R303.4, R1001.7.1 (WAC), AND R1006. (WAC), M1701 and G2407.

Fuel burning appliances shall be provided with combustion air obtained from outside the structure ducted into the firebox. Direct vent appliances or equipment that do 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 manufacturer's 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 inches 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 M12, Chapter M 13, M2005, G2406. Appliances shall be listed and labeled for the application in which they are installed and used. A permanent factory-applied nameplate shall be affixed to appliances with information listed in accordance to M1303. 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, *access 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 appliances 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. A luminaire, 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. Appliances located in a garage, carport or other location where subject to mechanical 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. 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. 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. Drain may not be trapped and 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" strapping shall be used and be placed at points within the upper one-third (1/3) and lower one-third (1/3) of it's 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 addition combination space and service water heaters shall have an Energy Factor (EF) or Combined Annual Efficiency (CAE) not less than that specified in WSEC Section 504.2.1. Service water heating systems shall be equipped with automatic temperature controls and shall be set to 120°F. WSEC Section 504.2.1 requires that all electric water heaters shall be placed on an R-10 pad when located in an unheated space or on a concrete floor.
19. **LPG (PROPANE) APPLIANCES & TANKS:** IRC M1301, G24, & IMC Section 303.7 and IFGC303.7. Appliances installed in pits or excavations shall not come in direct contact with the surrounding soil. The sides of the pit 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. Containers used for storage of LPG shall be installed in accordance with the Fire Code, see details attached.
20. **MANUFACTURER'S SPECS:** IRC Section M1302, 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 603.4.7. Potable water outlets with hose attachments other than water heater drains, and clothes washer connections shall be protected by a listed non-removable backflow preventor, a non-removable frost-free hose bib type 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.
22. **TRAP PRIMERS, DISHWASHER AIRGAP:** UPC Section 1007 & 807.4. Floor drains 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. All **dishwashers** connected to a drainage system or food waste disposer shall be equipped with an approved 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 drain board, whichever is higher.
23. **GARAGE/DWELLING DOOR/OPENINGS:** IRC Section R302.5. Openings between the garage and residence shall be equipped with solid wood doors not less than 1-3/8 inches (35mm) in thickness, solid or honeycomb core steel doors not less than 1-3/8" thick, or 20-minute fire-rated doors.
24. **GARAGE/DWELLING SEPARATION:** IRC Section R302.6, R302.5. The garage shall be separated from the residence and its attic area by not less than ½" gypsum board applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than 5/8" Type X gypsum board or equivalent. Where the separation is a floor-ceiling assembly, the structure supporting the separation shall also be protected by not less than ½" gypsum board or equivalent. 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. 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. Openings shall meet the same protection as required in R302.5.
25. **SEPARATION BETWEEN DWELLING UNITS:** IRC Section R302.3. Walls and floors assemblies separating dwelling units in 2-family dwellings shall not be less than 1-hr fire-resistive rating.
26. **FIRE-RESISTANCE OF EXTERIOR WALLS:** Washington State Amendment to R302.1. 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. Projections shall not extend to a point closer than 2-feet from the line used to determine the fire separation distance. *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.* Openings shall not be permitted in the exterior wall of a dwelling or accessory building with a fire separation distance less than 3-feet. *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 120 square feet of gross floor area. Other habitable rooms except kitchens shall have an area of not less than 70 square feet. Habitable rooms shall not be less than 7-feet in any 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 rooms, hallways, corridors, bathrooms, toilet rooms, laundry rooms and basements shall have a ceiling height of not less than 7-feet, measured from the finished floor to the lowest projection from the ceiling. *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) Bathrooms shall have a min. ceiling height of 6'8" over the fixture and at the front clearance area for fixtures as shown in figures R307.1. The ceiling height above fixtures shall be such that the fixture is capable of being used for it's intended purpose. A shower or tub equipped with a showerhead shall have a minimum ceiling height of 6'8" above the area 30-inches x 30-inches at the showerhead. Portions of basements that do not contain habitable space, hallways, bathrooms, toilet rooms and laundry rooms may project to within 6'8" of the finished floor. Exception: beams, girders, ducts or other obstructions may project within 6'4" of the finished floor*

29. **ATTIC ACCESS:** IRC R807.1. Buildings with combustible ceiling or roof construction shall have an attic access openings to attic areas that exceed 30 sq. ft.

and have a vertical height of 30". Minimum access openings shall not be less than 22" x 30". The attic access shall be located in a hallway or other readily accessible location with a 30" minimum unobstructed headroom in the attic space above the access opening.

30. **EXTERIOR DOORS/EXITS:** IRC R311. At least 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 openable from the side from which egress is to be made without the use of a key or special knowledge or effort.

31. **LANDINGS AT DOORS AND STAIRWAYS & CONSTRUCTION:** IRC R311.3, R311.5. There shall be a floor or landing on each side of each exterior door. The width of each landing shall not be less than the door served and shall have a min. dimension of 36-inches measured in the direction of travel. The floor or landing at the exterior door shall not be more than 1 ½" lower than the top of the threshold. The landing shall be permitted to have a slope not to exceed 1/4 unit vertical in 12 units horizontal (1:48). *Exception: The exterior landing at an exterior doorway shall not be more than 7-3/4" below the top of the threshold, provided the door does not swing over the landing.* 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 (See R311.7 and R311.8. Floor elevations for other than the required egress door shall be provided with landings no more than 7-3/4" below the top of the threshold. *Exception: A landing is not required where a stairway of two or fewer risers is located on the exterior side of the door, provided the door does not swing over the stairway. Storm and screen doors are permitted to swing over all exterior stairs and landings* A flight of stair 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.

32. **GUARDS:** IRC Section R312. Table R301.5 Guards shall be provided for porches, balconies, ramps, or raised floor surfaces located more than 30" above grade or a floor below. Grade shall be measured 36-inches

- horizontally from the edge of the floor surface. Guards shall be not less than 36" in height, measured from the adjacent walking surface, **adjacent fixed seating** or the line connecting the leading edges of a tread. *Exception:* 1) *Open sides of stairs with a total rise of more than 30" above the floor or grade below shall have guards not less than 34" in ht. measured vertically from a line connecting the leading edges of the treads.* 2) *Where the top of the guard also 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" above the leading edge of treads.* 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 sphere 6-inches 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 R311.7.7, R311.5.1 All stairways with 4 or more risers shall have at least one handrail. 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 1/2" between the wall and the handrail. TYPE I: Circular handrails shall have an outside diameter of at least 1 1/4" 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 1/4" with a maximum cross-section dimension of 2 1/4". TYPE II: Handrails with a perimeter greater than 6 1/4" shall have a graspable finger recess area on both sides of the profile. The finger recess shall begin a distance of 3/4" 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 3/4" below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 1/4" to a maximum of 2 3/4". 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 1/2" 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 1/2" 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 311.7.4 & R311.8.1 The maximum riser height shall be 7 3/4". 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 3/4" but not more than 1 1/4" shall be provided on stairways with solid risers. Open risers are permitted, provided that the opening does not permit the passage of a 4" diameter sphere. *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.* Ramps shall have a maximum slope of 1 unit vertical in 12 units horizontal.
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 accessible space under stairs shall have walls, under stair surface and any soffits protected on the enclosed side with 1/2" gypsum board.
38. **ILLUMINATION:** IRC Section R303.6, R311.7.8 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. Exterior stairways shall be provided with a light source located in the immediate vicinity of 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. 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. The illumination of exterior stairways shall be controlled from inside the dwelling unit.
39. **SPECIAL STAIRWAYS:** IRC Section R311.7.9, R311.7.3, R311.7.4, R311.4. Spiral stairways and bulkhead enclosure stairways shall comply with all requirements of stairways except: Spiral stairways are permitted, provided the minimum width below the

handrail shall be 26 inches with each tread having a 7 ½" minimum tread depth at 12" from the narrower edge. All treads shall be identical, and the rise shall be no more than 9 ½". A minimum headroom of 6 feet 6 inches shall be provided. Stairways serving bulkhead enclosures see IRC Section R311.7.9.2. The walk line across winder treads shall be concentric to the curved direction of travel through the turn and located 12" from the side where the winders are narrower. The 12" dimension shall be measured from the widest point of the clear stair width at the walking surface of the winder. If winders are adjacent within the flight, the point of the widest clear stair width of the adjacent winder shall be used. Winder treads shall have a minimum tread depth of 10" between the vertical planes of the foremost projection of adjacent treads at the intersections with the walk line. Winder treads shall have a minimum tread depth of 6" at any point within the clear width of the stair. 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.

40. FOUNDATION FOOTING SIZE: IRC Section R403.

Assume load-bearing value of soil 1500 psf unless proven otherwise. All exterior walls shall be supported on continuous footings placed on undisturbed natural soils or engineered fill. All required **interior braced wall panels** shall be supported on footings at intervals not exceeding 50-ft.

- Supporting 1 story: minimum 6" x 12".
- Supporting 2 story: minimum 6" x 15".
- Supporting 3 story: minimum 8" x 23".

Spread footing projections shall be at least 2" & shall not exceed the thickness of the footing. R403.1.3 Interior-stud-bearing walls, supporting 3-stories or less, are permitted to be supported by isolated plain concrete footings supporting columns or pedestals.

41. FOOTING REINFORCEMENT: IRC Section R403.1,

Standard Hook ACI Section 611.7.1.5. Concrete footings shall have bottom reinforcement located a minimum of 3-inches clear from the bottom of the footing. Where a construction joint is created between a concrete footing and stem wall, a min. #4, grade 60, vertical bar shall be provided at not more than 4-feet on center. The vertical bar shall extend to 3-inches clear of the bottom of the footing, have a standard hook and extend a minimum of 14-inches into the stem wall. The standard hook shall have a 3-inch return and shall engage the center-footing bar. 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. Concrete and plain masonry foundation walls located in Seismic Design

Categories D1 and D2, as established in Table R301.1(1), shall comply with the following: 1) Minimum reinforcement shall consist of one #4 horizontal bar located in the upper 12" of the wall (two bars if wall greater than 8' in height), 2) Wall height shall not exceed 10', 3) Height of unbalanced backfill shall not exceed 4'0" (except per table 404.1.1(5)), and 4) A minimum thickness of 7 ½" is required for concrete foundation walls except that a minimum thickness of 6" shall be permitted for concrete foundation walls with a maximum height of 4'6" provided the minimum specified compressive strength of concrete, *f_c*, is 3000 psi. 5) Masonry foundation walls shall be a minimum of 8" thick.

Vertical reinforcement for masonry stem walls shall be tied to the horizontal reinforcement in the footings. Masonry stem walls located in Seismic Design Categories D1 and D2 shall have a min. vertical reinforcement of one #4 bar located a max. of 4' o.c. in grouted cells. Foundation walls located in Seismic Design Categories D1 and D2, as established in Table R301.2(1), supporting more than 4' of unbalanced backfill or exceeding 8' in height shall be constructed in accordance with Table R404.1.1(5) and shall have two #4 horizontal bars located in the upper 12" of the wall.

As a minimum standard, refer to the attached handouts: Foundation Reinforcement Requirements.

43. STEPPED FOUNDATIONS: 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. See item #46.

44. FOOTING DEPTH: IRC Section R403.1.4.1, 403.1.4.2.

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.

45. CRIPPLE WALL BRACING: IRC Definition, Sections

R602.10.9. R602.10.9.1, In seismic D1, cripple walls supporting bearing walls or exterior walls or interior

braced wall panels as required in R403.1.2 and R602.10.7.1 shall be braced in accordance with table R602.10.1.2(1) and R602.10.1.2 (2) with the following modifications. 1) The length of bracing as determined from Table R602.10.1.2(1) and R602.10.1.2(2) shall be multiplied by 1.15, and 2) The wall panel spacing shall be decreased to 18' instead of 25'. In addition where interior braced wall lines occur without continuous foundation below, the length of parallel exterior cripple wall bracing shall be 1-1/2 times the length required by R602.10.1.2(1) and R602.10.1.2(2). Where the length cannot be achieved when using Wood Structural Panel method (WSP) the capacity of the sheathing shall be increased by reducing fastener spacing along the perimeter of each sheet to 4-inches O.C. Adhesive attachment of wall sheathing shall not be permitted in Seismic Design Categories D1 and D2.

46. **FOUNDATION ANCHORAGE:** IRC Section 403.1.6, R602.11. Braced wall panels shall be supported directly on continuous foundations. The wood sole plates at exterior walls on monolithic slabs and wood sill plates shall be anchored to the foundation with 1/2" anchor bolts spaced a maximum of 6' o.c. and shall extend a minimum of 7" into concrete or grouted cells of concrete masonry units. 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 1/2" 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, 1/2" anchor bolts shall be spaced not more than 6' o.c. and located within 12" from the ends of each plate section. Anchor bolts shall be at least 1/2" in diameter and shall extend a minimum of 7" into masonry or concrete. 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 1/4" x 3" x 3" plate washers except where approved anchor straps are used. At all braced wall lines sills and sole plates shall be protected against decay. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16" larger than the bolt diameter and a slot length not to exceed 1-3/4", provided a standard cut washer is placed between the plate washer and the nut..

47. **DAMP-PROOF FOUNDATION WALLS:** IRC Section R406. Except where required to be waterproofed by section R406.2, foundation walls that retain earth and enclose interior or usable spaces located below grade shall be damp proofed from the top of the footing 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 top of the footing to the finished grade. The membrane shall consist of 2-ply hot mopped felts, 55-pound roll roofing,

6-mil polyvinyl chloride, 6-mil polyethylene, 40-mil polymer-modified asphalt or 60-mil flexible polymer cement. The joints in the membrane shall be lapped and sealed with an adhesive compatible with the waterproofing membrane. See exceptions for additional information.

48. **FOUNDATION DRAINAGE:** IRC Section R401.3, R405. Surface drainage shall be diverted to an approved point of collection so as to not create a hazard. Lots shall be graded so as to drain surface water away from foundation walls. The grade away from foundation walls shall fall a minimum of 6" within the first 10.' *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 at least 1-foot beyond the outside edge of the footing and at least 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, and the drainage tiles or perforated pipe shall be placed on a minimum 2 inches of washed gravel or crushed rock at least one sieve larger than the tile joint opening or perforation and covered with not less than 6 inches of the same material.

49. **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. Footings adjacent to slopes shall be founded in firm material with an embedment and setback sufficient to provide vertical and lateral support for the footing without detrimental settlement. Alternate setbacks and clearances are permitted, subject to the approval of the building official. The building official is permitted to require an investigation and recommendation of a qualified engineer to demonstrate that the intent of the code has been satisfied. Such an investigation (geotechnical evaluation) shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material. *Exception:* Mason County Development Regulations may specify additional requirements.

50. **CHIMNEY FOUNDATION & SEISMIC**

REINFORCING: IRC Sections 1001, R1002, & R1003. 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 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 and concrete chimneys shall be reinforced in accordance to Chapter 10.

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 shall be installed in accordance to item #96. 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. Posts, poles and columns supporting permanent structures that are embedded in concrete in direct contact with the ground, or embedded in concrete exposed to the weather shall be approved pressure preservative treated or wood suitable for ground contact.

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.

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.

54. **GIRDERS ENTERING MASONRY OR CONCRETE**

WALLS: IRC Section R317.1 #4. The ends of wood girders entering exterior concrete or masonry walls shall be provided with a 1/2" airspace 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. 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 joints 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. In lieu of a grade mark, a certificate of inspection issued by a lumber grading or inspection agency meeting the same requirements 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 A 653 type G185. See also manufacturer specifications or distributor specific installation instructions or recommendations. *Exception:*

- 1) 1/2" 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- 1/2" bearing on wood or metal and not less than 3" on masonry or concrete except where supported on a 1" x 4" ribbon strip and nailed to the adjacent stud or by the use of approved joist hangers. 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 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. 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.

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 24-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) Studs greater than 10' in height that are 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 at least 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" 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: When 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" in height, such walls shall be framed of studs having the size required for an additional story. Cripple walls with a stud height less than 14" shall be 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. 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 R602.10.7.1 shall be continuous for the required cripple wall and constructed beyond the cripple wall for a min. distance of 4" and a maximum distance of the footing thickness. The footings extension is not required at intersections with other footings.*

62. **WALL BRACING:** IRC and WAC Amendments Section 602.10 & R301.1, R301.2.2.2.5, R301.2.2.3 All exterior walls shall be braced in accordance to Section 602.10, 602.11, R602.12. Where a building or a portion thereof, does not comply with one or more of the bracing requirements or meets the definition of an irregular building in Section R301.2.2. those portions shall be designed and constructed in accordance with Section R301.1. Wall bracing shall be supported with continuous foundations at intervals not exceeding 50-ft for single stories and all braced panels in 2-story structure located in seismic design category D2 shall be supported on a continuous foundation. Braced wall panels shall be constructed in accordance with the intermittent bracing method specified in Section R602.10.2 or the continuous sheathing method specified in Section R602.10.4. Mixed bracing may be allowed in accordance to R602.10.1.1, items #1-3. The length of bracing along each braced wall line shall be the greater of that required by the design wind speed and braced wall line spacing in accordance with R602.10.1.2(1) as adjusted by the factors in the footnotes or the Seismic Design Category and braced wall line length in accordance with Table R602.10.1.2(2) as adjusted by the factor in Table R602.10.1.2(3). Braced wall panel locations shall comply with the requirements of R602.10.1.4. In no case shall the min. total length of bracing in a braced wall line, after all adjustments have been taken, be less than 48-inches. The min. length of braced panels shall be in accordance to R602.10.3 Braced wall panels that are counted as part of a braced wall line may have offsets, out of plane of up to 4'0" provided that the total out-to-out offset dimension in any braced wall line is not more than 8-feet. Cripple wall bracing shall be provided as described in item #61, in accordance to R602.9 and R602.10.2.3. Spacing between

braced wall lines shall not exceed 25-feet o.c. in both the longitudinal and transverse directions except that one room, not exceeding 900 sq. ft may have spacing not to exceed 35-ft o.c. provided the length of wall bracing is multiplied by the appropriate adjustment factor, the length-to-width ratio for the floor/roof diaphragm does not exceed 3:1, and the top plate lap splice face nailing is 12-16d nails on each side of the splice. Braced wall panels shall begin no more than 8'0" from each end of a braced wall line (R602.10.1.4) provided one of the following exceptions is satisfied: 1) A minimum 24-inch wide panel is applied to each side of the building corner and the two 24-inch panels at the corner shall be attached to framing in accordance to R602.10.4.4(1); or 2) The end of each braced wall panel closest to the corner shall have a hold-down device fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below. The hold-down device shall be capable of providing uplift allowable design value of at least 1800 lbs and shall be installed in accordance with the manufacturer's recommendations. Unless exception listed in R602.10.2.1 apply intermittent braced wall panels shall have ½" gypsum wallboard (GB) installed on the side of the wall opposite the bracing material. GB shall fastened in accordance with Table R702.3.5 for interior GB. Adhesive attachment is not permitted. *See details attached to this checklist for approved wall bracing panels.* Continuous sheathed structure shall be constructed in accordance with R602.10.4. Continuous sheathing methods require that structural panel sheathing to be used on all sheathable surfaces on one side of a braced wall line including areas above and below openings and gable end walls and shall be constructed in accordance with Table R602.10.4.1. Different bracing methods shall not be permitted along a braced wall line with continuous sheathing. Continuous sheathed braced wall panels shall be full height, located at each end of a braced wall line and at least every 25-ft o.c. A min. 24" wood structural corner panel shall be provided at both ends of a braced wall line in accordance with R602.10.4.4(1) or provided with a hold-down device with a design uplift of at least 800# shall be fastened to the corner stud and to the foundation or framing below in accordance with Figure R602.10.4.4(3). See also exceptions R602.10.4.4.

R602.10.6 Braced wall panel connections. *Braced wall panels* shall be connected to floor framing or foundations as follows:

1. Where joists are perpendicular to a *braced wall panel* above or below, a rim joist, band joist or blocking shall be provided along the entire length of the *braced wall panel* in accordance with Figure R602.10.6(1). Fastening of top and bottom wall plates to framing, rim joist, band joist and/or blocking shall be in accordance with Table R602.3(1).
2. Where joists are parallel to a *braced wall panel* above or below, a rim joist, end joist or other parallel framing member shall be provided directly above and

below the *braced wall panel* in accordance with Figure R602.10.6(2). Where a parallel framing member cannot be located directly above and below the panel, full-depth blocking at 16 inch (406 mm) spacing shall be provided between the parallel-framing members to each side of the *braced wall panel* in accordance with Figure R602.10.6(2). Fastening of blocking and wall plates shall be in accordance with Table R602.3(1) and Figure R602.10.6(2).

3. Connections of *braced wall panels* to concrete or masonry shall be in accordance with Section R403.1.6.

Braced wall panels shall be fastened to required foundations in accordance with Section R602.11.1, and top plate lap splices shall be face-nailed with at least eight 16d nails on each side of the splice.

Connections to roof framing. Exterior *braced wall panels* shall be connected to roof framing as follows.

1. Parallel rafters or roof trusses shall be attached to the top plates of *braced wall panels* in accordance with Table R602.3(1).
 2. Applies to SDC A, B and C and wind speeds less than 100 miles per hour.
 3. For SDC D₁ and D₂ or wind speeds of 100 miles per hour or greater, where the distance between the top of rafters or roof trusses and perpendicular top plates is 15¼ inches (387 mm) or less, rafters or roof trusses shall be connected to the top plates of *braced wall panels* with blocking in accordance with Figure R602.10.6.2(1) and attached in accordance with Table R602.3(1).
 4. For all seismic design categories and wind speeds, where the distance between the top of rafters or roof trusses and perpendicular top plates exceeds 15¼ inches, perpendicular rafters or roof trusses shall be connected to the top plates of *braced wall panels* in accordance with one of the following methods:
 - 4.1. In accordance with Figure R602.10.6.2(2),
 - 4.2. In accordance with Figure R602.10.6.2(3),
 - 4.3. With full height engineered blocking panels designed for values listed in American Forest and Paper Association (AF&PA) Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM). Both the roof and floor sheathing shall be attached to the blocking panels in accordance with Table R602.3(1).
 - 4.4. Designed in accordance with accepted engineering methods. Lateral support for the rafters and ceiling joists shall be provided in accordance with Section R802.8. Lateral support for trusses shall be provided in accordance with Section R802.10.3. Ventilation shall be provided in accordance with Section R806.1
- ADD intermittent and continuous panel details! Add Table R602.10.2, R602.10.4.4(1) Figure R602.10.4.4(3),**

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 R502.5 (1) and R502.5 (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. Each end of all headers shall have at least 1-1/2" of bearing for the full width. A single flat 2"x4" member be used as 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.
64. **FIREBLOCKING & DRAFTSTOPPING:** IRC R302.11, R302.12, Sections R602.8, R502.12, R502.13, R1001.12, R1003.19. ***FIREBLOCKING*** shall be installed to cut off all concealed vertical and horizontal draft openings and shall form an effective fire barrier between stories and between a top story and the roof space. Fireblocking 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) 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 fireblocking of chimneys and fireplaces, see Section R1003.19. 6) Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation. Fire blocking materials shall consist of material listed in Section R302.11.1. Loose-fill insulation material shall not be used as a fireblock unless specifically tested in the form and manner intended. The integrity of all fireblocks shall be maintained. ***DRAFTSTOPPING:*** Where there is usable space both above and below a concealed space of a floor/ceiling assembly, draftstops shall be installed so that the area of the concealed space does not exceed 1000 square feet. Draftstops shall divide the concealed space into approximately equal areas. Draftstopping materials shall consist of the following materials: 1/2" 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 fireblocked with noncombustible material securely fastened in place. The fireblocking 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 R703.1, R703.4, R703.5, R703.6, R703.7, R703.8, R703.9, R703.10, R703.11. Exterior walls shall provide the building with a weather-resistant exterior wall envelope. 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 in item #66, R703.2, and a means draining water that enters the assembly to the exterior. Protection against condensation in the exterior wall assembly shall be provided in accordance with section R601.3 of this code and the Washington State Energy Code (WSEC) as described in item #95. Ensure proper fastening for type used, wood siding may not be less than 3/8" thick. See Table R703.4. 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.
66. **WEATHER RESISTANT SHEATHING PAPER and FLASHING:** IRC Section R703.2 and R703.8. One layer of #15 asphalt felt, free from holes and breaks, complying with ASTM D 226 for Type I felt or other approved water-resistant material shall be applied over studs or sheathing of all exterior walls. 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, R703.1. Exceptions: Omission of the water-resistant barrier is permitted in the following situations: 1) in detached accessory buildings. 2) Under exterior wall finish materials as permitted in Table R703.4. 3 or 3) Under paperbacked stucco lath when the paper backing is an approved weather-resistive sheathing paper. ***FLASHING:*** 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. 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 shall extend to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. 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. All stone and masonry veneer shall be installed in accordance with IRC Chapter 7, Table R703.4 and Figure R703.7. Such veneers installed over backing of wood or cold-formed steel shall be limited to the first story above grade and shall not exceed 5" in thickness. *Exception:* 2. For detached one- or two- family dwellings with a maximum nominal thickness of 4 inches (102 mm) of exterior masonry veneer with a backing of wood frame located in Seismic Design Category D-0 and D-1, exterior stone or masonry veneer, as specified in Table R703.7(2) above a noncombustible foundation. Wall bracing and holdowns at exterior and interior braced wall lines shall be in accordance with section R602.10 and R602.11 and the additional requirements of Table R703.7(2). Cripple walls shall not be permitted, and 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 earth 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 Section R317, R502.2.2. 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. 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. For decks with cantilevered framing members, connections to the exterior walls or other framing members, shall be designed and constructed to resist uplift.
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 at least 1-inch nominal thickness and not less than the cut end of the rafter. At all valleys or hips there shall be a valley or hip rafter 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 three units in 12 unit horizontal (25-percent slope), structural members that support rafters and ceiling joists, such as ridge beams, 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. When the header joist 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. Rafters 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 1101.11.1. Roof areas of a building shall be drained by roof drains or gutters. Gutters and downspouts to be installed on structures to conform with 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. Asphalt shingles classified using ASTM D 3161 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 be provided with corrosion-resistant wire mesh, with 1/16" minimum and ¼" maximum openings. The total net free ventilating area shall not be less than 1 to 150 of the area of the space ventilated, except that the total area is permitted to be reduced to 1 to 300, provided at least 50% and not more than 80% of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated at least 3' above eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents. As an alternative, the net free cross-ventilation area may be reduced to 1 to 300 when a Class I or II vapor barrier is installed on the warm-in-winter side of the ceiling. 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 Washington State Amendment R806.4 are met **AND** such installation allows warranty to be maintained by the roofing manufacturer.

77. **CHIMNEY HEIGHT/CHIMNEY CRICKETS:** IRC, R1003.9, R1005, R905.2.8.3. Masonry chimneys shall extend at least 2-ft higher than any portion of a building within 10-ft, but shall not be less than 3-ft. 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 counter flashed and 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 & Shelton Fire Department Fire Protection Standard 2003-0010 (see checklist item 110 also). 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 R303.8 & Washington State Amendment to R303.8.2 and R303.8.3. Every dwelling unit shall be provided with heating facilities capable of maintaining a minimum room temperature of 68° F at a point 3' above the floor and 2' from exterior walls in all habitable rooms at the design temperature. The installation of 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 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. 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 Section 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, particleboard, wafer board and oriented strand board shall

be identified as "EXPOSURE 1," "EXTERIOR" or "HUD-APPROVED."

83. **GYPSUM WALLBOARD & GYPSUM WALLBOARD FASTENING:** IRC Section R702.3, R702.4.2, R702.3.6, 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, or C1278. Use of water resistant gypsum backing board shall be permitted to be used on ceilings where framing spacing does not exceed 12" o.c. for ½" thick or 16" o.c. for 5/8" thick gypsum board. 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". *Footnote e, Table R702.3.5:* Type X gypsum wallboard for garage ceilings beneath habitable rooms shall be installed perpendicular to the ceiling framing and shall be fastened at 6" o.c. by minimum 1-7/8" 6d coated nails or equivalent drywall screws.
- 3/8" minimum from edge and ends for nails or screws.
 - Fastening (nails): 7" o.c. max. ceiling, 8" walls.
 - Fastening (screws): 12" o.c. ceiling, 16" o.c. walls when wall framing is 16" o.c., 12" when wall framing is 24" o.c.
84. **STORY/STORY ABOVE GRADE:** IRC Section R202. Any story having its finished floor surface entirely above grade plane, except that a basement shall be considered as a story above grade plane where the finished surface of the floor above the basement meets any of the following: 1) Is more than 6' above grade plane. 2) Is more than 6' above the finished ground level for more than 50% of the total building perimeter. 3) 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 grade plane to the average height of the highest roof surface. 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 within 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 24-inches of unbalanced backfill shall be designed 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.

ENERGY CODE

87. **FOUNDATION INSULATION:** WSEC Section 502.1.4.8 & Chapter 6. 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 for such use.
88. **UNDER-FLOOR INSULATION:** WSEC Section 502.1.4.7 & Chapter 6. Floor insulation shall be installed in a permanent manner in substantial 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. See Chapter 6 Table 6-1. Insulation supports shall be installed so spacing is no more 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:** WSEC Section 502.1.4.6 & Chapter 6. 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. See Chapter 6, Table 6-1. 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:** WSEC Section 502.1.4.1, 502.1.4.5 & Chapter 6, IRC R806.. 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-38. See Chapter 6 Table 6-1. The thickness of roof/ceiling insulation that is blown in shall be identified by inches of thickness, density and R-Value markers shall be installed at least one for every 300 sq. ft. through the attic/ceiling. 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" attic space. Eave vents shall be provided with baffle to deflect incoming air above the surface of the insulation. The baffles shall be rigid material, resistant to wind driven moisture. The minimum ventilation requirements in IRC Section R806.3 and R806.4 shall be maintained. *See also 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 Chapter 2, Section 602.1, & Prescriptive Table 6-1. 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 vaulted ceiling insulation shall be R-30, limited to 500-sq. ft. of any ceiling area for any one dwelling unit. After 500-sq. ft. insulation in a single rafter or joist vaulted ceiling shall be insulated to at least R-38. See Chapter 6 Table 6-1. WSEC Section 502.1.6.3. Faced batts shall be face-stapled (*not inset-stapled*).
92. **ACCESS HATCHES AND DOORS:** WSEC Section 502.1.4.4. 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. 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.

93. **DUCT INSULATION/DUCT LEAKAGE:** WSEC Sections 503.9, 503.10 & Table 5-11. Approved R-8 insulation shall be installed in the following locations: ducts, plenums and enclosures located on the roof or exterior of the building or installed in an attic, garage, crawl space, and walls and floor/ceiling spaces. Ducts located in a cement slab or in ground shall be insulated with an approved R-5 insulation. All low-pressure supply and return duct transverse joints, and enclosed stud bays or joist cavities/space used to transport air, shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), or mastic embedded-fabric systems installed in accordance with the manufacturer's installation instructions. *Exception:* 1) Ducts or building cavities used for air distribution that are located entirely within the conditioned space do not require sealing. 2) UL 181A listed tapes used with listed rigid fibrous glass ducts may be used as a primary sealant, when installed in accordance with the listing. 3) UL 181B listed tapes used with listed flexible air ducts may be used as a primary sealant, when installed in accordance with the listing. 4) Where enclosed stud bays or joist cavities/spaces are used to transport air sealing may be accomplished using drywall, drywall tape plus joint compound. 5) Tapes installed in accordance with the manufacturer's installation instructions, providing detailed information specific to application on ducts, including approved duct materials and required duct surface cleaning.
94. **PIPE INSULATION:** WSEC Section 503.11 & Table 5-12, UPC (WAC) 313.6. All piping, except piping installed within unitary HVAC equipment, shall be thermally insulated in accordance with Table 5-12. All hot and cold water pipes installed outside the conditioned space shall be insulated to a minimum of R-3.
95. **VAPOR RETARDER/MOISTURE CONTROL:** WSEC Section 502.1.6. Vapor retarders shall be installed on the warm side (*in winter*) of insulation. The vapor retarder shall have not more than one perm dry cup rating. Vapor retarding paint, listed for the application may be applied to walls provided compliance information is available. Vapor retarders shall not be required in roof/ceiling assemblies where the ventilation space above the insulation averages 12" or greater. Faced batts shall be face stapled.
96. **GROUND COVER IN CRAWL SPACE:** WSEC Section 502.1.6.7. A ground cover of 6 mil black polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped 12" minimum at the joints and shall extend to the foundation wall. The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab with a minimum thickness of 3-1/2".
97. **WINDOWS & EXTERIOR DOORS:** WSEC Section 502.1.5 & Tables 6-1, 602.6, 602.7.2. U-Factors for glazing and doors 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 glazing shall be .35 and exterior doors shall have a U-factor of .20 or less. See Chapter 6 Table 6-1. 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-lite doors, shall be considered windows for the purposes of energy code requirements. One unlabeled or untested exterior swinging door with a maximum area of 24-sq. ft. may be installed. Single glazing for ornamental, security, or architectural purposes and double glazed garden windows with a wood or vinyl frame shall be exempt from the U-factor calculations provided the total of all single glazing and garden windows does not exceed 1% of the floor area.
98. **AIR LEAKAGE INCLUDING RECESSED LIGHTING FIXTURES:** WSEC 502.4. Provisions to limit air leakage shall be provided to those locations separating outdoor ambient conditions from interior spaces that are heated or mechanically cold. *Seals & Weather-stripping:* 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, gasketed or weather-stripped to limit air leakage. Other exterior joints 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. Fixed lites shall have glass retained by stops with sealant or caulking all around. *Recessed lighting fixtures* shall be type IC rated, and ins and certified under ASTM283 to have no more than 2.0 cfm air movement from the conditioned space to the ceiling cavity. The lighting fixture shall be tested at 75 Pascal's or 1.57-lbs/sq. ft. pressure difference and have a label attached, showing with this test method. Recessed lighting fixtures shall be installed with a gasket or caulk between the fixture and ceiling to prevent air leakage.
99. **EXHAUST FANS:** IRC M1507: 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 M1507.3**

	WET ROOMS	KITCHENS
Kitchens or where cooking appliances are located	100 cfm intermittent or 25 cfm continuous	
Bathrooms and other rooms	50 cfm intermittent or 20 cfm continuous.	

NOTE: All fans shall provide the required flow when tested at .25 water gauge. Ventilation ducts shall terminate outside the building. Ventilation ducts located in unconditioned spaces shall be insulated to a minimum of R-4.

100. WHOLE HOUSE VENTILATION SYSTEM

(Intermittent): IRC M1508. 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 specified in M1508.4, M1508.5, M1508.6, or M1508.7 or in accordance to the International Mechanical Code and associated Washington State Amendment, Chapters 4 and 5. Whole house ventilation systems shall have a flow rating of .25 inches water gauge and a sone rating of 1.0 or less. 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 for at least 8 hours a day. 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)."

**WHOLE HOUSE EXHAUST FAN
PRESCRIPTIVE REQUIREMENTS
Table 1508.2 (Minimum rates)**

Floor Area, sq. ft	Bedrooms		
	0-1	2-3	4-5
<1500	50	50	60
1501-3000	50	60	75
3001-4500	60	75	90
4501-6000	75	90	105

101. VENTILATION DUCTS: IRC M1507.3, R303.5, IMC 403.8. All ventilation ducts shall terminate outside the building and be equipped with a back draft damper. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4. All supply ducts located in the conditioned space shall be insulated to R-4. Fan ducts shall be equipped with back draft dampers. 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.

Exhaust Ducts shall be sized in accordance to IMC, Table 403.8.4 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
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

1. For each additional elbow subtract 10-ft from length. Flex ducts of this diameter are not permitted with fans of this size.

102. OUTDOOR AIR SUPPLY: IRC M1508.4.5, M1508.5, M1508.6 and M1508.7. 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 1/2" above of the surface of the finish floor.

103. OUTDOOR AIR INLETS: IRC M1508.4.5. Individual outdoor air inlets shall be provided in each habitable room and have a) controllable and secure opening. b) be sleeved or otherwise designed so as not to compromise the thermal properties of the wall or window in which they are placed. c) Provide not less than 4 sq. inches of net free area of opening for each habitable space. Any inlet or combination of inlets which provide 10 cfm at 10 Pascals as determined by the Home Ventilating Institute Air Flow Test Standard (HVI 901 11/96) are deemed equivalent to 4 sq. in. net free area. Outdoor air inlets (*window or wall ports*) separated from fan locations by doors, adequate airflow shall be ensured by undercutting doors or installing grilles or transoms. Doors and operable lites in windows are not deemed to meet the outdoor air supply intake requirements. 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.

104. **INTERMITTENT WHOLE HOUSE VENTILATION INTEGRATED WITH A FORCED-AIR SYSTEM. (Make-up air through the furnace);** IRC M1508.5. Integrated ventilation systems shall provide outdoor air at the rate calculated using Table M1508.3. The ventilation system shall distribute outdoor air to each habitable room through the forced-air system ducts. The outside air inlet duct shall terminate outside of the building and be connected to the return air plenum of the forced air system at a point within 4-ft upstream of the air handler. The outdoor inlet shall be connected upstream of the forced air system blower and shall not be connected directly into the furnace cabinet. The system shall be provided with a motorized damper connected to the automatic ventilation control as specified in M1508.5.2. The required flow rate shall be verified by field-testing with a flow hood or a flow measuring station. A copy of the testing report shall be provided to the inspector during inspection. The system shall be controlled by a 24-hour clock timer with the capability of continuous operation, manual and automatic. This control will control the forced air system blower and the automatic damper. The 24-hour timer shall be readily accessible and capable of operating the whole house ventilation system without energizing other energy-consuming appliances. At the time of inspection the automatic control timer shall be set to operate at least 8-hours a day. A label shall be affixed to the control that reads, "Whole House Ventilation (see operating instructions)".

105. **Intermittent Whole House Ventilation Using a Supply Fan,** IRC M1508.6. Supply fan ventilation systems shall distribute outdoor air to each habitable room through the forced-air system ducts or through dedicated ducts to each habitable room. Supply fans shall have the capacity to provide outdoor air specified in Table M1508.2 at .40" w.g. The outdoor air must be filtered before it is delivered to habitable rooms. Ducts shall be installed in accordance to M1508.6.2, dampers in accordance to M1508.6.3, and controls in accordance to 1508.6.4.

106. **Whole House Ventilation using Heat Recovery Ventilation;** M1508.7. Heat Recovery ventilation systems shall be sized and installed in accordance to manufacturer's instructions and in accordance to M1508.7. Minimum flow rating shall not be less than that specified in Table M1508.2.

109. **LIGHTING;** WSEC Section 505 & Chapter 2. Luminaires providing outdoor lighting and permanently mounted to a residential building or to other buildings on

the same lot shall be high efficacy luminaires. High efficiency luminaires as defined in Chapter 2 of the WSEC includes a lighting fixture that does not contain a medium screw base socket and whose lamps have a minimum efficiency of: a) 60 lumens per watt for lamps over 40 watts; b) 50 lumens per watt for lamps over 15 watts to 40 watts; c) 40 lumens per watt for lamps 15 watts or less. *Exception: 1) Permanently installed outdoor luminaires that are not high efficacy shall be allowed provided they are controlled by a motion sensor(s) with integral photocontrol photosensor. 2) Permanently installed luminaires in or around swimming pools or water features.*

All linear fluorescent fixtures must be fitted with T-8 (1-inch diameter) or smaller lamps (but not T-10 or T-12 lamps). This applies to all typical fluorescent fixtures used for interior or exterior lighting.