City of Westport

RESIDENTIAL PLAN REVIEW CHECKLIST
UPDATED TO 2009 IRC

Applicant Name: _____

Permit Number: _____ Project Name: _____

THIS CHECKLIST IS PART OF THE APPROVED SET OF PLANS.
DO NOT REMOVE, SEPARATE OR DETACH ANY DOCUMENTS.

- 2009 International Residential Code, *WAC 51-51*
- 2009 Washington State Energy Code (WSEC), *WAC 51-11 (2006 until January 1 2011)*
- 2009 Uniform Plumbing Code, *WAC 51-56 and 51-57v*
- 2009 International Mechanical Code and 2009 International Fuel Gas Code, *WAC 51-52*
- **City of Westport Municipal Code Title 15 & 16**

The numbered items on the following pages are associated with the above referenced codes, as adopted and amended by the City of Westport. This checklist is intended to provide basic, helpful information only, and shall not be construed as an all-inclusive list of code requirements.

In order to aid with the transition from the 2006 International Residential Code to the 2009 International Residential Code, substantial code changes or differences between the 2006 IRC and the 2009 IRC codes are in **bold type.** The Westport City Hall has the code for reference & research. The Energy Code may be researched at www.energy.wsu.edu.

The issuance or granting of a permit or approval of plans, specifications and computations shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of the City of Westport Building & Fire Code or any other ordinance of the City. Permits presuming to give authority to violate or cancel the provisions of the codes and ordinances of Westport shall not be valid.

Office hours are from 8:30 a.m. to 5:00 p.m. Monday through Friday. To schedule an inspection, call (360) 268-0835 and provide your permit number, the name and address shown on the permit, the type of inspection needed, and a contact telephone number. Inspection requests will be scheduled for the following business day and in the order they are received. The final building inspection will not be approved until other agency(s) final inspections have been performed and approved. (Water, Sewer, Fire, Street and Planning Departments).

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ci.westport.wa.us

The City of Westport is an equal opportunity provider and employer.

FLOOR PLAN

1. **ROOM IDENTIFICATION:** IRC Section R105.3. Each room and its intended use must be clearly shown on the plans by the applicant for plan review purposes.

2. **EGRESS WINDOWS:** IRC Section R310.1. Basements, **habitable attics**, and every sleeping room shall have at least one operable emergency escape and rescue opening. Windows shall have a minimum net clear openable area of 5.7 square feet, or, may be a minimum of 5.0 square feet for grade floor openings. The minimum clear opening height shall be 24", and the minimum clear opening width shall be 20". The window shall have a finished sill height at 44" or less above the floor. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, tools, or special knowledge. Window wells shall be provided when egress windows have a finished sill height below the adjacent ground elevation. The well shall allow the window to be fully opened and provide a minimum accessible net clear opening of 9 square feet, with a minimum dimension of 36". Window wells with a vertical depth of more than 44" shall be equipped with a permanent ladder or steps. See Page 21, *Emergency Escape and Rescue Windows* for additional information.

3. **SMOKE ALARMS:** IRC Section **R314.1**. A smoke alarm listed in accordance with UL217 shall be installed in each sleeping room, including each bedroom, bonus room, and other habitable rooms that could potentially be sleeping rooms that contain an intervening door that can be closed to separate the room from areas otherwise provided with smoke alarms, as well as outside each separate sleeping area in the immediate vicinity of the bedrooms, and each additional story of the dwelling including basements (but excluding crawl spaces and uninhabitable attics.) In dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level. When more than one smoke alarm is required to be installed within an individual dwelling unit, 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. Interconnection and hardwiring is not required in existing buildings if the alterations do not result in the removal of wall or ceiling finishes unless there is a basement, attic, or crawl space which could provide access for hardwiring and interconnection without removing the interior finish. Note: Habitable rooms such as dens, libraries and offices that are provided with built in features that establish the specific use of the room as something other than for sleeping, and do not contain clothes closets, need not be considered a sleeping room.

3a. **CARBON MONOXIDE ALARMS: An approved carbon monoxide alarm listed with UL 2034 shall be installed outside of each separate sleeping area in the immediate vicinity of the bedroom, unless the dwelling has been owner-occupied prior to July 1, 2010. In a building where a tenancy exists, the tenant shall maintain the CO alarm as specified by the manufacturer including replacement of the batteries.**

4. **SAFETY GLAZING:** IRC Section R308.4. All glass located in an area considered hazardous must be safety glazed:

   1. Glazing in all fixed and operable panels of swinging, sliding and bifold doors, except decorative glazing and glazed openings
   2. Glazing adjacent to a door where the nearest vertical edge is within a 24" arc of the door in a closed position and whose bottom edge is less than 60" above the floor or walking surface. Exceptions: decorative glazing; an intervening wall or permanent barrier is between the door and the glazing; glazing is in a wall on the latch side of the door and perpendicular to the plane of the door in a closed position; glazing adjacent to a door giving access to a closet which is less than 3' in depth; and glazing adjacent to the fixed panel of a patio door.
   3. Glazing. that meet all of the following conditions:
      A. Exposed area of an individual pane is greater than 9 square feet. *and*
      B. Exposed bottom edge is less than 18" above the floor. *and*
      C. Exposed top edge is greater than 36" above the floor. *and*
      D. 1 or more walking surfaces are within 36" horizontally of the plane of the glazing.

      Exceptions: Decorative glazing; **a rail at least 1½" high and capable of withstanding a horizontal force at least 50 pounds per linear foot without contacting the glass is installed in front of the glazing 34" to 38" above the walking surface, or 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, roof, walking surfaces or other horizontal surface adjacent to the glass exterior.**
   4. **Glazing in railings regardless of area or height above a walking surface.**
   5. Tub, shower, hot tub, whirlpool, sauna, & steam room enclosures and any glazing in a bathroom wall enclosure, where the bottom is less than 60" above the walking surface. **Exception: Glazing**

more than 60" measured horizontally from the waters edge of a hot tub, whirlpool or bathtub.

6. Glazing in walls and fences used as the barrier of indoor and outdoor swimming pools and spas when the bottom edge of the glazing is less than 60" above a walking surface and the glazing is within 5' of the water's edge.
7. Glazing within 36" horizontally of a walking surface and adjacent to stairways,, landings and ramps when the exposed surface is less than 60" above the plane of the walking surface. **Exception: A rail, guard or wall is installed meeting conditions of R308.4(7).**
8. Glazing within 60" horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glass is less than 60 inches above the nose of the tread. **Exceptions: Guardrail or handrail complies with R311.7.6 and R312 and the glass is more than 18" from the railing, or a solid wall or panel extends 34" to 36" above walking surface and top of wall can withstand same forces as a guard.**

5. **NATURAL LIGHT & VENTILATION** IRC Section R303.1 and R303.2. All habitable rooms shall be provided with aggregate-glazing area of not less than eight percent (8%) of the floor area of such rooms, except for rooms which have artificial light capable of average illumination of 6 foot candles at a height of 30" above floor level. An adjoining room may be considered under certain conditions of R303.1.1. Ventilation shall be provided through source specific and whole house ventilation systems designed and installed as specified in Sections M1507 and M1508.

6. **EXHAUST FANS:** IRC Section M1507, IMC 501.2, 501.2.1 Source specific exhaust ventilation is required in each kitchen, bathroom, water closet, laundry room, indoor swimming pool, spa, and other rooms where water vapor or cooking odor is produced. Exhaust fans providing source specific ventilation shall have a minimum fan flow rating not less than 50 cfm at 0.25 inches water gauge for bathrooms, laundries, or similar rooms and 100 cfm at 0.25 inches water gauge for kitchens.

   The air removed by every mechanical exhaust system shall be discharged outdoors. Air shall not be exhausted into an attic, soffit, ridge vent, or crawl space. *See the energy section of this checklist for additional requirements.*

7. **CLOTHES DRYERS:** IRC Sections M1502, G2439.3 & G2439.5. Clothes dryer exhaust ducts shall terminate outside the building at least 3 feet away from any openings and be equipped with a back draft damper. Exhaust ducts shall be constructed of minimum 0.016-inch-thick rigid metal ducts, having smooth interior surfaces with joints running in the direction of air flow. Ducts shall not be connected with sheet metal screws or other fasteners which could obstruct the flow. **Exhaust ducts shall be supported at 4' intervals and secured in place.** Approved **(UL 2158A)** transition duct of not more than 8' in length may be used within a dwelling, provided they are not concealed within construction. Duct length shall not exceed a total combined vertical and horizontal length of 25' **from the connection of the transition duct from the dryer to the outlet terminal.** The maximum length of the duct shall be reduced **in accordance with Table M1502.4.4.1, except the manufacturer's instructions may prevail if the instructions are provided to the inspector at the time of the concealment inspection.** No screens shall be installed at the duct termination. **Where the duct is concealed within the building construction, the equivalent length of the exhaust duct shall be identified on a permanent label or tag located within 6' of the exhaust duct connection.**

Table M1502.4.1.1 Dryer Exhaust Duct Fitting Equivalent Length

Exhaust Duct Fitting Type	Equivalent Length
4" radius mitered 45° elbow	2' 6"
4" radius mitered 90° elbow	5'
6" radius smooth 45° elbow	1'
6" radius smooth 90° elbow	1' 9"
8" radius smooth 45° elbow	1 '
8" radius smooth 90° elbow	1' 7"
10" radius smooth 45° elbow	9 '
10" radius smooth 90° elbow	1' 6"

8. **RANGE HOOD:** IRC Section M1503, M1901. The vertical distance between the cooking top of a domestic range and unprotected combustible material shall not be less than 30". Reduced clearances may be permitted in accordance with the listing and labeling of the range hoods or appliances. Commercial cooking equipment shall not be installed within dwelling units; cooking appliances shall be listed and labeled as household-type appliances for domestic use.

9. **WATER CLOSET CLEARANCES:** IRC Figure 307.1. Water closets shall be located in a clear space not less than 30" in width, and not closer than 15" from the center of the fixture to a wall or other side barrier such as a tub. The clear space in front of the water closet shall be at least 21". **The ceiling height above the fixture shall be such that the fixture is capable of being used for its intended purpose.**
10. **SHOWER AREAS:** IRC Figure 307.1, R305, R307. Showers shall be minimum 30"x 30" and have a minimum 24" clearance in front of the opening, and at least 6' 8" clearance above the shower floor or tub. A non-absorbent wall finish shall be provided to a height of not less than 6 feet above the shower floor.

11. **CHIMNEYS & FIREPLACES:** IRC Chapter 10. Factory-built chimneys and fireplaces shall be tested in accordance with UL 127, listed and labeled, and shall be installed and terminated in accordance with the

manufacturer's installation instructions. Masonry or concrete fireplaces shall be constructed in accordance with IRC Chapter 10 and certified in accordance with Washington State Building Code Standard 31-2 and IBC 2114.

12. **TIGHT-FITTING DOORS (FIREPLACE):** IRC Section R1001.7.1. Solid fuel burning appliances and fireplaces shall be provided with tight-fitting glass or metal doors, or a flue draft induction fan or as approved for minimizing back-drafting. An outside source of combustion air shall be ducted to the firebox with ducts at least 6 square inches.

13. **FIREPLACE HEARTH EXTENSION:** IRC Section 1001.10. An approved noncombustible hearth must extend at least 16" from the 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.

14. **CLEARANCE TO COMBUSTIBLES:** IRC Section 1003.18, 1001.11. When masonry chimneys are built within a structure, a 2" clearance to combustible material is required. When a chimney is placed on the exterior of the structure, a 1" clearance is allowed. Combustible material shall not be placed within 6" of fireplace opening. No combustible material placed within 12" of the fireplace opening (such as mantles or decorative fireplace surrounds) shall project more than 1/8" of each 1" clearance from the opening. See IRC Chapter 10 for additional requirements.

15. **COMBUSTION AIR:** IRC Section M1701.1. Solid-fuel-burning appliances shall be provided with combustion air in accordance with the appliance manufacturer's installation instructions. Oil-fired appliances shall be provided with combustion air in accordance with NFPA 31. The requirements for combustion and dilution air for gas-fired appliances shall be in accordance with Chapter 24. Fireplaces shall comply with Section 1001.

16. **APPLIANCE LOCATIONS:** IRC Section G2406.2. Fuel burning appliances shall not be installed in a sleeping room, bathroom, toilet room, or closet. *Exception: direct vent appliances (see IRC Section G2406.2 for additional exceptions).*

17. **APPLIANCES LOCATED IN GARAGE:** IRC Section M1307.3. Appliances located in a garage or carport or any other location subject to vehicle damage shall be protected by approved barriers. Appliances having an ignition source shall be elevated so that the source of ignition is at least 18" above the floor in garages and in any room that opens to the garage. Appliances designed to be fixed in position shall be fastened or anchored in an approved method.

18. **WATER HEATER:** IRC Section M1307.2; UPC 508.2, 508.4, 608.5; WSEC Section 504.2.1. Water heaters shall be anchored or strapped to resist horizontal displacement due to earthquake motion. Strapping shall be at points within the upper one-third and lower one-third of the appliance and shall be at least 4" away from the controls. Where water heaters are installed in locations where leakage of the tank or connections can cause damage, a watertight pan of corrosion-resistant materials shall be installed beneath the water heater with a minimum ¾" diameter drain to an approved location. Temperature and pressure relief valves shall be drained to outside, except that replacement water heaters shall only be required to provide a drain pointing downward from the relief valve to extend between 2' and 6" from the floor with no additional floor drain. Drain may not be trapped and must terminate no more than 2' nor less than 6" from the ground and shall not be threaded. . All electric hot water heaters shall be placed on an R-10 pad when located in an unheated space or on a concrete floor. A thermal expansion (compression) tank shall be installed on water heater tanks.

19. **L.P.G. (PROPANE) APPLIANCES:** IFGC Section 303.2 and 303.3 prohibits appliances from being installed in a hazardous location, which is any location considered to be a fire hazard for flammable vapors, dust, combustible fibers or other highly combustible substances. L.P.G. (heavier than air) containers shall not be installed in a basement, cellar, pit, under-floor space, below grade or similar location where heavier-than-air gas might collect.

L.P.G. tanks shall be installed in accordance with NFPA 58 and Chapter 38 of the 2009 International Fire Code. L.P.G. standard shall be NFPA 58.

Typical LPG Tank Setbacks

L.P.G. Tank Size	Required Setback from Buildings and property lines
< 125	zero, with conditions*
125 to 500	10 feet
500 to 2000	25 feet

*Minimum 5 feet to property lines; building openings; sources of ignition; ventilation air intakes; openings into direct-vent appliances.

20. **MANUFACTURER'S SPECS:** IRC M1307.1. The manufacturer's operating and installation instructions shall remain attached to the appliance until final inspection.

21. **BACKFLOW PREVENTORS:** UPC Section 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 hose bibb type backflow preventer, or atmospheric vacuum breaker. All cross connections between potable water sources and other systems, such as landscape irrigation systems, hydronicradiant heating systems, swimming pools, etc. shall be equipped with backflow preventers in accordance with UPC Section 603.

22. **TRAP PRIMERS:** UPC Section 1007. Floor drains or similar traps connected to the drainage system and subject to infrequent use shall be protected with a trap

seal primer, except where it's deemed not necessary for safety or sanitation by either the Building Dept. or the Water Dept. Trap seal primers shall be accessible for maintenance.

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

24. **GARAGE/DWELLING SEPARATION, GARAGE FLOOR:** IRC Section R302.5, R309.1 The garage shall be separated from the residence and its attic area by not less than ½" gypsum board applied to the garage side, including garages located less than 3' from a dwelling unit on the same lot. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than 5/8" Type X gypsum board. Structural members supporting the horizontal separation shall be protected by minimum ½" gypsum board (this includes all bearing walls, posts, columns, etc.). Ducts in the garage and ducts penetrating the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum No.26 gage sheet steel or other approved material and shall have no openings in the garage. Openings around vents, pipes, ducts, cables, and wires shall be fire blocked with an approved material to resist the passage of flame and products of combustion. The garage floor shall be of concrete or other approved noncombustible material, and shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway. A carport (open on at least 2 sides) may have a floor surface of asphalt.

25. **SEPARATION BETWEEN DWELLING UNITS:** IRC Section R302.3, R302.2. Walls and floors separating dwelling units in two-family dwellings shall not be less than 1-hr fire-resistance construction when tested in accordance with ASTM E 119 or UL 263. Fire-resistant-rated floor-ceiling and wall assemblies shall extend to and be tight against the exterior walls, and wall assemblies shall extend from the foundation to the underside of the roof sheathing. Wall assemblies need not extend through attic spaces when the ceiling is protected by 5/8" Type X gypsum board, an attic draft stop is provided above and along the wall assembly, and the structural frame supporting the ceiling is protected by not less than ½" gypsum board. Townhouses shall be separated by either a 1-hour fire-resistance-rated wall assembly at ***each*** townhouse, or a common 2-hour fire-resistance-rated wall assembly between townhouses, with no plumbing, ducts, or vents in the cavity, tested in accordance with E119 or UL 263. See R302 for details of fire-resistant-rated construction.

26. **FIRE-RESISTANCE OF EXTERIOR WALLS:** IRC Section R302.1 Table R302.1. **1-hr fire-resistive construction is required within 5 feet of property lines. Openings are not permitted at less than 3' and are limited between 3' and 5'. Projections are allowed to be protected with 1-hour fire-resistance rated construction on the underside when the projection is between 2' and 5' from the property line.** Unprotected, detached garages shall be at least 3 feet away from other residential or accessory buildings.

27. **FLOOR AREA:** IRC Section R304. Dwelling units shall have at least one habitable room with not less than 120 square feet of floor area. Other habitable rooms except kitchens shall have an area of not less than 70 square feet with a minimum dimension of 7' in one direction.

28. **MINIMUM CEILING HEIGHTS:** IRC Section R305.1 Habitable spaces shall have a ceiling height of not less than 7 feet. Beams and girders spaced not less than 4 feet on center may project not more than 6 inches below the required ceiling height. Ceilings in basements without habitable spaces may have a ceiling height of 6'-8" with beams projecting to within 6'-4" of the finished floor. Bathrooms shall have minimum ceiling height of 6'-8" at the front clearance areas of fixtures.

29. **ATTIC ACCESS:** IRC Section R807.1. Attics which exceed 30 square feet and have a vertical height of 30" or more as measured from the top of the ceiling framing member to the underside of the roof framing members must be provided with an access opening of not less than 22" x 30" and located in a hallway, corridor, or readily accessible location. **When the access is located in the ceiling, minimum unobstructed headroom in the attic space shall be 30" at some point above the access measured vertically from the bottom of the ceiling framing members. Attics containing appliances shall be provided with an opening and a clear and unobstructed passageway large enough to allow removal of the largest appliance and with an opening with a minimum dimension of 20" by 30" and maximum passageway of 20' long measured from the opening to the appliance. See M1305.1.3 for additional details.** *The attic access shall not penetrate the garage/dwelling fire resistive barrier.*

30. **DOORS & EXITS:** IRC Section R311.2. **At least one egress door shall be provided in each dwelling unit. The egress door shall be side-hinged, with a minimum clear width of 32" when measured between the face of the door and the stop** (usually a 36" door) and clear height of 78", and that can be opened without the use of a key, tool or special knowledge.

31. **LANDINGS:** IRC Section R311.3. There shall be a floor or landing on each side of exterior doors with dimensions of at least 36" measured in the direction of travel, and at least the width of the door served. The floor or landing shall be not more than 1.5" lower than the threshold of the doorway, except doors other than the main exit may have the landing up to 7 ¾" below the level of the threshold provided the door does not swing over the landing *(except that screen and storm doors may)*; OR, if not the main exit and there are two or fewer risers, a landing is not required. In addition, an *interior* door may open at the top of a flight of stairs provided the door does not swing over the top step. Exterior landings may have a slope not to exceed 2% (1" in 48").

32. **GUARDS:** IRC Section R312. Porches, balconies or raised floor surfaces located more than 30" above the floor or grade below shall have guards not less than 36" in height, including areas enclosed with insect screening, except where guards are required at the open side of stairs, the height may be reduced to 34" above the stair nosings. Guardrails shall be designed such that a sphere 4" in diameter cannot pass through, except the triangular opening between a riser, tread and the bottom rail of the guard may be of such size that a sphere 6" cannot pass through.

33. **HANDRAILS:** IRC Section R311.7.7 & 311.8.3. All stairways with 4 or more risers and ramps exceeding a slope of 1:12 (8.33%) shall have at least one handrail. Such handrails shall be placed not less than 34" nor 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 of the flight or the full length of a ramp. The handgrip portion of the handrail shall not be less than 1-1/4" or more than 2-1/4" (maximum 2" if circular) in cross-sectional dimension, and shall be of a "grippable" shape. *(see Page 21 for handrails)* There shall be a space of not less than 1-1/2" between the wall and the handrail, however, the handrail shall not project more than 4-1/2" into the required stair width. Handrail ends shall be returned or shall terminate in a newell post or safety terminals.

34. **STAIRWAYS:** IRC Section R311.7. Private dwelling stairways shall not be less than 36" in width and shall have a headroom clearance of not less than 6 feet 8 inches measured vertically from the sloped plane adjoining the tread nosings, or landing surfaces.

35. **STAIR RISE & RUN:** IRC Section R311.7.4. Maximum riser height shall be 7-¾ inches and the minimum tread depth shall be 10 inches. The greatest riser height may not exceed the smallest by more than 3/8 inch. The radius curvature at the leading edge of the tread shall be no greater than 9/16 inch. A nosing not less than ¾ inch but not more than 1-¼ inches shall be provided on stairways with solid risers. The greatest nosing projection shall not exceed the smallest nosing projection by more than 3/8 inch between two stories, including the nosing at the level of floors and landings. Exception: A nosing is not required where the tread depth is a minimum of 11 inches. Open risers are permitted, provided that the opening between treads does not permit the passage of a 4-inch diameter sphere.

36. **STAIRWAY ILLUMINATION** R311.7.8, R303.6.1. All interior and exterior stairways shall be provided with a means to illuminate the stairs, including the landings and treads. Interior stairways shall be provided with a light located in the immediate vicinity of each landing of the stairway that provides at least 1 foot candle of illumination measured at the center of treads and landings. A wall switch shall be provided at each floor level where the stairway has six or more risers. Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top 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. The illumination of exterior stairways shall be controlled from inside the dwelling unit.

37. **USABLE SPACE UNDER STAIRS:** IRC Section R302.7 The walls and soffits of enclosed usable space under stairs shall be protected on the enclosed side by not less than 1 layer of ½" gypsum board.

38. **WINDING STAIRWAYS:** IRC Section R311.7.4.2 Winding stairways shall have minimum tread depth of 6" and a minimum tread depth of 10" measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline.

39. **SPIRAL STAIRWAYS:** IRC Section R311.7.9.1. Spiral stairs must provide a clear walking area measuring at least 26" from the outer edge of the supporting column to the inner edge of the handrail. The tread run must be at least 7 ½" at the point 12" from where the tread is the narrowest. The rise must be sufficient to provide 6'-6" headroom, and each riser shall not exceed 9 ½ inches.

STRUCTURAL

40. **MIN. CONCRETE FOOTING SIZE;** IRC Section R403.1, R403.1.3.
    - Supporting 1 floor: minimum 6" by 12".
    - Supporting 2 floors: minimum 6" x 15".
    - Supporting 3 floors: minimum 8" x 23".

    All exterior walls shall be supported on continuous footings or other approved structural systems of sufficient design to accommodate all loads and to transmit the resulting loads to the

supporting soil within the limitations determined from the characteristics of the soil. Footings shall be supported on undisturbed natural soil or engineered fill. As a minimum standard, see* Prescriptive Foundation Requirements, on *Page 16.

41. **MIN. CONCRETE FOOTING REINFORCEMENT:** IRC Section 403.1.3. At least two #4 bars are required for all continuous concrete footings. As a minimum standard, *Prescriptive Foundation Requirements* on Page 16.

42. **MIN. CONCRETE FOUNDATION WALL SIZE:** IRC Section 404.1.4.2, Walls that exceed **8** feet in height or have more than 4 feet of unbalanced fill and no permanent lateral support at the top of the wall, must be designed, signed and sealed by a Licensed Washington State Design Professional.

43. **MIN CONCRETE FOUNDATION REINFORCEMENT:** IRC Section R404. As a minimum standard, see *Prescriptive Foundation Requirements* on Page 16.

44. **MINIMUM FOOTING DEPTH:** IRC Section R403.1.4. All exterior footings shall be placed at least 12 " below the undisturbed ground. Interior footings supporting bearing or bracing walls and cast monolithically with a slab on grade shall extend to a depth of not less than 12" below the top of slab.

45. **SLAB ON GRADE FLOOR:** IRC R403.1.3.2 IRC R309.1. Foundations must extend at least 6" above finish grade. Monolithic foundations shall have footings at least 12" wide, be at least 12" below grade, extend at least 6" above finish grade, and shall have at least two #4 bars at the bottom of the footing and one #4 bar located within 7 inches of the top of the slab. See Page 16, *Foundation Requirements,* for additional information. Garage or carport floor surfaces shall be sloped to a drain or toward the main vehicle entry doorway.

46. **FOUNDATION ANCHORAGE:** IRC Section R403.1.6 & R602.11.1. Anchor bolts shall be not less than ½" diameter, embedded at least 7", and spaced no more than 6' apart. (4' if over 2 stories). There shall be a minimum of 2 bolts per piece (sill plate), with a bolt located within 12" of each end of each piece. 3" x 3" x 0.229" thick hot dipped galvanized plate washers, and nuts shall be tightened on each bolt to the plate. If foundation anchor straps are used instead of anchor bolts, they shall be spaced no more than 4' apart (3' if over 2 stories).

47. **DAMP-PROOF FOUNDATION WALLS:** IRC Section R406 Exterior foundation walls that retain earth and enclose habitable or usable spaces located below grade shall be damp proofed in accordance with IRC R406.1 or waterproofed in accordance with IRC 406.2, from the top of the footing to the finished grade by approved methods and materials. All joints in membrane waterproofing shall be lapped and sealed with an adhesive compatible with the membrane.

48. **PIER PADS & COLUMNS:** IRC Section R407.3. Concrete pier footings shall have a depth to width ratio not to exceed 2:1, or, shall have #4 bars located each direction spaced not more than 12" on center. (Rebar must be in place upon inspection.) Positive connections shall be provided to prevent lateral displacement at both the top and bottom of columns.

49. **FOOTING/PIER SETBACK FROM SLOPE:** IRC Section R403.1.7 The placement of buildings and structures on or adjacent to slopes steeper than 1 unit vertical in 3 units horizontal (33.3%) slope shall conform to Sections R403.1.7.1 through R403.1.7.4. (See also IRC Figure R403.1.7.1) Footings must be embedded in material sufficient to provide vertical and lateral support for the footing without detrimental settlement.

50. **CHIMNEY FOUNDATION:** IRC Section R1001.2 and R1003 Masonry chimneys shall be supported on foundations of solid masonry or concrete at least 12 inches thick, at least 6 inches beyond each side of the exterior dimensions of the chimney, be at least 12" below grade, and on natural undisturbed earth or engineered fill.. Reinforcement shall conform to the requirements set forth in Table R1003.2 and IRC Figure R1001.1.

51. **FOUNDATION VENTILATION:** IRC Section R408.2. Minimum net area of ventilation openings shall not be less than 1 square foot for each 300 square feet of under-floor space area. One such ventilating opening shall be within 3 feet of each corner of the building except one side of the building is permitted to have no ventilation openings.. Ventilation openings shall be covered for their height and width with materials identified in IRC R408.2 such that the openings are not larger than ¼ inch.

52. **PROTECTION AGAINST DECAY:** IRC Section R317.1, R317.3.1. All wood in contact with the ground that supports permanent structures intended for human occupancy shall be approved pressure preservative treated wood suitable for *ground contact* use and treated in accordance with AWPA U1. All wood framing members that rest on concrete or masonry foundation walls shall be treated wood or decay-resistant heartwood of redwood, black locust, or cedars. Cut ends of pressure-treated wood shall be treated in accordance with AWPA M4. (Note: All fasteners used in pressure treated lumber [sills, joists to sill, rim joist to sill, etc.] shall be hot dipped galvanized, stainless steel, silicon bronze or copper.)

53. **POSTS, POLES AND COLUMNS:** IRC Section R317.1.2, R317.1.4. Columns and posts supporting permanent structures that are embedded in concrete or

in direct contact with the ground or embedded in concrete exposed to the weather shall be approved pressure treated wood suitable for ground contact use. Posts or columns which are exposed to weather, or are located in basements or cellars, shall be supported by piers or metal pedestals projecting 1 inch above the floor (and 6" above exposed earth) and shall be separated by an approved impervious moisture barrier, or must be of pressure treated wood, or wood of natural resistance to decay. Posts or columns in enclosed crawl spaces located within the periphery of the building, supported by concrete piers or metal pedestals shall be greater than 8 inches from exposed ground and must be separated by a moisture barrier or be of pressure treated wood.

54. **GIRDERS ENTERING MASONRY OR CONCRETE WALL:** IRC Section R317.1(4) Ends of wood girders entering concrete or masonry walls must have a minimum clearance of ½ inch on tops, sides and ends, or shall be of an approved species and grade of lumber pressure treated or decay resistant heartwood of redwood, black locust, black walnut or cedars.

55. **POST-BEAM CONNECTIONS/FASTENING:** IRC R301, R407.3, R502.9. Where posts and beam or girder construction is used to support 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 capable of transferring all loads from their point of origin through the load resisting elements to the foundation.

56. **SPECIFY WOOD SPECIES & GRADES:** IRC Sections R502.1, R602.1 Load-bearing dimension lumber for joists, beams, girders, studs, plates and headers 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, for wood locally milled, a certificate of inspection issued by a lumber grading or inspection agency meeting the requirements of this section may be accepted.

57. **FLOOR FRAMING:** IRC Sections R502.3, R502.6, R502.6.1, R502.7 The ends of each joist, beam or girder shall have not less than 1-1/2" of bearing on wood or metal or not less than 3" on masonry or concrete. Joists framing from opposite sides over a bearing support shall lap a minimum of 3 inches and shall be nailed together with a minimum three 10d face nails. Joists shall be supported laterally at each end and at each intermediate support by full-depth solid blocking not less than 2" nominal thickness; or by attachment to a header, band, or rim joist; or shall be otherwise provided with lateral support to prevent rotation. See IRC Tables R502.3.1 (1) & (2) for floor joist spans, R502.5 (1) & (2) for girder spans, and R502.3.3 (1) & (2) for cantilever spans. A load path for lateral forces shall be provided between floor framing and braced wall panels located above or below a floor.

58. **BEARING PARTITIONS:** IRC Section 502.4. Joists under parallel bearing partitions shall be of adequate size (as a beam) 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 inches in nominal thickness spaced not more than 4 feet on center. Bearing partitions perpendicular to joists shall not be offset from supporting girders, walls or partitions more than the joist depth unless such joists are of sufficient size to carry the additional load(s).

59. **UNDER-FLOOR CLEARANCE:** IRC Section 317.1. 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 pressure treated wood or wood of natural resistance to decay, including all 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

60. **UNDER-FLOOR ACCESS:** IRC Section 408.4. 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 of 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. Underfloor spaces containing appliances shall be provided with an unobstructed passageway large enough to remove the largest appliance but not less than 30" high by 22" wide, nor more than 20' long from the opening to the appliance. A level service space of at least 30" by 30" shall be provided at the front or service side of the appliance. See M1305.1.4 for details of mechanical equipment access.

61. **WALL FRAMING:** IRC Sections 602.3.1, 602.3.2, 602.3.3, 602.3.4, 602.6 & 602.9. Studs shall be a minimum No. 3, standard or stud grade lumber, except that utility studs may be used for bearing studs not supporting a floor above or nonbearing studs. Utility grade studs shall not be spaced more than 16" on center, support more than a roof and ceiling, or exceed 8' in height for exterior and load bearing walls. The size, height, and spacing of all other wood-framing studs shall be in accordance with Table R602.3.(5). (Maximum 10 feet in Seismic Design Category D_2.)

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 shall be offset at least 24". Studs shall have full bearing on a nominal 2" or larger plate or sill having a width at least equal to the width of the 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.

Cutting and notching: May not exceed 25% of the stud width in bearing or exterior walls and may not exceed 40% of a single stud width in non-bearing partitions.

Bored or drilled holes: The diameter of the resulting hole may not exceed 40% of the stud width, can be no closer than 5/8" to the edge of the stud, and may not be located in the same section as a cut or notch. See IRC Section R602.6 for exceptions See IRC Figures R602.6 (1), R602.6.2 (2), and R602.6.1 for additional details.

Foundation Cripple walls, IRC Section R602.9:

Foundation cripple walls 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 in Seismic Design Category D_2 shall be supported on continuous foundations.

62. **WALL BRACING:** IRC Section 602.10. All braced walls and cripple wall bracing in Seismic Design Category D_2 shall be constructed in accordance with IRC Table R602.10.1.2(1), (2), and (3) and Sections R602.10 and R602.11. Typically braced wall panels require nailing patterns of 6" o.c. along all panel edges. All sheathing joints must be over studs (vertically) or solid blocking (horizontally).
    - Braced wall panels shall begin no more than 8' 0" from each end of a braced wall line. If the braced wall panel is not located at the corner, then a 24" panel is required at the corner (in addition to the 4' BWP within 8') Or, a hold down device is required at the end of the braced wall panel end nearest the corner.
    - Spacing of interior braced wall lines shall not exceed 25 feet apart (except to accommodate up to one room up to 900 square feet, an increase to 35' is allowed – adjustment factors will apply, See IRC R602.10.1.5).
    - Braced wall lines may have offsets, out of plane of up to 4'0".
    - In one-story buildings, braced wall panels shall be supported on continuous foundations at intervals not exceeding 50 feet. In two- story buildings all interior braced wall panels shall be supported on continuous foundations. (See exceptions in IRC Section R602.10.7.1.)
    - Interior braced wall panels shall be fastened to both the floor and roof framing in accordance with Table R602.3(1) (typically 3-16d @ 16" o.c.)
    - Cripple walls shall be braced as braced wall panels in accordance with IRC R602.10.9.1 and Tables R602.10.1.2 (1) and (2). A cripple wall greater than 4' shall be designated as the first story wall for purposes of designating the wall bracing requirements (R602.10.7.1).
    - Where "stepped foundations" occur, See IRC Section R602.11.2 for additional requirements such as plate strapping, cripple wall height limitations, etc.
    - See the attached "*Braced Wall Panel*" and "*Alternate Braced Wall Panel*" details for typical construction requirements.

63. **OPENINGS IN EXTERIOR & INTERIOR WALLS (HEADERS):** IRC Section R602.7. Headers shall be provided over each opening in interior and exterior bearing walls. Headers shall be sized to support the load above in accordance with IRC Tables R502.5(1) and R502.5(2), or as designed to support the loads as specified in IRC Table R301.5. Alternately, wood structural box headers may be used in accordance with IRC Section R602.7.1, Table R602.7.2 and Figure R602.7.2. Each end of all headers shall have at least 1.5" of full-width bearing.

64. **FIRE-BLOCKS & DRAFT-STOPS:** IRC Sections R602.8, R502.12. Fire blocking & Draft stopping 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. Fire blocking shall be provided in concealed spaces of wood stud walls and partitions: vertically at the ceiling and floor levels; horizontally at intervals not exceeding 10 feet; and at all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings, as well as stair stringers at the top and bottom of the run and openings around vents, pipes and ducts at ceiling and floor levels. Fire blocking materials shall consist of materials listed in IRC Section R602.8.1. Loose-fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended. Fire blocking of chimneys and fireplaces shall be in accordance with IRC Section R1001.16. When there is usable space both above and below a concealed space of a floor/ceiling assembly, draft stops shall be installed so that the area of the concealed space does not exceed 1000 square feet. Draft stopping materials shall consist of materials listed in Section R502.12.1. All fire blocking and draft stopping shall be in place prior to requesting a framing inspection.

65. **SIDING TYPE** IRC Section R703.3, R703.4, R703.5, R703.8, R703.9, R703.10, Table R703.4. Exterior wall coverings shall be installed, attached and flashed in accordance with the provisions of IRC Section R703 and the siding manufacturer's installation instructions. **Please note that masonry wall coverings exceeding 3" in thickness require an engineered design in Seismic Design Category D_2.**

66. **WEATHER RESISTIVE BARRIER:** IRC Sections R701.2, R703.2, R703.4 R703.8, R703.9.1 Products sensitive to adverse weather shall not be installed until adequate weather protection for the installation is provided. Exterior sheathing shall be dry before applying exterior cover. The exterior wall envelope shall be designed and constructed to provide a water-resistant barrier behind the exterior veneer. Asphalt-saturated felt or other approved weather resistant material such as house wrap shall be applied over the sheathing of all exterior walls except where panel siding with shiplap joints or other approved weather resistive methods are used. Such felt or house wrap material shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2". Approved corrosion-resistive flashing shall be provided in all exterior walls in such a manner as to prevent entry of water into the wall or the building structural framing components. The flashing shall extend to the surface of the exterior wall finish and shall be installed to prevent water from reentering the exterior wall envelope. Approved corrosion-resistant flashings shall be installed at exterior window and door openings; at the intersection of chimneys or other masonry construction, with frame or stucco walls, with projecting lips on both sides under stucco copings; under and at the ends of masonry, wood or metal copings and sills; continuously above all projecting wood trim; where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction; at wall and roof intersections; and at built-in gutters.

67. **ANCHORED STONE AND MASONRY VENEER:** IRC Section R301.2.2.3.2.
**** **ENGINEERING REQUIRED** **** Buildings with anchored stone and masonry veneer shall be designed in accordance with accepted engineering practice except where the masonry veneer has a maximum actual thickness of 3 inches as permitted within the limitations of IRC Section R703.7, Exception 2.

68. **SIDING/EARTH SEPARATION:** IRC Section R317. Wood siding, sheathing and wall framing on the exterior of the building used within 6" of earth shall be pressure treated wood or wood of natural resistance to decay as identified in item #52 of this checklist.

69. **DECKS & EXTERIOR STAIRS:** IRC Section R317, R502.2.2. Pressure treated wood shall be used for those portions of exposed wood members and members subject to wind driven rain, such as within a covered porch, that form the structural supports of buildings, balconies, porches or similar appurtenances, including all joists, beams, girders, decking and posts, poles and columns. Treatment must be applied by manufacturer, see item #52 of this check-list. Ledger boards fastened to a wall shall be properly flashed and positively connected. 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.

70. **WOOD TRUSSES:** IRC Section R502.11, 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. Trusses shall be supported laterally at points of bearing by solid blocking to prevent rotation and lateral displacement, and braced in accordance with the individual truss design drawings. Truss members shall not be cut, notched, drilled, spliced or otherwise altered in any way without the specific approval of a registered design professional (structural calculations required). Alterations resulting in the addition of load (e.g., HVAC equipment, water heaters, etc.) that exceed the design load shall not be permitted without specific engineering justifying the design.

71. **RAFTERS:** IRC Section R802.3, R802.8 Rafters shall be framed to ridge board or to each other with a gusset plate as a tie. The ridge board shall be at least 1" nominal thickness, and all valley or hip rafters shall be at least 2" nominal thickness. Rafter ties shall be placed not more than 4' on center. See IRC Tables 802.5.1(1) through 802.5.1(8) for allowable spans. When the depth–to-thickness ratio exceeds 5 to 1 the roof rafters and ceiling joists shall be provided lateral support at points of bearing to prevent rotation.

72. **RAFTER OPENINGS:** IRC Section R802.9. When the header joist span does not exceed 4', the header joist may be a single member the same size as the ceiling joist or rafter. Single trimmer joists may be used to carry a single header joist that is located within 3' of the trimmer joist bearing. Trimmer and header rafters shall be doubled and of sufficient size to support all loads when the span of the header exceeds 4'. Approved hangers shall be used when the span exceeds 6'. Tail joists over 12' long shall be supported at the header by framing anchors or on ledger strips not less than 2" x 2".

73. **CEILING JOISTS:** IRC Sections R802.4, R802.8, and R802.8.1 Ceiling joist spans shall be in accordance with IRC Tables R802.4 (1) and R802.4 (2) or specifically designed for applied loads. Rafters and

ceiling joists having a depth–to-thickness ratio exceeding 5 to 1 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 shall be supported laterally by solid blocking, diagonal bridging (wood or metal) or continuous 1" x 3" wood strip nailed across the rafter ceiling joists at intervals not exceeding 8'.

74. **ROOF SHEATHING:** IRC Section R803. Allowable spans for lumber used as roof sheathing shall conform to Table R803.1 Spaced lumber sheathing ("skip sheathing") is prohibited in Seismic Design Category D_2. Wood structural panels shall be identified by grade mark or certificate of inspection issued by an approved agency and shall comply with the grades and spans specified in Table R503.2.1.1 (1).

75. **ROOF DRAINAGE & COVERING** IRC Section R801.3, R903, R904, R905. All structures shall have a controlled method of water collection and disposal from roofs (typically gutters). Water shall discharge to an approved drainage system or to splash blocks where a drainage system is not required. Roofs that do not drain over edges shall have roof drains installed at the low point of the roof as well as overflow drains. See IRC R903.4. Roof slope shall be indicated on the plans and selected roof covering must be appropriate for the roof pitch. Roof coverings must be installed in accordance with the manufacturer's installation instructions. Flashing shall be installed at wall & roof intersections, at changes in roof slope or direction, and around roof openings. Where flashing is metal, the metal shall be corrosion- resistant with a minimum thickness of 0.019 inch (No. 26 galvanized sheet). Roof dead loads are limited to a maximum of 15 pounds per square foot unless the additional bracing provisions of R301.2.2.2.1 are provided.

76. **ATTIC VENTILATION:** IRC Section R806. Enclosed attics and rafter spaces shall have cross ventilation. For each separate space, the total net free ventilating area shall not be less than 1 to 150 of the area of the space ventilated, 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 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. Vent openings shall be provided with corrosion resistant wire mesh with 1/8" minimum to ¼" maximum openings. A minimum of a 1-inch airspace must be maintained between the insulation and the roof sheathing at the locations of the vents.

77. **CHIMNEY HEIGHT:** IRC R1003.9, R1003.20. Chimneys shall extend at least 2' higher than any portion of a building within 10', but shall not be less than 3' above the highest point where the chimney passes through the roof. 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 built & flashed according to Figure R1003.20 and Table R1003.20.

GENERAL

78. **PREMISES IDENTIFICATION:** IRC Section R319.1. Addresses shall be provided in such a position as to be plainly visible and legible from the street or road fronting the property. Numerals shall be at least 4" high with ½" stroke and be conspicuously displayed on a contrasting background. If the building is not clearly visible from a named way of travel, the numerical designation (address) shall also be displayed near the main entrance to the property as well as at the driveway entrance that leads to the building. Property addresses shall be posted prior to requesting any inspections.

79. **APPROVED PLANS:** IRC Sections R105.7, R106.3.1, R106.4. When the building official issues a permit, the construction documents shall be approved in writing or by stamp. Work shall be done in accordance with the approved construction documents, any changes made during construction shall be resubmitted for approval. The building permit, inspection card, and 1 set of approved construction documents must remain on the job site at all times until the completion of the project.

80. **HEATING:** IRC R303.8. Every dwelling unit shall be provided with heating facilities capable of maintaining a room temperature of 68° F at a point 3' above the floor and 2' from exterior walls in all habitable rooms. Primary heating sources in all new and substantially remodeled buildings in designated areas 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 United States Environmental Protection Agency certified or a pellet stove either certified or exempt from certification by the United States Environmental Protection Agency.

81. **SKYLIGHTS:** IRC 308.6. 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. Skylights shall comply with Washington State Energy Code requirements and be provided with flashing appropriate for the skylight and the roof covering material.

82. **INTERIOR FINISH:** IRC R302.9, R702.3.8 & R702.4.2, R702.3.8.1. Wall and ceiling finishes shall have a flame-spread classification of not greater than

200 and a smoke-developed index of not greater than 450, except for trims, handrails, door and window frames, and wallpaper. When gypsum is used as a base for tile or wall panels for tub/shower enclosures, water-resistant gypsum conforming to ASTM C 1396, C1178, or C1278 shall be used. Water resistant gypsum wallboard may not be used over a Class I or II vapor retarder in a shower or tub compartment, or on ceilings where frame spacing exceeds 12" on center for ½" or 16" for 5/8" gypsum board, or where there will be direct exposure to water, orin areas subject to continuous high humidity. Fiber-cement, fiber-mat reinforced cement, glass mat gypsum backers, or fiber-reinforced gypsum backers in compliance with ASTM C 1288, C 1325, C 1178, or C 1278 and installed in accordance with manufacturers recommendations shall be used as backers for wall tile in tub & shower areas and wall panels in shower areas. Wood veneer paneling and hardboard paneling shall be placed on wood or cold-formed steel framing spaced not more than 16" on center. Wood veneer and hardboard paneling less than ¼" nominal thickness shall have gypsum board backer at least 3/8" thick. Wood veneer paneling of at least ¼" nominal thickness shall conform to ANSI/HPVA HP-1, and hardboard paneling shall conform to CPA/ANSI A135.5.

83. **GYPSUM WALLBOARD FASTENING:** IRC R702.3.6 & Table R702.3.5..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", and structural insulated panels at least 7/16".
    - 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.

    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.

84. **NUMBER OF BUILDING STORIES:** IRC Sections R101.2, R202. In accordance with the scope of the 2009 International Residential Code, (IRC) any building that exceeds 3 stories, must be built in accordance with the 2009 International Building Code (IBC). A building story is that portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above. The first "Story Above Grade" is the first story having its finished floor surface entirely above grade, except that a basement shall be considered as a story above grade where the finished surface of the floor above the basement is: 1) More than 6' above grade plane; 2) More than 6' above the finished ground level for more than 50% of the total building perimeter; or, 3) More than 12' above the finished ground at any level. The number of stories is the sum of the first story above grade plane plus all of the stories above.

85. **HEIGHT OF BUILDING / GRADE PLANE:** IRC Section 202. The building height is the vertical distance from grade plane to the average height of the highest roof surface. The grade plane is 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, (which is required) then the reference plane shall be established by the lowest points within the area between the building and the lot line, or, 6' from the building, whichever is less. See BMC Title 20 for height restrictions and measurement of height for certain areas or zones (Zoning Code).

86. **RETAINING WALLS:** IBC 1806.1, IRC R105.2, R404. Retaining walls that are not laterally supported at the top and that retain more than 24" of unbalanced fill 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 do not exceed 4' in height, measured from the bottom of the footing to the top of the wall, and that do not support a surcharge (load above) are exempt from permit requirements, but must still be constructed properly and must conform with Zoning Code Setback requirements. A separate permit is required for construction of a retaining wall.

ENERGY CODE

100. **FOUNDATION INSULATION:** WSEC Sections 502.1.4.8 and 602.4. Slab-on-grade insulation, at least R-10 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". For slabs installed inside a foundation wall, the insulation shall be installed to provide a thermal break between the slab edge and the foundation. Insulation installed outside the foundation shall extend from the top of the below-grade wall to the top of the footing. Insulation used on the interior side of the wall shall extend from the top of the below-grade wall to the below-grade floor level. Above grade insulation shall be protected.

101. **UNDER-FLOOR INSULATION:** WSEC Sections 502.1.4.7 and 602.5. Floors over unconditioned spaces, such as vented crawl spaces, unconditioned basements and garages shall be insulated with at least R-30 insulation. Insulation supports shall hold insulation in substantial contact with the subfloor and shall be installed such that spacing is no more than 24 inches on center.

102. **WALL INSULATION:** WSEC Sections 502.1.4.6 and 602.2. Above grade exterior walls shall be insulated with minimum R-21 insulation Faced batts shall be face-stapled *(not inset-stapled)*, to avoid compression. Below grade walls shall be insulated either on the exterior to a minimum level of R-10, or on the interior to the same level as walls above grade. Headers shall be insulated with minimum R-10 insulation.

103. **ATTIC INSULATION:** WSEC Section 502.1.4.5 and 602.1. **Ceilings below vented attics shall be insulated with minimum R-38.** Where eave vents are installed rigid baffles shall be installed to deflect the incoming air above surface of the insulation.

104. **VAULTED CEILING INSULATION:** WSEC Sections 502.1.6.3 and 602.1, IBC 1203.2. **Where two or more layers of rigid board insulation are used in a roof assembly, the vertical joints between each layer shall be staggered. Open-blown or poured loose fill insulation may be used in attic spaces where the slope of the ceiling is not more than 3 feet in 12 and there is at least 30 inches of clear distance from the top of the bottom chord of the truss or ceiling joist to the underside of the sheathing at the roof ridge.** Baffles shall be rigid material, resistant to wind driven moisture. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. A minimum of 1" of airspace shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than 1/150th of the area of the space ventilated, with 50 percent of the required ventilating area 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. When feasible, the baffles shall be installed from the top of the outside of the exterior wall, extending inward, to a point 6" vertically above the height of non-compressed insulation, and 12" vertically above loose fill insulation. See IBC 1203.2 for exceptions. Roof/ceiling assemblies where the ventilation space above the insulation is less than an average of 12 inches shall be provided with a vapor retarder. Faced batt insulation where used as a vapor retarder shall be face stapled. Single rafter joist vaulted ceiling cavities shall be of sufficient depth to allow a minimum 1" vented air space above the insulation. See WSEC 502.1.6.3 for exception for unvented attic assemblies. **Single rafter or joist vaulted ceilings shall be insulated to at least R-38.**

105. **HATCHES AND DOORS:** WSEC Section 502.1.4.4. Access doors from conditioned to unconditioned spaces (such as attic and crawl space access doors) 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 the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation.

106. **DUCT INSULATION:** WSEC Sections 503.9, 503.10 & Table 5-11. All heating ducts within unconditioned spaces shall be insulated to a minimum of R-8. Ducts installed under slabs shall be insulated to a minimum of R-5.

107. **PIPE INSULATION:** WSEC Section 503.11 & Table 5-12. Water pipes outside of the conditioned space shall be insulated to a minimum of R-3 or the thickness specified in WSEC Table 5-12. Cooling and heating systems shall be insulated to he thickness specified in Table 5-12.

108. **VAPOR RETARDER:** WSEC Section 502.1.6. Vapor retarders shall be installed on the warm side (in winter) of insulation. Vapor retarders are not required in roof/ceiling assemblies where the ventilation space

above the insulation averages 12" or greater or where all of the insulation is installed between the roof membrane and the structural roof deck.. Faced batt insulation where used as a vapor retarder shall be faced stapled.

109. **VAPOR BARRIER IN CRAWL-SPACE:** WSEC Section 502.1.6.7. A ground cover of 6 mil black polyethylene 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.

110. **WINDOWS:** WSEC Section 502.1.5 & Table 6-1. The total glazing area shall have an area weighted average U-factor not to exceed that specified in Table 6-1 on the 2006 WSEC Residential Prescriptive Compliance Form. (typically **.32**). Any change in windows must be approved by the Building Division before installation. NFRC compliance stickers shall remain on the windows until the framing inspection has been approved by the Building Department.

111. **EXTERIOR DOORS:** WSEC Section 502.1.5.2, 602.6. Glazed doors are considered to be windows. Exterior (opaque) doors shall have an area weighted average U-factor not to exceed that specified in Table 6-1 on the 2006 WSEC Residential Prescriptive Compliance Form (U-0.20). Exception: One unlabeled or untested exterior swinging door with the maximum area of 24 square feet may be installed for ornamental, security or architectural purposes

112. **EXHAUST FANS:** IRC Section M1507: Source specific exhaust ventilation is required in each kitchen, bathroom, water closet, laundry room, indoor swimming pool, spa, and other rooms where water vapor or cooking odor is produced. The minimum source specific ventilation effective exhaust capacity shall not be less than levels specified in Table M1507.3. Source specific ventilation systems shall be controlled by manual switches, dehumidistats, timers, or other approved means. Source specific ventilation system controls shall be readily accessible. Source specific ventilation ducts shall terminate outside the building. Exhaust ducts shall be equipped with back-draft dampers. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4. Terminal elements shall have at least the equivalent net free area of the duct work. Terminal elements for exhaust fan duct systems shall be screened or otherwise protected from entry by leaves or other material.

Table 1507.3 Minimum Required Exhaust Rates for One- and Two-Family Dwellings

	Laundry rooms or Bathrooms	Kitchens
Intermittently Operating	50 cfm	100 cfm
Continuous Operation	20 cfm	25 cfm

All fans shall provide the required flow when tested at 0.25 water gauge. Fans larger than the above prescriptive sizes may be necessary to attain the required flow.

113. **WHOLE HOUSE FAN:** IRC Section . Each dwelling unit shall be equipped with a whole house ventilation system, which shall be capable of providing the volume of outdoor air specified in Table 1508.2. Fans located 4 feet or less from the interior grill shall have a sone rating of 1.5 or less measured at 0.10" water gauge.

114. **WHOLE HOUSE VENTILATION SYSTEM CONTROLS:** IRC Section 1508. All ventilation system controls shall be readily accessible. Intermittently operated systems shall have a manual control, as well as an automatic control, such as a clock timer. The automatic control timer shall be set to operate the whole house fan system for at least 8 hours a day. A label shall be affixed to the control that reads "*Whole House Ventilation (See Operating Instructions).*" The installer shall provide the whole house ventilation system manufacturer's operation description and operating instructions.

Table 1508.2 Minimum Ventilation Rates:

(Continuously Operated Systems)(cfm)

Floor Area (ft^2)	Number of Bedrooms				
	0-1	2-3	4-5	6-7	>7
<1500	30	45	60	75	90
1501 – 3000	45	60	75	90	105
3001 – 4500	60	75	90	105	120
4501 – 6000	75	90	105	120	135
6001 – 7500	90	105	120	135	150
>7500	105	120	135	150	165

115. **VENTILATION DUCTS:** IRC Section M1507.3.3, M1508.5.3, M1508.7.3.. All ventilation exhaust ducts shall be sized in accordance with **Table 1508.6.2** and shall terminate outside the building. Exhaust ducts shall be equipped with back draft dampers and shall be insulated to a minimum of R-4 where passing through an unconditioned space.

Table 1508.6.2

Prescriptive Supply Fan Duct Sizing

Supply Fan Tested CFM at 0.40" w.g.		
Specified Volume from Table 408.1	Minimum Smooth Duct Diameter	Minimum Flexible Duct Diameter
50–90 cfm	4 inch	5 inch
90-150 cfm	5 inch	6 inch
150-250 cfm	6 inch	7 inch
250-400 cfm	7 inch	8 inch

116. **WINDOW OR WALL PORTS: IRC Section M1508.4.5..** Outdoor air shall be distributed to each habitable room by individual outdoor air inlets. Individual room outdoor air inlets shall have a controllable and secure opening and be capable of a total opening area of not less than 4 square inches. Outdoor air inlets shall be located so as not to take air from within 10 feet of a plumbing vent opening, or an appliance vent outlet, or where it will pick up objectionable odors, fumes or flammable vapors..

117. **DISTRIBUTION: IRC M1508.4.5.** Where outdoor air supplies *(window or wall ports)* are separated from fan locations by doors, adequate air flow shall be ensured by undercutting doors or installing grilles or transoms. Doors shall be undercut to a minimum of ½" above the surface of the finished floor covering.

118. **MAKE-UP THROUGH FURNACE: IRC M1508.5.1,.** Integrated forced-air ventilation systems shall distribute outdoor air to each habitable room through the forced-air system ducts. Integrated forced-air ventilation systems shall have an outdoor air inlet duct connecting a terminal element on the outside of the building to the return air plenum of the forced-air system, at a point within 4 feet upstream of the air handler. The outdoor air inlet duct connection to the return air stream shall be located upstream of the forced-air system blower and shall not be connected directly into a furnace cabinet to prevent thermal shock to the heat exchanger. The system will be equipped with a motorized damper connected to the automatic ventilation control. The required flow rate shall be verified by field testing with a flow hood or a flow measuring station. The whole house ventilation system shall be controlled by a 24-hour clock timer with the capability of continuous operation, manual and automatic control. This control will control the forced air system blower and the automatic damper. The 24-hour timer shall be readily accessible. The 24-hour timer shall be capable of operating the whole house ventilation system without energizing other energy-consuming appliances. At the time of final inspection, the automatic control timer shall be set to operate the whole house system for at least 8 hours a day. A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

119. **PRESCRIPTIVE HEATING SYSTEM SIZING: All equipment must now be sized using a recognized engineering practice. Typical sources include:**

- **ASHRAE Handbook of Fundamentals**
- **ACCA Manual J, 8th Edition- Residential Load Calculation.**
- **ACCA manual N- Commercial Load Calculation.**
- **WSU has developed a spread sheet for WSEC Chapter 5 code qualification. The CP Worksheet is applicable for heating systems sizing of wood frame apartments with heating only equipment (no heat pumps or air-conditioners). Spreadsheet available at the website listed.**
- **WSEC: www.energy.wsu.edu/code**

PRESCRIPTIVE FOUNDATION DETAILS

For Typical Light Frame Constructed Buildings

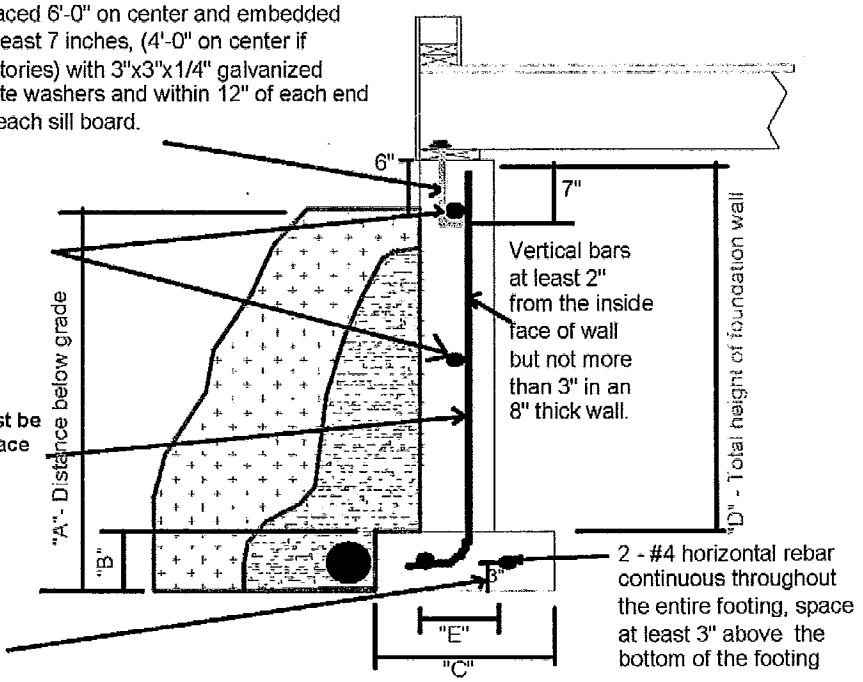
Assumptions for this Detail:

- **Conventional Light-Frame construction**
- **Wood or other light siding**
- **1500 psf soil bearing cap.**
- **Group I, II, or III soils (IRC R405.1)**
- **Backfill no closer than 6" to top of wall**
- **Walls must be laterally restrained at the top and bottom of wall**

#4 Horizontal bars spaced 18" on center. Top bar must be within 7" of the top of the wall to engage the anchor bolts.

Vertical bars spaced per the schedule below, or in accordance with IRC Tables R401.1.1(5), as adopted by Kitsap County. Bars must be hooked at the connection within the footing.

Reinforcement placed in concrete forms where the concrete will be exposed to earth, shall be at least 1-1/2" from the edge. Where concrete is placed agains the earth, there must be at least 3" clearance.



Minimum Requirements for Foundations Supporting Bearing Walls

Number of Floors Supported by Foundation	"E" Minimum Stem Wall Thickness	"A" Depth to Bottom of Footing	"B" Minimum Footing Thickness	"C" Minimum Footing Width	Minimum Footing Reinforcement
1	6"	12"	6"	12"	2 - #4 Bars Cont.
2	6"	12"	6"	15"	2 - #4 Bars Cont.
3	8"	12"	8"	23"	2 - #4 Bars Cont.

Minimum Wall Reinforcement (Grade 60 reinforcement steel)

Minimum Wall Thickness - (E)	Maximum Wall Height - (D)	Horizontal Reinforcement Steel	Vertical Reinforcement Steel*
6"	24"	1 - #4 Bar	#4 bars @ 48" oc
6"	36"	2 - #4 Bars @ 18" on center	#4 bars @ 48" oc
6"	60"	4 - #4 Bars @ 18" on center	#4 bars @ 24" oc
8"	48"	3 - #4 Bars @ 18" on center	#4 bars @ 48" oc
8"	72"	4 - #4 Bars @ 18" on center	#4 bars @ 48" oc
8"	108"	6 - #4 bars @ 18" on center	#7 bars @ 36" oc
10"	108"	6 - #4 bars @ 18" on center	#6 bars @ 36" oc

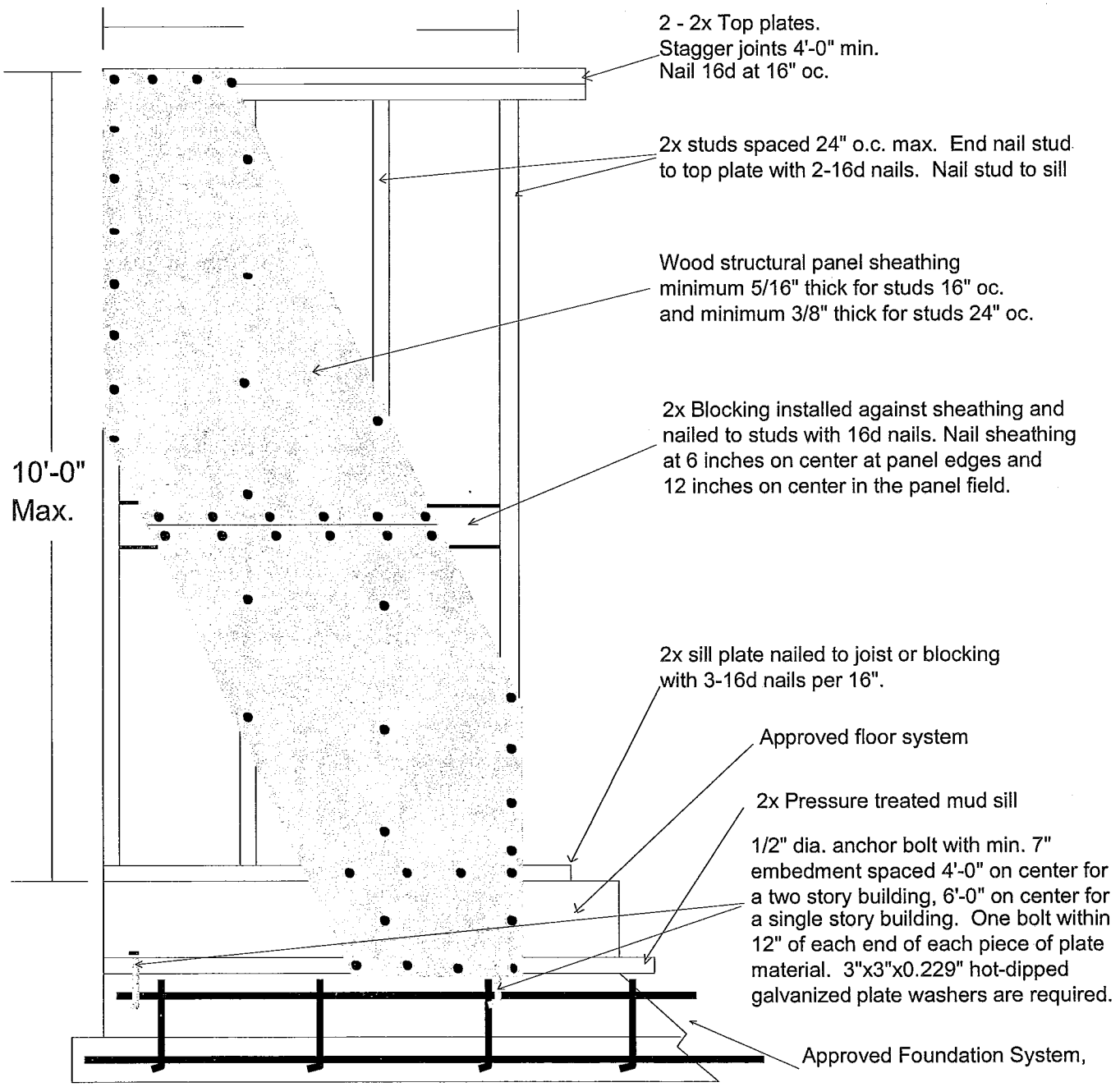
See Table R404.1.1 (8)

TABLE R404.1.1(8)
REINFORCED CONCRETE FOUNDATION WALLS [1,2]

MAXIMUM WALL HEIGHT[7,8] (FEET)	MAXIMUM UNBALANCED BACKFILL HEIGHT [6] (FEET)	MINIMUM VERTICAL REINFORCEMENT SIZE AND SPACING [3,4]			
		ALL GROUP I, II AND III SOILS [5]			
		MINIMUM WALL THICKNESS (INCHES)			
		5.5	7.5	9.5	11.5
5	4	#4@48"	#4@48"	#4@48"	#4@48"
	5	#4@48"	#4@48"	#4@48"	#4@48"
6	4	#4@48"	#4@48"	#4@48"	#4@48"
	5	#4@24"	#4@48"	#4@48"	#4@48"
	6	#5@24"	#4@48"	#4@48"	#4@48"
7	4	#4@36"	#4@36"	#4@48"	#4@48"
	5	#5@36"	#4@36"	#4@48"	#4@48"
	c	#6©36"	#5@36"	#4@36"	# 4@48"
	7	#6@24"	#6@36"	#4@36"	#4@48"
8	4	#4@36"	#4@36"	#4@36"	#4@36"
	5	#5@36"	#4@36"	#4@36"	#4@36"
	6	#6@36"	#5@36"	#4@36"	#4@36"
	7	#6@24"	#6@36"	#5@36"	#4@36"
	8	DR	#6@24"	#6@36"	#4@36"
9	4	DR	#5@36"	#5@36"	#5@36"
	5	DR	#5@36"	#5@36"	#5@36"
	6	DR	#5@36"	#5@36"	#5@36"
	7	DR	#6@36"	#5@36"	#5@36"
	8	DR	#7@36"	#6@36"	#5@36"
	9	DR	DR	DR	DR
10	4	DR	DR	#5@36"	#5@36"
	5	DR	DR	#5@36"	#5@36"
	6	DR	DR	#5@36"	#5@36"
	7	DR	DR	#6@36"	#5@36"
	8	DR	DR	#7@36"	#6@36"
	9	DR	DR	DR	DR
	10	DR	DR	DR	DR

1. Concrete shall have a specified compressive strength of not less than 2,500 psi at 28 days.
2. "DR" means a design is required in accordance with ACI 318 or ACI 332.
3. Reinforcement bars shall have a minimum yield strength of 60,000 psi. (Grade 60)
4. Vertical reinforcement shall be placed nearest the inside face of the wall a distance d from the outside face (soil side) of the wall where d equals 4" for a 5.5" wall, 5.5" for a 7.5" wall, 7" for a 9.5" wall and 9" for a 11.5" wall. The reinforcement shall be placed within a tolerance of +/- /z inch. In no instance shall concrete cover for reinforcement be less than 1 inch from the inside face of the wall, nor less than 3 inches from the outside face of the wall.
5. Soil classes are in accordance with the United Soil Classification System. Refer to Table R405.1. Group IV soils require a design prepared by a registered design professionaL
5. Unbalanced backfill height is the difference in height of the exterior and interior finish ground levels. Where there is an interior concrete slab, the unbalanced backfill height shall be measured from the exterior finish ground level to the top of the interior concrete slab.
7. Concrete stem walls not exceeding 5 feet in height, supporting less than 4 feet of unbalanced backfill, are exempt from the lateral bracing requirements of Section R404.1.
8 Concrete stem walls exceeding 5 feet in height, or supporting more than 4 feet of unbalanced backfill, shall comply with the lateral bracing requirements of Section R404.1. (All 10 foot high walls shall be braced in accordance with Table R404.1(1) as shown for 9' walls with 9' of unbalanced backfill.)

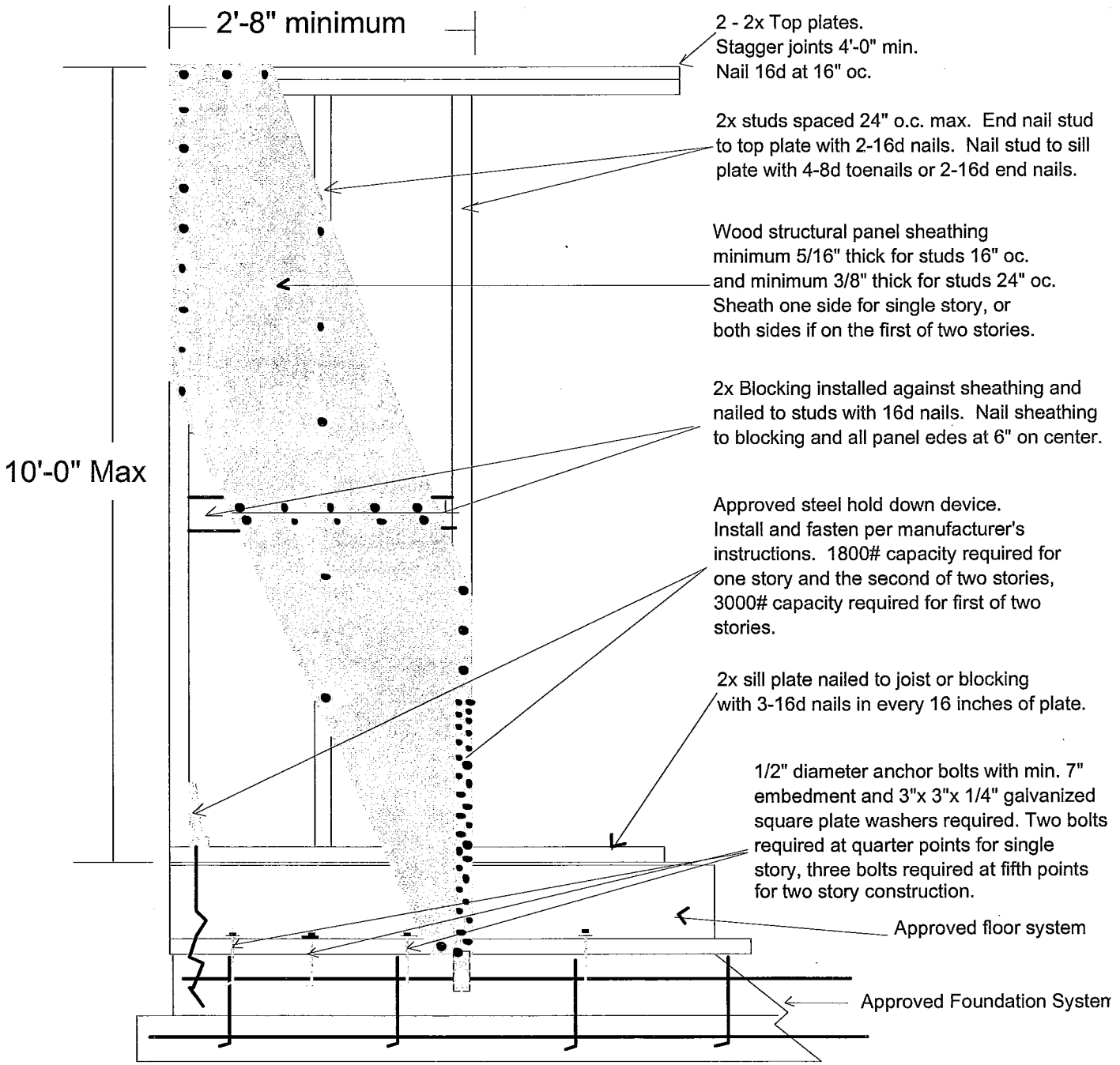
FIGURE 4:
TYPICAL PRESCRIPTIVE BRACED WALL PANEL
(per IRC Section R602.10.3, Method WSP)



* Nail sheathing with 8d common or galvanized box nails spaced 6" on center at sheathing panel edges and 12" oc. in the field.

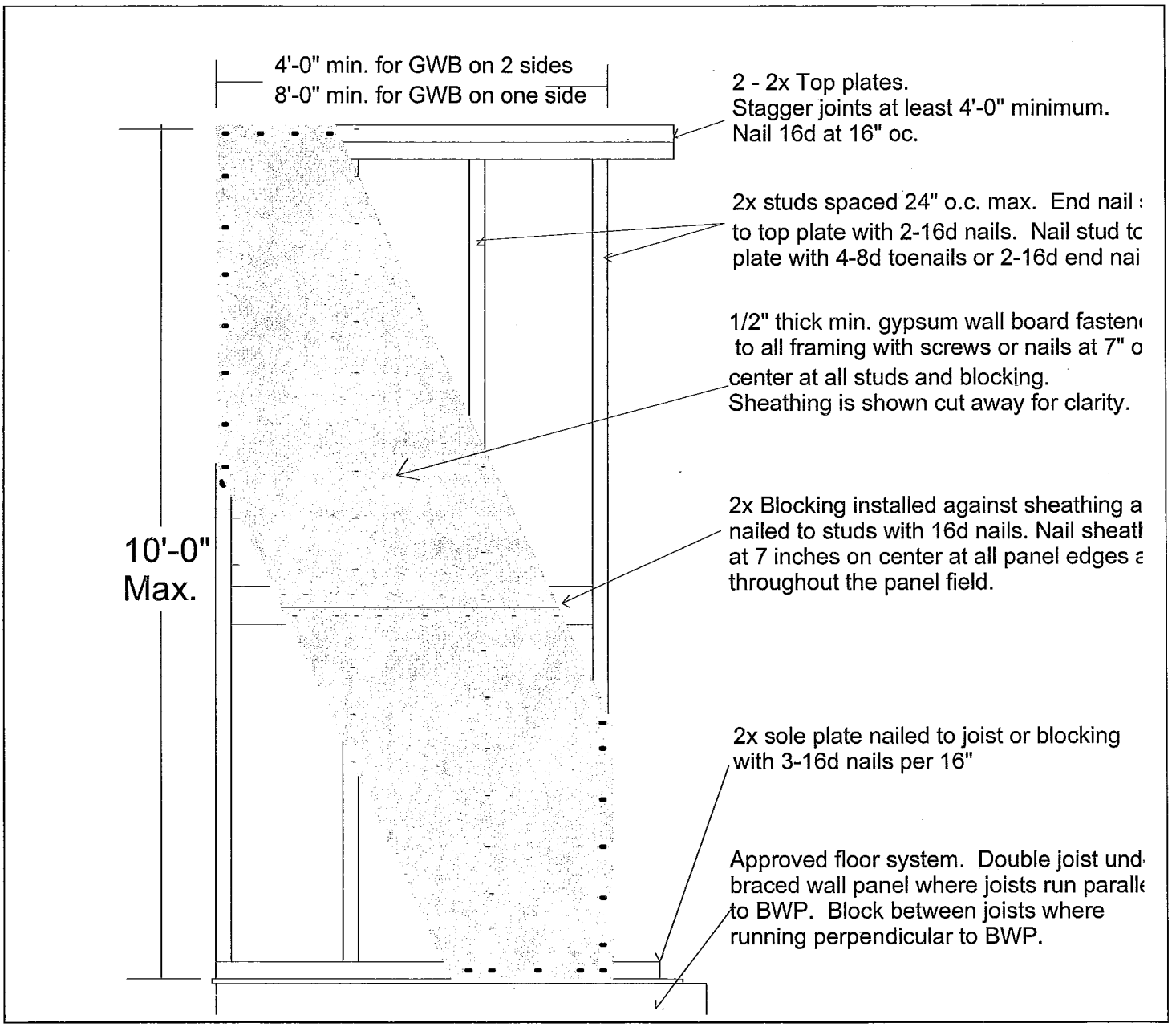
Braced wall panels (BWP or ABP) must be located at each end of each braced wall line.
Or, IRC Section R602.10.11 allows the braced wall panel (BWP) to be located up to 8' from the end of the braced wall line, provided there is a hold down device at the end of the BWP nearest the end of the braced wall line. Additional options may also be available, See IRC 602.10 for more information.

FIGURE 6:
PRESCRIPTIVE ALTERNATE BRACED WALL PANEL
(per IRC Section R602.10.6)

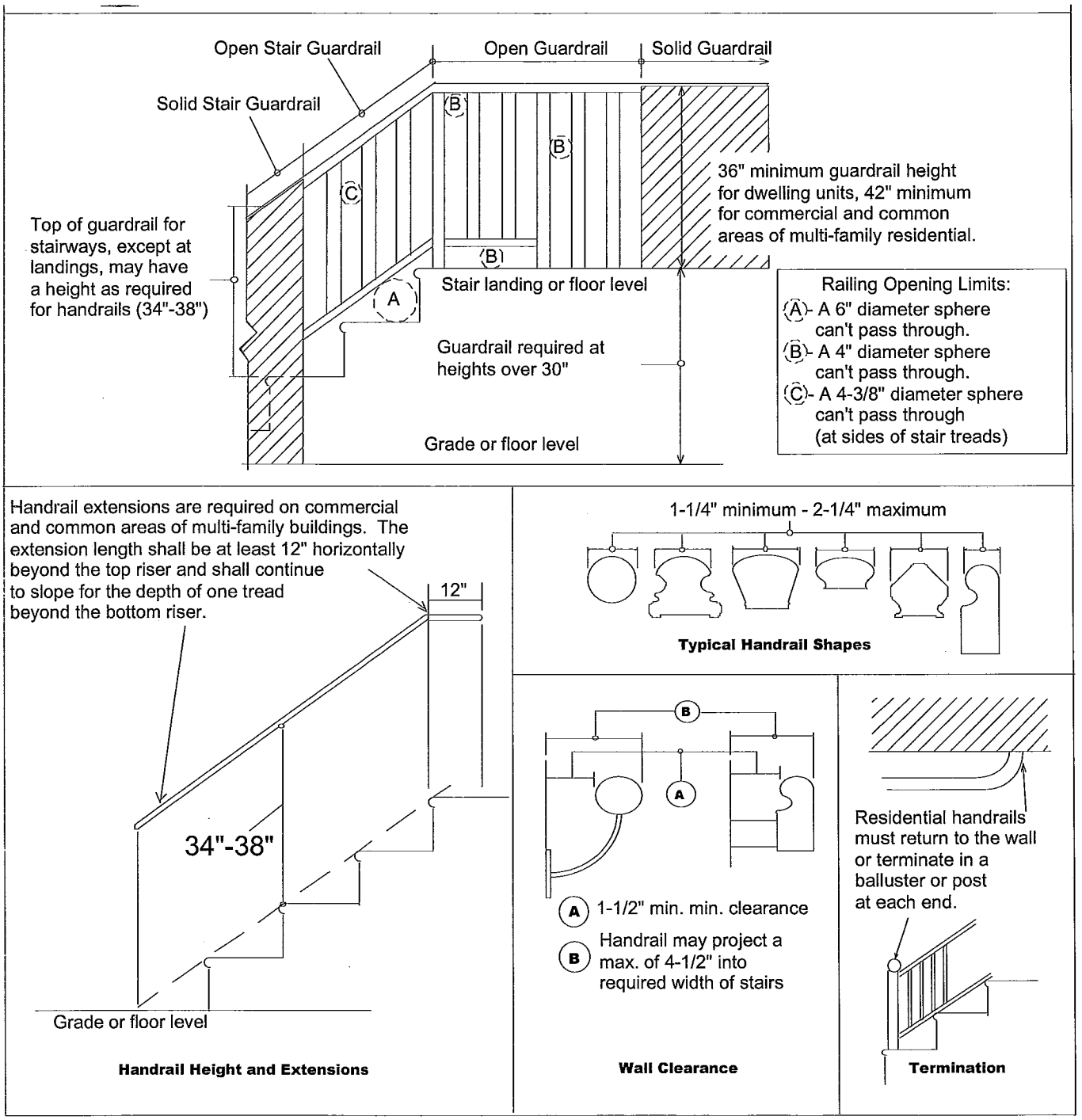


* Nail sheathing with 8d common or galvanized box nails spaced 6" on center at sheathing panel edges and 12" oc. in the field.

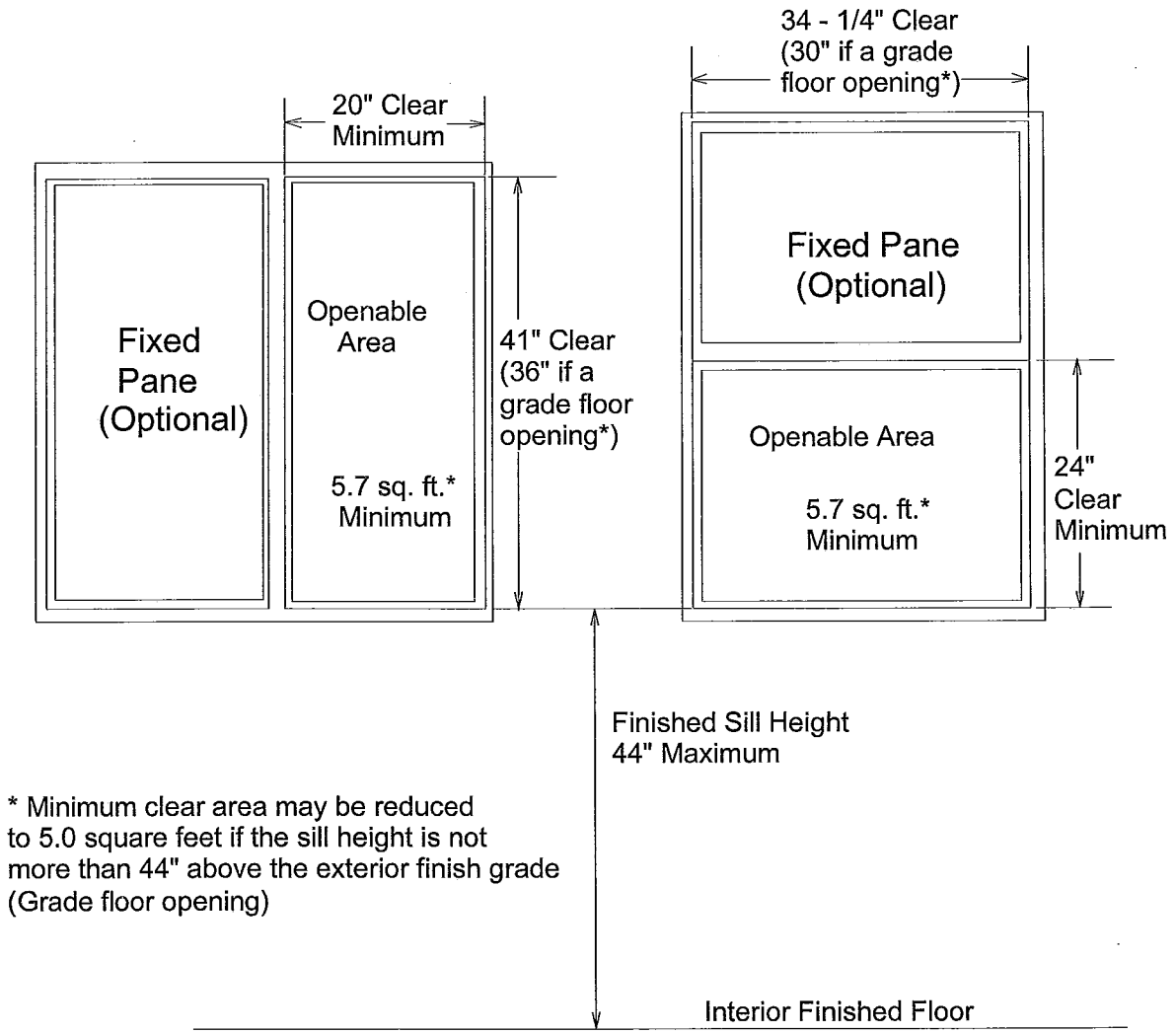
Figure 5:
Prescriptive Interior Braced Wall Panel
(per IRC Section R602.10.3, Method GB)



Standard Construction Details
Handrails and Guardrails
IRC 311.5.8



STANDARD CONSTRUCTION DETAILS
EMERGENCY EGRESS/RESCUE OPENING
R310



* Minimum clear area may be reduced to 5.0 square feet if the sill height is not more than 44" above the exterior finish grade (Grade floor opening)

Notes:

1. Basements in dwelling units and every sleeping room below the fourth story shall have at least one emergency escape and rescue window or door opening directly to an approved outside location.
2. The door or window shall be openable from the inside without the use of separate tools.
3. Finished sill height of 44" is measured from interior finished floor level. A step may not be used to achieve proper sill height unless it complies with the code requirements as a landing.