RAYMORE
development services

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RESIDENTIAL PLAN REVIEW CHECKLIST

- 2012 International Residential Code
- 2009 International Energy Conservation Code
- **Raymore Municipal Code, Chapter 500**

The numbered items on the following pages are associated with the above referenced codes, as adopted and amended by the City of Raymore. 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 2012 International Residential Code, substantial code changes or differences between the old (2006 IRC) and the new (2012 IRC) codes are in **bold type.**

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 International Residential Code or any other ordinance of the City of Raymore. Permits presuming to give authority to violate or cancel the provisions of the codes and ordinances of the City of Raymore shall not be valid.

Office hours are from 8:00 a.m. to 5:00 p.m. Monday through Friday. To schedule an inspection, call (816) 331-7916 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 must be made before 12:00 p.m. in order to be scheduled for the same business day. The final building inspection will not be approved until other department final inspections have been performed and approved (Public Works).

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 with habitable space 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 if within 44 inches of exterior grade. The minimum net clear openable height dimension shall be 24". The minimum net clear openable width dimension shall be 20". The window 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 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. 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, 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. When any alterations or repairs are made that require a permit, smoke alarms must be installed in accordance with **IRC 314.1**. 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. Some additional exceptions may apply, see IRC 314.1.

4. **AUTOMATIC FIRE SPRINKLERS: (Optional) R313. A builder of a one- or two- family dwelling or townhouse shall offer to any purchaser on or before the time of entering into the purchase contract the option, at purchaser's cost, to install or equip fire sprinklers in the dwelling or townhouse.**

5. **CARBON MONOXIDE ALARMS: New construction, an approved carbon monoxide alarm shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units within which fuel-fired appliances are installed and in dwelling units that have attached garages.**

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

    1. Glazing in swinging doors, except jalousies.
    2. Glazing in fixed, sliding, bi-fold, door assemblies and panels in swinging doors (except jalousies).
    3. Glazing in storm doors.
    4. Glazing in all unframed swinging doors.
    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 any standing or walking surface.
    6. Glazing in any opening adjacent to a door within 24" **arc** or where the bottom is less than 60" above the walking surface.
    7. 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 within 36" horizontally of the plane of the glazing.
    8. Glazing in guards and railings
    9. 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 inches above the pool side of the glazing and

the glazing is within 5' of a swimming pool or spa's water edge.

10. Glazing in walls enclosing stairway or ramp landings or within 5' of the bottom or top of stairways where the bottom edge of the glass is less than **36"** above a walking surface or landing.

7. **NATURAL LIGHT & VENTILATION** IRC Section R303.1. All habitable rooms shall be provided with aggregate-glazing area of not less than eight percent (8%) of the floor area of such rooms. Natural ventilation shall be through windows, doors, louvers or other approved openings to the outside. The minimum openable area shall be four percent (4%) of the floor area being ventilated. (Exceptions may apply, see IRC R303.1)

8. **EXHAUST FANS:** IRC Section M1501. Exhaust fans are required in each kitchen (above cooking appliances), bathroom, water closet room, 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 from which it cannot again be readily drawn in by a ventilating system. Air shall not be exhausted into an attic or crawl space. *See the energy section of this checklist for additional requirements.*

9. **CLOTHES DRYERS:** IRC Sections M1502. Clothes dryer exhaust ducts shall terminate outside the building and be equipped with a backdraft damper. Exhaust ducts shall be constructed of minimum 0.0157-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. Duct length shall not exceed a total combined vertical and horizontal length of **35'. The maximum length of the duct shall be in accordance with Table M1502.4.4.1.** An approved **transition** duct connector of not more than 8' in length may be used within a dwelling, provided it is not concealed within construction. No screens shall be installed at the duct termination.

10. **RANGE HOODS and OVENS:** IRC Section **M1503** and 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.

11. **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 (tub). The clear space in front of the water closet shall be at least 21".

12. **SHOWER AREAS:** IRC **Figure 307.1**, R305. 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. A non-absorbent wall finish shall be provided to a height of not less than 6 feet above the shower floor.

13. **CHIMNEYS & FIREPLACES:** IRC Chapter 10. Factory-built chimneys and fireplaces shall be tested in accordance with **Type HT requirements of UL 103** and UL 127, listed and labeled, and shall be installed and terminated in accordance with the manufacturer's installation instructions. Masonry fireplaces shall be constructed in accordance with IRC Chapter 10.

14. **COMBUSTION AIR (FIREPLACE):** IRC R1006. Solid fuel burning appliances and fireplaces shall be provided with outside source of combustion air, ducted to the firebox with ducts at least 4" in diameter.

15. **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.

16. **CLEARANCE TO COMBUSTIBLES:** IRC Section 1003.18. 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. IRC Section 1001.11. Combustible material shall not be placed within 2" of the front face and sides. 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.

17. **COMBUSTION AIR:** IRC Section M1701.1. In buildings of unusually tight construction, (all new construction) fuel-burning (liquid or solid) appliances shall obtain combustion air from outside the sealed thermal envelope. Combustion air for gas appliances shall be in accordance with IRC Section G2407.

18. **PHYSICAL SECURITY: RMC R324.3.1. Wall framing at door openings shall be set in openings constructed with double studs on each side. Doors with sidelights shall have double stud construction on each side of the door and on each side of the sidelight(s). Horizontal blocking shall be placed between studs at the door lock height for 3 stud spaces on each side of the door opening. R324.4.6 Sliding doors. All sliding glass doors shall be equipped with a secondary locking device consisting of a metal pin, a surface mounted bolt assembly, or other equivalent device as approved by the building official. Where used, metal pins shall be installed at the intersection of the inner and outer panels of the inside door and shall not penetrate the frame's exterior surface.**

19. **EXTERIOR LIGHTING: R324.6.1 Front and street side exterior lighting. All doors shall be protected with a minimum of one lighting outlet providing a minimum of 60 watt lighting (or energy efficient equivalent). R324.6.2 Lighting protection. Lighting outlets required by this Section shall be located a minimum of eight feet (8') above grade or adjacent walking surface accessible from grade, or shall be of a type manufactured such that the light bulb is not readily accessible.**

20. **APPLIANCE LOCATIONS:** IRC Section G2406.2 (303). 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).*

21. **APPLIANCES LOCATED IN GARAGE:** IRC Section M1307.3. Appliances located in a garage or carport (or any rooms that directly communicate with the garage) shall be protected from impact by automobiles and, when such equipment generates a glow, spark or flame capable of igniting flammable vapors, (including electric or gas water heaters, furnaces, pumps, etc.) it shall be installed with sources of ignition at least 18" above the floor.

22. **WATER HEATER:** IRC Section M1307.3. Water heaters 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 three-quarter (3/4) inch diameter drain to an approved location. Temperature and pressure relief valves shall be drained to an approved fixture or outside. Drain may not be trapped, must terminate not less than 6" from grade or concrete floor and shall not be threaded. All domestic electric hot water heaters shall comply with UL 174 and also Chapter 34 through 43.

23. **L.P.G. (PROPANE) APPLIANCES:** NFPA 58 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. Appliances that burn L.P.G. (heavier than air) 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 2012 International Fire Code. L.P.G. standards shall be NFPA 54 and NFPA 58.

Typical LPG Tank Setbacks

L.P.G. Tank Size (gal)	Required Setback from Building 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.

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

25. **BACKFLOW PREVENTORS:** 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 prevention device, or atmospheric vacuum breaker. All cross connections between potable water sources and other systems, such as landscape irrigation systems, hydronic-radiant heating systems, swimming pools, etc. shall be equipped with backflow prevention devices in accordance with **IRC Chapter 29 and Article X of Raymore Municipal Code Chapter 500.**

26. **TRAP PRIMERS: IRC Section 3201.2. Floor drains or similar traps connected to the drainage system and subject to infrequent use shall be provided with an approved automatic means of maintaining their water seals.**

27. **GARAGE/DWELLING DOOR:** IRC Section **R302.5.** 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.

28. **GARAGE/DWELLING SEPARATION:** IRC Section **R302.5.1** The garage shall be separated from the residence and its attic area by not less than ½" gypsum board applied to the garage side. 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 (this includes all bearing walls, posts, columns, etc.).

29. **SEPARATION BETWEEN DWELLING UNITS:** IRC Section **R302.3**. Walls and floors separating dwelling units in two-family dwellings shall not be less than 1-hr fire-resistive construction. **Except when fire sprinklers are installed then ½ hour rating**. See **R302.2** for townhouse separation.

30. **FIRE-RESISTANCE OF EXTERIOR WALLS:** IRC Section R302.1, 302.2 & 302.3. 1-hr fire-resistive construction is required within 5 feet of property lines (or assumed property lines between separate buildings located on the same property). Openings are not permitted at less than 3' and are limited between 3 and 5 feet. Unprotected, detached garages shall be at least 3 feet away from other residential or accessory buildings.

31. **FLOOR AREA:** IRC Section R304.1 & R304.2. Dwelling units shall have at least one 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. Section R304.3 requires that habitable rooms other than a kitchen shall not be less than 7' in any dimension.

32. **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" over the fixture and at the front clearance areas of fixtures.

33. **ATTIC ACCESS:** IRC Section R807.1. Attics which exceed 30 square feet and have a minimum vertical height of 30" must be provided with an access opening of not less than 22" x 30" and located in a hallway, corridor, or readily accessible location. *The attic access shall not penetrate the garage/dwelling fire resistive barrier.*

34. **DOORS & EXITS:** IRC Section **R311.2**. In every dwelling and accessory building, at least 1 doorway shall be of a size as to permit the installation of a door not less than **32"** in width and not less than **78"** in height that can be opened without the use of a key, tool or special knowledge.

35. **LANDINGS:** IRC Section **R311.3**. There shall be a floor or landing on each side of exterior doors with dimensions of at least 36 inches 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)*. 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% (1/4" per foot).

36. **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 leading edges of the treads. 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. Insect screening shall not be considered as a guard.

37. **HANDRAILS:** IRC Section **R311.7.8 & 311.7.8.1**. 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. 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 20 for separate handrails handout)* 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.

38. **STAIRWAYS:** IRC Section R311.5. 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. (See Item 39 for spiral stairways.)

39. **STAIRWAYS (RISE & RUN):** IRC Section **R311.7**. 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.

40. **STAIRWAY ILLUMINATION** **R303.7**. 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.

41. **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.

42. **WINDING STAIRWAYS:** IRC Section **R311.7.5.2.1** Winding stairways shall have no width of run less than 6" and a required width of run (10") provided at **any point within the clear width of the stair.**

43. **SPIRAL STAIRWAYS:** IRC Section **R311.7.10.1**. 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 403.1.
    - Supporting 1 floor: minimum 6" by 12".
    - Supporting 2 floors: minimum 6" x 15".
    - Supporting 3 floors: minimum 8" x 23".

    As a minimum standard, see the attached handout: *Prescriptive Foundation Requirements,* Page 16.

41. **MIN. CONCRETE FOOTING REINFORCEMENT:** IRC Section 403.1.3. At least 2 #4 bars are required for all continuous concrete footings. As a minimum standard, see the attached handout: *Prescriptive Foundation Requirements,* IRC Section 403.

42. **MIN. CONCRETE FOUNDATION WALL SIZE:** IRC Section 404.1, **Tables R404.1.2(3).** All basement walls that 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 Missouri State Design Professional.

43. **MIN CONCRETE FOUNDATION REINFORCEMENT:** IRC Section R404. As a minimum standard, see Page 16 for the attached handout: *Prescriptive Foundation Requirements,* IRC Section 403.

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. Foundations must extend at least 6" above finish grade. Monolithic foundations shall have footings at least 12 inches wide, be at least 12 inches below grade, extend at least 6 inches above finish grade, and shall have at least 2 #4 bars at the bottom of the footing and 1 #4 bar located within 7 inches of the top of the slab. See Page 16, *Foundation Requirements,* for additional information. IRC R309.3: 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 & 602.10.1. 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 dampproofed 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.

48. **PIER PADS & COLUMNS:** IRC Section R407.3. Concrete pier footings shall have a depth to width ratio not to exceed 2:1, minimum 36" deep. 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 and at least 6 inches beyond each side of the exterior dimensions of the chimney and must also be at least 12" below grade. 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 150 square feet of under-floor space area. One such ventilating opening shall be within 3 feet of each corner of the building. 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.** All wood in contact with the ground and that supports permanent structures intended for human occupancy shall be approved pressure preservative treated wood suitable for ground contact use. All wood framing members that rest directly on concrete or masonry foundation walls shall be treated wood or decay-resistant heartwood of redwood, black locust, or cedars. (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 **R317.1.4.** 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, R502.2.1 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. See M1305.1.4 for mechanical equipment access.

61. **WALL FRAMING:** IRC Sections 602.3.1, 602.3.2, 602.3.3, 602.3.4, 602.6 & 602.9. 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). 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 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 shall be supported on continuous foundations.

62. **WALL BRACING:** IRC Section 602.10. All braced walls and cripple wall bracing in shall be constructed in accordance with IRC Table R602.10.1 and Sections R602.10 and R602.12. 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 R602.10.11).
    - Braced wall lines may have offsets, out of plane of up to 4'0".
    - In one-story buildings, interior braced wall lines shall be supported on continuous foundations at intervals not exceeding 16 feet. In two- story buildings all interior braced wall panels shall be supported on continuous foundations. (See IRC Section R602.10.3.)
    - 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 have at least 75% of the wall length sheathed in accordance with IRC R602.10.1. If the building exceeds 16 feet in length and interior braced wall panels are not supported on continuous concrete foundations, the cripple walls shall be fully sheathed with a nailing pattern of 4" o.c. along all panel edges.
    - Where "stepped foundations" occur, See 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. Fireblocking & Draftstopping 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 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. Fireblocking materials shall consist of materials listed in IRC Section R602.8.1. Loose-fill insulation material shall not be used as a fireblock unless specifically tested in the form and manner intended. Fireblocking 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, draftstops shall be installed so that the area of the concealed space does not exceed 1000 square feet. Draftstopping materials shall consist of materials listed in Section R502.12.1. All fireblocking and draftstopping 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, and R703.10. 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.

66. **WEATHER RESISTIVE BARRIER:** IRC Sections R703.2, R703.4 R703.8, and R703.9.1 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 housewrap, 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 housewrap 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. **See Section R703.8 for specific locations.**

67. **ANCHORED STONE AND MASONRY VENEER:** 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 1.

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 pressure treated wood or wood of natural resistance to decay as identified in item #56 of this checklist.

69. **DECKS & EXTERIOR STAIRS:** IRC Section R317. 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 #56 of this checklist. Ledger boards fastened to a wall shall be properly flashed and positively connected.

70. **WOOD TRUSSES:** IRC Section R502.11. 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, 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. 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).

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 **40% and not more than 50%** 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 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 **R303.9**. 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.

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 International Energy Conservation Code requirements and be provided with flashing appropriate for the skylight and the roof covering material.

82. **GYPSUM WALLBOARD:** IRC R702.3.8 & R702.4.2, R702.3.8.1. When gypsum is used as a base for tile or wall panels for tub/shower enclosures, water-resistant gypsum shall be used. Water resistant gypsum wallboard may not be used over a vapor retarder, or on ceilings where frame spacing exceeds 12" on center. Cement, fiber-cement, and glass mat gypsum backers in compliance with ASTM C 1288, C 1325 or C 1178 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.

83. **GYPSUM WALLBOARD FASTENING:** IRC R702.3.6 & Table R702.3.5, IBC 2306.5.1. Screws for attaching gypsum board to wood framing shall be type W or Type S in accordance with ASTM C 1002 and shall penetrate the wood not less than 5/8".
    - 3/8" 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. 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. In accordance with the scope of the 2012 International Residential Code, (IRC) any building that exceeds 3 stories, must be built in accordance with the 2012 International Building Code (IBC).

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, where the lot line is more than 6' from the building, the grade plane shall be established by the lowest points between the building and points 6' from the building. See Unified Development Code for maximum height requirements.

86. **RETAINING WALLS:** IBC 1806.1, IRC R105.2. Retaining walls 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, that do not support a surcharge (load above) are exempt from permit requirements, however, must still be constructed properly and must conform with the Unified Development Code setback requirements. A separate permit is required for construction of a retaining wall 4 feet or greater.

ENERGY CODE

100. **FOUNDATION INSULATION:** Slab-on-grade insulation, (typically R-10) installed inside the foundation wall, shall extend downward from the top of the slab for a minimum distance of 24". Horizontally beneath the slab for a minimum combined distance of 24" will not be enforced because of heavy termite infestation. Insulation installed outside the foundation shall extend downward to a minimum of 24". Above grade insulation shall be protected.

101. **UNDER-FLOOR INSULATION:** Floors over unconditioned spaces, such as vented crawl spaces, unconditioned basements and garages shall be insulated to not less than the nominal R-value shown for floors over unconditioned spaces on the energy code application for the compliance option chosen (typically R-19). Insulation supports shall hold insulation in substantial contact with the subfloor and shall be installed such that spacing does not exceed 24 inches on center.

102. **WALL INSULATION:** Above grade exterior walls shall be insulated to not less than the nominal R-value as specified on the energy code application for the compliance option chosen. (Typically R-13) 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 basement floor.

103. **ATTIC INSULATION:** Ceilings below vented attics shall be insulated to not less than the nominal R-value shown for ceilings on the energy code application for the compliance option chosen (typically 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:** Vaulted **or single rafter ceilings 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 airspace above the insulation** shall be insulated to not less than the nominal R-value shown for vaulted ceilings ****limited to 500 square feet of ceiling area or 20% of the total ceiling area for any one dwelling unit. *(2x10 rafters require High-Density 2 R-30 to meet prescriptive Energy Code.)***

105. **HATCHES AND DOORS:** 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.

106. **DUCT INSULATION:** All heating ducts within attic spaces shall be insulated to a minimum of **R-8**. All other ducts installed shall be insulated to a minimum of **R-6**, except ducts installed completely inside the building envelope.

107. **PIPE INSULATION: Water pipes outside of the conditioned space shall be insulated to a minimum of R-3.**

108. **VAPOR RETARDER:** 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.

109. **VAPOR BARRIER IN CRAWL-SPACE:** 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:** The total glazing area shall have an area weighted average U-factor not to exceed that specified in Table 402.1.1. (typically **.35**). The window brand, model and U-value must be shown on the energy code application. Any change in windows must be approved by the Building Inspection Division before installation. NFRC compliance stickers shall remain on the windows until the framing inspection has been approved by Building Inspections.

111. **EXTERIOR DOORS: 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 303.1.3 (3) (typically **.35**). **An insulated fiberglass or thermally broken steel door will usually meet the U-factor requirement.**

112. **EXHAUST FANS:**

Table 3-1 Minimum Source Specific Ventilation Capacity Requirements

	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:** 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 3-2. Fans located 4 feet or less from the interior grill shall have a zone rating of 1.5 or less measured at 0.10" water gauge.

114. **WHOLE HOUSE VENTILATION SYSTEM CONTROLS:** 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 3-2 Minimum and Maximum Ventilation Rates: Cubic Feet per Minute (CFM)

Floor Area, ft^2	Number of Bedrooms													
	2 or less		3		4		5		6		7		8	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
< 500	50	75	65	98	80	120	95	143	110	165	125	188	140	210
501-1000	55	83	70	105	85	128	100	150	115	173	130	195	145	218
1001-1500	60	90	75	113	90	135	105	158	120	180	135	203	150	225
1501-2000	65	98	80	120	95	143	110	165	125	188	140	210	155	233
2001-2500	70	105	85	128	100	150	115	173	130	195	145	218	160	240
2501-3000	75	113	90	135	105	158	120	180	135	203	150	225	165	248
3001-3500	80	120	95	143	110	165	125	188	140	210	155	233	170	255
3501-4000	85	128	100	150	115	173	130	195	145	218	160	240	175	263
4001-5000	95	143	110	165	125	188	140	210	155	233	170	255	185	278
5001-6000	105	158	120	180	135	203	150	225	165	248	180	270	195	293
6001-7000	115	173	130	195	145	218	160	240	175	263	190	285	205	308
7001-8000	125	188	140	210	155	133	170	255	185	278	200	300	215	323
8001-9000	135	203	150	225	165	248	180	270	195	293	210	315	225	338
> 9000	145	218	160	240	175	263	190	285	205	308	220	330	235	353

- For residences that exceed 8 bedrooms, increase the minimum requirement listed for 8 bedrooms by an additional 15 CFM per bedroom. The maximum CFM is equal to 1.5 times the minimum

115. **VENTILATION DUCTS:** All ventilation exhaust ducts shall be sized in accordance with Table 3-3 and shall terminate outside the building. Fan 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 3-3: Prescriptive Exhaust Duct Sizing

CFM @ 0.25" W.G	Minimum Flex Diameter	Maximum Length (feet)	Minimum Smooth Diameter	Maximum Length Feet	Maximum Elbows [1]
50	4 inch	25	4 inch	70	3
50	5 inch	90	5 inch	100	3
50	6 inch	No Limit	6 inch	No Limit	3
80	4 inch[2]	N.A.	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]	N.A.	5 inch	50	3
100	6 inch	15	6 inch	No Limit	3
125	6 inch	15	6 inch	No Limit	3
125	7 inch	70	7 inch	No Limit	3

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

116. **WINDOW OR WALL PORTS:** 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. *Outdoor air inlets are **not** required if the home is provided with a ducted forced air heating system that communicates with all habitable rooms.*

117. **DISTRIBUTION:** 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:** If the ventilation system is combined with the forced air furnace, the outdoor air 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.

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.**
- **www.energy.gov./energycode**

Table 3-6: Prescriptive Supply Fan Duct Sizing

Supply Fan Tested at 0.40" W.G.		
Specified Volume from Table 3-2	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

Prescriptive Foundation Details

For Typical Light Frame Constructed Buildings

Assumptions for this Detail:

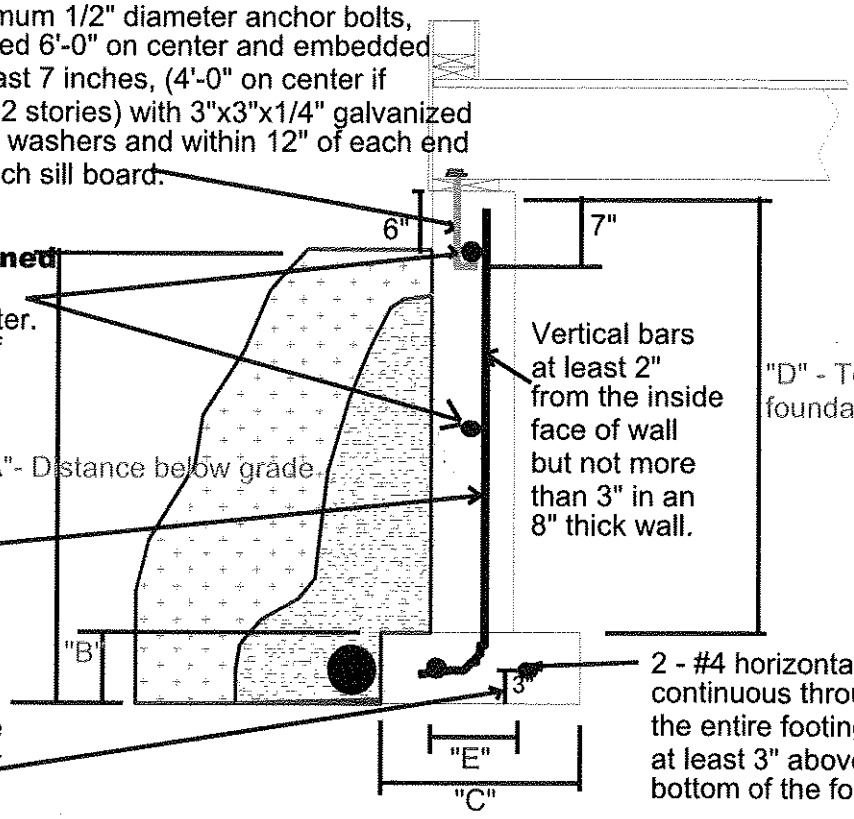
- **Conventional Light-Frame construction**
- **Wood or other light siding**
- **1500 psf soil bearing cap.**
- **Group I, II, or III soils**
- **Backfill no closer than 6" to top of wall**
- **Walls must be laterally restrained at the top and bottom of wall**

Minimum 1/2" diameter anchor bolts, spaced 6'-0" on center and embedded at least 7 inches, (4'-0" on center if over 2 stories) with 3"x3"x1/4" galvanized plate washers and within 12" of each end of each sill board.

#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 against the earth, there must be at least 3" clearance.



2 - #4 horizontal rebar continuous throughout the entire footing, spaced at least 3" above the bottom of the footing

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"	3 - #4 Bars Cont.

Minimum Wall Reinforcement (Grade 40 reinforcement steel)

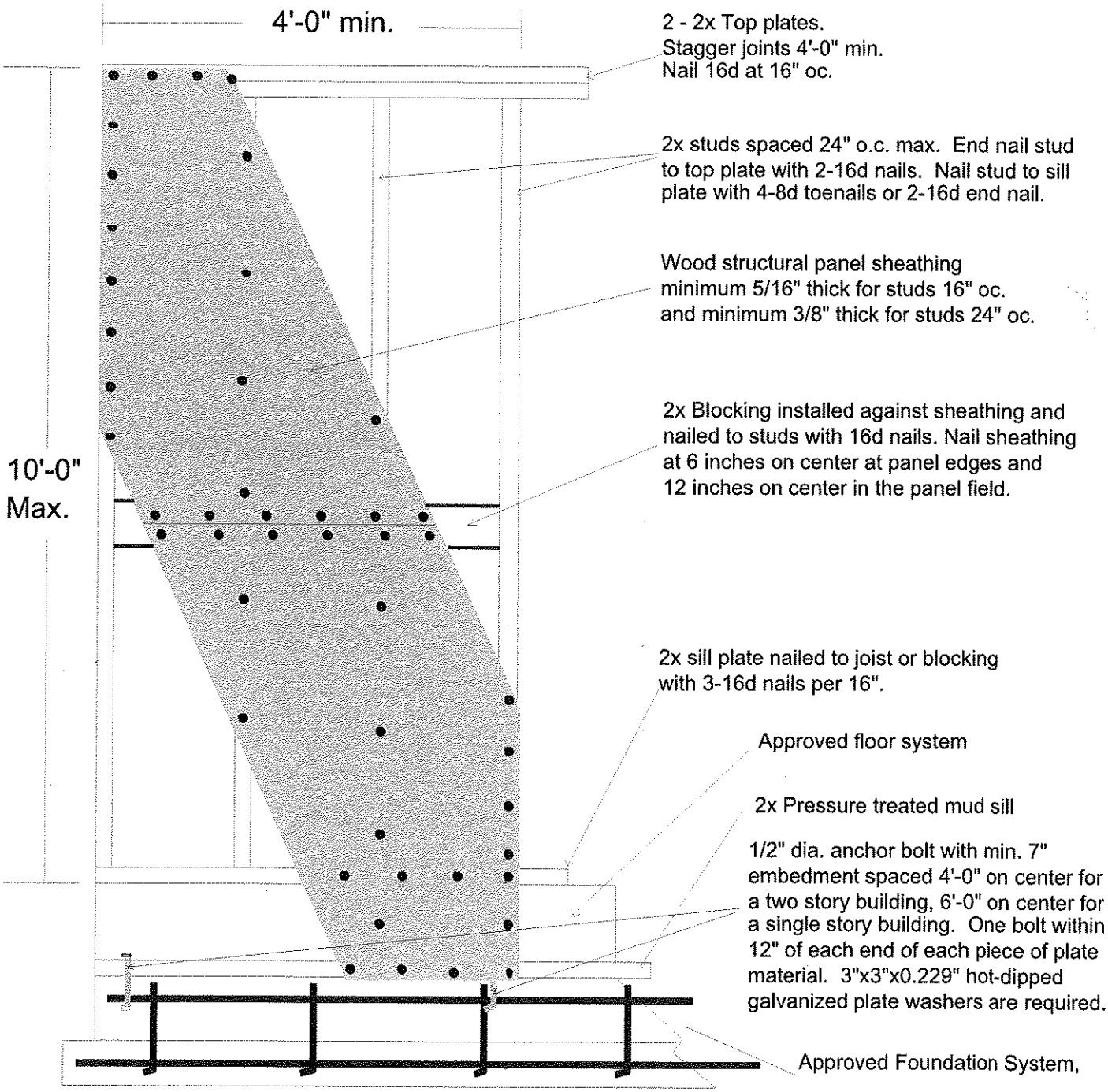
Minimum Wall Thickness - (E)	Maximum Wall Height - (D)	Horizontal Reinforcement Steel	Vertical Reinforcement Steel*
6"	24"	1 - #4 Bar	#4 bars @ 48" oc
6"	36"	2 - #4 Bars @ 24" on center	#4 bars @ 24" oc
6"	60"	4 - #4 Bars @ 24" on center	#4 bars @ 24" oc
8"	48"	3 - #4 Bars @ 24" on center	#4 bars @ 24"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

* Additional options are available for your specific project. See IRC Section R404, as amended.

Figure 4:

Typical Prescriptive Braced Wall Panel

(per IRC Section R602.10.3, Method #3)

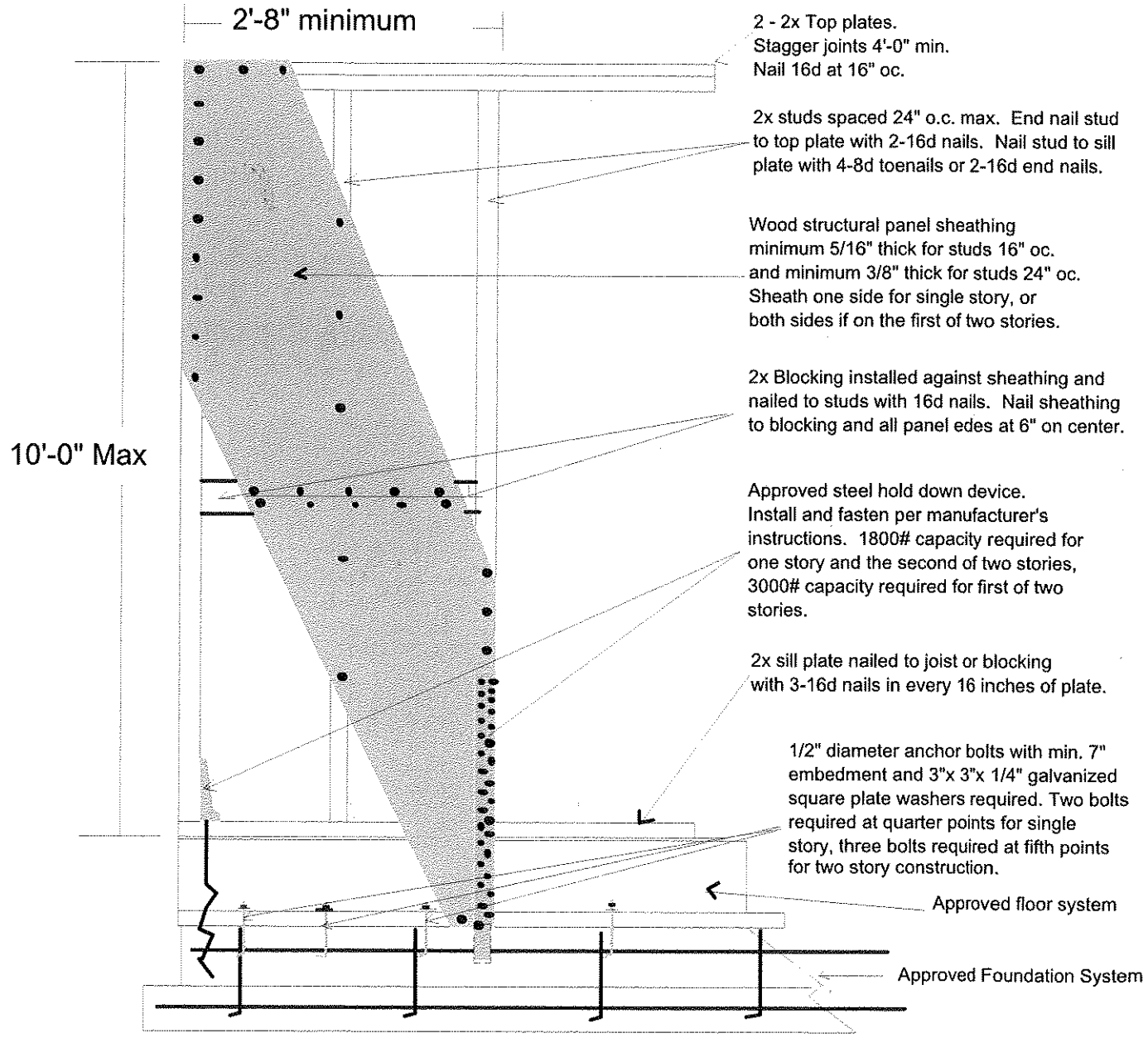


* Nail sheathing with 8d common or galvanized box nails spaced 6" on center at sheathing panel edges and 12" oc. in the field.

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.

Figure 6:

Prescriptive Alternate Braced Wall Panel
(per IRC Section R602.10.6)

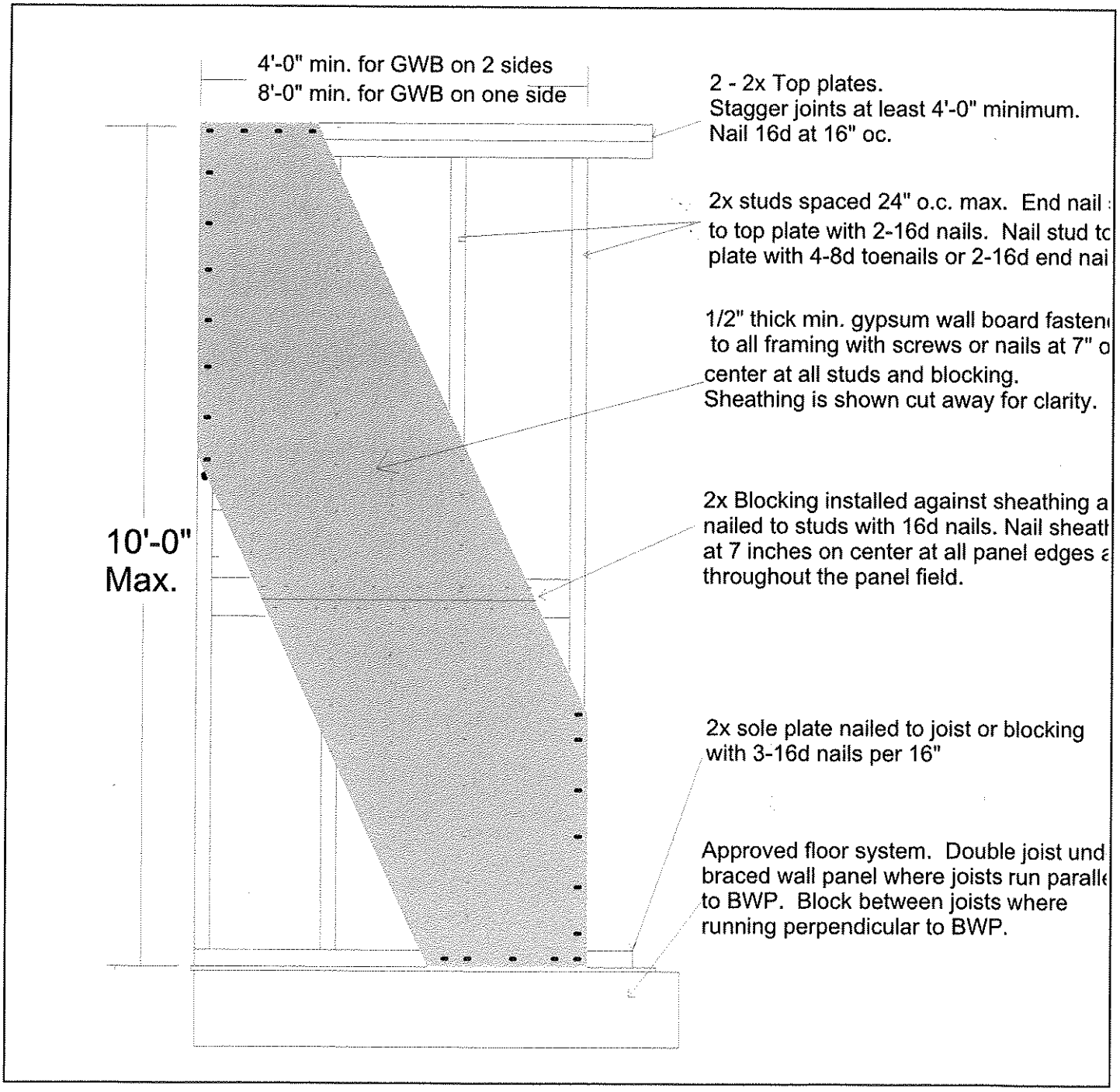


* Nail sheathing with 8d common or galvanized box nails spaced 6" on center at sheathing panel edges and 12" oc. in the field.

Figure 5:

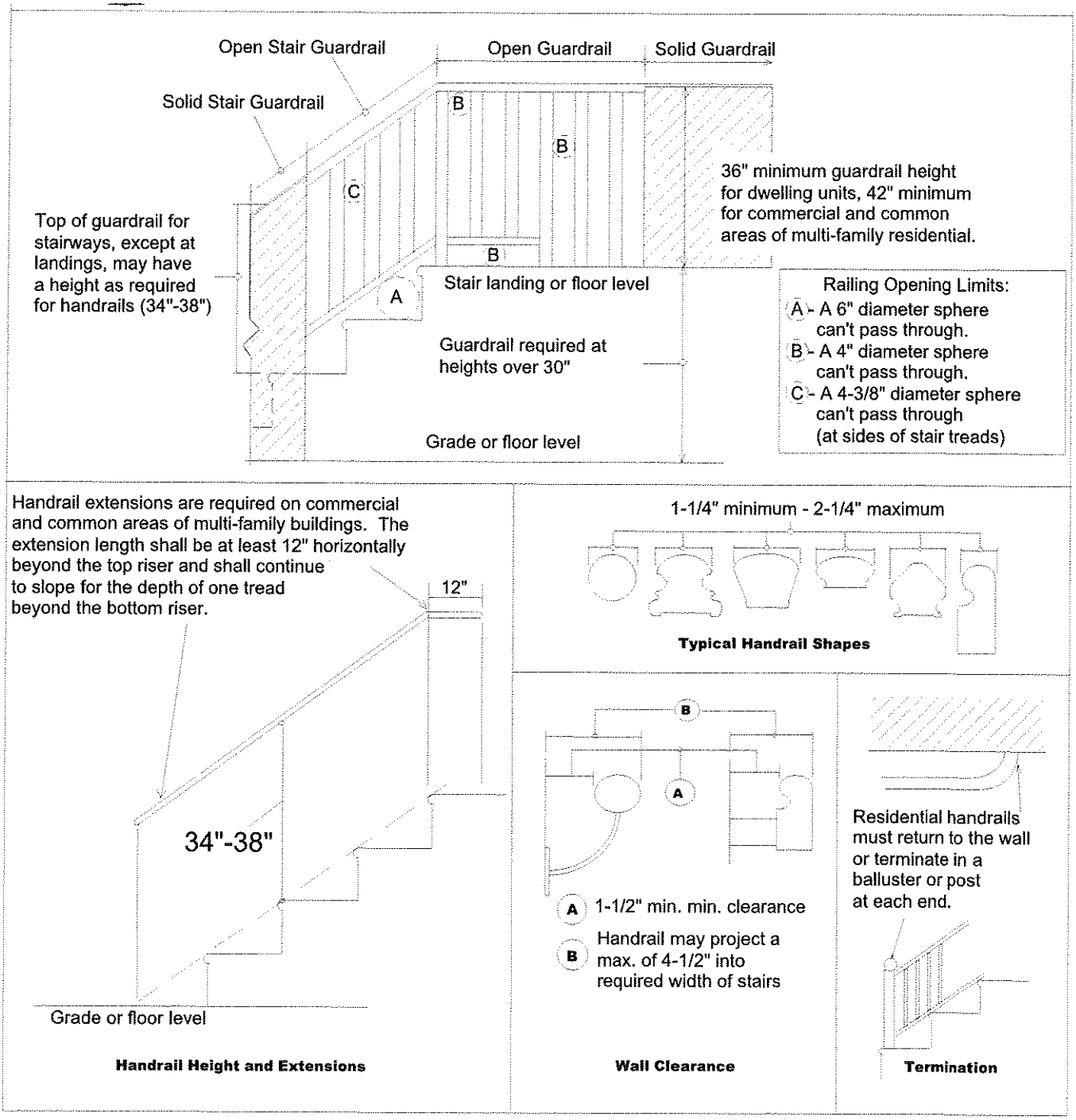
Prescriptive Interior Braced Wall Panel

(per IRC Section R602.10.3, Method #1)



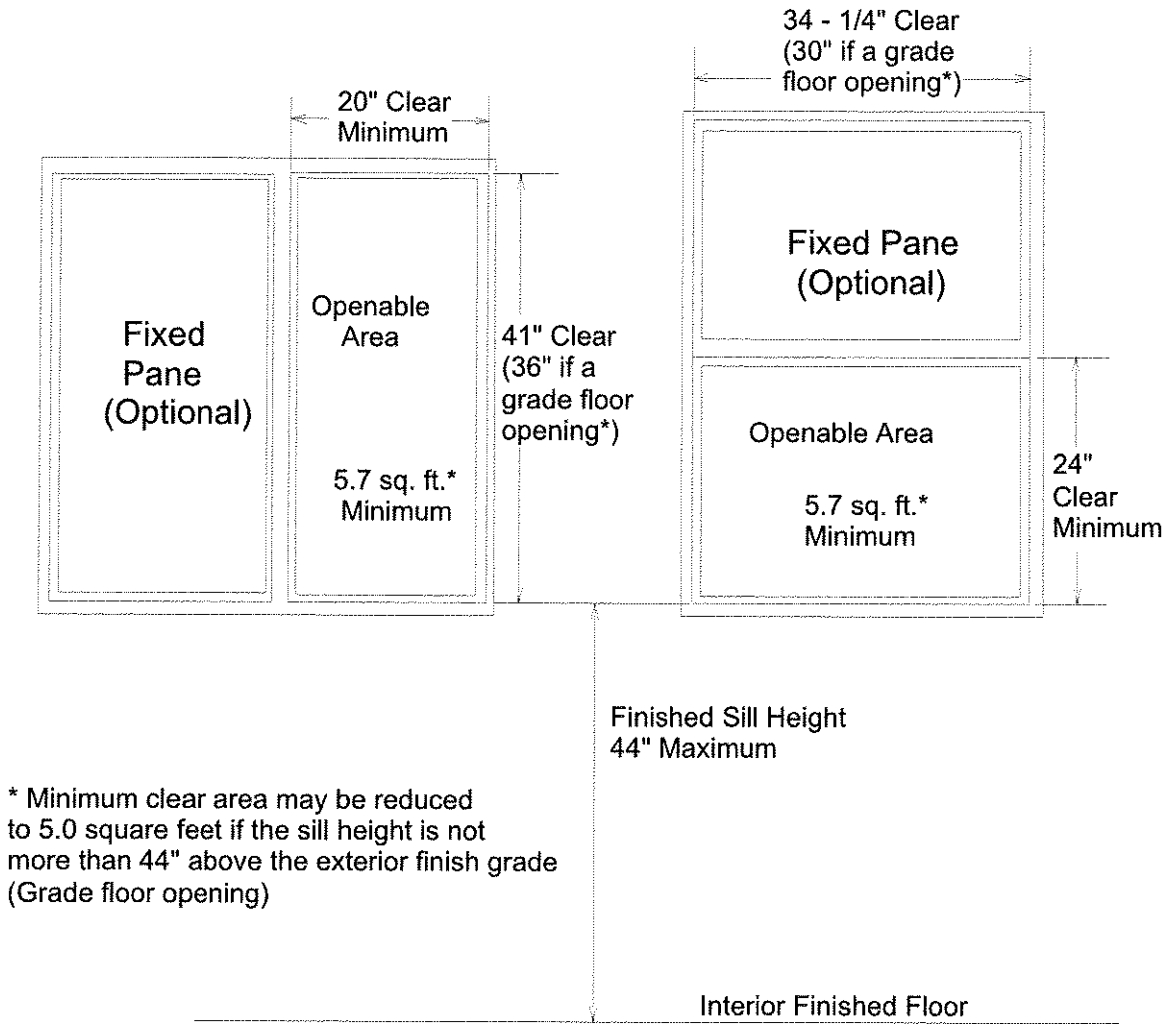
Standard Construction Details
Handrails and Guardrails

IRC 311.7.8



Standard Construction Details

Emergency Egress/Rescue Opening
IRC 311



* 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.

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Residential Plan Review Worksheet & Calculations

Permit Number:	Structure Information: _____ **Bedrooms:**	Square Footages: _____ **Main Floor:**	_____
Owner Information:	**Bathrooms:** _____ **Roofing Material:**	**2 Story Floor:** _____ **Finished Basement:**	_____
Building Official: Jon Woerner **Plan Reviewer: ____ JW ____ TE**	**Heating Type:**	**Unfinished Basement:** _____ **Garage:**	_____
Structural Engineer Information: **Name:** _____ **MO Lic#:** _____ **Address:** _____ **City:** _____ **State:** _____ **Zip:** _____		**Front Porch:** _____ **Open Deck / Patio:** _____ **Roof over Deck / Patio:**	_____ _____
Architect of Record Information **Name:** _____ **MO Lic#:** _____ **Address:** _____ **City:** _____ **State:** _____ **Zip:** _____		Plumbing Fixtures **Clothes Washer:** **Dishwasher:** **Hose Bibbs outside:** **Sinks:** **Tubs and Showers:** **Water Closets / Urinals:** **Water Heaters:** **Floor Drains:** TOTAL # OF TRAPS:	_____ _____ _____ _____ _____ _____ _____ _____ _____
Project Evaluation Cost Calculations and Notes: Fire Sprinkler System: Yes No		Mechanical Fixtures **Furnace / Heat Pump:** **Gas Fireplace(s):** **Gas Piping System:** **Exhaust Fans (bath)**	_____ _____ _____ _____

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