



City of Pleasant Hill

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BUILDING CODE GUIDELINES

REFERENCED CODES: **2012 INTERNATIONAL BUILDING CODES & UNIFIED DEVELOPMENT CODE**

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INTRODUCTION

The following guidelines are provided to assist property owners and contractors with the orderly construction of residential projects within the provisions of Pleasant Hill Building Codes and Zoning Ordinances. Please read them carefully and understand that they do not include all code requirements, but are summarized for an efficient guideline. Should a question arise, contact the building inspection department at (816) 3135540 or tkrahenbuhl@PleasantHill.com

Effective June 25, 2018, the 2012 International Residential Code, with minor revisions, applies to all permits. Also, the City of Pleasant Hill is required by the EPA and MoDNR to comply with all stormwater regulations under an NPDES Permit, which will require erosion control measures on all projects. The City requires permits and inspections for all construction. Please contact Tom Krahenbuhl at (816) 554-8387 or tkrahenbuhl@pleasanthill.com to schedule inspection appointments, erosion control and any questions about applying for a permit.

PART I – PERMITS AND FEES

In order to obtain a building permit, the building inspector needs to review the building plans and site plan for building code and zoning regulations. The building plans shall show each of the following items:

- A foundation plan
- All floor plans
- Building elevations
- Wall cross section details
- Location of emergency escape and rescue openings for basements and sleeping rooms
- Location and method of wall bracing (R602.10)
- Stamp of registered engineer or architect on all pages, when requested by the Building Official

A completed application, including plot plan, shall accompany 2 sets of drawings. The Plan review should not take more than five (5) working days for new plans. Mastered plans may take less time. Once approved, one approved set will be returned for construction and inspections, and shall remain on site.

All Residential, Commercial and Agricultural permit fees are on city code Appendix B. This permit is invalid if construction is not started within one hundred eighty (180) days of issuance.

In addition to the building permit fees, other impact fees may also assessed. Water, sewer, and park land fees which are set by city code Appendix B.

Anyone working in the City of Pleasant Hill is required to purchase an occupational license. Electrical, mechanical, and plumbing contractors are required to be licensed as a Master in their respective discipline, and show proof of certification from a nationally accredited testing company. The general contractor can also obtain a blanket occupation license which covers themselves, and any sub-contractor. (Electrical, Mechanical and Plumbing contractors must still submit proof of Master's License)

Site Plan Review

Applications for one or two family dwelling building permits shall include a site plan provided by a land surveyor licensed in the State of Missouri. The following information must be shown on the site plan and will be reviewed prior to the issuance of a building permit. The site plan shall depict the legal description, property dimensions, all easements, existing and proposed buildings, lot corners, foundation and finished floor elevations, total square footage of the lot, total square footage of the structure, percentage of lot coverage, dimensions from proposed building to property lines and any floodplain boundaries and/or elevations on the lot.

PART II - INSPECTIONS

The inspections, which are listed below, are performed on behalf of the City by our inspectors. These inspectors will inspect the project in accordance with the approved plans, a copy of which **MUST** be available on site during all inspections. The quality and structural strength of the project is the responsibility of the builder and the architect/engineer and the inspector cannot override a requirement in the plan. Any plan requirement that is in excess of the minimum code requirements may **ONLY** be changed by a signed, stamped notification from the architect/engineer. To schedule an inspection, call 816-540-3135, by email at tkrahenbuhl@pleasanthill.com or through the city website at www.pleasanthill.com.

It shall be the duty of the person doing the work or the permit holder to notify the building official **24 hours** in advance that such work is ready for inspection. (R109.3) a **4-hour** notice is required for concrete and sewer inspections. It shall also be the duty of that person to provide access to and means for inspection of such work. (R109.3) Silt Fence or other approved erosion controls are required at all down-slope locations to prevent soil from leaving the property. **Identification for each site must be visible from the roadway and contain the street address and permit number.**

1. Footing Inspection – A footing inspection is required after all steel is in place and prior to placing of concrete. (R109.1.1)
2. Wall Inspection – All foundation walls will be inspected after all forms and steel are in place and prior to placing of concrete. (R109.1.5)
3. Sewer Inspections - A sewer inspection is required after the building sewer is connected to the sewer “Y” and before backfilling. Contact the Community Development Department for sewer “Y” location information. (R 109.1.5)
4. Ground Rough Plumbing Inspection– All underground or under slab plumbing must be inspected prior to covering. (R109.1.5)
5. Erosion Control Inspection – Silt Fence or other approved erosion control must be installed on all down-slopes and along curb line. A gravel base for the driveway must be installed to allow access to the property during construction. **All erosion control must be maintained throughout construction process and inspections will be rejected if not installed prior to the ground rough inspection.**

6. Wall Bracing Inspection – The Garage Door Panel and any Alternate Brace Panel will need to be inspected prior to covering with house wrap or other materials.
7. Rough-In Inspection- All rough **Plumbing** must be inspected when drain/waste/vents and water piping are roughed in prior to insulating. (R109.1.2) **Framing**-Building framing must be inspected after all framing and furring is completed, prior to insulating or drywall stocking. (R109.1.2) **Electrical**-The electrical wiring must be inspected after all wiring, boxes, and recessed fixtures are installed. Boxes should be made up and home runs should extend to the service location. The inspection must be approved prior to insulating or drywall stocking. The service must be inspected before KCP&L will provide electricity. The service panels disconnect, and service entrance conductors need to be complete for service panels and sub panels. The panel cover should be off but available nearby. **Mechanical**-Mechanical vents, ducts, and return air spaces require inspection prior to insulation or drywall stocking. (R109.1.2) Electric and gas service will not be released to the utility company until all rough-in inspections have been approved. (R111.1)
8. Driveway/Sidewalk Inspections - Inspections are needed for driveway approaches and public sidewalks prior to placing concrete. See Approach in Appendix A. (R109.1.5)
9. Occupancy Inspection - An occupancy inspection is required prior to any occupancy of a building or addition. All electrical connections, faceplates, panels, and fixtures must be complete. Plumbing fixtures, mechanical equipment, final grade, sidewalks, driveways and safety features such as handrails, guardrails, and smoke/carbon monoxide detectors must be completed. (R109.1.6). All landscaping and site work shall be completed, weather dependent, prior to a final inspection. In the event this is not completed a Temporary Occupancy may be issued at the discretion of the Building Inspector.
10. Inspection Agencies – For weekend or holiday inspections, the building inspector is authorized to accept reports of approved agencies, provided such agencies satisfy the requirements as to qualifications and reliability. The contractor must request approval of the agency PRIOR to the inspection to allow the building inspector to investigate its qualifications.

PART III BUILDING GUIDELINES:

FOOTINGS and FOUNDATIONS

The following guidelines are provided to assist in meeting the requirements of the 2012 International Residential Code for typical residential footings. Where the guidelines are not specific, please contact the Building Inspector. **Building plans must be on site.**

A footing inspection is required after the steel is in place, and before the concrete is poured. (109.1.1)

When completed the bottom of all footings must be 36" below the ground surface adjoining it. (R403.1.4.1)

Footings supporting a second story must be 15" wide. (Unless soil has a Load Bearing Value >1500psf (Table R403.1)

Footings supporting three stories must be 23" wide. (Unless Load Bearing Value of Soil >1500psf (Table R403.1)

Steel reinforcing of footings shall be according to the approved plans.

No less than 2500 lb. concrete may be used for footings, with no less than 5% or more than 7% air is required if the concrete will be exposed to freezing and thawing during construction. (Table R402.2)

No less than 3000 lb. air entrained concrete may be used for foundation walls. (Table R402.2)

No less than 3,500 lb. air entrained concrete may be used for garage slabs and concrete slabs exposed to weather. (R402.2)

Where footings and foundations are stepped, the footings and foundations must be continuous (in a plan view) without cantilevering of foundation walls. (R403.1)

The wood sole plate at exterior walls on monolithic slabs, **wood sole plates of braced wall panels at building interiors on monolithic slabs, interior bearing wall sole plates not part of a braced wall panel and all wood sill plates shall be anchored to the foundation with anchor bolts spaced a maximum of 6 feet on center.** Bolts shall be at least ½ inch in diameter and extend a minimum 7 inches into concrete. There shall be a minimum of two bolts per plate section with one bolt located not more than 12 inches or less than seven bolt diameters from each end of the plate section. (R403.1.6)

Perimeter drain tiles shall be provided around all concrete and masonry foundations that retain earth and enclose habitable or usable spaces located below grade. Drain tiles, crushed stone drains and perforated pipe shall be installed at or below the area to be protected and shall discharge by gravity or mechanical means into an approved drainage system.

Gravel or crushed stone drains shall extend at least 1 foot beyond the outside edge of the footing and 6 inches above the top of the footing and be covered with an approved filter membrane material or covered with an additional 18 inches of washed gravel or crushed stone. (R405.1)

FRAMING

The following guidelines are provided to assist in meeting the requirements of the 2012 International Residential Code for typical residential buildings. Where the guidelines are not specific, please contact the Building Inspector. **Building plans must be on site.**

A framing inspection will be done along with the plumbing, electrical, mechanical and remaining wall bracing inspections.

Habitable rooms shall have a ceiling height not less than seven (7) feet, measured from the finished floor to the lowest projection from the ceiling. For rooms with sloped ceilings at least 50% of the required floor area must have a ceiling height of 7 feet. Bathrooms shall have a ceiling height of at least 6 feet 8 inches at the center of the front clearance area for fixtures. (R305.1)

In dwelling units, where the opening of an operable window is located more than 72 inches above the finished grade or surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4-inch-diameter sphere where such openings are located within 24 inches of the finished floor. (R312.2.1)

Exceptions:

- 1. Windows whose openings will not allow a 4- inch-diameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.**
- 2. Openings that are provided with window fall prevention devices that comply with ASTM F 2090.**
- 3. Windows that are provided with window opening control devices that comply with Section R312.2.2.**

Treated wood is needed for plates, columns, or posts on concrete foundations or floors, and floor joists in crawl spaces with less than 18” of clearance to the exposed ground. (R317.1)

Washers and nuts shall be placed on anchor bolts and tightened securely. Some designs require washers larger than the standard size, check plans for these requirements. (R403.1.6)

Steel and **wood columns shall be restrained with 2-3/8” bolts with nuts and washers to prevent lateral displacement at bottom end.** (R407.3)

Joists under and parallel to bearing walls shall be of adequate size to support the load. (Check plan details) (R502.4)

2 x 4 utility grade studs 16" O. C. shall support no more than a ceiling and a roof and not exceed 8 feet in height for exterior or load-bearing walls or 10 feet for interior non-load-bearing walls. (R602.3.1 exception 1.)

2 x 6 studs 16" O. C. shall be used for support of buildings over two stories. (Table R602.3(5))

Many headers over 5 feet in length require double cripples. (See Table R502.5.2) An excerpt of this table is located below. All calculations are based upon a snow load of 20 psf.

Girders and Headers Supporting:	Size	Building Width (feet)					
		20		28		36	
		Span	NJ	Span	NJ	Span	NJ
Roof and Ceiling	2 2x8	6-10	1	5-11	2	5-4	2
	2 2x10	8-5	2	7-3	2	6-6	2
	2 2x12	9-9	2	8-5	2	7-6	2
Roof, ceiling and one center-bearing floor	2 2x8	5-9	2	5-0	2	4-6	2
	2 2x10	7-0	2	6-2	2	5-6	2
	2 2x12	8-1	2	7-1	2	6-5	2
Roof, ceiling and two center-bearing floors	2 2x8	4-9	2	4-2	2	3-9	2
	2 2x10	5-9	2	5-1	2	4-7	3
	2 2x12	6-8	2	5-10	3	5-3	3

NJ = Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

Where ceiling joists are not parallel to rafters, rafter ties shall be a minimum of 2 inch by 4 inch (nominal) and installed 48 inches on center and nailed per table(R802.5.1(9)). (R802.3.1)

The ridge board must be equal or greater in depth than the plumb cut on rafter. (R802.3)

Ends of ceiling joists shall be lapped a minimum of 3 inches or butted over bearing partitions or beams and toe-nailed to the bearing member. When ceiling joists are used to provide resistance to rafter thrust, lapped joists shall be nailed together in accordance with Table (R802.5.1(9)). and butted joists shall be tied together in a manner to resist such thrust. (R802.3.2)

Holes bored in joists shall not be within 2" of the top or bottom. The diameter shall not exceed 1/3 of the depth of the joist. Notches in the top or bottom of joists shall not exceed 1/6th the depth of the member or longer than 1/3rd the depth of the member and shall not be located in the middle 1/3 of the span. (Figure R502.8)

Exterior or interior load-bearing walls, with more than 50% of the top plate cut for plumbing or mechanical, shall be strapped with 1/8" (16 ga) x 1 1/2" galvanized metal ties, with **4-10d nails per side**. The metal tie must extend a minimum of 6 inches past each side. (R602.6.1)

Fire blocking shall be provided in wood frame construction in the following areas:

In concealed spaces of stud walls, including furred spaces

Vertically at ceiling and floor levels

Horizontally at intervals not exceeding 10 feet in soffits, drop ceilings, and furred spaces.

(R302.11)

Fire blocking shall consist of either 2" nominal lumber, 1 ply of ¾" particle board, ½" gypboard, or batts or blankets of mineral wool or glass fiber. (R302.11.1)

Solid tops or backs are needed on soffits, drop ceilings, and concealed chases for flues and plumbing. (R602.8)

Purlins may be used to extend the span of rafters. Purlins shall be sized no less than the required size of the rafters that they support. Purlins shall be continuous and shall be supported by 2 x 4 braces installed to bearing walls at a slope not less than 45 degrees from horizontal. Braces shall be spaced not more than 4'-0" O. C. and the un-braced length of braces shall not exceed 8 feet. (R802.5.1)

Attics greater than 30 square feet and have 30" of vertical height shall be provided by an opening at least 22" x 30" in a hallway or other accessible location. A thirty inch (30") minimum unobstructed headroom in the attic space shall be provided at some point above the access opening. (R807.1) **Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weather stripped and insulated to a level equivalent to the insulation on the surrounding surfaces. (N1102.2.4)**

Stair Construction:

Stairways shall have a maximum rise of 7-¾" and a minimum tread depth of 10" measured horizontally from the nose of one tread to the nose of the next tread. The greatest rise height within any flight of stairs shall not exceed the smallest by more than 3/8".

Risers shall be vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 degrees from the vertical. **Open risers are permitted**, provided that the opening between treads does not permit the passage of a 4-inch diameter sphere. The opening between adjacent treads is not limited on stairs with a total rise of 30 inches or less. (R311.7.5.1)

A minimum of 6'-8" of headroom is required over stairs. (R311.7.2)

A flight of stairs shall not have a vertical rise larger than 12 feet between floor levels or landings. (R311.7.3)

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. **Handrails shall be permitted to be interrupted by a newel post at a turn. Ends shall be returned to the wall or terminate into a newel post or safety terminals. Handrails shall be graspable** and a minimum one and one-half inches (1 ½") from the wall. (R311.7.8.2)

Egress and Fire Rated Assemblies:

Basements, habitable attics, and every sleeping room must have at least one operable door or window leading directly to the outside for emergency egress. Windows must have at least 5.7 sq. feet of open-able space. The minimum open-able height is 24", and the minimum open-able width is 20". The finished sill height shall be no more than 44" measured from the finished floor to the bottom of the clear opening. (R310.1-310.1.4)

Carbon monoxide alarms shall be installed outside of each sleeping area and in the immediate vicinity of the bedroom, in dwelling units where fuel fired appliances are installed or in dwelling units with attached garages. (R315.1)

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 metal or other approved material and **shall have no openings into the garage.** (R309.1.1)

Fireplaces:

Chimneys shall extend at least 2 feet higher than any portion of a building within 10 feet, but shall not be less than 3 feet above the highest point where the chimney passes through the roof. (R1003.9)

Metal fireplaces must be installed in strict accordance with its listing and manufacturers installation instructions. (R1004.1) Clearances to adjoining combustibles, mantles, hearth trim, and adjoining walls are specified in the instructions. Hearth dimensions are also specified and must be carefully checked. Hearth extensions shall be readily distinguishable from the surrounding floor area. Many fireplaces require 22" hearths. (R1004.2)

Where a factory built chimney assembly incorporates offsets, no part of the chimney shall be at an angle of more than 30 degrees or include more than 4 elbows. (R1005.7)

ELECTRICAL

The following guidelines are provided to assist in meeting the electrical requirements of the 2012 International Residential Code and 2011 NEC for one and two family dwellings. Where the guidelines are not specific please contact the Building Inspector.

Two electrical inspections are required at each dwelling:

Rough in when the wiring, boxes, and recessed fixtures are the installed. The wiring should be made up and run to the service location. The service inspection is needed before KCP&L will provide electricity. The service panel, disconnect, service entrance conductors, and grounding need to be complete. Please have the panel cover off, but available nearby. The electrical service will not be released to the utility company until all rough-in inspections are approved.

Final testing of GFCI, AFCI and other outlets, labeling of service panel, and testing of lighting will be done at the time of final inspection.

Services

200-amp residential service shall have 2/0 copper or 4/0 aluminum service entrance conductors with #4 copper grounding electrode conductors connected from the service neutral grounding bar to the water service where it enters the building and a #6 copper grounding electrode conductor from the neutral grounding bar to an 8' ground rod or other approved location. (Table E3603.1)

Grounding conductors shall be installed such that at least 8 feet of length is in contact with the soil. They shall be driven a depth of at least 8 feet except where rock is encountered the grounding conductor may be driven at an angle of no more than 45 degrees, or buried in a trench 30" in depth. (R3608.1.4.1)

A concrete encased electrode consisting of at least 20 feet of either of the following shall be considered as a grounding electrode:

- 1. One or more bare or zinc galvanized or other electrically conductive coated steel reinforcing bars or rods not less than 1/2 inch in diameter, installed in one continuous 20-foot length, or if in multiple pieces connected together by the usual steel tie wires, exothermic welding, welding, or other effective means to create a 20-foot or greater length.**
- 2. A bare copper conductor not smaller than 4 AWG. (E3608.1.2)**

In every kitchen, family room, dining room, living room, parlor, library, den, sunroom, bedroom, recreation room, guest room, or other similar rooms of dwelling units, receptacle outlets shall be installed so that no point along the floor line of any wall space is more than 6' measured horizontally from an outlet in that space, including any wall space two feet (2') or more in width. The fixed panel of a sliding door is considered as wall space. (E3901.2.1 & E3901.2.2)

The wall space afforded by fixed room dividers such as freestanding bar-type counters shall be included in the six-foot (6') measurement. There should never be more than twelve feet (12') between receptacles on a continuous wall space. (Figure E3901.2)

A wall space shall include the following: Any space that is two feet (2') or more in width, occupied by fixed panels in exterior walls, and the space created by fixed room dividers such as railings or free standing bar type countertops. (E3901.2.2)

Receptacle outlets in floors shall not be counted as part of the required number of receptacle outlets except where located within eighteen inches (18") of the wall. (E3901.2.3)

Counter Tops

In kitchens and dining rooms of dwelling units, a receptacle outlet shall be installed at each counter space wider than twelve inches (12"). Receptacles shall be installed no more than twenty-four inches (24") apart along the wall line. (E3901.4.1)

Counter tops separated by range tops, refrigerators, or sinks shall be considered as separate counter top spaces. Receptacles rendered inaccessible by appliances fastened in place or appliances occupying a dedicated space shall not be considered as these required outlets. (E3901.4.4)

At least one receptacle outlet shall be installed at each island counter space with a long dimension of twenty-four inches (24”) or greater and a short dimension of twelve inches (12”) or greater. (E3901.4.2)

All fifteen (15) and twenty (20) Ampere receptacles that serve countertop surfaces shall have ground-fault circuit-interrupter protection for personnel. (E3902.6)

Halls and Foyers

Hallways 10’-0” or more in length shall require at least one receptacle. (E 3901.10)

Foyers that are not part of a hallway in accordance with Section E3901.10 and that have an area that is greater than 60 ft² shall have a receptacle(s) located in each wall space that is 3 feet or more in width and unbroken by doorways, floor-to-ceiling windows, and similar openings. (E3901.11)

Bathrooms

In dwelling units, at least one wall receptacle outlet shall be installed in bathrooms. Such outlet shall be located within thirty-six inches (36”) of the outside edge of each lavatory basin and GFCI protected. (E3901.6)

Exhaust fans vented to outside air are required if there is no operable window in the bathroom and or the toilet room. (R303.3)

All fifteen (15) and twenty (20) Ampere receptacles installed in bathrooms shall have ground-fault circuit-interrupter protection for personnel. (E3902.1)

Outdoor Outlet

At least one receptacle outlet accessible at grade level shall be installed outdoors at the front and back of each dwelling unit having direct access to grade. (E3901.7)

Where installed in a wet location, 15- and 20-ampere, 125- and 250 volt receptacles shall have an enclosure that is weatherproof whether or not the attachment plug cap is inserted. (E4002.9)

All fifteen (15) and twenty (20) Ampere receptacles installed outdoors shall have ground-fault circuit-interrupter protection for personnel. (E3902.3) In-use weatherproof covers are required (E4002.9).

Underground fifteen (15) and twenty (20) amp wiring buried twelve inches (12”) to twenty-four inches (24”) deep shall have GFCI protection (Table E3803.1)

Basements and Garages

For a dwelling unit, at least one receptacle outlet in addition to any provided for laundry purposes shall be installed in each basement and each garage. (E3901.9)

All fifteen (15) and twenty (20) Ampere receptacles installed in garages and grade level portions of unfinished accessory buildings or unfinished basements used for storage or work areas shall have ground-fault circuit-interrupter protection for personnel.

Exceptions:

- 1. A dedicated receptacle supplying solely a garage door opener or refrigerator/freezer and is clearly identified as NOT GFCI PROTECTED. (E3902.2)**

All 125-volt single phase, 15- and 20- amp receptacles installed in unfinished basements shall have GFCI protection for personnel. Unfinished basements are designed as portions or areas of the basement not intended as habitable rooms and limited to storage areas, work areas, and the like. (E3902.5)

Exception:

- 1. A receptacle supplying a permanently installed fire or burglar alarm system and identified as “NOT GFCI PROTECTED”**
- 2. A dedicated receptacle supplying a sump pump and identified as “NOT GFCI PROTECTED”**
- 3. A dedicated receptacle supplying a refrigerator/freezer, and identified as “NOT GFCI PROTECTED”**

Lighting Outlets

At least one wall switch controlled lighting outlet shall be installed in every habitable room, in bathrooms, stairwells (simple stair lighting is not adequate for entire stairwell), hallways, garages, and outdoor entrances. An overhead door in a garage is not considered as an outdoor entrance for this purpose. (E3803.2 & E3803.3)

Where spare, separately switched, ungrounded conductors are provided to a ceiling mounted outlet box and such box is in a location acceptable for a ceiling-suspended (paddle) fan, the outlet box or outlet box system shall be listed for sole support of a ceiling-suspended (paddle) fan. (E3905.8)

Where one or more lighting outlets are installed for interior stairways, there shall be a wall switch at each floor level and landing level that includes an entryway to control the lighting outlets where the stairway between floor levels has six (6) or more risers. (E3903.3)

At least one wall switch controlled lighting outlet shall be installed at the point of entrance to an attic, under floor space, utility room, and basement, where these spaces are used for storage or containing equipment that may require servicing. The lighting outlet shall be provided at or near the equipment requiring service. (E3903.4)

Appliances

Outlets for a specific appliance should have the circuit rating of the appliance served. Look for the nameplate rating. (E3702.2)

Central heating equipment is required to be on a separate circuit. (E3703.1)

Receptacles

A maximum of fifteen (15) outlets are permitted on a typical fifteen (15) AMP circuit. (Table E3702.13)

A maximum of twenty (20) outlets are permitted on a typical twenty (20) AMP circuit. (Table E3702.13)

All branch circuits that supply 120 volts, single phase 15- and 20- amp receptacles installed in bedrooms shall be protected by combination type arc-fault circuit interrupter installed to provide protection of the branch circuit. (E3902.12)

Kitchen and Small Appliances

A minimum of two 20 AMP circuits are required for the kitchen, pantry, breakfast room, and dining room of a dwelling unit for small appliance loads, including the refrigeration equipment. These circuits shall not be used for any lighting. (E3901.3) & (E3903.2)

Laundry, Utility or Wet Bars

At least one receptacle outlet shall be installed to serve laundry appliances. (E3901.8)

All fifteen (15) and twenty (20) Ampere receptacles that serve countertop surfaces and are located within six (6) feet of the outside edge of a laundry, utility or wet bar sink shall have ground-fault circuit-interrupter protection for personnel. Receptacle outlets shall not be installed in the face-up position in the work surfaces or countertops. (E3902.7)

All fifteen (15) and (20) ampere receptacle outlets which are not part of the permanent wiring of the building or structure and which are in use by personnel shall have GFCI protection. (E3802.2)

Recessed Fixtures

Recessed incandescent Luminaires shall have thermal protection and shall be listed as thermally protected. (E4003.5)

Clothes Closet

Lighting fixtures shall be installed on the wall above the door or on the ceiling, provided there is a minimum clearance of twelve inches (12") for surface mounted incandescent and six inches (6") for surface mounted fluorescent. Incandescent fixtures with open or partially enclosed lamps shall be prohibited. (E4003.12)

Smoke Detectors

Smoke detectors shall be located in each sleeping room, outside of each separate sleeping area in the immediate vicinity of the bedrooms, on each additional story of the dwelling, including basements and cellars, but not including crawl spaces and uninhabitable attics. (R314.3)

Addition: A smoke detector shall be placed in each enclosed laundry closet.

Alarm devices shall be interconnected in such that the actuation of one alarm will activate all alarms in the unit. (R314.5)

Smoke alarms shall receive their primary power from the building wiring and when primary power is interrupted shall receive power from a battery backup. Wiring shall be permanent and without a disconnecting switch other than those required for over current protection. Do not connect to a GFI circuit. (R314.4)

When *alterations*, repairs or *additions* requiring a *permit* occur, or when one or more sleeping rooms are added or created in existing *dwellings*, the individual *dwelling unit* shall be equipped with smoke alarms located as required for new *dwellings*.

Exceptions:

1. Work involving the exterior surfaces of *dwellings*, such as the replacement of roofing or siding, or the *addition* or replacement of windows or doors, or the *addition* of a porch or deck, are exempt from the requirements of this section.
2. Installation, *alteration* or repairs of plumbing or mechanical systems are exempt from the requirements of this section. (R314.3.1)

Carbon Monoxide Alarms

For 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. (R315.1)

Carbon monoxide detection systems that include carbon monoxide detectors and audible notification appliances, installed and maintained in accordance with this section for carbon monoxide alarms and NFPA 720, shall be permitted. The carbon monoxide detectors shall be listed as complying with UL 2075. Where a household carbon monoxide detection system is installed, it shall become a permanent fixture of the occupancy, owned by the homeowner and shall be monitored by an approved supervising station. (R315.2)

Exception: Where carbon monoxide alarms are installed meeting the requirements of Section R315.1, compliance with Section 315.2 is not required.

Where work requiring a *permit* occurs in existing *dwellings* that have attached garages or in existing dwellings within which fuel fired *appliances* exist, carbon monoxide alarms shall be provided in accordance with Section R315.1.

Prevention of physical damage

In locations where electrical equipment is likely to be exposed to physical damage, enclosures or guards shall be so arranged and of such strength so as to prevent such damage. (E3404.10)

Wiring installed in bored holes shall be a minimum of two inches (2") from top and bottom, and any other hole in the member. (Figure R502.8.1)

Bored holes shall not exceed sixty percent (60%) of stud width. If a stud in exterior walls or bearing partitions is bored between forty percent (40%) and sixty percent (60%) of its' width, the stud must be doubled, with no more than 2 successive double studs bored. Bored holes shall be a minimum five-eighths inch (5/8") from the edge of stud or strapped with a sixteen (16) gauge X one and one-half inch (1-1/2") **strap with a minimum 4 – 10 d nails each side.** (R602.6, R602.6.1)

Wire Support

Nonmetallic-sheathed cable shall be secured by staples, straps, or similar fittings so designed and installed as not to injure the cable. Cables shall be secured in place at intervals not exceeding four and one-half (4-1/2) feet and within twelve inches (12") from every cabinet, box, or fitting. (E3802.4 & Table E3802.1)

Cable in Return Air

Where wiring methods having a nonmetallic covering pass through stud cavities and joist spaces used for air handling, such wiring shall pass through such spaces perpendicular to the long dimension of the spaces. (E3904.7)

Splices and Connections

A box or conduit body shall be installed at each conductor splice point, outlet, switch point, junction point, and pull point. (E3905.1)

All boxes and conduit bodies shall be of sufficient size to provide free space for all enclosed conductors. (E3905.12)

A connection shall be made between the one or more equipment grounding conductors and a metal box by means of a grounding screw that shall be used for no other purpose or by means of a listed grounding device. (E3908.15)

Outlet boxes and outlet box systems used as the sole support of ceiling-suspended fans shall be marked by their manufacturer as suitable for this purpose and shall not support ceiling-suspended fans that weigh more than 70 lbs. (E3905.9)

Circuit Identification

All circuits and circuit modifications shall be legibly identified as to their clear, evident, and specific purpose or use. The identification shall include sufficient detail to allow each circuit to be distinguished from all others. (E3706.2)

PLUMBING

The following guidelines are provided to assist in meeting the requirements of the 2012 International Residential Code. Where guidelines are not specific, please contact the building inspector.

Sewers

Horizontal drainage piping shall be installed in uniform alignment at uniform slopes not less than 1/4" unit vertical in 12 units horizontal (2-percent slope) for 2 1/2-inch diameter and less, and not less than 1/8 unit vertical in 12 units horizontal (1-percent slope) for diameters of 3 inches or more. (P3005.3) Underground drain piping shall be laid on a firm bed for its entire length. (P2605.1(2))

Piping may be plastic schedule 40 PVC or SDR 26(PS 115) with solid, cellular core or composite wall. (Table P3002.2)

Sewers must have cleanouts extended to grade at, or in the building (P3005.2.3), at each one hundred feet (100') thereafter (P3005.2.2), and at each fitting with a change in direction > 45 degrees (P3005.2.4).

The connection of the building sewer to the public sewer must be visible at the time of the inspection.

Piping passing through a foundation wall shall be provided with a relieving arch, or a pipe sleeve shall be built into the foundation wall. (P2603.4)

Interior horizontal plastic drain piping shall be supported each four feet (4'). (Table P2605.1)

Standpipes shall extend a minimum of eighteen (18) inches and a maximum of forty-two (42) inches above the trap weirs. Access shall be provided to all standpipe traps and drains for roding. (P2706.2)

Every trap and trapped fixture shall be vented. (P3101.2.1)

Vents shall extend a minimum of six (6) inches above the roof. (P3103.1)

Every dry vent connecting to a horizontal drain shall connect above the centerline of the horizontal drainpipe. (P3104.3)

All stubbed plumbing must be fully vented. (P3104.6)

Each fixture trap shall have a protecting vent located so the slope and developed length in the fixture drain from the trap weir to the vent is located a maximum of:

SIZE	SLOPE	DISTANCE
1 ¼"	¼"	5'
1 ½"	¼"	6'
2	¼"	8'
3	1/8"	12'
4	1/8"	14' (Table P3105.1)

Any combination of fixtures within two (2) bathroom groups located on the same floor level shall be permitted to be vented by a horizontal wet vent. Only the fixtures located in the bathroom groups shall connect to the wet-vented horizontal branch drain. (P3108.1)

Each vent must be no less than one-half the size of the drain it serves, with no vent smaller than one and one-fourth inches (1¼"). If the developed length of the vent exceeds forty (40) feet, the pipe shall be increased one nominal pipe size. (P3113.1)

Water

Underground exterior water piping must be forty-two (42) inches below grade. (P2603.5)

The minimum size water service pipe shall be three-quarter (¾) inch. (P2903.7)

Hose bibs subject to freezing, including the "frost proof" type, shall be equipped with an accessible stop-and-waste-type valve inside the building so that they can be controlled and drained during cold periods (P2903.10), and protected by an atmospheric-type or pressure-type vacuum breaker or a permanently attached hose-connection vacuum breaker. (P2902.4.3)

When main pressure exceeds eighty (80) PSI an approved pressure-reducing valve shall be installed on the main riser at the connection to the water service pipe. (P2903.3.1)

Each dwelling shall be provided with an accessible main shutoff valve near the entrance of the water service. (P2903.9.1)

An accessible, individual shutoff valve is required on the water supply pipe to each fixture, excluding bathtubs and showers. (P2903.9.3)

Interior copper water piping 1 ¼" diameter and smaller, shall be supported horizontally each six (6) feet. PEX© piping shall be supported each thirty-two (32) inches. (Table P2605.1)

Solder and fluxes used in potable water supply systems shall have a maximum of two-tenths (0.2) percent lead. (P2905.14)

MECHANICAL

Steel or wrought iron pipe shall be at least Schedule 40 for all interior gas piping. (G2414.4.2)

Seamless copper, aluminum alloy, or steel tubing may be used with gases not corrosive to such material. (G2414.5)

Interior gas piping must withstand a ten (10) minute air pressure test with a 30-PSI gauge to equal 10 PSI. (G2417.4-G2417.4.2)

In order for inspection approval a pressure loss of **zero** must be obtained. (G2417.5)

Pipe protective coatings and wrappings shall be approved for the application and shall be factory applied. (G2415.11.2)

Underground piping shall be installed 12” below grade. (G2415.12)

Plastic piping requires yellow insulated #18 copper tracer wire suitable for direct burial and terminating above ground at each end. (G2415.17.3)

Metallic pipe or tubing exposed to corrosive action, such as soil condition or moisture, shall be protected in an approved manner. (G2415.8)

Gas piping shall not be installed under any building. (G2415.14)

Where wet gas exists, drips shall be provided at any point in the line of pipe where condensate could collect. A drip shall also be provided at the outlet of the meter, and shall be installed as a trap wherein an accumulation of condensate will shut off the flow of gas before the condensate will run back into the meter. (G2419.2)

Drips shall be provided with ready access to permit cleaning and emptying. Drips shall not be located in areas subject to freezing. (G2419.3)

Where a sediment trap is not incorporated as part of the appliance, a sediment trap shall be installed downstream of the appliance shutoff valve as close to the inlet of the appliance as practical. (G2419.4)

Appliance shutoff valves shall be located in the same room as the shutoff valve, be located within 6 feet of the appliance and be installed upstream of the union. (G2420.5.1)

DUCTS

Duct openings are not permitted into the garage area. (R302.5.2.)

Combustion air ducts shall meet the requirements in the manufacturer's specifications, or be 2 permanent openings, one commencing within 12 inches of the top and one commencing within 12 inches of the bottom of the enclosure shall be provided. The openings shall communicate directly, or by ducts, with the outdoors or spaces that freely communicate with the outdoors. Each opening shall have a minimum free area of one square inch per 4,000 BTU of total input rating of all appliances in the enclosure. Ducts communicating with the outdoors through horizontal ducts shall be calculated by one square inch per 2,000 BTU F of total input rating of all appliances in the enclosure. (G2407.6.1)

RADON CONTROL METHODS

A layer of gas permeable material shall be placed under all concrete slabs, within the walls of living space of the building. This layer shall consist of clean aggregate at least 4 inches thick. (AF103.2)

A minimum 6 mil polyethylene or equivalent sheeting material shall be placed on top of the aggregate prior to placing of concrete. The sheeting shall cover the entire floor area and any sections of sheeting shall overlap a minimum of 12 inches. The sheeting shall fit closely around any piping or other penetrations, and any tears or punctures shall be sealed or covered with additional sheeting. (AF103.3)

Openings around bath tubs, showers, water closets and other objects shall be filled with polyethylene caulk or equivalent sealant applied in accordance with the manufacturers specifications. (AF103.4.1)

All control joints, construction joints and joints between the foundation and the concrete slab shall be sealed with a caulk or sealant. (AF103.4.2)

Sump pits open to soil or serving as the termination point for sub slab or exterior drain tile loops shall be covered with a gasketed or otherwise sealed lid. (AF103.4.4)

A plumbing tee or other *approved* connection shall be inserted horizontally beneath the sheeting and connected to a 3- or 4-inch-diameter fitting with a vertical vent pipe installed through the sheeting. The vent pipe shall be extended up through the building floors, terminate at least 12 inches above the roof in a location at least 10 feet away from any window or other opening into the *conditioned spaces* of the building that is less than 2 feet below the exhaust point, and 10 feet from any window or other opening in adjoining or adjacent buildings. (AF103.5.3)

In buildings where interior footings or other barriers separate the sub slab aggregate or other gas-permeable material, each area shall be fitted with an individual vent pipe. Vent

pipes shall connect to a single vent that terminates above the roof or each individual vent pipe shall terminate separately above the roof. (AF103.6.2)

All components of the radon vent pipe system shall be installed to provide positive drainage to the ground beneath the slab or soil-gas-retarder. (AF103.7)

ENERGY EFFICIENCY CODE

To meet the requirements of this code, this table must be followed:

Table 1

THERMAL COMPONENT	MINIMUM INSULATION R-VALUE
Ceiling R-value	49
Cathedral Ceiling R-value	30
Floor over Unheated Space R-value	19
Floor over Outside Air R-value	30
Basement Wall R-value	9
Crawl Space R-value	19
Exterior Wall R-value ¹	13
	MAXIMUM U-FACTOR
Glazing ^{2,3}	0.40 or Less

1. Steel-frame walls shall have one of the following combinations of wall cavity and sheathing R-values. R-11+R-5, R-15+R-4, R-21+R-3.
2. The default U-factor for fixed windows (“Patio glass”) with double panes, argon-filled and with low-e treatment shall be 0.40. Skylights shall have a maximum U-factor of 0.80.
3. Opaque doors separating conditioned and unconditioned space shall have a maximum U-factor of 0.40. One opaque door shall be permitted to be exempt from this requirement.

Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weather stripped and insulated to a level equivalent to the insulation on the surrounding surfaces. (N1102.2.4)

OCCUPANCY - FINAL INSPECTION

An occupancy inspection is required prior to occupancy of all buildings. The inspector will check the property and structure for code compliance.

Where sidewalks and a driveway approach are required, shall be installed in accordance with the design located in the Unified Development Code section 24006.

Site Address Numbers shall be a minimum of 4 inches high and minimum stroke width of ½ inch. They shall be displayed in contrast of the background and clearly visible from the street. (R319).

Each residential lot shall have in the front yard a 1 ½ inch caliper (min) tree. And shall be planted with turf grass, (Unified Development Code Chapter 240, section 24006.10).

Untreated wood must be separated from final grade by no less than six inches (6"). (R319.1(5))

Final grade must drain away from the structure six inches (6") within the first ten (10) feet. (R401.3)

An occupancy separation is required from the garage to the dwelling. The occupancy separation includes all garage walls and the garage ceiling. The garage shall be separated from the residence and its attic area by not less than one-half (½) inch gypsum board applied to the garage side. If the garage is beneath a habitable room, it shall be separated by not less than five-eighths inch (5/8") Type X gypsum board or equivalent. Where the separation is a floor ceiling assembly, the structure supporting the separation shall also be protected by not less than one-half (½) inch gypsum board or equivalent. This includes steel beams and posts. (R302.6 & Table R302.6)

Where required Storm Shelters shall comply with R323 –Storm Shelter.

Doors between the garage and residence must be at least one and three-eighths inch (1-3/8") in thickness solid core wood, honeycomb steel or 20-minute fire rated doors. **Doors shall be equipped with a self-closing device. (R309.1)**

Handrails shall be provided on at least one side of each continuous run of treads or flight with four or more risers. (R311.7.8)

Handrails shall have a minimum height of thirty-four inches (34") and a maximum height of thirty-eight inches (38"). (R311.7.8.1)

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. Handrails shall be permitted to be interrupted by a newel post at a turn. Ends shall be returned to the wall or terminate into a newel post or safety terminals. Handrails shall be graspable and a minimum one and one-half inches (1 ½") from the wall. (R311.7.8.2)

Porches, balconies, and any open sided walking surface located more than thirty inches (30") above the floor or grade below shall have guards not less than thirty-six inches (36") in height. (R312.1.2)

Required guards shall have intermediate rails or ornamental closures that do not allow the passage of a four-inch (4") diameter sphere. The triangular openings formed by riser, tread and bottom rail are permitted to be of such size that a 6" sphere cannot pass through. Openings for required guards on the sides of stair treads shall not allow a sphere 4 3/8 inches to pass through. (R312.1.3)

Each building shall be posted with the proper address numbers so they are visible from the street. Address numbers shall contrast with the background and be a minimum 4 inches tall. **Illumination shall be provided during hours of darkness. (R319.1&.2)**

Double-keyed deadbolts are not permitted. (R311.2)

The electrical service must be completed, with panel cover on, and all circuits identified. (E3404.11)

Electrical faceplates must be on. (E4004.1)

Lights must be completed and in working condition with bulbs installed.

Any unfinished wiring, for back ordered fixtures, shall end in a proper box with a cover.

The air conditioner shall be provided with a means of disconnect as required in Table 4101.5.

Plumbing fixtures must be properly connected with the water service turned on.

Future plumbing installations shall be terminated with an accessible plug or cap fitting. (P3005.1.6)

The building sewer cleanout and backflow prevention devices shall be accessible. (P3005.2.5)

Each dwelling unit shall be provided with an accessible main shut off valve near the entrance of the water service pipe. (P2903.9.1)

Perimeter drain tiles are required around footings for control of surface water and shall drain by gravity to grade or under the footing and into a sump hole. (R405.1, R405.2.3)

All sump locations shall be plumbed for discharge to the outside of the building and not to the sanitary sewer. If a pit but no pump is installed, a discharge pipe shall be installed with both ends of the pipe capped and clearly labeled as a sump drain.

PART IV - GENERAL REQUIREMENTS FOR RESIDENTIAL DECKS

A permit is required for the construction of a residential deck, below is a list of guidelines to follow.

Check into the proposed location of the deck. Make sure you know where any easements are and the exact locations of your property lines.

Footings and piers shall extend thirty-six inches (36") below grade and bear on undisturbed soil and must be inspected prior to placing concrete. Mechanical post bases are required for the connection of deck posts to the piers.

The diameter of the footing shall be calculated in accordance with Chart B.

Guards shall be provided for decks, balconies and porches, which are more than 30" above grade. Guards must be not less than 36" above walking surface. Intermediate rails shall be placed so that a 4" ball cannot pass through. (R312.1, R312.2) Guardrails shall extend a minimum of thirty-six inches (36") above the walking surface. Decks less than 30" above the ground are not required to have guardrails. Guardrails and stair railings shall have intermediate rails or an ornamental pattern so that a 4" sphere cannot pass through.

Handrails are required on at least one side of stairs and all open sides. The top of the handrail shall be 34"-38" measured vertically from the nose of the tread.

Structural requirements for deck are based upon loads of 40-lbs/sq. foot. The following spans are for floor joists.

MAXIMUM SPANS FROM TABLES R502.3.1(1), R502.3.1(2)

<u>PRESSURE TREATED LUMBER</u>	<u>#2 – 24" O.C.</u>	<u>#2 – 16" O.C.</u>
2 X 6	8'-6"	9'-9"
2 X 8	11'	12'-10"
2 X 10	13'-1"	16'-1"

Chart A.
 Maximum post heights for 40 lb/ft² deck design.

Species	Post Size	40 lb/ft ² live load – 10 lb/ft ² dead load Tributary load area to post (ft ²)													
		36	48	60	72	84	96	108	120	132	144	156	168	180	192
Southern Pine	4X4	10	10'	10'	9'	9'	8'	8'	7'	7'	6'	6'	6'	6'	5'
	4X6	14'	14'	13'	12'	11'	10'	10'	9'	9'	8'	8'	8'	7'	7'
	6X6#1	17'	17'	17'	17'	17'	17'	17'	17'	17'	17'	17'	17'	16'	16'
	6X6#2	17'	17'	17'	17'	17'	17'	17'	17'	16'	16'	15'	14'	13'	13'
Redwood or Western Red Cedar	4X4	10'	10'	9'	8'	7'	7'	6'	6'	5'	4'				
	4X6	14'	13'	12'	11'	10'	9'	8'	8'	7'	7'	7'	6'	6'	5'
	6X6#1	17'	17'	17'	17'	17'	17'	17'	17'	16'	15'	15'	14'	14'	13'
	6X6#2	17'	17'	17'	17'	17'	16'	13'	7'						

Chart B.

Pier Sizes based on deck area supported.

Pier Diameter	Square footage of deck that can be supported
8"	14
10"	20
12"	32
14"	40
16"	56
18"	72
20"	88
22"	104
24"	126

Chart C.

Footing Diagram

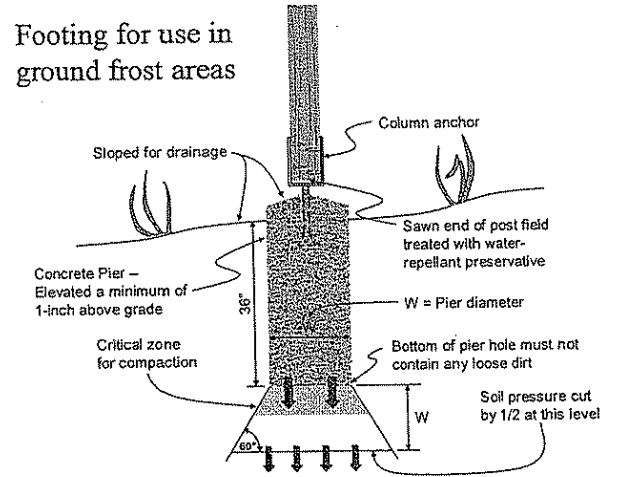


Chart D.

Tributary load area for posts

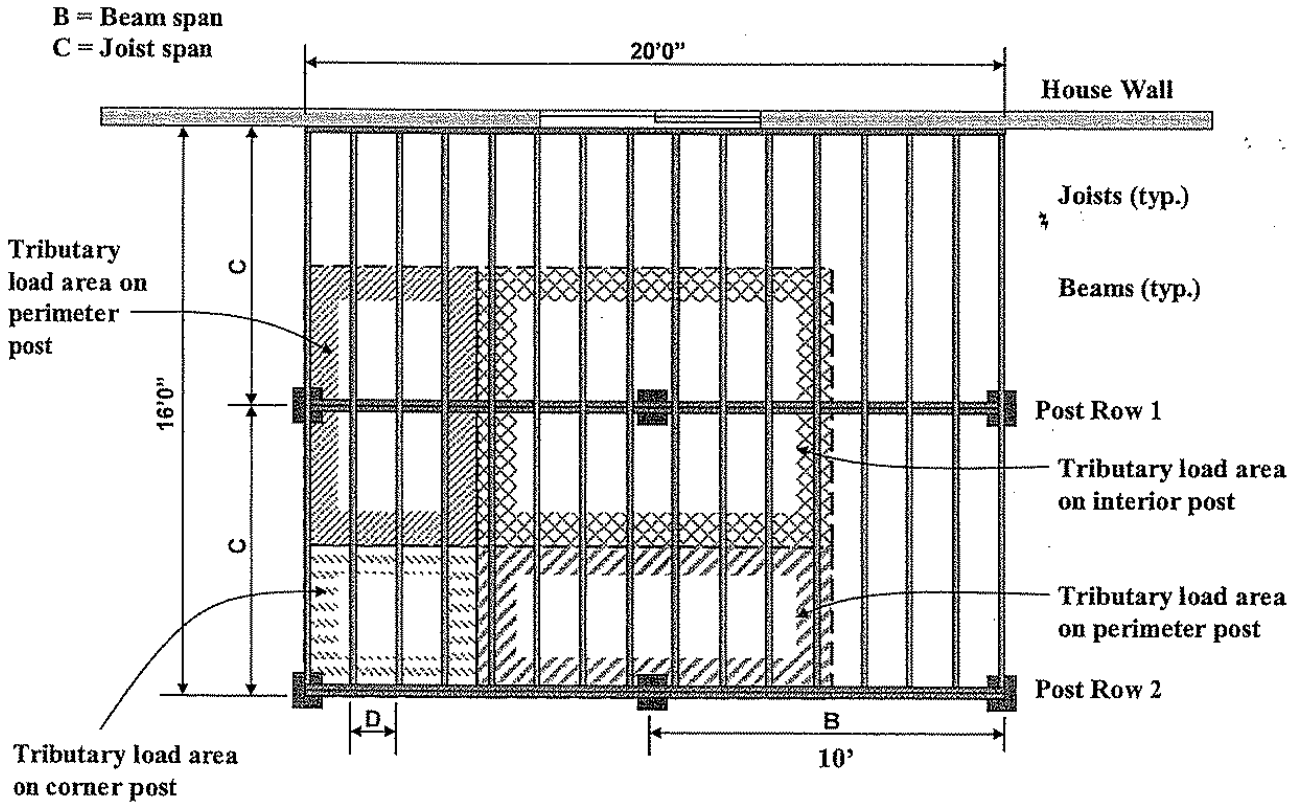
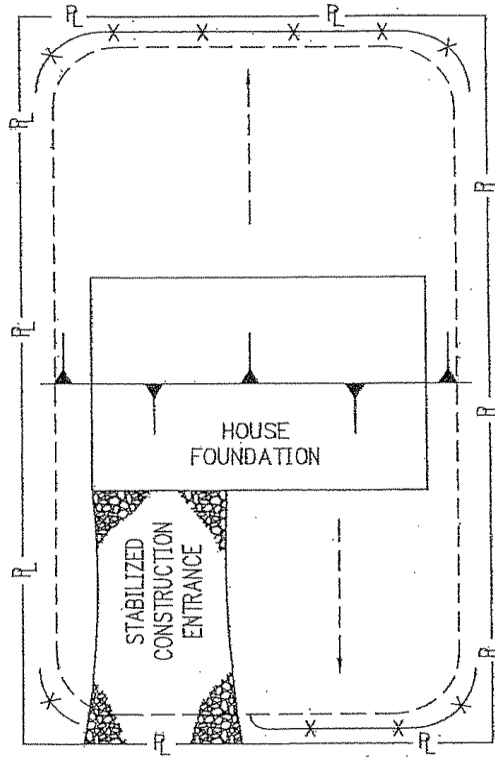


Chart E.

Required size and spacing of corrosion resistant lag screws for attaching deck ledger to house for a given joist span.

On-center spacing of lag screws (inches)					
Lag size	Joist span (feet)				
½" dia. Lag	0-5 ft	6-7 ft	8-10 ft	11-14 ft	15-18 ft
	32" O.C.	24" O.C.	16" O.C.	12" O.C.	8" O.C.
Equivalent spacing joists @ 16" O.C.	Every other joist space	Two every third joist space	Each joist space	Each joist space with two every other space	Two in each joist space
3/8" dia. Lag	0-4 ft	5-6 ft	7-8 ft	9-12 ft	13-18 ft
	24" O.C.	16" O.C.	12" O.C.	8" O.C.	6" O.C.
Equivalent spacing joists @ 16" O.C.	Two every third joist space	Each joist space	Each joist space with two every other space	Two in each joist space	Two each joist space with three every other space

SINGLE FAMILY RESIDENTIAL DRAWING #1



LEGEND:

- P — PROPERTY LINE
- X-X- SEDIMENT BARRIER
- - - LIMITS OF DISTURBANCE
- - -> DIRECTION OF SURFACE WATER RUNOFF
- ▲ TOP OF SLOPE INDICATOR

